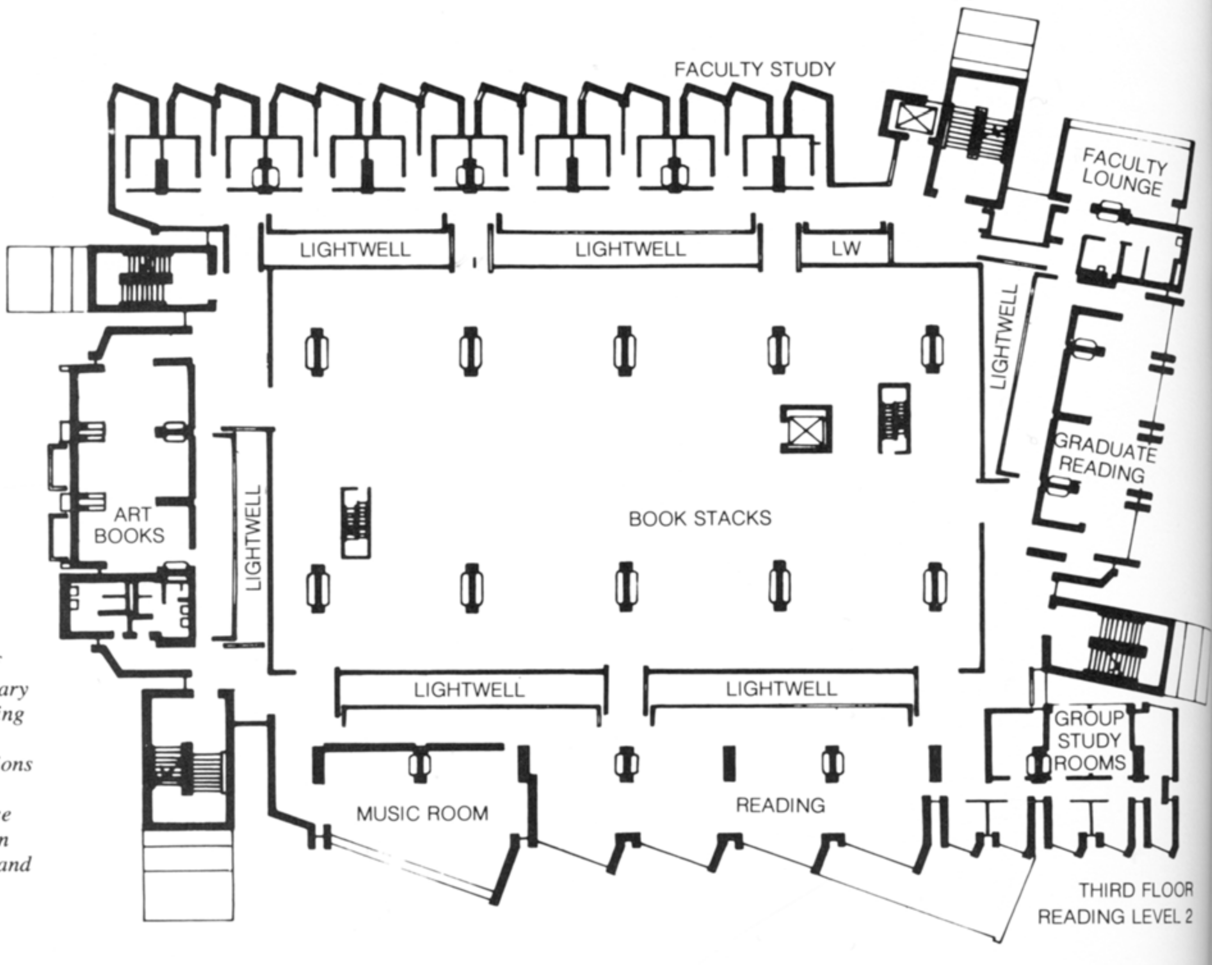
Unlike the theoretician, analyst, critic, or academic, the practicing architect must draw upon the experience of his own design practice, upon what he can record of his pragmatic search for what he perceives architecture to be. In this search some of us are concerned with what we have done and are doing and where our search will lead us. Most of us think we know our direction and have some clue to our further achievements in the context of a mainstream in current architectural history. Yet often enough, we don't, and it takes some more analytic mind or some other critic to either "put us in our place" or put us in some place, relative to other professional works.

