7 Body Movement Robert J. Yudell

The interplay between the world of our bodies and the world of our dwelling places is always in flux. We make places that are an expression of our haptic experiences even as these experiences are generated by the places we have already created. Whether we are conscious or innocent of this process, our bodies and our movements are in constant dialogue with our buildings.

There is, perhaps, no more clear and powerful image of our relation to the forms built with our own hands than the caryatids of ancient Greek temples. These young maidens, carrying the weight of ornamented and inhabited entablature and pediment, stand serenely, seemingly not burdened by the transfer of a great load. They establish the link between earth and sky, between the rocks upon which they stand and the gods whose lives are recorded in the pediment. Nor are they static or frozen in this role. Undaunted by their special burden, they express the potential for movement as, with raised knee, they are ready to venture with ease and certainty into the space of their mortal world. This image of humankind carved into architecture affirms our place in the world. (79)

As with the caryatids, our movements are ever subject to the same physical forces as are built forms and may be physically contained, limited, and directed by these forms. Inevitably they are more intricately entwined with and dependent upon architecture than are the sound and notation expressions of conversation, song, music, and writing. This critical interaction of body form and movement with architecture deserves careful attention.

The Spatiality of Movement

It is not surprising that forms are more often the focus of our attention than space or movement in space. Space is typically thought of as a void or as the absence of solid, and movement thought of as a

domain separate from its existence in space.

We can look to the dancer for some fresh sense of these realms. Dancers speak of "feeling" space. This ether through which most of us look, focusing on solid objects, becomes real "stuff" to the dancers. Martha Graham, the doyenne of modern dance in this country, would regularly base a set of exercises on the haptic experience of space; her students were asked to hold, push, pull, and touch pieces of space and places in space. A natural outcome of this kind of training is that the entire body gradually is mobilized to touch and feel space, so that movement becomes not a vague indescribable set of reflex actions, but an articulately felt interaction with the positive stuff of space. The dancer and the space animate one another as partners.

If dancers feel a critical relationship to the space outside their bodies, they also sense an essential relationship to the inside. In forms as divergent as classical ballet and modern dance the practitioners speak of the constant need to find or feel one's "center." This is usually described as being in the region of the deep abdominal muscles, but the location is not as important as the fact that the "center," the inside, must be felt before the dancer can confidently move in space, the outside. This is, indeed, reminiscent of our need to sense the security inside our dwelling place in order to act with strength in the outside community.

A vital aspect of the dancer's maintenance of a sense of body center while moving in space is the continuous awareness of the pull of gravity. This omnipresent force that we seldom consciously consider is the object of the dancer's acute awareness. Dancers' responses to gravity have been varied but always intense, almost obsessive. Ballet has developed, in part, as the art of denying gravity, and years of technical training are devoted to creating the illusion of effortless leaps and flutters through space. With contrary intention but an equally powerful response, much of modern dance and folk dance displays and celebrates the pull and power of the earth with the actions of falling, stomping, and embracing the ground. In one of the revolutionary acts of early modern dance, Mary Wigman scandalized German audiences by bumping her way across the stage on her back, feet, and hands. In this performance of 1919 she was saying that gravity, the earth, and down are real and that we are inevitably bound by such powers.

Thus "center" is not a concept of geometry but one of the musculature with all its kinesthetic ramifications, of orientation in response to the pull of gravity, and of a sense or feeling of inside.

Looking at the body in space, we find that geometric abstractions and descriptions quickly assume layers of associative meaning. Rudolf Laban, an influential pioneer in graphic notation for dance, has described movement in terms of the "frontal," "vertical," and "horizontal" planes, providing a triaxial structure remarkably similar to the psychophysical coordinates of the body-image theorists.[40] A look at the vertical and horizontal

dimensions is especially relevant to movement in architectural space.

The standing figure becomes a symbol as well as an element of the vertical axis. As the implicit link between earth and sky, he or she becomes the communication between the two realms. And because these realms have radically different properties, the body becomes the matrix for the synthesis and resolution of this polarity. Up and the sky are divine, spiritual, ethereal, light, rarefied, spreading, a canopy. Down and the earth are material, mineral, dark, compact, firm, a solid, a cave.

Movement upward can be interpreted as a metaphor of growth, longing, and reaching, and movement downward as one of absorption, submersion, and compression. Since the images of womb and tomb are associated with the earth, and images of resurrection and the afterlife are related to the sky, the vertical axis is also closely bound to the concept of transition through the cycles of life.

In contrast, movement in the horizontal plane relates only to the earthly stage in that cycle. Laban has identified this plane as the zone of communication and social interaction. The communication or change, however, is not related to the personal longing which is associated with the vertical axis.

