THE CITY AS AN ACT OF WILL

The building of cities is one of man's greatest achievements. The form of his city always has been and always will be a pitless indicator of the state of his civilization. This form is determined by the multiplicity of decisions made by the people who live in it. In certain circumstances these decisions have interacted to produce a force of such clarity and form that a noble city has been born. It is my premise that a deeper understanding of the interactions of these decisions can give us the insight necessary to create noble cities in our own day.

The purpose of this book is to explore the nature of these decisions as they have occurred in the past, the influence of the circumstances in which they were made, the way in which they have related to one another and to the ideas that emerged from their union, and to examine the gradually evolving forms they have produced. My hope is to dispel the idea, so widely and uncritically held, that cities are a kind of grand accident, beyond the control of the human will, and that they respond only to some immutable law. I contend that human will can be exercised effectively on our cities now, so that the form that they take will be a true expression of the highest aspirations of our civilization.

With the enormous improvement in the techniques of mathematical manipulations of electronic computers applied to the problem of projecting past trends, we are in danger of surrendering to a mathematically extrapolated future which at best can be nothing more than an extension of what existed before. Thus we are in danger of losing one of the most important concepts of mankind, that the future is what we make it.

Recent events in Philadelphia have proved incontrovertibly that, given a clear vision of a "design idea," the multiplicity of wills that constitutes our contemporary democratic process can coalesce into positive, unified action on a scale large enough to change substantially the character of a city. A principal aim of this book is to consider what is meant by "design idea."
AWARENESS OF SPACE AS EXPERIENCE

The basic ingredient of architectural design consists of two elements, mass and space. The essence of design is the interrelation between these two. In our culture the preponderant preoccupation is with mass, and to such an extent that many designers are "space blind."

Awareness of space goes far beyond cerebral activity. It engages the full range of senses and feelings, requiring involvement of the whole self to make a full response to it possible.

The human organism progresses in its capacity to perceive space from the spaceless embryonic state, through the limited space exploration of the infant, to the primarily two-dimensional exploration of the crawling child, and finally to the bodily leap into space essential to the athlete's skill and the dancer's art. There is an intellectual parallel of deepening perception which is based on becoming connected with larger and larger systems. In architectural terms it means progressing from the earth and earth materials into the less tangible elements of the universe. Through this sense of connection with a system greater than himself man achieves aesthetic satisfaction, and the more nearly universal the system, the deeper the satisfaction. This is why a conscious expression of space is essential to the highest expression of architecture.

Q to realize space!
The plenteousness of all,
that there are no bounds,
To emerge and be of the sky,
of the sun and moon and flying clouds,
as one with them.

In these words Walt Whitman has given a great assignment to architecture. But it can never be fulfilled unless the designers themselves develop an awareness of space through the involvement of their whole being.
FORM AND SPACE

Architectural form is the point of contact between mass and space. Where the philosophical interrelationship between these two elements is unclear, so will form of the architecture be unclear. By defining the point of juncture between mass and space, the architect is making a statement about the interrelationship of man and his universe.

The Egyptian pyramid stands as the consummate expression of a form which emerges from the earth as dominant mass. It is a statement of unchangeable absolutes.

Chinese architecture, on the contrary, is a powerful expression of a state of harmony with nature, not dominance over it. The concavity of a roof is an expression of the modesty of man, of the receptivity of his structures to universal space which these roofs gracefully receive and which becomes the core of his architectural compositions in the courtyards.

In Islamic architecture the use of form and space is different again. The magnificent domes which are central to so much Islamic work seem a reflection of inner space, which, seeking expression, pushes the membrane outward, taut, to set the form. This is in marked contrast to the domes of Christian churches and cathedrals of Western Europe, which were conceived in terms of structure of mass.

