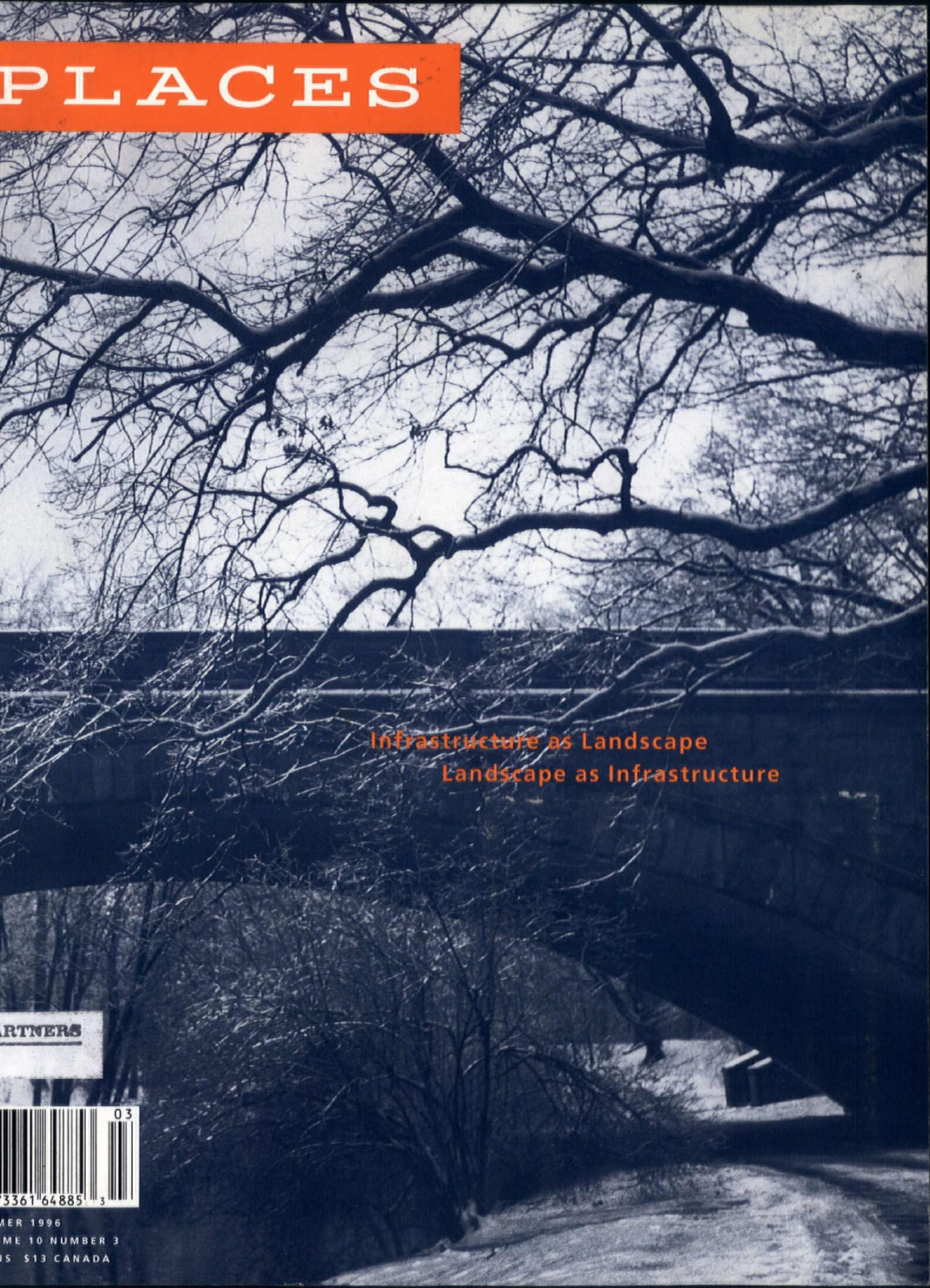
PLACES



Infrastructure as Landscape
Landscape as Infrastructure

03
3361 64885 3
MER 1996
ME 10 NUMBER 3
US $13 CANADA

Places, A Forum of Environmental Design, is published by the Design History Foundation, a nonprofit, charitable organization that sponsors a range of educational, publishing and research activities. The Foundation's mission is to establish forums in which designers, public officials, scholars and citizens can discuss issues vital to environmental design, with particular emphasis on public spaces in the service of the shared ideals of society.

Sponsors
National Endowment for the Arts
Pratt Institute School of Architecture
University of California, Berkeley, College of Environmental Design

Patrons
Design Center for the American Urban Landscape, University of Minnesota
Fulton + Partners, New York
Graham Foundation
Mr. and Mrs. Jeffrey Kenner
The New York Community Trust, Blecher Family Fund
University of California, Berkeley, DeMars Fund

Supporters
Altman-Stiller Foundation
Duany/Plater-Zyberk Architects and Town Planners, Miami
Dobbins Foundation
Ellenzweig Associates, Cambridge
Eskew-Filson Architects, New Orleans
Haines Lundberg Waehler Architects, Planners, Engineers, New York
Hartman-Cox Architects, Washington, D.C.
Jones and Jones Architects and Landscape Architects, Seattle
Lyndon-Buchanan Associates, Berkeley
Moore, Ruble, Yudell Architects, Santa Monica
The New York Community Trust, Ruth and Frank Stanton Fund
oration

rk

About the cover: Longwood Avenue Bridge, Boston. The bridge is part of the Muddy River Improvement portion of Boston's five-mile "emerald necklace," which consists of five parks and connecting parkways. The Muddy River project included seventeen bridges and footbridges, as well as other architectural elements, such as pedestrian shelters.

The Longwood Avenue Bridge was designed in 1895 by Shepley Rutan and Coolidge (in collaboration with Frederick Law Olmsted) and constructed in 1898. It was photographed in 1995 by David Akiba for Shepley Bulfinch Richardson and Abbott.

CONTENTS

Infrastructure,
the great constructed pattern
of grids, channels, pipes
and networks
that course across the land,
sets the underlying
circumstances of our daily lives.
Landscape, too,
is a constructed pattern,
a way of seeing the context
in which we live.

Landscape paintings, whether majestically wrought with towering storms over mighty land forms or delicately inscribed with mythic figures prancing through the meadows in a pastoral dream, have become a part of the mental structure through which we process our perceptions. Summonings from other media, like Strawberry Fields Forever and the Worldwide Web, similarly beckon us towards differing visions of our relations to each other and to nature.

We need to keep alert to the implications of structured perceptions, to be cautious lest they lead us too easily along paths that no longer inform about our real circumstances. It is prudent to force ourselves periodically to step aside and wonder whether the patterns of image and thought with which we surround ourselves serve to enlighten or to obscure, whether they fashion effective ways of viewing the world or deflect our attention away from things that should be carefully considered.

Landscape, whether experienced through images or along highways and wandering paths, or as forms inscribed in the earth, has remained, until recently, the medium through which we most readily imagined the workings of nature. Growth and decay, transformation and disruption, the fusion of materials into new forms, have been rendered picturesque and digestible, their balanced shapes and colors cultivated for appreciation. Despite the large component of human cultivation and construction that underlies most landscape scenes (even the Colorado River was temporarily released from control this year so that flooding waters could restore nutrients to the soil of the Grand Canyon) the works of humans have generally been imagined to be set in opposition to the landscape.

Conversely, the infrastructure that has been built upon the land to make it habitable for communities has been separately conceived: lines drawn across a map, then towering constructions that string power from here to far away there, structures that gather and control the flow of rivers and channels that transport objects and people, subjecting them to defined purpose and the demands of the market. Whereas "nature" has been rendered as fecund, dynamic and infinitely varied, infrastructure has been cast in the mode of single-minded determination, drawn out through the structures of engineering; pipelines, canals, dams arcing across valleys, freeway channels and wires propped above the land. Lines have been the medium of control.

Gradually we are coming to see these linearly conceived structures dissolve into interactive ecologies or multiply into networks that behave in a very different way, dispersing and combining rather than collecting and separating energies, movements, resources and information. In the end the Web may not absorb us into itself, but serve, rather, as a metaphor that will help us to see the world and the constructs we make within it in a more multiple, more "natural" way.

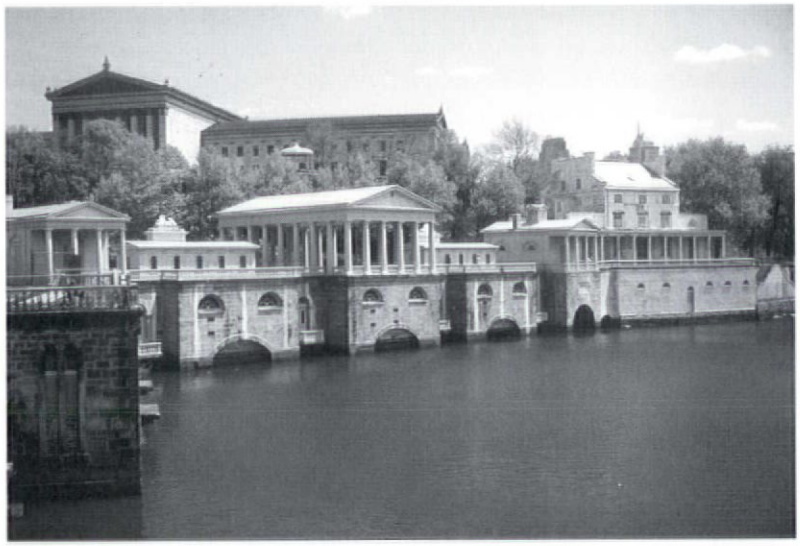
In this issue we explore some of the diverse implications of looking to landscape and infrastructure as interwoven, reciprocal concepts. The suggestions and examples included here, multiplied and extended, can lead to the forming of cities, systems and artworks that more aptly represent the conditions in which our lives take place.

We are particularly pleased to include a place debate on the outcome of one such proposal, the Phoenix Public Art Master Plan, which we first reported in *Places* 5:4 in 1988. William Morrish, Catherine Brown and Grover Mouton prepared a plan for relating the location and funding of artworks to infrastructure improvements that were to be created in the landscape – cityscape of Phoenix. The outcome is mixed, the outreach exemplary.

— Donlyn Lyndon

Serendipity on the Schuylkill: The Fairmount Waterworks

Heather Hood



View of the Waterworks from the Schuylkill River. Courtesy Mark B. Thompson Associates.

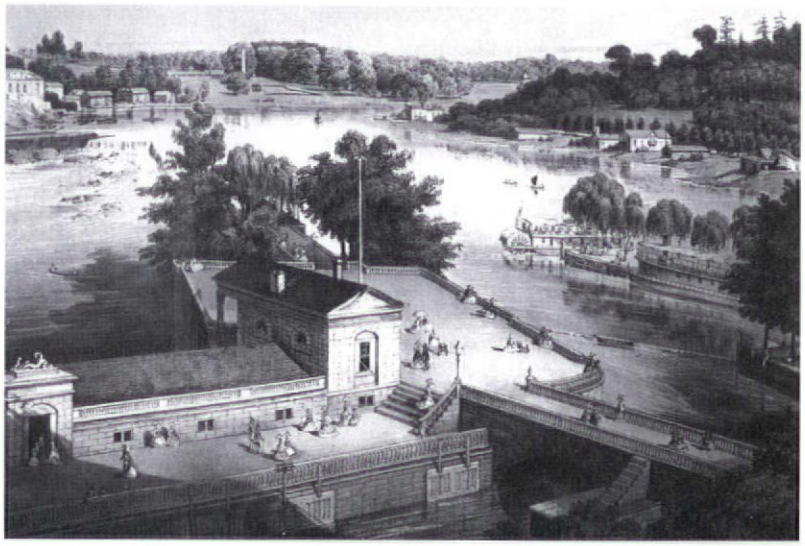
Philadelphia's Waterworks is a unique case of a civic place being born from urban infrastructure needs. Although its function has changed many times and it has suffered from a lack of consistent maintenance, the Waterworks remains embedded in many Philadelphians' image of their city. Today, people who see the Waterworks' potential and beauty are struggling to define a new generation of public uses that best adapt to the architecture and the diversity of people who could enjoy it.

The Waterworks played a significant role in Philadelphia's transformation from an artisan to a manufacturing economy. The city established a Watering Committee in 1798 after it had suffered two yellow fever epidemics and because it lacked a reliable source of water for putting out fires. The committee found that city wells were contaminated by cesspools and that an entirely new system needed to be engineered.

The first buildings were finished in 1815 and served as Philadelphia's primary pumping station until 1911, supplying up to five million gallons of water daily. The Waterworks drew in water from the adjacent Schuylkill River, purified it and pumped it to the adjacent Fair Mount, from which it flowed by gravity throughout the city. The compound evolved as the machinery evolved from steam engines to waterwheels to turbines. The New Mill House was constructed from 1869 to 1862 and the Old Mill House was renovated from 1868 to 1872.

The Waterworks' designers and superintendents, Frederick Graff, Sr., and Frederick Graff, Jr., always envisioned the Waterworks as a civic and educative place and found ways to incorporate public access to its grounds and structures. Paintings from the nineteenth century depict people strolling around and within the Waterworks, rowing, biking and picnicking. It was popular with the bourgeois Philadelphians, traveling businessmen, tourists, ice skaters, painters and lovers for many years. It even served as a steamboat terminal. By the 1880s, however, the city decided that filtration at other sites would be more efficient and reliable and stopped maintaining the Waterworks. By 1911, Schuylkill River water was far too polluted to be a source for the facility, which was decommissioned.

From 1911 to 1962, the Waterworks was used as one of the first aquariums in the country. In 1974, the Junior League (a local civic group) led a fundraising campaign to restore and preserve the main structures before they collapsed. Since then, the Watering Committee, Junior League members, Philadelphia's Water Department, the Fairmount Parks Commission and various individuals have been seeking a way to revive the Waterworks as a great place. Currently, a restaurant occupies the Engine House and an interpretive center occupies the Old Mill House.



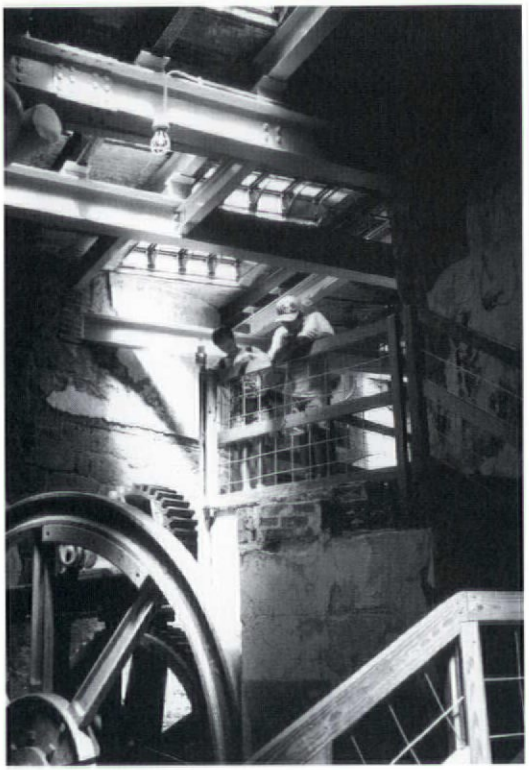
Julius Bien, *View of Fairmount Waterworks from the Landing*, 1867. Courtesy Philadelphia Museum of Art. Collection of S. Robert Teitelman.

During the twentieth century, many activities have found a home in various parts of the Waterworks: the aquarium, restaurant and interpretive center; a swimming pool, a cafe and a storage place for the Waterworks' own architectural elements. Teens hang out there, rollerbladers meet there, people fish there. We know that something must be special about the Waterworks if it has remained a choice kissing spot for two centuries.

The Allure of the Waterworks

What about the Waterworks allows it to be so many things? Moreover, what has compelled people to rally for its preservation and reuse for almost a century?

Visiting the Waterworks, one feels a sense of comfort, security and possibility. The site, chosen so the Waterworks would be close to river water and Fair Mount, offers both a sense of seclusion and opportunities for expansive views. The winds are mild; the afternoon sun is warm; the sounds of the river create a gentle beat; and the varied architectural spaces and niches invite discovery. There is no one way to see and know the place;



Today the Waterworks' original machinery is open to view. Courtesy Heather Hood.

one can look down upon it, walk through it or see it, as most people do, from expressways across the river.

The Graffs infused the Waterworks with civic meaning by using the Greek Revival Style, signifying democracy and Philadelphia's gounding ideals of egalitarianism and humanism. They included human-scaled elements such as balconies, pavilions, promenades, gazebos and sculptures, and they included platforms from which people could observe the turbines at work and experience this great technological achievement. Imagine if our local power stations, television newsrooms and manufacturing plants were similarly conceived and explored.

As Philadelphia has matured, the location has become fixed in Center City's grand plan. The Waterworks now nestles between two prominent city landmarks, the Philadelphia Art Museum and Boathouse Row. All three sit at one end of the Benjamin Franklin Parkway, a diagonal boulevard that leads from City Hall past institutions like the public library, the Franklin Institute, the Natural History Museum and the Rodin Museum.

People often assume the Waterworks is a civic place. My brother thought it was a mini-museum; an old schoolmate thought it was an abandoned theater house; someone else I talked to was sure it was the first boathouse. While each had seen it but never been to it, each imputed to it a civic identity.

Current Intentions, Potential Alternatives

The Waterworks has again sparked people's imaginations, this time to preserve the place. The current Watering Committee is assembling funds in hopes of finding new functions for the Waterworks. Determining a program is difficult for many reasons. Much of the site lies within a 100-year-flood plain, there is little parking nearby and there will be difficulties with handicapped accessibility and safety.

One challenge is to strike a balance between the Waterworks's stature, which derives from its history, architecture and location, and its humble scale. The renovated Waterworks should also be accessible and attractive to its neighbors, as should any local project financed largely with public funds ($2 million from the city and $2.5 million from the state).[1]

Nearby development projects will strengthen the Waterworks's importance at the civic and community scales. The Schuylkill River Development Council is developing a riverfront park that will lead from the Waterworks to South Street. Six thousand people (two thirds of them minorities) already live in this area; the conversion of the National Publishing Building into condominiums and construction of new homes nearby will bring in even more.[2]

The Brown Thompson Group, a development and architecture firm, brought the project to the fore three years ago by proposing that the Waterworks be used for an Olympic training center. The idea was rooted in the love many people in the area have for rowing and, after it was criticized for being too exclusive, evolved to include a mentoring program for inner-city kids. Still, to many

Far left: A cafe operated on the terrace in the 1970s. Courtesy Mark B. Thompson Associates. Left:: Children attending the Philadelphia Water Department's summer camp at the Waterworks. Courtesy Philadelphia Water Department Interpretive Center.

people, rowers mentoring children from inner-city Philadelphia seemed to be an improbable idea.

The architecture and history of the Waterworks offer simple lessons. The Waterworks' future should be pondered through a public and local debate, rather than the proposals of a committee or hired professionals. The architecture and the program should be civic, educative and allow for further evolution.

Many types of spaces remain in the Waterworks (open, broken-up, small, large, above and below water levels, grouped, independent, slender, wide, indoor and outdoor), suggesting that it can accommodate the multiple activities that are characteristic of contemporary community centers and the multiple demands of diverse urban communities.

A number of activities immediately come to mind: artists in residence spaces for visiting artists or art scholars through a museum program, a crafts museum, an architectural education facility, offices and shared meeting space for nonprofits in the arts and education, a conflict management headquarters for local companies and organizations, a facility for public and private celebrations (company picnics, weddings, graduation parties, summer solstice festivals, Kwansa festivals, rowers' rock-a-thons, rap contests and poetry slams), a restorative center and bath house, an affordable gym, an outdoor market (including food and crafts) during the warmer months and the rowing season. There must be many more.

The most powerful potential for The Waterworks lies in the convergence of the great desire to save it and the great needs nearby. If the Watering Committee and its consultants continue to develop an inclusive process to learn what those needs are, their dreams to save the place will more likely become reality, and the place will be even more widely cherished.

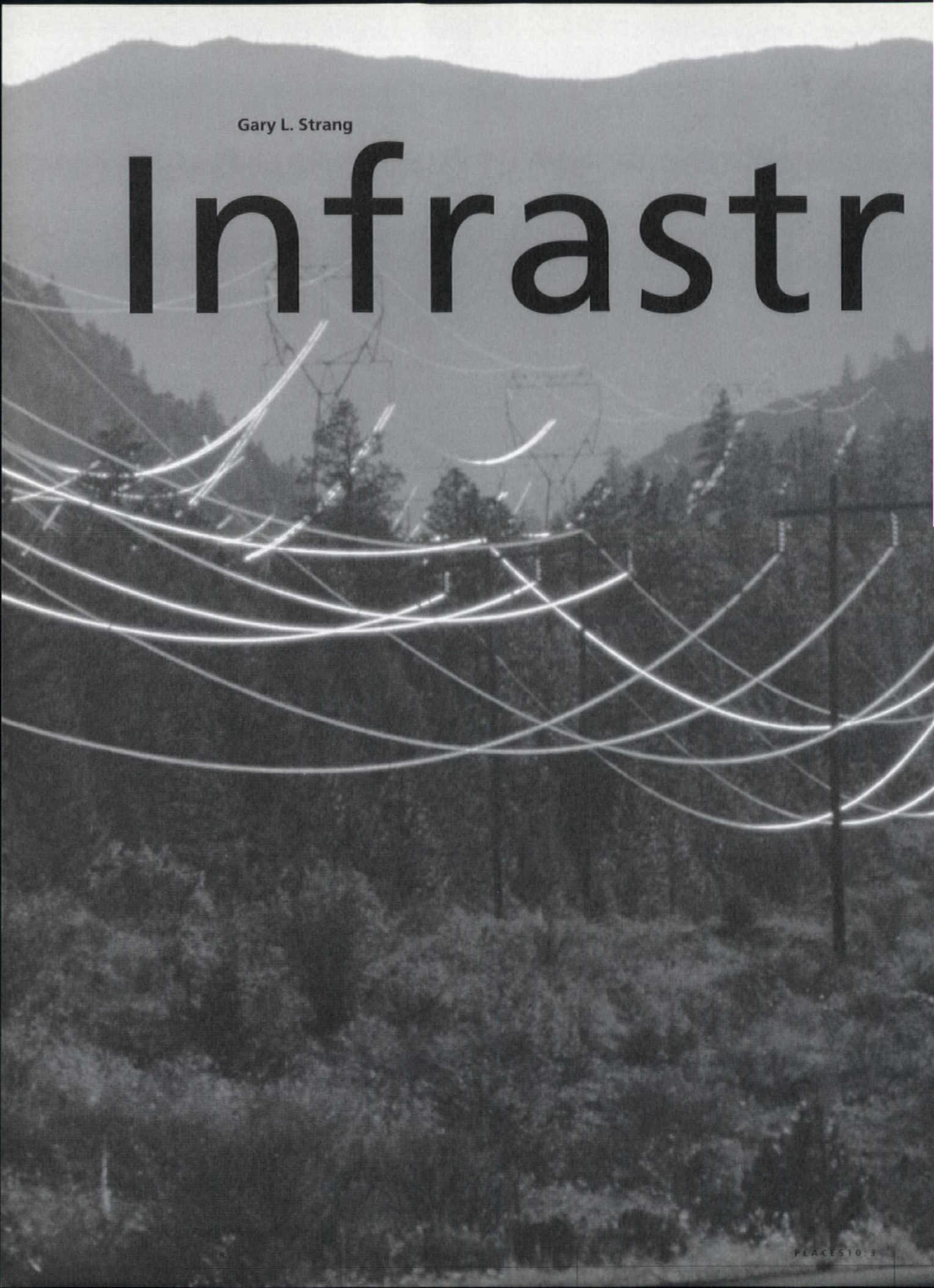
Notes

1. "Works in Progress: Two Visionaries Push a Grand Plan to Save the Showpiece on the Schuylkill: The Historic, Picturesque, Dilapidated Waterworks," *Philadelphia Inquirer Magazine* (20 November 1994), 11.
2. Alan J. Heavens, "Schuylkill Park Ready to Bloom," *The Philadelphia Inquirer*.

Historical references from Jane Mork Gibson, "Fairmount Waterworks," *Philadelphia Museum of Art Bulletin* 84:360-361 (Philadelphia: Philadelphia Museum of Art, 1988).

Gary L. Strang

Infrastr



ucture as Landscape

Traditionally, the tools and landscapes that insured human survival were viewed with great reverence. But in contemporary times, they have been replaced with centrally controlled systems that extract the resources necessary for life — food, water, power — and transport them hundreds or thousands of miles to urban centers. The architecture of the city has evolved into a complex mechanism extending deep into the earth and far into the hinterland, beyond any individual's understanding or direct influence.

Infrastructure systems, by virtue of their scale, ubiquity and inability to be hidden, are an essential visual component of urban settlements. Yet the responsibility for designing this machinery into the landscape is diffused, falling piecemeal to many disciplines — engineering, architecture, landscape architecture, agriculture, planning and biology.

Background: Eastern Washington landscape. Photographs courtesy Gary L. Strang unless noted otherwise.

Above: Missouri River Valley.
Right: Water from the California Aqueduct is piped across the Tehachapi Mountains before reaching Los Angeles.

The potential these infrastructure systems have for performing the additional function of shaping architectural and urban form is largely unrealized. They have an inherent spatial and functional order that can serve as the raw material of architectural design or establish a local identity that has a tangible relationship to the region. They can be designed with a formal clarity that expresses their importance to society, at the same time creating new layers of urban landmarks, spaces and connections.

Infrastructure and Landscape

In 1964, cultural historian Leo Marx wrote *The Machine in the Garden*, which explores an inherent contradiction in the American ideology of space. Free economic competition and technological progress are valued equally with the tradition of landscape pastoralism; thus, Marx observed, in our landscape the machine is accommodated in the garden. Today it is fair to say that the machine is not so much in the garden as it is indistinguishable from the garden; they are inexorably intertwined.

California was once a land of flash floods and drought, but most of the state has been transformed into a huge catchment basin, where water flow is monitored from Lake Shasta to the Mexican border. Most California rivers have been removed from their beds and flow directly into water treatment plants and irrigation canals that constitute the only visible, architectural components of a system that interfaces with every habitable space in the state.

In Los Angeles, the structure of the Los Angeles River is indistinguishable from the urban and residential structure of the city. If Angelenos know their city has a river, it may be because it has been featured in chase scenes in movies like *Grease* and *Terminator Two*. A member of the California assembly actually proposed using the river bed to carry a carpool lane in the dry season.

One needs to know that Los Angeles has 470 miles of concrete-lined channels in order to reclaim the meaning of the term "L.A. basin." The river is a huge storm drain that carries rainwater from the Santa Monica and San Gabriel Mountains to the Pacific Ocean; much of the rainwater never even touches soil. As the Los Angeles basin has been covered with rooves, roads and parking lots, the land has lost its capacity to absorb water and the increased runoff has overloaded the system.

While the architecture of water systems provides the most easily understood opportunities for architects, there are corollaries forsteam, natural gas, electricity, sewage, oil and telecommunications. Each of these constitutes a network as complex as a river system; each has the unrealized potential to perform multiple uses.

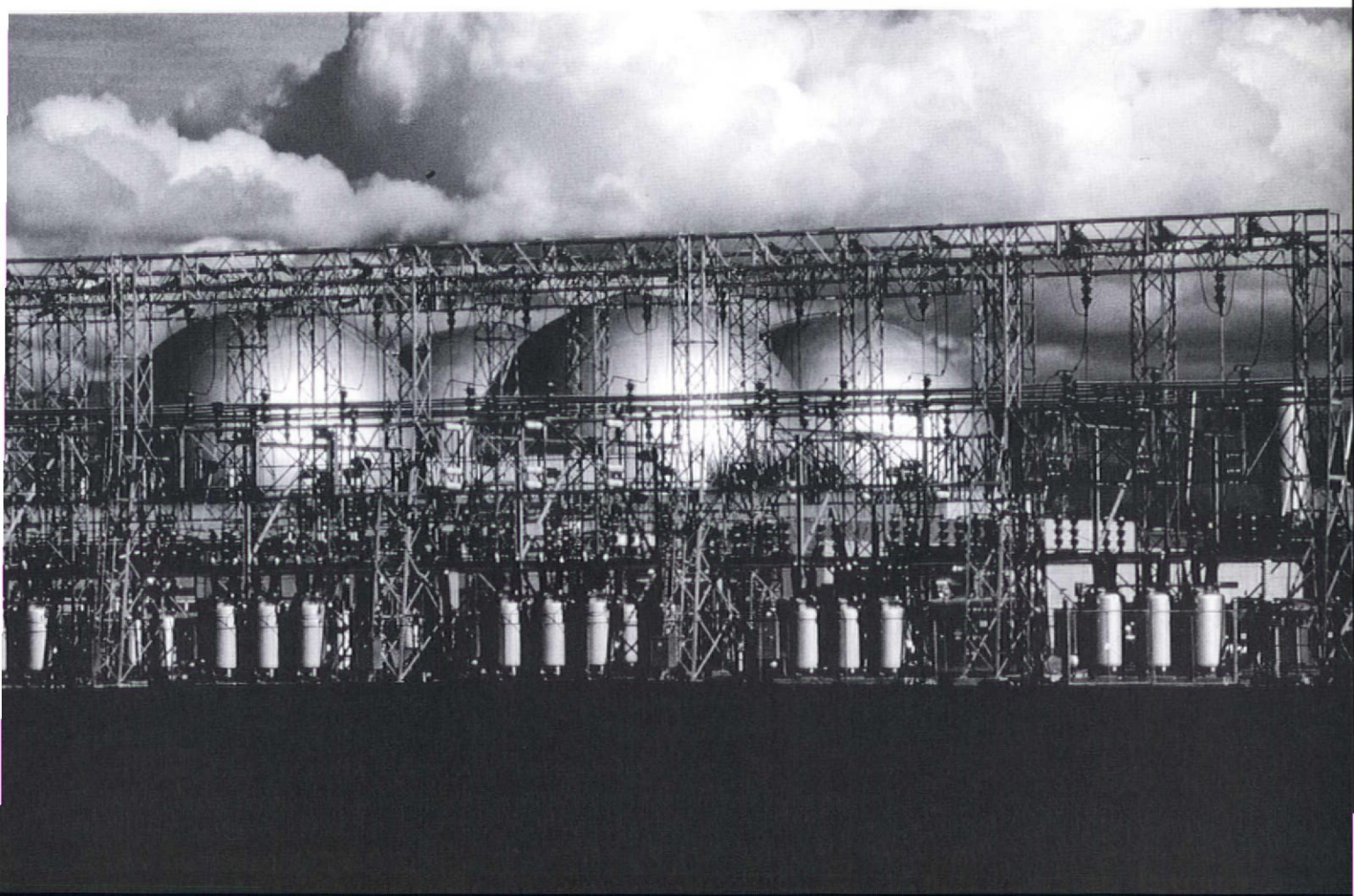
The tendency to engineer for a single purpose is also apparent in horticulture. Genetic engineering and cloning of plant materials has emphasized, primarily, visual characteristics while breeding out desirable qualities such as resitance to disease and drought and tolerance to local soils.

Plants have become unfamiliar to insects and wildlife. Parks and gardens may seem a minor consideration, but taken collectively, we are building large areas of a new habitat that is essentially sterile in terms of its ability to support the biological diversity necessary for human life. This new habitat is a mixed suburban forest that consists of a community of plants assembled from around the world and is guaranteed to confound any indigenous plant or animal that tries to colonize it (African daisies, Japanese maples, Australian tea trees, Canary Island pines, Burmese honeysuckle and so on). Since the '50s, the whole thing has been supported by a horticultural heart and lung machine made up of irrigation pop-ups, electric timers, fossil-based fertilizers and the associated blowers and weed wackers. If we pulled the plug, much of this landscape would disappear in a few months.

Despite this reliance on the constructed landscape, our culture's response to the disruptions of infrastructure has largely been one of denial, rather than reverence. Designers have most often been charged with hiding, screening and cosmetically mitigating infrastructure, in order to maintain the image of the untouched natural surroundings of an earlier era. They are rarely asked to consider infrastructure as an opportunity, as a fundamental component of urban and regional form.

As early as 1924, social critic Lewis Mumford castigated modern architects for romanticising new technologies while ignoring the potential for making civil architecture from the important, everyday elements of the city, such as water towers and subways. He attacked the City Beautiful

Above: Oil fields near McKittrick, California.
Below: Fuel tanks and electric power station at the NASA Ames Research Center in Mountain View, California.



Infrastructure often overwhelms the amenity it is meant to provide.
Left: Sidewalks often crowd street trees, sometimes with unexpected results.
Right: Temporary vents for underground steam conduits disrupt surface movement in New York.

movement for obscuring important structural and social developments saying that beautification was equivalent to "the icing on a birthday cake" that "detracts from the realism needed for the colossal task of the renovation of the city."[1] Today we are still masking a system of infrastructure vastly and impractically expanded beyond the boundaries of the city, multiplying the task of maintenance and renovation beyond comprehension.

From Heroism to Biological Complexity

To regard infrastructure as a legitimate field for regional architecture, it helps to understand the periods of civil engineering have transpired in the last two centuries.

The first American school of engineering was started at the U.S. Military Academy in 1802. The Army Corps of Engineers, which is responsible for waterway design in the U.S., was founded at that time. The school was started with the aid of French engineers who had helped during the Revolutionary War. From them, we inherited the idea, dating to Louis XIV, that a nation needs an army to direct public works.

