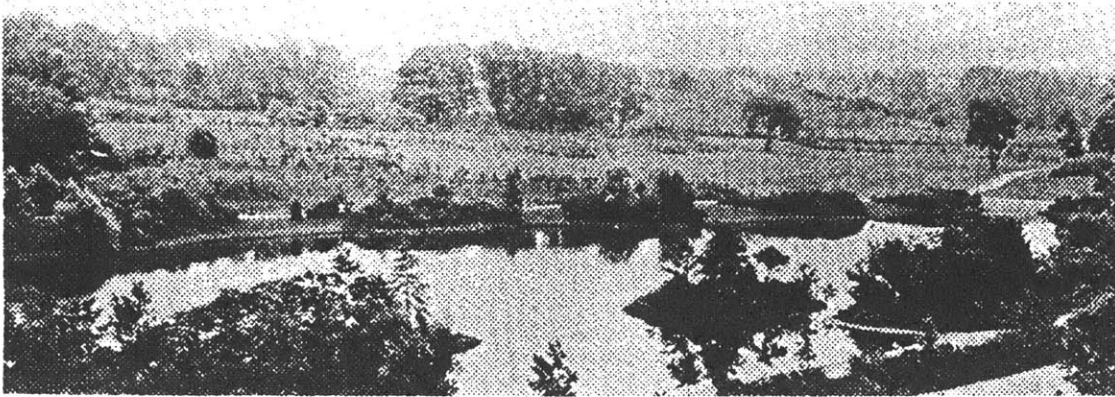


THE ZOO AS URBAN REFUGE

A Transformation of Boston's Franklin Park Zoo



by Patrick C. Jackson
B.A. Political Science,
University of California, Berkeley 1982
Submitted to the Department of Architecture
in partial fulfillment of the requirements for the Degree of
Master of Architecture

at the Massachusetts Institute of Technology February, 1990

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We need another and a wiser and perhaps a more mystical concept of animals. Remote from universal nature and living by complicated artifice, man in civilization surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err, and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours, they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.

Henry Beston, *The Outermost House*

Thesis Abstract

Given the assumption that a zoo can be a useful institution to preserve endangered species, conduct research and educate the public about the complex natural world of which we are a part, how can its use/form be constructed to provide a direct experience of the life of animals and people as interdependent but distinct? Furthermore, how can such a place be integrated into the city to provide the urban culture a sense of the natural world?

Zoos have always created a vision of animals which is part fantasy and part reality. The zoo constructs an image of the world and the relative position of animals and people which tells us something about them, but also something about ourselves and how we should perceive our role in the world at large. This thesis intends to communicate the interdependence and differences of the human and natural worlds through architecture in the zoo experience. The zoo is conceived as a microcosm of our regional environment, a wildlife refuge in which territories for animals and people are defined by the larger order of the designed landscape and are separated by built boundaries which tell the story of the journey from the city into nature, from our world into the animal world, and from a perception of the community of people to a perception of the larger natural community in which we play such a vital role. In movement, the evolutionary change from one world to another is related to an expanding temporal and spatial scale in which particular events and places narrate the distance between the viewer and the viewed.

Thesis Advisor: William L. Porter

Title: Leventhal Professor of Architecture

Head, Department of Architecture



Acknowledgements

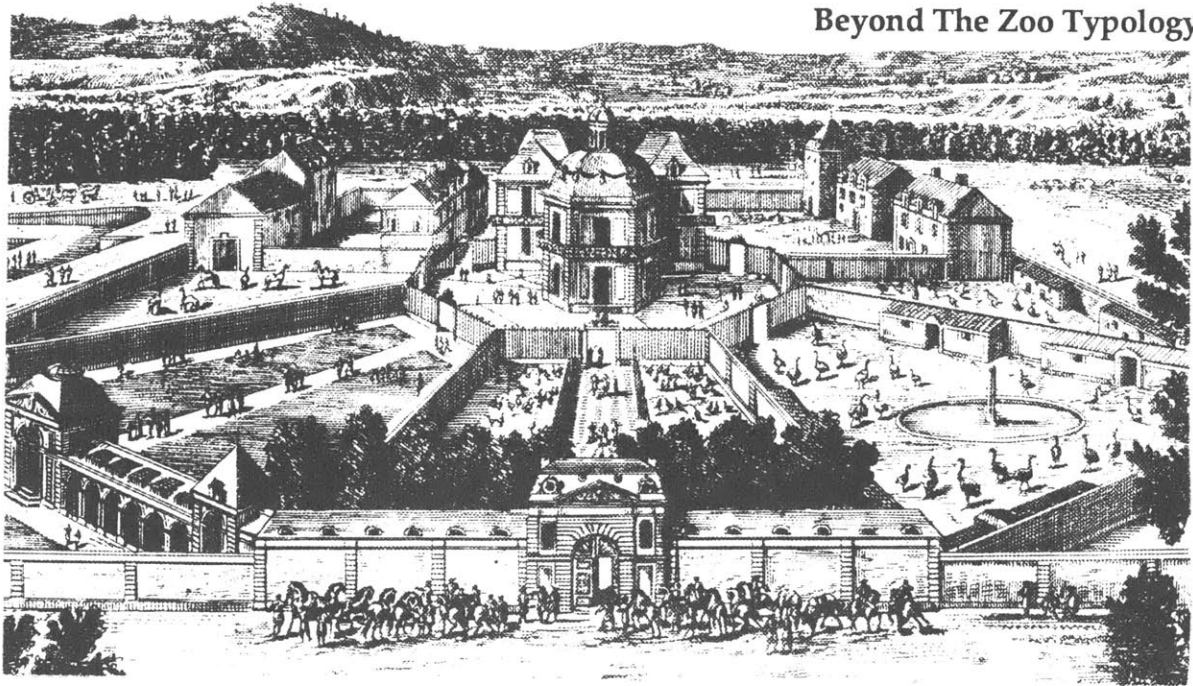
Thanks go to many people for their help in bringing this project together; to Bill Porter for his generosity and insightful commentary, to Rick Epstein for his clarity and support, to Sabina and Shira for their friendship and laughs, to Dennis Frenchman and Michael Singer for their unwavering convictions about both the design and the ethical issues in zoos. Thanks also to my parents for their support, both emotional and financial, which made this program possible for me; and thanks to my sister for her creative wit and writing critiques. Most of all thanks to my wife Kimberly, for her patience and support when I needed it most, and for her understanding .

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Chapter One





Chapter One

A Brief History

Figure 2 Versailles Menagerie,

It would promise us a more serene and confident future if, at the start of our sixth century of residence in America, we began to listen to the land and hear what it says, and know what it can and cannot do.

-Wallace Stegner

Originally, the zoo was a menagerie of wild animals in cages. As early as the 17th century in Europe, and even earlier in ancient China, animals were kept as tokens of the world beyond our own, the wilderness in which man survived as a matter of conquest. The form of these exhibits placed the animals in a position of status architecturally, but only in terms of our own cultural understanding. The exhibits were merely cages in which the form of the cage took some symbolic meaning architecturally (i.e. the lion house as a Palladian villa),

but substituted a building for the real environment of the animal. The organization of exhibits ignored the natural distributions of these animals in their native habitat, again using monumental architectural orders for our culturally bound tastes and ignoring the needs of the animals in the form of the zoo. Thus, the animals were portrayed as novelties or even side show freaks, the objects of ridicule and awe in their captive state.

Concurrent to the cultural interest in bringing the exotic and wild world into captivity during the 17th

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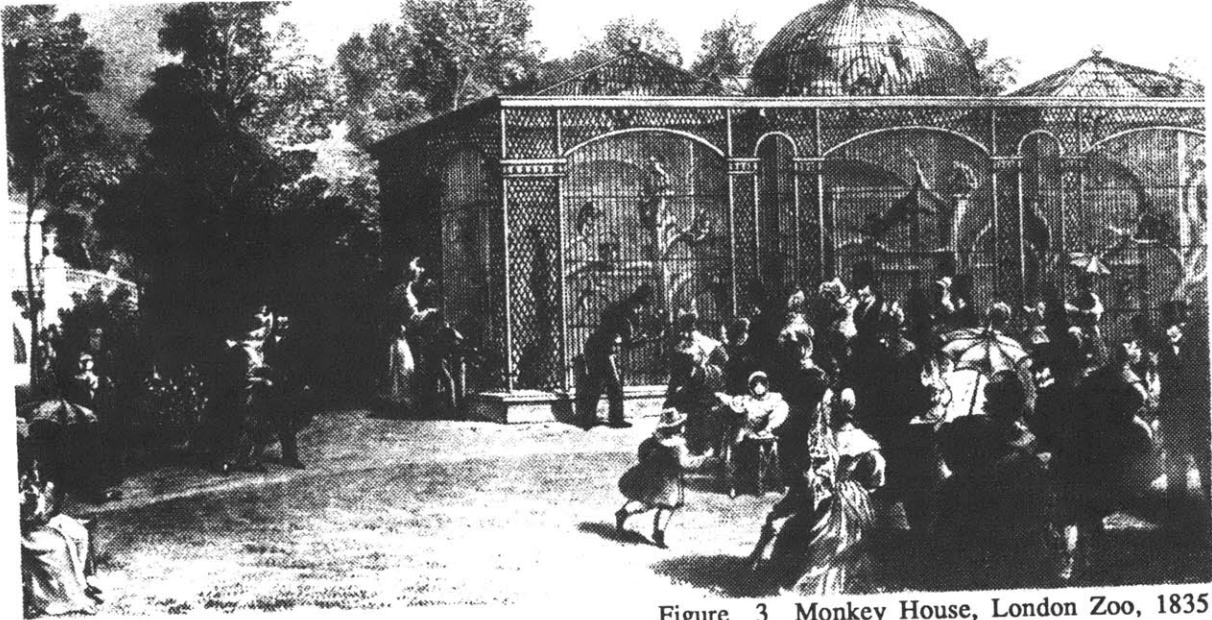


Figure 3 Monkey House, London Zoo, 1835

and 18th centuries, the advent of science accelerated interest in the taking of wild animals for study and education. The design of zoos began to reflect an attitude toward animals which was framed in the Cartesian logic

of the separation of mind and body, and therefore the position of man and animals, which further alienated them from their own world. Thus, animals were placed in taxonomic groups : cats, bears, hoofed browsers, etc. and

isolated from the matrix of species which share their natural habitat. The result was the denial of the animal as a whole being, reducing them to specimens which had certain physical traits, but no connection to the world from which they were taken. This ideology ultimately severed any spiritual connection between man and animal in the zoo, as scientific study rationalized all our understanding of what animals think and how they act, removing the basis for an empathetic relationship between people and the natural world.

As humans have asserted their dominance over the



Figure 4 Primate House, Philadelphia

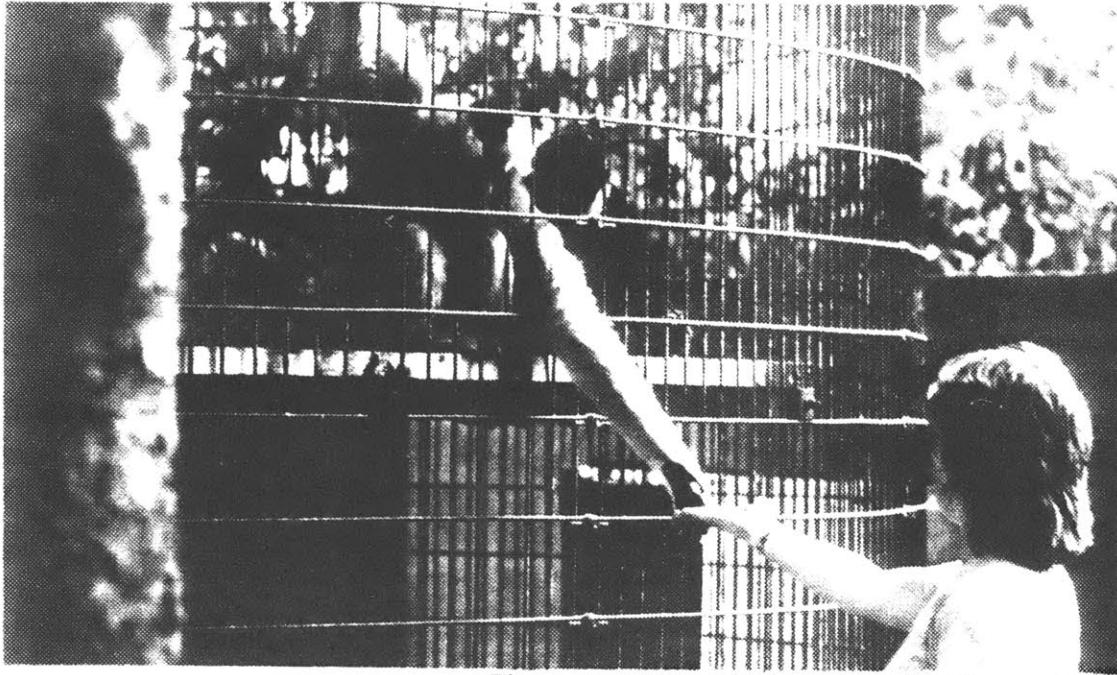


Figure 5 Gibbon, National Zoo, Washington, D. C.

natural world through the progressive elimination of habitats and exploitation of natural resources, the scientific and egocentric attitudes of the 19th century have been slowly replaced by a sense of the loss of "nature" as we perceive it should remain. Consequently, parks, refuges and wilderness areas have been set aside through much of the world in an attempt to capture the sense of nature untouched by humanity. Zoos have evolved into zoological parks or gardens, creating a different kind of experience that seeks to evoke the qualities of worlds which we

have either destroyed or cannot reach. In terms of design, zoos have become a kind of theater of the "real" in which we try to make the animal feel at home and simultaneously make the viewer feel more "immersed" in this built world of nature. The effect is to take some of the escapism or pure fantasy out of the experience in one sense, and replace it with a more educational one which demands a complete sense of the animal's world. Although this is necessarily more deceptive of the true nature of the way in which the place is made (i.e. the rocks are made of concrete and the water is

recirculated), seeing the animal in its own habitat creates a perception of "real" behavior and integrity which makes us feel that the experience is more authentic. When it is designed well, the falseness of the setting as a stage is forgotten and the viewer is transported perceptually into another place, a reality which replaces our own for the duration of the experience. Entire zoos have been devoted to one "bio-habitat" in an effort to make the experience coherent for a particular setting. Thus, one falsehood has replaced another, as the cage has become a sublime

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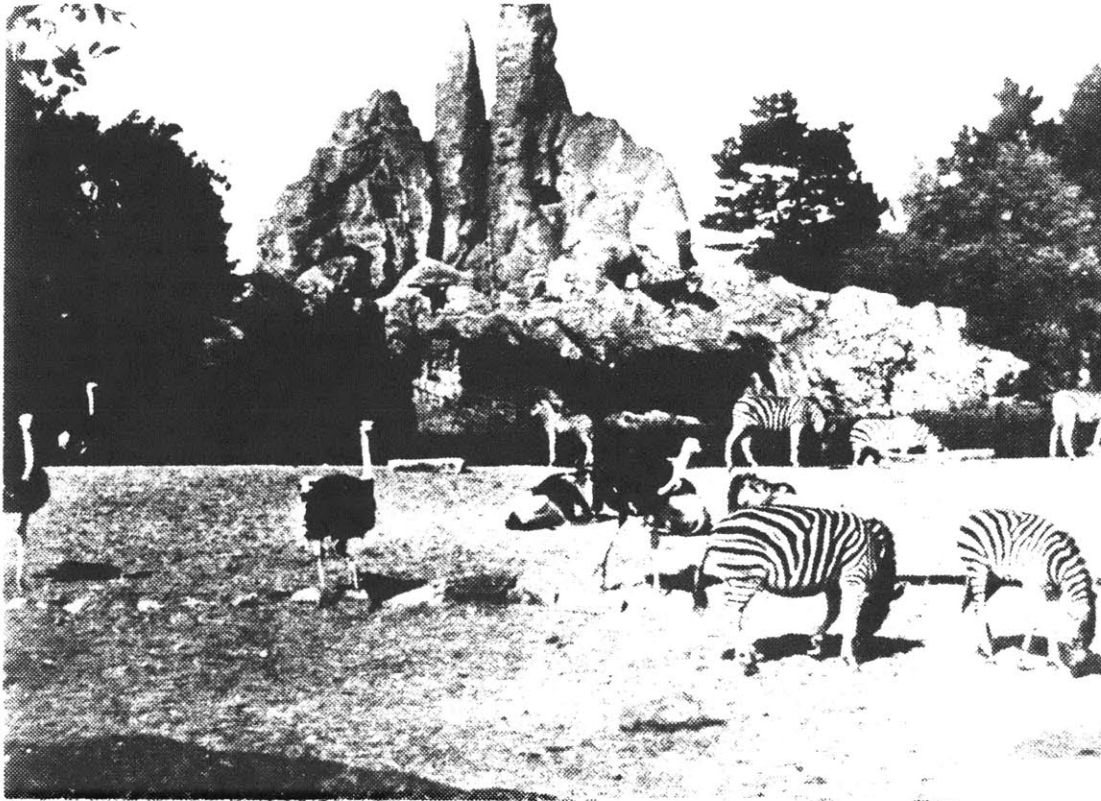
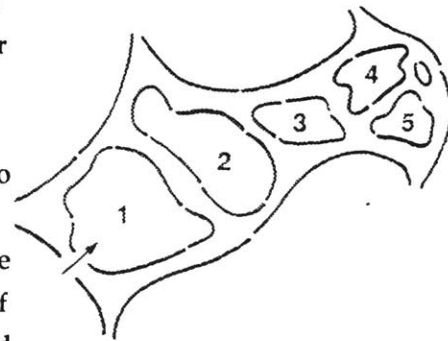


Figure 6 African Exhibit, Hagenbeck Zoo, Hamburg, West Germany

instrument to deceive the viewer (as well as the animal) into an sense of nature which isn't real for the animal or the human, but which contrives a supportive attitude toward the animal world.

In the change from the menagerie to the wild animal park, zoos have become a means for people to have a "real" experience of nature, a kind of encounter which is unattainable in our

daily lives. The realism of exhibit design expresses our concern for the needs of the animals and our interest in their world as it appears to us. But the zoo remains separate from its immediate cultural context, an island of "nature" in the human world which ultimately doesn't promote a deeper spiritual connection between people and animals or between the city and nature.



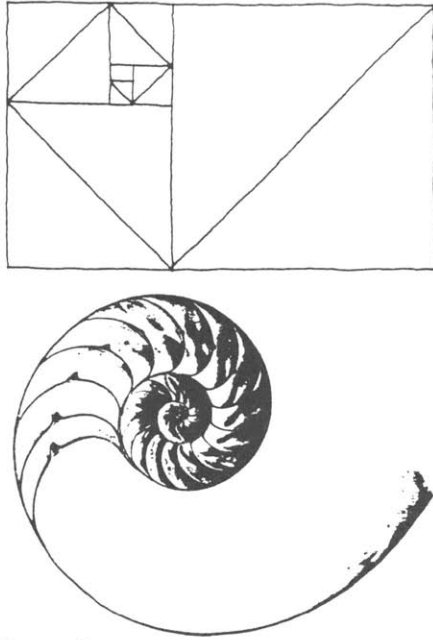


Figure 8 Mathematics, nature and man

Form and Function

The primary function of zoos is twofold. First they are cultural institutions which display animals for our pleasure. Second they are sanctuaries for animals that care and feed them and protect them from the vagaries of a wild existence. Zoos have always separated the experience of the audience from the functional support of the animal populations which live there. Behind the facade of stone or trees which serves as a stage set, a service network is concealed to make the sense of the wild more real. But as we try to make the experience more real, the act of capturing

or holding captive is still denied in the effort to evoke another place. The evolution of zoo design indicates that we want to see not just what the animal is and where it comes from, but also how it eats, how it lives in this place

Beyond The Zoo Typology

of the zoo. In the alliance of design with the perceptual support of animals, we are bringing them into our culture. We are making the support of the animals' needs a cultural value which is reflected in the design. The logical conclusion of this understanding is the zoo as a working environment. The act of holding the animals is therefore acknowledged and expressed as a constraint which is necessary but not obtrusive. And the care and feeding of the animals is part of the public experience, an integrated function in the theater of the zoo. To some degree, these functions are already expressed in the way

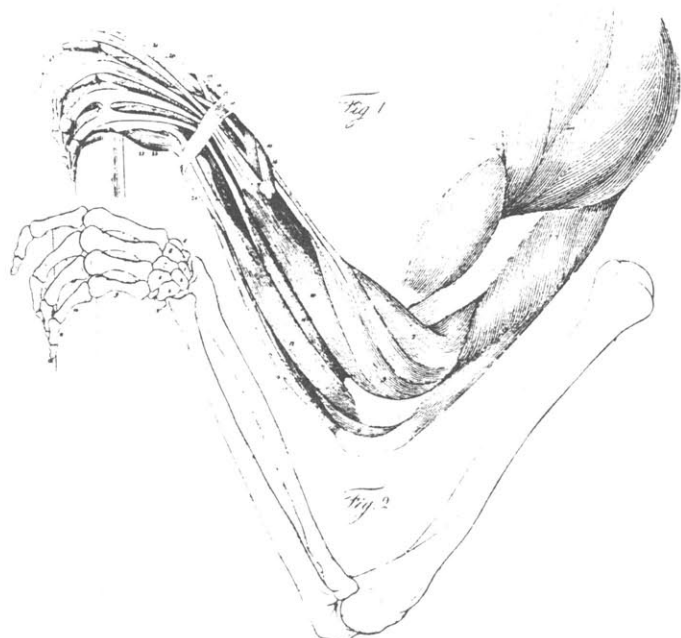


Figure 7 Mathematics, nature and man

Chapter One

that zoos work. Feeding and animal shows provide entertainment, and cages or enclosures are artfully designed to provide evocative views or spaces. But in the design of zoos, attempts are often made to blur the distinction between the built and natural in an effort to connect them. This necessarily removes some of the power of the experience by diluting the separation of the human and animal world. And it alienates the real experience of the animal and the setting from the world around it, making it harder for us to see the zoo in any way connected to a larger world.