So in all the cultures of the world, architectural form is an expression of the philosophical interaction of the forces of mass and space, which, in turn, reflects the relationship between a man and nature and man and the universe. The clarity and vigor with which mass and space are resolved set the level of excellence of architectural work at any period of a culture's development.
DEFINING SPACE

Space itself can assume strongly marked attributes. The Greeks recognized this, and it was an important element in their art and religion. Thus there were groves and valleys set aside for certain spirits, particular places which became sacred precincts and mountains dedicated to gods personifying human qualities. Much of Greek architecture was designed to infuse spaces with a spirit, and to serve as a link between man and the universe by establishing a firm relationship with natural space.

In Islamic architecture devices were developed for delimiting space as a positive (and often religious) element. The four minarets about a mosque establish a transparent cube of space infused with the spirit of the mosque. The dome animates the space so defined.

The square plane of the great elevated platform of the Mosque of Omar in Jerusalem sets vertical forces into motion which define a shaft of space rising from it, enveloping the dome. The free-standing archways have no function other than to frame the act of specific entering into this space.

So in cities today we must think beyond the design of buildings and circulation systems. We must establish volumes of space that are in scale with the needs of the present time and defined by means which are in harmony with modern technology. These volumes of space must be infused with a spirit which is generated by architectural forms. In this way richness and variety can be established in the city, and through the cumulative effect of various kinds of association with the different parts of the city, its citizens may build up loyalty to it.
ARTICULATING SPACE

It is one thing to delimit space by structural devices such as walls. It is quite another to infuse the space with a spirit which relates to the activities that take place in it and which stirs the senses and emotions of the people who use it. Architecture encompasses both.

By the building of a blank wall, as indicated in the sketch shown at left, a space is defined, but it remains a characterless space. The second sketch suggests how rhythm, texture, and spirit are injected into such a space by architectural means — in this case through the recall of Chinese forms.

In Sigfried Giedion's book *Architecture, You and Me* (Harvard University Press), Fernand Léger develops this principle in modern terms through the concept of "colored space." He says, "It was about 1910, with Delaunay, that I personally began to liberate pure color in space," adding that the "habitable rectangle is going to change into a boundless colored space."

Architectural forms, textures, materials, modulation of light and shade, color, all combine to inject a quality or spirit that articulates space. The quality of the architecture will be determined by the skill of the designer in using and relating these elements, both in the interior spaces and in the spaces around his buildings.

In most cities there are buildings of character which lose their effectiveness because they are situated in out-of-the-way locations; there are also prominent sites occupied by uninteresting buildings which make no contribution to the surrounding area. In urban design there should be skillful deployment of architectural energy so that the influence of fine buildings radiates outward, articulating the whole fabric of the city.
SPACE AND TIME

One of the prime purposes of architecture is to heighten the drama of living. Therefore, architecture must provide differentiated spaces for different activities, and it must articulate them in such a way that the emotional content of the particular act of living which takes place in them is reinforced.

Life is a continuous flow of experience; each act or moment of time is preceded by a previous experience and becomes the threshold for the experience to come. If we acknowledge that an objective of life is the achievement of a continuous flow of harmonious experiences, then the relationship of spaces to one another, as experienced over time, becomes a major design problem. When viewed in this way, architecture takes its place with the arts of poetry and music, in which no single part can be considered except in relation to what immediately precedes or follows it.

The Botticelli painting above depicts a space beautifully scaled and simply and powerfully articulated for the great event which is taking place within it. It is also a representation of time: the flow from the past is symbolized by the archway to the left, and the anticipation of the future is represented by the glimpse (through the archway at the right) of open space extending to the horizon and beyond.

Since designers should provide a setting for a totally harmonious life experience, the dimensions of their designs should encompass the whole of a day, the whole of a city.
SPACE AND MOVEMENT

Up to this point architecture has been discussed as a series of linked spaces, each possessing a particular quality and each related to the other. The purpose of a design is to affect the people who use it, and in an architectural composition this effect is a continuous, unbroken flow of impressions that assault their senses as they move through it. For a design to be a work of art, the impressions it produces in the participator must be not only continuous, but harmonious at every instant and from every viewpoint. It is the failure of the architect to project himself into the mind and spirit of the people who are to experience his designs that causes much of the staccato feeling to be noted in work today.