Beginning in the 1850s was the heroic period of bridge and dam building, which culminated in the great projects of the Works Progress Administration, which integrated engineering, architecture, agriculture and the arts and was memorialized in Diego Rivera's murals.

To be an engineer between 1850 and 1950 was to participate in a great adventure, to lead the crusade for health and progress that corresponded to the high period of modern architecture in Europe. Plumbers were the pioneers of cleanliness at the end of the pre-industrial age, when people could still remember that the earth was swept by plagues that traveled thousands of miles before their forces were spent. In 1898, Viennese architect Adolph Loos observed that the plumber brings civilization.

As the statue "Mercury, The Genius of Electricity" was being mounted on the top of the AT&T headquarters in New York in 1916, the street below told a dramatically different story. Romantic images that depicted the benefits of technology contrasted with the messy process of retrofitting cities to accommodate an overwhelming tangle of pipes and wires – which often laid claim to open space formerly reserved for people. The city was undergoing a fundamental, systemic change as energy formerly produced by human labor was being generated or collected in remote areas and carried into the city from the surrounding region.

In 1947, WPA writer Harry Granick identified the dawn of a new era of biological complexity in engineering. He authored *Underneath New York*, the first book to describe the anatomy of a modern city using the metaphor of the human body. The book conveys his sense of wonder at the hidden structure that converts natural resources into the energy that makes urban culture possible.[2]

Granick's New York rested on a foundation of tangled plumbing as deep as the Chrysler Building is high. On the top lay a three-inch mat of asphalt, beneath that ten inches of concrete. Below that, a few inches of soil soaks up chemicals from the street. In the next three inches are the wires – telephone, electric, street light and fire alarm. Gas lines lay another foot below, water mains are four feet deep, steam pipes puff away six feet under. Sewer pipes are above the subway vaults, which vary from a few feet to eighteen stories deep. Water tunnels, running between 200 and 800 feet deep, occupy the farthest man-built depths.

There are two ironies about this infrastructure of biological complexity. First, the system is so complicated that it has begun to take on qualities of nature itself and, therefore, presents the same threat of random catastrophe that nature does. Infrastructure, like nature, is resilient and adaptable, but it is also unpredictable and uncontrollable.

"Man's own cramped-together creations, anything from underground sewage systems and subways to a badly hem-med-in sky overhead, irritatingly criss-crossed by a maze of electric wires, should not prove as inescapable as fate. Lightning and the plague, once so formidable, have been countered by proper measures; must we then here find ourselves helpless? Must we remain victims, strangled and suffocated by our own design?"
— Richard Neutra, in *Survival Through Design*.

It is well known that a simple broken water main in Manhattan can trigger what is known in ecological circles as a "feedback loop." The problem is directed back into the system, resulting in additional and magnified effects. In July, 1995, a 36-inch diameter water main carrying three million gallons per day erupted from beneath the asphalt on 34th Street, turning Seventh Avenue into a river that flowed to Greenwich Village. Water drained into subway ventilation grilles, shutting down two lines, forcing pedestrians to the streets and causing power outages. In extreme cases, technological malfunction can have catastrophic results. In April, 1992, the sewers of Guadalajara filled with propane and exploded, leveling 25 square city blocks and leaving 15,000 homeless.

The second irony is that the support system occupies so much space that it overwhelms the amenity it was intended to provide. The public realm and natural areas have become repositories for meters, transformers and zones of access to buried conduit networks. Anyone who has peered into an urban street during construction will need no explanation to comprehend the difficulty of finding an uninterrupted volume of soil large enough to support a tree for the seven to twenty years that now constitutes its average life span.

Infrastructure, Architecture and Landscape

Utilitarian intrusions – which often result in disturbed landscapes, defaced retrofitted buildings and the erasure of nature that we have come to accept as the everyday urban and regional landscape – are actually opportunities. Designers can generate meaningful new architectural, urban and regional forms by integrating the works of the estranged disciplines of architecture, civil and structural engineering, landscape architecture and biology.

An examination of pre-industrial cities shows that some of their most profoundly moving landscapes were nothing more than the irrigation, domestic water supply, sanitary sewer and flood control systems of the time. These landscapes allowed the workings of nature to be revealed in the urban setting.

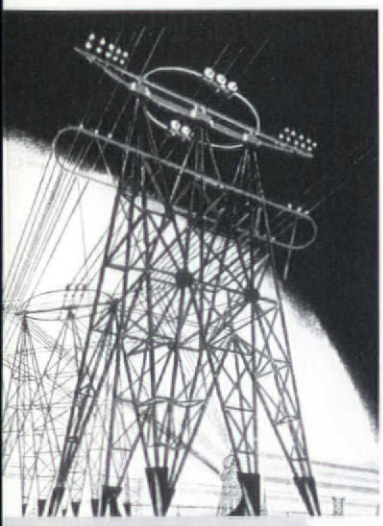
The technology of a pre-industrial urban fountain maintained, by necessity, a legible connection to a watershed. At a tiny Inca village in Peru, a manmade fountain was the ordering system for the town. Agricultural terraces took their form from a bowl in the topography while an elaborate stair and fountain connected a temple at the top with a compact cluster of houses and storage buildings below. The fountain intercepted the flow of the drainage beyond with a series of stepping water basins, whose volume could be retained or released depending on the seasonal flow. The logic of the watershed was evident within the context of the city.

In contemporary American cities, the hydrology of the place has been largely ignored. Drainage systems have been put underground unnecessarily or channelized with concrete, erasing the visual and spatial logic of the region. Contemporary fountains, which are loops of recirculating chlorinated water that operate independent of rainfall and gravity, need to be replaced with fountains that have nature driven, seasonal variations.

A place's hydrology should be part of the basic armature of the urban form. Water treatment

"For even as your brain, nerves, heart, lungs and stomach are hidden from view, so it is with the City. Its nervous system, the vital organs which provide it with heat, water, light and air, its intestines, which like yours, eliminate its wastes, its great arteries of rapid transit, which, carry its stream of life to all ends of its body, all these and more that make it possible for eight million people to live together, are out of sight under the pavements and waterways."
— Harry Granick, in *Underneath New York*

Inset: A Moorish wall built with Roman technology at the Alhambra, Granada, Spain. Background: Kiwi vines near Woodland California.



Inset: Prototype design for a transmission tower, by Iakov Tchernikov.

plants should be designed to accomodate visitors and to demonstrate appropriate site design and water use. Sewage plants are magnificent sources of nutrients, which could be collected and expressed in landscapes that could rival the great gardens of the renaissance.

Significant sources, paths and transition points of our collectively owned resources should be made legible in the landscape. They can comprise an alternative system of urban and regional landmarks that replace those that glorify the transitory economic prowess of individuals and companies.

In Sunol, Calif., a water temple marks the place where water piped from San Francisco's Hetch Hetchy Reservoir, more than 100 miles away, surfaces before passing into Crystal Springs Reservoir, where it is stored for domestic use. This logic could be applied to all the great utilities. Oil, steam and natural gas lines should be marked at significant locations, such as their source and the point at which they enter the city, with structures that make their functions, and important positions in society, legible. A huge natural gas line could be marked with an eternal flame that announces the number of miles the gas has traveled. Invisible communications technologies chould be expressed at transfer points.

The biggest immediate gains can be made in the renovation of single-purpose utilities. The reconstruction of urban drainage systems, for example, can provide networks of open space shared by people and working biological systems at little additional cost. To reduce the loads on drainage systems, many regions (such as Los Angeles, where proposals are already on the table) will eventually require that water be retained on site in basins, gardens and cisterns, from which it will soak directly back into the earth. Compare this approach to the recently adopted proposal by the Army Corps of Engineers to heighten the walls of the Los Angeles River by four to eight feet and to raise eleven street and railroad bridges.

Architects should be more like farmers, who depend upon the architecture of natural systems for their livelihood. The strict lines of human geometry and production efficiency should be allowed to deform to incorporate, rather than neutralize, biological networks. Good agricultural fields perform more than the single function of producing food; they can also be percolation fields, floodplains or flyways for migrating geese that fertilize the earth. Buildings, likewise, can be elements of infrastructure that contribute to stable natural ecosystem; they can they occupy more than one niche simultaneously.

Horticultural practices also need to be revamped to incorporate the common-sense attitudes of small farmers who use materials at hand to solve complex technical and horticultural problems in an efficient and beautiful manner. Nature is being severely altered and we need new, legible models to illustrate how nature currently works and does not work — intertwined, such as it is, with architecture. We must find ways to allow the natural landscape and the landscape of infrastructure, which occupy the same space, to coexist and perform multiple functions.

In California, this means planting more Monterey Cypress in the fog belt, more oaks and grasses in the hot interior. It also means understanding that a western urban landscape is better informed by an Islamic courtyard in Spain than by the green English countryside. This was a principle not lost on Frederick Law Olmsted, who demonstrated his understanding of regional variation with his site plan for the Stanford campus, which included arcaded courtyards and a dry oak woodland landscape. The fragmentation of the building process into so many different disciplines has led to a gross simplification of the issues involved in building.

In the earlier part of the century architects were more optimistic about expressing utilities, buildings and highways as legitimate components of a larger system. Frank Lloyd Wright, raised on a farm and trained as an engineer, demonstrted an uncommon understanding of structure and nature. Taliesin West is sited adjacent to a seasonal desert wash that provided a full range of sands and gravel for his masonry and supplies water for domestic use (stored in a tower) and firefighting (stored in a central garden basin). Russian constructivist Iakov Tchernikov developed a language based on the new spatial possibilities of technological expansion. He produced exuberant architectural compositions from building types we have

New canopy for light rail station in San Francisco. Designers: Leonard Hunter and Sheila Ghidini. Photograph by Peter Hamblin, courtesy Federal Transportation Administration.

regretfully given up on — electrical towers, industries and factories.

More important are developments in architecture and structural engineering, which are being remarried after a 100-year divorce — a movement that predicts the corresponding and much needed reconciliation between landscape architecture and civil engineering. Renzo Piano and Ove Arup engineers have begun to overcome the barriers to developing integrated architectural systems by combining technological developments with the organic principles of nature. Says Piano, "at the beginning of the century technology was really an adversary to nature. But today you can see that technology and nature are not so far apart."

In San Francisco, Bill Leddy has made a proposal for the renovation of Sutro Baths on the Pacific Coast, which would be enclosed by a water desalinization system driven by a dependable supply of offshore wind. In this instance, infrastructure, serving a multiple purpose, would renovte an existing ruin, reinvigorate a civic landmark, generate power, provide fresh water and relieve pressure on the Hetch Hetchy Reservoir.

In an open chapel and cemetery Dan Solomon and I designed in Houston, the 50 to 100 inches of rain that fall on the roof each year will be captured in a huge elevated gutter that doubles as a portico. The rainfall will be captured in a pool that retains floodwater as a seasonal site amenity. The pool overflows to walkways that double as drainage structures, and form the geometric lines which structure the site for the ritul of burial. The problem of drainage and flooding in Houston is seen as an opportunity to organize the site and to allow mourners to confront the cycles of nature.

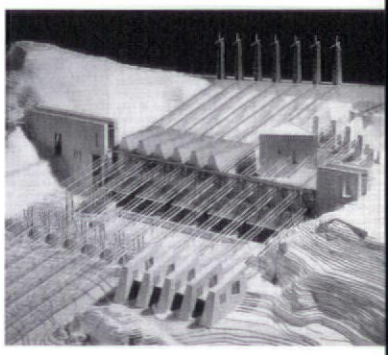
Prospects for Regional Intervention

Acknowledging the potential for appropriating infrastructure as landscape offers pragmatic and immediate advantages. The amount of funding for building and renovating public infrastructure is likely to far exceed the amount that will be available for buildings, parks and open space. These large budgets can be used to produce urban designs that simultaneously solve utilitarian problems and help repair cities and regional landscapes at a scale not dreamed of since the days of the great dams.

Given the magnitude of changes occurring within natural and technological systems worldwide, a position that links human survival to the preservation of pristine nature is increasingly difficult to visualize; nature is a dynamic process that is rarely independent of human interaction. Nevertheless, we must learn to intervene in a way that facilitates, rather than disrupts, natural processes.

The historian of religion Mircea Eliade contends that the Neolithic shift from nomadic to agricultural civilization provoked upheavals and spiritual breakdowns whose magnitude the modern mind finds it impossible to conceive. It is not only imaginable but probable that the current shift to a predominantly technological environment has provoked a similarly profound spiritual crisis — one that can be relieved by reconsidering the relationship between urban settings and natural processes.

Likewise, the total management of nature is a dream that fades farther from view with every Kobe earthquake and Mississippi flood. An architectural method that exploits the unignorable marriage between nature and technology provides an opportunity for new spatial and visual possibilities that result from using infrastructure as a fundamental component of architectural design. Nature and infrastructure, working together, must both be allowed to express themselves as a major determinant of urban and regional form. It is up to architects, landscape architects, engineers and biologists to show the way.



Proposal for the renovation of Sutro Baths, San Francisco. Designer: Bill Leddy.

Notes

1. Lewis Mumford, *Sticks and Stones* (Liveright: Boni and Liveright, 1924).
2. Harry Granick, *Underneath New York* (New York: Fordham University Press, 1991).

James Brown, Kim Storey

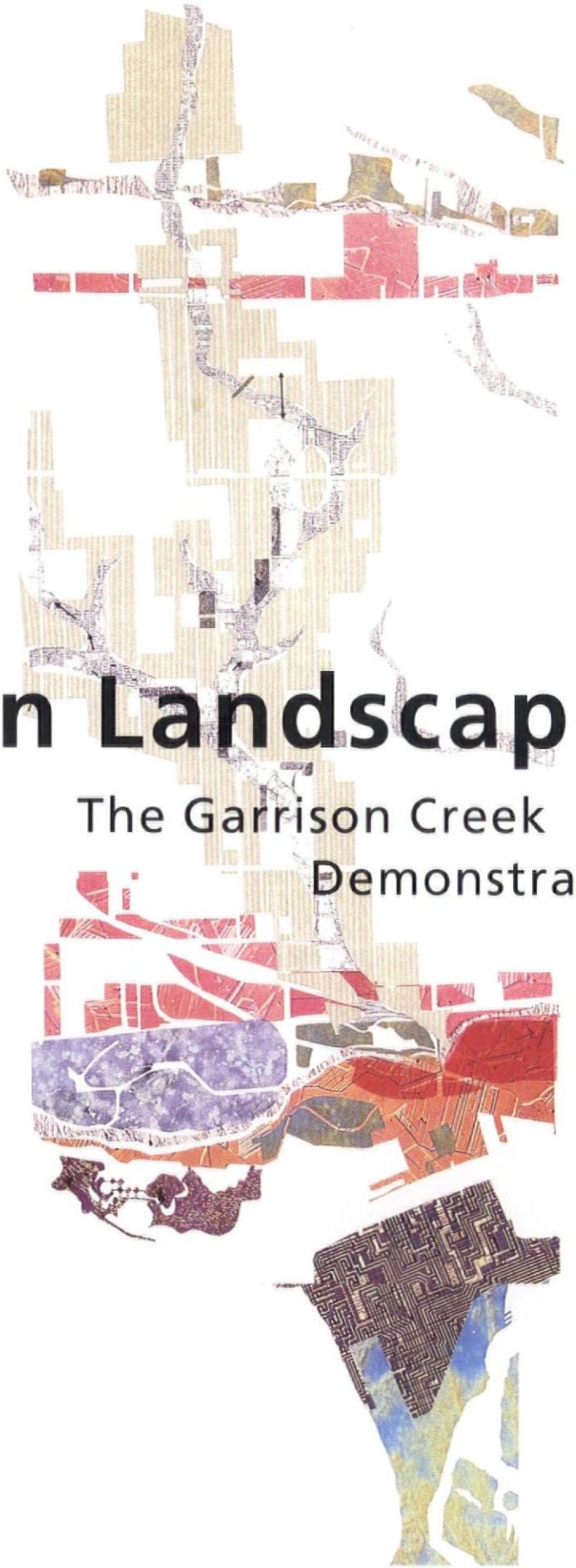
Rainwater in the

The connection between city and nature is often made by the human intervention of infrastructure. The manner in which we lay this framework for the support of our daily lives (water, movement, energy, waste removal) can leave a disjointed gap in our environment – or it can intensify and enrich a community landscape of public space.

Toronto's Garrison Creek is a typical example of the disconnection between the city and its landscape. Today the creek flows through an elaborate, Victorian brick sewer buried beneath dense urban neighborhoods and parks just west of downtown. Much of the ravine through which the creek once coursed has been filled, and some of it has been built over.

The "connected pond system" proposed here for the Garrison watershed could reverse this century-old trend of disconnection. The pond system would divert stormwater from the city's underground sewers into a community park system where it would be collected, stored, cleaned and reused. The pond system would be built in phases through a currently disconnected set of city parks that trace the original path of the creek and ravine to the shore of Lake Ontario – regenerating the open and hidden landscapes of Toronto into a vital and living part of people's experience of the city.

The Garrison Creek Project has been partially funded by the Canada Council and the Waterfront Regeneration Trust.



Urban Landscape

The Garrison Creek Demonstration Project

Co-evolving systems: Toronto's Garrison Creek Ravine, city structure and water infrastructure. Graphics courtesy James Brown and Kim Storey.

A swimming hole made by the excavation of Christie Pits, a quarry in the Garrison Creek Ravine, c. 1915. Courtesy City of Toronto Archives.

Our examination of the open spaces that trace the Garrison Ravine has included many layers of information: actual physical data about the open spaces and original landform (sizes, characteristics, topography, soil composition, etc.), built form patterns, local economic development, archaeological and buried artifacts, present water collection systems, night lighting, how people (and cyclists and cars) move through the system and so on.

This broad approach enables us to propose an integrated and sustainable infrastructure solution that responds to more than one issue. The money spent on wastewater treatment infrastructure, traditionally perceived as a single-purpose system, would have the additional public benefit of regenerating the city's parks and creating a connected public open space system.

Co-Evolving Systems

The history of Garrison Creek is a story of exchange between the evolving urban and environmental landscapes of Toronto. When the first British Governor, Lord Simcoe, arrived in 1792 to establish a military outpost, Garrison Creek had been flowing for thousands of years, meandering through a ravine cut into the vast, sloping plain by the receding waters of an ancient glacial lake. In the eyes of army engineers, the creek provided a secure natural water resource for Fort York.

The balance between town and ravine first shifted with the laying out of "Park Lots" by Lord Simcoe's engineers. This system of orthogonal land division created large estates that were offered as enticements to prospective gentlemen settlers. Although the boundaries of these lots ignored the influence of the ravine, the first villas that were constructed did not – they typically were sited on the banks of the ravine, at the highest point, and formally addressing Lake Ontario.

Early in Toronto's history, many industries located along Garrison Creek, particularly close to the lake. As industry and settlement increased, the Garrison was used for discarding waste. It quickly became polluted and its status changed from water resource to health hazard due to its noxious fumes.

In the late 1880s, the creek was buried in a ten-foot diameter brick sewer built to provide predictable, safe and serviceable stormwater and wastewater management. If infrastructure can be considered as the connection between the city and the natural landscape, then the burial of the creek reflected the attitude that nature was to be found in the wilderness and open space within the city limits was better managed as predictable land parcels.

During Toronto's rapid growth in the early twentieth century, the Garrison Creek ravine, though partially filled by the brick sewer, persisted as a continuous open space network. The ravine's use as a site for local industry established it as a vital part of the city's economy; certain locations, such as Christie Pits and Shaw Pits, became gravel quarries and others, such as Bickford Vale and the present College-Crawford intersection, were developed as brickyards.

At the same time, park lot owners began to subdivide and sell their large estates, and most of the ravine lands were designated for filling and new residential development. However, up until the 1920s, the City of Toronto followed a policy of acquiring Garrison ravine lands (including Trinity Bellwoods Park, Christie Pits, Bickford Ravine and Prittie Ravine) to create and maintain a publicly owned connected open space system. Where streets intersected with the ravine, the city built an elaborate system of bridges (at first wood, then concrete) that ensured the city and the ravine could coexist as continuous paths for movement.

A certain balance was possible at this point: the city could co-exist with the ravine, its natural host. The neighborhoods of the watershed were conceived around the continuous open space of the

ravine. Major institutions sited along the ravine, like the original Trinity College, brought vitality and prestige as central monuments. The bridges were landmarks that made direct connections between the city grid and the natural ravine course.

In the 1930s and '40s, however, city politicians lost interest in the Garrison lands. Both public parks and private property designated for housing development were treated as inexpensive landfill sites, available for dumping garbage and construction debris. Only vestigial traces of the ravine profile remain, and many of the bridges, which had been instrumental in preserving the continuity of the ravine through the grid, were buried intact.

This third wave of settlement reflected a break in the relationship between city and nature – they were no longer regarded as integrated, co-existing, harmonious elements, but as very separate and non-compatible entities. The parceling of the ravine lands into separate parks divided by city streets allowed the piecemeal disintegration of the Garrison system. As one piece of the ravine was filled, another maintained a ghost of the ravine profile, and another was sold off for new housing, a new school or a shopping center. The central, sustaining core of the Garrison community had been lost.

The Combined Sewer System and CSOs

In an urban setting, rainfall washes over street pavements, roofs, gardens, yards and trees, capturing both bacterial and metal contaminants in the process. The sewer system that was built in the Garrison watershed (and still essentially in place today) was a typical "combined sewer system," which channels both stormwater and sanitary sewage in a single pipe. The combined volume of rainwater runoff and sanitary sewage is carried to a treatment plant, where it is cleaned and discharged to the receiving waters – Lake Ontario.

Harbord Street Bridge, c. 1915, connecting Bickford Vale and Montrose schoolyard. This bridge was buried intact during the 1930s or '40s when the south part of Bickford Ravine was filled. Courtesy City of Toronto Archives.

In heavy rainfalls, the amount of stormwater suddenly increases and exceeds the sewer system's design capacity. The excess mix of stormwater and raw sewage escapes from the sewers directly into the lake through what are called "CSOs" – combined sewer overflows. These discharges are considered to be the prime cause of local bacterial pollution, so after heavy rainfalls Toronto's beaches are typically closed to swimmers. This has made the elimination of CSOs a common environmental, political and community goal.

As Toronto's sewer infrastructure ages, the city is planning to rehabilitate and rebuild many of the original lines. The Public Works Department has also proposed a large, new storage tunnel that would collect and store CSOs until the excess water can be treated later. This tunnel would be located beneath the waterfront at a cost of $60 million.

We believe the city can reduce the volume and improve the quality of rainwater that drains into the sewers by collecting and treating rainfall locally within the Garrison watershed. The connected pond system is part of a fine-grained solution that could include environmentally sensitive stormwater management programs (such as downspout disconnection, rain barrels, tree canopies, French drains and porous pavements) and treatment methods (such as biofiltration systems and smaller local treatment plants). The system would enlist the resources of the community landscape – neighborhood, open space, individual and collective – to treat rainwater as a renewable, reusable resource instead of a disposable waste.

Opposite page, left: The existing context. Right, from top down: Detail of Garrison sewer, ravine, open spaces and institutions; detail of built context on landfill; detail of areas of depressions.

Toronto has generally been considered too densely developed to allow for the amount of land necessary to manage stormwater through techniques like these. However, we have traced the topography of the original watershed through a series of existing, unconnected park lands — open space that adds up to a considerable inventory of land in public ownership and suggests that alternative stormwater management techniques are not only possible but also can contribute to the regeneration of a community infrastructure.

The Christie–Bickford–Montrose Demonstration Site

To test the idea of local rainwater collection in the Garrison system, we examined a trio of once connected parks — Christie Pits, Bickford Vale and the Montrose Schoolyard. The evolution and condition of these parks are representative of many of the special areas that occur along the length of the Garrison Ravine. We sought to demonstrate how alternative stormwater management techniques could not only help the city collect, treat and reuse rainwater but also catalyze the regeneration of the ravine parks and adjacent communities — and of the Garrison ravine system as a whole.

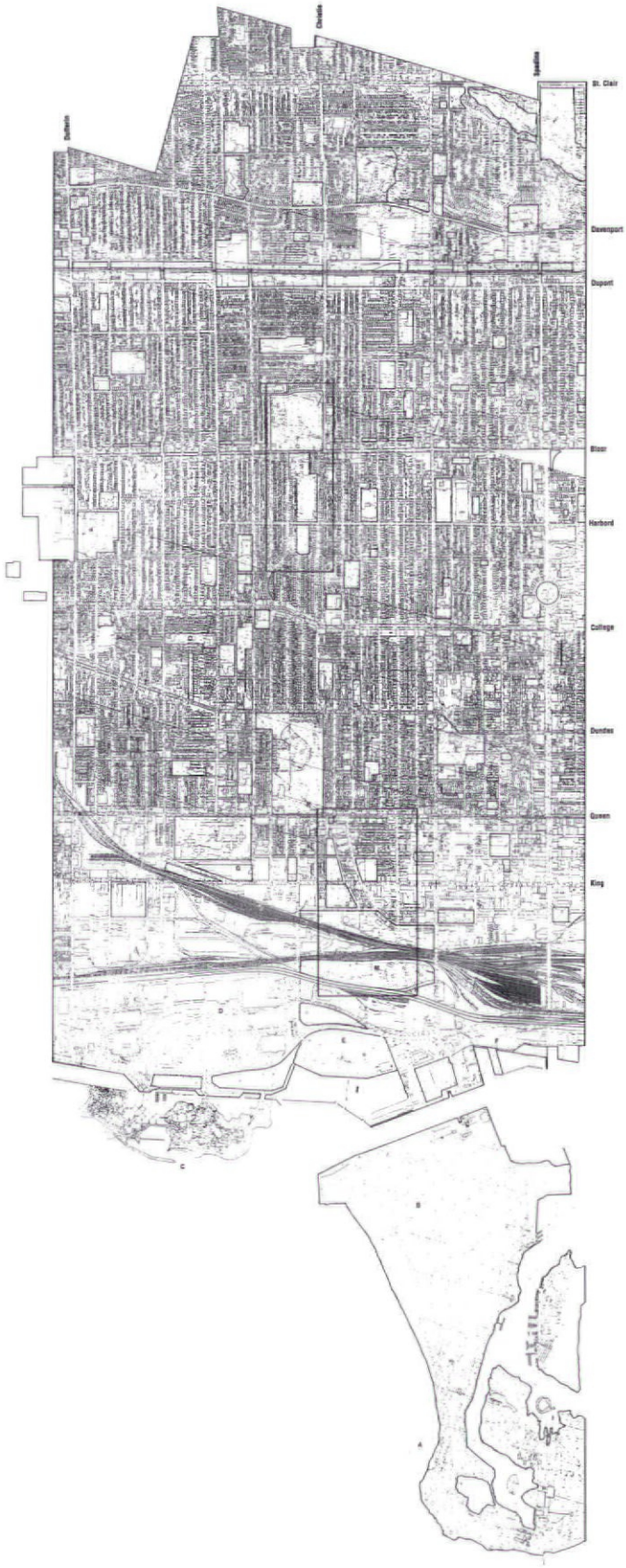
Christie Pits, Bickford Vale and Montrose Park once formed a continuous ravine. For many years, these parks remained connected because bridges at Bloor Street and Harbord Street, constructed at the turn of the century, allowed the ravine to continue through. When these bridges were filled in, the connectedness of these open spaces was lost, along with the grand scale of the ravine. After the ravine had been divided into small parcels, filling it in became simpler to accomplish through incremental steps. Today the area around these spaces is largely residential, with commercial cross streets occurring at Bloor Street and Harbord Street.

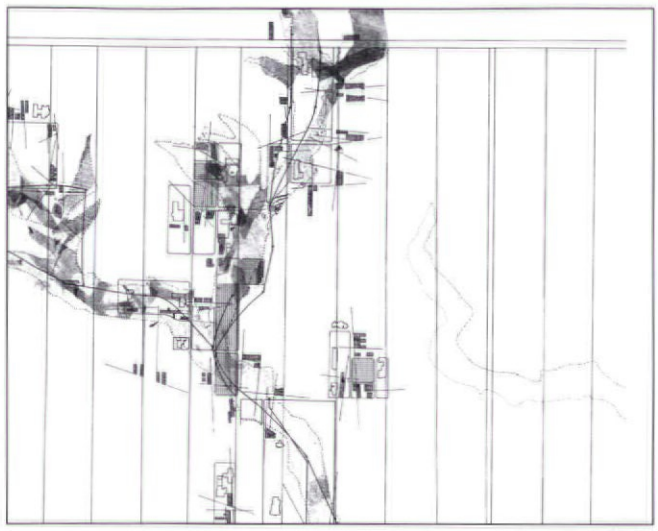
Willowvale Park (commonly called Christie Pits) began operation as a large, deep gravel quarry in the 1880s. It was acquired by the city in 1906 and partially filled in the 1910s. The present-day park is set approximately 50 to 60 feet below street level, sloping steeply up to the sidewalks on all edges. The grounds now contain recreational facilities, including an outdoor pool, changing rooms, baseball diamonds, seasonal washrooms and a children's playground. The western edge was developed as small housing lots, and a row of garages on a lane now faces the park. A sharply descending asphalt path at the northeast corner is the only path into the park from the north.

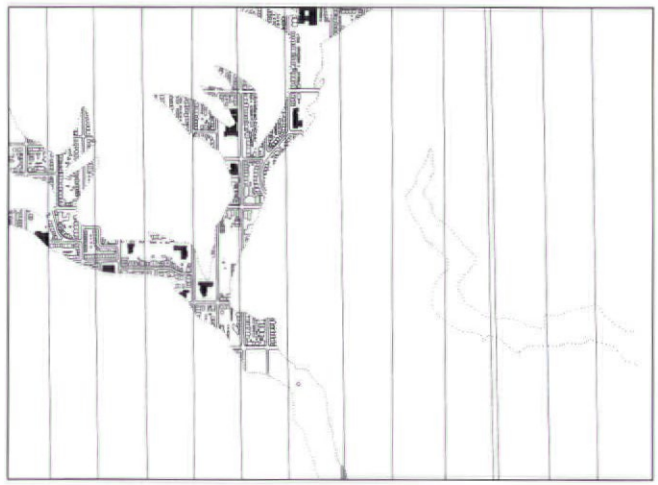
Directly south of Christie Pits lies Bickford Vale, originally known as Bickford Ravine. It was once used as a brickyard, and, like Christie Pits, the original banks of the ravine quickly disappeared through excavations for clay that gradually increased its width. This area was obtained by the city for parkland in the early 1910s. The ravine was then filled with garbage to a level of about twenty-five feet below the surrounding streets.

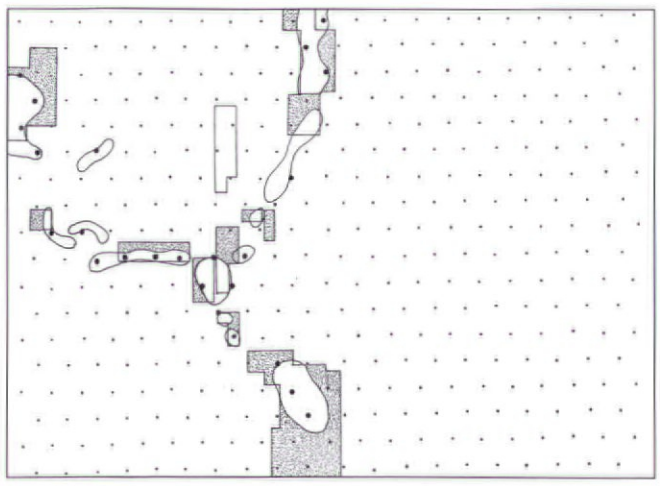
The sloping edges of Bickford Vale still recall the ravine depression, although its present depth is only a faint reflection of the original ravine. Bickford contains one baseball diamond and one bocci court, but its predominant character is that of a largely vacant green space.

