Cubist Space, Volumetric Space, and Landscape Architecture

Patrick Michael Condon

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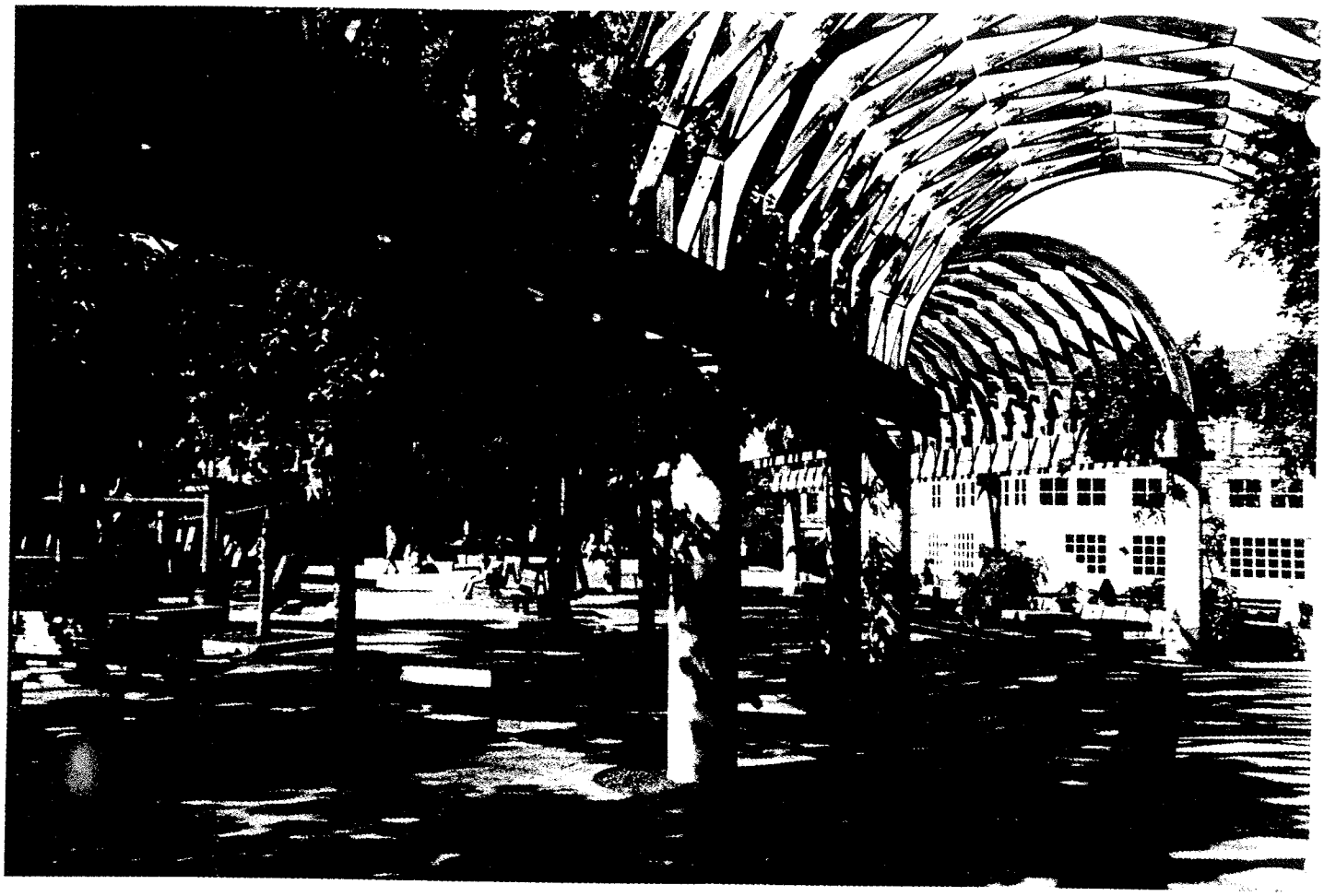
Abstract: *There are profound differences between two kinds of landscape space: the space that surrounds and is therefore subordinate to solids, and the space that is made an explicit form by solids with the solid subordinate to the intended space. The first of the two space types is herein characterized as Cubist space; the second is characterized as volumetric space. In the author's view, landscape architects make design interventions for the purpose of creating spaces for human activities. It is argued that of the two space types, volumetric space is the more logical choice for this task. It is further argued that volumetric space is neglected by contemporary landscape architects out of reflexive adherence to Modernist aesthetic principles, even though the philosophical underpinnings for those principles have been severely weakened. In conclusion it is suggested that the generative void left by discredited modernism is being filled by the emerging paradigm of environmental holism; and that from within this new paradigm the validity of volumetric space as the figural media for creating experiential "place" is strongly supported.*

This paper focuses on two distinct designed space types: modernist space, first made explicitly manifest through the time/space explorations of Cubist painters and thus characterized as *Cubist space*, and its antithesis, *volumetric space*. Cubist space, to simplify drastically, is made by placing solids in space; volumetric space is made by enclosing space with solids. Examples of Cubist spaces would include the Waterfront Park in Boston, Nicollet Mall in Minneapolis, Greenacre Park in New York City, Harlequin Plaza in Denver, and "housing projects" all over the world. Examples of volumetric space would include the Piazza San Marco in Venice, Prospect Park in Brooklyn, Paley Park in New York City, the Piazza del Campo in Sienna, and the European space type known as the medieval city.

Volumetric space in the landscape can be as large as the "outdoor room" experienced when adrift at sea—that is, the room formed by the apparent celestial sphere resting on the horizon (Goldfinger 1941). Conversely a volumetric space can be as small as a closet. Volumetric space is therefore distinct from enclosure. Enclosure is a relationship between volumetric space and human scale. When adrift at sea one experiences the least enclosure possible on this planet; when sequestered in a closet one experiences the greatest possible enclosure short of the grave.

The example of the Piazza San Marco in Venice will serve to illustrate the important characteristics of volumetric space. The Piazza San Marco is a large bounded space with few fixed elements inside. What gives it distinction is the character and proportion of the "floor," "walls," and "ceiling" of the space. The two rooms of the space, the Piazza and Piazzetta, share a continuous and level floor. Except for the Basilica facade, the walls of the space are continuous planes or, in essence, simple rectangles. Again with the exception of the Basilica, the equal height and continuous cornice line of the other buildings defines the perceived ceiling, thereby bringing the blue sky down to cap the space explicitly at a more intimate scale than is usually experienced. The much studied proportional relations between floor and wall (Sitte 1965) provide unity. The delicate filigree and solid/void contrast of the carved masonry walls provide all the richness and variety one could wish for; by imagining the space with windowless concrete walls but otherwise unaltered, it becomes evident how critical this aspect is.

As in many other volumetric spaces (the Piazza San Pietro and the Piazza Navona to name but two), the detached object is used in ways that contribute to, rather than contradict the boundaries of the space. At the Piazza San Marco, the freestanding object of the Campanile hinges the Piazzetta to the Piazza. The freestanding columns at the south end of the piazzetta define the south "wall" of the space; the columns act as "mullions" to make a huge "bay window" that opens



Waterfront Park in Boston. Structural elements serve as sculptural elements or objects in space. Photograph by Patrick Michael Condon.

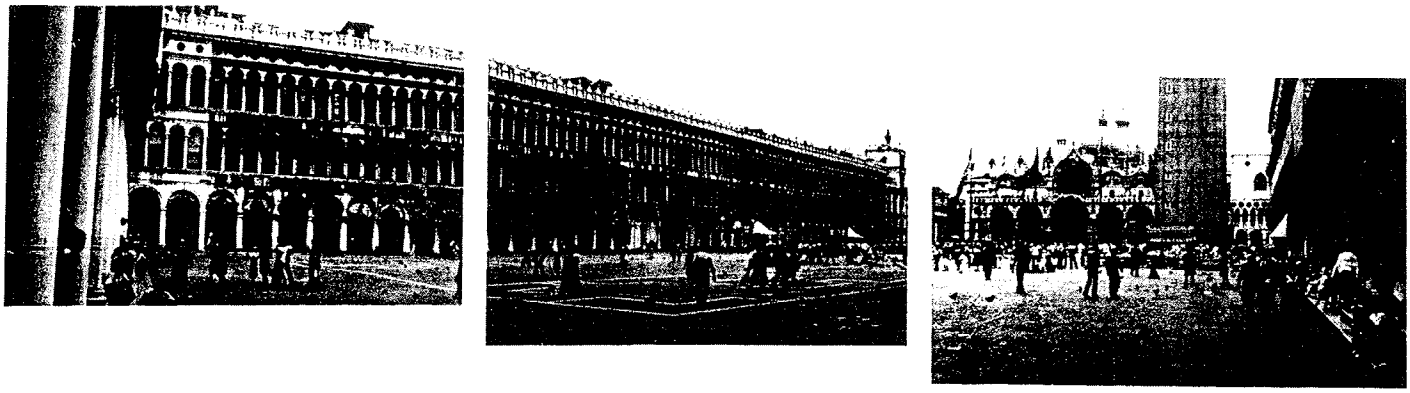


Figure 1. Ninety degree view of Piazza San Marco from the south west corner. The floor and walls of the space are explicit. Visual texture and variety are provided by the intricate filigree of bounding walls. Photo by Stacy Moriarty.