Figure 10 Tropic World



Figure 9 African Savannah: Fort Wayne Children's Zoo

The Zoo Experience

The construction of a "real" place for animals implies that the zoo experience now incorporates the needs of animals into our cultural values. Instead of the purely functional support of the animal populations in zoos as a separate issue in their design from the experience to which people are exposed, the two functions are integrated in the

zoo's evolution toward a "working environment". The way that the zoo works becomes explicit to the public and literally connects our cultural interest in the animals with their care and feeding. This increases the interactive qualities of the experience and creates an opportunity for different interactions from day to day. The daily rhythm of

Beyond The Zoo Typology

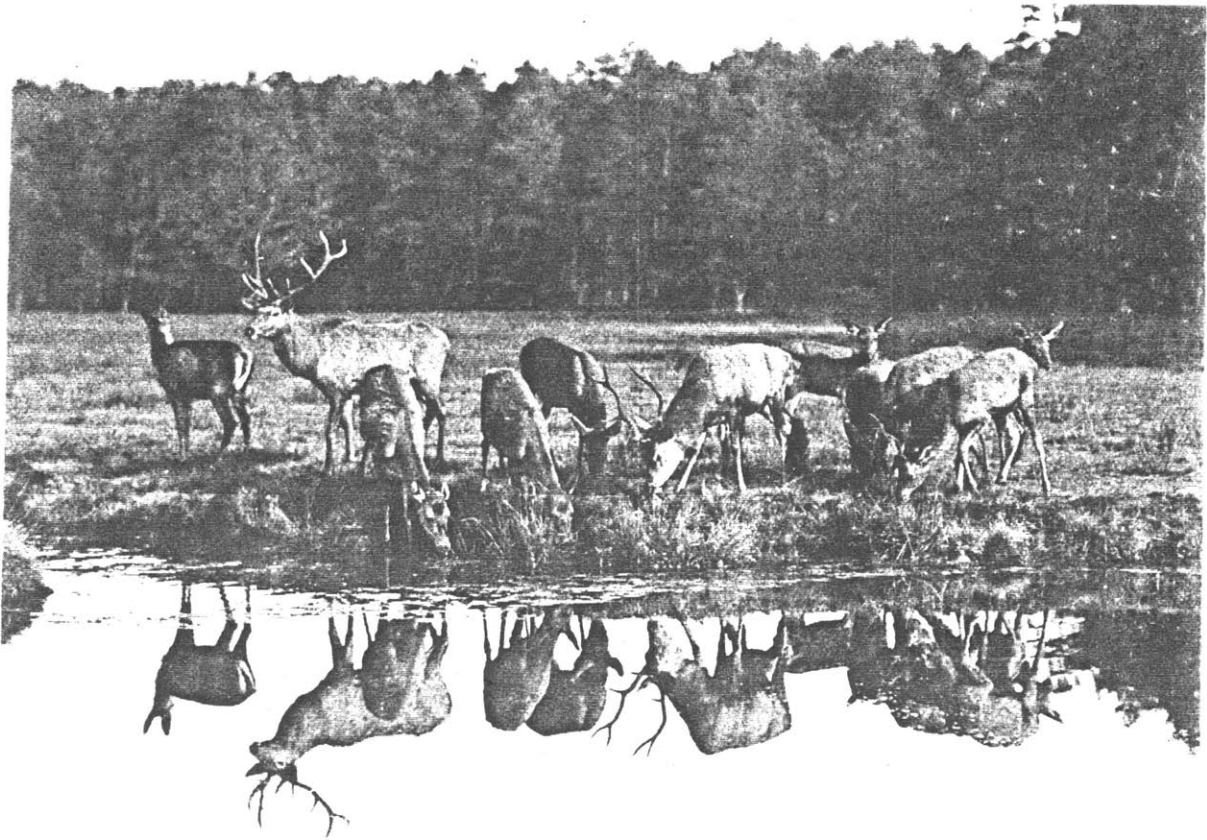


Figure 11 Elk grazing

activities such as feeding and maintaining the grounds is expressed as one regular motif, and the unusual events, a birth or death, an observational study, or the seasonal arrival of migratory birds is expressed as a punctuation that one might witness without knowing beforehand, or that might be announced so that people

could come for that experience alone. Thus, the workings of the zoo are related to the natural cycles of nature and the experience is less about contrived theater, more about viewing the real events of the animals' lives.

The conception of the zoo as a refuge augments this notion with a physical sensibility of the layout and the manner in

which both people and animals move in the zoo according to their particular territories. In a refuge the land is untouched and the animals free to inhabit it as a wild territory. As such, many of the territories overlap as animals generally assert their territoriality only with those animals that compete for food or mates. The land is an open

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Figure 12 The Country Park: View across Nazingdale

palette within which the animals find their place. From one part of the refuge to another, depending on the scale, the climate or ecological system changes in an evolutionary way, one territory giving way to another in an incremental shift that creates local conditions suited for different animals and plants.

In the design of a zoo, the evolutionary changes from exhibit to exhibit, from climate to climate, are contrived in the condensation and dramatization of landscape features and constrained territorial limits for larger animals. The sense of a refuge as real wilderness is replaced by a constructed

vision of a "real wilderness". Actual changes of both climate and habitat are interpreted in a microcosm, and a sense of the larger geographical order is created in movement through the landscape. The refuge as a place operates at a local scale, as most refuges do not encompass more than two or three climates. In making the zoo, this aspect has

implication for the scope and number of territories that are created, as well as their adjacency and sequential order. It also implies that the reality of the zoo is more grounded in the place in which it is located. Refuges are established to protect local animals and plants in their native habitat. They capture and preserve a piece of nature in its untouched

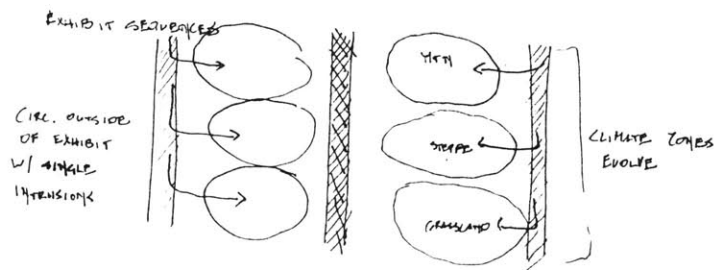


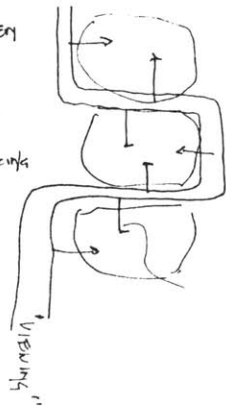


Figure 13 African Exhibit Panorama, Hagenbeck Zoo



Figure 14 Axis Deer and Blackbuck, Indian Exhibit

CIRC. BETWEEN
EXHIBITS
W/ MULTIPLE
ALT. ROUTES
FOR VIEWING
EXPERIENCING



form. In the effort to be more "real", the zoo can emulate that same quality, capturing a sense of nature which is local and particular, and even undramatic, while maintaining the sense of a world in miniature.

The refuge concept also defines the separation of animals and people. As in nature, the territories of each

Beyond The Zoo Typology

are fluid and overlapping, an open system which only separates predator from prey, and large or belligerent animals from public access. Also, animals from a particular habitat are prevented from moving into another habitat which is unsafe or unlikely in the natural state. Thus, the zoo expresses capturing the animals as an explicitly built boundary where people move through the zoo, and separates the animals where necessary using natural boundaries such as water, cliffs, or moats (predator-prey or inter-habitat). Territories for each animal interact with others of their natural setting and where possible, are mixed to promote a real sense of their world. Predator and prey could interact in some instances, with safeguards of the prey controlling the interaction with an escape mechanism that involves their natural abilities over those of the predator. As in nature, the possibility of an animal being killed by another exists, but is dependent on the natural defenses of each animal being

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maintained, unlike conventional zoos. Finally, the zoo as a refuge implies a kind of experience which preserves the integrity of animals and people as separate and yet connected in the larger order of nature. Through the sequence of spaces and path networks, people are able to see animals in their setting through oblique and often indirect ways, perspectives which offer glimpses into the world of the animal and its



Figure 15 Deer



Figure 16 Chimpanzee Exhibit: North Carolina Zoo

Beyond The Zoo Typology



The Working Environment In The City

The zoo as support for the animal world in the form of a refuge, as a working model of our interaction with nature, ties into our world at several levels. First, as an institution, the zoo becomes a conference center for conservation groups and animal behavior research, providing an educational aspect to the public experience, and a strong base for these groups to communicate the conservation and research issues of the day. Permanent facilities for such organizations as the Audubon Society, the National Zoological Society, The Sierra Club, or The Nature Conservancy are provided to create a regional center for the coordination of efforts to preserve natural areas or to study animals in their habitats. A medical facility provides care for resident animals and for victims of natural or man-instigated injuries. These functions are



Figure 17 Beaver Dam, Idaho

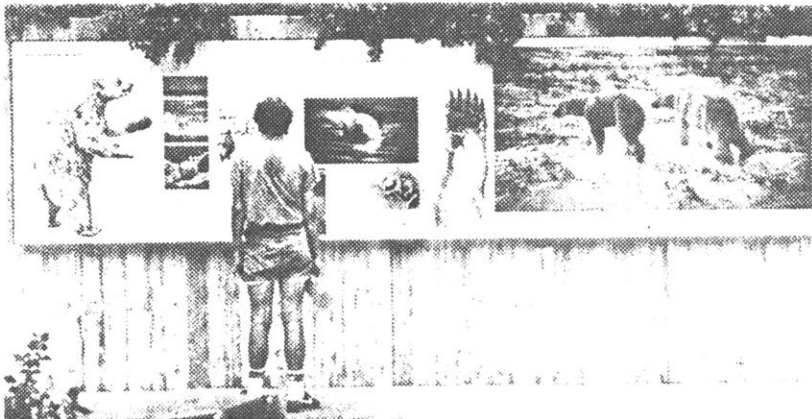


Figure 18 Interpretation/Graphic displays: Lincoln Park Zoo

daily life without exposing its entire territory. Thus, the animal's privacy is asserted and the opportunity to see it depends on its daily patterns of use of space. Views of the territory are limited and the animal's shelter, whether a cave, a den or a thicket of trees is not visible. The indirectness of the view

diminishes as one moves away from the city and our world into another place which is different yet embedded in a present and local sense of the larger natural world, and the size and length of views increase until the entire landscape is perceptible.

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part of a semi-public experience through organized tours aimed at educating school groups or interested individuals and are part of the regular cycle of events in the zoo. Second, the zoo is conceived as a resource for the community of the city and its immediate vicinity in the perceived need for people in the urban environment to experience nature as a part of their lives. The zoo as an experience which stimulates an individual interpretation of nature within a framework of a conservation-oriented position can heighten people's awareness of the dynamic qualities of the natural world and their part in its protection. Also, the individual is made aware of the larger urban and regional community to which he/she belongs in the explicit educational intent of the zoo. Third, the zoo is considered to be integrated with its immediate context, not separated by an economic or spatial barrier from the public. As an open system, the zoo brings the territory of the city in as a public "street" to engage the local people with



Figure 19 Freshwater marsh

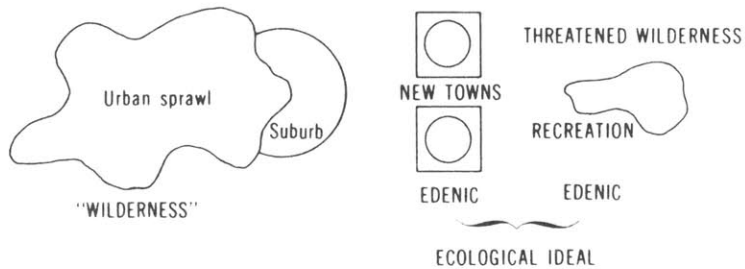


Figure 20

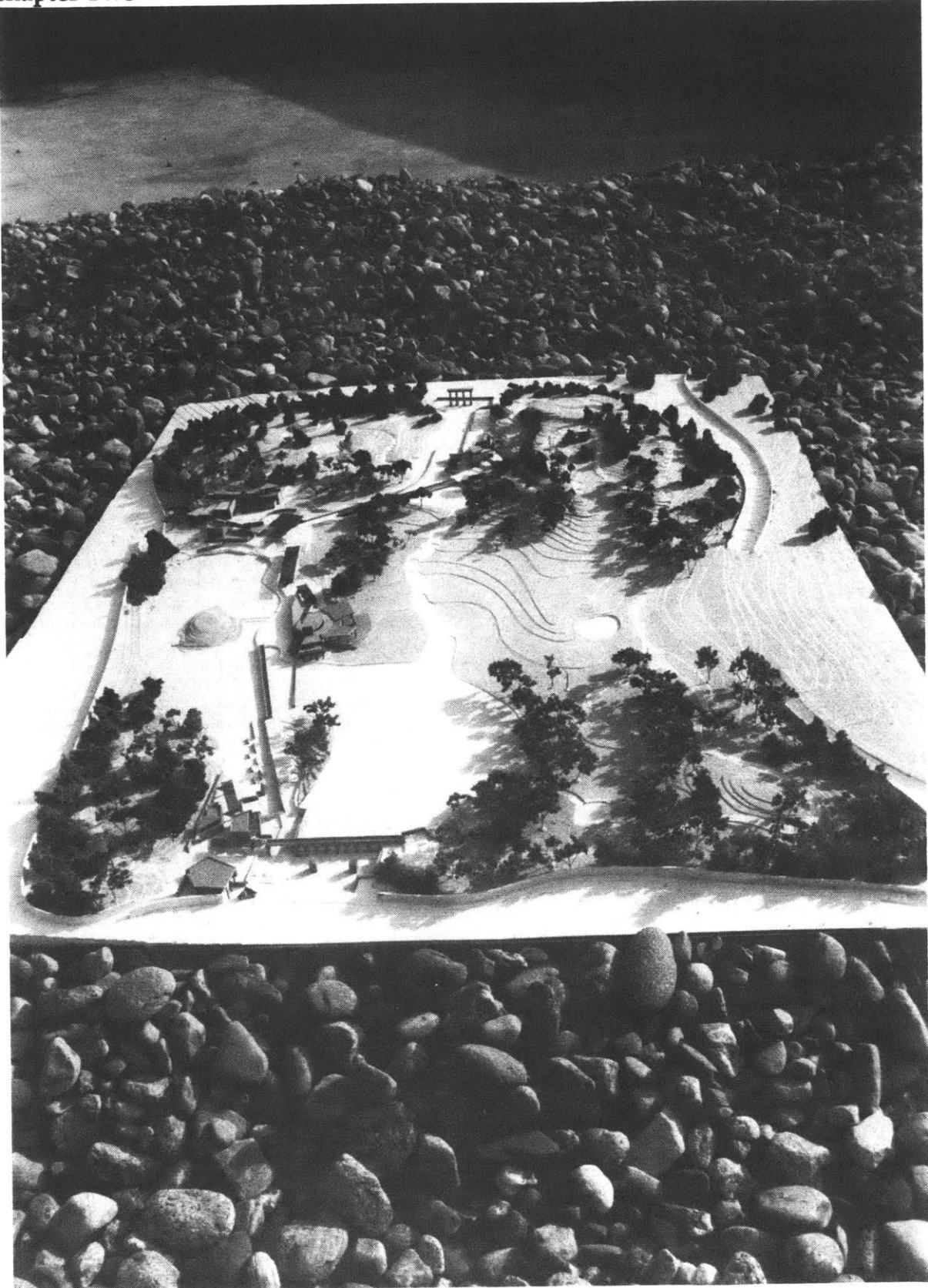
the use of natural space and provide an urban link between one side of the zoo and the other. The zoo is not an island, but an extension of the larger natural world into the city, with a reciprocal relationship of our definition of public use and a "natural" one for animals. The zoo also provides an economic base for the local community, as a source of jobs and increased

business activity by those who visit the zoo. The increased social interaction of the neighborhood with the larger urban culture would again promote communication between people of different backgrounds, and could help to integrate the social identity of the city with the region, and ultimately, the natural environment which is shared by all.



Figure 21 The Erechtheum

Chapter Two



Chapter Two

Journey From The City

As you leave the heart of Boston, with its concentric-ringed streets and walls of brick and wrought iron, its overlay of landfill, cobbles and asphalt, and the new towers which rest on the bedrock below, a series of avenues radiate outward, anchoring the peninsular city to the towns it spawned during the 1800's. Originally, just one of these avenues connected the city to the mainland via the Boston Neck. Orange street, or Washington street today, starts from the center of Boston's commercial district and follows the old shoreline through neighborhoods in various states of decay, revealing the development of the "streetcar suburbs" as the city reached out into the land to draw its resources for support. Many of these areas are built on landfill, the hills and drumlins cut and levelled to provide solid ground over the mudflats and bogs that



Figure 22 The Acropolis

surrounded the old city. As you continue on Washington street, it begins to rise and turn with the land, as the rock which supported the Laurentide ice sheet asserts its worn and durable crown. The ground is alternately rich with peat and humus and then sandy, with pockets of gravel and rock smoothed by the glacier and deposited in bands or small hillocks. The buildings here are newer and sit in the landscape, resting on the rock and soil where it is possible. They seem closer to the land, forced to

acknowledge its presence.

The street begins to climb a large, more deeply set hill and then skirts around it, offering a glimpse of thick foliage and rocky outcrops as it passes on, dropping into the valley alongside and following the old rail system. Although the crest of the hill is not visible, the trees and rocks signal that the territory of the city has not run over this place, that the order of nature is intact here. Moving away from the old road, you climb into the park.

Chapter Two

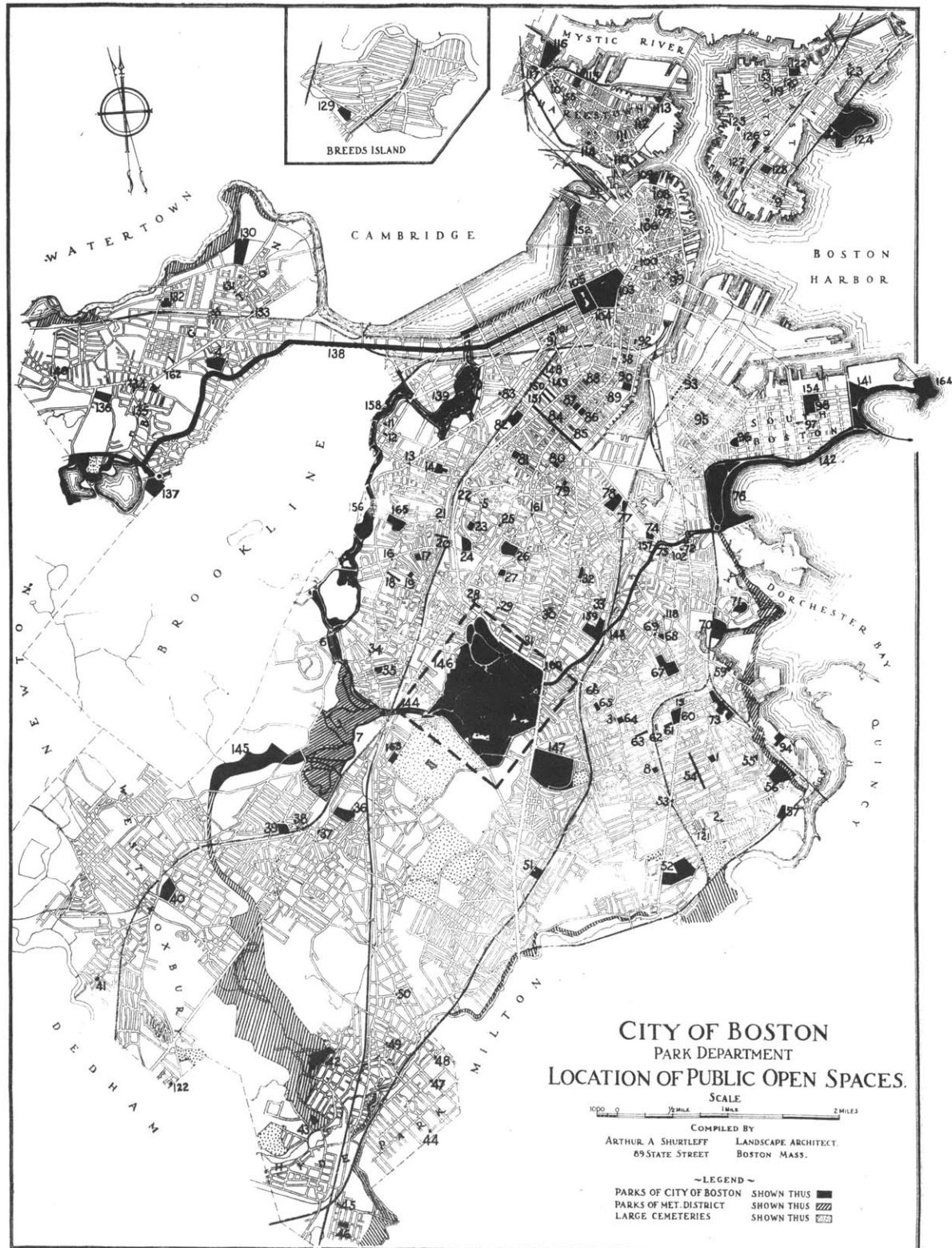


Figure 23 Map of Boston



Figure 24 Woodland path in Franklin Park, 1895

The Park

Franklin Park is the largest in a series of natural areas in Boston protected from development in the late 19th century. The land is generally open, rolling fields with heavily forested areas around its perimeter. The ancient glaciers left the area a relatively flat and deep layer of small till (rounded rock), with a few prominent bedrock planes surviving as rounded

granitic hills and outcrops.

The till mixed with ocean silt to form a metamorphic conglomerate that has since been exhumed in faulting due to more recent glacial episodes. Thus, the land undulates and hills and valleys are less the result of erosion than of the scouring and deposition of the passing glaciers.

In Frederick Law Olmsted's design for the

The Site Design



Figure 25

park, he conceived the experience of a rural landscape as an important facet in city life, thereby preserving much of its natural form and vegetation.

"Relieved of a few houses, causeways and fences, left with an unbroken surface of turf and secluded by woods and hillsides, this would at once supply a singularly complete and perfect, though limited example of a type of scenery which is perhaps the most soothing in its influence on mankind of any presented in nature."

He divided the park into different kinds of experiences of nature; The Country, The Wilderness and The Playstead were defined by

Chapter Two



paths and roadways or by the change from a meadow to a wooded area. At the crest of the hill, the "Ante-Park" was designed as a formal axial promenade which was the entry to the park from the adjoining residential area and the major routes from the city. Here is where the zoo was placed, with the enclosures relating directly to the axis at the entrance, and then breaking away into the landscape as the promenade became a wandering path through "low crouch woods". The animals were kept in classically decorated buildings and elegant wrought iron cages, part of a cultural experience of nature and nature in the Victorian era.

Olmsted's original design is partially intact today,

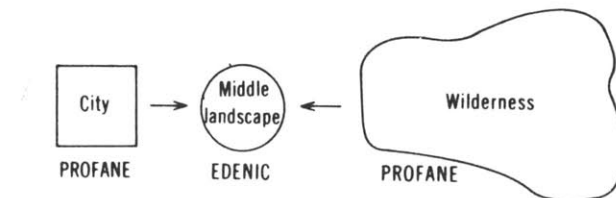


Figure 26

The ideal of the "Middle Landscape"

although only one of the buildings is still in use. Through the past century, the zoo has eliminated many exhibits for lack of funds or cruelty to the animals, and its extent has been reduced to the original promenade and adjacent grounds, some 85 acres. The zoo has also adopted a paid admission policy, eliminating Olmsted's through access into the park. Thus, the land is neither used by the public nor by animals, and is maintained as an isolated expanse of

lawn. Like the zoo, the neighborhood around it has been ravaged by violence and disinvestment. Large, multi-unit housing projects 2-3 blocks deep have been built over the old single family neighborhood, and burned out buildings or foundations occupy many of the lots adjacent to the zoo. In spite of the problems of drug violence and poverty, some area residents use the streets and public spaces of the park, where possible.