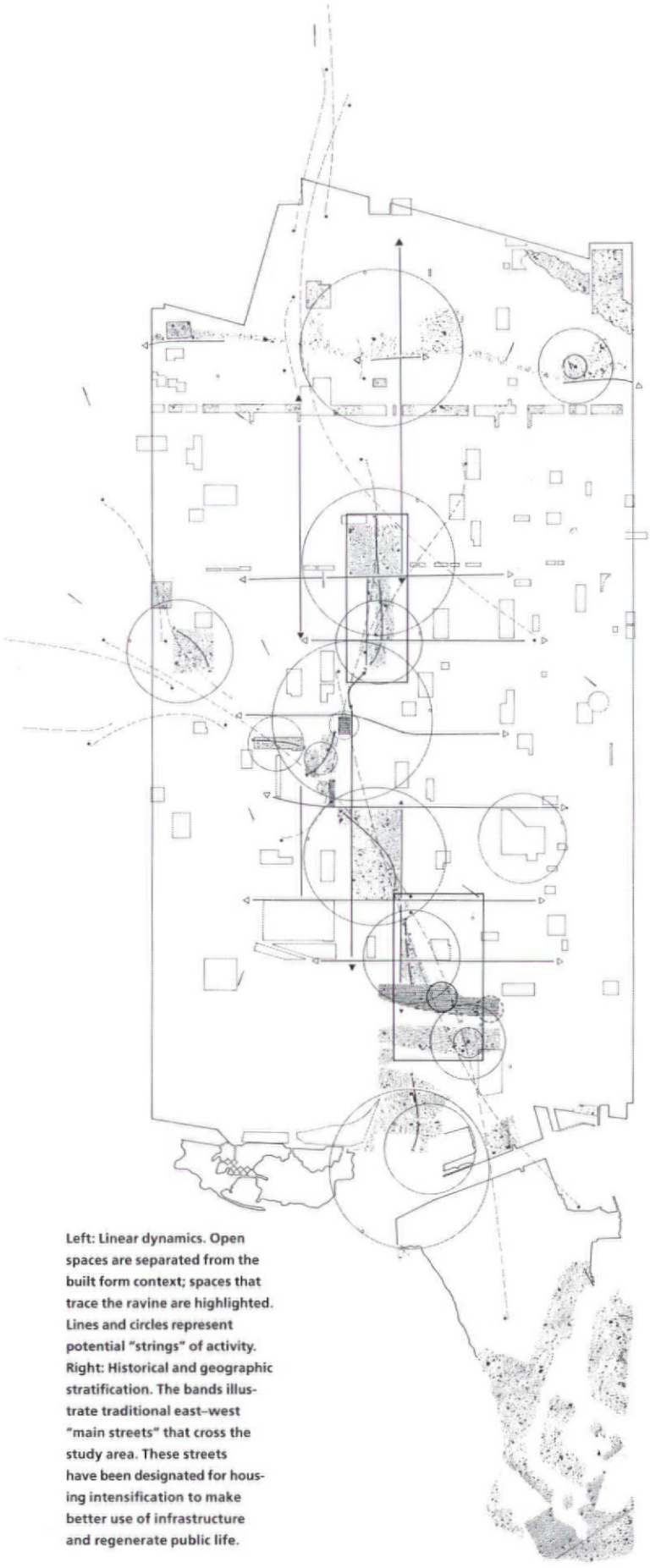
The Montrose Park and Schoolyard were once connected to Bickford Ravine by the Harbord Bridge. After the city took possession of this land, the eastern and southern edges were developed for single-family housing. Since that time, this site has been filled to the level of the surrounding streets. The filling of Montrose Park probably prompted the burial of the Harbord Street Bridge. On the western edge of the park, part of the open space became the site for Montrose Public School, built in the 1960s.

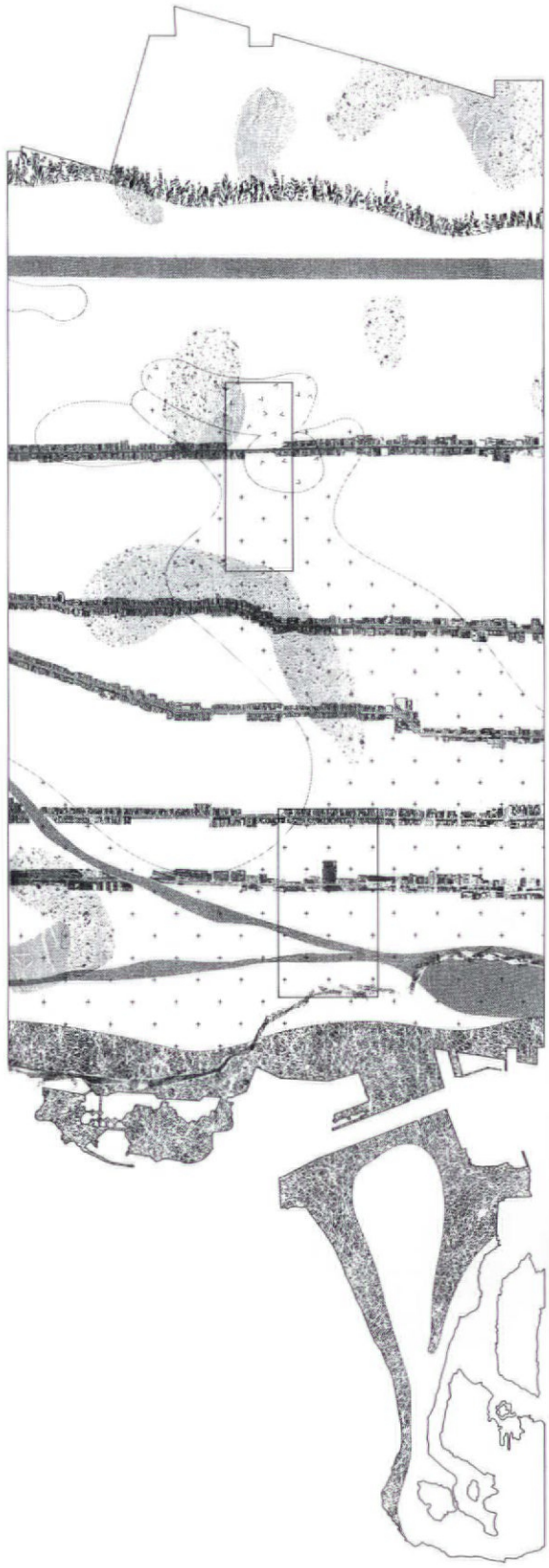

Dufferin
Dundas
Gladstone
St. Clair
Davenport
Dupont
Bloor
Harbord
College
Dundas
Queen
King











Left: Linear dynamics. Open spaces are separated from the built form context; spaces that trace the ravine are highlighted. Lines and circles represent potential "strings" of activity. Right: Historical and geographic stratification. The bands illustrate traditional east–west "main streets" that cross the study area. These streets have been designated for housing intensification to make better use of infrastructure and regenerate public life.

Left: Fills, excavations and the combined sewer system. Cross streets, areas of fill, depressions and existing fragments of the ravine are indicated.
Right: Pond system abstract. Conceptual zones for water drainage pattterns are suggested and overlaid on the existing storm network. Ponds would divert water to adjacent city parks.

Standing on a small footbridge over Garrison Creek as it passes through the northeast corner of Christie Pits, c. 1905. This area was filled by 1915. Courtesy City of Toronto Archives.

The Connected Pond System

The north-to-south progression of parks, Christie to Bickford to Montrose, corresponds to a progression from the largest space to the smallest, and from the highest elevation to the lowest. This provides a rationale for the pond locations: Christie Pits, the largest park, can accommodate larger bodies of water; Bickford's length enables a series of thin linear ponds; and the nature and scale of the Montrose schoolyard provides the best siting for a small and finite wetlands that can be part of an educational curriculum. The schoolyard also serves as the temporary terminus of the demonstration project's conveyance train.

Four stormwater drainage zones serving adjacent neighborhoods would be disconnected from the sewer system and fed into the new pond system. For this project, we have assumed the number and type of ponds that would be needed and the techniques that would be used; ultimately, the volume of the water that is tapped from each zone would determine the number of ponds required and their capacities.

The rainwater would be collected and treated through a system of filtration and detention ponds in a gravity-fed, finite system that ends in a small wetlands. After the rainwater passes through the detached autonomous system, it could travel in many different ways. It could be reused for irrigating parks, stored naturally in an urban canopy of trees, left to filter into the groundwater supply or directed back into the underground wastewater system as a smaller and cleaner volume than what was collected. Eventually the demonstration project could connect into a connected pond system that would trace the course of the ravine all the way to Lake Ontario.

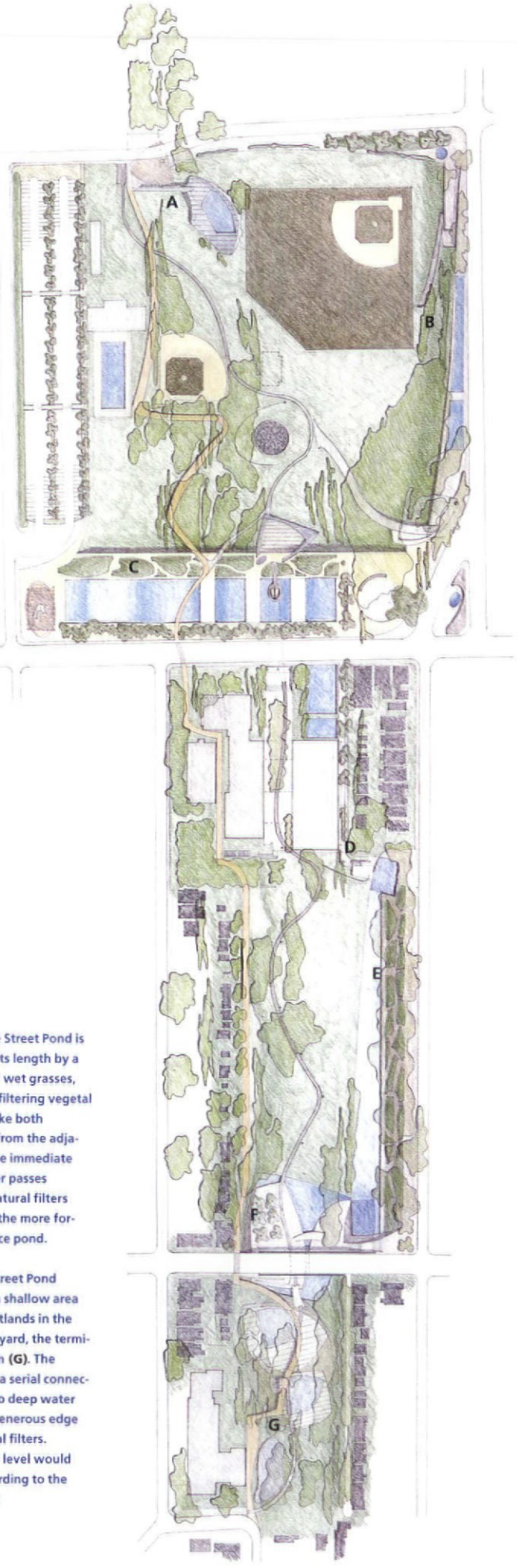
The specific elements of the demonstration project play many roles as the instruments that integrate the function of the water treatment infrastructure with urban and environmental design.

The infrastructure of the stormwater system is integrated with vegetal, urban and civic spaces to create cultural and recreational benefits from the water while functioning as a local collector of rainwater.

The Metropolitan Context

The Garrison watershed is one of twenty creek systems, intact or buried, that run down the gently sloping Toronto plain into Lake Ontario. Many of them have a set of open spaces that could support connected pond networks similar to that proposed here. This study of restoring Garrison Creek to its original function of collecting and draining rainwater can be a prototype for these other watersheds.

The Garrison Creek Connected Pond System can be seen as part of a larger movement towards more ecological methods of stormwater collection and treatment. If stormwater management ponds can act as catalysts for the regeneration of disconnected green spaces, then every creek in the region represents a significant opportunity for creating linked open space systems that knit local neighborhoods to the lakeshore, and the region to its landscape.



The Garrison Creek Project: An Autonomous Pond System

This proposal envisions a connected stormwater and park system in four of the zones depicted in the "pond system abstract" on page 21. Stormwater from adjacent neighborhoods would be diverted from the existing sewer system into a series of ponds that re-create the natural drainage pattern of the watershed.

A The Raised Standing Pool is sited on a constructed promontory, making a historical reference to the original bank of the Garrison Ravine. The pool at this raised height collects and measures rainwater directly.

B, C Linear connecting ponds are strategically located to refer to the original presence of water in the ravine, to create both formal settings and to reconfigure natural landscapes in Christie Pits and Bickford Vale.

The ponds located along Christie Street **(B)** collect water for an adjacent drainage zone and feed it (by pumping or gravity) to a larger group of ponds **(C)** along the public face of Bloor Street. These ponds are both shallow and deep and form part of the "Christie Terrace," a raised promontory that looks north across the expanse of Christie Pits. The flow of water from these ponds is pumped below grade, under Bloor Street to cascading courtyard ponds in the Bob Abate Centre.

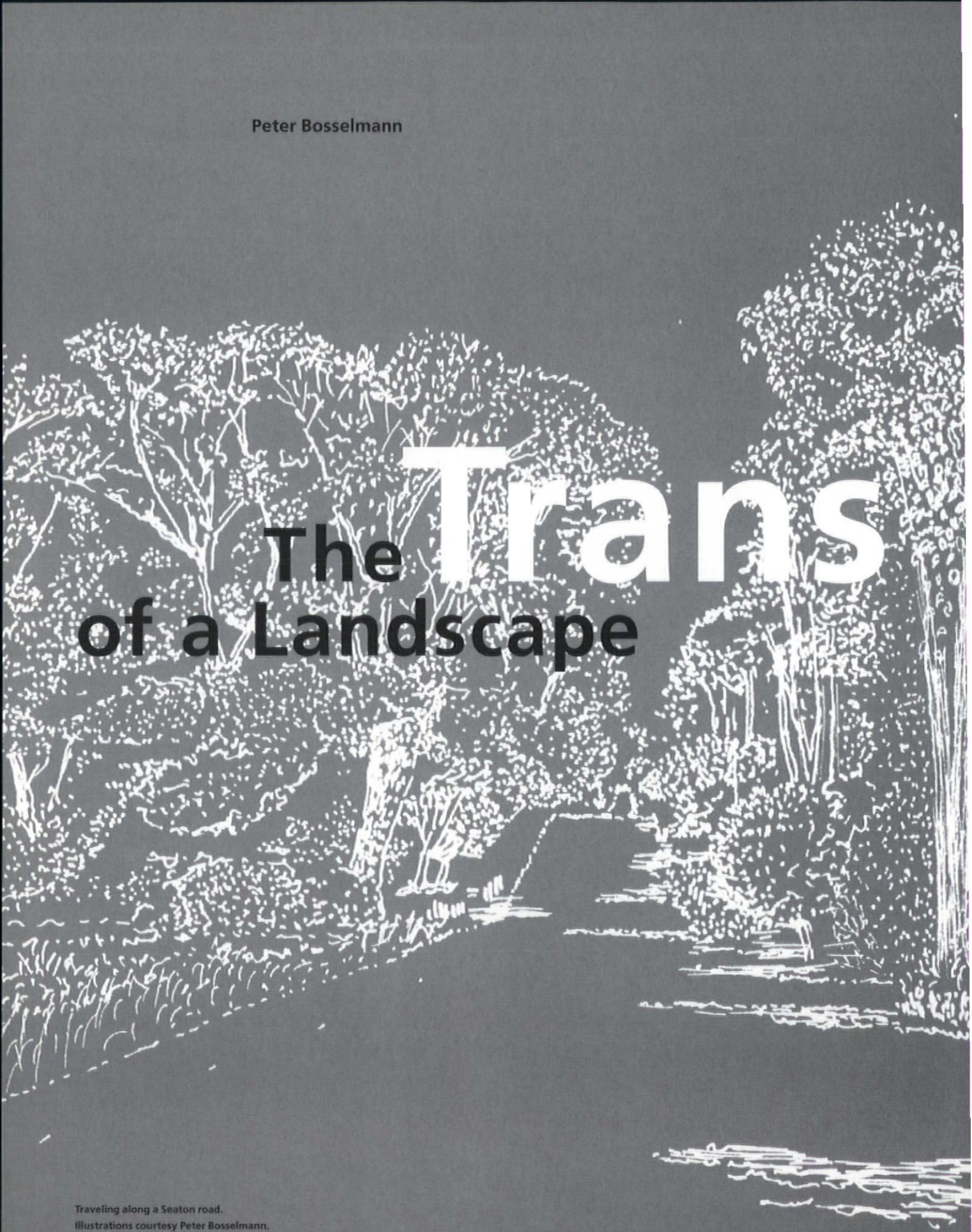
D The gravity-fed connection from the stepped Bob Abate ponds to the long Grace Street Pond is made by a canal that acts both as a shallow filter and channel during normal periods, and allows water ponding during storms.

E The long Grace Street Pond is bordered along its length by a receiving area of wet grasses, reeds and other filtering vegetal elements that take both collected water from the adjacent zone and the immediate catchment. Water passes through these natural filters before reaching the more formally edged Grace pond.

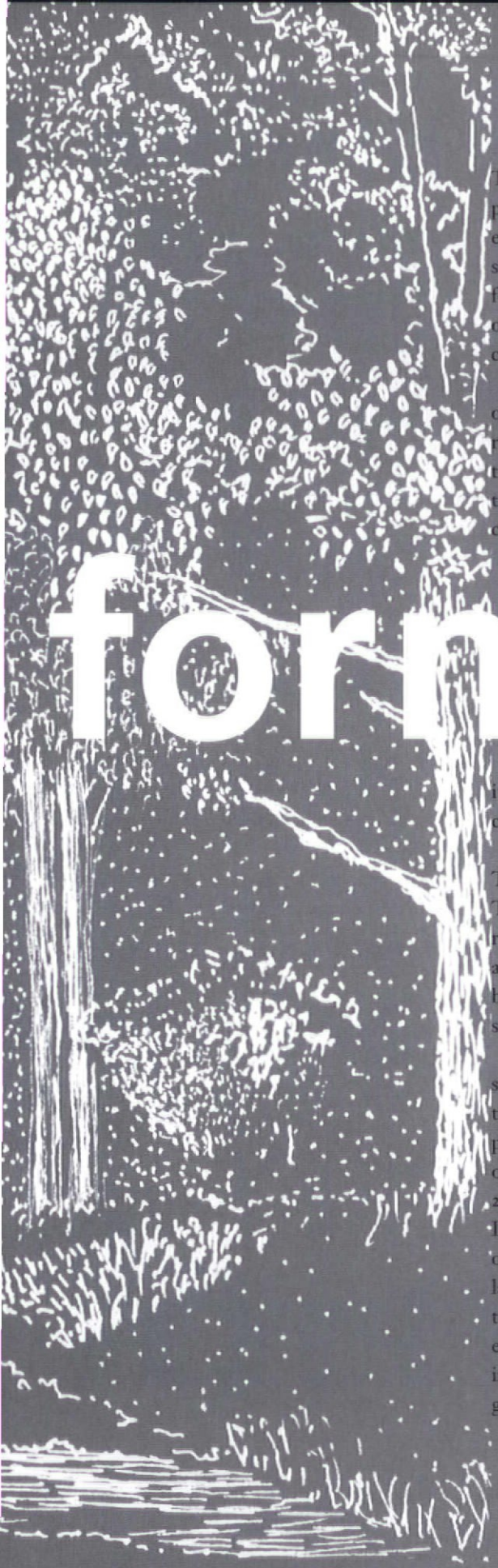
F, G The Grace Street Pond passes through a shallow area **(F)** to a small wetlands in the Montrose schoolyard, the terminus of the system **(G)**. The marsh combines a serial connection of shallow to deep water and supports a generous edge of natural vegetal filters. The marsh water level would rise and fall according to the seasonal rainfall.

Peter Bosselmann

The Trans of a Landscape



Traveling along a Seaton road.
Illustrations courtesy Peter Bosselmann.



formation

This article is about a landscape in the southern portion of Ontario, in Canada. Since the late eighteenth century, when European settlers started farming here, the land has been transformed. Over time settlers laid a regular grid of fields on a rolling terrain that was once covered by dense forests.

The horizons are open, and a traveler driving on straight roads sees the view open up when reaching a rise and watches vistas close when traveling through a swale. Hedgerows framing the fields rise and fall with the land. A person can look at the landscape and understand how its form evolved as a part of nature and part of the cultural history of the province.

In the township of Pickering, northeast of Toronto, the forests have started to grow back. The landscape has begun to work against the regularities of roads and fields. Unused road allowances have reverted back to strips of dense bush and many fields, no longer cultivated, show patches of young trees.

Twenty-five years ago farmers were forced to sell this land. The government distinguished this township for urban development and prepared plans for a second Toronto airport. Facing strong opposition, plans for the airport and a town of 225,000 people were dropped in the mid 1970s. In the late 1990s, after a quarter century of little or no farming, enough time has passed for this landscape to show signs of a transformation back to an earlier condition. Also, within society, enough time has passed to consider new solutions in this long-lasting controversy between local groups and government.

The transformation of the Seaton landscape from 1800 (left) to 1850 (center) to 1900 (right). Side roads evolve as tree-lined alleés, hedgerows subdivide the concession lots and the imprint of the ravines remains.

In early 1994, Ontario's provincial government announced a design competition to explore the future of the Seaton lands. Neither the federal nor the provincial government was considering plans for a new airport any longer, but an alliance of local community and environmental groups had convinced the Ontario Ministry of Housing to re-examine the potential of a new town on a portion of the site. The alliance re-emerged with most members recalling their more than twenty-year history of opposition to provincial and federal government authority over their land. The momentum that brought this alliance together again was triggered partly by the success of its previous opposition, partly by the perceived threat to a large land holding still designated for urban development, but without a detailed plan.

The expropriation had forced local farmers to give up 38,000 acres. About 18,000 acres had been set aside for the airport and continues to be held by Canada's federal government. The other 20,000 acres are controlled by the province.

After the abolition of the airport plans, part of the province's land was placed into an agricultural preserve and land was given back to farmers, not as property, but on a long-term lease. The province designated 7,000 acres for urban use and renamed it Seaton. The long list of smaller leaseholders includes a quarry, a refrigerator dump operator, a concrete recycling plant and a mushroom factory. The province also approved a new three-mile long arterial road reaching from the eastern to the western border of its land, but not connecting to places beyond; thus traffic is usually very light.

The greatest threat to the land and the final motivation for local interest groups to convince the Ministry of Housing to clarify the future of the Seaton lands came from a proposal to expand a regional waste disposal facility that would serve roughly one third of the Toronto metropolitan area. Last summer, Ontario's provincial governmente announced that it was cancelling the project.

The town described in this article is one of three proposals for the site invited by the province. Like earlier town schemes, it might never become reality. But if it were built, it could have been designed with an understanding of the existing landscape and its transformations.

In announcing the competition, the minister of housing adopted three guiding principles advocated by thirty-five representatives of the local and environmental groups. First, all activities on the provincially held lands were to be guided by a principle of ongoing stewardship: "protecting, restoring and enhancing for future generations the agricultural, natural and cultural assets." Second, the housing minister agreed with the alliance that the development of a compact urban community of up to 90,000 people on 3,500 acres of the land would be consistent with the overall vision of stewardship. Third, the residents of the new city were to depend not on commuting to Toronto for work, but on workplaces (a total of 45,000) within the new city.

The brief also explained that competition would not commit the province to implement any of the winning schemes. Rather, it described the competition as a planning exercise to create a new town model applicable for Seaton and elsewhere in Ontario.

Understanding the Seaton Landscape

The visual landscape is public property, but it is a property undergoing constant change. Over the course of two hundred years, the Seaton landscape has been transformed incrementally. What we see today was formed by eighteenth-century land divisions into road allowances and 200-acre farmlots. The subsequent clearing of forests and further subdividing of the farmlots established a visual structure delineated by hedgerows, fence lines and tree-lined alleés. Orchards and gardens visible from the road give the landscape a domesticated appearance. This manmade structure was laid on a topography shaped by glacial forces — a rolling terrain traversed by occasional streams and rivers. The woodlots, though second growth, and the forested riverbeds are remnants of these natural conditions.

Twenty years of public ownership have continued to transform the landscape. The hedgerows have grown wild, orchards planted by farmers remain unchecked, formal alleés and farm roads are overgrown, and in remote places wild lilies cover the floors of the ravines. New geometries have been introduced, such as the curving alignment of Taunton Road, an arterial with two large, curving concrete bridges, and the manmade contours of large landfill and quarry operations.

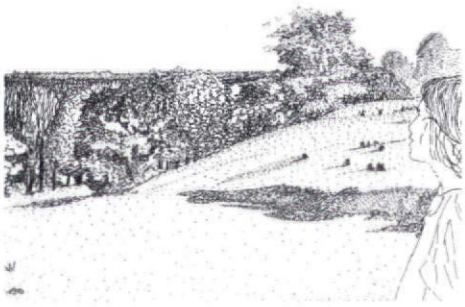
The transformations of the last twenty years contrast with the form of the landscape. Stewardship of the land, as defined in the competition brief, implies a transformation of the land that respects and restores the elements of the landscape. When approached with care, these elements can help structure the form of a new city. Thus an image of a city can emerge that can be seen and understood as part of the ongoing transformation of the landscape.

The Elements of the Seaton Landscape

The Horizon. The local horizon has important meaning in a landscape without well defined boundaries. The horizon should be preserved in order to maintain the proportions of the landscape. In the new city, building heights should stay below the tops of trees. Only occasionally and deliberately should buildings silhouette above the form of the land.

The Hills. Hills in the Seaton landscape are subtle rises. The early settlers frequently selected raised locations to build farmhouses and barns. The buildings of the city should follow the hill contours, thus the elevated places

the horizon



the hills

ravines

in Seaton will continue to hold the eye as important visual destinations.

In Seaton, one particular chain of hills forms an edge that can be traced along the 145-meter contour line. This edge, in places an escarpment, was formed during the last ice age by the shoreline of prehistoric Lake Iroquois. The edges of these hills rise abruptly; wherever they are found within the new city, land below them and along them should be kept open. This will make the natural landform visible to people moving alongside the hills or looking out over the terrain below and toward Lake Ontario.

Ravines. Springs, brooks, creeks and rivers flow through Seaton in a network of ravines, each with its individual shape. Places with running water are full of attraction and sometimes mystery. Running water is important to the landscape because of its movement, light quality and constant seasonal change. Animal life is drawn to ravines. The ravines of Seaton should be preserved. Together, they can structure the new city. They can mark its natural boundaries and define its major districts.

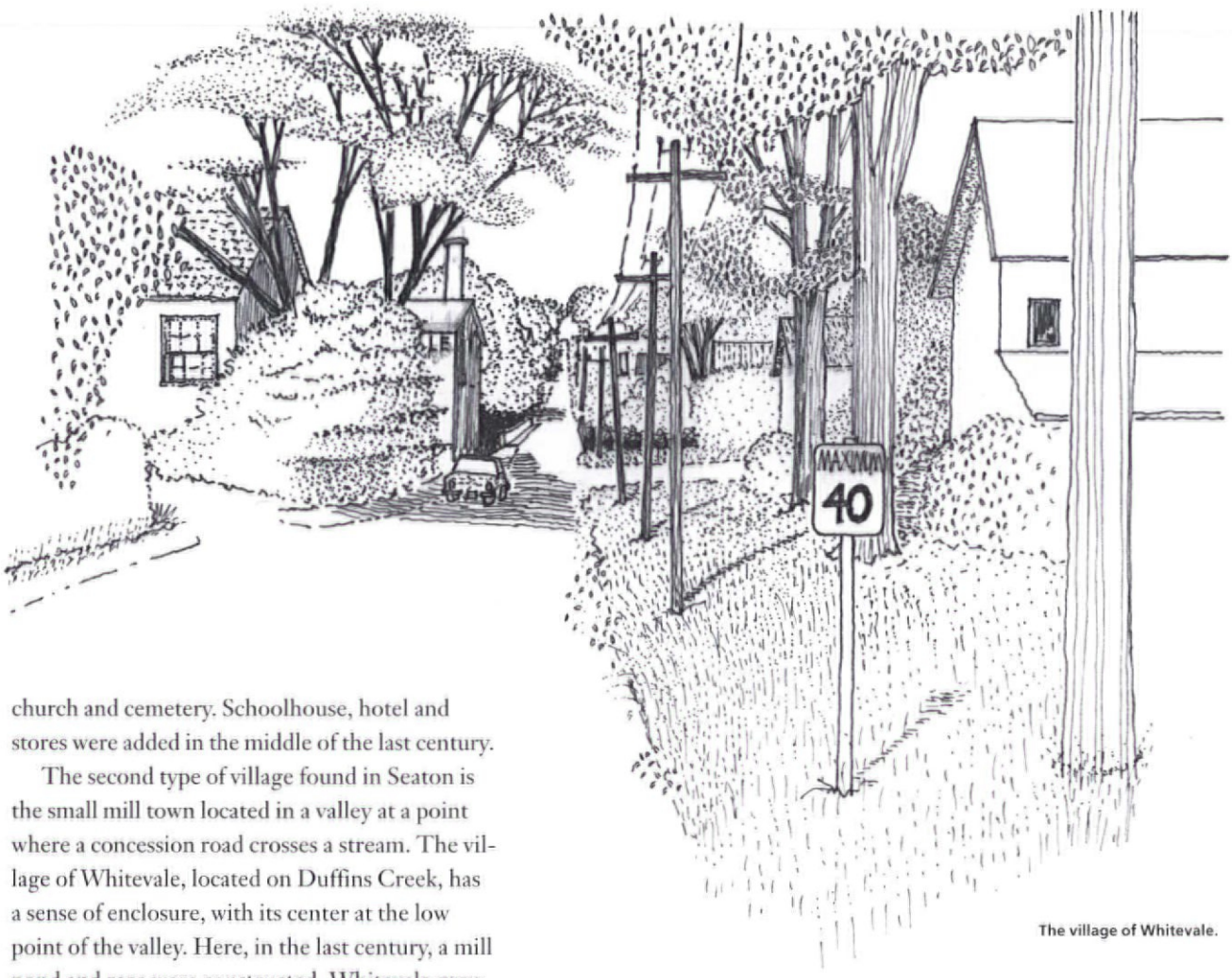
The Tree-Lined Alleés. The regular pattern of land divisions laid a large-scale grid over the landscape. Regardless of topography and riverbeds, every 1,320 feet a north-south road allowance crosses an east-west concession road. Most road allowances in Seaton were never established as side roads; some existed only as paths leading to farms. Many are overgrown. But the double rows of mature trees that line these allowances form strong visual axes in the landscape. The design of the new city should maintain and keep the alleés as boundaries of urban quarters, and as major visual corridors connecting the city to the farm land.

Hedgerows. Seaton's hedgerows are single lines of trees or dense rows of shrubs. They form a linear geometric grid, frequently in areas where crop rotation was practiced and where new crops needed protection from constant northwest winds. After spring plowing when field stones surfaced, the farmers gathered the stones and carried them to the edge of their fields. Over time, shrubs and trees grew into dense green lines above these stone walls.

The design of the new city should maintain and keep the hedgerows as part of its visual structure. Taller than two-story residential structures, the hedgerows form edges defining the smaller neighborhoods as part of the larger urban quarters.

Milltowns, Hamlets and Villages. In Seaton, like elsewhere in Ontario, small rural settlements often originated at the intersections of road allowances. The village of Brougham, for example, is located at the intersection of a concession road (one that later became the King's Highway) and a north-south side road (one that connects to the main highway along the lakeshore). Located on a rise of land, Brougham started around a

tree-lined alleés



The village of Whitevale.

church and cemetery. Schoolhouse, hotel and stores were added in the middle of the last century.

The second type of village found in Seaton is the small mill town located in a valley at a point where a concession road crosses a stream. The village of Whitevale, located on Duffins Creek, has a sense of enclosure, with its center at the low point of the valley. Here, in the last century, a mill pond and race were constructed. Whitevale grew in a linear fashion along the concession road between two offset intersections with side roads (the original survey failed to establish perfect correspondence between the farmlots on opposite sides of the concession road). These offset intersections contribute to the enclosure of the village in that they define its edges.

Never connected to a major highway, nor to the railroad that came to Pickering township at the end of the last century, the village has largely kept its nineteenth century scale. Whitevale Road, which connects the milltown to the landscape, has remained within its original right of way. The road follows the topography, dipping down to cross creeks and rising up to places where farm houses are located. Dense vegetation near creeks and large trees near farms make clear the rise and fall of the road.

Whitevale Road and the village should be preserved. Traffic generated by the new city of Seaton should be directed away from Whitevale Road. The village should not be incorporated into the new town; Whitevale should continue to exist in its own landscape setting.

hedgerows

The continued transformation of the landscape. Above: two stages in the development of the town of Seaton. Below: the evolution of the Seaton's first center.

The Quarry and the Landfill. The quarry has a distinctive form, a sloping plane cut into the land by large earthmoving equipment. This large quarry provided the nearby garbage disposal site with the necessary material to cover layer upon layer of refuse. Thus, over time, next to the quarry a manmade hill has emerged.

The quarry site cannot be restored. It cuts 15 to 25 meters deep into the sloping landscape. This manmade edge, located exactly on the prehistoric shoreline of Lake Iroquois, provides a continuation of the escarpment.

Here, near the most damaged part of the Seaton landscape, an existing railroad traverses the site. A new station should be located here, and this is where the new town should have its beginning. The new hill cannot be used as a building site for the foreseeable future, but will become a major park for the town of Seaton with places for summer and winter sports activities.

The Elements of the Town

No manmade element has dominated the visual landscape of Seaton as strongly as the eighteenth-century survey grid, which delineates roads and farmlots. All original measurements were made using iron chains measuring 66 feet long, the width, for example, of all road allowances. Regardless of topography, men with chains and an axeman moved in straight lines up and down the land, through ravines and thick forests. Along the lines they laid upon the land, the

axeman periodically marked a significant member of a tree, deforming the tree's natural growth and making the lines visible until roads could be cleared.

The frequent lack of correspondence between the alignments of side roads is an advantage in the layout of streets in the new towns. The grid's irregularities are obvious along Taunton Road: they create closure at the end of some streets, limiting vistas, thereby shortening perspectives. Over time, buildings located at offset intersections will become memorable due to their prominent locations.

The elements of the town should make reference to the original grid, taking advantage of its regularity and irregularities. Wherever ravines, alleés and hedgerows intersect, the town grid should yield to the landscape elements. The many interferences, both natural and manmade, will create relief in the form of the city and will help structure the city into identifiable districts, quarters and neighborhoods.

The Streets and Blocks. North-south streets should be more frequent than east-west streets. Most houses will be oriented along north-south streets, giving both street-facing and rear yard-facing facades nearly equal amounts of sunlight.

To encourage walking, the distance between north-south streets should not exceed 300 feet. The distance between east-west streets should vary, generally exceeding 300 feet but never exceeding 500 feet. Streets should be as narrow as possible to encourage slow driving speed, in order to balance the movement of cars, pedestrians and bicyclists.