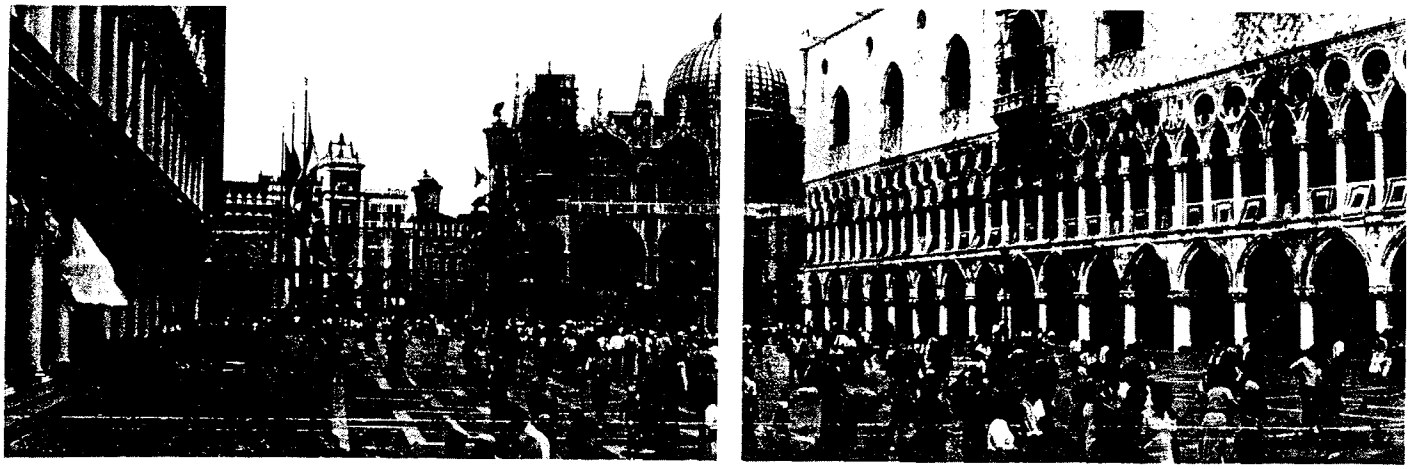


Figure 2. The piazzetta, a clearly defined yet linked "room," hinged by the campanile at left. Photo by Stacy Moriarty.

onto a "balcony" overlooking the sea. When arriving in this volumetric space from the many narrow access ways, there is an unmistakable sense that one has "arrived," in both the literal and metaphorical sense of the word. To construct a simile, having arrived at Piazza San Marco is much like the fantasy image of having "arrived" at the heart of regal society after moving through the protected layers of palatial entry, up the grand stair, and down the gilded vaulted hallway terminated by great double doors that are swept open by twin doormen to reveal, in the brilliance of ten thousand candles and the ebullience of five hundred seductive voices, the immense ballroom of one's destination. At San Marco, one wants nothing else but to linger there forever. The nature of the containment is such that no worthy egress, not even the portal of the Basilica, can tempt a person; only the "balcony" overlooking the Laguna Veneta at the far end of the Piazzetta offers sufficient enticement to draw one forward, affording a suitable place for a brief flirtation before returning to the ball.

I have chosen to compare the Piazza San Marco with Waterfront Park in Boston because both relate to their urban contexts similarly, and to water virtually identically; as space types, however, they are opposed. At the Piazza San Marco the two "rooms" of space are explicitly defined. At Waterfront Park, however, explicit enclosure is lacking; it is traded away for a highly complex spatial field activated by sculptural forms. Here the walking surface is not a level plane but it is quite animated and changes grade frequently with stairs and ramps; these changes of level make the base highly complex, a relief sculpture that prevents the participant from perceiving it as a floor. "Walls" are intentionally indistinct; existing contextural walls of waterfront structures and elevated highway are neither acknowledged nor

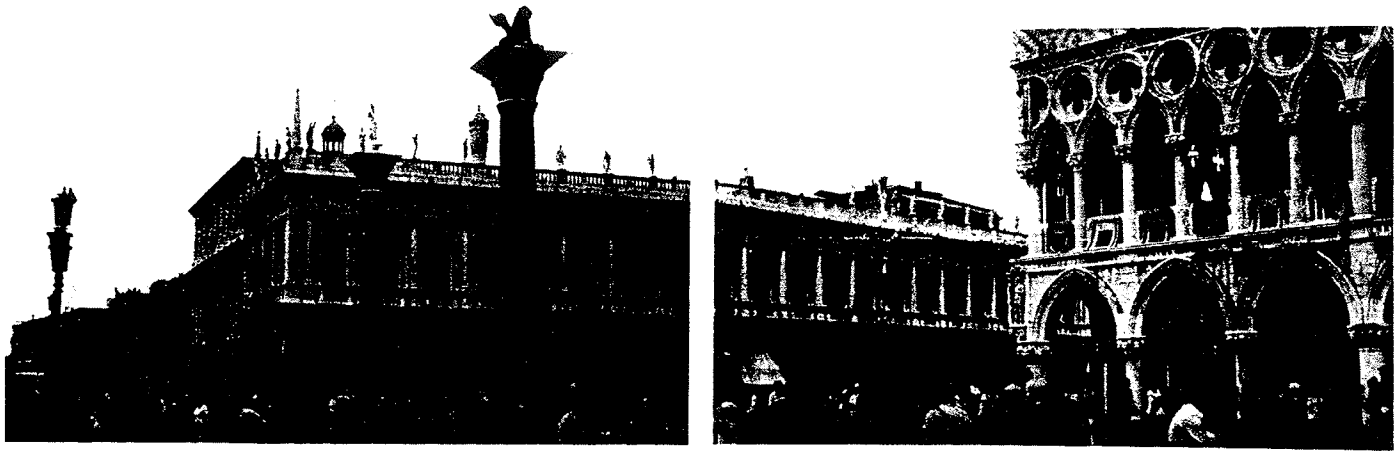


Figure 3. The junction of the piazzetta and the laguna. Columns act as "mullions" in a "window" that divides the "room" of the piazzetta from the "porch" on the laguna. Photo by Stacy Moriarty.

completely obscured, but are mitigated or counterpointed by intervening free-standing elements. Design unity derives not from the proportion of the "room" but from a complicated asymetrical balance between the park's sculptural objects; the most noticeable of these is the overscale arbor. Within this strategy, where unity is so difficult to achieve, one might expect variety to take care of itself; in large measure it does, but for insurance a relatively rich plant palette is deployed in a number of different but thematically unified ways. The themes are asymetrical balance, sculptural dynamism, natural growth patterns, and painterly concern with color.

Likewise, structural elements are individually sculpted as distinct independent objects that are expressive of a concern for purity of form and materials. Whereas at the Piazza San Marco the objects were used in ways that supported clearly defined "rooms," here, at Waterfront Park, it is fair to say that there are no "rooms" to define. Rather, the numerous objects in the space must, by their relationship one to the next, establish the quality of spatial experience. In this way the objects of the space (some of which, like the arbor, are large enough to enter, but are still fundamentally sculptural objects) are similar to the rocks intuitively arranged in a Zen garden. To invoke Gertrude Stein, at Waterfront Park "there is no there there." This does not suggest a weakness in the design itself, but rather points out the logical impossibility of creating sense of arrival without specific space definition. The "there" quality of knowing precisely when you are "in" has been sacrificed to gain a dynamic quality of experience, whereby the moving participant experiences an environmental field that dramatically changes with each step. As a consequence, each person in the park will be experiencing quite a different set of visual stimuli at any single moment. This interest in motion, spatial dynamism, and singularity of perception so evident at Waterfront Park can be seen as the hallmarks of modernist aesthetics, arguably best and certainly first popularized in Cubist painting. In this light, the term "Cubist space" has been chosen as the most adequate shorthand descriptor for the space of Waterfront Park and many other modern landscape designs.