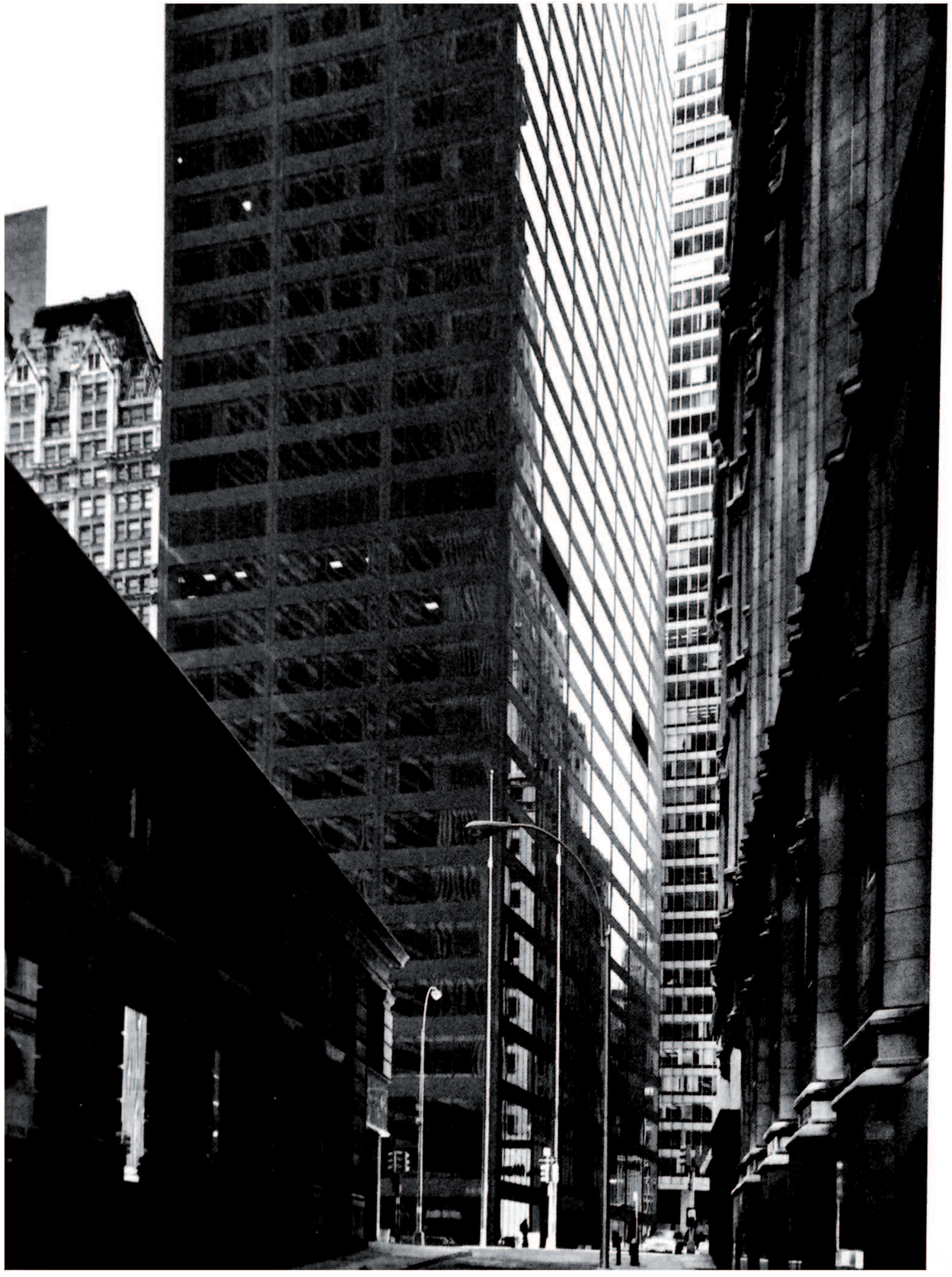
All human movement traces complex spatial configurations. Its forms can be seen as a compounding of movements through the spatial axes—a process continually changing in time. Curvilinear and diagonal motions are developed in relation to the two axes, while spiral and helical motions are developed in relation to three axes. It is interesting to note that movement in two axes or one plane, such as walking, running, and most forms of human locomotion, is the most prevalent mode in a typical day's activities. Movement in one dimension, such as diving into the water (a very tightly defined and restricted movement), and movement relative to three dimensions, such as the baseball player's wind-up (a very spatially complex and dynamically changing movement), are both exceptions to our normal patterns.

Although we are capable of an infinite range of movements, most of us move within a fairly narrow range of our possible spectrum. One of the critical determinants of this range is the built environment: the spaces and stuff that we construct and inhabit.

The Building as a Stimulus for Movement

All architecture functions as a potential stimulus for movement, real or imagined. A building is an incitement to action, a stage for movement and interaction. It is one partner in a dialogue with the body.

We need only recollect our own childhood activities to see how easily sparked is the haptic interaction of body form with built form. Consider the simple game of stepping on every crack in the sidewalk. Here the child plays his body (its dimensions, shapes, and rhythms) against the given grid of the sidewalk paving. Usually the chance cracks



are integrated into the game, thus complicating the time and movement patterns that are developed. Or consider the game of hopscotch. Here a bilaterally symmetrical chalk grid is the "structure" with which the body plays. Variations in the speed, rhythm, and dynamic of the movement are rather simply induced by the configuration of the grid; fast, less stable movement through the single-box-one-leg hops, slower, more controlled and balanced movement through the double-box-two-leg maneuvers, and jump turns at the ends of the grid. In both games the body is stimulated by the physical pattern into an interaction which generates a kind of spontaneous primitive dance. It is an experience almost all of us have shared and of which we are still capable.