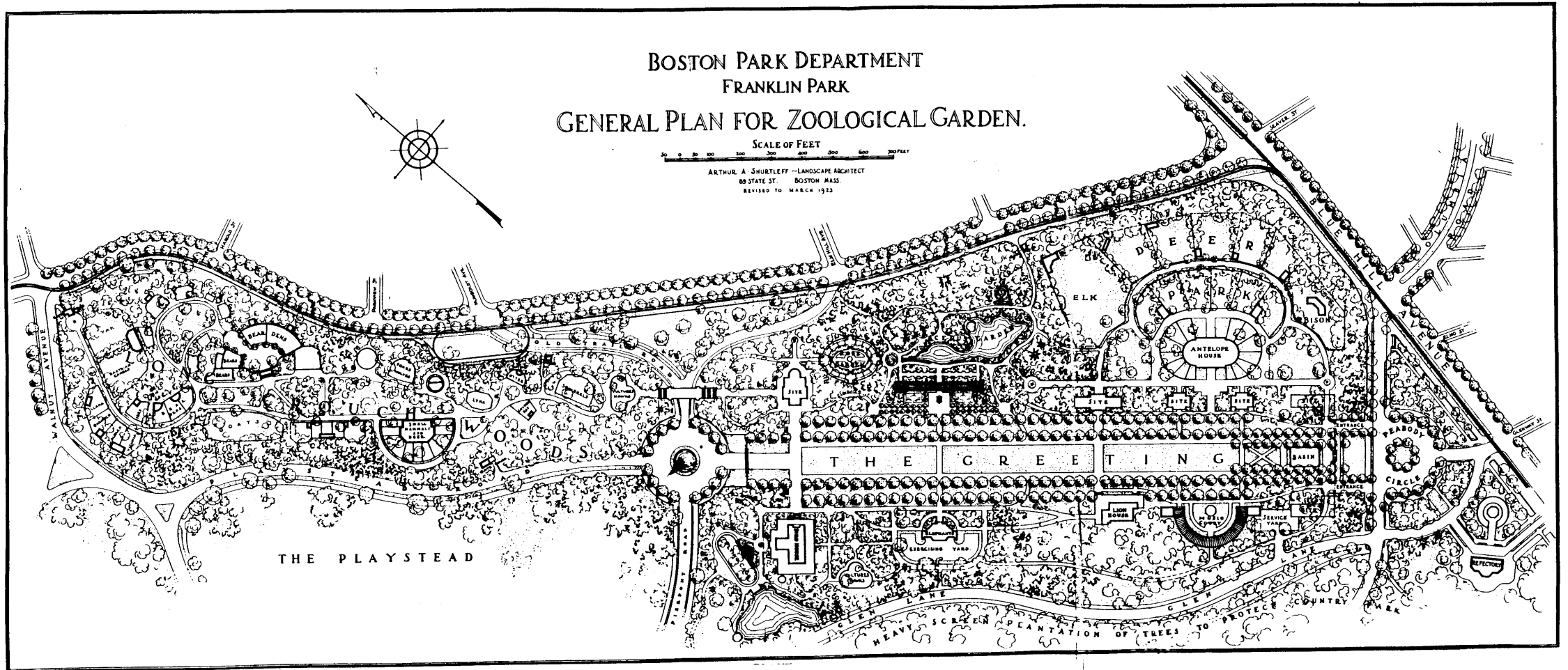


Figure 27



The Site Design

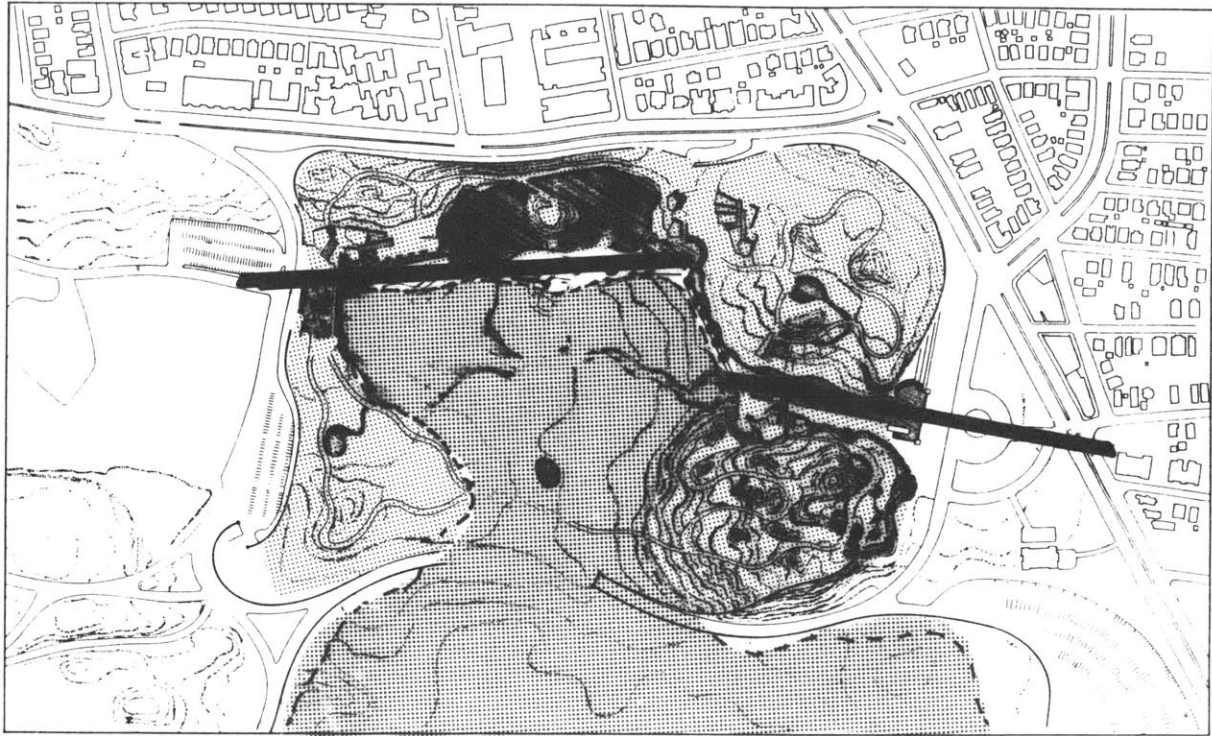


The Refuge

In the new design for the zoo, the whole extent of the eastern part of Franklin Park is set aside as a refuge for indigenous, non-predatory animals. The zoo is conceived as an extension of the refuge and is connected by a land bridge over a road which bisects the park. The refuge is protected from the city by a

stone wall around its perimeter, and by the zoo, which offers the public limited access into the area. The zoo responds to the needs of the city as well, and our built interpretation of public space as the street in the extension of a large public pedestrian way through the site and into the park.

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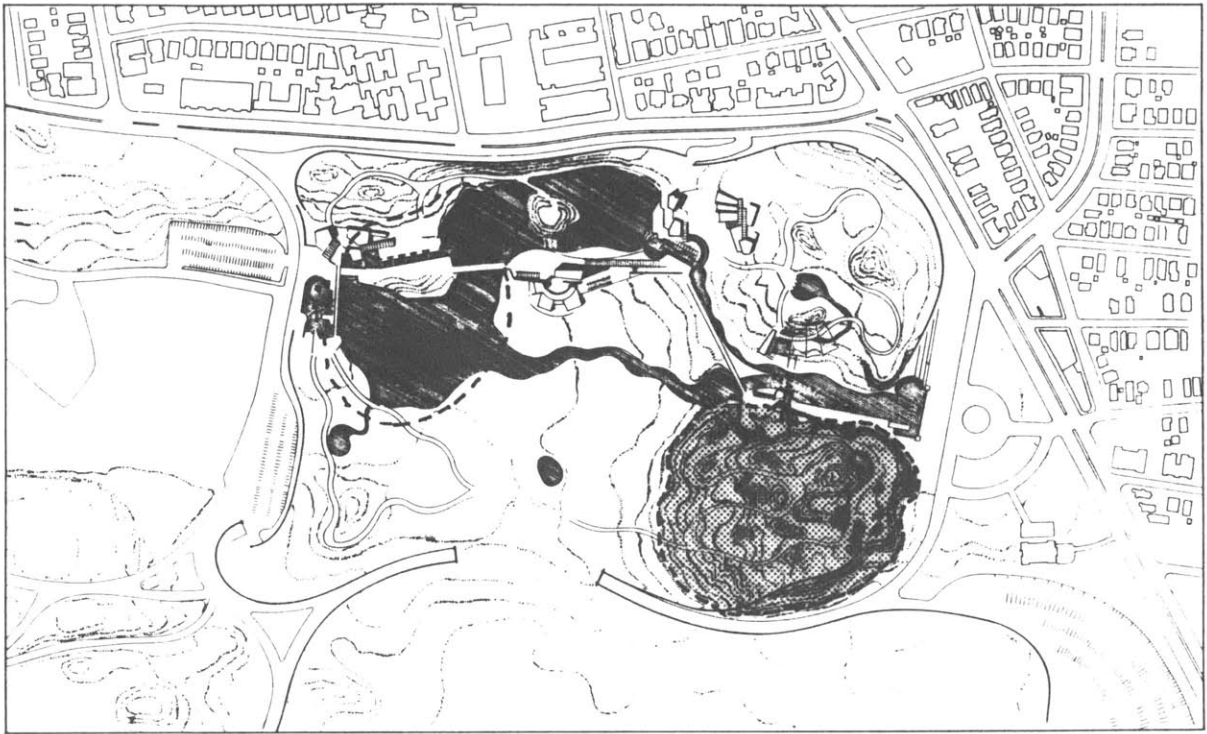
Primary Definitions:

The Refuge in the Zoo

With the extension of the refuge into the zoo, the original promenade axis is displaced, and the area in the center of the site is reserved for the range animals in the larger refuge such as deer, elk, antelope and bison, as well as for birds and small mammals. Three zones of use

are thereby created; one for animals exclusively- the refuge, one for animals and people- the zoo, and one for people exclusively- the pedestrian way. The refuge area is left as an open plain, with a visual connection to the larger landscape stretching to the horizon.

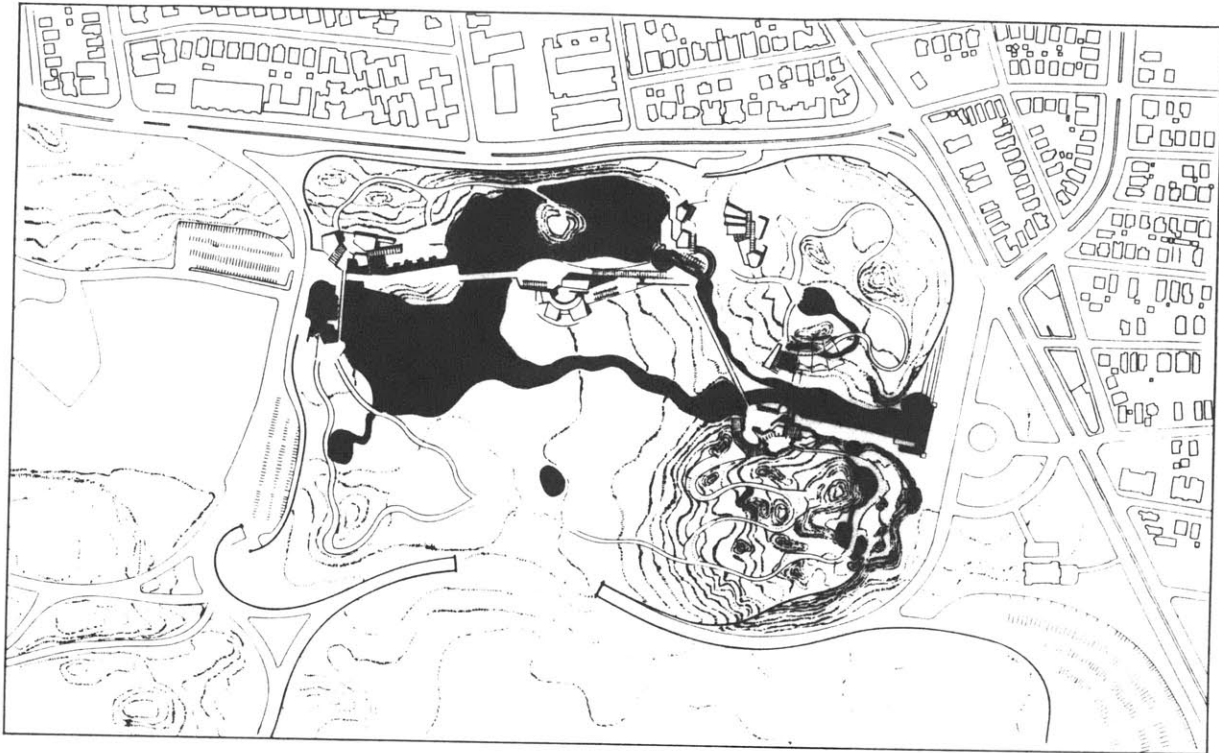
The Site Design



Built Landscape

Most of the natural landscape is left untouched, and the existing contours direct the design responses at both the landscape and building scale. The base level of the site at the northwest corner generates a lake, and a small hill on the southwest corner is enlarged to create a mountainous terrain.

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Water

Water is used as a symbolic element as well as a spatial boundary between different uses. A gentle gradient through the site (15 feet in 2500) generates water flow from the East entry to the lake in the refuge. A recirculating system provides pressurized water for fire protection and a fountain at the east entry. Each of the four areas of the zoo are related to water in a secondary system for use in the habitats.

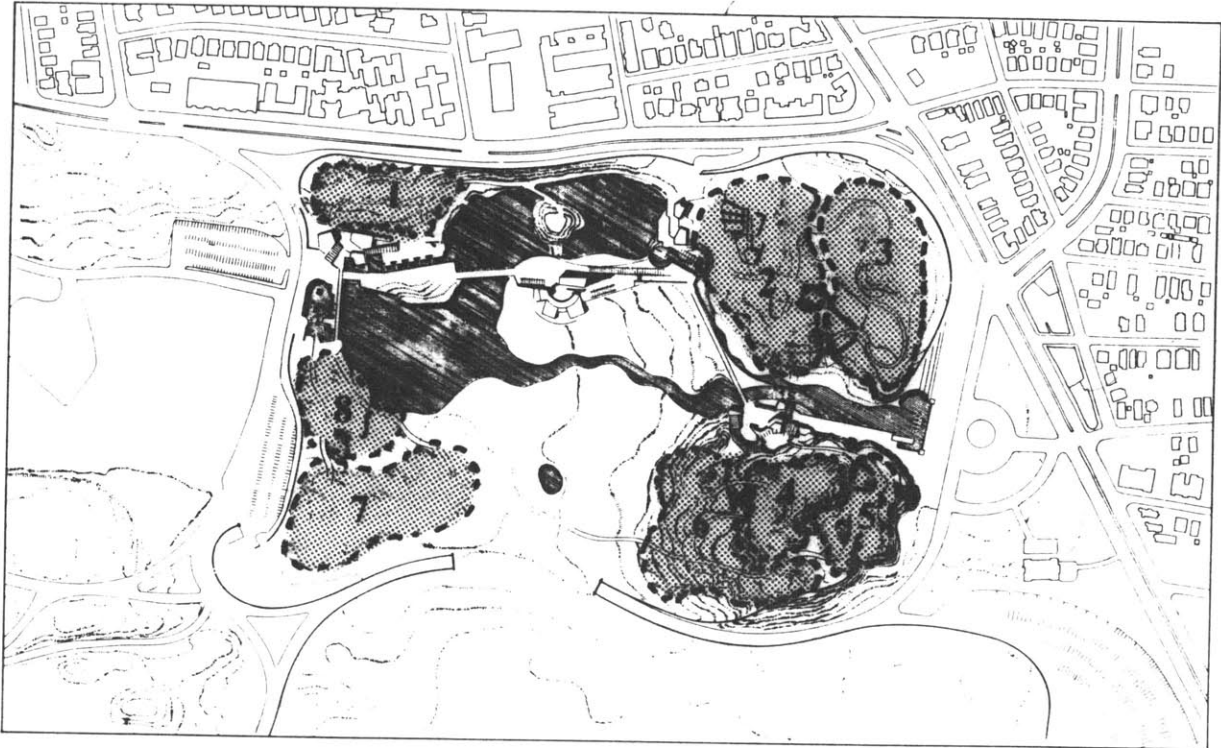
The Site Design



Climatic Regions

Adapting to the existing topography, the zoo is divided into three principal climatic regions: The Midlatitude Forest/Wetland, Grassland/Steppe, and Northern Forest/Mountain. The scope of species of animals in the zoo is defined by these regions as they are found in North America. Thus, the animals in the zoo are indigenous to the extent that Boston's climate shares attributes of both sub-arctic and midlatitude regions through the changing seasons.

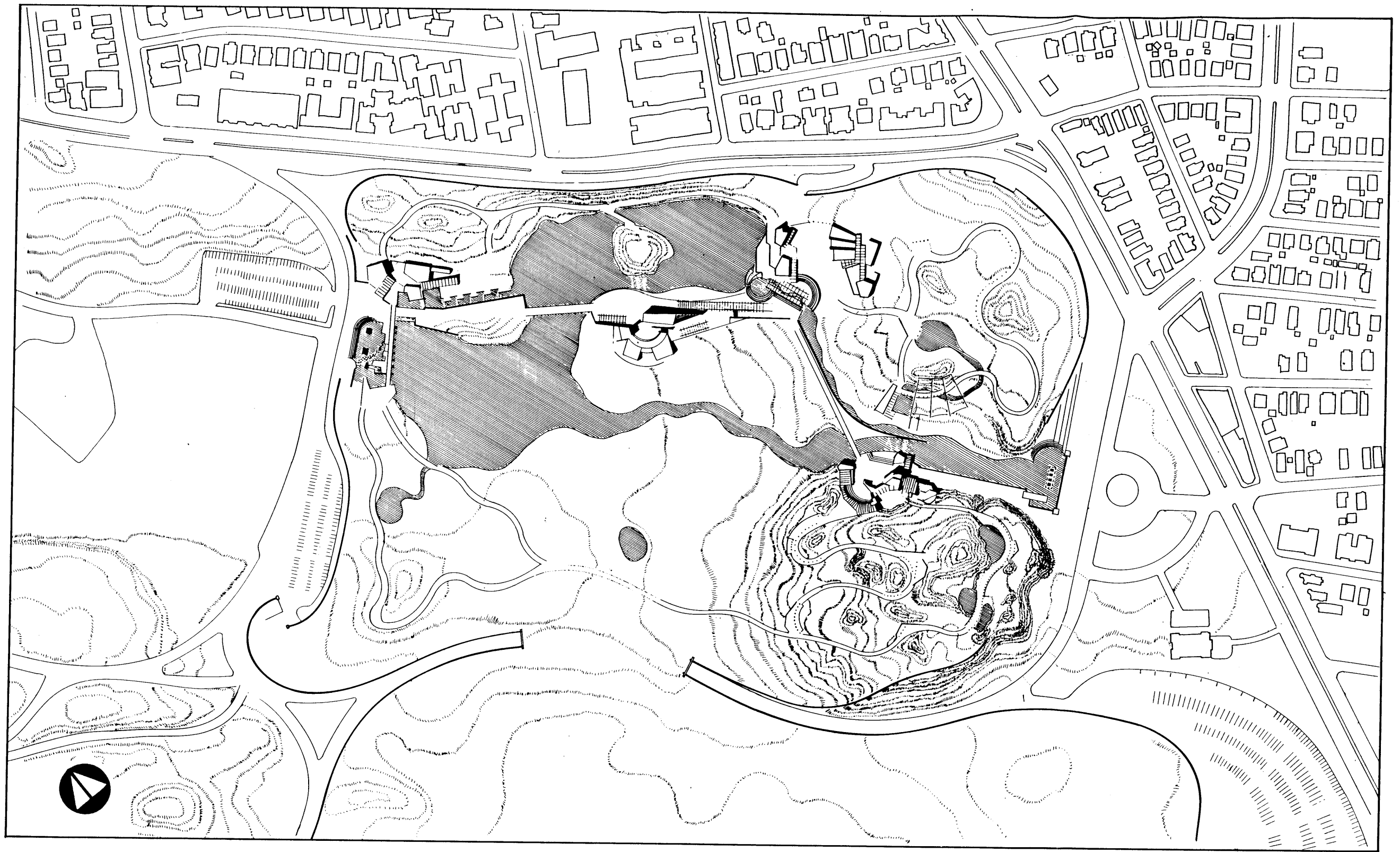
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Climate/Habitat

Within the larger regional definition of climates, individual habitats form an evolutionary sequence to provide the participants with a sense of larger geographical relationships between climates in North America.

- 1 The Pine Barrens
- 2 Eastern Hardwood Forest
- 3 Canadian Taiga Forest
- 4 Western Mountain Plateau
- 5 Alaskan Tundra
- 6 Midwestern Steppes
- 7 Lowland Hardwood Forest
- 8 Northeastern Wetland



SITE PLAN



The Site Design



Public And Zoo Access

The public way through the site allows unmediated access during the daylight hours. Views from the path are limited by screens of trees and no direct views of the refuge are offered except at the rooftop observation deck of the conference center. The

zoo access consists of four discreet loops which can be experienced in any sequence. Access across the public way is achieved with a bridge at the West Entry and a tunnel at the East Entry, and access across the refuge is possible on a footpath.