The choice between the two types of space is not just a matter of the designer's preference; it is far more fundamental. Recent explorations in landscape design theory have productively questioned modern era foundations for landscape design ethics (Koh 1982), process (Lyle 1985a), and meaning (Howett 1987). Work that suggests the implications of such shifting theoretical foundations for actual space-shaping in landscape design is vitally needed, since the way in which space is presumed to exist is linked to the ethical, procedural, and semiological issues mentioned above; these issues are, in turn, linked to the political, scientific, and philosophical notions that underlie culture. Given the dramatic erosion of formerly secure precepts in all of these realms, it is logical to expect a revised space aesthetic to emerge. The central hypothesis of this paper is that volumetric space is a supportable candidate for this revised space aesthetic, based on arguments grounded in environmental holism (Koh 1982, Grange 1977), a comprehensive paradigm that includes political, scientific, and philosophical components.

Hand and Mouth: Corbusier and Giedion

We begin with what became, in most landscape architecture curricula of the post war period, one of the bibles for modern designers—Sigfried Giedion's (1967) *Space, Time and Architecture*. Originally published in 1941, Giedion presumed that a fundamental shift in the meaning of space and time occurred just after the turn of the century. Previously space had been under-

stood in Cartesian terms: space and time were static and separated, and space was an order whose logic in nature was hidden from casual view. The role of design was to reveal essential and rational symmetry in three dimensions, thus wresting order from chaos (Peterson 1980). Giedion opposed this Cartesian view, claiming that it was an antiquated space concept and that twentieth-century designers should see space and time as being inextricably interrelated (Norberg-Schulz 1971).

The artistic movement that Giedion discussed as first promulgating these aesthetic principles was Cubism. Cubist painters like Braque and Picasso were interested in form as a relative state simultaneously substantial and insubstantial through the permeation of space. A variety of cultural forces converged in complex ways to provoke this interest. Materialism, or scientific determinism, had been in ascendancy against the idealist opposite for most of the century (Grey 1953). The materialist view held that absolute cause-effect governed all natural relations, even the realm of human relations. The restriction on free will that this implied dispirited those with artistic temperaments. The idealist alternative, developed in both rationalist and romantic versions by Kant and Schopenhauer respectively, was ultimately seized on by the Cubists. For the idealist, the cognitive power of the singular intellect was the only true essential. By eschewing representation of three dimensional appearance, the Cubists transcended the evident to paint the more "real" symbol of the more "real" mental state. Thus the world beyond the apparent became a legitimate area of formal concern.

But in fact, this opposition of the material and the ideal were the two sides of the same modernist coin. The modernist paradigm in both art and science is marked by a tendency to radical reductionism in the belief that truth is found through examination of

Figure 4. At Waterfront Park in Boston the base plane is highly animated, making it difficult to read as "floor." Photo by author.

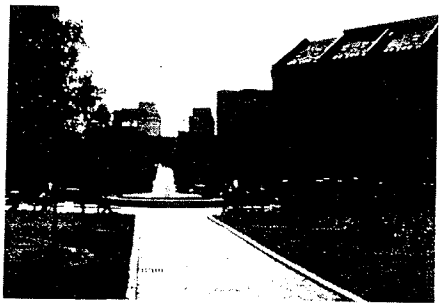


Figure 5. Waterfront Park, Boston. Existing bounding walls of historic buildings and elevated highway are neither blocked nor are they incorporated as "wall." Photo by author.

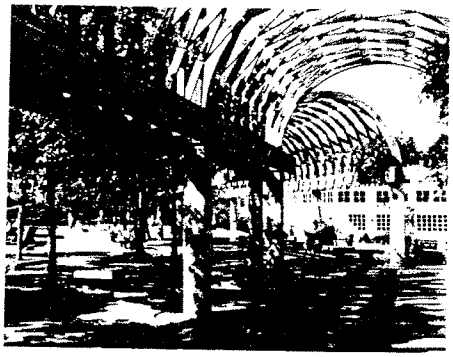


Figure 6. Waterfront Park, Boston. Structural elements are sculpted as distinct elements. Even here in the arcade where opportunity for volumetric spatial continuity is evident, the choice is for disjunction and tension expressed by the breaking of the line and the form itself. Photo by author.

Figure 7. Waterfront Park main arrival point. The arrival is not signaled by a gate. Users begin participating in the park through perceptual effects consequent to the changing pattern of asymetrically placed trees. Photo by author.

Figure 8. Arrival axis distorted and deflected by stairs. The elevation change here is for aesthetic reasons since the site is flat. Note incorporation of naturally formed and informally arranged plants at right not usually associated with urban contexts.

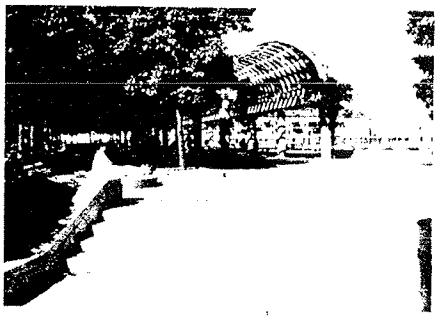


Figure 9. Deflected axis moves one's direction toward the arcade. The arcade itself shifts this axis to the left drawing your movement intentions in this direction. The water is now coming into view and extends a different directional pull.

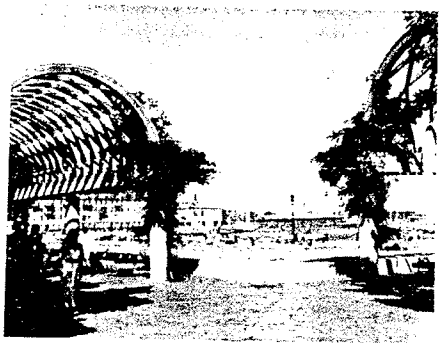


Figure 10. The water is finally revealed. It is not celebrated with a singular spacial orientation towards it as in the case of the Piazzetta in Venice; here the arcade divides in an ambiguous deference to the sea, yet pulls the user on two opposite directions. The arcades are spatial yet still distinctly sculptural objects.

Figure 11. Georges Braque, *French Harbor in Normandy.* The traditional landscape painting motif, where the landscape is depicted from one viewpoint at one moment in time, has here given way to a concatenated collection of perceptual impressions; in theory, these impressions are accumulated in consciousness over time as a consequence of moving through space. These accumulated mental images are depicted by Braque in the conviction that they are more "real" than evident external "reality." Courtesy of the Art Institute of Chicago.

the lower, more basic levels of phenomena (for example, in the structure of atoms or the elemental nature of perceptual phenomena) rather than the higher (Vitz 1984). This view contrasts with the synthetic and hierarchical approach characteristic of medieval or Eastern societies. In this view essentials are not found below the level of the materially evident, but in synthetic structures and processes that reside above (e.g., spiritual belief systems and synthetic ecological theoretical positions).

The drive to explore mental states underlying the evident material reality was validated by early twentieth-century scientifically based theories that suggested a world incompatible with the three dimensional static geometries fundamental to Euclidian space notions. Two were most influential: the discovery of subatomic electrons and the popularization of Einstein's Theory of Relativity. Both blurred distinctions: the former between matter and energy, the latter between time and space (Margolius 1979). It could now be stated with authority that the "material" world was less "real" than the invisible. Space as molded by experience over time—the equivalence of solid and void, and, most importantly, the essential primacy of perception—became valid focal areas for artistic exploration. Grounded in Cubist theory, Giedion (1967) could argue that for "space-time" designers, the "contemporary spatial approach has to get away from the single point of reference." Objec are to be viewed "relatively," and should have characteristics of "simultaneity," "penetration of inner and outer space," and "interpenetrating and hovering planes" (Giedion 1967, p. 437).

Eventually Giedion's overture was accepted by most building and landscape architects. Not surprisingly it was Giedion's C.I.A.M. (Congres Internationaux D'Architecture Moderne) associate, Le Corbusier, who was first able to translate Cubist principles explicitly to a form appropriate for architecture. Le Corbusier was first a Cubist painter who contributed significantly to the development of Cubist based art theory. In 1922, together with A. Ozenfant, he published *Apres le Cubisme* which catalogued and articulated the principles of their "Purist" paintings. In Purism the basic Cubist principles of simultaneity, interpenetrating hovering planes, and the interpenetration of inner and outer space were retained. Added was the value of economy and efficiency, the search for universal invariables over individual lyricism, and the consequent conclusion that the right angle was expressive of modern life and should therefore be used in design (Margolius 1979). Le Corbusier expressed these formal principles three-dimensionally in his most influential pre-World War II structure, the 1928 Villa Savoye. Ultimately of more influence to landscape architects was the visionary "Ville Radieuse" of 1935 (Jeanneret-Gris 1967), a city design vision based on the same aesthetic principles but proposed at mind-numbing scale.