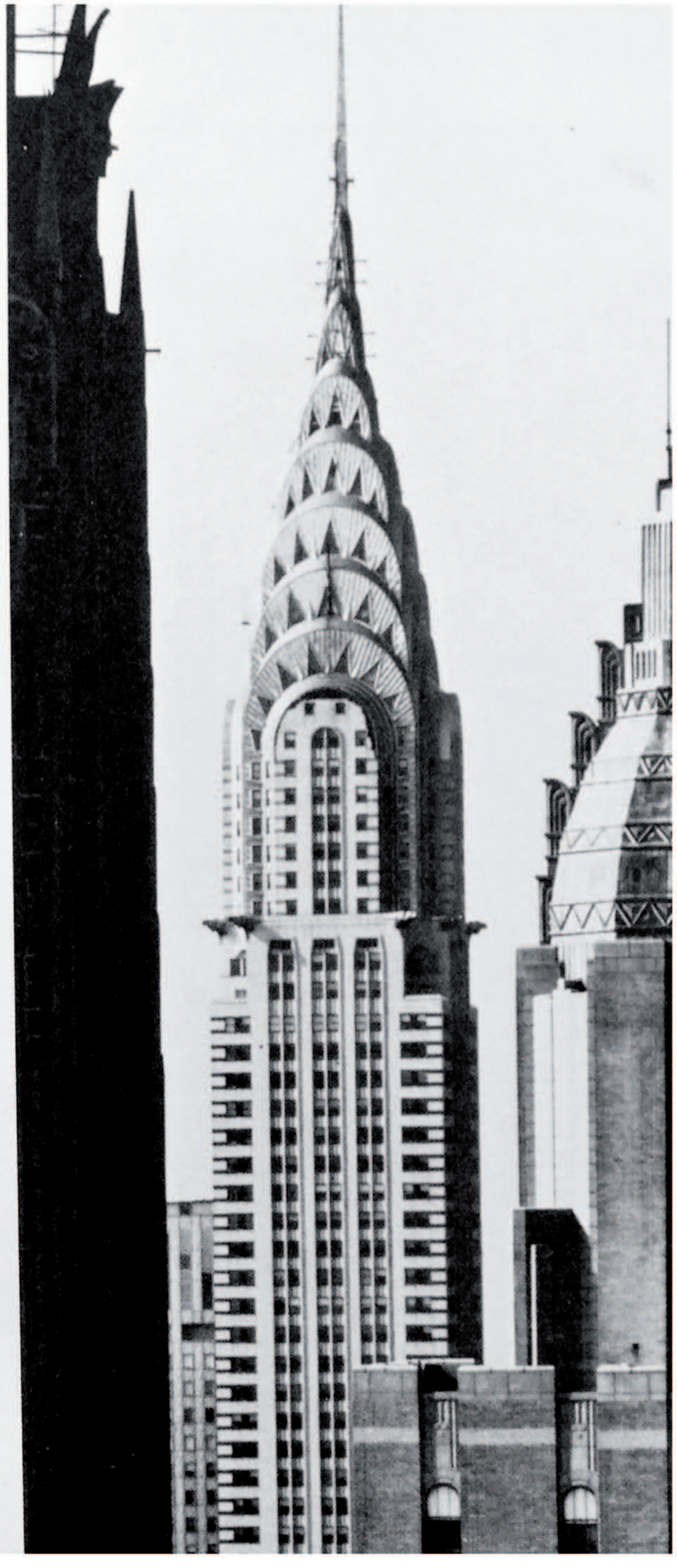
Another common experience, running a stick along a picket or cyclone fence, also shares these characteristics. The regular periodic spacing of the pickets or steel wire is the "Cartesian" given of the built environment. The rhythmic variables are the speed and pacing with which the child or "musician" moves against the grid. Here a kind of music is the product, and the importance of both the animate and inanimate participants is heightened.

The ebbs and flows, weights, rhythms, and surges that emanate from us are inherent in the body and its movements. Try to walk in precise and even measures. Even if you succeed in doing so horizontally, as in a march, there will still be complex rhythmic events in the vertical dimension

(the raising and lowering of the chest with breathing and the changes in the relative alignment of body weight), not to mention the internal rhythms of heart and pulse.

Given this rhythmic richness which we all possess, and the fact that patterns as mundane as pavement cracks and picket fences can elicit complex haptic responses, we might well wonder why any building cannot be as good as the next in generating a body response. Why are we not *moved* by our neighborhood shopping mall or city center office tower? Take, for example, a typical curtain-wall skyscraper. Its potential for pulling us into the realm of a movement or sound game is almost nil. We can neither measure ourselves against it nor imagine a bodily participation. Our bodily response is reduced to little more than a craned head, wide eyes, and perhaps an open jaw in appreciation of some magnificent height or of some elegantly prescribed mullion detailing. (80)