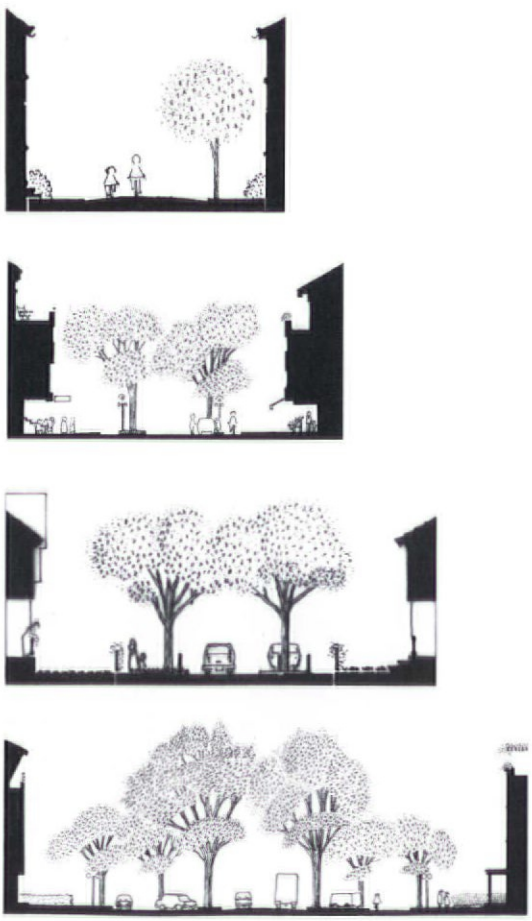
A number of streets should take on special roles in the make-up of the town. Some follow hedgerows; some are designed as alleés following the former farmroads or sideroads.

One road, however, should be different from all others: the rebuilt Taunton Road. Currently it is designed for high-speed through traffic, but in the new town it should be tamed. It should be designed as an urban boulevard, lined with commercial and residential buildings. It should have a tree-lined right of way for public transit and intersections approximately every 300 feet to slow traffic. Intersections every 1,320 feet, at the boundaries of the old farm lots, will stand out in the design of Taunton Road. They will be the major crossroads of Seaton. The intersecting alleés, lined with double rows of maple trees, should structure the town into quarters and connect the town with the rural landscape to the north.

The Center of Seaton. When Seaton reaches its ultimate population of 90,000, it will have a commercial center, but such a center would not function well while the town is at an early stage. At the beginning, Seaton should have a center that is intimate in scale and connected to the landscape.

The south fork of the Ganatsekiagon Creek, which runs a short distance parallel to Taunton Road, forms a small lake near the crossing of an old farm road. The lake, lined with tall trees, and the existing hedgerows following the farm road give this place a strong identity. Seaton's first center should be located here.

The center should consist of a small square that faces a row of stores and a school with an



Sections of some of the types of streets that would be built at Seaton.

auditorium, which should be Seaton's political and cultural gathering place until the new town reaches a population of 30,000 to 50,000. At that point, a larger center with space for commercial, cultural and political activities should be established between Taunton Road and the railroad station. But the former center should live on in its more intimate scale.

Thus the town will grow from three nodes: the initial center, the station along the existing railroad near the former quarry, and a major north-south crossroad at a high point on Taunton Road. Early in the existence of the town public transit will connect the three points of this triangle. This initial loop, ideally a streetcar line, will be expanded and connected to a larger system of streetcars and buses.

What it Would be Like to Live in Seaton

Living in Seaton would be unlike living in any recently built community and more like living in a neighborhood of Toronto, a city that has maintained a compact urban form and whose residents have continuously opted for higher transit use and lower car use.[1]

The first generation of Seatonites would be choosing a place where they could expect to live and work, where the convenient layout might allow them to walk to school, work and stores, use public transportation for longer trips and give up most of their automobiles (with the possible exception of one per family). Residents would be selecting a place where the past is incorporated, where people can sense and experience the proximity of nature, the ravines, escarpments, forests and fields, and where people can, if they wish, have food grown nearby.

In Canada, like in many other societies, an increasing number of people are living away from traditional places of employment, such as central business districts and large industries. Many workplaces have moved to smaller communities at the edge of metropolitan areas. Seaton would be such a place. But unlike other suburban communities, Seaton would combine workplaces with housing, and due to its greater concentration, Seaton would provide services that only traditional cities can provide.

What it Would Take to Build Seaton

Large urban infill projects have been built in a number of Canadian cities at densities comparable to or higher than those proposed for Seaton (ranging from a minimum of 12 units per acre, rarely exceeding 60 units per acre, and averaging 24 per acre) But an entire new town has not been built at these densities in a similar location for many decades.

Such a compact town surrounded by agriculture or forests had been the model for Seaton proposed by the ministers' steering committee. But this goal is at odds with conventional land economics. Preservation of good agricultural land is an important public goal in a region with a relatively short growing season. But land can only be farmed with good prospects if the expectation exists that good agricultural land will indeed by protected by permanent farmland preservation. Also, forestry and alternative agricultural products would have to be considered that compete better with crops produced by Canada's southern neighbors recently united in a free trade agreement.

In fact, a compact community like the one illustrated here is perceived by developers as not feasible under current market conditions. Restricting development into a compact form with clearly defined boundaries is at odds with a society that has traditionally enjoyed an abundance of space.

Providing a local employment base for future Seaton residents is another difficult goal. Neither the Canadian government nor the province can be expected to start a new university or to decentralize one of its programs or ministries and move it to a new location like Seaton. Nor is a large corporate employer expected to make such a move. Seaton will have to compete with other municipalities for small- and medium-size employers.

Clearly the Ministers' Steering Committee was aware of these issues, but for the committee Seaton was a special case. Government had taken control of the land by eminent domain and had not returned the land to former owners when it abandoned its plans for the airport and the associated urban development. The committee felt the government was still under the obligation to use the land for a public purpose. A compact new

town would fulfill such a purpose because it would preserve farm land or forests, provide savings in infrastructure cost, reduce dependency on fuels, reduce daily commute times, provide cleaner air and make children and elderly people less dependent on others for transportation to educational, health and recreational services. In short, the steering committee believed that political leaders in the government should define the rules of the market for a variety of social, economic and environmental reasons. Then Seaton as illustrated here could become a reality.

The key to controlling Seaton's compactness will be limiting the amount of land to be developed and monitoring the pace at which land is absorbed for growth. Only the Ontario government, as the owner of the land can exercise such a long-term commitment.

The second most important implementation strategy will be the design of the street layout because more than any other element of a town, the road grid defines the size of developable parcels. Distances between roads also define the pattern of circulation, including convenient walking distances.

The third strategy will be to set a range of allowable residential settings, including detached single-family houses, attached houses and walk-up apartments mixed with stores, services and employment areas.

The commitment toward building Seaton extends beyond the government; future political leaders of Seaton would have to make difficult choices in keeping the town compact. Currently, suburban employment centers accommodate fifteen workers on one acre of land.[2] At Seaton, that ratio means 3,000 of the city's 3,500 acres would be needed to accommodate 45,000 jobs. Also, Seaton could not afford to build its 30-plus schools on five-acre sites, the size expected by school boards; classrooms would have to fit on three-acre blocks. Large-scale retailers would have to build stores facing streets with little parking in the rear of stores.

Turning down building applications that would be approved "as of right" in neighboring communities will require a political will and commitment of all residents. Establishing among the future residents a commitment to the landscape has been the most important consideration in the design of Seaton. Future residents will be the guardians of a town design that is structured by landscape elements. People will understand the value of the tree-lined alleés connecting the town with the landscape. They will understand the history of hedgerows and the importance of their continued maintenance. They will understand the ravines as clear and definite boundaries of the town. These elements provide an understandable concept of the town's structure. They can be experienced by everyone.

This article has tried to answer the question of what it would take to design a city that lives within the landscape. The question of what it would take to build such a city would be faced again and again by the Ontario government. It would have to demonstrate a long-term commitment to planning development and controlling the town's growth through the incremental re-privatization of the land. And the question of what it would take to maintain such a city would be faced again and again by its future residents and their representatives. An understanding of the ongoing transformation of the landscape should help answer this question.

Notes

1. Jeff Kenworthy and Peter Newman, "Toronto – Paradigm Regained," *Australian Planner* 11:1 (1994): 137-147.
2. Kevin Lynch and Gary Hack, *Site Planning* (Cambridge, Mass.: MIT Press, 1984), 468.

Historical references were drawn from John van Nostrand, *Seaton, the Form of its History, A Socio-Economic History of the Seaton Lands within the North Pickering Planning Area* (Toronto: Province of Ontario, Ministry of Housing, 1992)

Acknowledgements

The author entered this 1994 competition as a member of a team that included Henning Bang, Peter Bosselmann, Jeffrey Cook, Klaus and Mariut Dunker, Margaret Eichler, Jan Gehl, David Gordon, Cameran Mirza, John Newton, Al Regehr, Charles Simon, Richard Sobermann, Jeffrey Stinson and Ron Struys. The team won second place.

Robert Wright

The Transformation of a Landscape: How the Seaton Process Worked

To look at the planning of Seaton is to investigate the changing aspirations of planning, design and public policy in the Toronto region over the last 25 years. The story of the Seaton lands reflects the variation in political will and ideological attitudes towards issues like community development, environmental consciousness, economics and public involvement.

The urbanization of Seaton was first contemplated in the early 1970s. The Ontario provincial government, concerned about the increased urbanization taking place west of Toronto, began an initiative to redirect growth eastward and rationalize it with the development of infrastructure and several new-town-style communities. A new trunk sewer was built east to the Durham region.

Keeping with this strategy, the provincial and federal governments announced plans to build an international airport and two of the new communities (with a total population of up to 300,000) in the area served by the new sewer, some 20 miles northeast of Toronto. They expropriated about 38,000 acres for the project.

Public outcry forced cancellation of the airport in 1975, but there was support for some development. The recommended plan called for a mixed-use community of up to 85,000, the creation of a large agricultural zone and protection of historic hamlets.

In 1982 the Durham regional government designated urban land uses for the areas where the new communities would be and in 1986 the town of Pickering began a more detailed planning study. But the abandonment of the airport changed many of the assumptions about the area, and there was a growing perception that the plan should be more environmentally sound and that there should be a more open public process. The Pickering Planning Committee deferred its draft plan in 1988, closing the first phase of Seaton's history.

In the late 1980s the urbanization of the Toronto region continued at a fast pace. In 1989, the provincial government, concerned about rising housing costs, reactivated the quasi-public corporation that had been in charge of developing the Seaton lands and set up the Seaton Interim Planning Team, which would be responsible for updating plans for the land.

There was also a shift in strategy: Seaton was now seen as an opportunity to explore emerging approaches in environmentally sound and sustainable development within the context of planning, designing and developing a new community.

The team began by conferring with public interest groups, stakeholders, regional and local planning agencies, other ministries, academic institutions and private consultants. The process culminated with a community workshop, sponsored by the province.

What generally emerged from these discussions was a concern about typical suburbanization of the rural urban fringe — sprawling development, dependence on automobiles, lack of pedestrian orientation, segregated land use patterns, the loss of natural areas — and a desire to conserve water and energy and reduce waste.

The workshop resulted in a report, *Seaton: A Strategy for Environmentally Responsible Planning*, that was sent directly to the housing minister in 1990. The report urged that the development of Seaton be guided by principles of stewardship — preserving the environmental quality of the land, maximizing the quality of life for residents and creating sustainable economic opportunities.

The report differentiated between two basic issues. It argued that preserving the existing environment and rural community should be the first priority. (The province soon put the lands to the west side of its holdings into a long-term agricultural preserve, leaving only the 7,000 acres under urban designation available for future development.)

The report also proposed a new town of up to 90,000 residents on up to 3,500 acres (not including natural features). The development, the report said, should follow five principles:

1. Seaton should demonstrate how compact development can better meet current needs.
2. Seaton's population should reflect the diversity of cultures, ages and incomes found in the region. It should include many scales of business and industry and promote a variety of land ownership including cooperatives, corporations and institutions.
3. Seaton's neighborhoods should include a mix of building types that encourage living, working and gathering places. Social services should be designed to meet the diverse needs of the community and be accessible to everyone.
4. Seaton should be an adaptable community, with a built in capacity to evolve over time. Its physical, social and economic structures should be flexible, so the community has built in resilience.
5. Seaton's plan should work within the limitations imposed by available natural resources, the larger economy and market realities.

The report also proposed a design competition that would test these planning ideas, guide the development of design criteria and guide decisions about what lands should be developed.

Changes in the provincial government stalled the project until 1993. That October, the province established a public advisory committee to oversee the competition. Together, the committee and the Interim Planning Team retained technical advisors and created a jury of outside experts and committee members to evaluate the design proposals.

In December, 1993, multidisciplinary consulting teams were invited to submit concept plans and written statements. The initial direction they were given was based essentially on *Seaton: A Strategy for Environmentally Responsible Planning*. In April, 1994, three finalist groups were asked to develop their concepts more thoroughly. The competition was completed in November, 1994.

That fall, the provincial government shifted once again, this time to the Conservative Party, which was elected essentially by a suburban – rural electorate based on a mandate to reduce the provincial deficit. Its term has been focused on cutting costs by reducing the role of government, reorganizing social programs and promoting privatization.

Enlightened aspects of the planning act (environmental and social considerations and public consultation) have been repealed or ignored. The Seaton agricultural preserve is now being dismantled and market studies are being conducted to evaluate its sale. Yet, amidst all this posturing, Seaton remains intact.

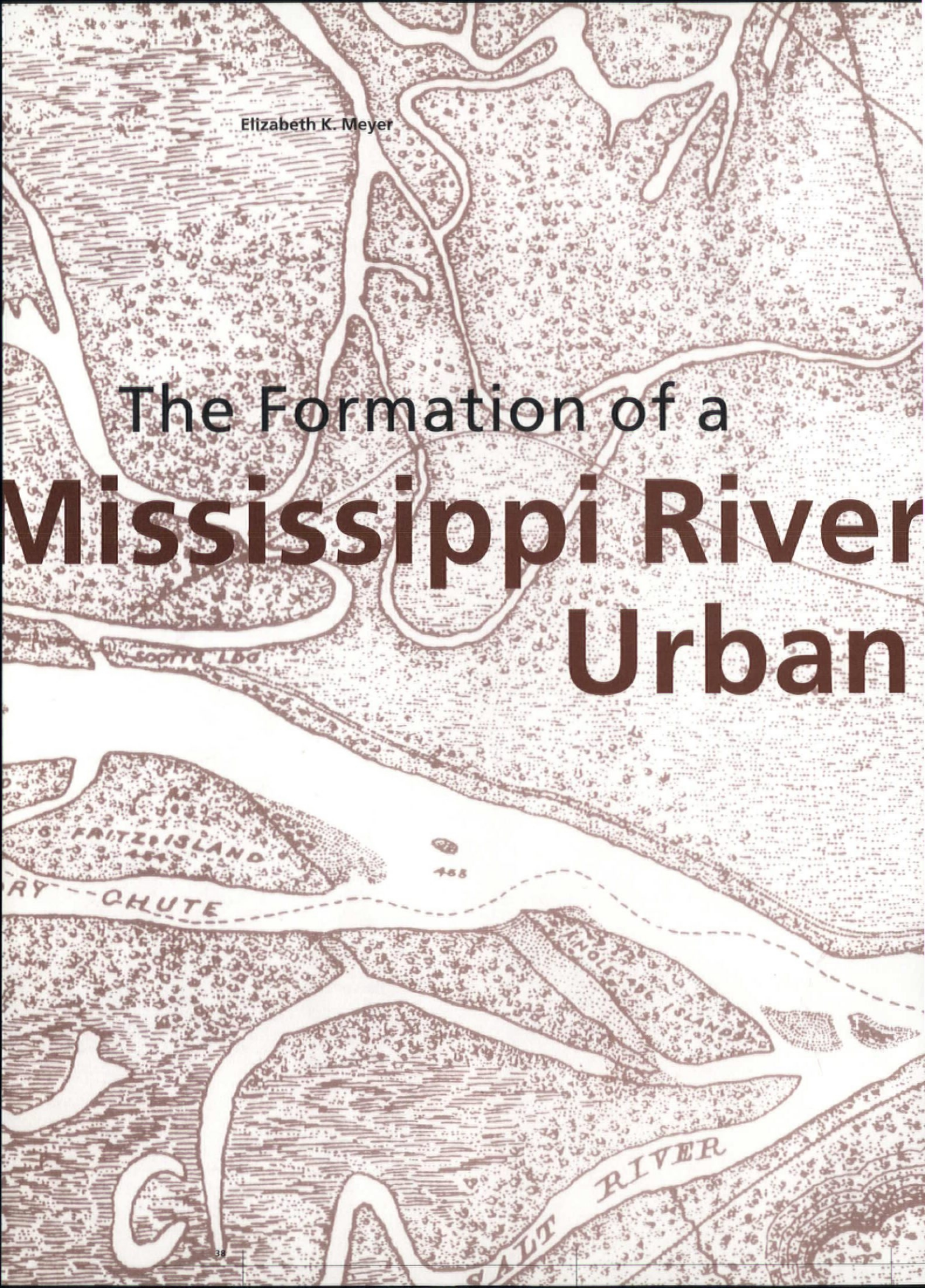
The true lesson of Seaton is that when higher level government leadership fails, dedication by principled public servants and an open, community-based planning approach can carry an important vision into the future. As Blake once said, "A person's reach must exceed his grasp, or what's a heaven for?"

For more information about the Seaton project, contact the Seaton Interim Planning Team, 25 Grosvenor St., 13th Floor, Toronto, Ontario, M7A 1R1, (416) 314-0770.

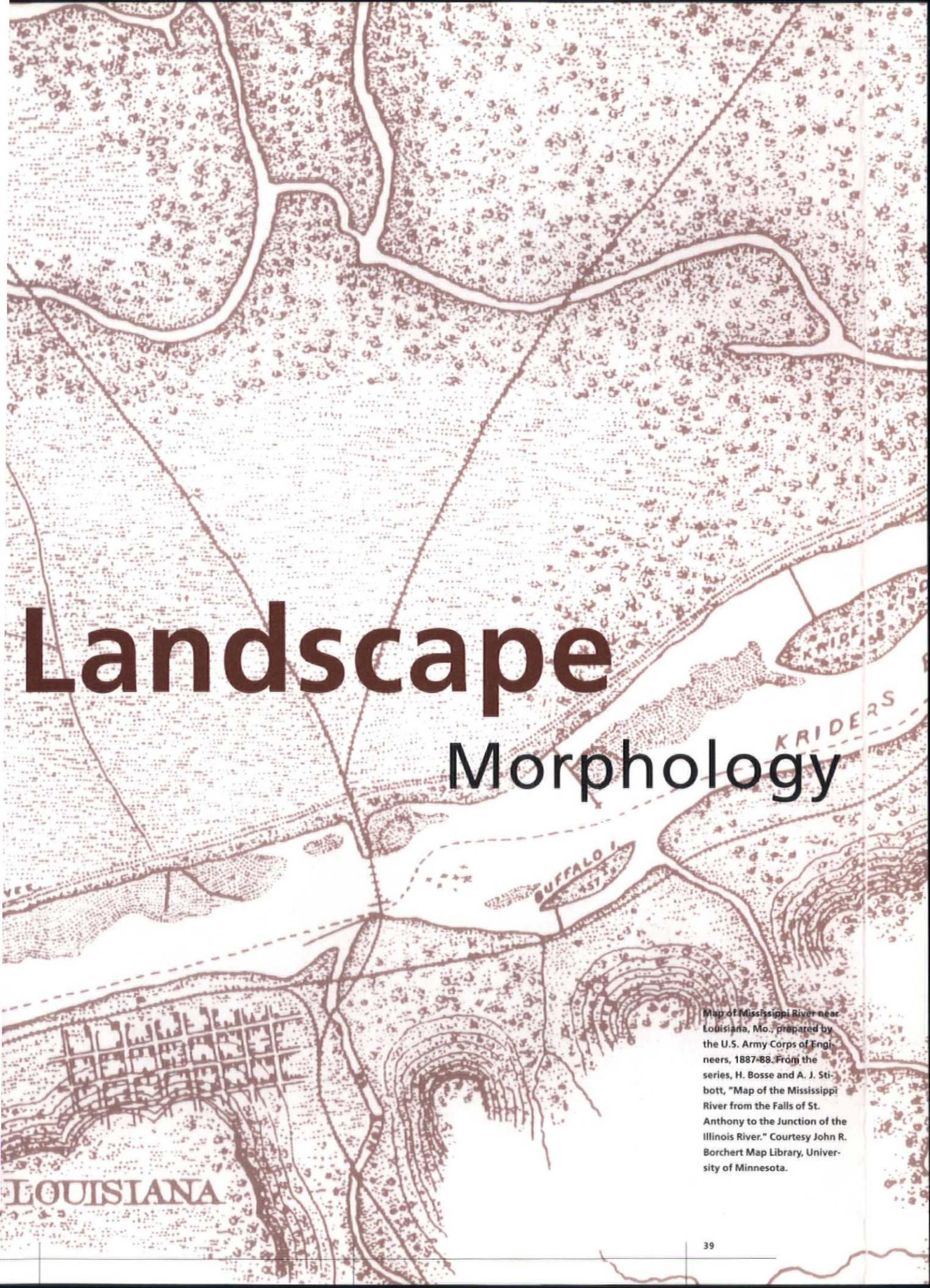
The first place entry to the Seaton competition was submitted by a team called Ontario Form Collaborative, whose members included: George Baird, Mac Cosburn, Adrian DiCastri, Anne Fort-Menares, Peter Goring, Pat Hanson, Ed Levy, Doug McGill, Val Rynnimeri, Barry Sampson, John Sewell, Warren Sorenson, Alex Topps, John van Nostrand, Jim Ward, Gary Watchorn, Peter Weller, Tom Zizys.
The second place entry was submitted by a team led by Klaus Dunker (see page 35 for a list of team members).
The third place entry was submitted by a team called The C.E.E.D. Group (Community, Ecology, Economy, Design), led by Dunlop Farrow, Inc.

Elizabeth K. Meyer

The Formation of a Mississippi River Urban



Landscape Morphology



Map of Mississippi River near Louisiana, Mo., prepared by the U.S. Army Corps of Engineers, 1887-88. From the series, H. Bosse and A. J. Stibbott, "Map of the Mississippi River from the Falls of St. Anthony to the Junction of the Illinois River." Courtesy John R. Borchert Map Library, University of Minnesota.

Topology. "a topographic study
of a particular place;
specifically, the history of a region
as indicated by its topography"

Topography.
"the configuration of the surface...
the lay of the land"

Morphology.
"the science of structure or form;
in geology, the external structure of rock
in relation to the development
of erosional forms
or topographic features"

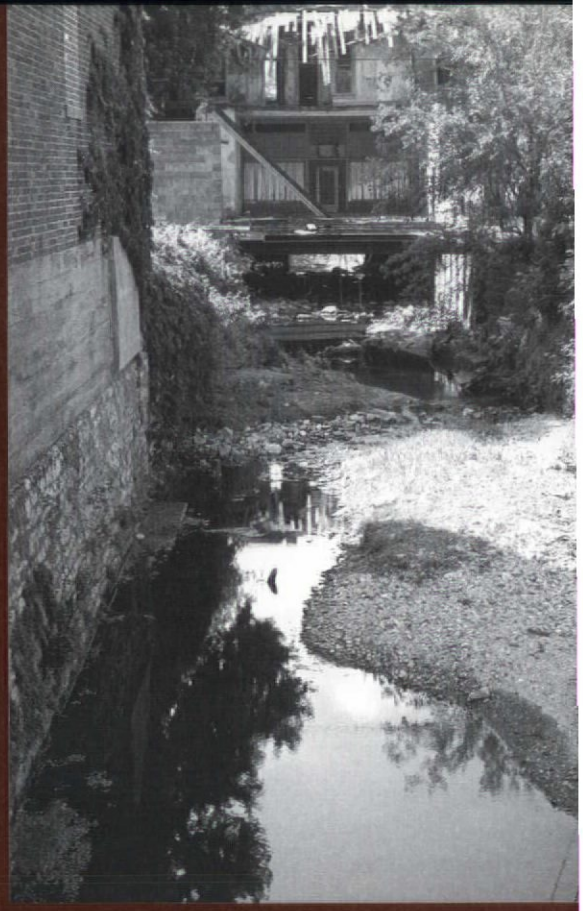
How do we discover the landscape as we travel up a river? Clearly, the experience is different from that of reading about landscapes in a book, or viewing places from a moving automobile, or surveying places from an airplane. Traveling with some two dozen students of American urbanism in a boat moving at four to seven m.p.h. up the Mississippi River intensifies my encounters with the towns along it and magnifies the analytical lens through which I observe these landscapes.[1]

This new perspective emanates, in part, from an uneasy sense of spatial and temporal displacement. We are, in effect, occupying a boundary between Missouri and Iowa to the west and Illinois to the east. From an outsider's perspective — gleaned from the study of large-scale national maps — this line is an edge between, not an occupiable space. But now we find ourselves moving along within this line. We are guided by different maps, the U.S. Army Corps of Engineers Mississippi River Navigation Maps, which not only give the river a width but also note its depth, locate its nine-feet-deep and 400-foot-wide navigation channel, calibrate its length in distance from the Ohio River and mark the towns along its banks.

View from the captain's chair towards the bow of the *Viking Explorer* during the Mississippi River expedition in which the author participated.

Louisiana, Missouri

River mile 282 River elevation + 450′



Louisiana occupies the Noix Creek valley, which runs perpendicular to the river and between golden hills that rise up 400 feet. The southern hills are quarried in spots and densely forested elsewhere. The northern bluff is terraced with burial plots edged with limestone and sandstone walls and densely peopled with tombs.

Louisiana's grid of 300- by 300-foot blocks extends west from a river esplanade toward another topographic rise. At that rise, the grid deflects; oriented at first to the Mississippi, now it orients to the narrow creek valley. The valley defines Louisiana's western entrance, where the historic Stark Brothers' nursery headquarters acts as a gateway to the town.

What distinguishes Louisiana is the overlay of the speculative grid and the topographic and hydrologic features. The town's landscapes are organized sectionally and topographically, not in plan. Esplanade, park and cemetery mark edges between river and land, each landscape occupying a different elevation and assigned a different role in the town's structure and social life.

The esplanade, a narrow strip of asphalt, is defined by a long, low limestone wall that lifts the surface above the river. A narrow opening marks the watergate to the city. The esplanade's west edge is lined with mature trees. Underneath their shade and between their thick trunks, a row of picnic tables faces the river. This narrow, unpretentious band of occupation—wall, gate, promenade, prospect and adjoining parking lot—is a civic space. It gathers the townsfolk together to stroll and to gaze, in close proximity to their river, at the city gate.

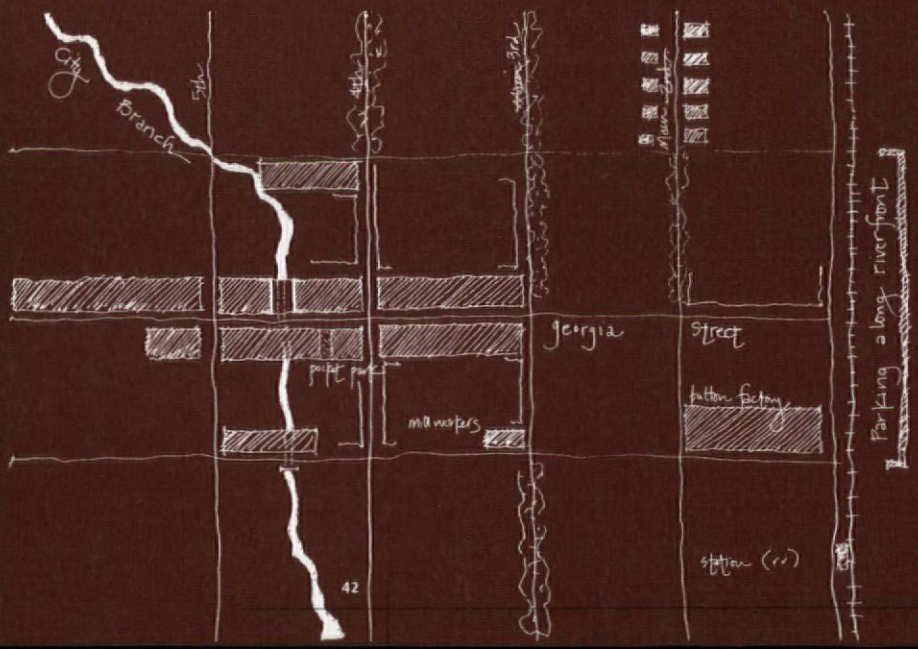
Henderson Park is a river overlook. From a playground and parking lot, one looks through raspberry-pink and white hollyhocks across and down the river. A tow spewing black smoke guides four barges towards a gap in a low railroad bridge created by a pivoting truss. To the south, where the smoky blue-gray river meets the horizon, sky and water merge into an indistinguishable haze. While the park is as close to the riverbank as the esplanade, it is perched well above, thus distancing itself vertically from the river. This overlook park offers a sense of detachment while maintaining prospect over the river's abundance.

The cemetery, the town's highest public landscape, overlooks both town and river. In Louisiana, the deceased occupy privileged ground high above the river's fury and the valley's heat.

Louisiana's landscape deviations from its grid are the result of hydrological processes and glacial depositional layering. These deviations trace the Noix Creek tributaries through the town, materializing that system in specific urban projects. Stone wall revetments expose channeled, sunken creeks mid-block where one expects alleys, gardens and basements. City streets cross over metal bridges, not culverts, when the stream and grid intersect.

This overlay of a generalized grid upon a particular geography is marked, not concealed. The terrain transformed the grid into a series of seemingly discrete, but integrally related, urban landscape projects. They inscribe Louisiana's two orders, grid and terrain, into a unique urban form.

Below: The topographic structure of Louisiana—the enframing hills, river parks, creek and grid.
Right: Intersection of the generalized grid and particular geography. The creek runs as an open channel through the block and under the storefront.



A sense of altered time accompanies this phenomenon of spatial displacement. We are moving upstream against the passage of time, against the flow of sediment-saturated floodwaters. Our travel speed is only twice that of walking, but even this pace is tempered by daily passage through locks, where we are slowed by both the process of raising the water level and the etiquette of river boat travel.

I begin to notice continuities and relationships along this line where I saw only differences before. Towns that would normally be experienced along the upland edge, the twentieth-century strip or bypass, are now seen from their original front, the river. Entering through these old city water gates allows me to discover the town's facade or elevation before its plan and to experience the riverfront as a threshold, not a back door.

This reading of the town encourages speculation about the past, about the relationship between town and terrain, and about the present – how our normative means of analyzing the landscape can cloud or limit the proposals we make and the conclusions we reach.

Topography, Topology and Morphology

As we move within the edge between two land masses, the Mississippi River reasserts itself as the center of a vast basin, the original highway between the Rockies and the Appalachian Mountains. The river re-emerges as a vital artery supporting the towns scattered along its banks.

Each town's location, access points and natural boundaries are topographically dependent upon the river valleys, terraces and bluffs. For instance, towns on the western banks were sited for ease of crossing by ferry or train from the east. The width of a particular stream valley and the height of its bluffs limit a town's size, the direction of expansion and the degree of integration between various precincts or neighborhoods.

Despite these local variations, each town's form is topologically consistent. The initial plats graft themselves onto the riverbanks, extending the river's alignment inland. These blocks are clustered around the riverfront and centered on a small, but ceremonially important, town square.

As this matrix of city blocks expands away from the river, two other forces compete with the river for control of the town form. First, the river bluffs (a particular, local condition) assert themselves as the location of three common, urban landscapes: the park, cemetery and suburb. Second, the Land Ordinance survey (an abstract, universal system) operates at a larger scale, reorienting the city grid from the river's alignment to that of the nation's consistent latitudinal and longitudinal grid.

Panorama and Prospect as Ways of Seeing the Urban Terrain

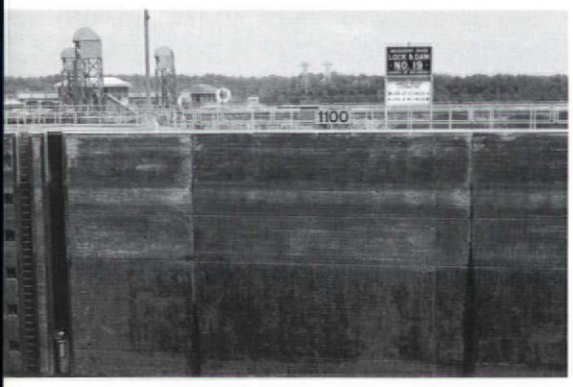
This conceptual, structural consistency, this particular morphology, manifests itself in the long, horizontal panorama that unfolds as we approach a town from the river.

Between towns, the riverbanks are sparsely populated. Small wooden houses with second-story porches elevated on stilts hover above the shoreline in front of the river's forested sections; screens of trees veil farmland in the distant flood plain; clusters of tall, cylindrical grain elevators, conveyor belts and loading docks are reminiscent of monumental, constructivist assemblages – until the arrival of an empty barge starts the movements, noises and smells of loading grain.

At the edge of a town, curtains of densely vegetated slopes or transparent screens of riverbank trees open to reveal a bowl-like river valley bottom of buildings enframed by green bluffs.