In the Radiant City, urban space would be radically transformed. Traditional urban space was explicitly bounded by buildings joined to form a continuous wall of facades at the street edge (Krier 1979). In the Radiant City, shafts of structure would be placed as objects on the undifferentiated space of the city site. Thus the nineteenth-

century city of space becomes the twentieth-century city of object buildings *in* space, obliterating the street as a figural spatial entity and consuming space without context. Le Corbusier suggested that those who fear the monotony of such a context are not aware of the aesthetic pleasure gained when moving through the fabric of the city and perceiving the sublime dynamic interaction of free standing objects that approach, recede, cross, and glint, in a choreography driven by the speed of the observer (Jeanneret-Gris 1967). The city is no longer a series of interconnected voids but a fantastic modern sculpture of immense yet perceptible extent, capable of being seen entirely at once, yet being dramatically transformed at each moment through motion. Space in this model is not defined and controlled as Renaissance logic demanded; containment is exploded. Space flows around monumental slab buildings like water around rocks in a swiftly flowing stream. In this way the transformation of experience over time and the interpenetration of inner and outer space are expressed in urban form.

Justification for the spatial reversal was not only based on formal/perceptual grounds; the destruction of the existing city of corridor streets was also justified by the imperative to bring "nature" into the city. Nature, with its warming sun and clean air, is the human need that validates Corbusier's entire urban design theory (Jeanneret-Gris 1967). But the particular form of nature that Corbusier had in mind was, ironically for this champion of "machines for living," a romantic one. "Nature" was allowed to flow freely throughout the city, even under and through the buildings that were raised up on piloti for this purpose. While not stated explicitly, it is clear from Corbusier's "City of Tomorrow" drawings that the landscape should appear as if the steel and glass dwelling shafts had been lowered into an undifferentiated Garden of Eden, the "city in the park" where trees of all types sprang up where God had scattered the seed. *The City of Tomorrow* even includes a photograph captioned: "This is what the open spaces of our great cities might be like" (Jeanneret-Gris 1971, p. 200). The photo could well have been a painting by Claude Lorrain. The moss-covered scattered trees, the classical statuary, and the mist hanging over the mowed lawn awaits only nymphs and satyrs to complete the scene. The split personalities of the architecture designed for the collectivized man/machine and the landscape designed for the individualist man/animal is total. This categorical split is now manifest in most post-war American development that includes a "landscape" component; exterior areas are designed to appear "natural," that is to say, picturesque, while the buildings are quite "modern." Were it a unified aesthetic, one would expect the buildings to be framed with wattle and daub and roofed with thatch; but this quite evidently is not the case.

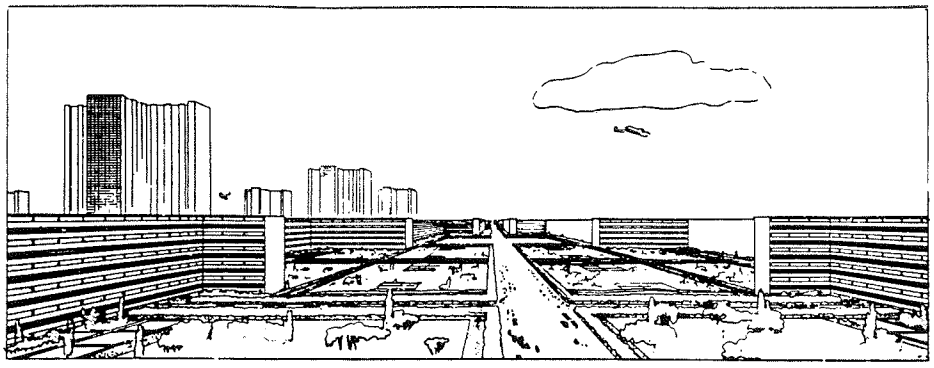


Figure 12. Drawing from *Radiant City*, Le Corbusier. A city of vast yet perceptible extent. The unrelieved order of the urban composition is mitigaded by "The Miracle of Trees and Parks" that "reaffirms the human scale." The parks are conceived in romantic terms with irregular plantings. Drawing by Le Corbusier.

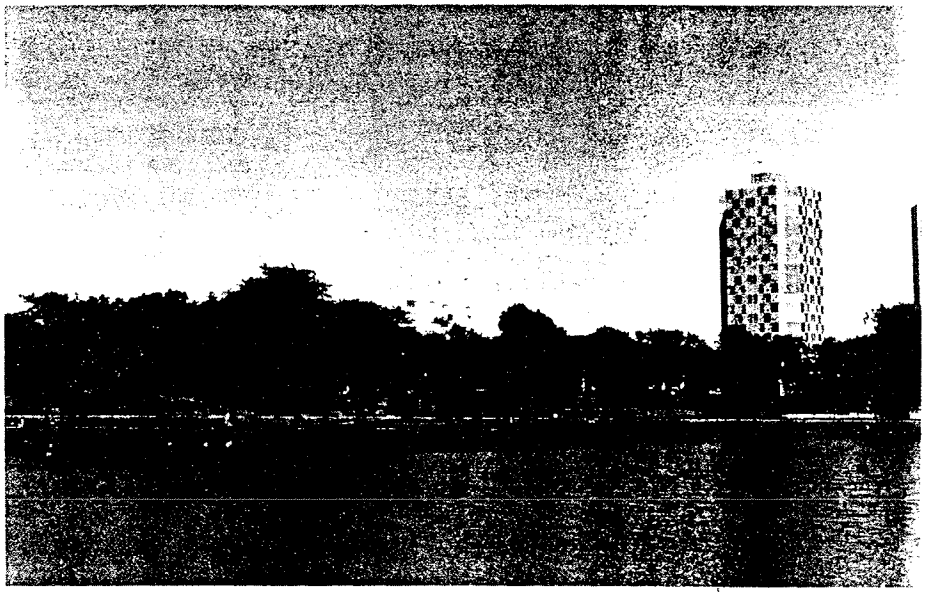


Figure 13. The tower in the park notion partially realized in Minneapolis. Photo by author.

Other Cubist Voices

I have chosen Corbusier and Giedion to illustrate what was the general tenor of the times, not to suggest that they alone proselytized the breaking down of spatial definition. There were (and are) many others who

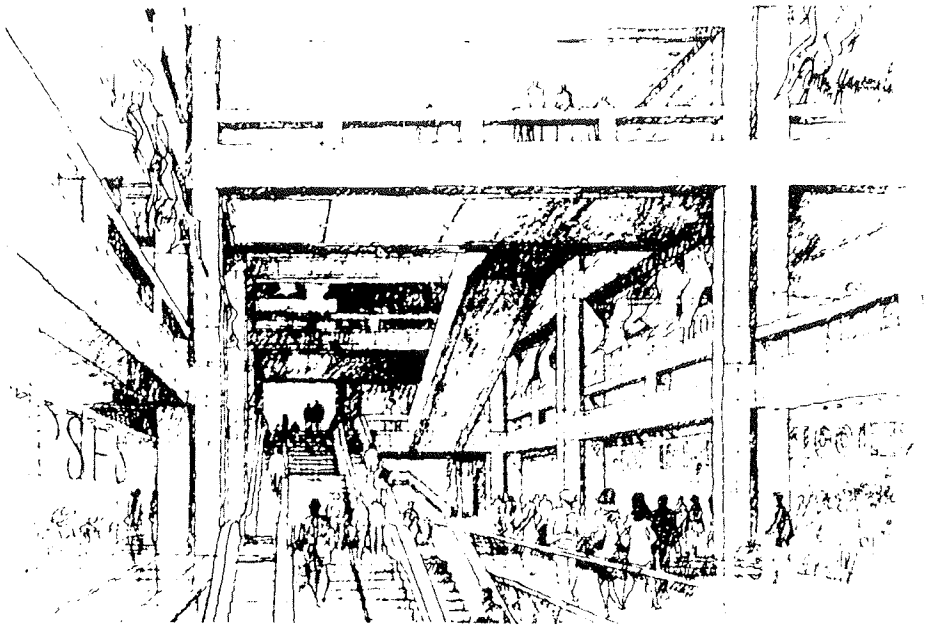


Figure 14. An illustration from *Design of Cities* by Edmund Bacon illustrating a typical city space in Bacon's urban ideal. The space's built form, and the consequent spatial nature of the entire city, are premised on the notion of "movement systems." Drawing courtesy of Bower Lewis Thrower/Architects, formerly Bower and Fradley.

defined space as an ever changing perceptual field associated with the moving viewer rather than as positioned volumes formed by solids. Arnheim (1977, p. 17) has suggested that, "The architect must be aware of the conception, suggested to him by the physicist and the psychologist that space is created as a relation between objects." In this view space is the nothingness that awaits objects for its activation. It is as if space were some form of force field where the energy is provided by the objects that fill it. Space can only be understood by moving through the field in time and experiencing the changing dynamics of the space that surrounds objects. The possibility of *making* space through the basic act of simple enclosure is ignored. Space becomes entirely relative, and, as Peterson (1980) says in "Space and Anti-Space":

> In a sense the location of space is reversed. Anti-Space [close to what is here called Cubist space (author's note)] becomes associated primarily with the observer rather than the forms which create it, so that architecture receives its vitality not from an integrated figure but from a personal space which is mobile and individualized . . . We no longer move through a fixed space but along with a moving fluid one (Peterson 1980, p. 100).