Compare this with a 1930s ziggurat skyscraper such as the Chrysler building. (81) Here we have not only the vertical differentiation of the building but chunky setbacks which conjure landscapes or grand stairways. We can imagine scaling, leaping, and occupying its surface and interstices. Even the cheap and efficient stepped-back curtain-wall buildings erected along New York City's Park Avenue in the 1950s and 1960s provide us with some form of imagined cubic landscape, in spite of their forfeiture of body relation at smaller scale and at street level. (82) A section through a street



80 (opposite)
The most that an ordinary curtain-wall prism can elicit from us is a craned head and perhaps an open jaw

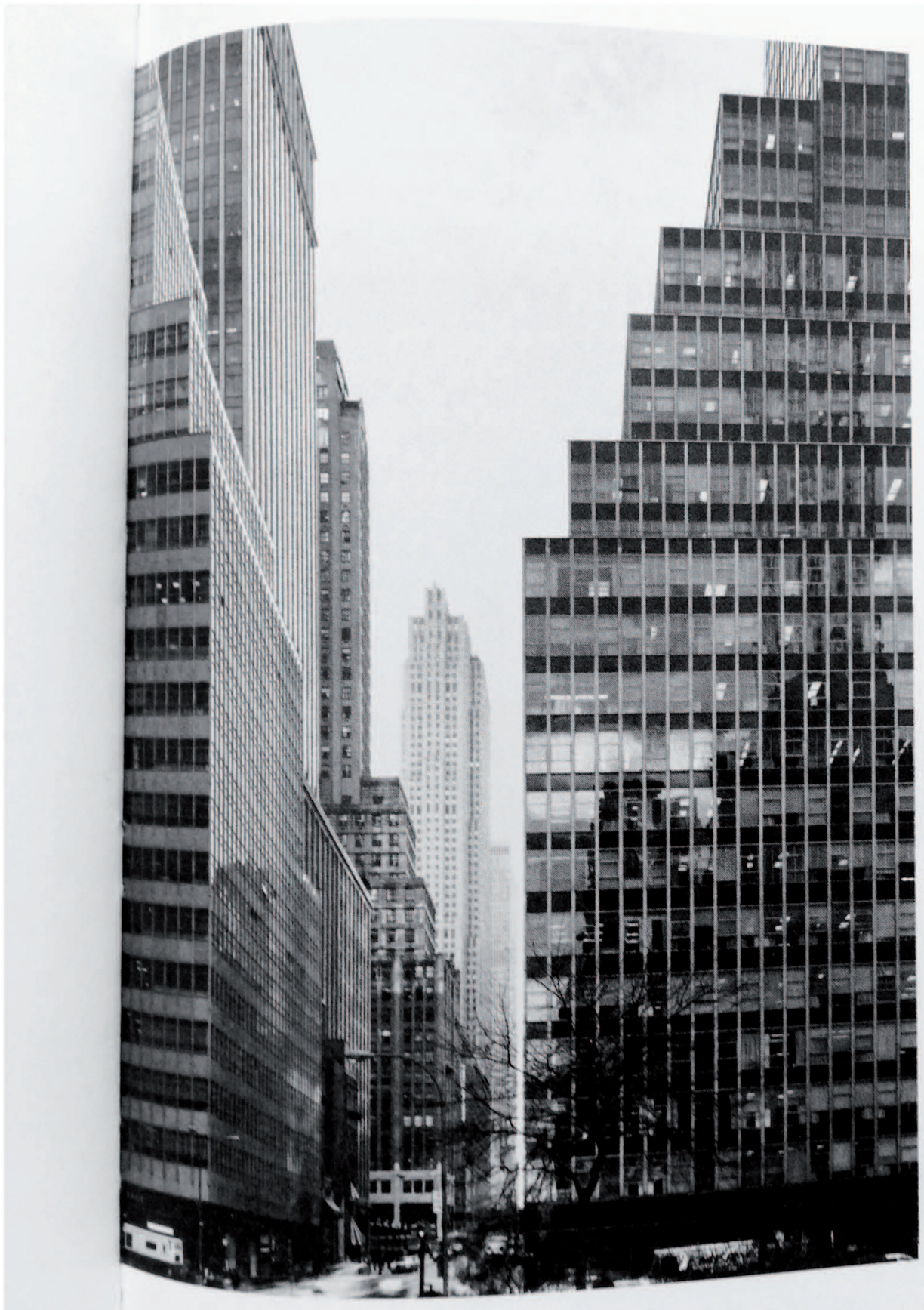
81
But we can imagine ourselves occupying the pinnacles of the Chrysler building

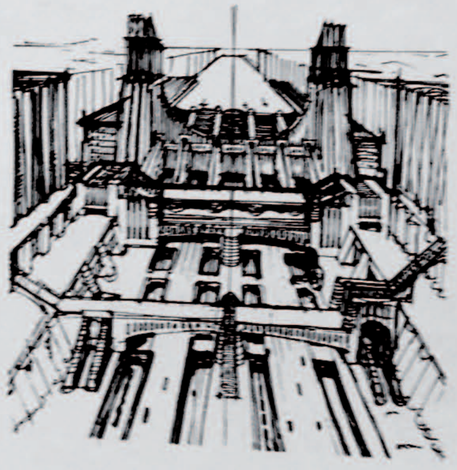
82 (left)
Even the cheap ziggurats of earlier New York zoning laws invite us to people their landscape

83, 84 (opposite)
The ziggurat buildings yielded a street section like a canyon (left); but the sheer prisms give us shafts, out of which even Superman could not leap "with a single bound" (right)

flanked by ziggurat buildings yields the "canyon," (83) quite different from the tight, unpenetrated slot that the sheer curtain-wall towers produce. By these we are given not the "canyon" but the "shaft," (84) and the difference in imagery is significant. Man can climb into and out of a canyon, but traditionally his way into and out of a vertical shaft must be aided, usually by some form of mechanical lift. He is therefore rendered somewhat less independent and considerably less mobile. He is now the object of an operation, not the subject of an action, and this change has important implications for his sense of himself and his strength and vitality. Even Superman could not leap out of the shaft in one of his "single bounds."