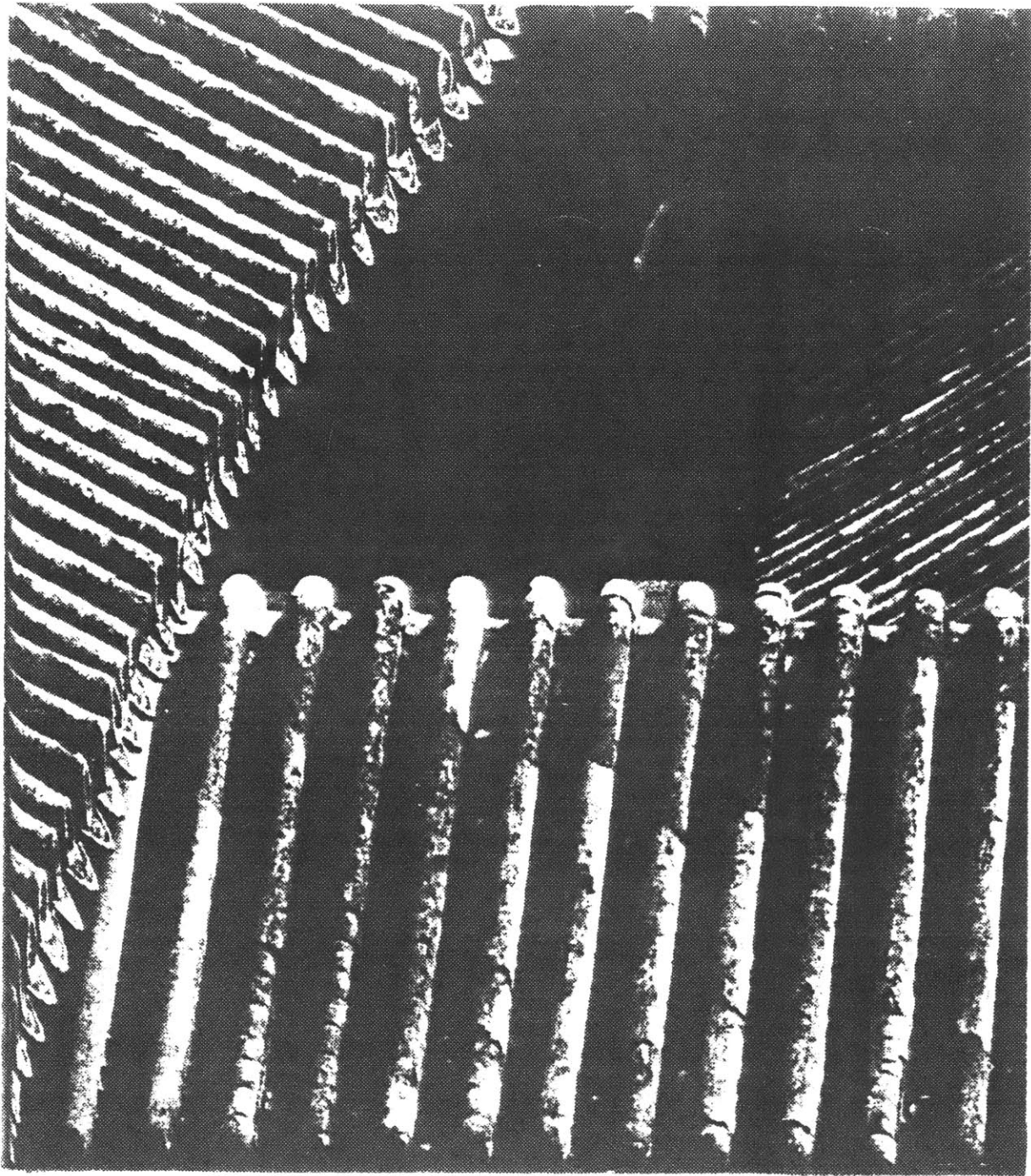
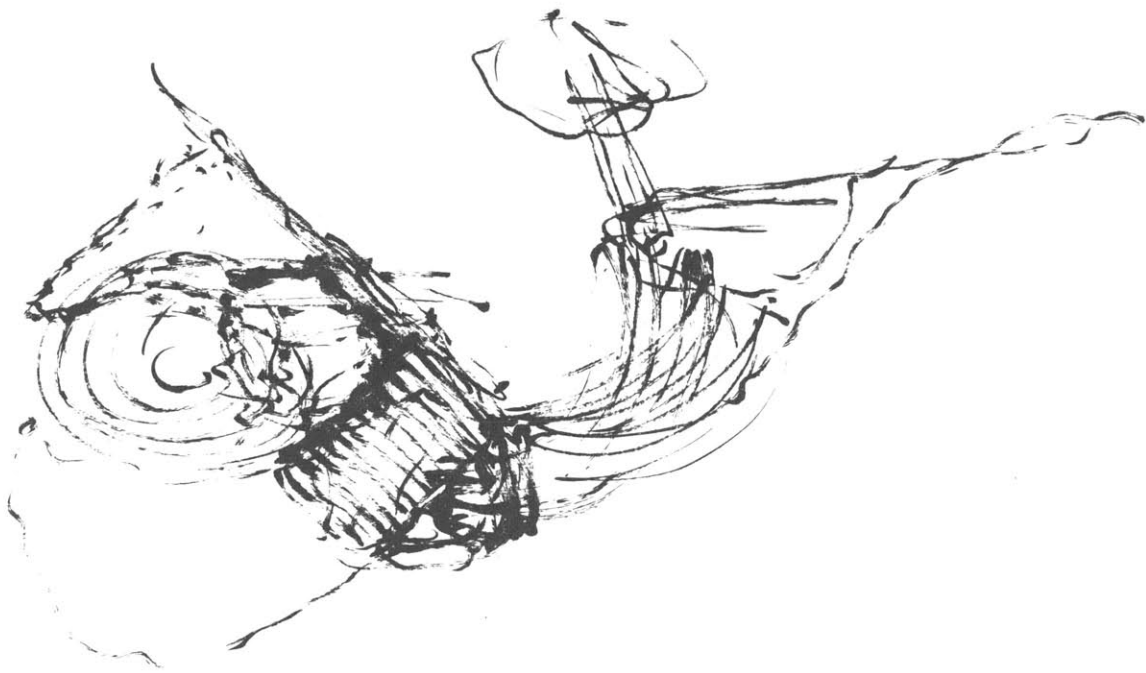


Figure 28 Tile Roof



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Movement

As opposed to a classically designed zoo, where the animal territories are fixed and the sense of stasis in their captivity limits the experience, the zoo as a refuge emphasizes the fluidity of territories and change through time. People are exposed to the animals and their habitat as a dynamic world in which the natural rhythm of life is intact, insofar as possible.

In the three primary zones of the refuge, the zoo, and the public path, the refuge and path are mutually exclusive territories in which movement and interaction are free. In the zoo these two territories contact as the captivating and captive space, each separate but immersed in the other, and in a sense interdependent. The paths of the zoo are extensions of our territory and our sense of movement, and the zoo



Figure 29

Chapter Three

exhibits are extensions of the animals' territories, both perceptually and literally.

The experience of the zoo is of course based on movement through the land and the changing views of animals as they inhabit it. In the dynamic of moving observer and moving observed, the sense of fluidity is heightened and the observer becomes a part of the drama, one of the observed along with the animals. Where enclosure is provided, the landscape generates the boundary either as a natural one, a cliff, a watercourse, or a ravine, or determines its placement and extent as a built intervention. In this way, the ambiguity of who is captive and who is captor becomes a part of the experience, reinforcing the sense of dynamism of the natural places of the zoo.

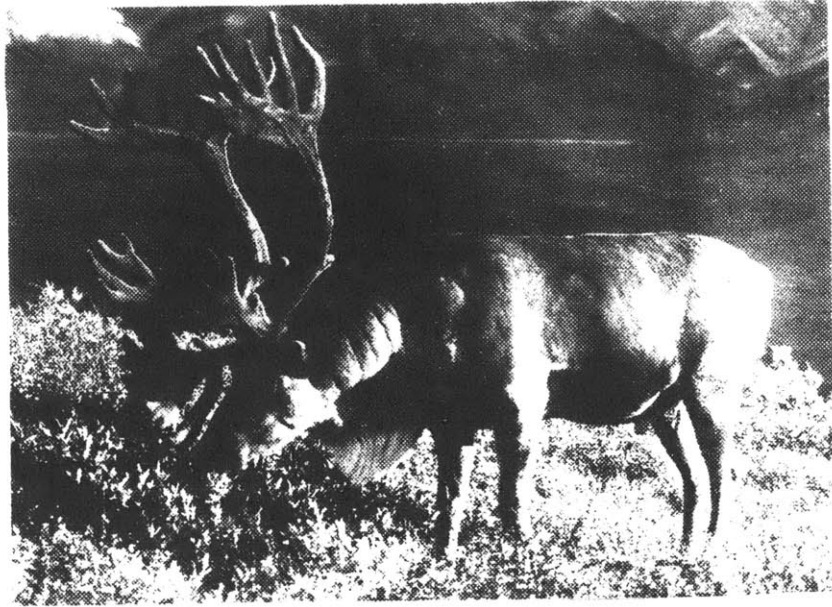
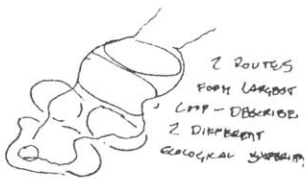
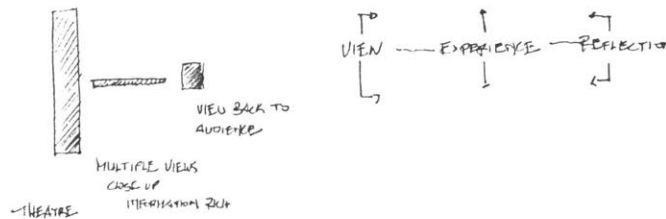


Figure30 Caribou

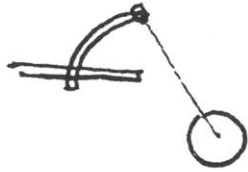


Serial and Narrative Experience

The zoo experience has two principal aspects. The first is the active experience of moving through the land, exposed to the evolutionary change from one habitat to another, from our world to the world of nature. It is a sequential type of experience, a gradual revelation of the natural world and the order of the landscape. Thus, limited

views along the public way change toward longer views in the zoo and ultimately lead to a view of the horizon in the refuge. Architectural elements become lighter and more ephemeral as you move further into the zoo, finally replaced by the natural forms that stimulated them. The orientation of primary spaces changes from the city axis of

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The second aspect of the zoo experience is reflection in looking, or revelation. Stopping relates the viewer to the immediate place, to the particular habitat or exhibit or animal. The form of the built elements and their organization in the landscape tells a story of our connection to that place. Thus, in an area for large predators such as bears the pathway is elevated above the ground on a light frame, yet expands as a cantilever out next to the rising terrain of the bear habitat. The frame creates the enclosure but the perspective of the viewer is directed upward toward the bear, placing the viewer in the habitat but indicating the strong spatial separation necessary for the captive animal.



Figure 33 Puma



In the mountain area, the bighorn sheep occupy the tallest outcrop in the zoo, but people are allowed to use a lower, adjacent outcrop for a viewing pavilion made of rock and a light trellis. The rock forms sitting areas and a low barrier to the sheep's territory, and the trellis hovers above, a protective canopy. At the east entry, an amphitheater is carved into the hill and looks out toward

the public path and the water beyond, a built association of our community with the natural elements around it.

The form of the boundaries and their placement narrate the experience from one place to another in terms of a particular context. As such, the architecture is less about the connective elements between areas than the



building of a specific site. Although movement along the boundary generates the experience, the form is related to the immediate reality of a given place. The narrative aspect of the zoo identifies changes toward nature as place making which does not build the direction of movement explicitly, but acts to change that movement.

Particular and General Experience

Where the movement is considered as an experience (i.e. an active role for the participant) of the general qualities of the zoo, the movement from one place to another is based on the rhythmic quality of everyday life, as a regular pattern in the form of the built world.

Where movement is changed in its direction or built sensibility (i.e. a

stopping point or a shift in scale of the built area) the rhythmic quality is disrupted and the place relates the movement to another scale of organization. Thus, the zoo relates the observer to the larger order of the natural world through the interaction of regular and exceptional built definitions.

The particular and general experience act as a duality in which the sense of different scales is related to

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the stopping points, but movement as a direct experience of nature generates an understanding of the evolutionary change from one world to another. Ultimately, the order of the landscape generates both of these modes of perception, asserting its hierarchical primacy as the largest order of the zoo. But within that framework, smaller scale definitions are generated by local conditions and elements, informing the larger sense of the zoo as an interdependent world, an organic entity in the city.

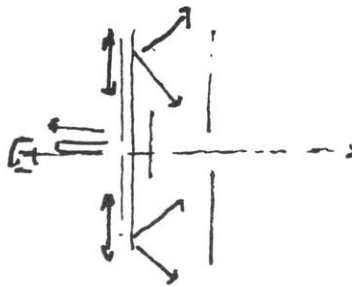
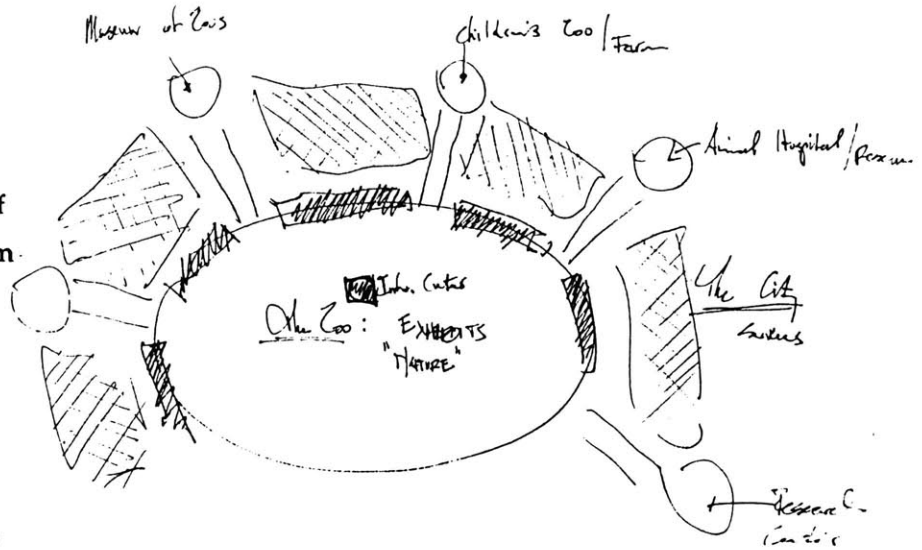


Figure 34 Theater at Segesta

Architecture and Landscape

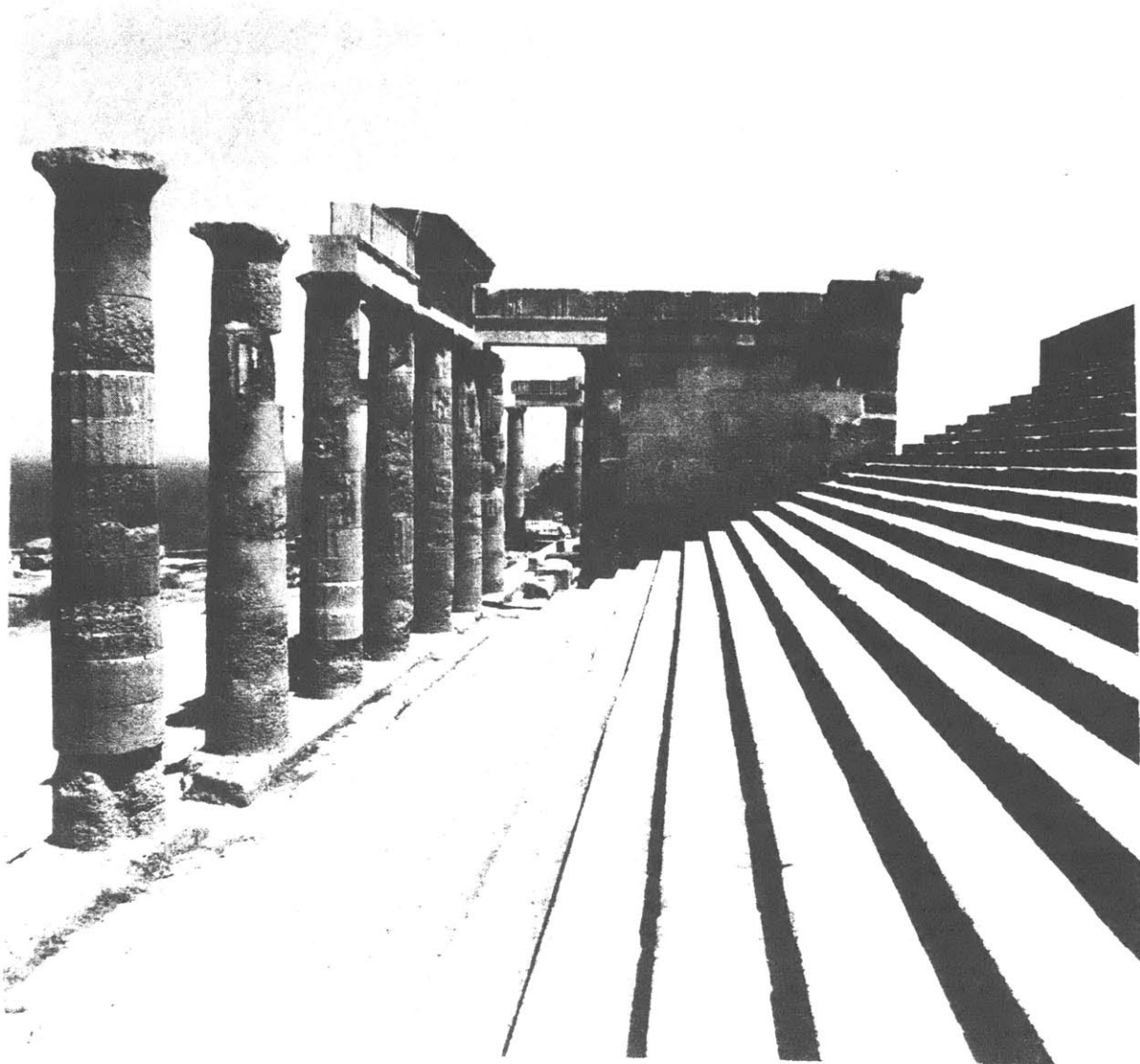
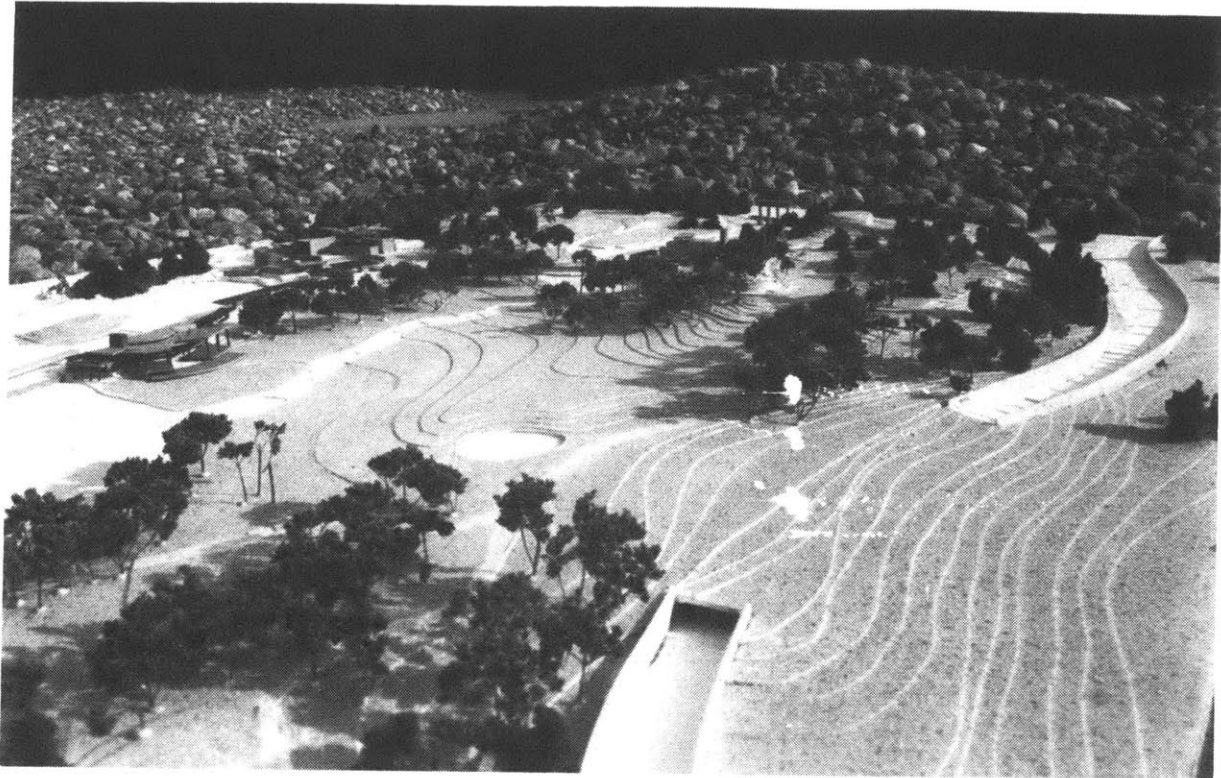


Figure 35 Sanctuary of Athena

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The word "nature" derives, it should be remembered, from the latin nascere, with such meanings as "to be born", "to come into being". Its etymology suggests, that is the embryonic, the potential rather than the actual.

*- Kenneth Olwig
Nature's Ideological Landscape*



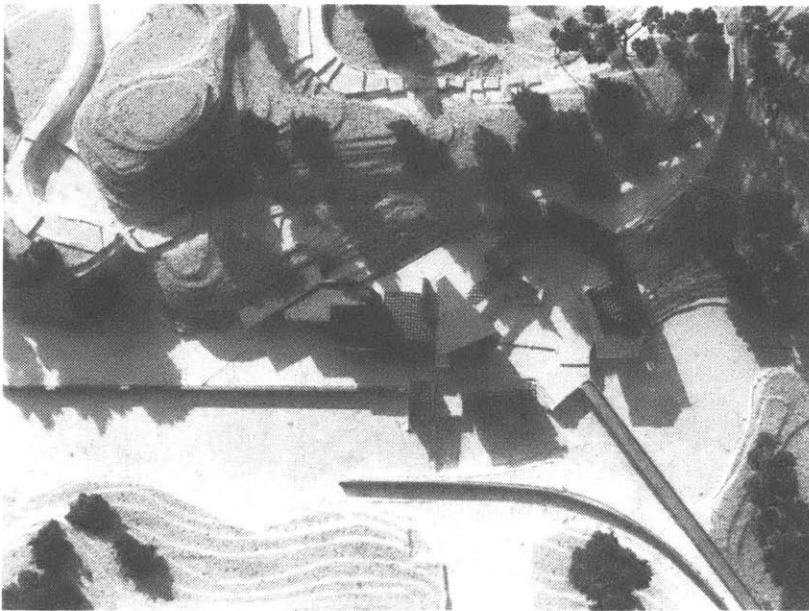
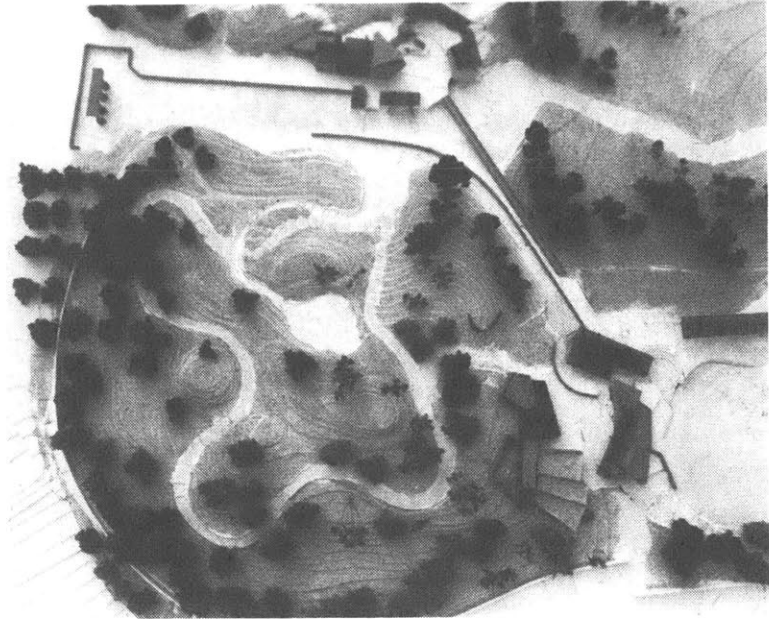
Figure 36

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Buildings and Movement

Within the larger order of the landscape and the framework of the zoo experience, the territories of the public way and zoo paths are connected through the entry nodes at the three junctures of the central path.