Thus, a host of learned voices were raised to validate the explosion of containment. Such a chorus could not fail to penetrate to the bookshelves of landscape architects.

Cubist Space and Bacon, Lynch, and Cullen

Insubstantial and fluid space, knowable only through motion and time, is an idea that is sometimes explicit and at other times implicit at the fundamental center of urban design theory most used by landscape architects; this is especially true of the works of Edmund Bacon, Kevin Lynch, and Gordon Cullen. Bacon (1974) structured his *Design of Cities* around the notion of the "movement system." Bacon, like Sant'Elia and Corbusier before him, stated that modern city form should be conditioned by the technics of modern mobility. He seemed not to be interested in the phenomenological cognitive effects—the disruption in sense of place—that results in people when swept along by these movement systems. Do they really enjoy this endless flow through indiscreet space? The question remains unanswered. Perhaps Bacon's lack of concern can be explained by his deterministic belief that humans, which make up the contents of the city, are transformable to a "higher" level of being, a modernist view articulated in the book primarily through inclusion of numerous quotes from Paul Klee, the Bauhaus painter and teacher whose writings on humans, nature, and art greatly influenced modernist theory.

> If I had to represent man "as he is," I should have required so bewildering a tangle of lines that a pure treatment of the element would have been out of the question; there would only have been an unrecognizable blur . . . Besides, I have no desire to show this man as he is, but only as he might be (Bacon 1974, quoting Klee, p. 321).

What man might be, we are led to presume, is freed, as Bacon (1974, p. 321) says " . . from the relationships imposed by Euclidean geometry or Newtonian physics . . a total environment that we have only begun to sense." This is to say, Einsteinian time/space, or, in a word: Cubist.

Another work of tremendous influence for the profession of landscape architecture has been Kevin Lynch's (1960) *The Image of the City*. Lynch's work in identifying the symbols of the city has been used to counter the vacuity of a singleminded functionalist modern theory of urban design (Rossi 1982); but ironically the work has tended to reinforce modernist space concepts. Relying as he did on interview methods to generate base data for the study, Lynch's work depended on the ability of humans to *articulate* the nature of their space

experience. Brain function research findings published after Lynch's work have shown that space perceptions and conscious verbal thought are disconnected and that space, while perceived as volume, is stored in verbal memory as symbol (Sperry 1973). Thus, when asked to recall a city-scape the subject quite naturally regurgitated the stored symbol set. Space as volume emerges as significant only when its type is markedly different than the norm (Lynch 1960); otherwise it remains unnoticed. Of course Lynch's urban taxonomy has already been tremendously useful for designers. Path, node, landmark, district *et al.* have been integrated into our design curricula and professional process; the mistake is to accept this taxonomy as complete when clearly the very essence of *urbanness*, the experience of moving through canyons of space formed by building walls of monumental proportions, is hardly mentioned. Lynch's view, while important, is incomplete; the window is difficult to conceive without the dialectics of the room, the vista without the promontory, the node that is not a plaza, the city landmark without its container, or the city path that is not an elongated volume of definitive corridor space.

Similarly, Cullen's (1961) *Townscape* has been justifiably seen as a reaction against Corbusier's "Tower in the Park" modern principles of landscape planning; unfortunately, Cullen provided no clearly articulated space theory in counterpoint. Thus Cubist space remains unchallenged. In fact, Cullen's view can be seen as having been influenced by time/space notions or, at the very least, as a picturesque revival. Spaces are either good or bad based on the quality of the changing pictorial views experienced over time, rather than by the meaning and scale of the enclosing urban walls. Cullen set out a design theory notable for its concentration on the parts of the urban composition while lacking a theoretical spatial notion upon which to affix them. The design critic Wolfe (1949) earlier described it as:

> . . . a dislike which amounts to an inability to see wholes or principles and an incapacity for handling theory; but on the other hand a passionate preoccupation with independent details, parts, or persons, an urge to help them fulfill themselves, achieve their own freedom; and thus by mutual differentiation, achieve a higher organization (Wolfe 1949, p. 362).

Cullen's laudable entreaties to enrich the environment were quickly accepted by landscape architects who were uncomfortable with the humanistic vacuum of Modernism. A profusion of kiosks, street furniture, rich paving patterns, and other enriching "place making" elements found their way into landscape/urban design; but the fundamental space theory employed by these practitioners remained space/time inspired Cubist space. Enriching objects are placed on the design field, as Arnheim (1977) has suggested, situated in dynamic space/time relationship to each other and to the pedestrian moving through the space. Space exists as a bubble around the user, and is never the same for two moments or for two users. The disheartening irony is that the medieval city of space, used as an exemplar by Cullen, somehow justified a design aesthetic based on sculptural solids. What explains the strength of this Cubist myopia? A partial explanation is revealed by the severity of the modernist attack on Camillo Sitte.

The Birth, Murder, and Resurrection of Camillo Sitte

The first publication, in 1898, of Camillo Sitte's *City Planning According to Artistic Principles*, marked "the birth of modern city planning" (Collins 1965). In this book Sitte published the dimensions and analyzed the aesthetic attributes of a number of European vernacular urban spaces; from these observations Sitte developed the first urban space typology and a set of supportive design canons. The book was tremendously influential; but none of the previously mentioned authors cited Sitte even though in some cases they analyzed the same spaces. The omission is reprehensible yet understandable since Sitte's theoretical precepts were enlightenment canons and could be easily discredited in the modern era's search for new principles. In addition, Sitte's volumetric conception of space and the notion of a preexisting *type* or general model, central to the purpose for Sitte's work, were unacceptable. The very suggestion that it was useful to acknowledge precedented solutions was a thesis in opposition to the modernist faith in unique solutions. Modern theorists took their cue from Corbusier, whose reactive level of contempt was the driving force in his now famous debates with Sitte's ghost wherein he derided Sitte's "Pack Donkey's Way" vs. his own "Man's Way" (Jeanneret-Gris 1924). Two decades later Giedion (1967, p. 780) wrote this about Sitte: " . . the town planner had lost contact with his period. He was a kind of troubadour, ineffectually pitting his medieval songs against the din of modern industry."

This modernist disdain is only now being reversed. A significant landmark in the rehabilitation of Sitte came with the publication of Rob Krier's (1979) neo-rationalist *Urban Space*, a work he dedicated to the memory and ideas of Camillo Sitte.

The Modern LA Exemplar, Lawrence Halprin

Cubist space/time design canons were the driving logic for modern landscape architects; they were seldom explicit and often disguised by notions of "variety," "interest," "movement," and "sense of place." As we have seen, these canons were founded on abstractions of abstractions; some of the abstractions were from physics, others were from psychology, and still others were from interpretations of nature. With an understanding of this vocabulary of inter-related abstractions one can read the works of landscape architecture for their implicit content. Lawrence Halprin is arguably the most influential landscape architect of the modern period and consequently his work is examined for evidence of these abstract notions in built form.

As with many other modernists since Paul Klee, nature is the primary source of inspiration for much of Halprin's work. What Halprin derives

from nature is remarkably similar to Cubist space/time: the free flowing interpenetration of space, and the environmental change of experience and space over time. In fact, the notion of designed space as a sequential activity over time simply floods out of his *The Notebooks, 1959-1971* (Halprin 1972). The parallels between dance and landscape architecture are constant: "scoring" for environments, the "plan for a 45 minute environment," the "fountain choreography," the imperative for "incomplete" designs. "Everything in motion—water, rocks, sea weed, air currents, birds, great baroque composition—all echoing each other" (Halprin 1972, p. 30), is the caption under a particularly fluid sketch. On the facing page is the statement that links nature with modern art. "Art by accident uses the same processes as exist in natural phenomena—up in High Sierra see it clearly" (Halprin 1972, p. 31).