In periods when people were excited about new ideas for grand action in the environment, their buildings and visions seemed to reflect a more acute sense of what the body could or should become. The "King's Dream of New York" of





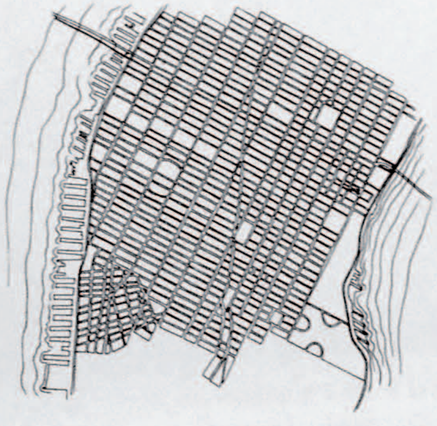
85
Citizens were in action in "King's Dream of New York" in 1908

86
In Sant' Elia's visions not much later, the human body in action never appears

1908, an illustrated tract conceived at a time when builders were aroused by the possibilities presented to them by new steel-frame building technologies, depicts throngs of citizens brushing by buildings in dirigibles, partying on skyscraper rooftops, and rushing across the trestle bridges high above multilayered streets and rapid transit traffic. (85) It was a vibrant image of action. Only a few years later, and in sharp contrast, Sant' Elia's futurist visions show a fascination with the speed and movement promised by new technologies. Streamlined vehicles streak through elegant machinelike building forms, but never is there a glance at a body in action. (86) Much as in the "shaft," the body must again be moved, while in the "King's Dream" we could still move ourselves.

Some of the most vivid and energizing images of the body in space come out of Russia in the years closely bracketing the Revolution. The majority of political posters by designers of this period feature man in action as the dominant theme. (87, 88) Bodies are leaping and flying through space, often in collage with elements of building form. These images impart tremendous excitement and confidence but also a sense of imbalance. It is surely no coincidence that diagonal movement through space is a persistent image. For by its nature diagonal motion is less easily oriented and its termination less predictable than that of either pure horizontal or pure vertical motion. In fact, diagonal motion appears to be related to quick change or upset in an existing order. The space of

Western cultures is usually ordered in a rectangular grid. When we want a short cut, a quick transition, a transformation, we cut through at a diagonal. The simple act of "cutting through" a neighbor's property or what Broadway does to Manhattan's grid (89) are in the same family of action as that asserted by the Russian Constructivist posters with their vivid diagonal body motions. They were saying "make a new order," but, more important, they were saying "make it with your body."



87
In Russian revolutionary political posters, bodies in action move diagonally across the frame

88
As people and (especially) buildings make a diagonal thrust

89 *(below)*
In New York, Broadway cuts across the grid

90
Tatlin's Monument to the Third International (1919–20) spirals diagonally

The Building as a Stage for Movement

If one combines the diagonal, the most dynamic single axis, with the spiral, the most spatially complex configuration for body movement, one produces the basic form of Tatlin's Monument to the Third International. (90) Even the static model of this unbuilt Utopian vision seems to streak and spin through space, implying a movement which begins with the building itself but which shoots out into space and the future. Indeed, the inner cylinder of the structure itself, housing conference and meeting rooms, was to have revolved about its axis once a year. There is an excitement here which goes beyond technology to man's role as an active agent.

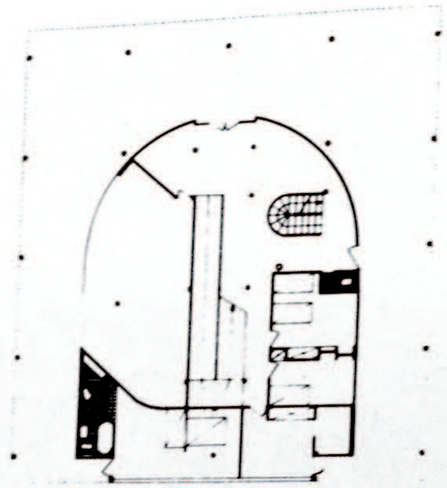
If this vision acts as a call to move, it also implies a stage and arena for the movement and for the complex interactions of many bodies in motion. In those Russian posters the energy of the bodies was more than the sum of the parts. Compositionally a new whole was made by the relationship of the bodies to one another and by their further relationship to built or planar form.