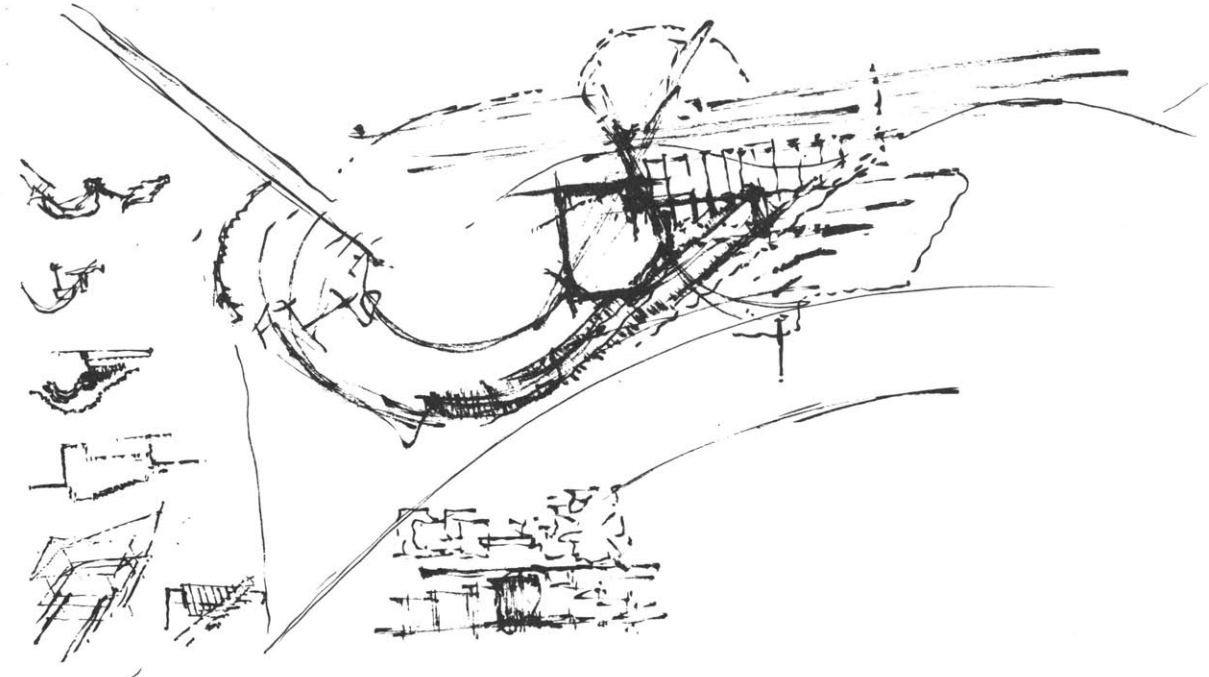
Each entry deals with the confluence of direction and movement, and the change from one territory to another as a transitional space.



The East Gate

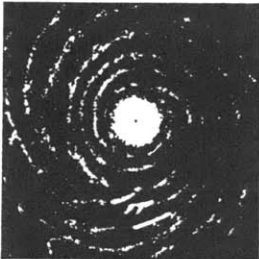
This entry leads to the Mountain Habitats on one side of the watercourse, and via a tunnel under the waterfall, to the Northern Forest on the other side. The entry is at a diagonal between two built arcs set into the larger arc of the hillside. The arc facing the public path is an open theater, a place to watch people or rest. The other arc relates to the zoo, a mountain

Chapter Four



goat exhibit coming down to the level of the plaza. A large auditorium anchors the outer edge of the building, and a cafe and concession area are placed within the large open canopy which sits between the auditorium and the services and offices set into the hill. Moving along the back of the open theater, a gallery describes the nature of the zoo experience in a

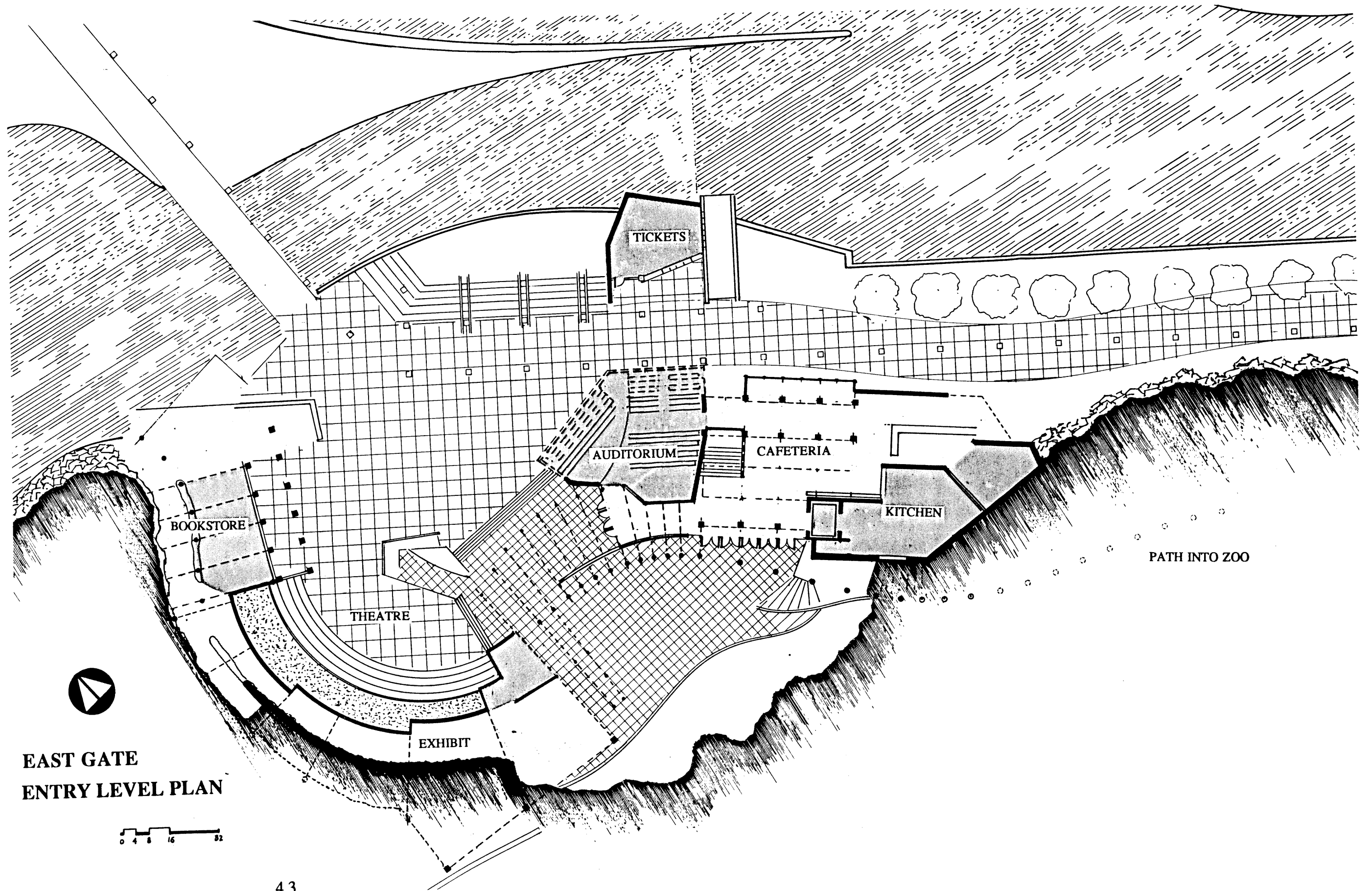
sequence of pictorial exhibits ending in a bookstore which fronts the main plaza again. Adjacent to the auditorium, steps descend to the lower level where restrooms mechanical and support services are located. From this level the tunnel crosses the water course, creating a waterfall in the main channel.



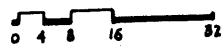
Auroville, Pondicherry, 1965



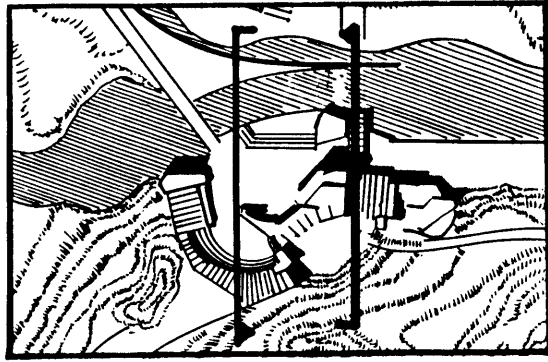
Figure 37



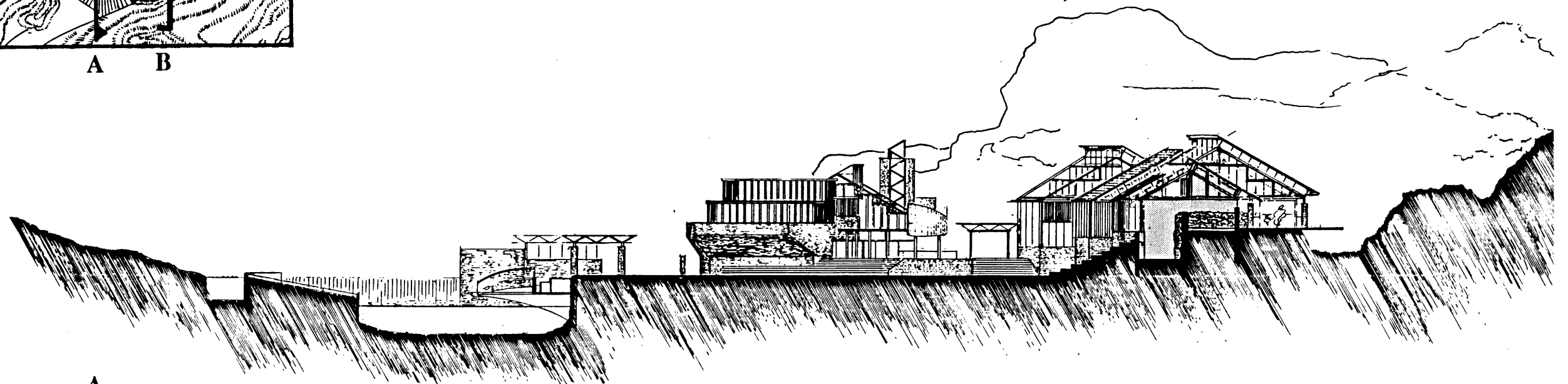
**EAST GATE
ENTRY LEVEL PLAN**



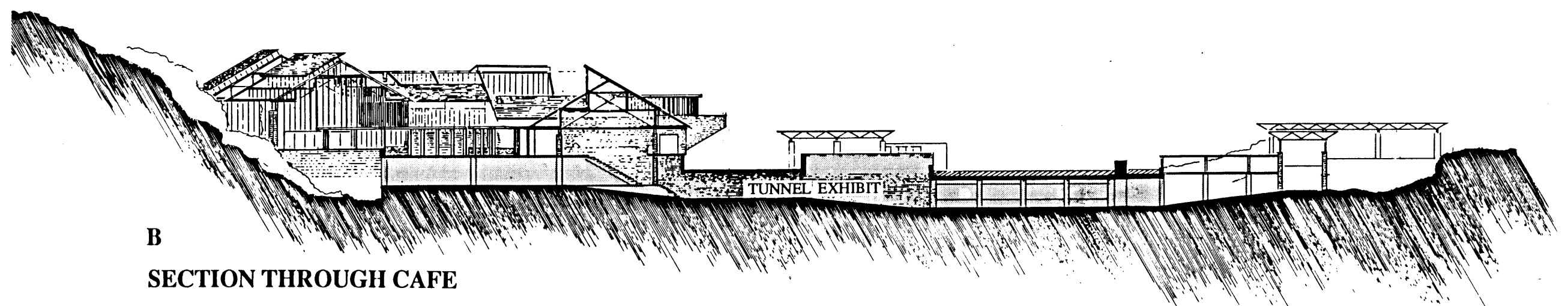
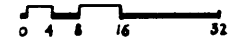




A B



A
SECTION THROUGH AUDITORIUM



B
SECTION THROUGH CAFE



Design Elements and Buildings

The West Gate

This entry, is set at the base of the lake and leads to the Pine Barrens on one side and the Northeastern Wetland on the other. The entry is adjacent to the dam and a reflecting pond below. A light canopy system extends into the heavy elements of the complex, which functions as a fishery and pump station for the recirculation of water to the East entry. The main path descends from the street

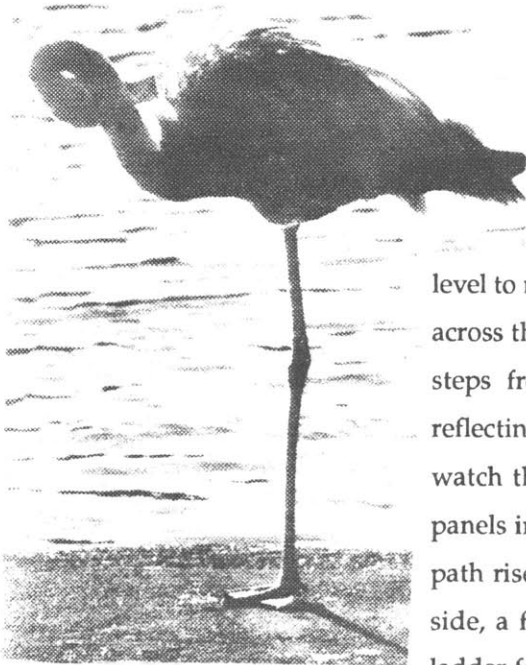
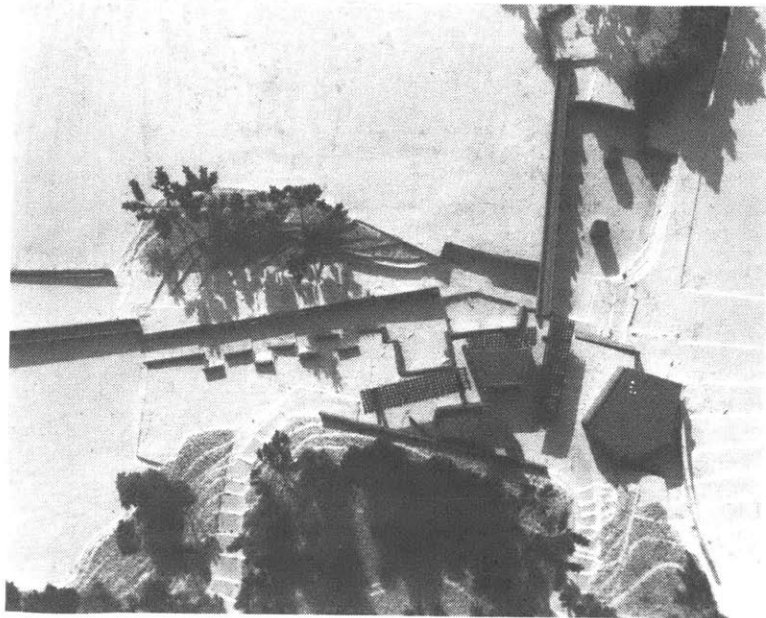
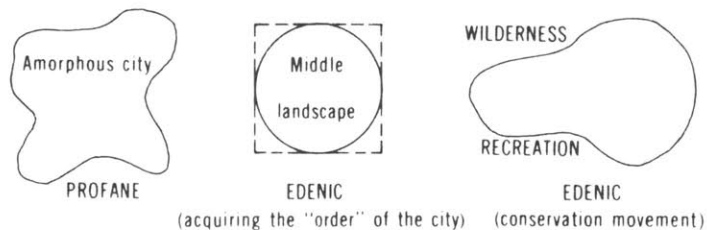
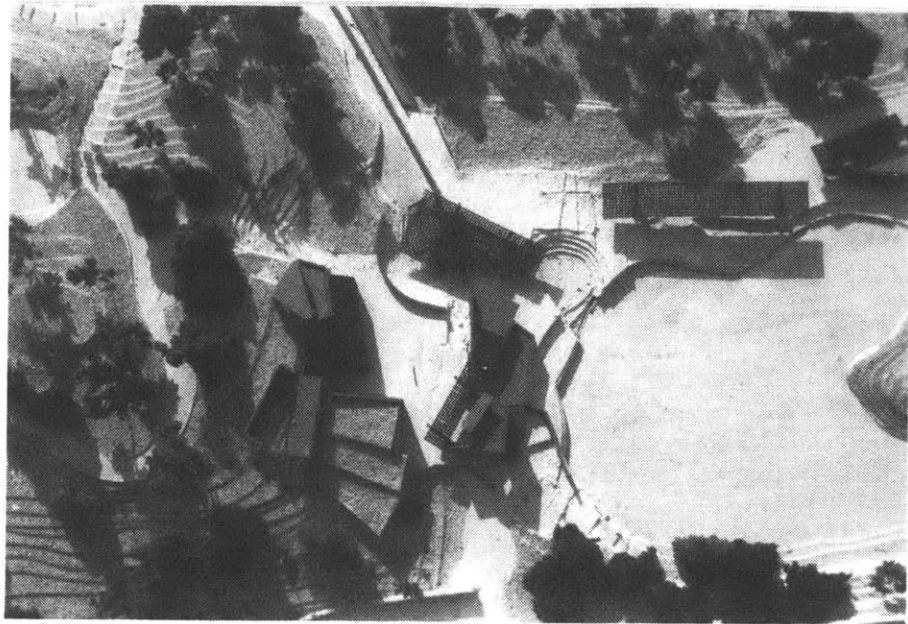
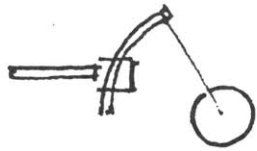


Figure 38

level to move under a bridge across the dam, and a series of steps from the street to the reflecting pool offer a place to watch the fish through glass panels in the dam. As the path rises again on the other side, a fish hatchery and ladder form a lineal boundary between the zoo and path,

and water cascades from the lake into a pool which leads to the pumping system. Within the complex, exhibits describe the role of water in the wetlands and the way that the fishery and pumps function, relating the use of the place to the support of the refuge.

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The Environmental Education Center

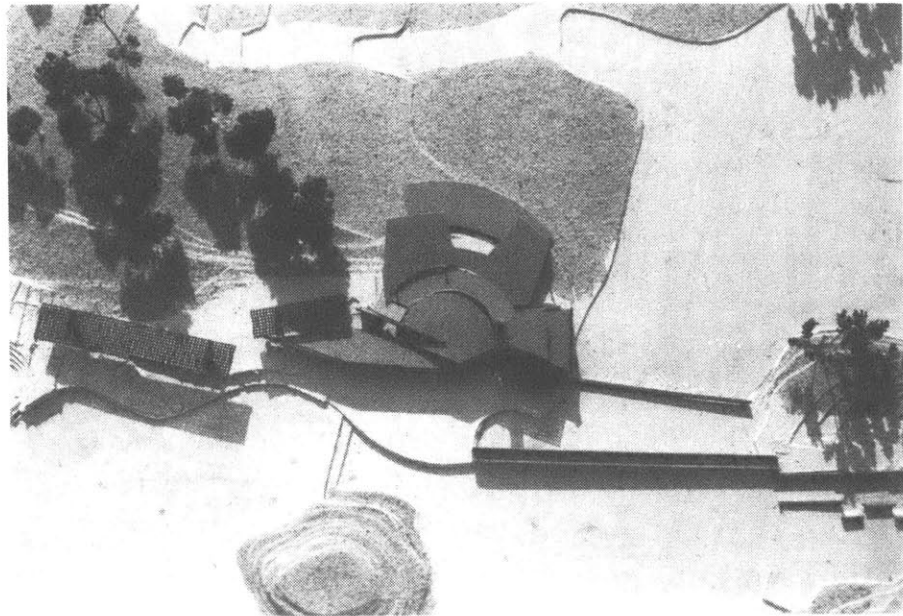
The largest node along the public way integrates the administrative offices of the zoo, research and conservation agencies, and the interactive exhibits around a large sunken court and cafeteria. Two arcs create open ends to a long canopy over the court. The larger arc creates an area for sitting and watching, and the smaller arc is a pool in the sequence of water from the

East entry. The two buildings which house the kitchen (adjacent to the plaza) and the animal care and support areas (set back in the hill) frame the yard where farm animals are kept for petting or riding. Here, interpretive tours start for each of the four segments of the zoo run by volunteers of the conservation organizations (i.e. The Audubon Society). On the zoo

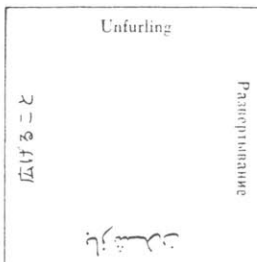
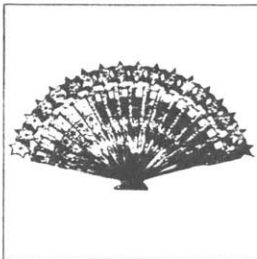
side of the animal care center, the medical facilities for ailing or injured animals are located with holding areas for their recuperation. Service access to the zoo and the center, as well as parking for the staff comes into the site through a side entry not used by the general public, but accessible for organized groups or conferences.