In order to emphasize this point I use the word “participator” to designate the person who senses the flow of messages that are transmitted by a design. The changing visual picture is only the beginning of the sensory experience; the changes from light to shade, from hot to cold, from noise to silence, the flow of smells associated with spaces, and the tactile quality of the surface underfoot, all are important in the cumulative effect.

Underlying it all is the modular rhythm of footsteps, the unchanging measure of space since earliest civilization. There is the muscular effort to cross a court, for instance, or the exhilaration induced by the prospect of ascending or descending a stairway. Only through endless walking can the designer absorb into his being the true scale of urban spaces.

A magnificent example of architecture related to movement is in China, north of Peking — the Tombs of the Ming Emperors. The long approach, cut through a forest, is distinguished by rhythmically spaced archways and stone figures, animal and human, which face the procession route. The climax is the groin-vaulted pavilion in the center of the semicircular mountain range. At the foot of the mountains are thirteen pavilions, behind which rise thirteen mounds containing tombs of emperors, so superbly placed that they bring into play, in memory of the dead monarchs, the entire volume contained within the mountain arc.
DEFINITION OF ARCHITECTURE

Each generation must rework the definitions of the old symbols which it inherits from the generation before; it must reformulate the old concepts in terms of its own age.

Using the range of ideas discussed so far, weaving them together into an organized relationship, we can formulate a definition of architecture that will serve as a working basis for the discussion which follows.

Architecture is the articulation of space so as to produce in the participator a definite space experience in relation to previous and anticipated space experiences.

INVolVEMENT

To put an awareness of space to use creatively requires participation in a process involving the whole range of one's capabilities.

At various times in history this process of involvement has reached a high pitch. One such period, certainly, was the Periclean Age in Athens, and another was the eighteenth century in Europe, the age in which Francesco Guardi made the drawing opposite. When an artist of the caliber of Guardi sees the world with such clarity, we are indebted to him for the gift of insight he brings to us, regardless of the environment in which we live.

This is architecture, not to look at, but to be in. It draws us into its depths and involves us in an experience shared by all the people who are moving about in it. The same kind of experience can be encountered at the Villa d'Este, at Tivoli, where the fountains are not merely something to see but something to be experienced. As the water sparkles, gurgles, and flows on all sides of us, we are completely involved by it. So it is, or should be, with the city. The designer's problem is not to create façades or architectural mass but to create an all-encompassing experience, to engender involvement.

The city is a people's art, a shared experience, the place where the artist meets the greatest number of potential appreciators. In many kinds of human relationships it is the function of the active person to establish the creative force and also to develop receptivity to it. So it is the function of the designer to conceive an idea, implant it, and nurture its growth in the collective minds of the community in such a way that the final product has a reasonable chance of coming close to his original concept.

The designer thus functions in time and space: he conceives forms as pulsating expressions of organic vitality flowing through the structure of the city, and he brings to the mind of the community the significance and meaning of the evolving forms in the flow of the total development. Simultaneously, he brings into full focus the physical realization of an idea which had been implanted before and establishes a glimmer of the vision of the development to come. This can be compared to the interweaving themes in music where one theme interlocks with another in the flow of time. In this manner a vast number of separate acts of city-building can be brought into relationship with one another over a considerable span of time and over a large area.

Should anyone conclude that this process places the designer in an autocratic position that will enable him to force his ideas on the community, I hasten to say that under the democratic system there are so many safeguards and processes of rejection that the possibility of overriding the sentiment of the community is extremely unlikely. Almost invariably, the final product of the designer at the city scale will be quite different from the original form proposed. To fail to provide any coherent vision of a finer, healthier, and more inspiring city is to fail to provide people with something to which they can react. The development of an adequate hypothesis or "design idea" of what the city ought to be imposes a severe disciplining on the designer and on the nature of the design itself, but until it is done there is nothing to accept, reject, or modify. The technical nature of his hypothesis, or vision of a "design idea," is of the greatest importance and consequently the subject of a major portion of this study.