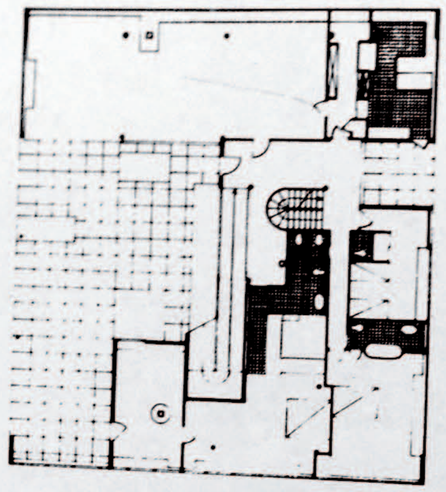
Similarly, buildings can encourage a choreography of dynamic relationships among the persons moving within their domains. Hans Scharoun accomplishes this in the foyer of his Berlin Philharmonic Concert Hall by slipping cascades of stairs over and under one another in diagonal relationships that begin to challenge one's sense of order and orientation. (91) A surprisingly similar and

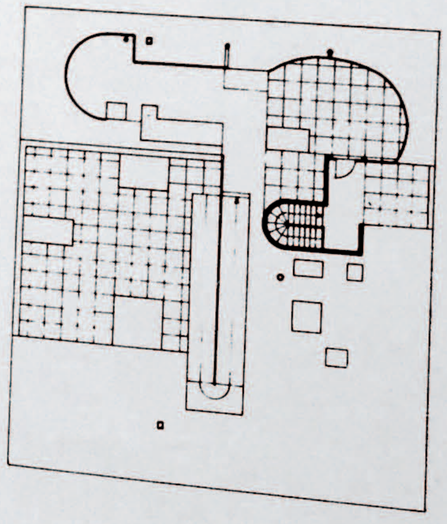
equally dynamic phenomenon can be seen in Moore/Turnbull's Faculty Club in Santa Barbara. (92) In both places people and their paths spin out a somewhat frenetic and highly energized spatial configuration. The potential disorientation forces on us an awareness of our own movements as well as our spatial relationships to one another. The tendency toward disorientation seems acceptable, even healthy, because it is so overt. We are put on alert and can respond to the situation. It is, in that sense, similar to climbing a tricky slope: one's

91
The stairways in Hans Scharoun's Berlin Philharmonic encourage dynamic interrelationships

92
As do those at the University of California Faculty Club in Santa Barbara







93
In Le Corbusier's Villa Savoie a stair and a ramp play against each other

94 *(opposite)*
At one point they are almost tangent

senses are heightened and one's bodily responses are quickened. Since we cannot, however, regularly function on the edge of disorientation or in the frenzy of dynamic complexity, stimulating though it may be in short exposures, we must employ other equally rich but more subtle means of experiencing one another and space.

Le Corbusier is masterful in his elegant weaving of different kinds and patterns of movement. In the Villa Savoie, for example, he provides two paths of vertical circulation. (93) One, a spiral stairway, is clockwise, curvilinear, and incremental in its vertical progression. The other, a ramp, is counterclockwise, rectilinear, and continuous in its vertical progression. These are related at a 90° angle to each other so that they have one point of near tangency. (94) In addition the paths are arranged so that this zone of tangency corresponds to the mid-level of the stair path and the full level of the ramp path. Thus, by an exceedingly skillful arrangement of otherwise fairly standard architectural elements, he has generated a highly complex periodic pattern of space–time relationships, experienced primarily through body movement. It is most exhilarating when we can sense our movement in relation to a person on the other path; catching and losing sense of that person, playing curve off straight and step off stride. Then we are acutely aware of our own movement by its periodic relation to that of another participant. The architecture takes on more life and gives more as it becomes a stage for movement.

