The Formation of a Mississippi River Urban
Landscape
Morphology
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 rocks 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.

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 Nolichucky Creek valley, which runs parallel to the river and between golden-brown hills that rise up 400 feet. The southern hills are wooded; the northern ones are larger and densely forested. The streams that water the farm lands are relatively small, and the only sizable reservoir is near Missouri. The limestone of the area is well suited for stone walling and other building materials.

Louisiana's grid of 300- by 300-foot blocks extends west from a river esplanade toward another topographically varied area. At that time, the grid was defined by a well-planned city, which was laid out on the Nolichucky Creek valley. The valley defines the city's western boundary, where its historic Stoops-Hall house is located at a gate-way to the town. Stoops-Hall is a two-story house with a wrap-around porch and many windows. The house is surrounded by a low stone wall, which is typical of the area.

The town's land-scape is organized se-


tionally and topographically, not in an urban setting. The esplanade, park, and cemetery center on the river and lend, each landscape occurring in a different area, and a different role in the town's structure and social life.

The esplanade, a narrow strip of asphalt, is defined by a long, low wall that lifts the surface above the river. A narrow opening marks the water gate to the city. The esplanade's west edge is lined with a few trees. Underneath their shade and between their thick trunks, a row of picnic tables faces the river. This narrow, unpaved strip of land is a good place to stretch out a picnic blanket, sit on the grass, and enjoy the view. A path leads down to the water's edge, where a low stone wall separates the town from the creek.

Henderson Park is a river overlook, from a play-ground and parking lot, one overlooks the river, and white cottonwood trees dot the landscape. The park is well maintained, and the view is quite scenic. The river flows through the valley, and the hills surrounding it are covered with trees. The town's highest point is the river's edge, where a low stone wall separates the town from the river.

Louisiana's landscape deviations from its grid are the result of hydrological processes and glacial deposition. These deviations trace the Nolichucky Creek tributaries through the town, materialising that system in specific urban projects. Stone wall revetments assure channelised, sandy creeks and black, low-lying areas, which one expects, gardens and basements. The town streets cross over metal bridges, not curving, but conforming to the river's flow. This overlay of a gener-alised grid upon a particular geography is marked, not concealed. The terrain transformed the grid into a series of seemingly dis-reet, but integrally related, urban landscape projects. They create Louisiana's two orders, grid and terrain, into a unique urban form.
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 site, 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 plans 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, the 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 panoramas that unfold 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 floodplain; 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.
Prospect. “a place that affords an extended view... a looking forward anticipation; foresight...to seek, to explore, to search

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.1

Viewed from the river, the riverbank establishes a town’s base or ground plane and its threshold. The character of this threshold 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.2

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. 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 destruc-

tive, ordering system of the American midwest town and that the quintessential landscape of the nineteenth century is the central town square.
Quincy’s city grid aligns with the river’s edge and the Land Ordinances’ section lines. Twin 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 gridiron field melts 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, alternately 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 role 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.

Conmemoration 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, prominently provide prospects of the Mississippi. Curving carriage drives define the bluff, protected from the edge by a massive stone retaining wall. The drive, leak north into the woods, where it crosses gorges of horizontally bedded limestone. There, along the soft gray limestone bridge spanning the gorge below, the spacious 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, inluding the cemetery with a unique landscape and character. Circulation and drainage are interwoven in a concrete and grass warp and woof that threads through terraced plots. The drives have central seals that collect water on the surface, and intermittently placed drains divert water directly downhill. The sloping walks present water from drainage, the paths and paves a muddling 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 105-foot-wide boulevard. The houses are set five feet above the street and forty feet back from the sidewalk. This separation from the public way repeats the town’s relationship to the river—proleptic, yet detailed, visually connected, yet ventrally 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 town variation occurs in a fragment of an 1899 ornamental suburb called Lennedale. The suburb’s winding drive has little to do with topographic relief, rather, they differentiate this speculative development from its surroundings. Yet Lennedale is only a fragment, after a block or two of aimless strolling, one returns to the grid’s familiar grain and orientation.

What is remarkable about Quincy, then, is the way in which urban landscape works at two contextual scales—the river and the town. Quincy’s bluff parks and cemetery bracket the river visible in both plan and elevation. At the scale of the town black, a number of projects continue this dialogue between grid and terrain. And the town squares, residential boulevard and romantic suburban drive—resistant to the grid’s overwhelming nature, yet resistant to reject its order—construct sites, make place, calibrate distance and announce difference without subverting the whole.
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 hillsides. Each hill has its square park around which fashionable residences cluster.

The slopes of these hills are steeper than in Louisiana. The grid defies the hills in two ways by eliminating streets where the slopes are too steep and by inventing an alternative means of navigating terrain. The second strategy is found in Snake Alley, an 1894 project that transformed North 5th Street into a curving brick alley connecting San Francisco's Lombard Street, built in the 1890s. Snake Alley has been a continual source of pride in Burlington, as evident in the residential historic district surrounding the alley and repeated references to the alley in contemporary tourism brochures.

This entire road network response to the intersection of the grid and terrain is 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 continuous, to fit to emanate from the specifics of a place. Rather, what seems successful—in fact, meaningful—is the town wevidas in 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 nineteenth-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 navigated Main Street's steep slopes. 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, combines the characteristics of a typical Victorian pleasure ground with the riverine 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 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 1895 one of the Lincoln-Douglas debates took place 80 miles south of here, in Dubuque's Washington Square, around which that town was built.
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)” 

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 unstrati-
ified, 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. 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 bluffs and riverbanks 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 its 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 sheer 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 few 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 space.
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
girl-van was taking place
around the square. all the
drivers are middle-aged
women. at last, a town
square with a civic—
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 lead-
ing out of town. within the
central landfill of blocks, the
town square and a park on
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 resi-
dential districts and parks
occupy the western and
northern bluffs. the separa-
tion between the bluff and
valley seems irremovable
until one notices a fezery
at the base of fourth street.
this small, counter-balanced
elevator and pulley consists
of two cars that rise 189 ver-
tical 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
down.

throughout dubuque,
the intersection of grid and
terrain is concreted (often
literally) in public stairways.
one of the stairways is an
intimate sculptural affair.

that chronographs our
movement from terrace to
terrace, view to view.

that chronographs our
movement from terrace to
terrace, view to view.

that chronographs our
movement from terrace to
terrace, view to view.
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 retracts 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 rivers, bluffs, 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 systems, not a circumstantial factor responsible for a formal type's transformation.

**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. 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 necessary 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 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—and) not oppositions (either—or)—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
1. The definitions accompanying the text are derived from Webster’s Seventh Century Unabridged Dictionary, 2nd ed. (New York: Simon and Schuster, 1964).
2. 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.
3. The 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 streets in Quincy, Ill., to envision analogies at the scale of the urban project.
4. I am using the word “section” in two distinct ways in this essay: "section" as a device in American land planning (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.
7. Mario Gandelsonas’s analysis of Des Moines2 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 1:2 (Spring 1991).

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