True involvement comes when the community and the designer turn the process of planning and building a city into a work of art.
MEETING THE SKY

Throughout history, architects have lavished much of their tenderest care on the part of the building which meets the sky. From the akroterion of the Greek temples, which delicately fused the harsh pedimental triangle with the upper atmosphere, through the spires and turrets of the Gothic churches, from the tortuous writhing figures, volutes, and urns on Baroque parapets to the cupolas and iron filigree of the Victorian period, this area has been a characteristic expression of the spirit of the times. Now, all too often, we establish a typical floor and repeat it mindlessly upward—all thought ceasing before the sky is reached. We sweep our rubbish into the upper air and use it as the crowning feature of our designs, with pipes, air-conditioners, and TV aerials as symbols of our relationship with the infinity of space.

The skyline of the city has long been a dominant element in urban design and should be reconstituted as a major determinant in city-building.

MEETING THE GROUND

The way in which the building rises out of the earth determines much of the quality of the entire structure. The constant and inspired expression in Greek architecture of the raising of the temple onto a podium elevated above the surrounding land was followed by the Roman expression of beautifully patterned marble-paved spaces which bound buildings together and set the scale of the foreground. Medieval architecture rose sheer from the level of the earth, but this earth was enriched by paving, by the buildings around it, and by the wellheads and fountains upon it. The raised podium and flights of steps were used to give stability to Renaissance buildings and beauty to the squares in which they were placed.

Today it seems as though we had lost such vision and care little that our important buildings stand almost as miscellaneous features among areas confused and dehumanized by automobile spaces and by ill-placed and ugly street lights and signs.
POINTS IN SPACE

Here is the excitement of points in space positioned freely, yet firmly established in the complex spatial geometry of the composition. Point reaches to point across the void. Tensions are set up between them, and as the observer moves about in the composition the points glide and move in relation to one another in a continually changing harmonic relationship. This is one of the finest aspects of many of the very great compositions. The plane of the point at the top of the obelisk in the Piazza Navona relates to the two towers and the dome of Sant' Agnese and then dips down to the heads of the sculptured figures in the fountains at each end. The points at the top of the two domes of the Piazza del Popolo interplay with that of the Sixtus V obelisk in the center. With much of our modern building, we have tended to lose the articulation of explicit points in space, thus robbing ourselves of many of the dynamic possibilities for harmonic spatial effects.

RECESSION PLANES

Here the basic composition is set back behind firm pylons which rise on each side of us and serve as a link between ourselves and the architectural forms, heightening their dramatic power. This is the prosenium effect, the establishment of a frame of reference to give scale and measure to the forms behind. It was frequently used by the Greeks, who skillfully placed their propylaea to emphasize depth and to define the approach to their temples — even in the most isolated sites. In China and Japan much the same purpose was served by free-standing gateways. While we are unlikely to use triumphal arches today, the creation of a setting for a building, the establishment of linkages in scale with objects in the foreground, such as flagpoles, sculpture, or stairways, as a measure of depth, remains as important as it ever was, and much can be accomplished by the careful placing of large buildings and small buildings in relation to one another.
DESIGN IN DEPTH

In the interrelation of these two arches, one deep behind the other, we again have a symbolic representation of a pleasurable human experience, that of penetration in depth. This form has been used repeatedly in the history of architecture. We see it in the archway of the clock tower in Padua, which interacts with the bull’s-eye window of the little church across the square; and we see it in the recession of the arches in medieval battlements and in the series of doors in a Renaissance palace. A sense of movement in depth is established, and, where the architectural forms are related to one another, the size of the space is made comprehensible by a comparison of similar forms reduced by diminishing perspective. Exemplified here is a device for unifying form in space and giving coherence to design on an urban scale.