Figure 39

Design Elements and Buildings



City Project, Doria, 1732



The Conference Center

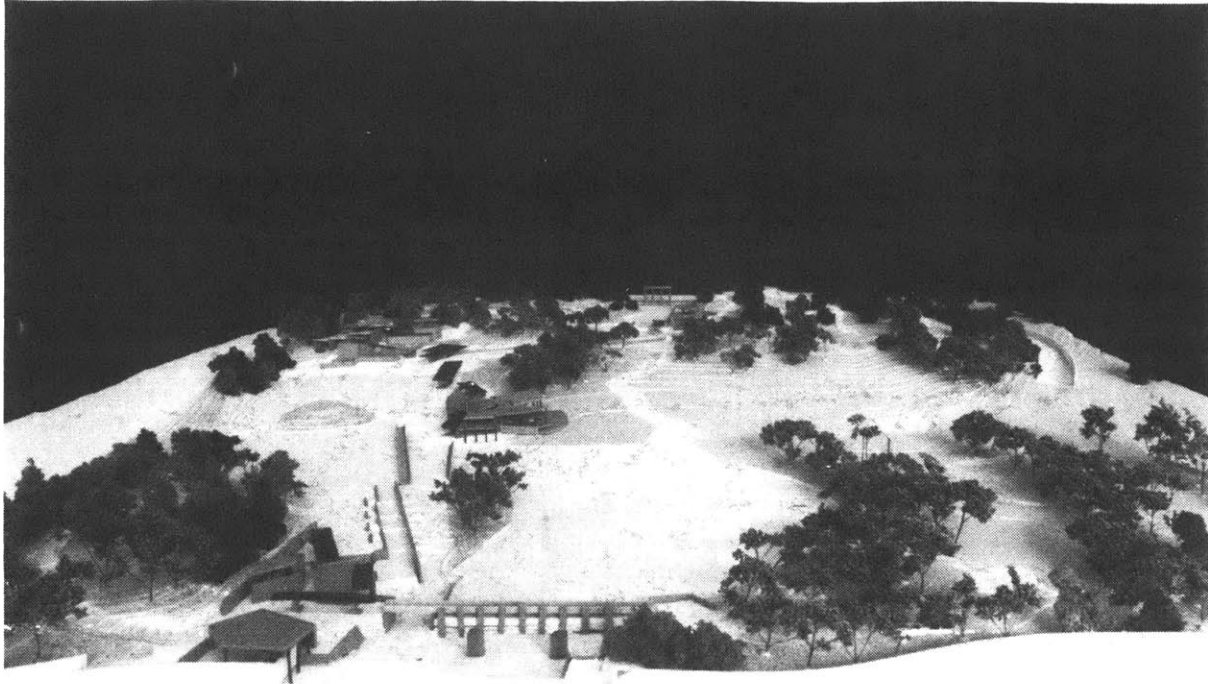
The Conference Center is the only building in the zoo which relates directly to the refuge. It is located along an existing ridge which separates the refuge from the upper lake, and looks out across the refuge to the largest extent of Franklin Park and the horizon.

The center is used for symposiums or lectures concerning the environment, and is also a resource for public (i.e. civic sponsored) conferences or meetings. Each of the other complexes have

open, spatially generated organization and sectional changes upward into the zoo. But the conference center is formed by a closed auditorium around which open meeting areas cluster and look out into the refuge. Movement into the building is a sequence of ramps down to the level of the marsh, and ultimately to the sunken theatre. The act of meeting becomes the form of the building, and the extension of the building out into the refuge focuses the views outward, toward the natural world.

Figure 40

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The Conference Center also has a ramp outside to a rooftop observation deck for public passers-by to gain a vista out into the refuge, with several visual displays that describe the geologic and cultural history of the park and the animals in the refuge. Each of the meeting rooms relate to a different view; one sees the lake, another the marsh, and a third the grassland and mountain areas of the zoo beyond. The center has a complete kitchen, support areas, and lavatories, as it operates independently within the zoo program.

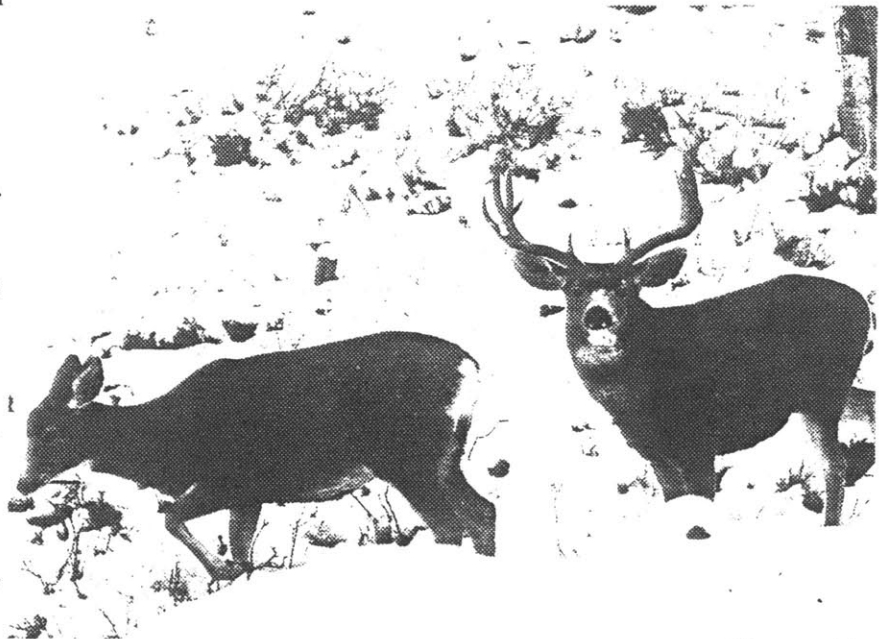
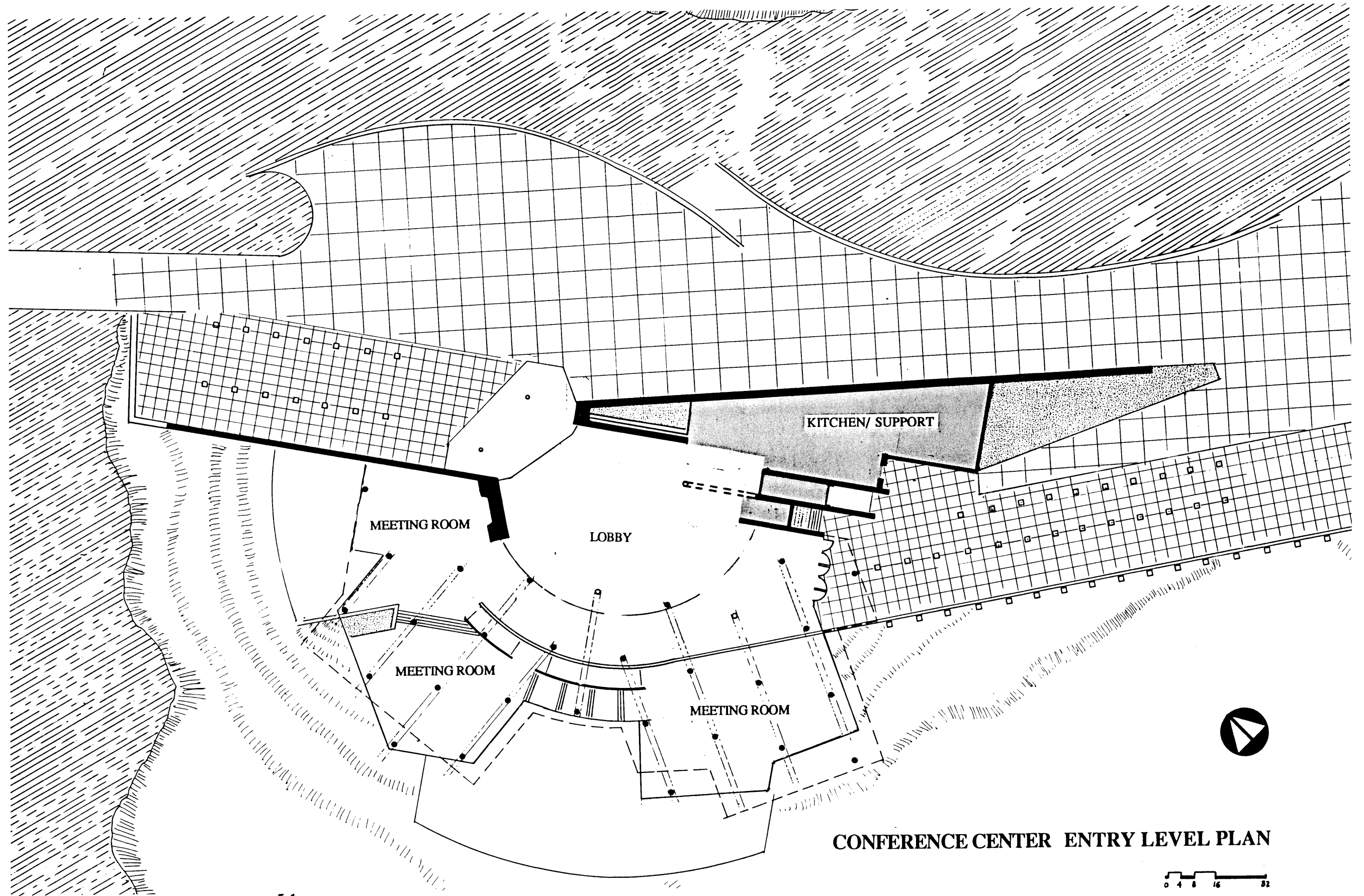
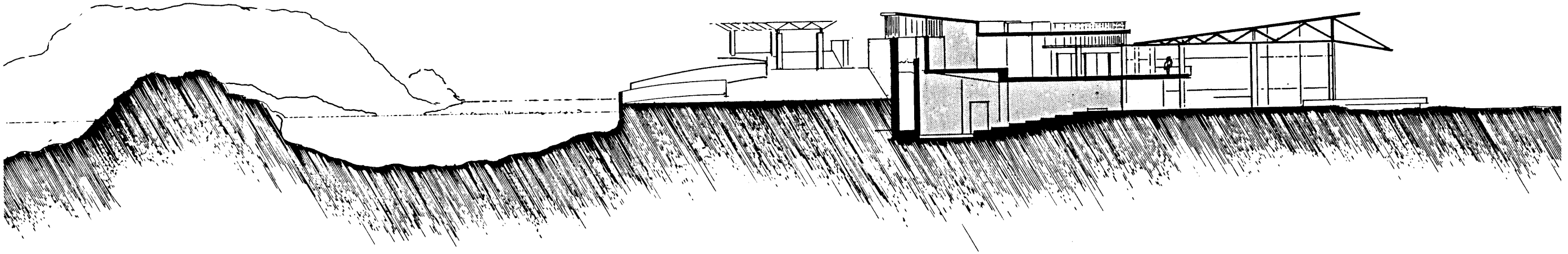
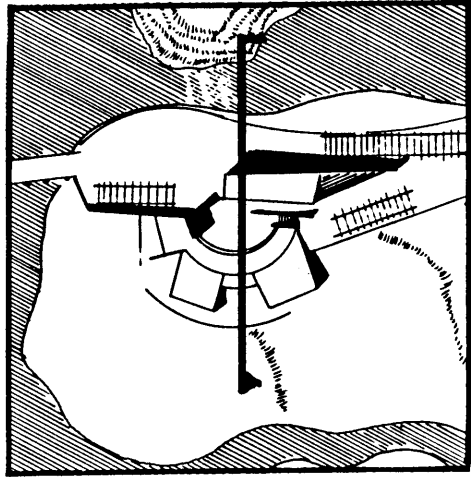


Figure 41

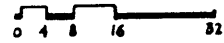


CONFERENCE CENTER ENTRY LEVEL PLAN





SECTION THROUGH AUDITORIUM

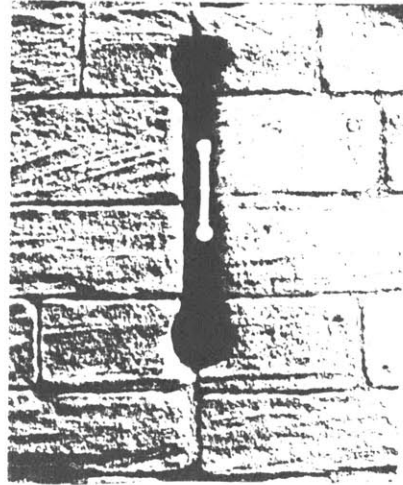




Design Elements and Buildings

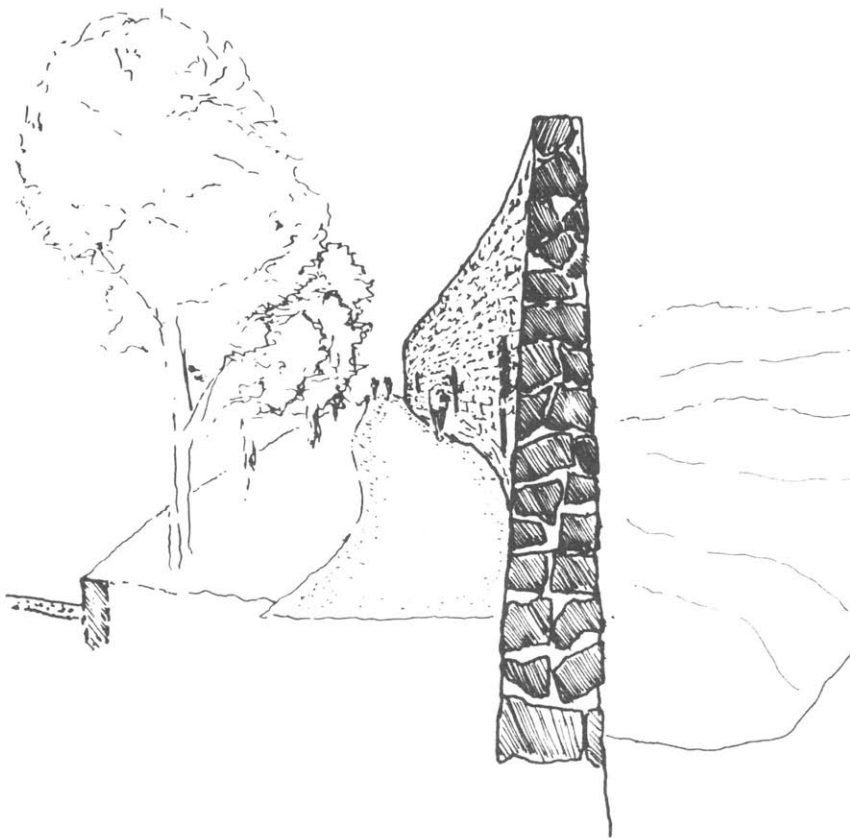
Built Definitions of Movement

The boundaries between the three territories of the public path, the zoo, and the refuge define perceptual distances between the viewer and the viewed as well as provide real separation between the territories.

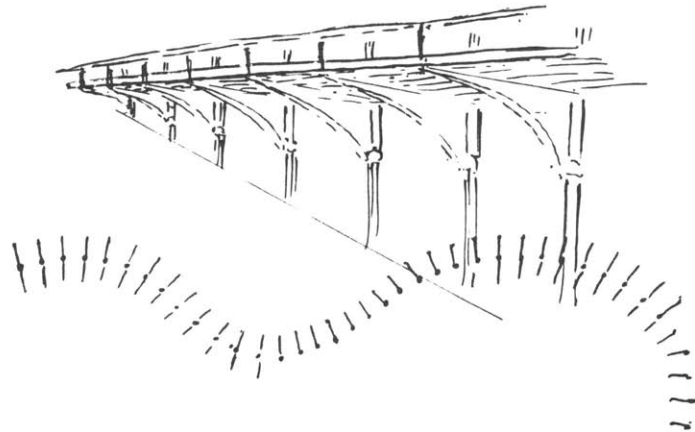
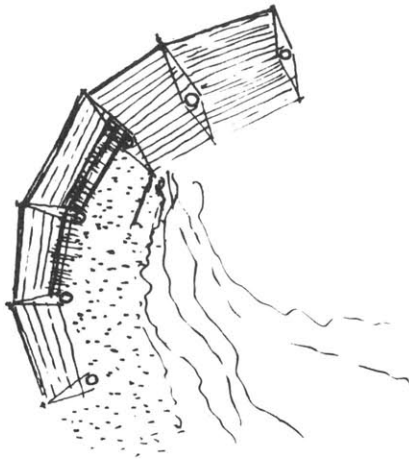


Walls

Using the language of the city, stone walls circle the perimeter of the site as it contacts the outside world, providing a definition of privacy like the facades of buildings along the edge of a street. The walls curve and follow the land, interrupted by outcrops of rock. Along the outside of the wall, a path gives people on the street glimpses into the park through narrow channels. Straight, low brick walls are used in the interior of the site to separate the public gathering spaces from the refuge or zoo. These change to bearing walls in the entry complexes for privacies and service areas.



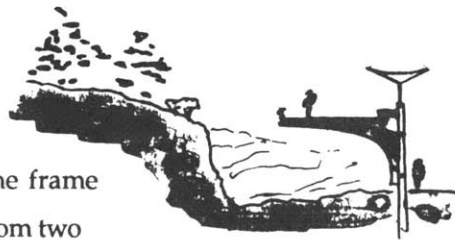
Chapter Four



Light Frames

Between the path and the refuge, as well as in the contained areas of the zoo, the strongest barrier is a light frame which connects the observer with the setting but makes them feel they are bound to the built world. Along the public path, the frame is integrated with the wall as a trellis on masonry columns, providing a protective screen. In the zoo entries the frame is used as an atrium or canopy for the primary social spaces, resting between the heavy elements of the privacies and services.

Within the zoo, the frame support changes from two columns to one, and it is used in predator habitats as a boundary to the territory of the animal as well as a viewing platform. Finally, at the base of the refuge where the lake adjoins the entry into the site, the frame is used as a dam with glass panels in a reversal of the frame as boundary. The dam offers views through the section of the lake and possible glimpses of the fish stocked there, but separates the refuge from the public view



Natural Boundaries

Between the zoo and the public, natural boundaries such as cliffs or water are used to generate a sense of spatial connection with natural separation.



Figure 42

Water

Water is used as a universal element in that it interacts with all parts of the site, creates separate territories and provides support for the animal populations. It also is used as an analogy for public movement along the central path, as it diverts people from Olmsted's axis and moves around the refuge, descending in a series of cascades which are coordinated with staircases or ramps for the path.

Water is treated as an element symbolic of nature in the immersion of the monumental ruins of the axis and the placement of a small pond as a gathering point in the refuge

Chapter Four

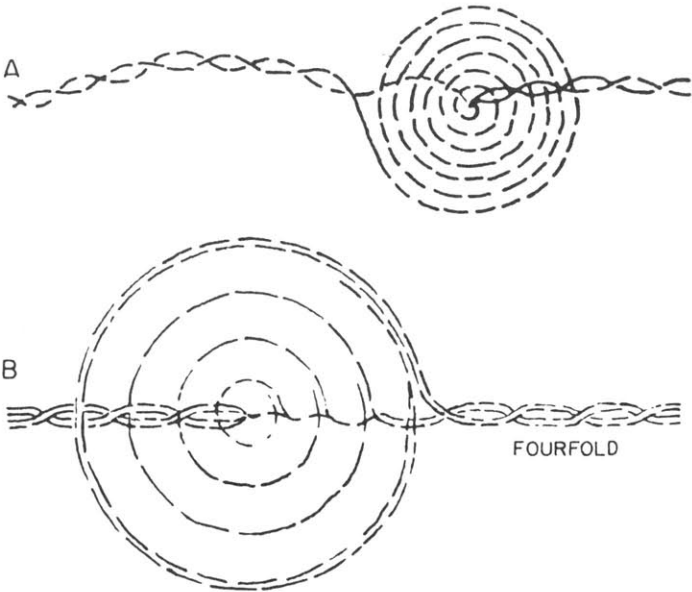
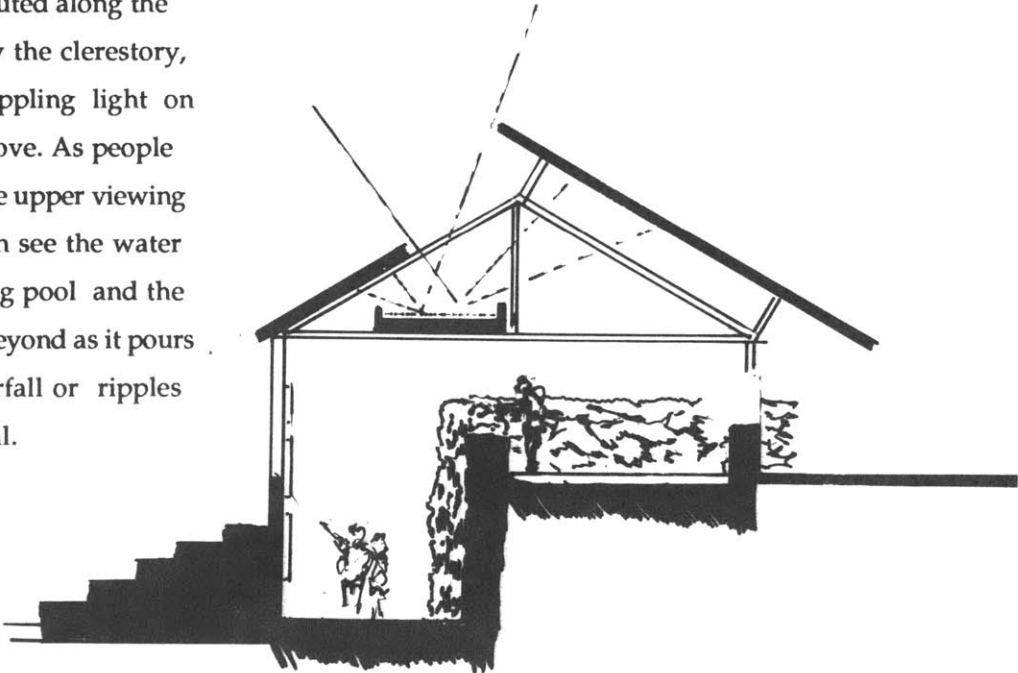
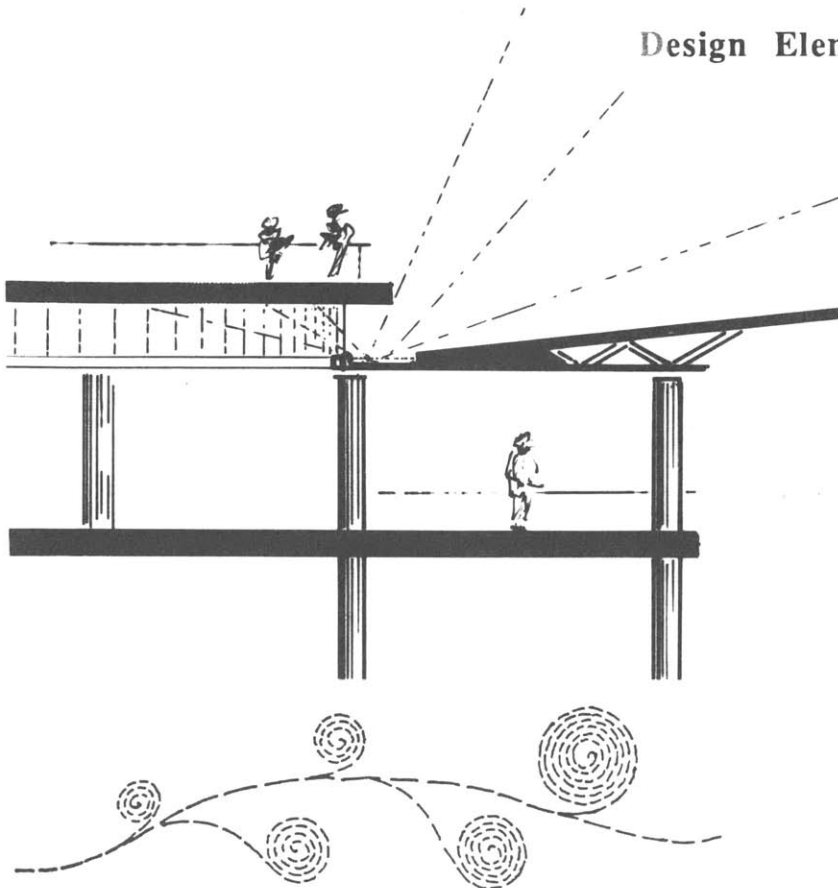


Figure 43

Water also affects the light and spatial qualities in the covered public spaces. In the exhibit behind the theater in the East entry, water runoff from rain is routed along the flat roof below the clerestory, reflecting a dappling light on the ceiling above. As people move up to the upper viewing level, they can see the water in the reflecting pool and the water course beyond as it pours over the waterfall or ripples down the canal.