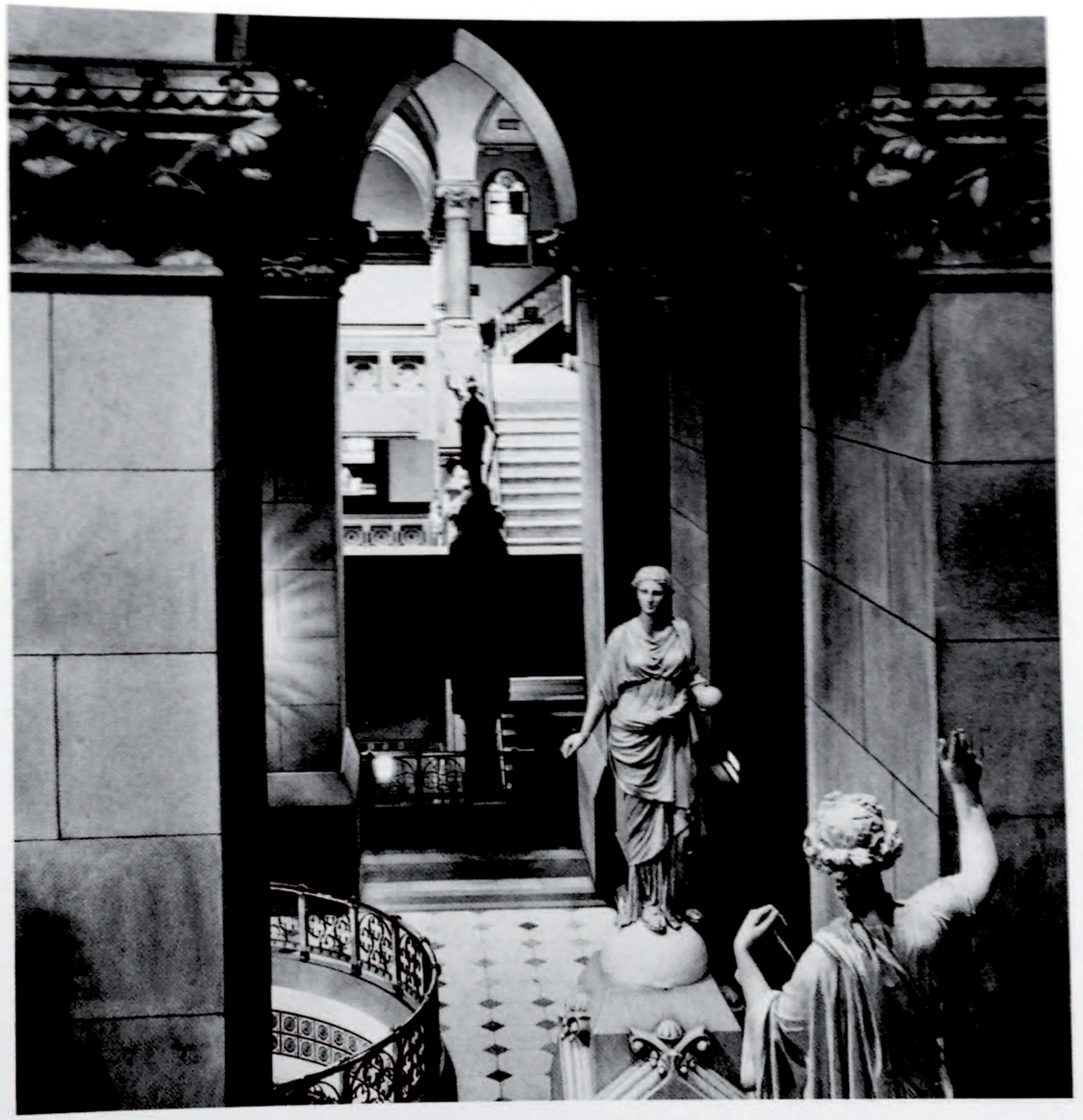
The Building as a Partner in Dialogue

The setting of a stage is but one aspect of the extended dialogue between body and building. We might simply ask what the building tells us about the place of our bodies within and around it. This may have as much to do with static fit ("Where do we sit, lean, nestle?") as with dynamic fit ("Where and how do we move?"). Richard Upjohn's Connecticut State Capitol is ready with answers to these questions. (95, 96) Its corridors, halls, and stairways are faceted with body-sized articulations that welcome our presence. Substantial stone balustrades invite cozy leaning. Niches and bays occur on landings and in halls so that intimate groups can gather. Arches frame the movements of others and layer these images in a complex reticulation. On any weekday all the real business of the legislature appears to be conducted in these amicable places, and the visitor is as welcome as the habitué. It is no accident that the

space is studded with stone carvings of graceful figures. The architect gave the human figure an essential place in the dialogue with his building.

This structure makes a complex but "loose fit" with the body. The body has many places and options within the space. Perhaps the opposite extreme, the "tight fit," can be seen in the Mesa Verde cliff dwellings. Here, for reasons of security, the path of access from the canyon floor to the dwellings is a set of hand- and foot-holes carved into the cliffside. The holes are arranged so that one must start from the bottom with a particular hand or else be stranded precariously just below the village. This exotic relation of body and pattern is not so far removed from the child at play with sidewalk patterns.

The fit and movements of our bodies within and around buildings are also significantly affected by our haptic sense, by the tactile qualities of the surfaces and edges we encounter. Smooth surfaces invite close contact, while rough materials such as hammered concrete generate movement in wide radii around corners and more careful, tentative movement through corridors. Changes of texture often signal special events and can trigger a slowing or quickening of one's pace. It would be possible to generate a whole choreography of movement through the composition of textural changes alone. In fact this has been explored in recent architecture for blind persons, where important spatial cues are produced by the organization of tactile experiences.



95, 96
Some great buildings such as the Connecticut State Capitol make as much of static fit (where do we sit, lean, nestle?) as of dynamic fit (where and how do we move?)

97
There is no body contact for the spaceman

98
Though there was plenty for his adventurous predecessors

Our Repertoire of Movement

The various body motions that are comprised in a typical day's activity constitute what we might call our repertoire of movement. Consider, for instance, the man who lives in suburban Connecticut and commutes to work as a midlevel executive in a 1960s glass office tower. Let's assume he lives in a large but totally horizontal modern ranch house. He takes the train fifty miles into the city, changes to a subway, and walks two or three blocks to his office. There he goes through a small lobby and into an express elevator that takes him a quarter of a mile into the sky. This man is "moving" faster and farther than mankind has ever moved before, but his movement is primarily a passive experience. Ironically, he is actually experiencing less active movement in the horizontal and vertical dimensions than ever before. His office tower, for all its impressive height, is sliced into uniform eight- to ten-foot slabs of space. His house, for all its sprawl, is similarly one slice of horizontal space. This man's counterpart of a century ago might well have walked to work and arrived at a four- to six-story building with no elevators, but with spatially ample vestibules and elaborate public stairways.