Many architects are intuitive rather than rational; they don't deal entirely in established or proven fact, but from some "sense" of how things are or might be. Although increasingly our profession draws on people with special knowledge, it still deals not with just the scientific, actual, literal truth, but with poetic truth, with concepts, ideas, expressiveness. As a practicing architect, then, I can only offer some observations of myself, my search for what I believe architecture might be, and a sequence of statements and structures which may illustrate this.

After a rather nonlinear search in my early career, I have more recently come to see buildings and building complexes in terms of their parts: that is, individuation. Admittedly this is an analytic approach, yet only through analysis have I been able to deal with synthesizing the final programs and their accommodation in terms of construction. Starting first with an analysis of a program, I begin to translate it into architectural terms by drawing up an inventory of elements to scale and laying them out like an exploded assembly drawing of a machine. At this point there is no attempt to make it look like a machine, but merely to borrow the principles of its organization.

## *Place It, Support It, Connect It: Typing the Parts*

For some time, I have considered that there are three essential elements in architecture: (1) enclosures, generalized or specific, to accommodate function, which are static and contained; (2) elements which serve as access, or circulation, in the




*Around the central box of books in the Goddard Library of Clark University is a ring of specialties and interchangeable reading functions supported by five distinct structural frames. To these were added the circulation elements for both people and mechanical services.*

*The profusion of small reading rooms and carrels attached to the main structure of the Goddard Library is an attempt to borrow from electronics.*

kinetic function of moving people and mechanical services; and (3) structural elements which hold it all up in some sort of mutually agreeable disposition. In concept and procedure I see it as simple as (1) "place it" (the enclosures); (2) "connect it" (provide access); (3) "support it" (hold it together structurally). However, the sequence might be in reverse: starting with a structural frame to which are attached enclosures later to be connected. Or starting with a circulation system, add structure and then enclosures. Thinking in terms of these three elements has freed me from lingering Beaux Arts attitudes still prevalent in what we mistakenly accept as our modern buildings.