ASCENT AND DESCENT

The use of varying levels as a positive element in the design composition is brilliantly portrayed here, with emphasis on the process of ascending and descending from one level to the other. We can sense the joy of anticipation of running up a flight of steps, of the muscular effort to reach the higher level and the feeling of satisfaction when this is achieved. There can be an equal sense of pleasure in descending a stairway and anticipating the unfolding forms of the level below. Even in Ostia, the ancient port of Rome, built on a flat plain, prominent buildings were set upon very high bases that had great flights of steps, providing the citizen with the pleasure of a change in level.

With the revival of interest today in the use of many levels, stairways have taken on new importance as design elements. The use of mechanically driven escalators imposes a new architectural discipline because of the perceptual sequences they produce.
CONVEXITY AND CONCAVITY

Here we see the continuous interplay of two forms, the positive and the negative, the massive and the spacious, convexity and concavity. The forms envelop us and involve us completely in their spatial animation. In design of this sort, interrelationships are established between parts at all levels. Design is not confined to forms that depend on the land as the basic connector; it functions effectively in new kinds of relationships at each level in space. It is not limited to the manipulation of flat planes but involves buildings freely positioned in spatial volume. In our own day there has been a resurgence of interest in the use of curved forms, but all too often these have been conceived as isolated forms in space. Architects have not taken advantage of the full excitement of interplay that is possible.

RELATIONSHIP TO MAN

In this last view of the drawing, we are concerned with the relationship of the architect to the man he is seeking to house. The forms are carefully scaled to involve the people within the building, to flow from that part of the structure the people can see at close range, that they can touch and feel. Unlike some Renaissance architecture, where the base of a column towers above the heads of the people, the column here is set on a pedestal within reach of the people passing by it.

The point of contact of the Greek Doric column with the marble block of the temple floor is in perfect relationship with the viewer. Even the most monumental of the classical Roman work was designed so that the bases of the columns were within reach of the hand. Today, with the towering dimensions of so many structures, the designer must devise new means for establishing a connection between the building he creates and the people on the ground.
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DESIGNER AS PARTICIPATOR

The seventeenth-century engraving on the facing page poses a question that persists today: Is the designer thinking of his work from the lofty bird's-eye viewpoint of a disembodied intellect, or as he able to project himself into the person of the participator, and so conceive his design in terms of the effect it will actually have on the senses of the people who use his buildings?

The answer to this is greatly influenced by the designer's philosophic and scientific apprehension of the culture of which he is a part, by the way he represents his ideas, and by the relationship of his method of representation to the actual realization of the building on the ground.

A contemporary illustration of this relationship is provided by the two photographs to the right. The upper one is a study model of the new town of Välingby outside Stockholm, and the lower one shows the actual town as it was built.

Here much of the designing was done through the use of blocks (representing buildings), which were placed and moved about on a cardboard base. The view from an airplane of the completed project (below, right) is extremely impressive. It places the observer in the same angular relationship to the finished town as the designer was while he was making the study model. However, when one actually enters Välingby on foot and moves about in the town, one looks in vain for a central organizing space. In fact, Välingby is not as satisfying an experience on the ground as it is when viewed from the air, and this, I believe, is because the design was conceived primarily in terms of the model and not from the viewpoint of the pedestrian who was to walk about in the town itself when it was built. This stresses the importance of developing new ways of representing present-day design concepts, and the necessity of achieving a deeper understanding of the actual effect of a design on the people who use it.

In his 1781 book, A Series of Plans for Cottages, Habitations of the Laborer, . . . John Wood the Younger, the great architect of Bath, (see page 185) says, “In order to make myself master of the subject, it was necessary for me to feel as the cottager himself . . . no architect can form a convenient plan unless he ideally places himself in the situation of the person for whom he designs.”
The engraving above, from Andrea Pozzo's *Prospettiva de' Pittori ed Architetti*, published in Rome in 1723, sets forth the problem of the interrelation of apprehension, representation, and realization.