In short, in spite of going faster and farther, we seem to be functioning with a reduced repertoire of active movement. We are increasingly replacing our own body movement with propulsion of the immobilized body. We are replacing motion with "frozen speed."

Our romantic images underline this development. Compare the mythic explorers of two eras: the modern spaceman and the swashbuckling buccaneer. The former travels distances that defy conception, but he is frozen for most of that travel. He is encapsulated and propelled. Even in his encounters with threatening other-worldly creatures he makes no body contact. He stands statically and lets his ray-gun do its business. (97) But our image of the buccaneer is a man scaling masts, swinging from rigging, pushing his assailants into the sea, and masterfully wielding his sword. He moves and makes contact, and there is grace and beauty in his actions. (98) The man in the spacesuit has lost much of his potential for individual affirmation. He is more the functionary of a far-removed effort.

If the body is becoming frozen and encapsulated in space, it may also be the victim of the opposite excess: becoming unhinged, free floating, and alienated in architectural space. This tendency may well have been foreshadowed fifty years ago by some of the masters of the modern movement. Images in Mies van der Rohe's own renderings often convey a sense of the ungluing of the body from the building. In his 1942 drawing for a small museum, the Maillol figure stands free and solitary in the neutral, gridded, Cartesian space. (99) It is indeed an image of lonely coexistence. The argument may well have been that neutral, undifferentiated space permitted any action and there-

Pencil and cut-out reproductions, 30 x 40". Courtesy, Mies van der Rohe Archive, The Museum of Modern Art, New York.

99
In the Mies Museum for a Small City *(1942), a figure stands free and solitary in neutral Cartesian space*

100
Superstudio promises us an infinite gridded platform for complete freedom from place

fore conferred a new freedom. But unlike the loose fit of buildings such as the Connecticut State Capitol, this leads to no fit at all. Nor is movement either catalyzed or implied.

Insidious Strains of Futurism

In the hands of a brilliant craftsman like Mies van der Rohe, a spatiality of alienation may still provide its rewards through the elegance of material and construction. But the more extreme applications of Cartesian space present an insidious threat to our identity as individuals. The futurist group Superstudio has given us some of the most haunting images of bodily alienation. One of their visions promises the total freedom of living on an infinite gridded platform into which we may plug for energy, information, or nutritive needs. (100) We are assured that, in this Utopia, we shall no longer require clothes or shelter and that we can be transported in an instant to any part of the earth. This scenario embodies a clear denial of the need for the interaction of body and architecture. There are no landmarks, no stimuli, no stages, and no centers.

The other extreme to alienation of the body is overmanipulation of the body. The two are often complimentary phenomena, and it is not surprising that this hypermanipulation is in the domain of some of the same futurists who would have us be neutralized nomads, unhinged from our special places. Members of the Archigram group have

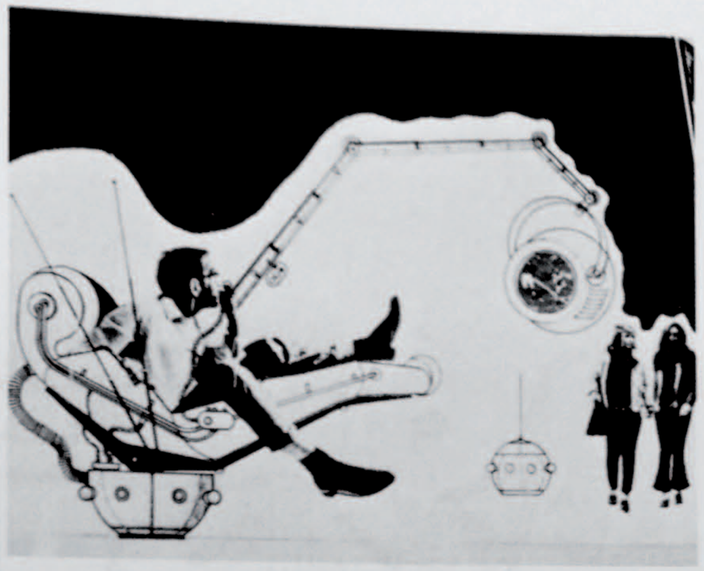
proposed such future pleasures as "Manzak":

All the sensory equipment you need for environmental information retrieval, and for performing tasks. Direct your business operations, do the shopping, hunt or fish, or just enjoy electronic instamatic voyeurism, from the comfort of your own home.

and the "Electronic Tomato":

For the great indoors, get instant vegetable therapy, from the new Electronic Tomato—a groove gizmo that connects to every nerve end to give you the wildest buzz.[41]

These are surely images of the manipulation and electronic cooption of our bodies and their initiative. (101) It is total passivity. Our bodies are circuited out of our existence as our world is realized in electronically stimulated sensation.



101
A freedom also enjoyed by Archigram's "Manzak" and "Electronic Tomato"