Henry Lewis, *Louisiana*. From *Das illustrirte Mississippithal* (Leipzig: Schmidt and Gunther, 1923). Courtesy Special Collections/Rare Books, University of Minnesota Library.

Prospect. "a place that affords an extended view. . . a looking forward; anticipation; foresight. . . to seek, to explore, to search"



Lock and dam #19. Courtesy Elizabeth K. Meyer.

The terrain establishes both the field (the valley) and frame (the bluff) for urban form. The bluffs also provide a prospect for understanding a town and its relationship to the river. Our panoramic understanding of the town is turned inside out as we stand at the overlooks atop these bluffs and survey the vastness of the Mississippi River valley. This prospect should not be dismissed merely as a spot for a beautiful view; it is also a place "to seek, to explore, to search," a way of knowing. Surely, part of a prospect's power is a result of its separation by vertical elevation, not horizontal distance, from the land surveyed.[2]

Viewed from the river, the riverbank establishes a town's base or ground plane and its threshold. The character of this threshhold varies, depending on its width and depth, on the peculiarities of natural terrain (valley or bluff) and of engineered terrain (esplanade or levee). This landscape is the locus of instability and change despite all civic and engineering attempts to control it.

These initial discoveries are followed by periods of reflection and reconsideration as we travel north, physically exploring new towns and mentally revisiting previous towns. Each day's docking signals the transition between viewing and moving, between exploring with the eyes alone and with the entire body. The shift in modes of movement is accompanied by perceptual and conceptual oscillations. What is foreground and background in these places, town or terrain? What is figure and field in this urban morphology, grid or landscape?

Terrain and Grid as Formative Features of the Midwestern Section

Three observations emerge from the contrast between the new (what I am witnessing on the trip) and the known (what I have absorbed from past experience). First, because we approached towns from the river, their original portal, the terrain (or section) figures prominently in our impression of their form and structure.[3]

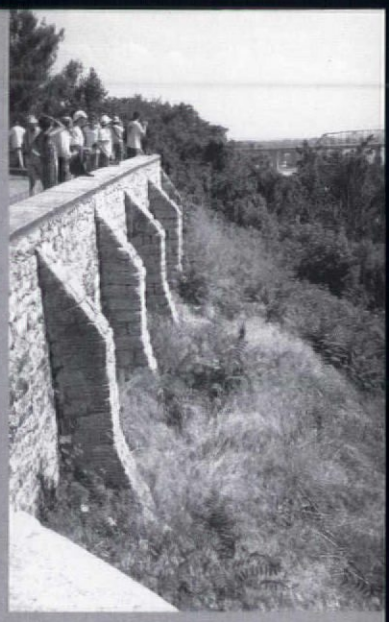
The Land Ordinance grid (or section) figures as the second formative feature of this midwestern American landscape. The Land Ordinance grid, when recognized as the primary ordering system of the American midwest, is usually characterized as oblivious to the terrain.[4] Such a thesis contradicts the physical reality of the towns I visited along the Mississippi. Their urban form is memorable because of the unpredictable interaction of the grid and terrain.

The third observation is that the significant urban landscapes in these towns are located at the edge and not in the center of the town.

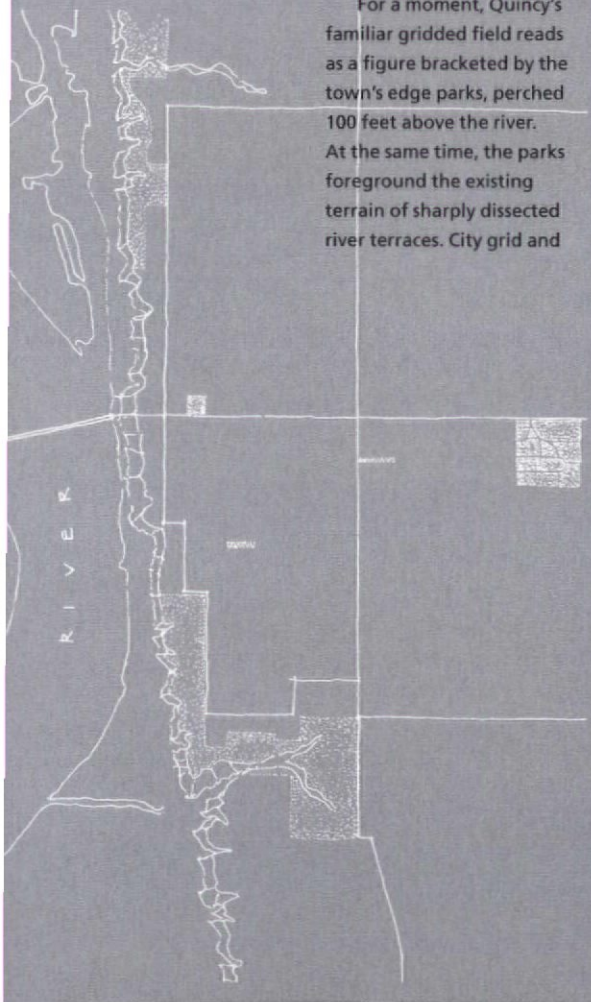
Each of these assertions contradicts two myths particular to American landscape literature: that the grid is the dominant, and frequently destructive, ordering system of the American midwest town and that the quintessential landscape of the nineteenth century is the central town square.

Quincy, Illinois

River mile 327, River elevation + 470'



Right: Bluff retaining wall and river overlook, Riverside Park. Below: Topographic structure of Quincy—bluffs and gorges, river parks and cemeteries. Figures in the field of the city grid include town square, two residential boulevards and the fragment of a meandering suburban project. Bottom: Grass corridors, Woodland Cemetery.
Courtesy Elizabeth K. Meyer.



Quincy's city grid aligns with the river's edge and the Land Ordinance's section lines. Two east-west sections and three north-south sections mark the extent of the early town. The sections subdivide into blocks, some 500 feet square, others, 500 by 1,000 feet.

For a moment, Quincy's familiar gridded field reads as a figure bracketed by the town's edge parks, perched 100 feet above the river. At the same time, the parks foreground the existing terrain of sharply dissected river terraces. City grid and park terrain oscillate back and forth, alternatively occupying the role of figure and field.

At the scale of the urban project—park, street, bridge and walk—Quincy emerges as a setting for a diverse array of spaces, each of which speaks to its particular place on the land. These spaces—parks, drives, squares, neighborhoods and boulevards—are vivid places because of their contrast to the repetitive pattern of the city plan.

Commemoration and recreation in Quincy represent the town's history and character for us, manifesting it in landscape form. The northern parks, each one block wide and together eight blocks long, predictably provide prospects of the Mississippi. Curving carriage drives line the bluff, protected from the edge by a massive stone retaining wall. The drive leads north into the woods, where it crosses gorges of horizontally bedded limestone. There, atop the soft gray limestone bridge spanning the gorge below, the rawness of the Illinois landscape is preserved within town.

To the south, at Woodland Cemetery, a different sensibility takes hold. Three elements—drainage, land terracing and statuary—intersect, imbuing the cemetery with a unique landform and character. Circulation and drainage are interwoven in a concrete and grass warp and woof that threads through terraced plots. The drives have central swales that collect water on the surface, and intermittently placed drains divert water directly downhill. The sloping walks prevent water from draining across the plots and provide an undulating counterpoint to the stepped planes of tombs and markers.

Quincy's remarkable urban landscape also results from unusual transformations of its block pattern. The first transformation, an open block near the town's original center and now the town square, was created by clearing or "not building." The act of not building carries symbolic meaning: the town's history can be read in the density of objects (war memorials, statues, commemorative fountains) and the type of events selected for commemoration.

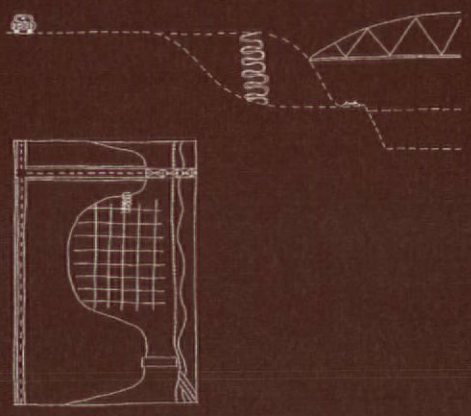
The second deviation occurs at Park Place, a residential block of large, yet unpretentious, houses overlooking a 165-foot-wide boulevard. The houses are set five feet above the street and forty feet back from the sidewalks. This separation from the public way repeats the town's relationship to the river—proximate, yet detached; visually connected, yet vertically separated. In the nineteenth century, street and river were both functional necessities, vital transportation corridors for commerce, and landscapes to be viewed and admired from a distance, from the shelter of the front porch or bluff park.

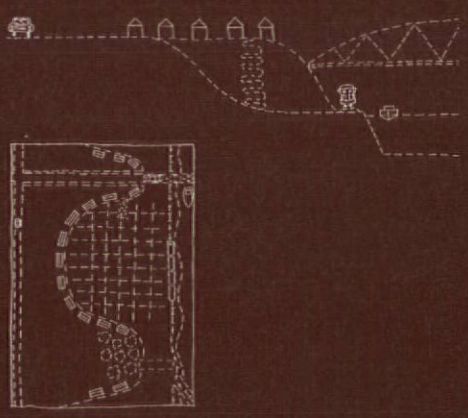
The third variation occurs in a fragment of an 1889 romantic suburb called Lawndale. The suburb's winding drives have little to do with topographic relief; rather, they differentiate this speculative development from its surroundings. Yet Lawndale is only a fragment; after a block or two of sinuous strolling, one returns to the grid's familiar grain and orientation.

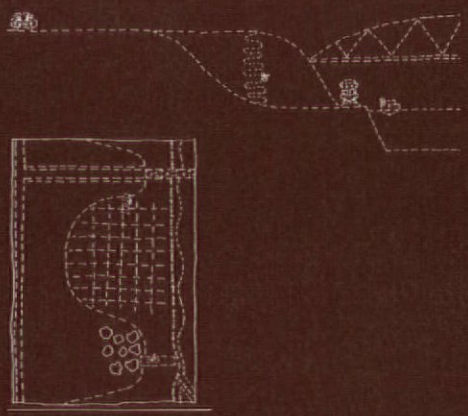
What is remarkable about Quincy, then, is the way in which urban landscape projects work at two contextual scales—the river and the town. Quincy's bluff parks and cemetery bracket the river facade in both plan and elevation. At the scale of the town block, a number of projects continue this dialogue between grid and terrain. And the town square, residential boulevard and romantic suburban drive—resistant to the grid's universalizing nature, yet reluctant to reject its order—construct sites, make place, calibrate distance and announce difference without subverting the whole.

Burlington

River mile 404, River elevation + 520'







Burlington's topographic morphology is similar to Louisiana's but larger in scale. The town sits in a valley with its residential neighborhoods occupying the flanking hilltops. Each hill has its square park around which fashionable residences clustered.

The slopes of these hills are steeper than in Louisiana. The grid defers to the hills in two ways: by eliminating streets where the slopes are too steep and by inventing an alternative means of negotiating terrain. The second strategy is found in Snake Alley, an 1894 project that transformed North Sixth Street into a curving brick alley (preceding San Francisco's Lombard Street, built in the 1920s). Snake Alley has been a continual source of pride to Burlington, as is evident in the residential historic district surrounding the alley and the repeated reference to the alley in contemporary tourism brochures.

This pride in local response to the intersection of the grid and terrain is all the more poignant in light of a more recent urban landscape project located a few blocks away on Jefferson Street, the town's main commercial street. It was "improved" with a pedestrian mall that has more to do with preconceived ideas inserted into a locale than it does with the particulars of the place. Unlike Snake Alley, the Jefferson Street mall occupies a parcel, but does not construct a site.

This is not to say that all landscape design has to be contextual, to fit, to emanate from the specifics of a place. Rather, what seems successful—in fact meaningful—in the towns we visited is the dialogue between the new and the existing, between the ideal plan type (the grid) and the terrain's circumstances.

There are other clues that twentieth-century urbanization has not been kind to this nineteenth-century commercial and civic center. One of the town's bluffs has been severed from downtown by a depressed arterial. One of the many blocks demolished for the bypass formed the north facade of North Hill Park, a residential square.

Fortunately, the town's continuity with its southern bluff is still intact. There Burlington's late nineteenth- and early twentieth-century suburbs were connected to the downtown by a trolley that negotiated Main Street's steep slope. The terminus of this trolley line seems to have been a loop that bridges over a steep ravine as it enters Crapo Park.

Crapo Park, situated at the southern edge of town, combined the characteristics of a typical Victorian pleasure ground with the riverview park seen earlier in Louisiana. Its overlook is large enough to hold public gatherings and we are told that presidential candidate Jimmy Carter held a rally here. That this 1976 campaign event was held in an edge park located on Main Street but a mile south and 130 feet above Market Street tells us much about the shift of civic life from the center of town to its edge. In 1858 one of the Lincoln–Douglas debates took place 80 miles south of here, in Quincy's Washington Square, around which that town was built.

Top: Snake Alley. Courtesy Iowa Division of Tourism.
Drawings by Mary deLaittre. Courtesy Design Center for the American Urban Landscape.

Survey. "to inspect or take a view of, especially in a general or comprehensive way. . . to examine carefully with reference to condition, situation, or the like to determine the boundaries, form, extent, area, contour, etc., of (a tract of land)"

Scaling the Grid—Land Ordinance, Town Plan and Urban Project

What is the Land Ordinance grid's influence on land organization in the American midwest? The Mississippi River basin is divided into 24- by 24-mile squares, each of which is subdivided into six- by six-mile townships bounded by county roads. Most towns that we visited were plotted within 1/36 of the township, the one- by one-mile section.[5]

Viewed at a scale larger than the section, the landscape bears the imprint of a pervasive north-south orthogonal matrix within which the circumstances of land use and terrain are accommodated. The patches of the quilt may vary in color and pattern, but the consistency of their size and shape contributes to the predictable regularity of the quilt. Within the square and the township, the grid and the terrain maintain a somewhat easy relationship with one another: one defers to the other at possible moments of conflict or intersection.

However, within the smaller scale of the section, one begins to discern another system of order. There is literally and figuratively a much closer fit of terrain and grid. If a prominent natural feature exists within or adjacent to the 640-acre section, the terrain frequently asserts itself as the controlling system, not the circumstantial event.

Of course, a grid may structure a town's blocks, alleys, streets and fields. But this local grid frequently orients itself to the river, a bluff, or a creek, not to the north-south Land Ordinance grid. The size and shape of the blocks, their grain and directionality, their extent or boundary, and their inevitable inflection to new orientations, sizes and shapes, are all suggested by the terrain.

This modulation or inflection from the Land Ordinance grid (a universal, abstract order given concrete form on a national scale) to the individual town grid (a local, particular order emerging from the figural characteristics of the terrain) denotes a reversal of priorities, a flexibility in the Land Ordinance grid. In short, "the ubiquitous grid" is really many grids of many scales with varying means of expression and varying degrees of interaction with the other system of order, the Mississippi River Basin physiography.

Subsurface and Surface Terrain

What is the role of the terrain in the urban landscape morphology at the scale of the section? First, the landscape's undulations take on the role of figure, not background; the landscape has a conspicuous form, shape and outline upon which speculative block patterns are inscribed. Second, the topography predicts a town's volumes, masses, circulation, boundaries and contours; as such, the terrain is the town's armature.

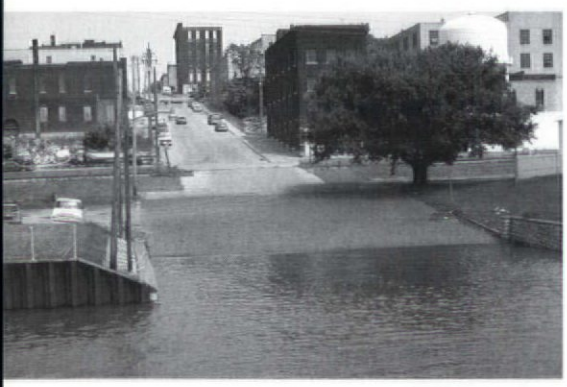
The order imposed on a town by its particular terrain is as much a consequence of the subsurface as it is of the surface. The subsurface of the zone through which I traveled, the dissected till plains area of the central lowland, consists of unstratified, glacial drift eroded by the Mississippi River and its tributaries. This structure is indirectly expressed on the surface as physiography interacts with the processes of wind, water and weather. Erosion has exposed steep bluffs of sandstone

and limestone and creates narrow secondary creek valleys – hence, the small bowls and prominent bluffs that characterize so many of our first impressions of these towns.

Also contributing to the form and contour of the town are the degree of curvature and orientation of the river, the steepness of the riverbank, the slope and width of the river terraces, the number and size of the intersecting stream valleys and the vertical relationship of the valley bottom to the opposite riverbank's slopes.

Urban Landscapes as Edges and Boundaries

The contour of the town – the line demarcating the extent of its form – is clearly, but discontinuously, articulated by the topography. These edges are not abrupt and emphatic. Instead, they are marked by changes in material, elevation, orientation and scale that have spatial and volumetric dimension. Some riverfronts are zones of transition and flux that provide for the advance and retreat of the river. Marginal uses that can tolerate occasional floods have prospered here: at first, commercial facilities dependent upon the river traffic; later, recreational facilities tentatively linked to the river's edge. Riverfront edges that exhibit substantial changes in elevation from land to water level permit more substantial urban activities, including promenades for edging along the brink between terrace and slope.



City street meets the river in a boat landing, Quincy, Ill. Courtesy Elizabeth K. Meyer.

The edges to the north and south are frequently the slopes or bluffs that connect the river valley to the prairie plain beyond. These edge parks or cemeteries operate at two scales. Their steep, wooded slopes bracket the orthogonal town grid, allowing it to compete for the role of figure. Simultaneously, the hilly, wooded parks serve as counterpoints to the farmed prairies and suburbs beyond, signaling a threshold between city and country, town and fields.

These these bluff parks and cemeteries are places of orientation, of surveying, enabling one to view (and understand) the town and its setting, to appreciate its economic and scenic values, and to "figure out" its precise morphology. Despite their seemingly marginal locations, they are integral to understanding the town's form and social life.

Since access from the town to the plain beyond logically follows a shallow slope or narrow river valley, the town grid usually fragments as it finds it way to the plain. Without exception, this fragmentation gives way to the Land Ordinance grid's section or township line as the town expands away from the river. The lines of shear or shift between the town grid and the Land Ordinance grid take many forms – irregular streets and blocks giving way to country roads and building parcels. They are the least noticeable edge, as they are manifest in plan more than in elevation.

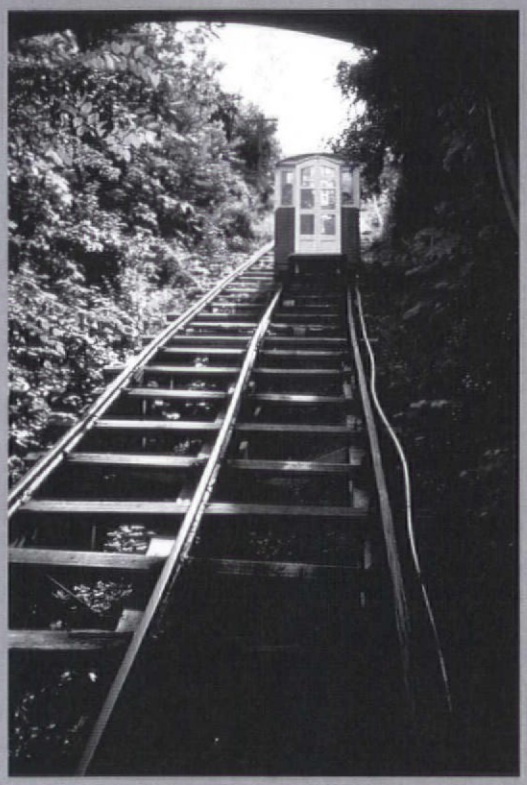
The Urban Project

One clearly sees the interaction between terrain and grid at the scale of an urban project. This interaction takes the form of disruptions to the city grid caused by the overlay of topography, hydrology and geometry. One such disruption, the twenty-five public stairs and the fenelon that connect Dubuque's downtown to its bluffs some 200-feet above, occurs when the terrain slope is so great that city blocks cannot continue. Rather than allow the slope to preclude circulation of any type between bluff and valley, Dubuque constructed elaborate stairways that traverse the steep terrain.

The plan of Louisiana is an example of an intersection of the town grid and the hydrologic

Dubuque, Iowa

River mile 579, River elevation + 592'



Above: Fenelon. Courtesy Carol Swenson.
Above right: Public stairs. Alfred R. Waud, "A Cross Street in Dubuque," from William Cullen Bryant, ed., *Picturesque America*, 1874. Courtesy Special Collections/Rare Books, University of Minnesota Library.
Right: Topographic structure of Dubuque. A series of public stairs (shown as black bars) connect the bluff to the downtown in the valley. Courtesy Elizabeth K. Meyer.

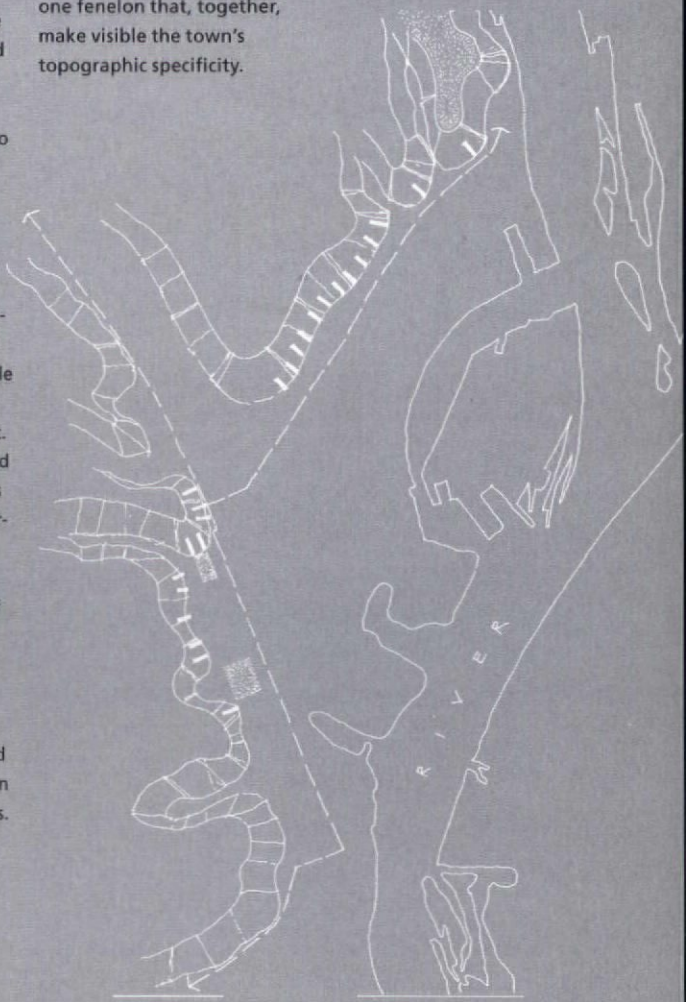
Dubuque's harbor is unlike any we have seen so far, enormous and well protected from the river's changing moods. Dubuque is also one of the densest cities I've seen on the river. The steep bluffs and the scarcity of valley land resulted in continuous street walls and tall buildings, many constructed of brick, instead of wood or sandstone.

In search of a post office, I wander through the streets seeking the inevitable town square. At last, I hear the town square. Yes, hear it. A go-cart race is taking place around the square. All the drivers are middle-aged women. At last, a town square with a purpose—and a post office.

This town square, 250 by 250 feet, is the same size as most of the downtown blocks. To the north, the blocks elongate, adjusting to a long, narrow valley leading out of town. Within the central field of blocks, the town square and a park are the only public spaces. Land is too precious for more public space; in fact, acres of land have been filled into the river to accommodate industrial uses.

Many of the city's residential districts and parks occupy the western and northern bluffs. The separation between the bluff and valley seems insurmountable until one notices a fenelon at the base of Fourth Street. This small, counter-balanced elevator and pulley consists of two cars that rise 189 vertical feet in 220 horizontal feet. Built in 1882 by the bluff's residents, it is one of more than twenty urban projects that connect bluff and town.

Throughout Dubuque, the intersection of grid and terrain is concretized (often literally) in public stairways. One of the stairways is an intricate sculptural affair that choreographs our movement from terrace to terrace, view to view, expanse to closure. Some of the stairways are exuberantly detailed with cast iron steps, concrete walls and profuse plantings. The intersection of the grid and the undulating topography creates a civic presence of public stairways and one fenelon that, together, make visible the town's topographic specificity.



pattern. Instead of enclosing the tributaries that empty into the Mississippi in culverts and eradicating their influence on the visible city form, Louisiana's blocks interact playfully with the drainage system. Open channels flowing through midblocks and building basements and under metal sidewalk grates and street bridges all contribute to one's awareness of the drainage patterns through town. Over time, one mentally constructs the creek's course from the traces manifest in urban projects – walls, bridges, grates and channels.

Terrain as Urban Armature and Figure

I am arguing for a reading of the Mississippi river towns that restores terrain to the role of urban armature and figure. The relationship between grid geometry and terrain geomorphology varies according to the scale of the site under scrutiny. Neither system is universally dominant; rather each deflects, intersects, overlaps, erases and transforms the other.

Such a premise insists on the dissolution of the simple, binary oppositions used to describe, analyze, and conceptualize urban landscapes. Such pairs, architecture and landscape, city and nature, built and natural, formal and informal, assume that one concept is not only the opposite, but also the negation of the other; that one has structure and the other does not; that one is dominant and the other is not.

The morphology of urban landscapes proposed here emerges out of a language of intersection and inclusion. These inclusive, intersecting landscapes occur throughout a town in small projects, and along its edges or boundaries as riverfronts, bluff cemeteries and riverfront parks, shifts from the river's to the Land Ordinance grid's alignment, etc. Their typological consistency owes more to the particularities of topography, geomorphology and adjacency than to functional and geometric morphology that inform most theories of architectural typology. In this theory of urban landscape morphology, site is an ordering system, not a circumstantial factor responsible for a formal type's transformation.[6]

Formulating a Theory of Urban Landscape Morphology

The principles of an urban landscape theory that posits order in the terrain and that looks to both geology and geometry as the basis for a formal morphology are as follows:

Terrain is an ordering system that interacts with the geometric plot (the grid) to structure the urban landscape, establishing a topological frame for urban space, circulation and life. The geometric plot defers to the terrain within the section – in the siting and orientation of a town as well as in the demarcation of its contour or boundary. The plot and terrain also intersect at the scale of the urban project, increasing the complexity and differentiation of city sectors and tailoring the project to the specific characteristics of the site.

A theory of urban landscapes that is formulated on the premise that a site's topography, geology and hydrology are structural, not circumstantial, must employ descriptive diagrams and drawings (such as the section and axonometric) that figure the terrain, that make it conspicuous and prominent.[7] A scheme for an urban landscape that is conceptualized sectionally can not avoid (or ignore or erase) the terrain in the same way that a conceptual plan can.

This theory of urban landscape morphology suggests site design strategies of scaling, intersection, overlay and superimposition, instead of strategies of composition, to create patterns of urban form. This principle is not an issue of stylistic appropriateness. It is a necessity if one is to avoid the biases of compositional strategies of addition and subtraction predicated on ideal

orders (geometry) and circumstantial factors (site and use).[8]

This theory offers an alternative to contemporary urban or landscape design theories that privilege the town plan over the topography. In these theories, which have geometric biases, the structure of the geomorphology and terrain is seen as "disorder, disruption, distortion, awkwardness and irregularity."[9]

This theory also challenges the writings of artists and designers who have been influenced by phenomenological theory. This essay might be seen as expanding their concerns to include a site's structure as well as its perceptual phenomena and, most importantly, how the urban landscape can be as meaningful to the collective as it is to the individual.

In place of these theories, this essay offers a perspective that foregrounds the terrain as a formative feature of urban landscape morphology. Such foregrounding calls into question the myth of place-making that seeks order in the general, the grid, the plan, and the marking of center. Instead, by altering one's perspective – in order to view landscape as foreground, not background, and to describe it as a system of intersections (both – ands) not oppositions (either – ors) – the particular, the terrain, the section and the marking of boundaries and edges are understood as essential, not marginal, components for placemaking in the urban landscapes of the Mississippi River valley...and beyond.

Notes

The definitions accompanying the text are derived from *Webster's Twentieth Century Unabridged Dictionary*, 2 ed. (New York: Simon and Schuster, 1983).

1. I joined the six-week journey during the middle two weeks. A longer version of this article includes vignettes from each of the eleven towns I visited.

2. This combination of proximity and separation occurs at many scales in the Mississippi River basin. One need only cite the relationship of the residential front porch to city street in Quincy, Ill., to envision analogies at the scale of the urban project.

3. I am using the word "section" in two distinct ways in this essay: "section" as a device in American land platting (the division of land into one-mile by one-mile squares), and "section" as a drawing convention that slices through the plan vertically, depicting the terrain's vertical change.

4. See Paul Spreiregen, "Designs on the Land," in *The American Land* (New York: Norton, 1979), 69. He describes the grid in the following way, "so it is that the grid has come to symbolize the explorative excesses of the nineteenth century, the careless and often irresponsible use of the land." While J. B. Jackson's "Almost Perfect Town," described in Ervin Zube's *Landscapes*, is also laid out in an "inflexible gridiron," Jackson does concede that "strangely enough, this inflexibility in the plan has had some very pleasant results."

5. For an excellent discussion of the structure of the Ordinance grid, see Richard Bartlett, "Ownership and Order: Legislations and Provision for Government" in *The New Country: A Social History of the American Frontier 1776-1890* (New York: Oxford University Press, 1974), 69.

6. Rafael Moneo, "On Typology," *Oppositions* 13 (Summer 1978):23-45.

7. Mario Gandelsonas's analysis of Des Moines comes to mind as an example.

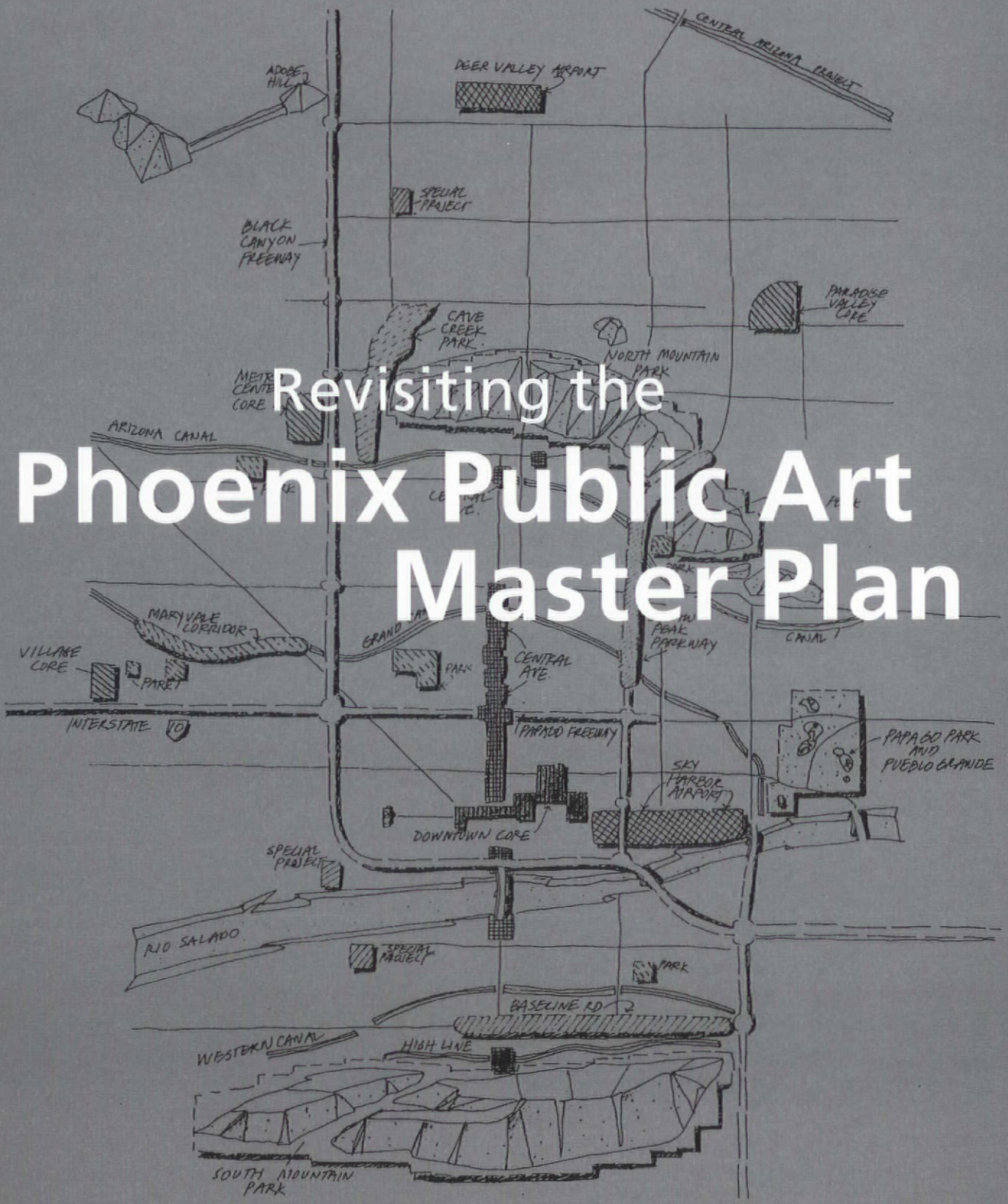
8. One might think of the writings of Bernard Tschumi and Peter Eisenman as representative of recent interest in the architectural implications of these strategies. For a critique of one such architectural theory from the perspective of landscape design, see my article, "The Public Park as Avant-garde (Landscape) Architecture" in *Landscape Journal* 10:1 (Spring 1991).