Some of the formal characteristics of nature that help justify the dissolution of the outdoor room are analyzed, including:

> "5. All edges are soft—they feel as though they have become by *being worn*—not created into a fixed edge . . . "; and
> "7. . . . Non-completion of spaces . . . the spaces all move into other spaces and are non-confined" (Halprin 1972, p. 64).

These principles are made manifest in Halprin's Nicollet Mall Project in Minneapolis. The design creates no clear legible spaces; rather it is a fluid continuous space that is influenced by the objects and people in it. As was clearly the objective, the design must be moved through over time to be understood. The design quite intentionally disrupts the clarity of the pre-existing street space by the addition of elements that are placed without relation to the spatial container. The sinuous curve of the "bus street" is intentionally at variance with the containing space. As Arnold (1980) has said:

> Since the sinuously disposed elements are visually less emphatic than the strong building lines, the visual effect is to weaken rather than reinforce the sense of space. The spatial quality of the city is sacrificed for the sake of arbitrary diversity in design" (Arnold 1980, p. 42).

Nicollet Mall is therefore a Cubist Space paragon that represents the replacement of pre-existing geometric space (the street) with fluid Cubist space/time space (the Mall).

This approach to design was pervasive in the work of Halprin and his associates to the point of becoming a fundamental element even in large scale urban planning projects. The *Hennepin Avenue Area Report* (Halprin 1969) begins its analysis section with a "Movement Notation" map that diagrams movement type, strength, and velocity for all of downtown Minneapolis. Mass/void, figure/ground, or any other form of analysis of the existing physical space are absent; this occurred even though the concluding recommendation was for a large number of new building masses to be inserted into the existing urban fabric. The mystical relationship of time to space ro motion renders the physical materials and volumes of the existing city invisible and insubstantial or again, in a word: Cubist.

From Modernism to Environmentalism

Today, modernist concepts based on utopian principles born of the industrial revolution are increasingly being called into question; recognition of the costs of technological change and the resistance of fundamental aspects of human behavior to *be* changed eventually stilled the modernist euphoria for progress. Throughout the post-war era there were important events that clouded the utopian vision of the modernists. While the assaults on modernism originated from a number of quarters, the concept of a paradigm shift from modernism to environmental holism (Koh 1982) provides a categorical frame broad enough to subsume these assault points. Environmental holism is defined as a comprehensive paradigm of environmental humanism manifested in the environmental movement. The landscape vision that this ethical view spawns is what John Lyle (1985) calls "human ecosystems," where the biosphere includes an active, integrated, and potentially beneficial human component. In this view nature is not "other" in the sense of something to be revered or despoiled. Rather, nature is "as one" with us. Acceptance of the tenets of environmental holism requires, as shall be shown, a revision in the way that space is presumed to exist.

To begin with, modernism and environmental holism have starkly contrasting precepts regarding the value of the individual relative to the group. Whether one studies the pre-fascist fantasies of the Italian Futurists (Tisdall 1978), the corporate statism of Le Corbusier's internationalism (Jeanneret–Gris 1974), or the socialist Russian Constructivism (Lissitzky 1970), a central idea that binds these disparate "modern" ideologies is the belief that humans were the "masses" of a species locked in a struggle to extend their influence over environment at the expense of other species. The concept of "mass housing" articulated by both Corbusier and Gropius was a product of this radical simplification. Environmental holism is grounded in a less Darwinian view of the survival of the species. Since the 1960's, research has revealed a level of complexity and interdependence in the biosphere that went well beyond Darwin and struck environmental movement adherents as being positively metaphysical. The current work of British biologist James E. Lovelock (Joseph 1986) rounds out the comprehensive environmentalist paradigm in that his concept of the biosphere as a self regulating organism (Gaia), provides both a scientifically credible theory opposed to brute Darwinism, and a metaphysics of environmentalist holism. The canons of this paradigm hold that the biosphere is an intricate system, the essences of which are unknowable to the analytic reductionist techniques of science favored by modernists of all disciplines: that the individual relationship to habitat is the beginning and end point for knowing, and that the knowledge thus gained can have useful general implications.

Environmental holism has a political face expressed at the surface of culture by the environmental movement: a scientific face, a feature of which is called ethology; and a philosophical face called phenomenology. The space making implications of these three faces of environmental holism are, in turn, dealt with below.

The Environmental Movement and The City as Environment

The wreckage of the historical American city, wrought by "Radiant City" utopians and demographics/economics based urban planners, was abated by that part of the environmental movement known as the American historical preservation movement. This movement and the environmental movement appear at similar times, move on parallel tracks, and often include the same activists. They argued that in the city, as in any other environmental system, precedents predicate the present; to lose the past alienates and ultimately destroys the present.

Statistics-based planners and modernist urban designers, including almost all of the theorists, lagged well behind grass-roots advocates in developing an appreciation for the city as environment. Their linear analytical models, *a priori* assumptions, and blind faith in the existence of cause-effect rendered them blind to the intricate web of historically built associations manifest in the city. For designers trained to the "Radiant City" creed, the historical city needed only destruction. For them the preservation, not to mention re-use, of historical space motifs was anathema. The struggle against the inevitable is painfully revealed in the work of urban design theorist Colin Rowe (1978). Rowe attempted to glue together what can be salvaged of rational, machine age, utopian Modernism with the historical city that he admitted was a continuous solid out of which a structure of spaces has been carved (Ellis 1979) and that, by 1978, seemed unlikely to disappear. His solution was to "collage" together

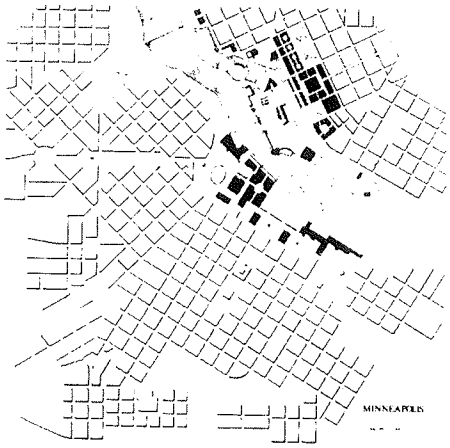


Figure 15. Colin Rowe's 1978 plan for Nicollet Island showing dynamically arranged "cubist" pieces on Nicollet Island, and other more traditional urban block forms on either bank, easing the transition back to the existing city shown in Whitte. Drawing courtesy of Professor Colin Rowe.

modern Cubist space pieces that intentionally collided with historical volumetric urban space. The act of collage was explicitly inspired by the work of Braque and Picasso. Therefore, Rowe's theory was a metaphor for the urban design discipline's reluctant acceptance of the city as volumetric space into which Cubist space might still be woven.

A rather more comfortable accommodation to the inevitable sweep of environmentalist ideas was made by Christopher Alexander, a modernist of impeccable credentials. Alexander's (1977) *A Pattern Language* marked the first major comprehensive design theory based on the environmentalist paradigm; the city was viewed, not as a "problem" in need of a solution, but as habitat—a complex system of interdependencies that together comprised the "patterns" of a "language." In the process of looking for patterns in the historical city, he naturally discovered the importance of bounded volumetric space, and many of the design rules that resulted stand in marked contrast to modernist object fixation (patterns 61, 69, 100, 101, 106 especially, 108, 114, 115, 119, 121, and 126 to name a few). Notions of space/time cubist space drop away, and are replaced by the amply precedented outdoor room bounded by solids.

Science Rediscovers Volumetric Space

Modernism drew ideological support from design theorists whose approach had been "scientific"; these included Klee, Gropius, Giedion, Arnheim, and others. By explicit or implicit adherence to space notions supported by Einstein's Theory of Relativity, re-enforced by a positivist orientation toward the study of human perceptions (Norburg-Schulz 1971), where isolated cause-effect was the *a priori* assumption and starting point for inquiry, theoretical canons were produced in support of cubist time/space notions.

Early twentieth-century biologists and social scientists were also fixated on direct causation, and tended to devalue the importance of instinct; instead, they believed that all of human response was explainable on the basis of social conditioning and stimulus-response (Watson 1925). Such views inspired modernist designers to conclude that revolutionary changes in behavior could be brought about as a direct consequence of revolutionary changes in environment.