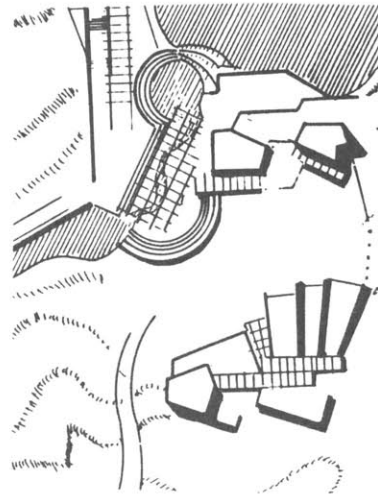
Design Elements and Buildings



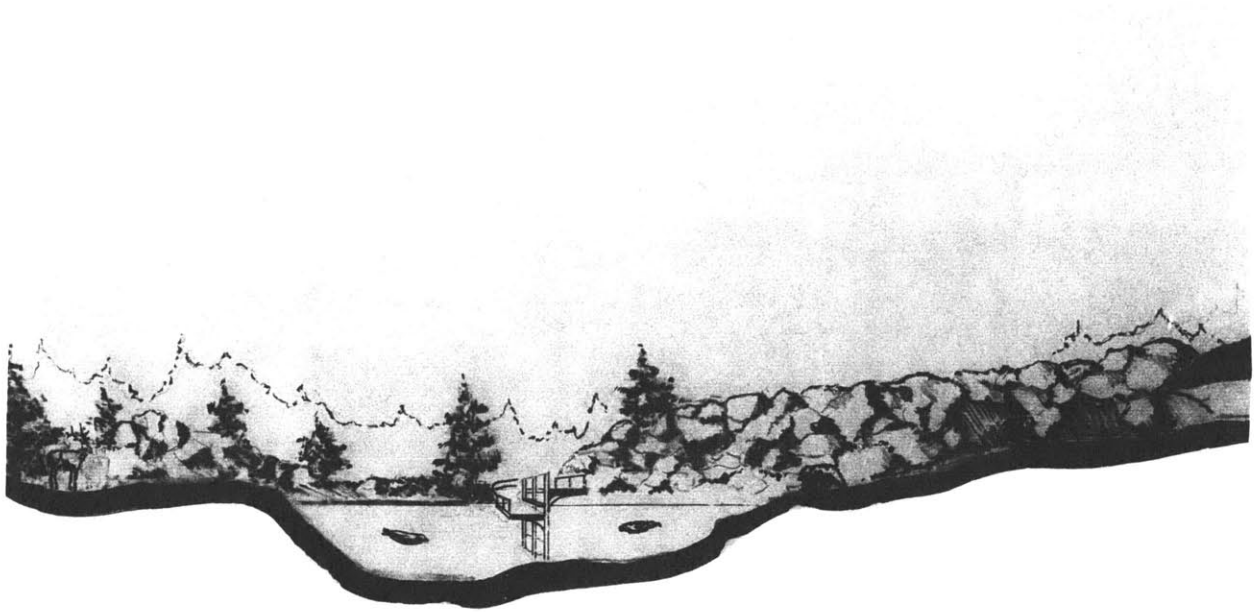
In the Conference Center, the water from the winglike roofs gathers in a band along the circulation area, again reflecting patterns on the ceiling through a clerestory. At the West entry, the water becomes an explicit function of the complex. Finally, the water creates a quiet space in the reflecting pool below the dam.

Figure 44

In the cafeteria plaza of the main node, the water from the canal winds through, separating the plaza into two sinuous halves. People must cross this stream on stones which are closely set, allowing the water to flow between them.



Chapter Four



Topography

Cliffs or moats are used as barriers to movement of the animals between climates, and as another boundary between people and animals where necessary. In the tundra habitat, the grizzly bear is contained by the steep walls of the adjacent mountain on one side, and by the light frame of the path on the

other. Further on, the caribou is prevented from going out into the refuge by a short but steep drop with a low barrier above to prevent a slip. In the mountain lion area, high cliffs on one side and the overhanging walkway on the other also frame the territory.



Figure45

Design Elements and Buildings

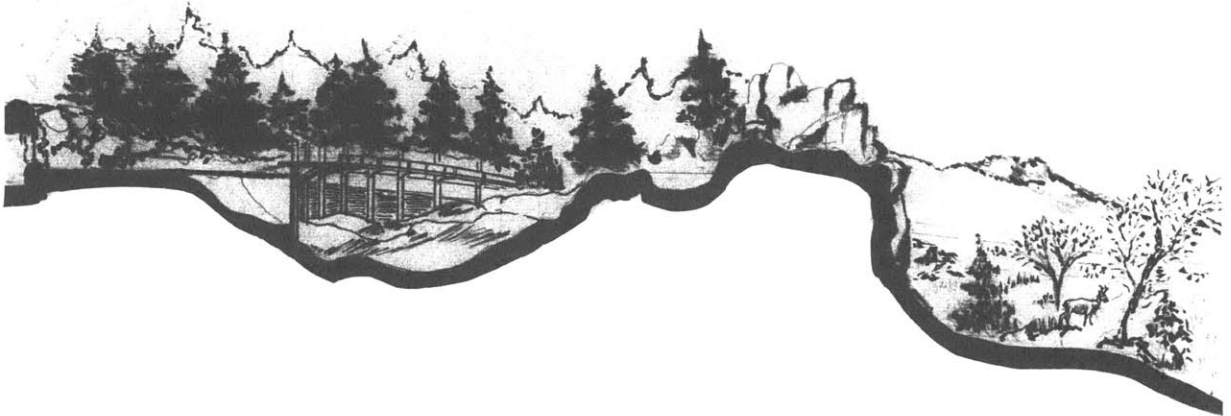
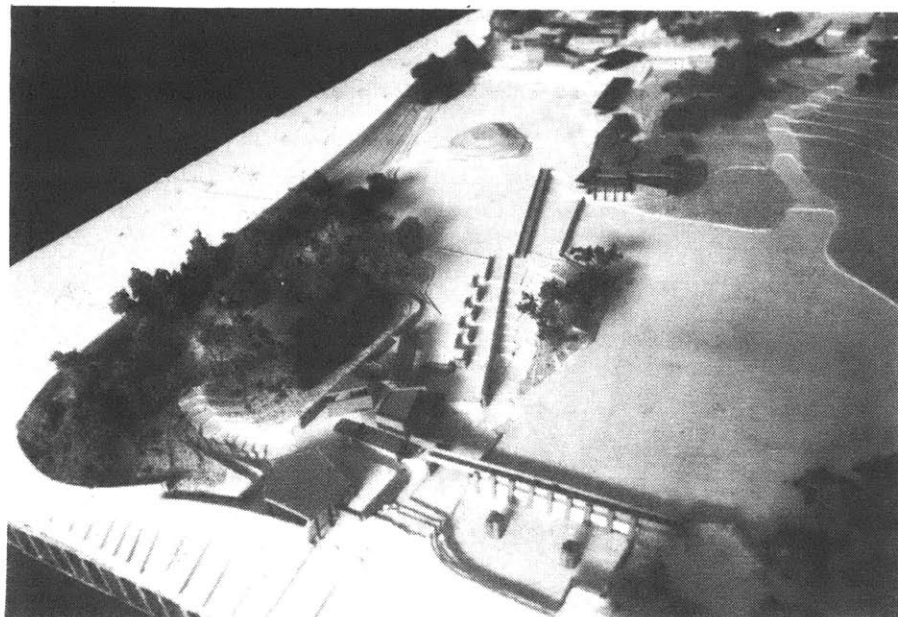
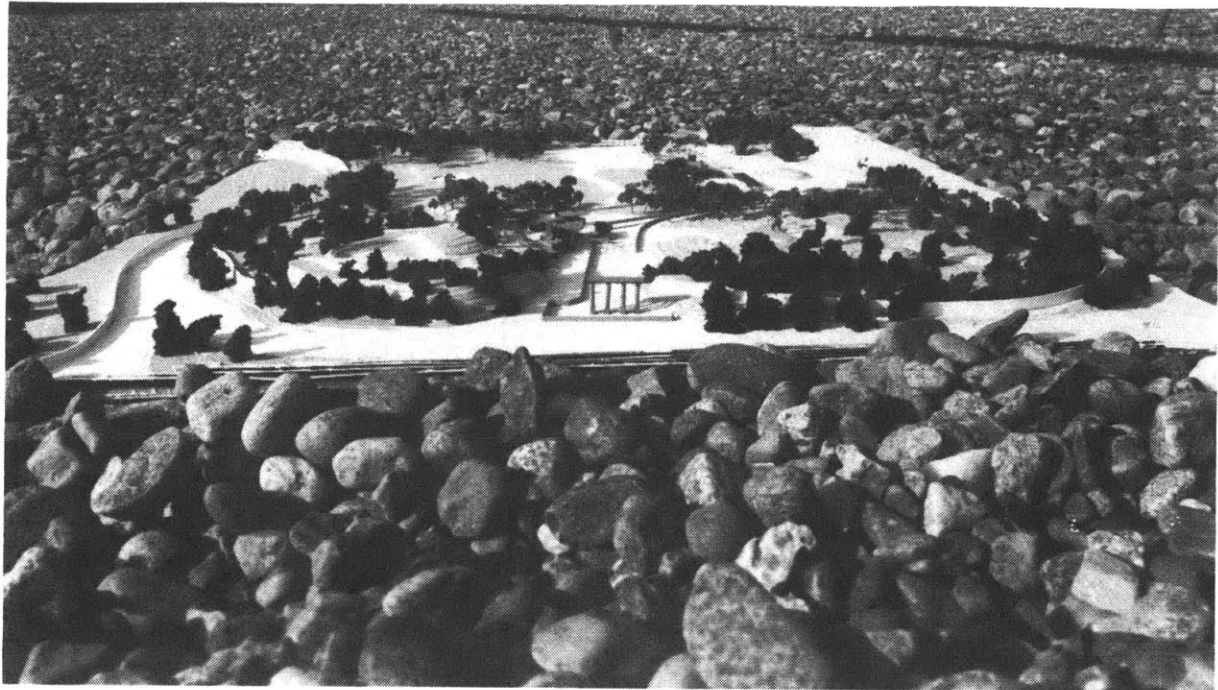


Figure 46

Chapter Five



Chapter Five

Journey Into Nature

As you move into the park, the noise of the city subsides and you become aware of your breathing, your footsteps and the stillness of the air. The path skirts a low outcrop, then crosses a long slope with old hardwood trees reaching out high above. The land moves quietly up then down, and the path is worn into the soil, exposing roots and small clusters of rounded pebbles.

Your awareness of the place you are in is broken by other sounds. People's voices carry from around another outcrop. The noise stops abruptly, and as they come into view, you see they are still, watching something up the hill. As you approach, the animal moves, and you see the coarse hair of a black bear as it ambles out of sight.

Animals and Habitats

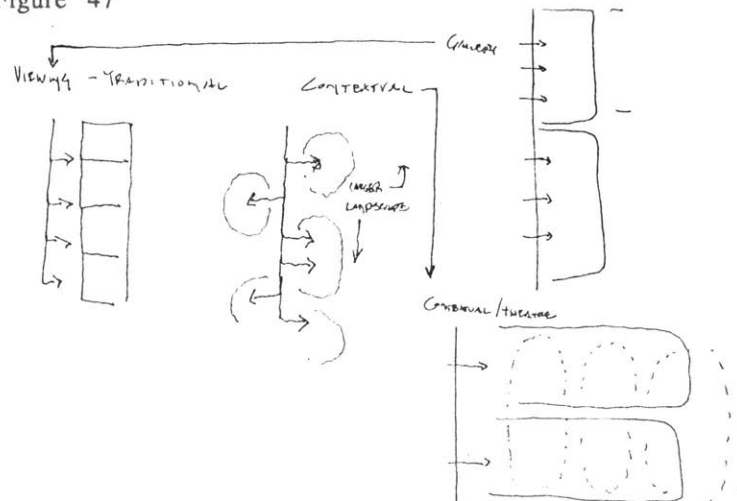
*A great cloud covers the heavens above,
Sends down snows thick falling
To them are added the fine rains of spring
All is swampy and drenched,
All is moistened and soft,
Ready to grow the many grains.*

-Shi Ching

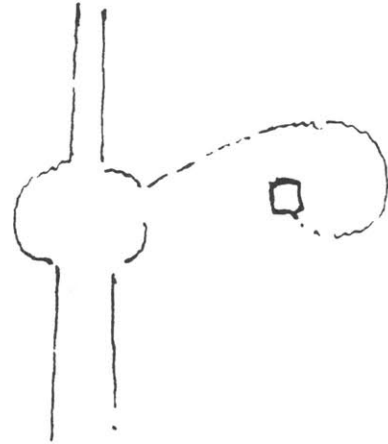
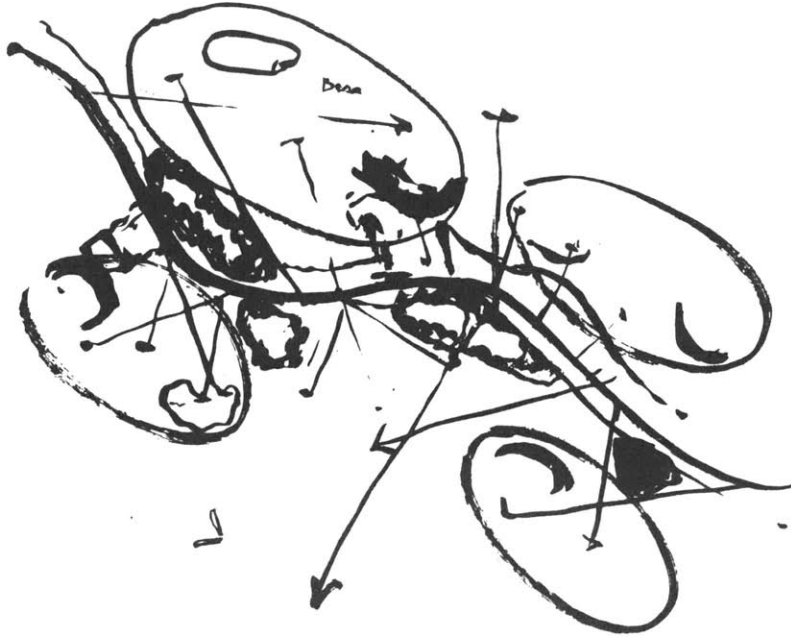
The Book of Song



Figure 47



Chapter Five



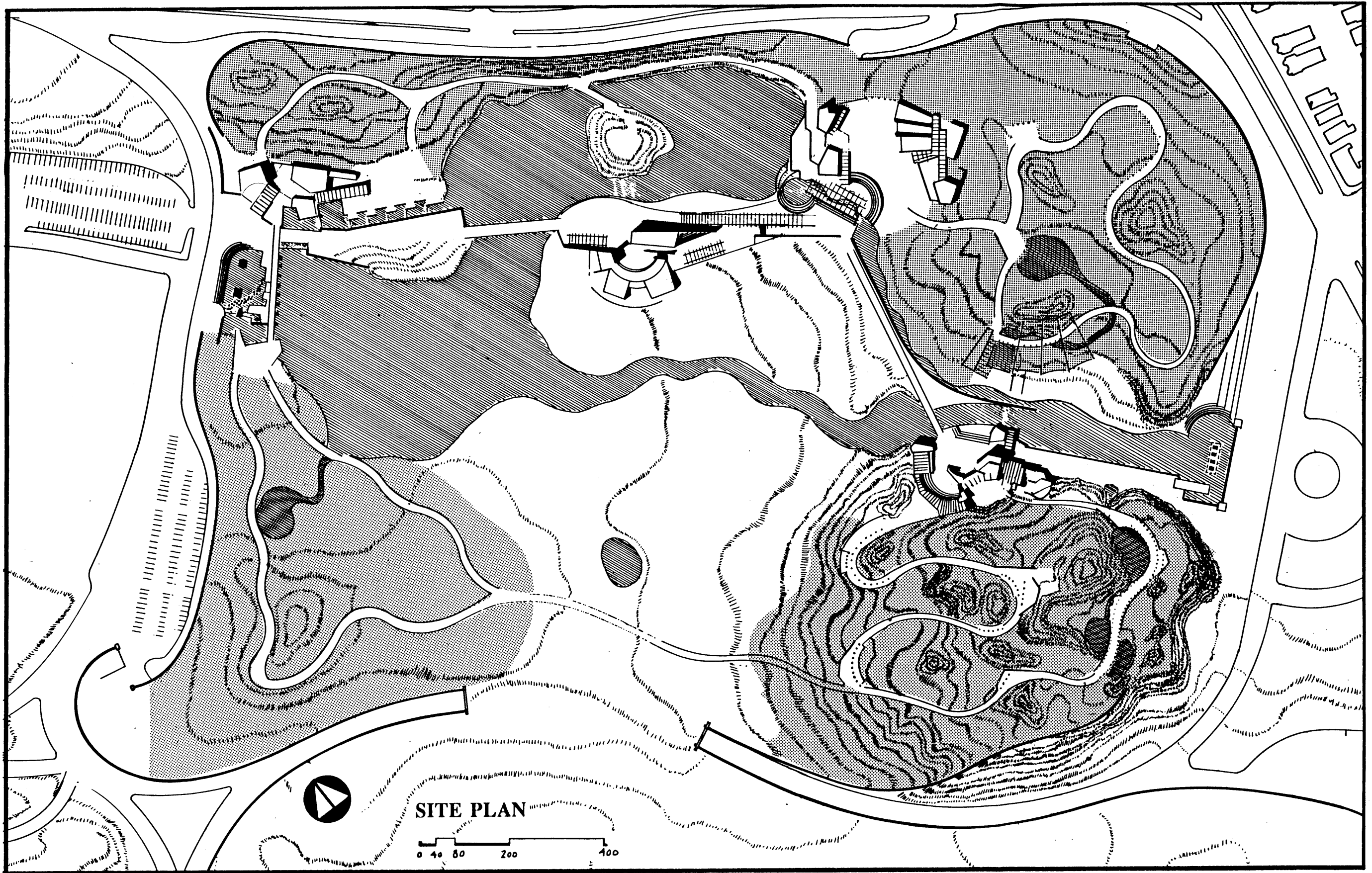
The Zoo Path

Each section of the zoo is both a set of individual exhibits and a sequence of habitats within a climatic region. The path moves through each section in a loop, enclosing some of the spaces and being enclosed by others. In the Northern Forest, the inner space is a mixed habitat for deer and moose. It is open and visible from several points along the path. Around this area the more controlled

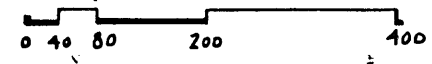
habitats of the wolf, the lynx and the black bear are situated, borrowing the landscape around them but contained by the elevated frame and the topography. Along the path, views of the exhibits are limited, providing glimpses of open areas but reserving the privacies of the animals from the public. Toward the middle of the loop, the views become longer and integrate

the inner habitat with the controlled areas, sequentially revealing the larger landscape. At the mid point, a view of the refuge is offered to those who move away from the main path, up onto a viewing platform. Through the trees, one can see the small pond in the refuge where people can stop and watch birds or deer.

The sequence of the path is related to the individual



SITE PLAN





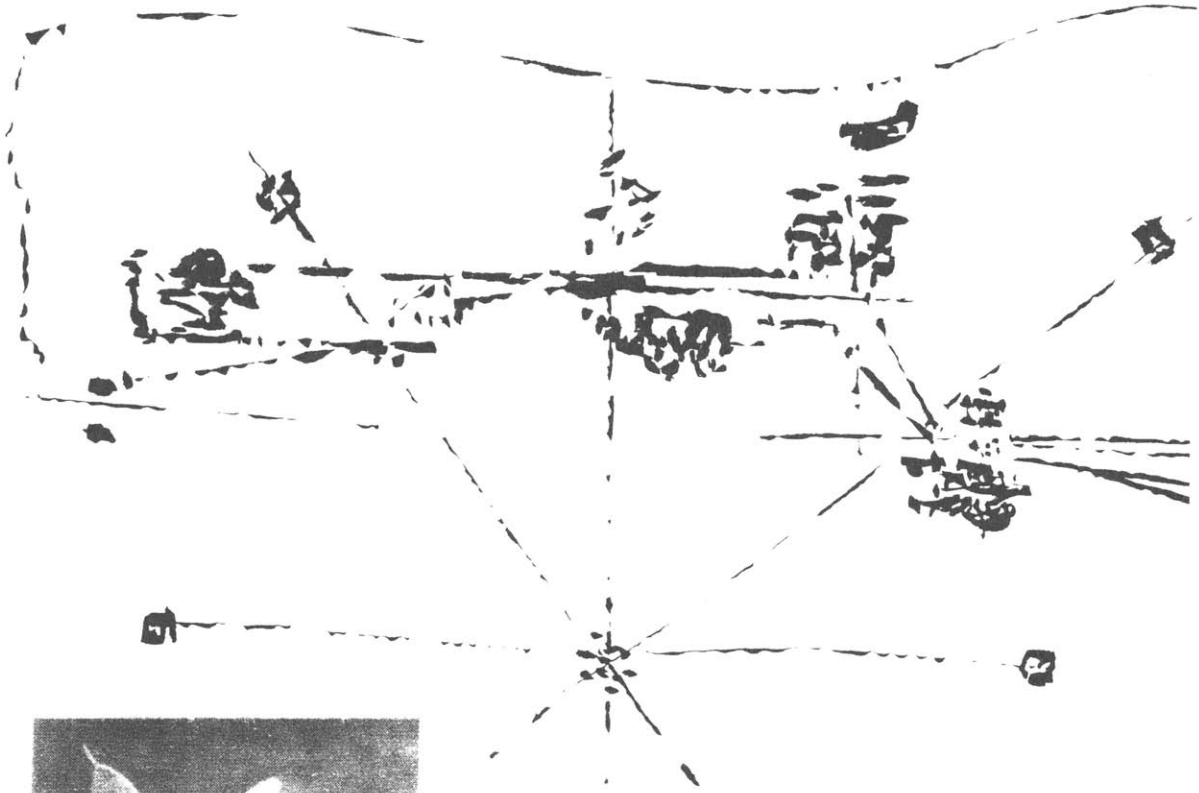


Figure 48

exhibits through the extension of built viewing points into the animals' territories. Although the extension is limited, it serves to identify a particular area of interest and a more extensive view of of the area. Thus, the experience of a particular habitat and animal is linked to the sequential revelation of the larger organization of the

habitat , and ultimately of the refuge as a whole. Moreover it is through movement away from the main path that the experience occurs. The secretive quality of looking and finding nature by moving out from our own world is consistent in the organization at the scale of the refuge, zoo, and habitat.