9. Here, I could cite the theories of new town planning advocated by Andres Duany, Elizabeth Plater-Zyberk and their colleagues. Those theories also draw on existing urban landscapes, but their architectural lens is neither wide nor focused enough to discern the structural role that the terrain played in the projects of their heroes, such as John Nolen and Raymond Unwin.

Acknowledgments

This article is a report from the "Discovering America's Fourth Coast" expedition, sponsored in summer 1990 by the University of Minnesota's Design Center for the American Urban Landscape. For another report from that expedition, see *Places* 7:4: "Promises, Promises: Of Earthly Power and Heavenly Glory," by Michael Mercil.

The author wishes to thank Teni Patterson for her considerable contributions to the style and structure of these essays.



Revisiting the Phoenix Public Art Master Plan

Eight years ago, Phoenix initiated an innovative citywide public art master plan. Instead of focusing on simple public space enhancement projects, the plan integrated the art program into the planning, funding and design of capital improvements — highways, water facilities, waste transfer stations, and more.

The plan, developed by William Morrish, Catherine Brown and Grover Mouton in collaboration with citizens, civic leaders and public agencies, responded to several challenges:

How could art projects make the city's underlying terrain and infrastructure systems more legible, part of the city's conscious cultural framework?

How could art projects involve citizens and designers in making public works that are not only functional but also visual and educative resources?

How could the art program create a dialogue that would elevate the design of other public and private development?

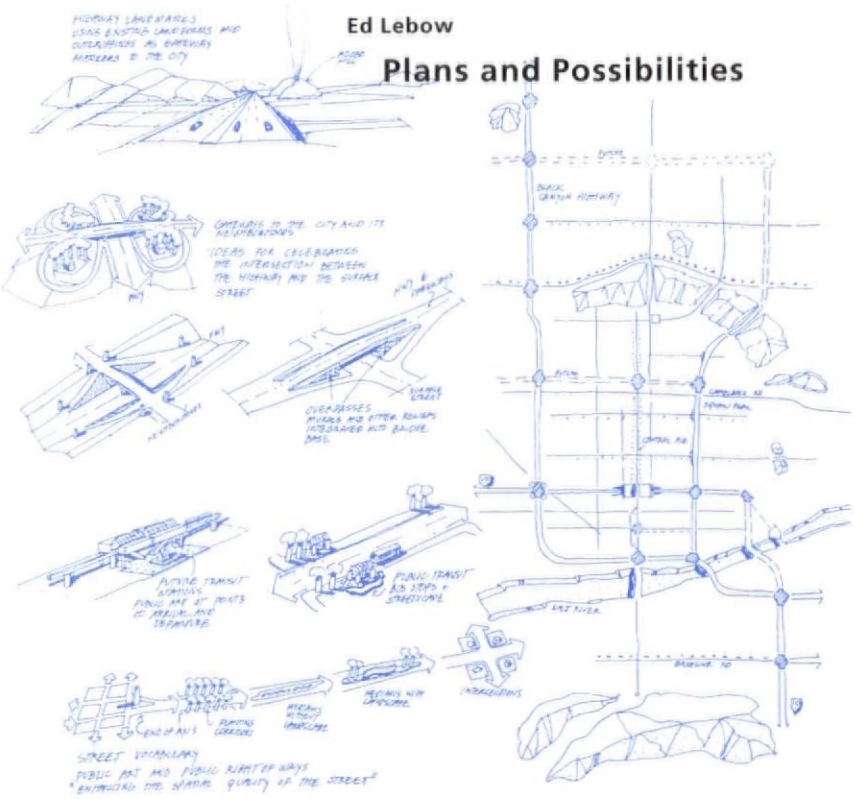
By 1992, political support for this program had declined. Even so, few art programs have matched the conceptual breath of Phoenix's plan, its integration of art and public works, and its understanding of how a public art program could be a catalyst for broader, sustained discussions about city design.

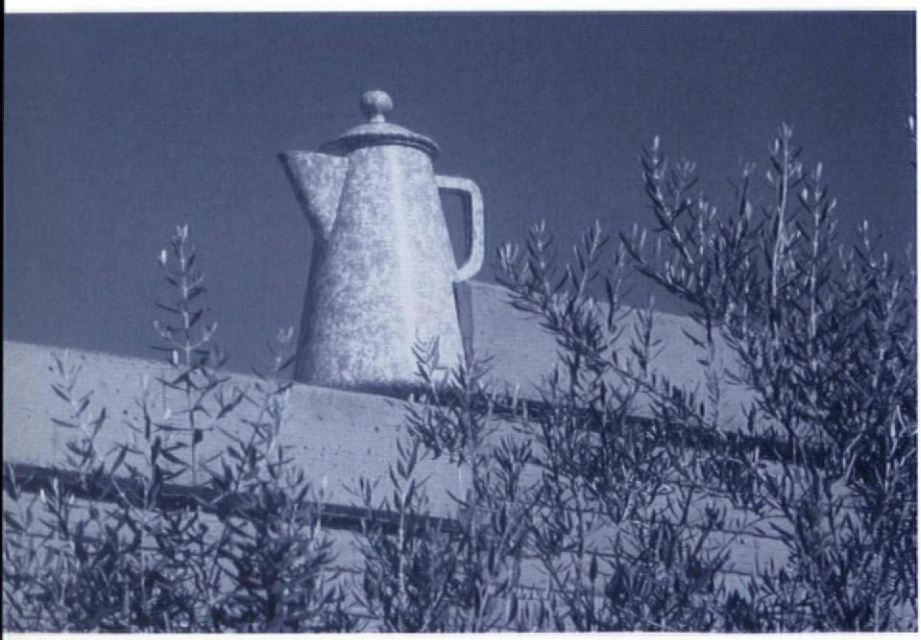
Places first reported on this initiative in 1988. Here, we offer reflections on what the plan accomplished and afterwords by Morrish and Phil Jones, the current Arts Commission director.

Opposite page: Summary drawing from the 1988 public art plan. This drawing, and others throughout this series of articles, courtesy William Morrish and Catherine Brown. Photographs courtesy Phoenix Arts Commission.

Ed Lebow

Plans and Possibilities





We like to think that plans are the seeds, rather than the fruits, of political vision. That may explain why Phoenix's 1988 Public Art Master Plan has been touted so widely as the real start of Phoenix's public art program — the moment when the program got its bearings and brains. In the beginning, goes the story, the plan established the now acclaimed link between public art and infrastructure and showed Phoenix how to transform itself from a sprawling act of real estate into a thoughtful expression of urban design.

In truth, the plan was largely a codification of what Phoenix had already begun to do by forming an arts commission, enacting a public art program and specifically linking public art to its infrastructure improvements. Before the plan was conceived, the city had approved more than seventy projects funded by thirteen municipal sources. The widely-praised Solid Waste Management Facility and Thomas Road Overpass were already in the works.

The plan added a flexible way of seeing the city whole. Its fifteen "Working Zones" amounted to priority areas where the city could get the best mileage out of its public art money. The zones included city services and systems — roads, mountain preserves, trails, solid waste, water and wastewater facilities — that the program was already addressing. They also included commercial cores, urban village centers and key urban networks, such as canals.

The thrust of the plan was to make something memorable out of daily arrivals and departures — to create orienting, you-are-here experiences for the average walker (who usually drives) in the city. The plan's prescription was a slew of artist-designed gateways, streetscapes and public markers. These were intended to give Phoenix's increasingly aimless expanse (up from 375 square miles in 1988 to more than 450 today) a more coherent and comprehensible pattern. They were also conceived to help the Arts Commission fulfill what William Morrish and Catherine Brown characterized in their 1988 *Places* summary of the plan as "its leading role as aesthetic urban designers for the city."

The claim sounds a little boisterous now. But, because the public art program draws from the till of every city department, the Arts Commission

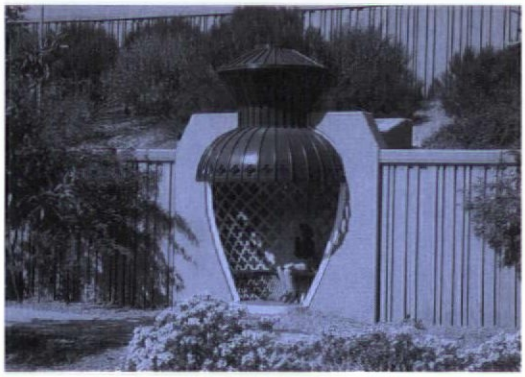
became the only agency that annually mapped out all of the city's upcoming design and construction projects. We could see the big picture of structures, systems and spaces Phoenix was about to build – where the concentrations of money were and where there might be opportunities for public agencies to combine efforts and avoid the inevitable conflicts of layering single-purpose projects on top of one another. In short, we could see how the city's new identity was being shaped.

Ultimately, the results were affected even more by the expectations other design professionals and city officials – elected and unelected – had of projects involving artists. Plenty of folks in and out of the city bureaucracy weren't enthused about artists butting into the traditional lairs of engineers, architects and landscape architects. Others were glad to put artists to work.

The Street Transportation Department was particularly receptive. The aims of the public art program suited the department's growing interest in finding new ways to soften the impact of streets on the city – to make them a friendly, even enriching ingredient of urban life. The department was attracted to the idea that involving an artist on a project gave it license to try something new, essentially freeing projects from the cookie-cutter designs that were causing the department and the city so much public grief.

Departments eager to experiment helped extend the urban design role of artists far beyond those that had been identified in the master plan. When the program got under way, the common assumption around the city was that artists could pretty up the humdrum designs of engineers, architects and landscape architects. The Thomas Road Overpass and the Solid Waste Management Facility showed that, given enough room to experiment, design teams – artists, architects, engineers and all – could invest the city's infrastructure with new forms and meanings.

The cloud in this silver lining is that few artists and city departments are really up to that task. Most of the artists who have worked here have wielded the cookie-cutter as deftly as the dullest engineers and bureaucrats. Too many have promoted tedious formulas that they defend with trumped-up pleas for artistic freedom and autonomy. Too few understand the give and take of urban design and how to address the compelling limits of a project's purpose and setting.



Opposite page, top: "Working Zone 13.0, Roads Freeways and Transit," from the 1988 plan.

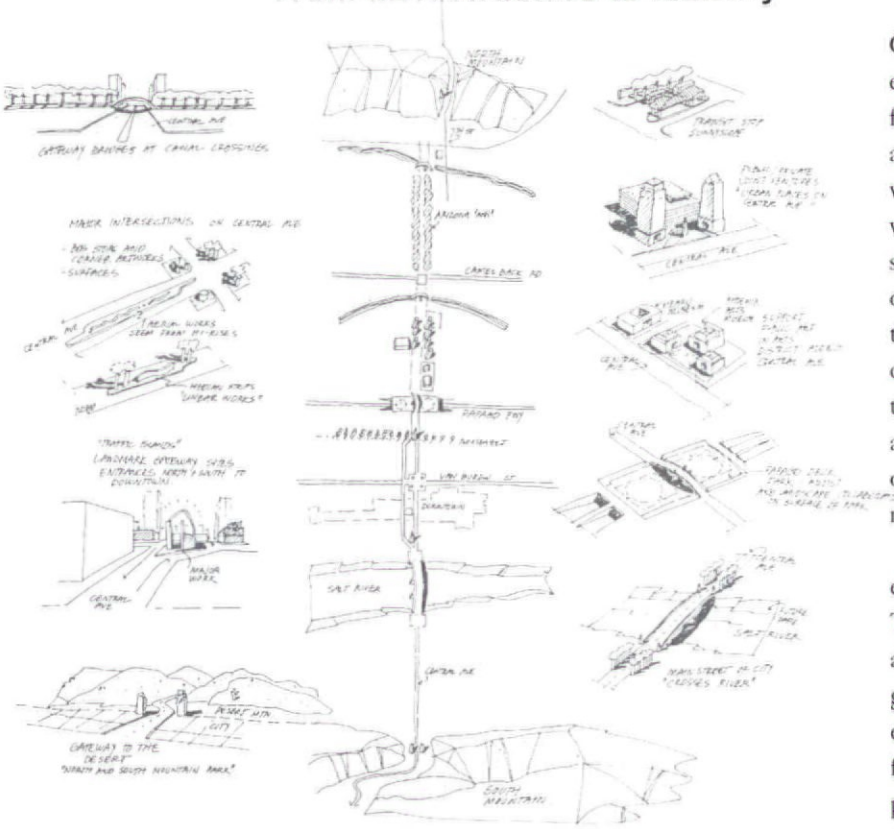
Photographs: "Wall Cycle to Ocotillo," 1992. These large- and small-scale vessels and planters, painted in different motifs, are placed on the neighborhood side of the Squaw Peak Parkway and serve as bicycle trail markers, neighborhood identity features, community gardens, seating niches and gazebos. Artists: Mags Harries and Lajos Heder.

But the talent pool of artists is no smaller than the bureaucracy's ability to withstand successful public art. Distinctive works inevitably arouse curiosity. Curiosity provokes debate. Debate is supposedly good for an open society. But in a bureaucracy with a well-defined corporate structure, uncontrolled debate is as welcome as uncontrolled fire. If the bureaucratic and fiscal moods are right – as they were when the brawl erupted over "The Wall Cycle to Ocotillo" in 1992 – controversy can even be used to suggest that the program that caused it has "insufficient oversight," that it is using the talents of too many outsiders, that its administrators are not properly reporting to the powers that be, or that the program is squandering public funds.

No plan can adequately anticipate the consequences of such reactions. Nor can a plan ever teach a city how to sustain its experimental search for quality and innovation in urban design through hard times. Phoenix's public art program continues to involve artists in designing the city. But the progress of the Public Art Master Plan's comprehensive vision – the one that briefly gave the Arts Commission a leading role in designing the city – ended when "The Wall Cycle to Ocotillo" became known in dark, sober tones around City Hall as "the Squaw Peak Pots."

Reed Kroloff

From Infrastructure to Identity



Top: "Working Zone 2.0, Central Avenue," from the 1988 plan.
Right: Streetscape for Dunlap Avenue, in the Sunnyslope neighborhood, 1990. Artist: Kevin Berry. Photograph by Tarah Rider Berry.

Fifty years ago, Phoenix was a sleepy little oasis of 50,000 people nestled together on about 25 square miles of the desert floor. Today, the metropolitan region boasts a population of 2.3 million occupying nearly 2,000 square miles. With growth like this, little wonder the city struggles for a sense of identity that includes anything more than the mountains heaving up out of the landscape, and the human-made net of streets that ropes them in.

In 1988, Bill Morrish, Catherine Brown and Grover Mouton imagined an extraordinary enrichment exercise for the city of Phoenix: a fusion of urban infrastructure and public art into a new system "connected, prepared and endowed with meaning" for the residents of the city. Art would transform roadways into cultural pathways, subdivisions into communities. The hope was to offer a model that would help ameliorate somewhat the "vast distances and long lines of formalized development that...overwhelm...and disorient... the observer... ." They proposed nothing less than a new cognitive mapping system for city residents, one that would supplement the natural and human-made structures already laid out across the valley.

The strategy brilliantly turned the city's worst enemy — its vast size — into hope for salvation. The plan would co-opt the very transportation and irrigation networks that enabled sprawl by giving them cultural legibility. The proposal was exciting for the clarity of vision and almost Confucian simplicity it offered for solving the complex problem of endowing a commonplace conurbation with a distinct character.

After seven years, the Phoenix Arts Commission can point to some smashing successes. Artist Kevin Berry's streetscapes for the Sunnyslope neighborhood are a playful, convincing abstraction of the suburb's history as a mining town and tuberculosis sanitarium. The city dump has become an unlikely, subversively, instructive sculptural presence in the form of a new reclamation and recycling building designed by a team of engineers and environmental artists.

The vision comes closest to fruition along the Squaw Peak Parkway, which, thanks to the plan, is certainly among the most beautiful in the nation. The landscape design is outstanding, and the roadway serves as an armature for several major

Left and below: Dreamy Draw pedestrian bridge, across the Squaw Peak Parkway, 1995. Artist: Vicki Scuri.

art installations. The installations — ranging from tire-tread-inspired sound barriers to bits and pieces of domestic bric-a-brac-cum-sculpture — are easily understood as part of a considered system of challenging public art. It has become a landmark that attracts tourists and locals alike.

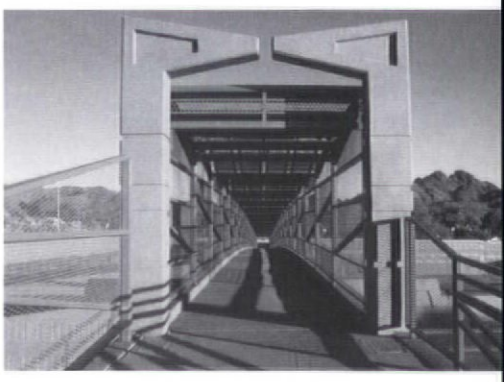
Sadly, the parkway also sowed the seeds of destruction for the Morrish, Brown and Mouton plan. A great political uprising about the quality of the parkway's art and the distribution of public funds for "non-essential" and "un-Arizona" design ultimately led to the gutting of the Arts Commission, the departure of its visionary and energetic director, and the drastic reduction of the percent-for-art budget that supported it.

In short, the plan was too good for itself. Public awareness was raised just enough to cast a wary eye toward public art. No new cognitive map was unfolded. And most of the installations now exist as so many of the other positive human contributions to this desert city: isolated, disconnected incidents in a vast web of streets, canals and mountains which remain the true compass points for most residents.

Yet all is not lost. Recently, the unenlightened art history major who currently occupies the governor's office in Phoenix decided, in his signature shortsighted fashion, that for budgetary reasons, landscaping and aesthetic improvements would be suspended on all new freeway construction. The public response was immediate and overwhelmingly negative. People had come to realize that infrastructure can and should be more than only purpose-driven.

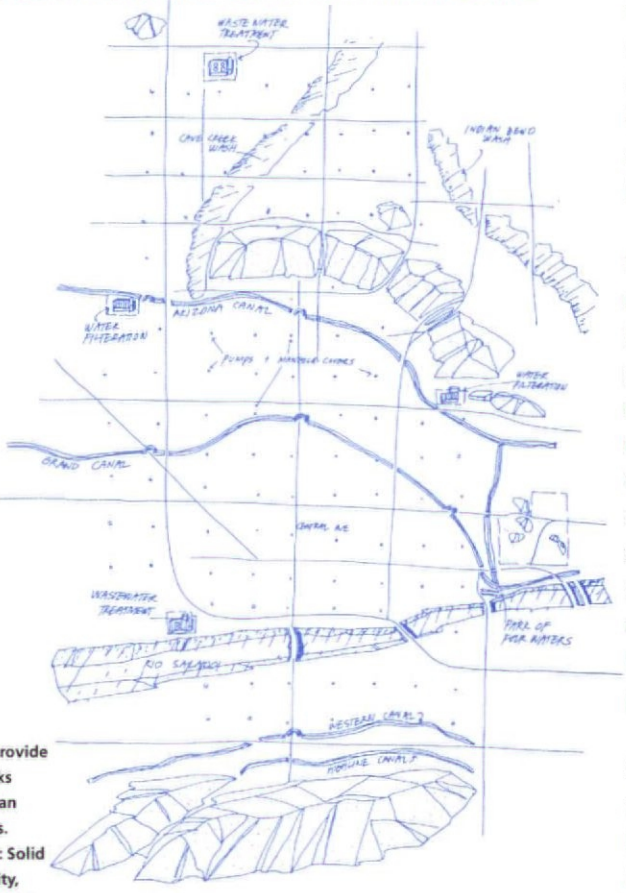
I am optimistic. No master plan can anticipate the spasms of public sentiment. At the same time Phoenix took a swipe at the Arts Commission, it was spending hundreds of millions of dollars for cultural infrastructure of the more traditionally concentrated variety. So we have a new world-class library, art museum expansion and science center, with more projects coming. The Arts Commission remains and will overcome its setbacks, slowly. There is no question that the public art plan has contributed to this exciting new climate.

Perhaps, as the modern Phoenix canal system is built, in part, over a thousand-year-old predecessor, and since the city takes its name and current form from the constant process of remaking itself, a coherent vision for public art will rise out of these tentative starts and help deliver Phoenix to the front ranks of American urbanism. What a city it could be.

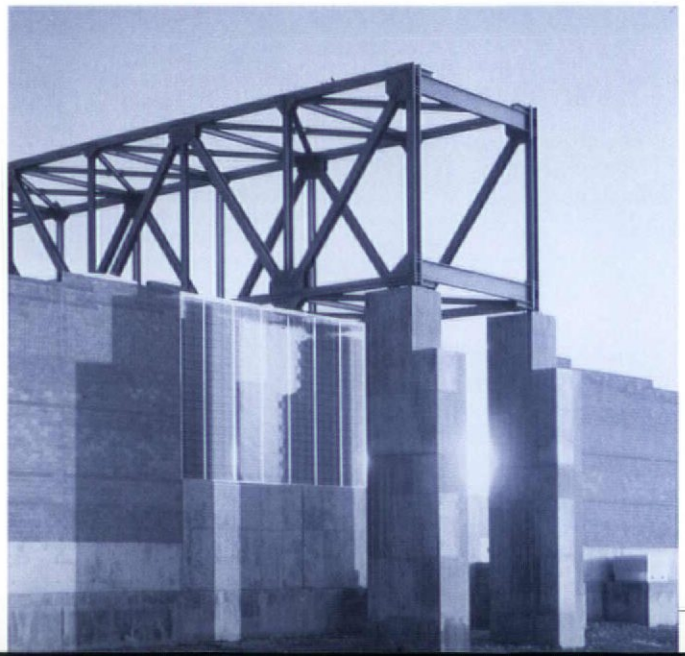


Ron Jensen

Artists and the New Infrastructure



Above: Water resources provide one of the five frameworks established in the 1988 plan for organizing art projects. Below and opposite page: Solid Waste Management Facility, 1993. Photograph, Craig Smith.



How did I, as public works director of a large city, get involved in developing projects that involve public art? The answer is not as simple as you might think.

As an engineer and manager, my background and training involve rational thinking with an emphasis on established standards. Artists, on the other hand, are creative and explore new concepts that at times go beyond what society will accept.

One of my responsibilities was reviewing capital improvement projects with the arts commission's executive director. When we discussed the solid waste transfer station, she asked, "Would art fit into this?" The station is adjacent to a landfill, and we hesitated. But the more we thought about it, we wondered, why not?

We are entering a new era of public concern for the environment at a time when economic conditions are poor; there are simply not enough funds to build all the facilities and operate all the programs that are needed. Services like public safety are a high priority, as crime is of great concern to all people. But even though people are very supportive of recycling programs and environmental efforts, facilities that support waste removal and treatment are out of sight, out of mind. The average citizen does not know where waste goes when they flush the toilet. The same thing is true of trash, which disappears when the garbage truck picks it up and drives away.

On the other hand, public concern for protecting the environment and maintaining property values has severely constrained our ability to locate, design and develop infrastructure projects. Solid-waste facilities and wastewater plants, or anything that is perceived as negative, trigger the NIMBY ("not-in-my-backyard") syndrome, and we get tremendous opposition.

The New Infrastructure

We need a new vision for the way we design, build and operate our infrastructure, if we are going to maintain the public support our programs and projects require. People need to understand that facilities for processing, transferring and storing waste are part of the environmental solutions they seek.

We must begin to invest in what I call "The New Infrastructure" — multipurpose, citizen

friendly and education-oriented facilities that meet a range of community needs, rather than just provide a basic service. These projects will be the products of multi-disciplinary teams operating in an open environment with extensive citizen input.

While public works often meet resistance, many public art projects have become well accepted and sources of public pride. The vision that comes from the involvement of artists can add a new dimension to infrastructure projects, balancing the elements of engineering design that protect public safety and meet operational requirements.

When our department agreed to work with the arts commission on the waste transfer facility, we made it clear we were not simply going to plop a statue at the corner and call it art. Rather, we wanted a vision for making the facility really open to the public. We wanted to counter the NIMBY syndrome and help people understand that they share in the responsibility of processing and disposing of their solid waste.

We wanted to include environmental education to help the public learn about recycling by watching the process. We did not want to have a strictly utilitarian project in which tours would be unsafe or would not portray what really goes on. We wanted to design educativeness in from the very beginning.

We envision this facility to be the first phase of an environmental research park. Nearby, there is a wastewater plant whose effluent is channeled in canals to farmers for irrigation. One of the artists' concepts, upon which we are expanding, was to divert some of that effluent into the flood control basin behind the waste transfer station. It would flow through a series of ponds and channels, with cattails, reeds and water hyacinths. At this research park, we could undertake research on wastewater treatment and create a habitat for water fowl.

Bringing Artists and Communities onto the Team

The future offers many opportunities for expanding the new infrastructure. Involving communities and creating multi-disciplinary teams of artists, architects, engineers, planners and managers, will be critical to this approach. I have a pet saying, "Involvement breeds commitment." If you get people involved in a project, they will become committed to its success.

Not all artists or engineers are able to function well in a multi-disciplinary, team environment. Many artists insist that what they create and sign their name to must be all theirs. Many engineers are fixed in the concept of doing things the same way, following established standards.

It takes an enlightened individual to work successfully on a team charged with creating the new infrastructure. Participants must be willing to be involved in give-and-take, they must be willing to consider factors of cost and function, even when exploring new ideas. There must be a process for balancing contrasting concepts and opinions.

The support of a citizens group can be the driving force to completing an infrastructure project. And my experience is that citizens are eager to learn more about their roles in recycling solid waste and conserving water. The power of the public should not be underestimated.

Nancy Connery

Years before Phoenix' new garbage facility was built, public works director Ron Jensen bragged it would become the city's "second biggest tourist attraction after Camelback Mountain." That kind of bravado is rare among public works officials. His gamble seems to have paid off in lavish press attention, along with a few snags and small ironies.

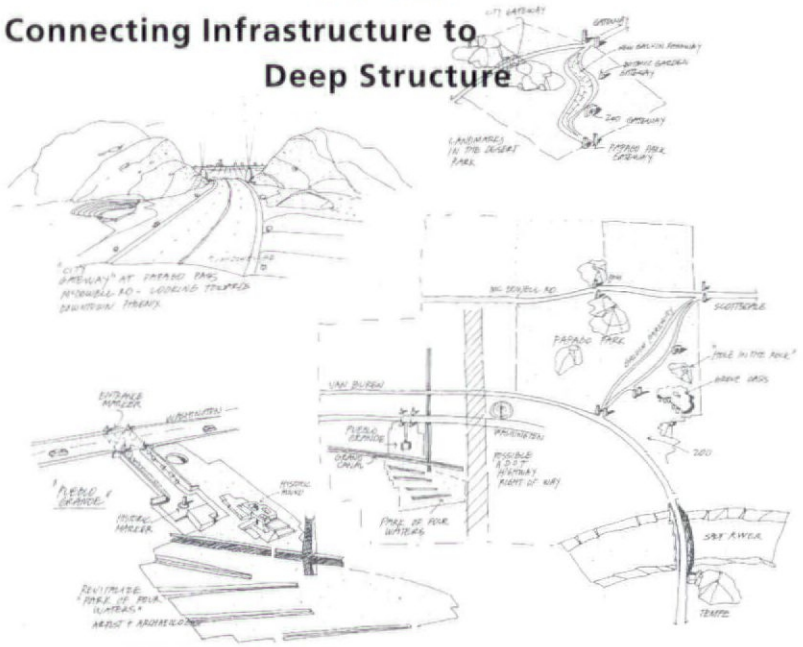
I went to see the facility late in 1994, just as it began operation. It is at once a soaring, cathedral-like structure and a gritty utility on the outskirts of Phoenix's industrial zone. Cascading gardens adorn the public entrance. Inside, state prison inmates sort through tons of garbage to extract "recyclables"; giant trucks convey the rest to a city landfill.

Chuck Hamstra, a civil engineer and impromptu tour guide, gave me a tough insider's look at the place. From his technical vantage, the artists (and the project's consulting engineers) had overlooked lots of practical concerns that now vexed its operators. For example, the dramatic external trusses drew hordes of pigeons and corrosion problems. A cracked window in the public viewing area would cost thousands to replace because of its unusual size.

But when I asked how he liked working at the facility, Hamstra became ebullient. He described the sense of peacefulness and pride he felt there. He liked the steady stream of international visitors. He ended the tour with an eloquent description of how the project should be expanded to foster greater public environmental awareness. His vision was remarkably similar to one offered by the artists.

Frederick Steiner

Connecting Infrastructure to Deep Structure



Top: Working Zone 4.0, Papago Park/Pueblo Grande, from the 1988 plan. Above: Papago Park/City Boundary Project, 1992. Designers: Jody Pinto, Steve Martino. Photo: Craig Smith.

From within the earth, if such a vantage point were possible, the form of Phoenix almost makes sense. The Valley of the Sun is a broad, fertile alluvial plain within ridges of hard rock. The deep geological structure, combined with the hot, arid climate and the flows of water at the surface and below the ground, set the stage for life in the region. Life flourishes in the valleys and has a more difficult time on the steep, hard rocks.

An understanding of this deep structure was fundamental to the 1988 Phoenix Arts Commission public art plan.[1] This knowledge was to be used to illuminate and redirect the superimposed urban infrastructure. How well do these artistic modifications connect infrastructure to the underlying geologic, hydrologic and climatic processes?

A visual language, a design aesthetic, that reflects the nature and the culture of the region is clearly emerging. Along Central Avenue, Phoenix's main street, petroglyph-inspired medallions are attached to light posts. Native-American references appear repeatedly, on pots along parkways and on reliefs in bridge columns. References to water, especially its scarcity in the desert, are another phrase in this language, as in the water valve and water meter box hatch covers Michael Maglich designed. Stone is also frequently used.

Earth, water, sun plants, animals – connections of parts to the whole – that is the essence of the aesthetic stimulated by the plan. But the projects that work best are also connected to their immediate surroundings, particularly the people who inhabit the area.

The Papago Park City Boundary Project (a result of collaboration between artist Jody Pinto and landscape architect Steve Martino) makes the most profound connection to the region's deep structure, in concept. However, the concept falls short of its promise largely because it does not challenge prevailing changes occurring in its surroundings. The plan originally conceived of the spot as a city gateway, an entrance into Phoenix from Scottsdale and Tempe along a major road. It became a "boundary project" when neighboring Scottsdale added funding. In the end, the project is effective as neither a gateway nor a boundary.

Martino told me the City Boundary Project is "a shrine to agriculture, irrigation and nature" because "the manipulation of water flow is why we're here in Phoenix in the first place."[2] The project consists of a 240-foot aqueduct wall built of stacked stone. The aqueduct collects rain water and distributes it to "farming terraces" or retention basins that are created by low, branch-like walls. There are also seven fieldstone markers that direct viewers to municipal, historical and natural sites in the region and are aligned with the summer solstice.

Martino and Pinto found regional precedents for the design in the uphill sides of the region's canals and the tanks built by cowboys for their livestock. In those landscape elements, the pooled

water results in new concentrations of vegetation, called "green ups," and the same thing was supposed to happen at the City Boundary Project.

At ground level, the City Boundary Project is a disappointment. One is impressed by the craftsmanship of the walls but they are dominated by both the immediate environment as well as the larger landscape context to the point of blending in without distinction. There has not been a noticeable green up behind the terraces. Instead, there are several dead or dying plants. Too little distinguishes this place from others in Papago Park: a gateway or boundary should make a more obvious mark.

The lack of connection or reference to the overall context is the biggest disappointment. To the south is the main body of the park, with power lines cutting across its edge. Catty-corner to the northeast is the Scottsdale Auto Park. To the north, the Oakland Athletics spring training facility continues to sprawl and the National Guard launches frequent noisy overflights of helicopters. Since the project was completed, there has been an increase in turf and high-pole lighting because of baseball fields and an overall degradation of environmental quality, rather than an effort to encourage the restoration of the former glory of the Sonoran cactus-dominated landscape.

The Thomas Road Overpass provides a significant connection between infrastructure, community and deep structure. The plan identified the Squaw Peak Parkway as a prime opportunity in designing the city's infrastructure because of its scale and centrality. Artist Marilyn Zwak called her design of the overpass "Our Shared Environment," an apt title. Zwak and engineer Jerry Cannon created six reptile-shaped support columns, each twenty-four feet tall, to support the bridge. Eighteen relief panels of human, abstract and animal images adorn the columns and the walls.

Hohokam artifacts found at the site during the freeway excavation inspired Zwak's imagery. She literally dug into the deep structure of the region for the construction material of the column surfaces. Zwak and two assistants spent 4,000 hours applying 150 tons of adobe to the overpass columns and walls. Adobe is, of course, a traditional southwestern building material, comprised of earth, water and straw.

The Thomas Road Overpass looks organic, as if it grew out of the place, and is certainly unlike any other highway bridge. It was an instant success, which is amazing because the parkway was controversial, having divided neighborhoods and antagonized community residents. Zwak responded in an almost clichéd way: involve people in a project and they will take ownership in it and be its stewards. The theory works, a truth too often overlooked in public projects.