It was not until the post-war era that some biologists turned their attention to the more constant instinctive and evolutionary aspects of human behavior; this is now called ethology. Ethologists study behavior by simulating as closely as possible the original habitat in all its multivalent complexity. The sympathetic and inclusive study of phenomena *in situ* closely links ethologists with phenomenologists. Ethological techniques would generate major works of revolutionary significance to landscape design. A partial list includes Jane Jacobs' (1961) *The Death and Life of Great American Cities*; Ocsar Newman's (1972) *Defensible Space*; Edward Hall's (1966) *The Hidden Dimension*; Barrie Greenbie's (1976, 1981) *Design for Diversity*, and *Spaces*; and Jay Appleton's (1975) *The Experience of Landscape*. All of these works directly support the validity of volumetric space while undermining time/space canons.

Jacobs (1961) began her work by asserting that it fitted within the ethological method: "For illustrations, please look closely at real cities. While you are looking, you might as well also listen, linger and think about what you see." The product of her observations was a set of rules for successful streets, the first of which was:

> First, there must be a clear demarcation between what is public space and what is private space. Public and private spaces cannot ooze into each other as they do typically in suburban settings or in projects (Jacobs 1961, p. 35).

The work, taken in its entirety, amounts to a validation of the space structure of historical cities; the types of this typology are the square, the street, the stoop (or yard), and the facade.

The destruction of the infamous Pruitt-Igoe housing project in St. Louis, portions of which were blown up in desperation by city authorities in 1972, has been used to mark the death of modernism (Wolfe 1981, Jenks 1984). Newman (1972) had previously argued that the fundamental flaw of the design was a lack of controlled private and semi-private space beyond the unit entrance. The project, designed by Minoru Yamasaki, was a textbook example of a Ville Radieuse site plan. Buildings styled after Corbusier were set in a "park" of "natural" greenery that was entirely undifferentiated, unstructured, and apparently uninhabitable. Newman's (1972) work provided strong evidence that despite the utopian collectivist hopes of modern era urban planners, and despite the higher "validity" of Cubist space theory, people still seemed to need their own street, stoops, yards, and gardens; these spaces were by nature volumetric, enclosed, and as Newman pointed out, defensible.

Hall's (1966) revelation of the cross cultural world of "proxemics," where humans respond instinctively to transgressions against invisible barriers, strongly suggested the need to recognize and re-enforce these spatial spheres in design. The modernist notion of "hovering and interpenetrating planes" could only confuse these instinctive needs and over-stress the organism.

As a designer, Greenbie (1981) added another dimension to Hall's theories. In *Spaces* Greenbie (1981) argues for a volumetric and spatial clarity in residential landscapes that is explicitly opposed to the collectivist spatial homogeneity of the modernists. Greenbie uses Hall's term "proxemics," to which he adds his own term "distemics," and thereby sets up a space type continuum that ranges from most private to most public. In his view, enclosed volumetric space supplies the elemental animal need for territory. As one moves toward the most public of spaces, the spaces he calls distemic, spatial enclosure becomes increasingly less important and accessibility more so, as long as the policing system keeps the space safe for this "community of stranger." Distemic spaces, such as airports, and the behaviors they engender, are components of a global system founded on abstract intellectual spatial concepts (such as aircraft navigational systems). This space system is superimposed on the older proxemic space and behavior system based on life experiences in particular cultures. Greenbie (1987) says, speaking of distemic space: "one only wants that much room, either for physical movement or for the imagination, when the more basic sensual needs for territory are taken care of." This basic sensual need for enclosure is greatest in residential communities. Here the disposition of clear spatial edges marking public to private transitions is vital. Ironically, the clear definition of residential territory makes informal social interaction more rather than less likely, lending credence to the old aphorism popularized by Robert Frost: good fences make good neighbors.

It was this dialectic between edge, space, and human behavior which was at the heart of Appleton's (1975) argument in the *Experience of Landscape*. Appleton, a geographer, based his influential book of synthetic aesthetic theory on the ethologically based idea that:

> . . . aesthetic pleasure in landscape derives from the observer experiencing an environment favourable to the satisfaction of his biological needs. Prospect-refuge theory postulates that, because the ability to see without being seen is an intermediate step in the satisfaction of many of those needs, the capacity of an environment to ensure the achievement of *this* becomes a more immediate source of aesthetic satisfaction (Appleton 1975, p. 73).

This is to say that one can analyze a space such as the Piazza San Marco relative to its capacity to satisfy both the need to see clearly—"prospect"—and the desire to not be too personally conspicuous—"to take refuge." Thus, the middle of the space is the least comfortable for sitting in while the edge is most suited for this activity. In addition, the fact that the edge is arcaded is also an advantage in that it allows immediate escape into a darkened surrounding. Appleton stated clearly and repeatedly that his proposition was not offered as an explanation for the entire realm of human aesthetic response. I also hold to this view. However, at the fundamental level of human comfort, the base line from which other levels of aesthetic appreciation in *landscape* can be reached, Appleton's work provides landscape architects with the most powerful theoretical tool to be offered in decades. What Appleton proposes is a way of looking at space and its human purpose that is diametrically opposed to Cubist space notions. In Appleton's view, space that was characterized by a dynamic relationship between objects, in the manner of Arnheim and Halprin, would be seen as satisfying neither the need for prospect nor the imperative for refuge. A design field filled with objects, dynamically situated, provides no place into which one can escape, but offers numerous hiding places for threats. Designers who use Appleton's theory to guide design decisions must inevitably produce clearly legible spaces for human activities.

Physics, Philosophy, and Space

Broadly speaking, environmental holism and the attending suspicion of reductionist science have combined to undermine the modernist philosophi-

cal basis characterized herein as analytical reductionist, but also known as logical positivism. As Koh (1982) has stated:

> This positivistic approach often leads to the dualistic separation of human and environment, and to the study of them independent of each other . . . The scientific positivism . . seems to have led to empiricism, materialism and pragmatism in which the tangible, measurable, and observable were emphasized over the intangible, immeasurable, and unobservable and the investigative study over the reflective one (Koh 1982, p. 77).

Today, designers are abandoning Modernism's philosophical basis in analytical-reductionist materialism and logical positivism for the embrasive philosophy of phenomenology. Phenomenology distinguishes itself through the assertion that "reality" cannot be understood through a reductivist objectivity but through a holistic acceptance of phenomena as they appear. As applied to environments, phenomenologists avoid the *a priori* theories of empiricism in the belief that they can distort reality to conform to presumed problem parameters (Seamon 1982).

> Through empathetic looking and seeing, [the phenomenologist] strives to make genuine contact with dimensions of environmental behavior and experience and thereby secure accurate qualitative descriptions which will provide a base for authentic conceptual portrayals of the various dimensions of the person-environment relationship (Seamon 1982, p. 121).

Thus the work of Jacobs (1961), Whyte (1979), and Greenbie (1981) can be classified as being phenomenologically based, as can the explorations of the spaces of the mind-world of Bachelard (1964). From this phenomenological orientation space is less abstract and consequently more immediate. Martin Heidegger (1971), in "Building, Dwelling, Thinking," has given its basic shape. He presented a view of the "fourfold" (mortals, divinities, earth, and sky) that in many ways anticipates the environmentalist paradigm.

> Mortals dwell in that they save the earth . . . To save the earth is more than to exploit it or even wear it out. Saving the earth does not master the earth and does not subjugate it, which is merely one step from spoilation (Heidegger 1971, p. 150).

Heidegger used the mine of language to support his views in the belief that language expresses "the primal nature of meanings." About space he said:

> What the word for space, Raum, Rum, designates is said by its ancient meaning. Raum means a place cleared or freed for settlement and lodging. A space is something that has been made room for, something that is cleared and free, namely within a boundary (Heidegger 1971, p. 154).

This space of the archetypal clearing, the volume of space extracted from the mass of the wilderness, draws on the logic of the archetypes of shared existence for its space definition. It draws from the deep structures of perception rather than from the inappropriate use of mathematical abstractions, about which Einstein himself had warned: "When mathematical propositions refer to reality they are not certain; when they are certain, they do not refer to reality" (Norberg-Schulz 1971, p. 10).

In humankind's philosophical struggle to understand the world of space experience, a series of higher and higher abstractions, from Euclid to Einstein, has tended to impoverish the relevancy of environmental design theory to the way space is normally experienced. Design theorist Christian Norberg-Schulz (1971), in *Existence, Space and Architecture* used the support of the phenomenologists Heidegger (1971), Bachelard (1964), Merleau-Pontey (1962), and Bollnow (1963) for re-enrichment. Norberg-Schulz (1971, p. 14) argued that space is "a dimension of human existence rather than a dimension of thought or perception," and in so doing erodes the twin support system for Cubist space in landscape architecture, namely the abstract theories of space/time advanced by Giedion, and the egocentric theories of perception a-la Arnheim. Norberg-Schulz's (1971) phenomenology of "existential space" borrowed from the psychologist Piaget (1971). Piaget proved that "space schemata" are a common language of learned space expectations:

> [Space schemata] . . are composed elements that have a certain invari ance, such as universal elementary structures (archetypes) and socially or culturally conditioned structure . . (Norberg-Schulz 1971, p. 11).