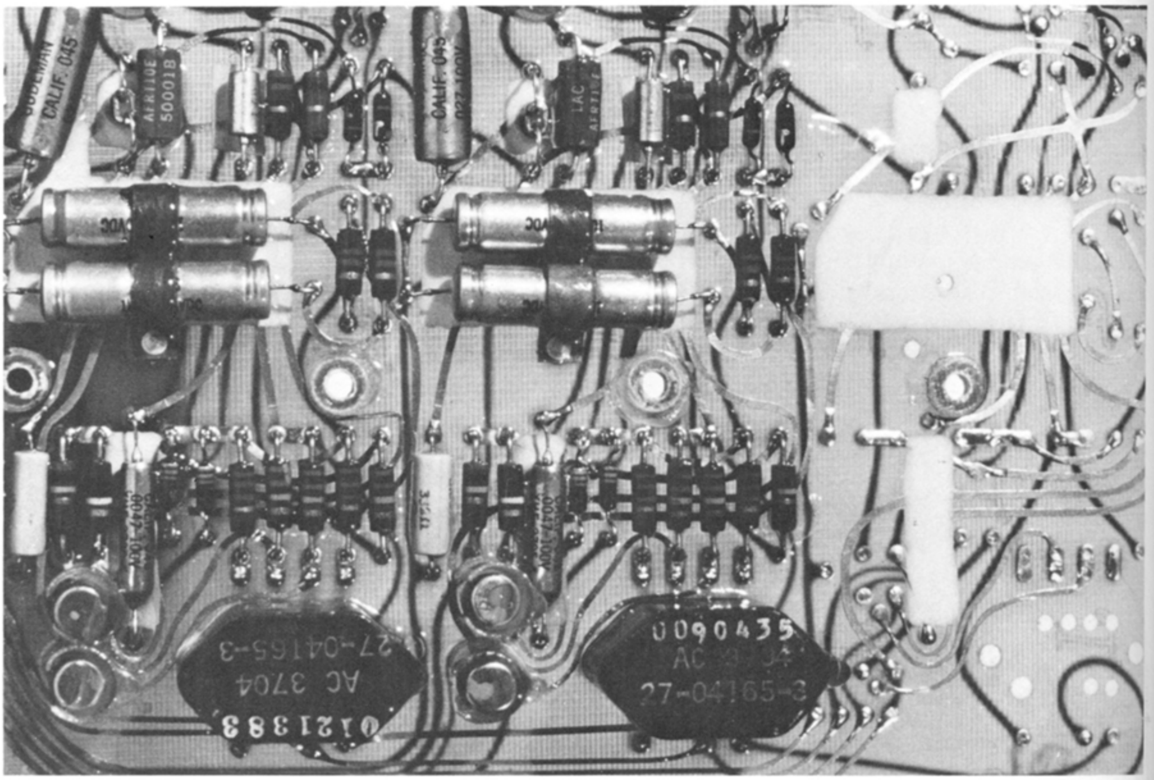
The first building where I applied this principle was the Goddard Library at Clark University. Completed in 1968, the library has literally five separate structural frames, each supporting a range of functional enclosures that form the specialized reading spaces. These enclosures were interchangeable, and although not actually "plug in-pull out," they were rigged and rerigged in the process of design to achieve the best interrelationship of functional parts. Architectural vitality, or the sense of life in a building, was important to me here, yet architectural composition was given little concern. To the elements of structure and enclosure were added the people-moving devices: bridges joining the inner and outer buildings, exterior fire stairs and elevator, plus the mechanical distribution system expressed vividly throughout the building. This building of concrete and brick is perhaps a bit heavy, but it was a start for me.