Zwak invited residents, city officials and other members of the overpass design team to leave their marks in the wet adobe. Some imprinted their hands and feet, several inscribed names, others imbedded things with meaning from their lives, such as drill bits, a wrench, a padlock, a hubcap, treasured rocks, shells and a lucky penny.[3] Zwak supervised the placement of all the objects and interacted with each of the participants.

The reaction to the Thomas Road Overpass is in sharp contrast to another Squaw Peak Parkway project: "Wall Cycle to Ocotillo" (known locally as the "parkway pots"). The artists sought to connect their work to the region; many of the vessels have obviously Native-American-inspired markings, others incorporate plants, water features or solar lighting. But the result was superficial; the pots appear to be more decorative than inspiring. Nor were these artists as successful in involving the community as Zwak. The artists did consult the community and design a few sheltered sitting areas, but the overwhelming public reaction was negative.

The Phoenix Arts Commission plan sought to put "place back into infrastructure." Many of the projects inspired by the plan have, indeed, created links between project and place, between human culture and the deep structure of the region. The surface landscape now reflects the deep structure in new and interesting ways. But the most successful projects still require connections to the local population.

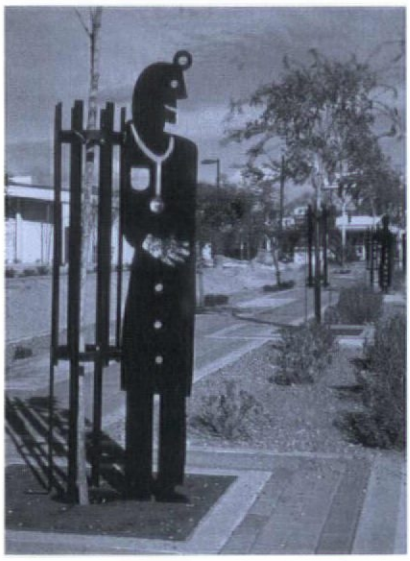
Left and above: "Our Shared Environment" (Thomas Road Overpass), 1990. Artist: Marilyn Zwak. Photographs: Craig Smith.

Notes

1. Phoenix Arts Commission, *Public Art Works: The Arizona Models* (Phoenix: 1992).
2. Frederick Steiner, "Basins Designed to Retain Water, Aid Vegetation," *The Phoenix Gazette* (27 March 1992): E1-E2.
3. Lynn Pyne, "City Stops for Roadside Art," *The Phoenix Gazette* (14 June 1990): D1.

Phil Jones

An Evolving Mission



Right: Several in a series of 100 steel tree guards on Dunlap Avenue in the Sunnyslope neighborhood. Artist: Garth Edwards. Photo: Craig Smith. Below: Several in a series of 300 medallions affixed to light poles on Central Avenue. They depict contemporary interpretations of traditional Native-American imagery and symbols. Artists: Howard Sice, Juan Navarette, Patricia Navarette, Doug Weigel. Photo: Craig Smith.

Phoenix's public art program was tested and almost eliminated during the unfortunate controversy over the "Wall Cycle to Ocotillo" in 1992. Reason prevailed, however, and the dialogue that took place between city leaders and the Phoenix Arts Commission resulted in revisions to the city's percent-for-art ordinance.

The changes refined the Arts Commission's role in administering the program and strengthened the role of citizens, other city departments and the city council in commissioning public art. For example, samples of an artist's past work are shown to a council subcommittee prior to contract approval. Proposed designs are shown to all council members before artwork is fabricated. The process sometimes seems more cumbersome, but it has helped build support for the program.

The arts commission has continued to implement the public art program in accordance with the goals of the 1988 master plan. We still place a high priority on involving artists as members of design teams planning major infrastructure projects. We also try to integrate art into the fabric of neighborhoods as much as possible. For example, we have asked artists to design wall treatments for booster and pump stations (elements of our water system) throughout the city.

At the same time, we are responding to new opportunities and changing political realities. We are developing public art projects that involve young people (a Police Activities League photography project) or focus on community education (artist-designed spaces or educational programs that demonstrate the use of recyclable materials in landscape design, the botanical uses for reclaimed water and the functions of recycling centers and wastewater treatment facilities). We are also trying to direct more of our resources into inner-city areas, which have seen less capital development than other parts of the city.

Our plan for 1996-97 includes thirty-eight projects in various stages of implementation, with a total program allocation of $3.5 million (similar to the amounts budgeted a few years ago). The staff we have to administer these projects, however, has been cut by half. Next year, we will begin updating the 1988 plan. Our new plan will acknowledge both the city's growth over the past decade and changes in our capital program priorities.

Community involvement and education have been vital to the success of Phoenix's public art program. Citizens serve on the artist selection panels and neighborhood organizations contribute to the development of each project. The involvement of citizens and artists, through participation in public forums, will be an essential part of planning future art projects and revising the 1988 master plan.

William Morrish

Raising Expectations

William Morrish was a co-author of the Phoenix Public Art Plan. Places *asked him to reflect on the impact of the plan.*

Phoenix's art program added to and was a catalyst for the idea that the city could have public places – places that are beautiful and thoughtful and ingenious. The greatest impact of the program was that the discussion of design actually began in the city. There was an explosion of projects. The new library (recently opened) won approval; the Heard Museum gained momentum.

Our idea for "working zones" was to identify projects that were powerful, vivid and compelling, and use them to inspire agencies to be creative with other projects, too. We wanted to send the message that public works can be culturally rich, rather than politically divisive. We wanted people to come to the table on their own, and some departments did start thinking that way.

We also looked at private-sector initiatives, to bring them to the game. Central Avenue is a good example. Near the Heard Museum there's a new office complex that has a sandstone fountain and public space that spills onto the street. The art program helped bring attention to places where people spend time.

On the "Wall Cycle to Ocotillo" controversey: The "parkway pots" were just an excuse. There was fundamental shift in city hall, which began to argue that even general landscaping was a waste of tax dollars, that there is no economic benefit to an art program. The previous mayor believed that public art does have an economic benefit, that visible expressions of civic pride contribute to a positive social atmosphere and neighborhood stability.

The city is also maturing. Citizens are thinking about things they can do to enhance their neighborhood – revitalizing neighborhood parks, fixing streets and improving transit nodes. We always sensed that after the first wave of infrastructure, the program would have to shift to neighborhood-based projects.

On public art and urban design: It's important to remember that public art is not urban design. Urban design should be about civic art, but it also has to be concerned about city functions and services. Public art opens up doorways to creative thinking about designing the city, but being a point of entry into the imagination is not enough to sustain all the functional critera that urban design has to address.

When you see the Thomas Road Overpass, you are reminded of a number of urban design themes, but the art is not a functional element by itself. At the solid waste transfer station, the essence of the art was to think about architecture; it's less visually didactic than it is a working example. I would argue the pots project tried too hard to solve urban design issues, but the pots themselves weren't enough to carry it off.

Top: "Desert Passages," 1990. Artist-designed trail through Lookout Mountain Park. Artists: Roger Asay and Rebecca Davis. Photograph: Craig Smith.
Above: Water main hatch covers, 1995. Artist: Michael Maglich. Photo: Michael Maglich.
Left: Patrick Park Plaza, 1992. Artist served on a city design team developing streetscape amenities and community plaza. Artist: Jody Pinto. Photo: Bob Rink.

Great Site

Two California Outdoor Theaters

"...when the drama has been simplest, most genuine and lit up by the joy of living, it has had its setting in the open."

— Sheldon Cheney, *The Open Air Theater*, 1918

Works

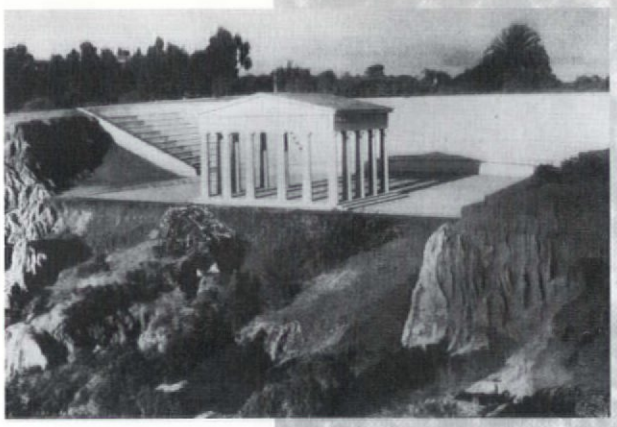
Sidney B. Cushing Amphitheater, Mt. Tamalpais, Marin County, Calif., 1994. Courtesy Anton Grassl.

Outdoor theaters have a uniquely close relationship to the landscapes they inhabit, particularly to the earth from which they are carved. Similar to the earthworks of today's environmental artists, they provide poignant insight into how a culture regards the landscape and nature. Exemplary outdoor theaters – constructed in America's estate gardens, parks, campuses and development projects – can provide models for creating memorable relationships between structure and site that reveal the unique character and spiritual power of a particular landscape.

Today we often associate outdoor theaters with large commercial facilities that offer music concerts to capacity crowds or historical dramas to summer tourists. Although outdoor theaters can be built at a fraction of the cost of similarly sized indoor theaters, they frequently mimic the characteristics of indoor theaters rather than capitalize on the unique opportunity of gathering citizens together in the landscape.

This disregard of the landscape setting in theater design was not always the case. During the early 1900s a "new drama" movement focused the creative energies of an avant-garde group of theatrical professionals, naturalists and designers on creating open air theaters that were an antidote to the increasing technical and commercial concerns of indoor theaters. Influenced by Greek artistic and democratic ideals, these theater enthusiasts envisioned theaters as community structures that would contribute to the spiritual and civic well-being of American life by making the joys, good health and inspiration of nature available to all.

This civic and environmental idealism was still evident in theaters built in the 1920s and in the Works Progress Administration theaters of the 1930s and '40s. After World War II, theater managers began updating older theaters and building new outdoor theaters with plastic seats, lighting structures, sound systems, concession facilities and canopies to provide the amenities found in interior theaters. The resulting structures often



"...through the spoken work, the rendition of music, through song and dance the outdoor theater can contribute to mental, physical and spiritual growth. If it is healthful to exercise, work, play, and sleep in the open, it should be even more beneficial to have our finer sensibilities unfolded in the same favorable atmosphere."

— Emerson Knight, Landscape architect, "Outdoor Theaters and Stadiums in the West," in *The Architect and Engineer,* 1924

obliterated vistas and destroyed the topography, vegetation and other natural patterns of the original landscape. This shift of design priorities from the interpretation of the landscape setting to a fascination with technology and physical comfort has resulted in contemporary outdoor theaters that are not much different from indoor theaters with a hole in the roof.

Today, public concern for the preservation of natural environments has made it crucial that designers understand the opportunities and limitations of placing structures in the landscape. In spite of these concerns, designers accept any contemporary suburb as a testament to the commercial pressure to disregard the landscape entirely. It is daunting to realize that structures designed to showcase artistic endeavors — such as outdoor theaters — have also relegated the landscape to incidental importance.

Not all the news is bad. Knight's "favorable atmosphere" persists in many older outdoor theaters that continue to attract large audiences. The best known of these pre-World War II theaters is Colorado's beautiful Red Rocks Theater, designed by the architect Burnham Hoyt in 1936 and built by the Civilian Conservation Corps. Despite what is considered a small seating capacity (9,000) that limits revenue, Red Rocks consistently wins *Pollstar* magazine's "best outdoor concert venue" survey of performers.

In other older theaters and at various impromptu found sites, audiences and performers frequently adapt to hard seats, awkward sight lines, minimal

Background: Bohemian Grove Theater, Guerneville, Calif. From Sheldon Cheney, *The Open Air Theater*, 1918. Inset: Theosophical Society Greek Theater, Point Loma, Calif., 1912. Courtesy San Diego Historical Society, photograph collection.

stage lighting, rain and overhead air traffic to participate in cultural and civic events that engage the landscape. An understanding of these memorable older theaters can rekindle our commitment to creating structures that interpret and highlight a site's unique natural character and, consequently, inspire reflection on how culture can interface with the beauty and rhythms of nature.

Locating theater precedents that successfully interpret their site is difficult since there are only two American books on outdoor theaters: *The Open-Air Theater* (1918) by theater critic Sheldon Cheney and *Outdoor Theaters* (1917) by landscape architect Frank Waugh. The majority of the case study theaters in these books are still intact and in active use, a testament of the appeal and endurance of thoughtfully designed theaters. Both books discuss explicitly how the theaters address their surrounding landscapes, indicating this era's focus on the landscape.

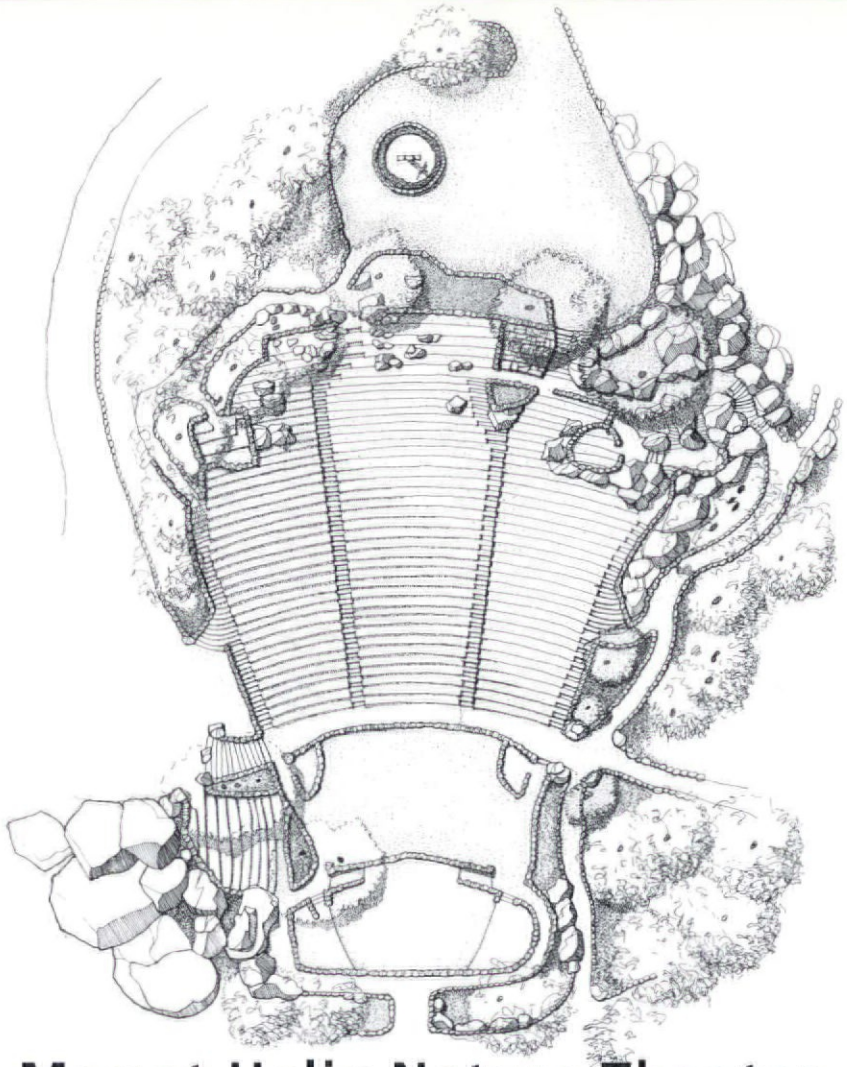
With insights pertinent to contemporary design, Cheney's book differentiates two design approaches. His "architectural theater" is most clearly depicted in the book's images of the 1901 Point Loma, Calif., Theosophical Society Greek Theater. This type juxtaposes strong geometric forms against the surrounding landscape to reveal characteristics of the site that might otherwise go unnoticed, such as a steep slope or an unusual rock formation that is highlighted by placing a contrasting wall behind it. The Theosophical Society Theater's white geometric forms contrast sharply with the adjacent canyon and coastline, focusing our attention on their rugged shapes. Like its classical Greek precedent, the still intact Theosophical Theater was sited for its view from the theater rather than by the appearance of the theater itself in the landscape.

Cheney's "nature theater" merges with the landscape, giving the impression that it is a part of its natural surroundings. With a stage background of vegetation or the landscape beyond, this theater type implies that both performers and audience are merely a part of the scenery. Seating is typically integrated into the topography, is built from materials indigenous to the site and is often interrupted by vegetation or stones. At one of Cheney's examples, the Guerneville, Calif., Bohemian Grove Theater, the stage evolved gradually on a redwood covered slope during the late nineteenth century. Its unique vertical stage still accommodates the annual Grove Plays, in which actors appear on three different levels from behind the redwoods.

The two California theaters derscribed in this article, Mount Helix Nature Theater and Mt. Talmalpais Mountain Theater, do not fit neatly into these categories, but instead exhibit properties of both theater types. The formal concepts of both theaters began with simple geometric ideas that, like Cheney's architectural theater, contrast with the geometries of the natural site. But these forms are modified, adjusted and distorted to respond to the natural patterns of the particular site. Many of these site-specific adjustments are apparent in the initial proposals, but significant modifications were made during construction when these schematic ideas were fine tuned to the particulars of their immediate landscapes.

A longer version of this article, and the photographs by Anton Grassl, are a part of a forthcoming book and exhibition, *Great SiteWorks: A Selection of American Outdoor Theaters*. The book will include twenty-five case studies of exemplary theaters drawn to the same scale with accompanying historical and contemporary photographs.

Funding for this research was supported by the National Endowment for the Arts, Design Arts Program, and by the University of California, Berkeley, through its Committee on Research and the Department of Landscape Architecture's Farrand Fund. Research assistants were Terry Clements, Gail Donaldson, Meg Calkino and Adrienne Wong.



Location: Sloping east on a summit 1320 ft. above sea level 12 miles east of San Diego.
Designers: Richard Requa, architect; Emerson Knight, landscape architect.
Construction date: 1924-25.
Designated seats: 5,000.
Total capacity with seating on boulders and walls: 8,000.

Mount Helix Nature Theater

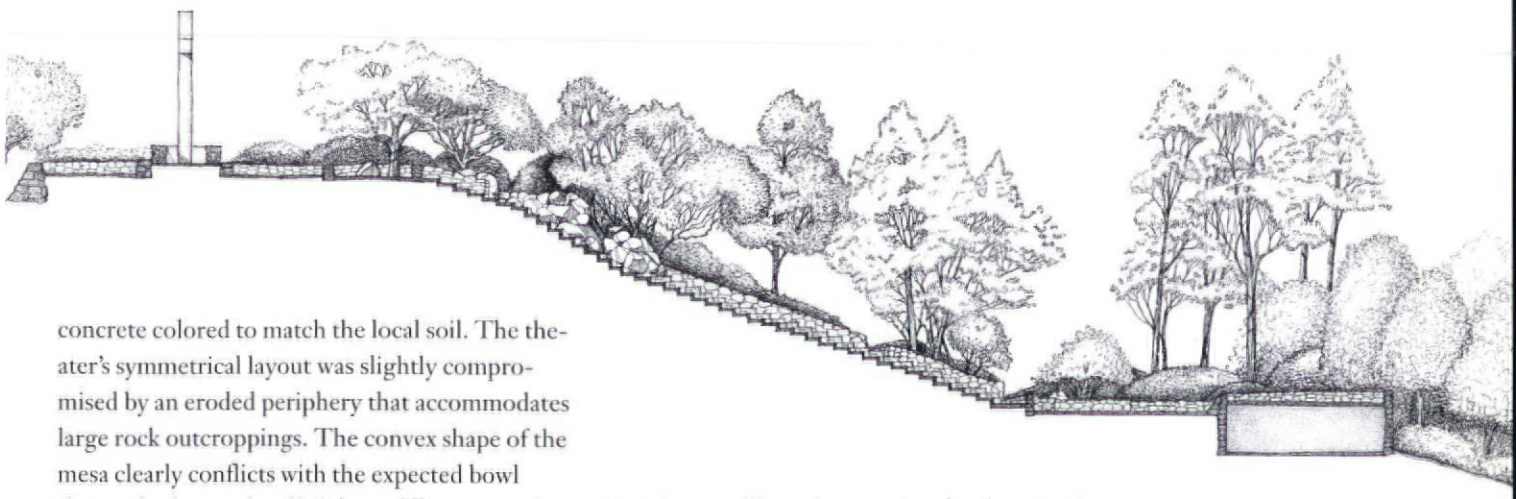
Each Easter since 1925, approximately 7,000 people have attended sunrise services in a grand theater atop Mt. Helix, the highest point in San Diego County. This mountaintop had attracted San Diego residents up a rough helix-shaped road to a panoramic vista long before the theater's 1925 dedication. Beginning in 1919, Easter worshipers walked two and a half miles up the mountain to crowd onto boulders and makeshift benches for a simple service with a spectacular sunrise view.

One nearby resident, Mary Carpenter Yawkey, came to the mountaintop frequently to meditate in this majestic natural setting. When Yawkey died in 1923 her daughter, Mary Yawkey White, and son, Cyrus Carpenter Yawkey decided to honor their mother by erecting a nature theater on top of Mt. Helix for "inspiration and public use." White asked Ed Fletcher, the local entrepreneur who owned the mountaintop, to sell the land. Instead, Fletcher donated it and designated his 23-year-old son, Ed Jr., to oversee construction of the project.

The Yawkeys hired Richard Requa and Emerson Knight to design the theater. Requa was a revered local architect who had designed many of the buildings in Balboa Park. Knight, a San Francisco landscape architect, had written extensively on outdoor theaters and designed several theaters in Northern California. The collaboration went well and they created a scheme that was distinct from the environs yet inspired by the rugged nature of the site:

"Mt. Helix rises from the mesas almost a perfect cone in outline to an altitude of 1,500 ft. A site more inspiring, more ruggedly picturesque, more accessible or otherwise more perfectly fitted to its purpose could hardly be found the world over. ...Every cut and fill, every rock formation and boulder and even every plant and shrub must be carefully considered so that perfect harmony of parts and unity with the setting is secured and maintained" (Requa, 1925).

The two men proposed a symmetrical, fan-shaped scheme to be built of indigenous stone and



concrete colored to match the local soil. The theater's symmetrical layout was slightly compromised by an eroded periphery that accommodates large rock outcroppings. The convex shape of the mesa clearly conflicts with the expected bowl shape of a theater, but Knight and Requa saw the power of this rugged site, with its extraordinary view, as reason enough to locate a theater there.

They then looked to the site itself to create a theater form that reflected the topography. The auditorium is long and narrow to minimize the amount of fill required to counter the conical shape of the mesa. The most unique adaptation is the way the aisles and central seating rise above the side sections to reflect the site's convexity, creating modulated shadow patterns along the stepped aisles:

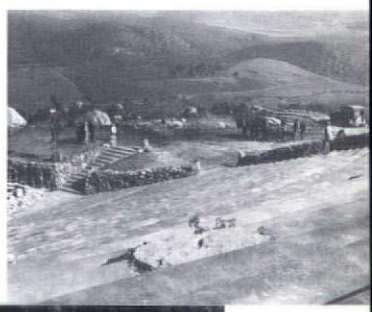
"This (convex) form has been preserved by so constructing the seats as to leave the middle section a foot higher than the side sections. The transition is effected first by a step down from the middle section to the adjoining aisles, and then by another step from these aisles down to the side sections" (Knight, 1925).

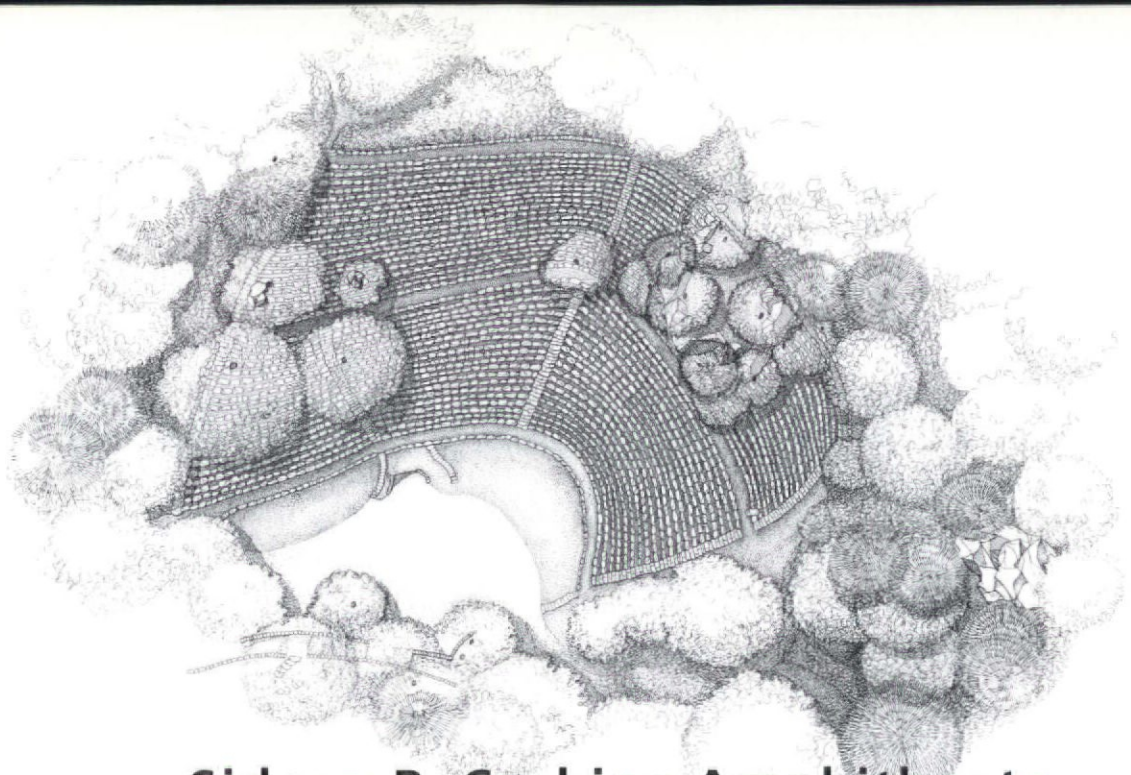
Although the theater was primarily built of materials found on the site, concrete and steel reinforcing were brought to the confined working area on a daily basis. In a recent interview construction manager Ed Fletcher, Jr., now 94, reminisced about the difficulties in transporting carloads of cement, tons of crushed rock, sand, steel and lumber up the mountain slope. They were able to bring only enough material for a day's work at a time, and they carefully avoided excavation that would require carrying drock and soil down the mountain. Due to the almost daily adjustments to subsurface conditions and an initial survey that had inaccurately located rock outcroppings, Requa visited the site several times a week to oversee the adaptation of the schematic plan.

The stage and lower tiers of seating were constructed with minor modifications from the original design, but my recent field measurements indicate that the design of the upper seating tiers was changed substantially to accommodate bedrock and outcroppings that became intimate boxseats. The theater's long northern aisle focuses on one of these picturesque box seats before taking a sharp diversion around it. The original design's consistent 1: 3 slope was adjusted in the top tiers to steeper slopes to avoid bedrock, thus giving the theater's profile a distinctive bend that is immediately apparent as one enters.

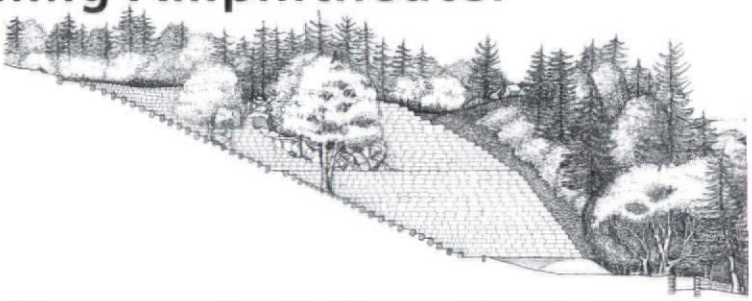
It is the distortions of the "perfect" geometries of the original proposal that give the theater its visual excitement and highlight the rugged, spiritual character of the natural site, making it a place that visitors return to again and again. The only interruption of the annual Easter observance was between 1942 and 1945, when the army occupied the site. Today the theater accommodates not only the sunrise service, but also dramas, musical events, graduations and weddings.

Plan and section of Mt. Helix Theater, as built. Courtesy Linda Jewell.
Below: Mt. Helix Theater under construction, 1925. Courtesy San Diego Historical Society, Union-Tribune photograph.
Bottom: Mt. Helix Theater, 1994. Courtesy Anton Grassl.





Sidney B. Cushing Amphitheater



Location: South-southwest facing slope of Mount Tamalpais, Marin County, California, twelve miles north of San Francisco.
Elevation: 2,000.
Designers: Emerson Knight and Paul Holloway, landscape architects.
Construction dates: Site clearing and earthwork, 1913-29; rock seating, 1934-41.
Seating: Up to 6,000, but presently restricted to 3,750.

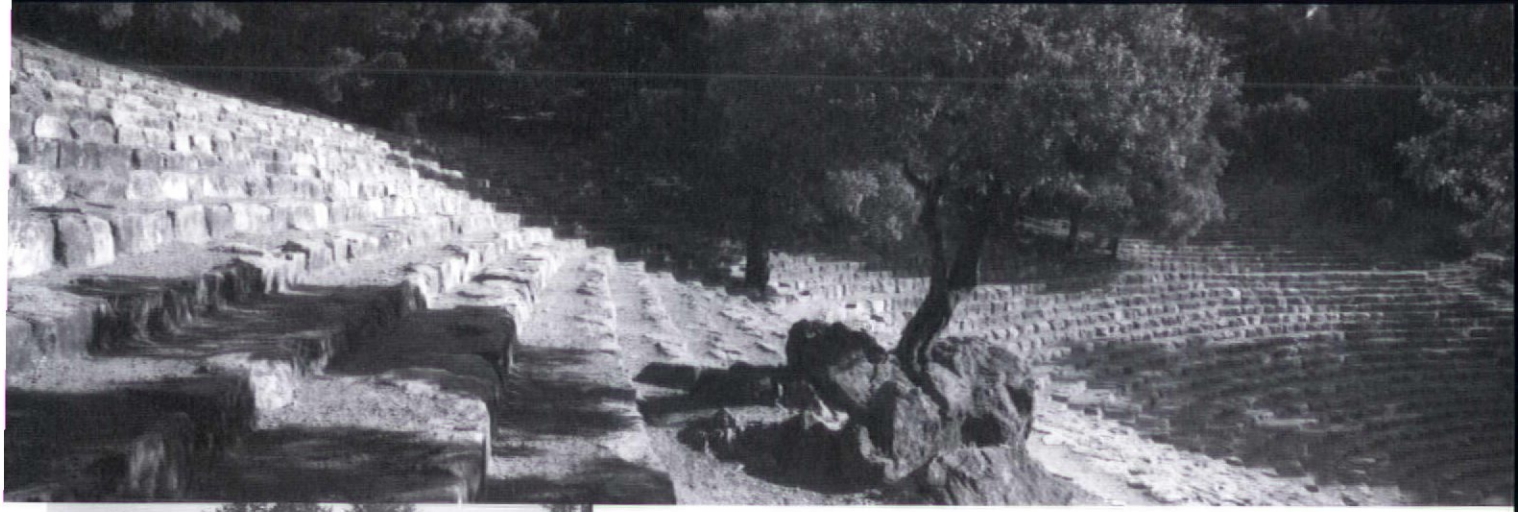
In the early 1900s, hiking at Mt. Tamalpais was a popular Bay Area pastime, fueled by a national conservation movement and magazine articles praising the virtues of nature and healthy outdoor activities as an escape from city congestion. Three hikers discovered the exceptional acoustics of a bowl-shaped Mount Tam site in 1912. They immediately began planning an event that would include a hike to the site, a picnic and an open-air drama.

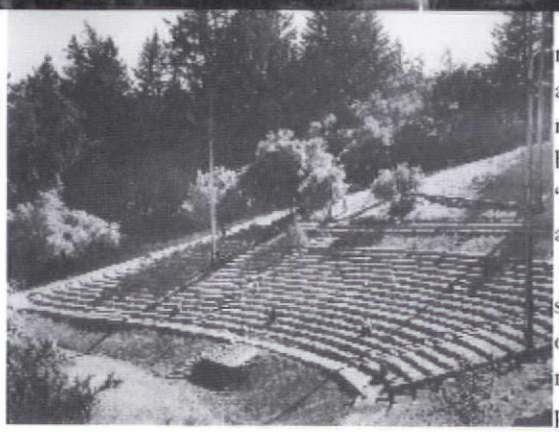
On May 13, 1913, 1,200 people hiked either the eight miles from Mill Valley or the one mile from the railroad stop to see the first mountain play, *Abraham and Isaac*. This first performance was deemed a success and the Mountain Play Association was formed to present a play annually. Over the next 12 years, brush clearings were the only improvements made to the site, even though the steep slopes of both stage and auditorium created challenging operating conditions.

In 1925, shortly after Mt. Helix was dedicated, Emerson Knight began designing the Mt. Tamalpais Mountain Theater. Serious construction on the scheme did not begin until 1934 when the site was donated to the state and the Civilian Conservation Corps began to build the stone seats.

Knight was inspired by Greek theaters' implied association with democracy, their simplicity and their classic symmetry. At the same time, his focus on maintaining the existing character and structure of the site's contorted topography is clear. His scheme stretches the traditional semicircular Greek theater horizontally across the site while maintaining the focus on a flat, essentially symmetrical, stage. Because two steep ravines had criss-crossed the stage area, this move required considerable fill and stone retaining walls — a clear indication of Knight's willingness to manipulate the site to meet his design intentions.