Apprehension, as Heinrich Wölflin points out (page 11), is a living and constantly changing power, influenced by the philosophical, religious, and scientific attitudes of various periods. It is the basic power which the architect exercises while he is designing in space.

Representation is the means by which spatial concepts are reduced to tangible images, and realization is the establishment of definite three-dimensional forms—the phase of which Walt Whitman speaks on page 15. It is only when these three elements are in harmony that great design is produced.

The Renaissance man in the Pozzo engraving apprehends space within the framework of the new humanity of his period, with its fresh emphasis on the individual and on individual experience.

The images in his mind are deeply influenced by the new method of representation—scientific perspective. Thus this picture can portray both the representation on the picture plane of an already existing reality, or, conversely, the projection of an imaginary three-dimensional concept which exists in the mind of the designer.

These two phases interact on each other, the concept influencing the structure and the structure influencing the concept in a never-ending interplay.

The designer conceives a three-dimensional form which is later built on the ground. From observation of this he gains new understanding of his own mental symbols as expressed in his two-dimensional drawing. However, there is a conflict between the drawing and the three-dimensional reality. Thus the four pylons in the drawing above, through which one can move in ever-changing directions, seem startlingly different from their perspective representation on the picture plane. This poses a dual dilemma.

In order that his three-dimensional concept
be realized through actual construction on the ground, the designer must reduce it to a two-dimensional, representational image which serves as the medium of communication to the builder, who must put it back into three dimensions again. This two-dimensional image also serves as the medium of communication to the client and to the general public, whose support may be necessary for its construction. When a design is truly rich in its three-dimensional aspect, to reduce it to a two-dimensional image may destroy its most vital qualities and thus result in a most imperfect process of communication. This occurred in the case of the winning design by Pedersen and Tilney for the Franklin Delano Roosevelt Memorial in Washington, D.C. The essential nature of the design was totally misunderstood by many of its critics because it was not reducible to a picture plane.

The second problem occurs in the mind of the designer himself. This is so because his work is limited by the stock of images, by the range of the vocabulary of conceptual models, at his command, just as a mathematician is limited by the mathematical symbols he uses. In vast three-dimensional design problems at the scale of the modern city, the traditional range of two-dimensional symbols has proved to be totally inadequate for the task at hand.

In the medieval era (see pages 53 to 57) perception and apprehension were often indivisible, and the representation or communication problem was greatly simplified because the designer and the builder were often the same man. In the Renaissance period, the buildings and their mode of representation were very much in harmony because building design was largely an outgrowth of form produced by scientific perspective.

Today our design problems have expanded to a degree of complexity that is beyond the capacity of perspective to represent. Thus traditional representation breaks down as a means of communication, and, even more important, it fails to provide the range of symbols that the modern designer needs for the formulation of his concepts.

In the chart below an attempt has been made to summarize the interaction of apprehension, representation, and realization over four periods of history. I have put question marks in the last two sections of the modern period because the questions raised in these areas are still unresolved.

<table>
<thead>
<tr>
<th>MEDIEVAL</th>
<th>APPREHENSION</th>
<th>REPRESENTATION</th>
<th>REALIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intuitive Design</td>
<td>Awareness of total environment</td>
<td>Simultaneously several objects from various viewpoints</td>
<td>Construction closely integrated to its environment</td>
</tr>
<tr>
<td>RENAISSANCE</td>
<td>The precise observation of one individual at one specific moment</td>
<td>Rational, rigid, one-point perspective of a single object in space</td>
<td>Single, self-sufficient buildings, detached from surroundings</td>
</tr>
<tr>
<td>INDIVIDUAL-CENTERED Design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAROQUE</td>
<td>Experience as simple continuity in time</td>
<td>Simultaneously multiple planes receding in space to single vanishing-point</td>
<td>Structures related to movement along a single axis</td>
</tr>
<tr>
<td>Single Movement System</td>
<td></td>
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</tr>
<tr>
<td>MODERN</td>
<td>Space-time relativity</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Simultaneous Movement Systems</td>
<td></td>
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