Accepting the existential space argument, we no longer move throu an impersonal world of objects in dynamic relation one to the next, pe ceived equally by identical perceivin persons; rather, we move through a highly personalized (although not in vidual) "life world" cognitively orde in relation to our total existence (in vidual, cultural, archetypal) on the planet. In existential space we move from the clearing (archetypal space with inborn meanings) to the park (culturally conditioned structure wit learned meanings). Phenomenologic theorists agree on the overriding importance of the "insideness outsideness" dialectic (Seamon 1982 Relph 1976, Tuan 1974, Norberg-Schulz 1971, Eliade 1957). Sense of place is impossible in space without here-there, me-you, us-them, inside outside definition. The conceptual c egories of inside and outside specifi cally connote the existence of enclosing space separation and are thus volumetric.

The logic of phenomenology offers immense opportunities for fu ther development by landscape arch tects since landscape speculation in area is underdeveloped (Zube *et al.* 1982, p. 23) and, given the inclusiv breadth of the phenomenological approach, it can potentially answer call "for a basic model to which lan scape perception research and theo can be related as a whole."

Conclusion

In this paper I have attempte to distinguish two fundamentally opposed types of space, the space t

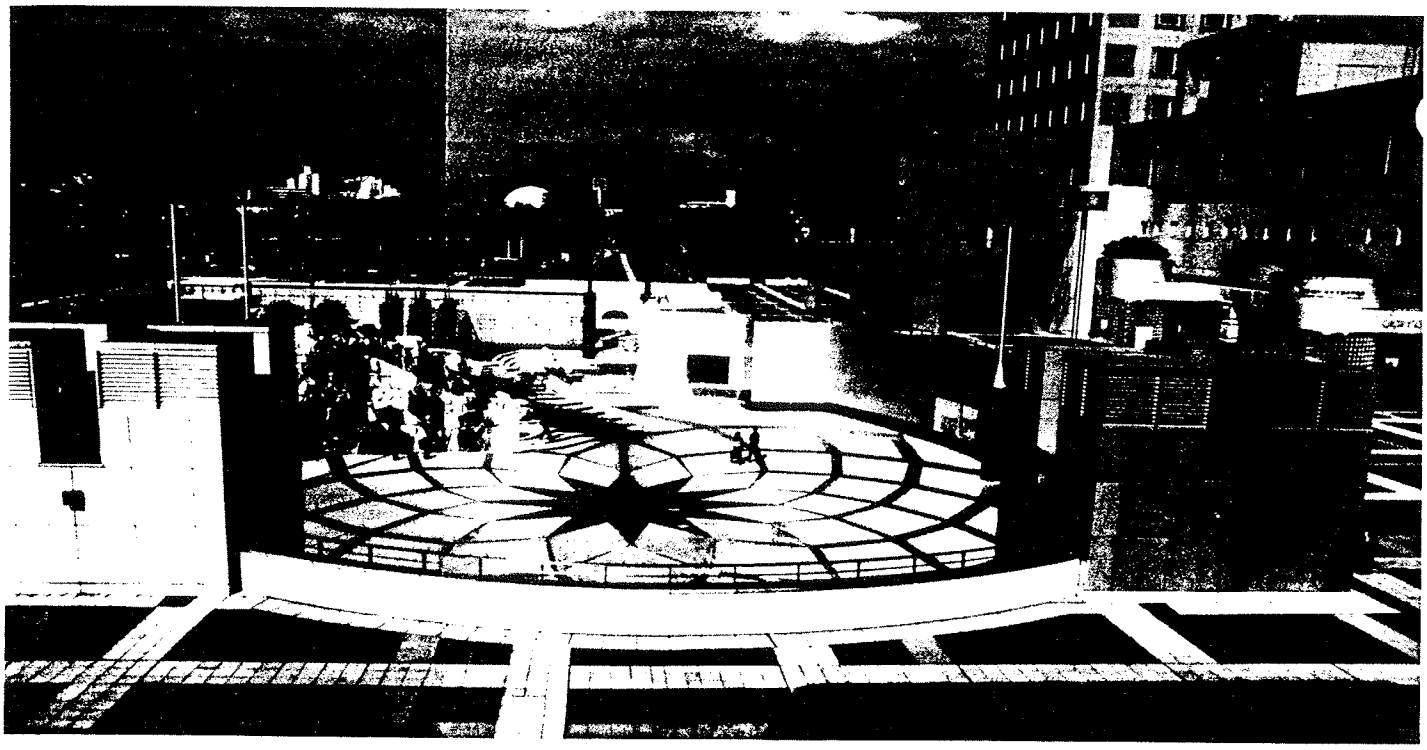


Figure 16. The highly referential Tsukuba Center turns the paragon of volumetric space, Michelangelo's Campidoglio, into an imprisoned volumetric space remnant in a Cubist space urban context. Photo by Marc Treib.

that I have called Cubist and the other that is called volumetric space. I have further attempted to show that Cubist space was not simply a matter of an abstract aesthetic preference, but was the consequence of political, scientific, and philosophical positions that, when taken together, provided the theoretical supports for Modernism in the arts. Subsequently, I argued that the precepts which supported the aesthetic of Cubist space had been discredited in an attempt to expose the irony of our discipline's reflexive adherence to this space concept. Finally, I have attempted to outline how more recent trends in politics, science, and philosophy strongly support the validity, from a variety of perspectives, of the reassertion of volumetric space in the landscape.

Volumetric space, I recapitulate, is the space of Olmsted's Great Meadow in Central Park, the space of Paley Park in New York, the space of the Tuileries in Paris, the space of the Grand Canyon, the seashore, the forest clearing, the Piazza del Campo in Sienna, and the Piazza Navona in Rome. Volumetric space is the figural media of the world's great landscapes, both designed and undesigned. The mystery, at first, is that this simple fact is not a design axiom. On the contrary, there is, despite the general reverence for the mentioned historical precedents, still an institutional abhorrence of clear space definition in landscape design. One looks in vain through the recent "post modern" works of landscape architecture (at least those that have captured the attention of the professional media) for one example that exhibits sensitivity to this fundamental shift. The Bagel Garden, the Necco Garden, Harlequin Plaza, and most recently Nancy Holt's Dark Star Park and the highly referential Tsukuba Center designed by Arata Isozaki all use space in a decidedly modernist way. In the case of Isozaki, the literal use of the floor plane from Michelangelo's Capidoglio Hill, without the spatial walls that give it typological meaning, is so bizarre that the gesture has only shock value to a small educated group. The climax of Rome becomes a pit in Japan.

These works share much with current trends in architecture where space, if anything, is becoming even more fractured. As Peterson (1980) has said:

> Like Modern Architecture itself, Post-Modern architects remain object fixated in their attempts to establish clear architectural symbols and icons. They tend to maintain the assumptions of Modern space while rejecting Modern Architecture's more explicit and obvious limitations on meaning (Peterson 1980, p. 92).

My own inquiry into the *why* of this illogical lapse of insight revealed the persistent strength of a functionally dead theory of design—a theory

so taken for granted that landscape architecture has lost the ability to replicate and enhance the phenomenal beauty of the world, a theory so disguised by superficial notions of the "natural" and "diversity" that even engaging the debate is hardly possible.

This proposition is an attempt first to expose and then to begin seriously questioning an approach to space disposition in landscape that threatens our professional viability. The argument for Cubist space, always tenuous for architecture, is simply absurd in landscape architecture. A unanimity of voices outside the design field states that the problem with all of our landscape spaces, from the shopping center parking lot to highways, is the total lack of definition between space. The "sublurbs" go on forever, creating a disorienting landscape where the fundamental characteristic is a lack of spatial definition, a deficiency that no amount of asymetrically "naturally" composed planting groups can cure. A design approach that accepts the palpability of space has the power to create "place" in our sprawling urban landscapes. No amount of individual kiosks, fountains, ornamental trees, or decorative lighting can possibly have such strength. And if our approach of defining space to create place contradicts some "higher" fifth dimensional Einsteinian reality, what does it really matter? For most of us on this planet, $E = MC^2$ stands for the existential void of nuclear incineration, and who wants that brought into the garden anyway?

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1. rust
2. lino
3. steps
4. wood