But the schematic proposal also plays homage to the natural structure of the site. The auditorium seating, rather than continuing the ovoid shape of the stage, tapers into the existing topography to avoid the end wall that would have been necessary to complete the symmetry. The plan also has subtle warps and bends that reflect the locations of the steeper slopes and the drainage ravines. And





the gracefully curving rows are interrupted by native oaks and protruding rock formations.

Recent field measurements and air photos of the as-built theater make it apparent that the distortions of the Greek theater plan became much more pronounced through field adjustments during construction. Although the final organization of forty rows of seats, three horizontal aisles and four curved vertical aisles remains similar to the schematic plan, the seat widths, seat heights and vertical slopes vary in profile to accomodate the topography. The upper tiers of seats, instead of following a consistent elevation, move up and down with the natural slope, creating undulations in the horizontal bands of stone to demarcate the location of the old ravine and drainage swales. The subtle warping towards the site's filled drainage ravine became an axis that reorients the seating around the old ravine and creates an assymetrical stage.

Under the direction of Knight and CCC landscape architect Paul Holloman the seating was constructed over a four year period. Workers carefully located 600- to 2,000-pound local stones that had two weathered surfaces at right angles to one another to provide flat seats and vertical risers for the terraced seats. Knight was adament that stones should not be cut so that a character of "age-old ruggedness" was not compromised. More than half of their stones' bulk is below grade to avoid using cement binder giving "the feeling that the structure will remain secure and intact for centuries."

Today visitors approach this extraordinary structure from the top, looking down onto rows of irregularly sized stone that blend with the surrounding landscape and do not distract from the powerful distant views. As one moves down to take a seat, the sweeping, curved geometry of the terraced seats provides a sharp contrast to the rugged natural terrain – a contrast punctuated by the protrusion of angular rock outcrops and picturesque native oaks into the graceful arcs. As one descends to the stage and looks back to the auditorium, the view is of an imposing stack of horizontal stone bands that gracefully dip downward to reveal the location of the old drainage ravine.

This choreography highlights both the strength of the concept's idealized geometry and the ability of the landscape to mold this geometry into an experience that heightens our understanding of the site. The reflective viewer leaves with the confidence that human culture and nature can not only coexist but also enhance each other.

Plan and section of Syndey B. Cushing Amphitheater, as built. Courtesy Linda Jewell. Top: Syndey B. Cushing Amphitheater, 1994. Courtesy Anton Grassl. Left: Mt. Tamalpais theater under construction. Courtesy Special Collections, College of Environmental Design Library, University of California, Berkeley.

References

Sean Carroll, "Mt. Helix Nature Theatre – A Gift to Us All," in *Lookout Avenue* (La Mesa Historical Society Newsletter, May 1990).

Sheldon Cheney, *The Open Air Theater* (New York: M. Kennerly, 1918).

Lincoln Fairley, *Mount Tamalpais: A History* (San Francisco: Scottwall Associates, 1987).

Emerson Knight, "Mountain Theater on Mt. Tamalpais," in *Landscape Architecture Quarterly* (October 1959): 5-9.

Emerson Knight, "Outdoor Theaters and Stadiums in the West," *The Architect and Engineer* (August 1924): 53-91.

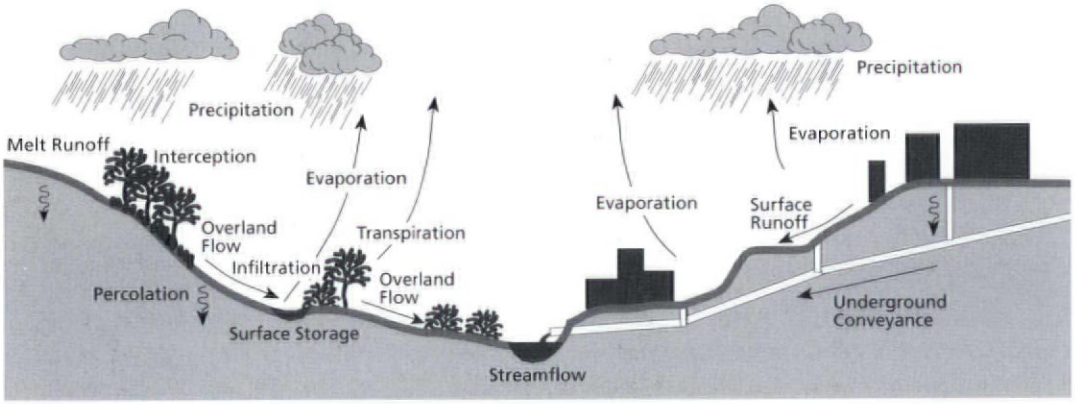
Emerson Knight, "The Mount Helix Nature Theater," in *A Book of Memories for the Ages* (Dedication Publication, 1925).

Richard Requa, "My Greatest Opportunity," in *A Book of Memories for the Ages* (Dedication Publication, 1925).

Frank Waugh, *Outdoor Theaters* (Boston: R.G. Badger, 1917).

Where Waterworks Meet Nature

Cynthia L. Girling



Right: Diagram of natural versus urban hydrology. Courtesy Kerry KenCairn. Opposite page: Diagram of water purification process in Shop Creek, Denver, Colo. Designer: Wenk Associates. Courtesy Kerry KenCairn.

Cities nationwide are recognizing the valuable ecological role riparian corridors, wetlands and other elements of natural surface water systems play in reducing, slowing, filtering and temporarily storing surface runoff.

This expanded concept of the value of natural systems in urban areas has also broadened approaches to open space planning. In the past, parks and recreation planners were concerned exclusively with providing green space and facilities for public recreation. Now, because of increased concern for the quality and health of the urban environment, planners are taking a broader view — an ecosystem perspective. Open space is being required to meet the needs of increasingly diverse populations while serving clearly defined environmental functions, such as controlling floods, enhancing water quality and preserving wildlife habitat.

Recent trends in stormwater management provide a clear example. In the past, flood control and stormwater removal have been regarded as autonomous systems, hidden in underground pipes and physically separated from public spaces. Conventional systems involve vast networks of underground sewers that feed into open channels and, eventually, into natural waterways.

Building and maintaining these systems is costly, yet they often fail to control runoff under extreme flood conditions. Moreover, it is now understood that urban runoff is a major contributor to water pollution — carrying contaminants like oil from vehicles, heavy metals, toxic chemicals used in daily life, pesticides, herbicides and fertilizers to natural waterways — and that it should be cleaned before being dumped into rivers, lakes or oceans.

Streams and wetlands, always valued for their visual, educational and recreational values, are now recognized for the vital role they play in storm water management. In natural surface hydrology, forested uplands hold water close to where it falls, reducing the quantity of runoff, while riparian corridors filter runoff and stabilize streambanks. Wetlands are large storage basins and help filter out silt and break down some pollutants.

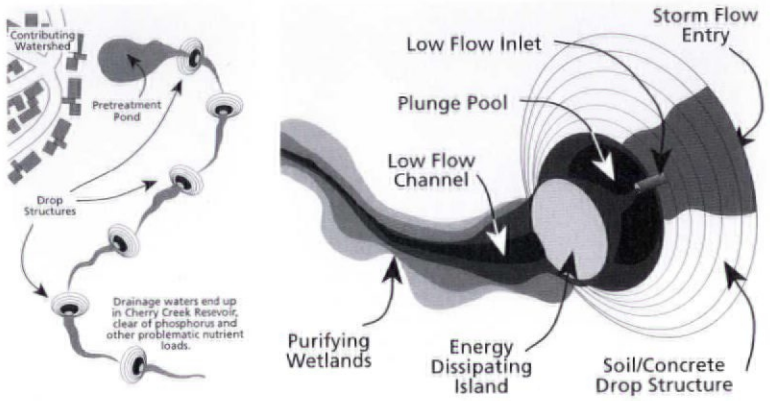
Bellevue's Open Drainage System

Bellevue, a suburb of Seattle, is an exemple of how cities can reclaim their natural systems by coordinating open space and surface drainage planning. In just over forty years, it has grown from a small settlement of 6,000 people in a hilly, forested landscape into Seattle's predominant edge city, with a population of more than 100,000 and businesses that employ more than 80,000.

In the mid-1970s, at the insistence of citizen activists, planners in Bellevue made some landmark decisions that caused it to have dramatically different settlement patterns and landscape character than most suburban cities. One concern was that Bellevue's rapid suburbanization was stressing the area's remnant natural systems. Backed by a University of Washington study that predicted the destruction of the Kelsey Creek fishery, a group of residents (organized as the Citizens Advisory Committee on Stream Resources) asked the city to preserve riparian areas and prevent further degradation of water resources. At the same time, many of the newly annexed areas of the city were experiencing frequent flooding, and residents there were calling for action, too.

The city decided to augment natural drainage systems to handle urban stormwater, rather than to build extensive new underground piped systems. City engineers in the newly established Stormwater Utility Department estimated that a surface drainage system would cost thirty percent less than a conventional underground system, despite land acquisition costs that were four times as great.

By the 1980s Bellevue had what was considered a ground-breaking storm drainage system, initially designed by a Seattle consulting team, Kramer, Chin and Mayo – Water Resources Engineers and Yoder, Trotter and Orlob and Associates. The system was characterized by a fine structure of naturalized local waterways – vegetated swales, creeks and streams – periodically interrupted by



natural ponds and wetlands or constructed dams and detention basins. Within eleven drainage basins there are 740 acres of wetlands, fifty miles of open streams, three small lakes and numerous ponds. Engineered interventions include small dams or hand-operated weirs at the heads of flood control ponds. Several major flood control sites are monitored and controlled by computer.

The system was designed to take advantage of the flood control, water quality and wildlife habitat values of riparian corridors and wetlands. At first, the primary mandate of the stormwater agency was to protect the community from floods. But in 1987, after Congress reauthorized and amended the Clean Water Act, requiring large communities to clean urban runoff before releasing it into natural waterways, Bellevue's engineers began to consider water quality as a serious mandate. The city's 1994 storm drainage plan reflects those concerns by setting goals to meet state clean water standards, upgrade fisheries, maintain a natural stormwater system capable of handling a 100-year flood, acquire and rehabilitate wetlands, preserve habitat for upland species and increase the use of native plants citywide.

Bellevue's Utilities Department and its Parks and Community Services Department plan and manage the waterways. These agencies work with the same open spaces but use them in different ways. The Utilities Department[1] has primary responsibility over water resources, has a budget for land acquisition and owns extensive natural or semi-natural lands along waterways.

The parks department's mandate is to develop a system of open spaces with a strong, though not exclusive, orientation to recreation and education. Its goal is to acquire ten percent of the city's area for public open space, from urban parks and plazas to recreational parks and playgrounds to sensitive natural areas with interpretive trails and limited human access. A second objective is to connect these spaces in a greenbelt, integrating recreation, education and alternative transportation.

Many of the city's natural open spaces are elements of the storm water system. Each department owns certain properties, and to maintain clarity about their relationships, especially with regard to landscape management, the departments make formal agreements. Typically, issues related to hydrology (such as water quality, the quantity and direction of water flow, and streambank erosion and siltation) are the purview of the Utilities Department. Although the Utilities Department undertakes revegetation projects and monitors habitat conditions, landscape management is typically passed to the parks department, which plans, designs and operates all recreation facilities and trails.

Expressing an Open Drainage System

Lake Hills Greenbelt Park best exemplifies the multiuse aspect of many of Bellevue's public open spaces. This 150-acre park, much of it bog or wetland, lies within the 100-year flood plain of Kelsey Creek. The site, traditionally farmed by Asian immigrants, continues to be primarily agricultural in character while also serving as a crucial link in the trail system, a wildlife habitat area and a primary cleaning and storage component of the storm water system.

At the northern extreme is Larsen Lake, a small body of open water surrounded by wetlands. The south shore of Larsen Lake has a large blueberry farm, and annual crops are planted on lands extending to the south. The steady stream of walkers and joggers on the paths through the wetlands and along the lake can see a landscape teeming with waterfowl, hawks, songbirds and the occasional stalking heron. On the ecotone between upland residential areas and the greenbelt there is a ranger station whose employees are primarily engaged in environmental education. Adjacent to that is the city's demonstration organic garden. At the southern extreme is

Left to right:
Street trees, wetland and schoolyard at Larsen Lake; Larsen Lake area; trail passing through a blueberry farm; downtown Park; Lakemont Park, with a path to residential area; Lakemont Park, with overview of sand filtration beds and detention ponds. Far left photo by Kenneth Helphand, other photos by Cynthia L. Girling.

Phantom Lake, site of a small park and a dock for launching nonmotorized craft.

Together these facilities form a hub of environmental education and appreciation for the community. In times of flooding the whole area transforms into a lake that helps protect the surrounding homes and the downstream community from damage.

Designed landscapes have been less successful at achieving a seamless merger between the working hydrological system and recreational areas. Lakemont Park is proudly cited as the most collaborative effort to date between the utilities and parks departments. This sixteen-acre community park lies in a steep valley between two streams and is surrounded by new single-family housing. Roughly ten acres between the two streams has been developed. A playground, tennis courts, a baseball field, picnic areas and trails encircle two large storm water facilities, a sand filtration bed and a detention basin.

While the recreational facilities have the simple, clean design qualities of many of Bellevue's parks, the drainage facilities have the clumsy, inelegant qualities of a purely functional response. The missed opportunity was to create an attractive, evocative feature that celebrates the cleansing and storage of water. Instead, when children began to explore the sand filter (unattractive to begin with) the Utilities Department erected a chain-link fence around it. Now, the heart of this park is an inaccessible eyesore.

In an article in *Orion* magazine's special issue, "Nature by Design," Jory Johnson and Douglas Johnston explained, "If ecological designers intend to more than mitigate or reverse environmental degradation (a worthy enough goal), if they want to transform public values about their landscapes, then they must strive to increase our awareness of the interdependence of human and natural ecology..."[2] In Bellevue, the raw material of check dams, weirs, detention sites and filtration beds all exist. They are the noticeable human interventions upon a primarily natural system and they await more creative and expressive interpretations of the junction of landscape, engineering and art.

Notes

1. Until 1994, the Storm and Surface Water Utility was a separate department with a dedicated fee structure. In 1994, all utility departments in Bellevue amalgamated.
2. Jory Johnson and Douglas Johnston, "Nature Constructed: Ecological Design and Public Understanding," *Orion* 12:1 (Winter, 1993).

General References

Bellevue Drainage Master Plan Summary Report (Bellevue, Washington: City of Bellevue, Utilities Department, January, 1976).
Comprehensive Drainage Plan (Bellevue, Washington: City of Bellevue, Utilities Department, 1994).

Joyce Earley Lyndon

Reading, fifty years after the end of World War Two, the articles in *Places* 9.3 in which planners and architects are exploring their roles in dealing with the crises ahead – social, economic, environmental – recalls the architects in Britain during and after the war, working outside their traditional role; their versatility; their capacity for sustained hard work under pressure; their immense contribution to reconstruction.

The Depression of the Thirties had shaken Britain. Many people had been unemployed. Farmers, using sustainable practices learned from experience and tradition, could not compete with cheap, imported food; some of the best land was disappearing under motorways and the factories of new, footloose, light industries. The British in 1939 were resolutely pacifist.

September 1939. Hitler's troops, having taken Czechoslovakia, invaded Poland, bombed Warsaw. Britain declared war. Men and women joined the armed forces. Factories changed to war production. Complexes to make war material, with houses for workers, were being built by contractors in remote countryside.

Everyone did a full-time job plus volunteer work. Everyone had a ration book for food and clothing, a gas mask and an identity card. (Ships bringing essential supplies were being sunk by the enemy.)

The country was divided into 12 regions, with offices of the central government in the regional capitals, and a commissioner with executive powers, so that if London's Whitehall were bombed out, the planning of food, labor, fuel, power, transport, supplies, trade and information would continue. Regional officers exchanged information, went regularly to London to meet the headquarters staff and colleagues from other regions. They were also in close contact with local administrations in their cities and counties. A basic principle of sustainability was being observed: "Everything connected."

May 1940. Bombing raids began on London for fifty seven consecutive nights. When the rubble was cleared, there were acres of open space patterned by street lines in the City of London, the East End and the Docklands. Then provincial cities were bombed, the rail networks, the cathedral cities and the western ports. When the raids stopped in June 1941, 3.5 million houses had been damaged or destroyed.

The British government realized that after the war Britain would have to rebuild its economy in radically different conditions. People's lives would be very different, city governments preparing development plans would need regular information on national policy; planning of cities and counties would have to be coordinated.

Under the 1932 Town Planning Act, covering "areas ripe for development" adjacent to built-up areas only, planning had been a minor activity of local government, generally in the departments of the city engineer or surveyor. Now a planning system covering all land was needed.

September 1942. A new planning ministry was set up in London with offices in the 12 regional capitals.

The number of experienced planners needed to meet the sudden demand was inadequate, but architects were available. William Holford, a South African architect who had been leading technical teams on factory construction, became Chief Technical Planner at the Ministry in Whitehall, with a multi-disciplinary staff. In the Bristol Region, probably typical, an experienced surveyor – planner supervised a staff of five, with three architects. In the Bristol City Engineer's office, ordinance survey maps (the standard map to be used for planning across the country) were being updated by a team of seven – a retired O.S. surveyor, a mining engineer, two local architects, an artist, a planning student and a bomb disposal officer who, when called to a "job," shook hands, half-joking, all round and was cheered on his return.

1944. Beginning in June, Hitler's Flying Bombs harassed southeast England; beginning in September, V2 rockets attacked, the whining scream of their travel arriving after the explosion. Thousands were killed and many more buildings were

destroyed before the Allies overran the launching sites at the end of March, 1945.

May 1945 — victory in Europe. Britons were thin, shabby, grateful and one nation. Working together, they had defended and sustained the country.

1946. Town and country planners crowded into a hall in London to hear Lewis Mumford. Afterwards, outside, a knot of people formed around a man conspicuous in army uniform — Percy Johnson-Marshall, just returned from Burma. He took out of his pocket a book, Lilienthal's *TVA — Democracy on the March*[1] "You should buy it", he said, "Good value. Ninepence."

It was a revelation! Few planners in Britain then knew that a democratic form of regional planning had been operating in Tennessee since 1933; (or that a progressive social reform movement in the U.S. early in this century had broadened the concept of conservation to include economics, political science, public administration, art and public health, as well as natural resources). In poverty-stricken, rural Tennessee, regional planning was restoring prosperity. In Britain, ironically, the government had just closed all the regional offices.

"The London County Council (Architects Department)...attained its postwar excellence largely through the brilliant early leadership of Robert Matthew and Leslie Martin and a young corps of inquiring, eager architects... (no private work of any kind could be done.)"[2]

Thanks to the LCC's enlightened hiring policies, the corps of eager architects designing public housing included many women. These women had not been tenants in public housing or acquainted with their clients, but all were still living in tight, makeshift spaces, had fed their families with the limited choice and amounts of food available, had repeatedly mended and patched their old clothes, had queued with sore feet for an hour at the local shop for luxuries just delivered (oranges or bananas, one item per ration book) and had experienced disturbed sleep and power blackouts. They knew how to help housewives and mothers with the design of their houses and so ensure stable families.

At County Hall, land-use planners and architects worked on the same floor, met in the cafeteria, walked together to buses and tube stations. The women talked about problems — what factors determined the position of the kitchen window, besides a view of the children's play area? Where to locate the play areas in relation to bedroom windows with night-shift sleepers? Should front doors allow eye contact from the doorstep along and across the street? And so on. There was only one social scientist; she was gentle, knowledgeable and helpful.

The Parks Department, whose staff today would explain sustainability in terms of natural principles, was in another building and did not use ecological words in public. It was clear, even then, that while human nature remained much as it had always been, following nature's way of restoring equilibrium after changes, by using mechanisims evolved over time, was no longer adequate. The speed and violence of changes and the new technologies needed more effective procedures to establish different equilibriums — to begin with, better organized and speedier cooperation between governments, as well as between specialists and among the public.

In 1959, I travelled across the United States. In Tennessee, a Soil Conservation Officer was happy to explain the agency's methods and demonstrate successes. The farmers I spoke to were content. TVA officials talked enthusiastically about recreation facilities on the reservoirs. But it seemed that the spirit Lilienthal had written about, of communities cooperating at the grassroots, was not apparent. Perhaps communities need crisis conditions to motivate them to work together. In that case, there are crises like hurricanes ahead.

Places *encourages comments from its readers on articles we publish. Please send letters to us at 110 Higgins Hall, Pratt Institute School of Architecture, 200 Willoughby Avenue, Brooklyn, NY 11205.*

Notes

1. David E. Lilienthal, TVA — *Democracy on the March* (New York: Penguin, 1944).
2. G.E. Kidder Smith, *The New Architecture of Europe* (New York: Pelican, 1962).

Streets: Old Paradigm, New Investment

Two years ago, when we decided to characterize *Places* as "A Forum of Environmental Design," as opposed to simply a journal, we committed to sponsoring a range of activities – research, workshops and public discussions – that could engage our readers in new ways and provide content for *Places* and other publications. We are now pleased to report on the first events we've organized.

During the past year, *Places*' editors convened two day-long working sessions at which designers, scholars and public officials discussed what design issues and resistances are emerging in making good, even great, streets a part of every community. About 30 people attended one meeting at the University of California, Berkeley, last November. About about 40 attended one at Pratt Institute in New York, this past April.

The presenters described how streets, whose role as urban space has been devalued by single-minded design standards, a fear of crime and the information superhighway, are once again receiving careful design attention. "Since the turn of the century, street sections have been drawn by engineers. But now streets are being designed for many uses," remarked urban designer Ken Greenberg, the keynote commentator in New York. "All dimensions in the right of way are being tested against each other to make the street a complex social space."

Presentations included case studies of street design projects, especially those that approach streets as spaces that must be designed for multiple activities. Mike Smiley and John Kriken, for example, described how San Francisco's Embarcadero is being reborn as a transit, traffic and recreational space – as well as a transition to the waterfront – now that the Embarcadero Freeway has been torn down.

Other presenters described new street standards and hierarchies, either proposed or adopted in codes or guidelines. Greenberg presented alternative street design standards he helped the province of Ontario, Canada, prepare. The standards include a wider range of street types than is typical and are related to the form of buildings along them.

Yodan Rofé presented boulevard design guidelines he developed with Allan Jacobs and Elizabeth S. MacDonald. They studied traffic and pedestrian patterns on existing boulevards and tested alternative designs with transportation officials in several cities. They concluded that boulevards can carry high traffic volumes yet still be vibrant urban places if local and through movement are separated properly.

The symposia also examined implementation strategies. Terry Bray and Victor Rhodes of Portland's transportation department explained how they won support from citizens and other public agencies for very narrow street types. Nathalie Beauvais of Boston's Redevelopment Authority explained how the "Boston Boulevards" project, an effort to redesign a web of arterials into a coherent network of streets that balance auto, pedestrian and transit use, grew out of reconstruction projects already scheduled by the city's public works department and the Metropolitan Boston Transportation Authority.

This project will result in the accumulation, presentation and publication (in a future issue of *Places* and, we hope, a book) of viable case studies for street design in a range of contexts – urban, older suburbs and newer suburbs. In the long run, we hope that the project will inspire an ongoing conversation about street design through follow-up articles, future teaching and design projects and, perhaps, subsequent forums of a similar nature.

Places' streets project is being assisted with funding from the Graham Foundation.

The Berkeley symposium was co-sponsored by the Urban Places Study Group, and assisted with funding from the DeMars Fund at the University of California, Berkeley, College of Environmental Design.

The Pratt symposium was co-sponsored by Pratt's urban design department, and assisted with funding from several firms: Thompson and Wood; Duany/Plater-Zyberk; and Buckhurst Fish and Jacquemart.

Peter Bosselmann is a professor of urban design at the University of California, Berkeley, and director of the Environmental Simulation Laboratory, where he has worked on projects in San Francisco, New York and Toronto. He is author of *Representation of Places—Reality and Realism in City Design* and has contributed to many books on urban design research, including the *Handbook of Residential Street Design*.

James Brown and Kim Story are architects and urban designers in Toronto. The research, teaching and built projects of their firm, Brown and Storey Architects, have been centered on nature and the design of public space and its connection to infrastructure, architecture and the environment.

Nancy Routledge Connery writes and consults on infrastructure finance, performance and design issues in the U.S. and developing countries. She directed a major study of the nation's public investment needs for the U.S. Congress in the late 1980s.

Cynthia L. Girling is associate professor of landscape architecture at the University of Oregon. She has lectured and published on the topics of neotraditional suburbs and retrofitting open space systems into the fabric of established suburbs. She has authored, with Kenneth Helphand, *Yard Street Park: The Design of Suburban Open Space*.

Heather Hood is an assistant to the editor at *Places* and a graduate student in architecture and city planning at the University of California, Berkeley, where she is helping to organize city-building workshops with Oakland Tech High School. She comes from Philadelphia, where she served on a committee helping to plan the future of the Waterworks.

Ron Jensen is director of public works for Phoenix. He is serving as a loaned executive to the president of Arizona State University, where he coordinates research activities of city–university teams. He was national president of the American Public Works Association in 1990-91, and is currently a member of the National Research Council's Board on Infrastructure and the Constructed Environment.

Linda Jewell is a professor of landscape architecture at the University of California, Berkeley, and is preparing an exhibition and book on outdoor theater design. She was construction editor of *Landscape Architecture* for ten years and is a fellow of the American Society of Landscape Architects.

Phil Jones is executive director of the Phoenix Arts Commission.

Reed Kroloff is an associate editor at *Architecture*. He was the architecture critic for the *Arizona Republic* and has written for *Center* and *Metropolis*. He has taught and practiced architecture in Arizona and Texas, and was educated at Yale and the University of Texas, Austin.

Edward Lebow manages public art projects for the Phoenix Arts Commission.

Joyce Earley Lyndon is a member of the Royal Town Planning Institute and a Fellow of the Landscape Institute in the United Kingdom. She spent 20 years in British planning departments and lives on the Rhine in south Germany.

Elizabeth K. Meyer chairs the landscape architecture department at the University of Virginia. She recently applied the perspectives gleaned from the Mississippi River trip in a cross-disciplinary graduate urbanism studio that studied Palmyra, a courthouse town located on Virginia's Rivanna River.

Frederick Steiner is director of the School of Planning and Landscape Architecture at Arizona State University; he also serves on the A.S.U. Public Arts Commission. He has worked for numerous government agencies on diverse environmental topics and currently is leading a team exploring the future of a 110 square-mile "undeveloped" portion of Phoenix.

Gary L. Strang is principal of the firm GLS Architecture/Landscape Architecture in San Francisco. He has designed exhibitions in New York, San Francisco and Berkeley that address issues of infrastructure. He has taught architecture at the University of California, Berkeley, and landscape architecture at the University of California, Davis.

Robert Wright is a professor at the University of Toronto's School of Architecture and Landscape Architecture and Head of Special Projects at the Centre for Landscape Research. He has been a technical advisor to the Seaton Interim Planning Team and was author of a study on the Seaton process.

Places: A Forum of Environmental Design is published three times a year by the Design History Foundation, a nonprofit, charitable organization that sponsors a range of educational, publishing and research activities. The Foundation's mission is to establish forums in which designers, public officials, scholars and citizens can discuss issues vital to environmental design, with particular emphasis on public spaces in the service of the shared ideals of society.

Places and the Design History Foundation depend on support from foundations, firms and individuals to continue these activities. To support our mission and to learn the benefits of joining us as a sponsor, patron, supporter or friend, please contact our Brooklyn office: (718) 399-6090.

Editorial Offices
Center for Environmental Design Research
390 Wurster Hall
University of California
Berkeley, CA 94720
(510) 642-1495

110 Higgins Hall
School of Architecture
Pratt Institute
200 Willoughby Ave.
Brooklyn, NY 11205
(718) 399-6090
placepratt@aol.com

Advertising
James F. Fulton, Publisher
Places
110 Higgins Hall
School of Architecture
Pratt Institute
200 Willoughby Ave.
Brooklyn, NY 11205
(718) 399-6090
placepratt@aol.com

Submission Information
Places encourages submissions from its readers. Please submit five copies of each manuscript, along with illustrations, to our editorial office. Color transparencies, black-and-white prints and line drawings are acceptable. Copies of our current Call for Submissions and editorial guidelines are available from our editorial offices upon request.

Articles published in *Places* have been reviewed by at least four people, including consulting and contributing editors and other scholars and/or professionals with specific background and expertise in the subject matter. All final editorial decisions are made by the editor.

Places is available on microform:
University Microfilms
300 N. Zeeb Road
Ann Arbor, MI 48106
(313) 761-4700

Places is indexed in the *Architectural Periodical Index*, the *Avery Index to Architectural Periodicals* and the *Design and Applied Arts Index*.

Subscription Information
Subscription orders, single copy orders, address changes and mailing list correspondence should be addressed to:

Places
P.O. Box 1897
Lawrence, KS 66044-8897
(913) 843-1221
(913) 843-1274 (FAX)

Annual subscription for individuals: $30 U.S., $36 Canada, $42 elsewhere. Add $15 for airmail (outside U.S.).

Annual subscription for institutions: $50 U.S., $60 Canada, $70 elsewhere. Add $15 for airmail (outside U.S.).

Single copies, $10. Add $3 per copy for postage and handling; add $5 per copy for airmail (outside U.S.)

All payments must be in U.S. funds.

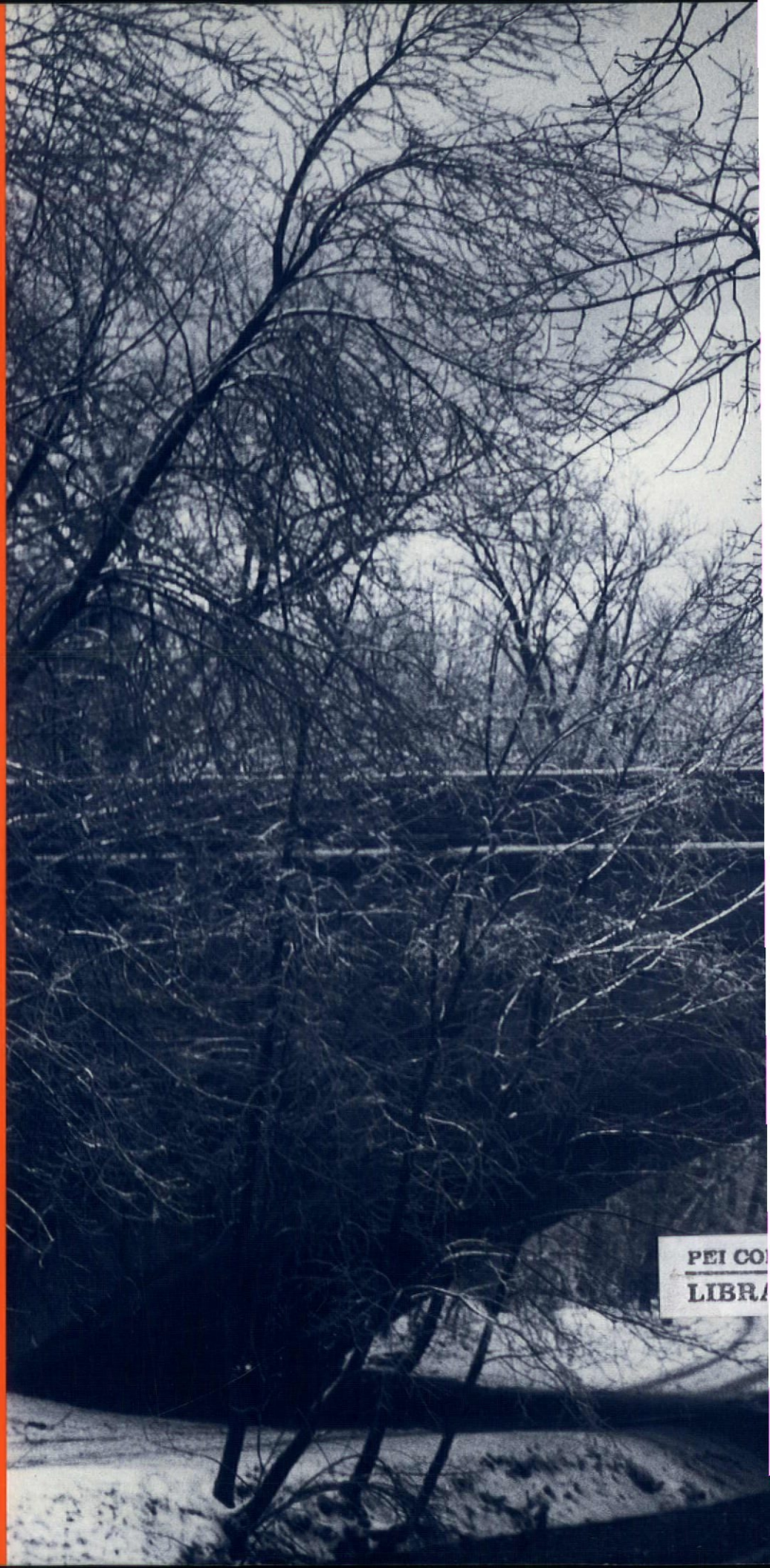
Missing Issues
Claims must be made immediately upon receipt of next published issue. Call (913) 843-1221.

Postmaster
Send address changes to:
Places
P.O. Box 1897
Lawrence, KS 66044-8897

A Forum of Environmental Design

PLACES

Infrastructure as Landscape
Landscape as Infrastructure



The Design History Foundation
Pratt Institute
University of California, Berkeley

ISSN 0731-0455 Made in U.S.A.