Chapter Five



The Mountain Habitats

Figure 49

From the East Gate you climb into the mountainous terrain of the alpine and arctic habitats. First, the mountain goat area rises from the plaza of the entry. To the east, the path follows a steep rocky incline. Bighorn sheep clatter across the precipices above, sharing a portion of the goat's territory. Further on, a short bridge crosses the cataract that falls away toward the base of the cliff. below. A pool provides water for the sheep and goats and marks the beginning of the grizzly bear enclosure. On the other side of the path, caribou graze in a free area which extends around the



perimeter of the high mountain region, sharing the alpine and steppe climates. Small conifer trees and boulders screen the view beyond, and heather covers much of the available ground. Water descends into the pool of the bear enclosure from a winding stream flowing between a section of elevated walkway and the steep wall of rock of the highest outcrop.

As you follow the stream a split in the walkway allows you to descend on the outside to the level of the water to view salmon and steelhead swimming in the current. Ahead, the stream's source becomes visible, a pool which integrates the bear area with a seal habitat. The walkway is still divided, the lower level offering a waist height view of the water line

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Figure 50

and thus both the underwater and above water vantage point. On the upper level, the view is focused toward the bear's area and the rocky terrain of the cliffs beyond. Around the next bend, the appearance of taller trees signals a change, and the rocks become more jagged and broken as you move into the sub-alpine steppe area. Mule deer can be seen to the left as

they come in from the refuge for oats provided by the staff. On the other side, a grey fox family occupies a rocky area. These secretive creatures are difficult to glimpse, and so a small alcove in the trail provides seating. From this point you can see the mountain more clearly and the form of the landscape. Views out toward the refuge are limited, but the long slope

down to the woodlands ahead is open, and you can see the pronghorn antelope and elk in the distance. The trail winds through a thicket of conifer trees before emerging into the open land of the steppe, and the barriers of the trail diminish into low curbs with scrub brush behind to discourage movement from the trail. At the beginning of another wooded area, this time large hardwood trees, there is a junction which takes you back to the East Gate, or to the Wetland Forest across the refuge. If you return to the Gate, the path climbs around a long ridge where antelope and deer range, and then cuts through a steep incline to arrive at the puma and coyote habitats. The trail has changed to a frame platform once again, providing glimpses into the rocky areas of the cat on the left and the coyote on the right. A bowl has been carved into the rock wall of the outcrop above, forming a sitting area from which you

Chapter Five

can see other parts of the zoo in the distance. A small path leads from the sitting area up into the rocks. You aren't sure that it is intended for the public, but the steps are worn so you decide to try it anyway. The path winds upward through the rocky base of the cliff above. A bighorn ram moves away as you come into sight, and the path cuts back into the hill bringing you to a small platform. From here, you can look back down to the loop of the trail, and much of the mountain habitat. The cat which was hardly visible before can be seen lounging on a secluded rock, and beyond you see the expanse of grass and then cattails, water and the wetland area.



Figure 51

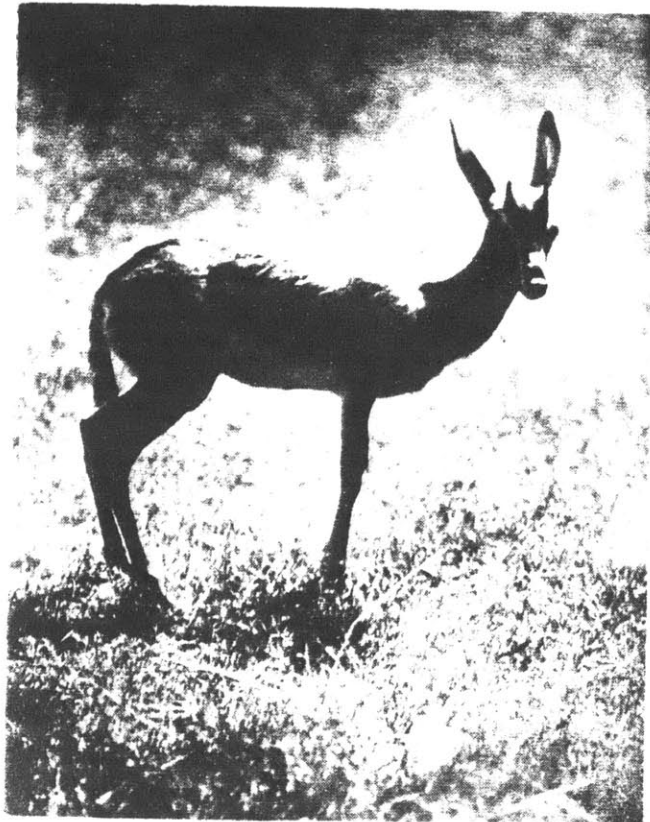


Figure 52



The Zoo and the Refuge

Moving through the refuge, you come out from behind the ridge of the mountain region, winding through a wooded area, then across a broad field. To the right, the rest of the zoo is hidden by the rise. Ahead, a pool comes into view. It is small, and there is no water running through it, but a dry watercourse is visible at the far end. Large stones about waist high are set around one side of the pond. They are not evenly

spaced, and they have marks etched into them. Behind these, cobbles are set into the hill, creating a curved terrace for sitting. Each of the large stones relates to the path of the sun through the seasons, marking the time of year and the time of day on a smaller set of stones set in an arc in the water. Two of the stones are higher than the others, with notches in their irregular tops. Plaques on the ground on the opposite sides of the pond

from these describe their relation to the zoo viewing platforms across the refuge, and their coincidence with the cardinal points on the compass.

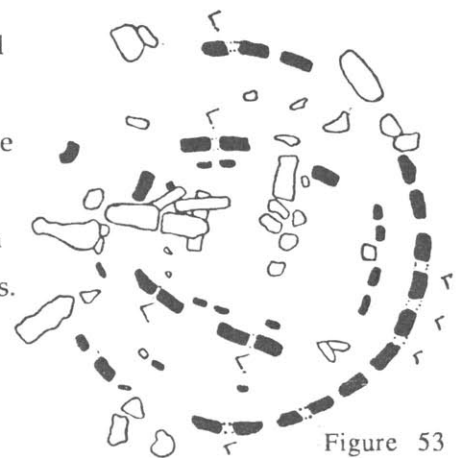


Figure 53

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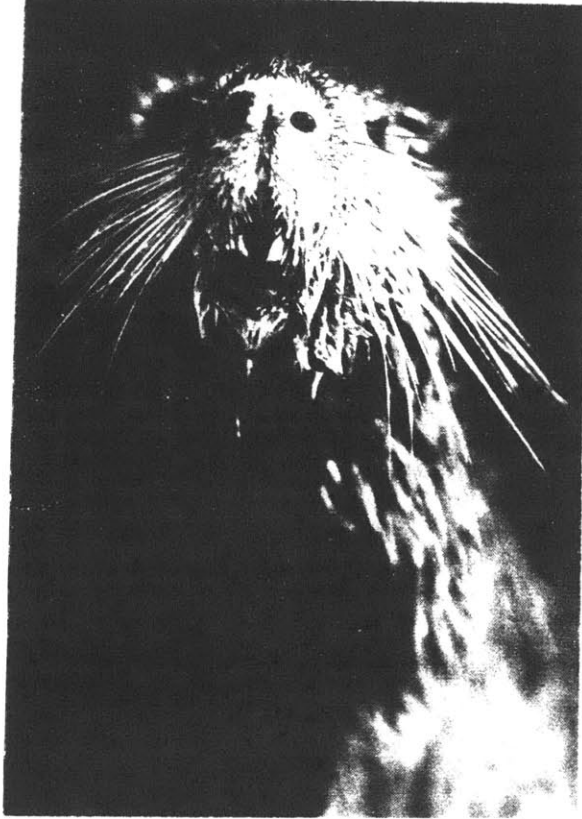


Figure 54

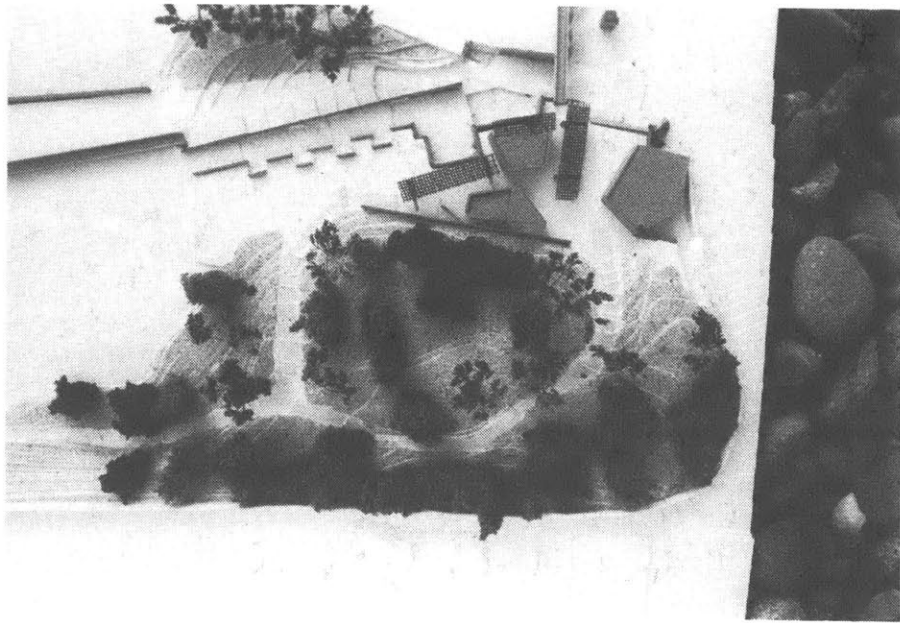


Lowland Forest/Wetland

From the pond you proceed toward the Lowland Forest and Wetland areas. A junction starts the loop in a grove of Tamarack trees, leading toward the lake of the refuge on the right and hardwood forest on the left. In these areas, the refuge becomes an active part of the zoo, with animals such as white tail deer, badger, and beaver inhabiting the land more or less spontaneously. Places are

provided for each to have a secure territory; in the beaver's case a small pond with sapling trees planted around it and a recirculating system providing water flow to the lake, in the deer's case, a thicket of trees away from public view with access to water nearby. In this region the path is simply a slightly raised band moving through the landscape, unbounded but for a low wood rail. The path

is briefly elevated on a frame at the bobcat habitat as it winds around a wooded hillside at the southwest corner of the zoo. In the wetland area, the path is elevated slightly as the light frame system supports a boardwalk around the beaver pond and through the marsh. Finally, you emerge from the forest, the sound of falling water telling you that another experience is ahead.



The Pine Barrens

Across the dam from the Wetlands, the land rises quickly and tight bunches of pine trees provide a screen for the animals. In the entry area, exhibits for the pumping station and the fishery describe their function in the zoo, and as interventions in the natural world.

As you move out into the Barrens, a covered frame provides a viewing point for a small mammal exhibit that reaches up into the hill. Here martens and foxes share a large area bounded by a short

cliff. Following the path, you can see several other small mammals, the porcupine, the raccoon, and the skunk in areas that are separated by the trail and the rock cliff of the last exhibit. As you round the corner at the top of the loop, the trail opens into a small field where a plaque describes the view out toward the refuge

Coming down from this point, you skirt along the base of a steep ridge planted thickly with evergreens. The path traces the shoreline

of a long lake which is split by an island and a small dam. Here, you can walk out onto the island and up to its crown. The ruin of a small tower creates a place where one person can look out across the refuge, seeing the conference center, the pond and the horizon of trees in the distance.

Returning to the path, you proceed to the Environmental Education Center, stopping to see the animals in the petting zoo and a refreshment at the cafeteria.

Chapter Five

The Northern Forest

From the Center , a path leads up into the woods past the animal care facility. On the right, a moose is barely visible through the trees, looking up from its meal as you move by. A junction in the trail splits the loop at a small pond where elk and deer are grazing in the reeds. To the left, the loop moves out onto a platform viewing a large area reserved for wolves. Several are in open view, and a den opening is just discernible in the distance.

Moving on, the path circles around a broad hill. The path moves up onto a frame as you approach, and you cannot see anything, but the area is for black bear. As you move along the frame, you keep looking into the area hoping for a glimpse of something. There, up in the rocks, a black nose and fur are all that is visible of a bear snoozing in the sun.

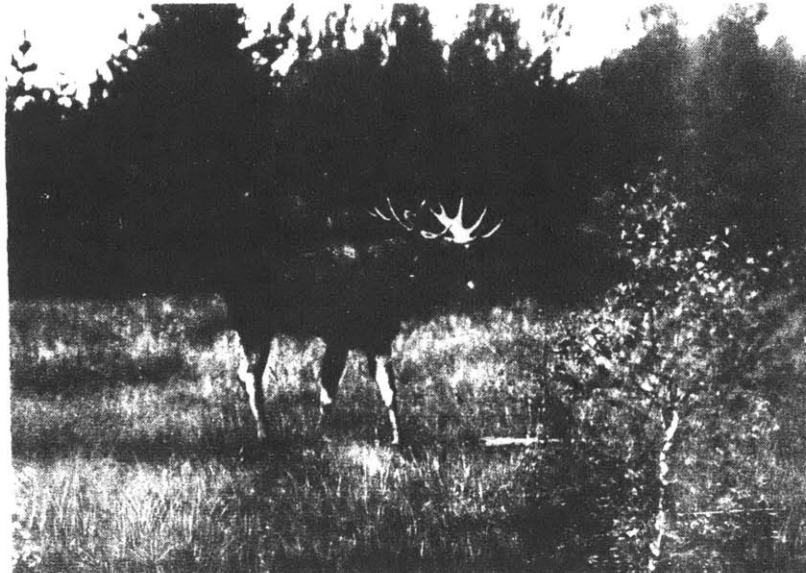


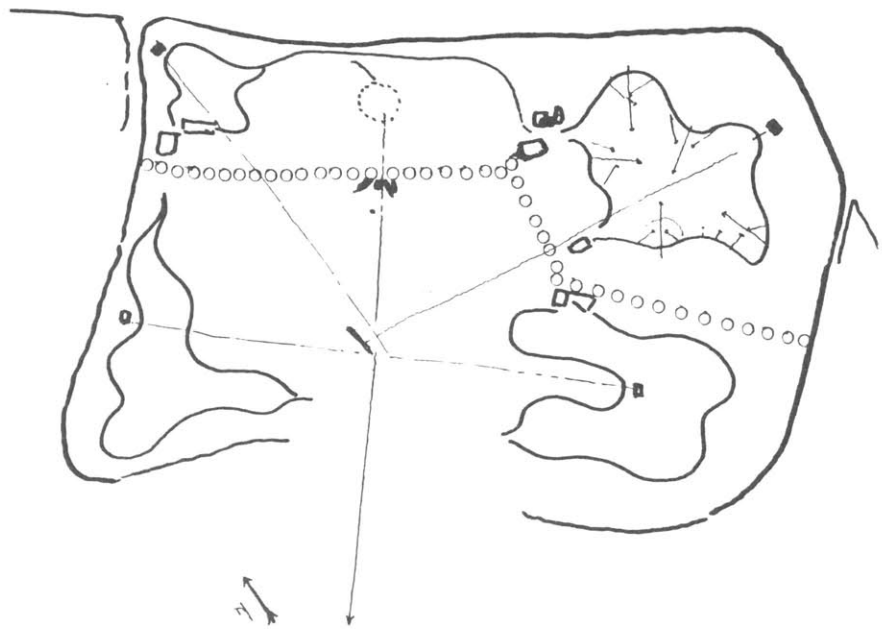
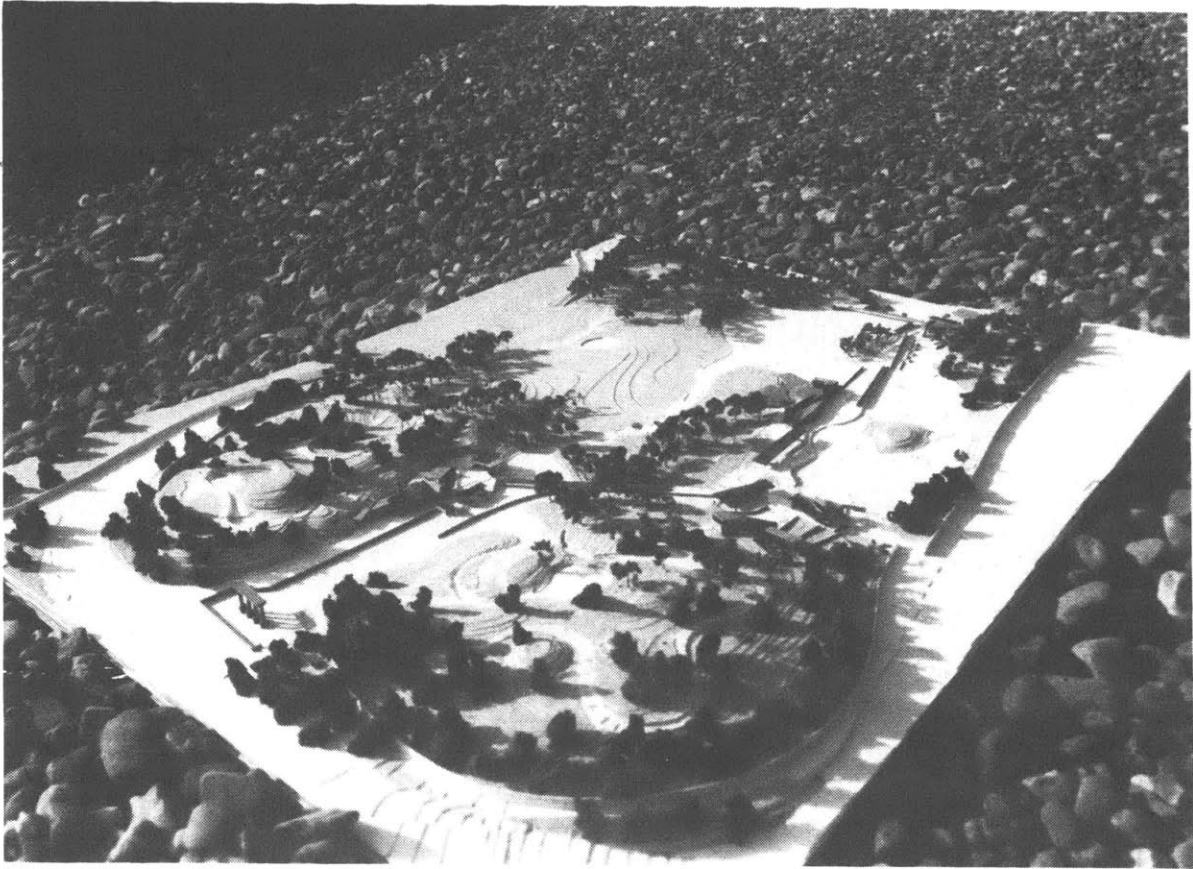
Figure 55

The path moves on, staying on the frame as it moves between two large outcrops. A raised area on the left forms an extension of the path and you see a narrow trail leading onto the rock. Climbing the trail, you come to another small platform like that in the mountain habitat. As you gaze out toward the refuge, your gaze is caught by something in the foreground. An elk is rubbing its antlers against a tree, shaking it from bottom to top.

The elk seems engrossed in its chore , turning from side to side. The distant view fades as you watch the animal, and then the light on the lake behind it.

As you descend the main path toward the tunnel of the East Gate, the elk stays in your mind. The flaking bark, the absent minded look in its eyes, the tawny fur. The details of that view somehow capture the sense of the place, remind you to come back.

Animals and Habitats



Epilogue

Zoos are compelling places, both as examples of what nature is and what nature is not. More than the major issues of control of spaces and the role of barriers in the evocation of a natural place, this project has made me acutely aware of the limitations of zoos as architectural metaphors of the real. In focusing on how architecture can make us aware of nature or bring us into touch with a particular landscape, I was drawn toward the idea of making the zoo a "real" place, not just a theater for amusement or description. The act of building the place was still a contrivance, but the notion of creating a zoo that "works" was always in the back of my mind. This made the task more difficult and more rewarding. But ultimately it brought me back to the essential question of why zoos are still in use, indeed why they are making a comeback

as replicas of natural environments.

The disturbing news is that nature in the romantic sense is turning into "nature" as a controlled environment. The zoo may help to reverse this trend by bringing people into touch with nature in an empathetic way. But the conception of the zoo as a place to see exotic animals, even if endangered, serves to alienate them from their world, and separates the experience of the zoo from its context. For the zoo to be a valuable place beyond its recreational use, it must become more of an extension of the natural world, more closely tied to the reality of nature.

Architecture can evoke the qualities of nature, can bring us closer to that part of ourselves. But it cannot create that experience of emptiness that is nature. As an analogy, architecture brings us to the real experience but does not

need to substitute its own value for that of the larger world.

In terms of process, I found the tendency in my own work to move from the largest scale down to the smallest was problematic in this instance. The relation between a specific experience and the understanding of larger orders of a place evolved in my exploration of the difficulties of making "nature" and then experiencing it. Thus, my work began to focus on the minute details and the largest organization. The middle scale of buildings and pathways became references of the dialogue between these extreme ends of the spectrum of experience.

Appendix A: Photo References

“

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Figure 4

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Figures 23, 27

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Figures 7, 8, 28, 29, 31, 37, 39

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Figure 32

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Figures 21, 22, 35

Keneth J. Polakowski, *Zoo Design: The Reality of Wild Illusions.*

Figures 2, 3, 5, 6, 9, 10, 13, 14, 16, 18

Vincent Scully, *The Earth, the Temple, and the Gods.*

Figure 34

Yi Fu Tuan, *Topophilia- Study of Environmental Perception, Attitudes and Values.*

Figures 20, 26

United States Department of the Interior, *Restoring America's Wildlife, 1937-1987*

Figures 17, 19, 30, 36, 38, 40

Paul Wolff, *Tiere in Sohonnen Bildern.*

Figures 11, 15, 25, 33, 41 46 47, 48, 49, 50, 51, 52, 53, 54, 55

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