## *Electronic Circuitry: Grouping the Parts*

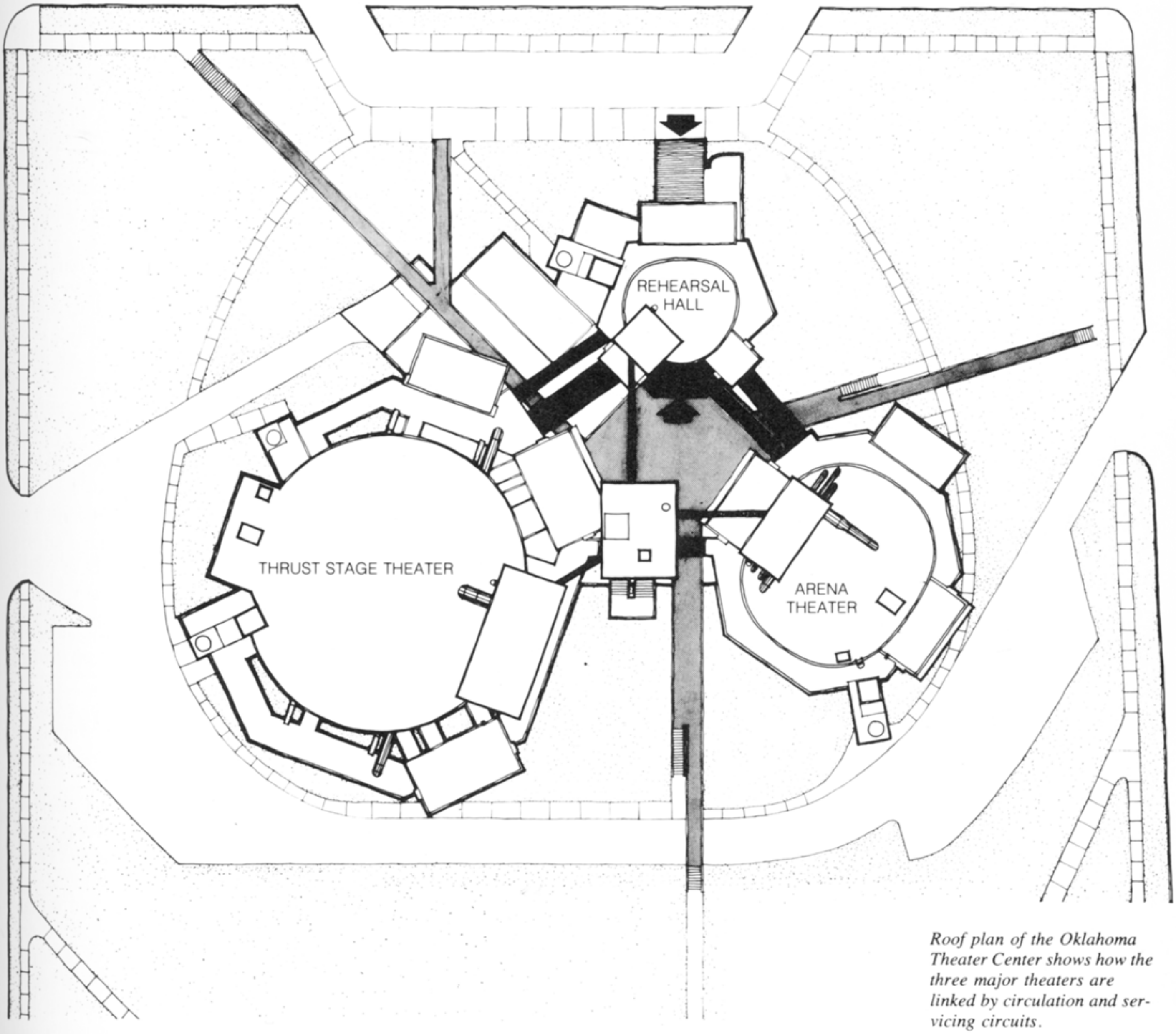
In a further effort to free myself from myself—from habits of thinking—and from the profession with its institutional resistance to change, I seized upon electronics as a more sophisticated technical field to borrow from, since in fact it is the electronic age we now live in. For the *American Scholar* in 1966, I wrote an article entitled "An Architecture for the Electronic Age." Prompted by the observations of Marshall McLuhan, I suggested six possible ways in which, through the retraining of our perceptive habits, our architecture would be changed and accepted by a new client whose perceptive habits, due to the same exposure, would also have to be retrained. Of particular concern to me was not so much the actual imitation of electronic devices appearing in our buildings, so-called techno-aesthetics, nor the bombardment of TV images which has prompted the explosion of woodsy, funk, shed roofs, and supergraphics, but rather the organization upon which electronic devices are actually constructed. I wanted to borrow the underlying ordering principles and their systematic logic and use them as a model for architectural methodology.

We have a great deal to learn from electronics, but even the simplest circuit will illustrate a basic organization of three principal elements, which suggest their architectural counterparts. First, there is the "chasis," representing the structural frame; second, there are "components," with subcomponents attached to them which further define the function of that component, representing in architecture, functional enclosures; and third, there is the circuiting system, the "harnesses," which represent channels for the circulation of people and mechanical services. By identifying and assembling a given program of building requirements on the strength of this ordering device, I had freed myself from that Beaux Arts design principle which still lingers in the work of most contemporary architects: that is, "the tasteful arrangement of compositional elements." In such an organization, components representing various functions can be changed. Subcomponents representing various subfunctions, supportive functions, "servant spaces," as Louis Kahn said in the 1950s, can be added or discarded, thereby qualifying more explicitly the nature of that accommodation for a particular function or human event. Also, circuiting, or the circulation routes, can be rerigged to make for different interaction; other circuiting systems can be overlayed to operate independently as long as there is no "short circuiting."

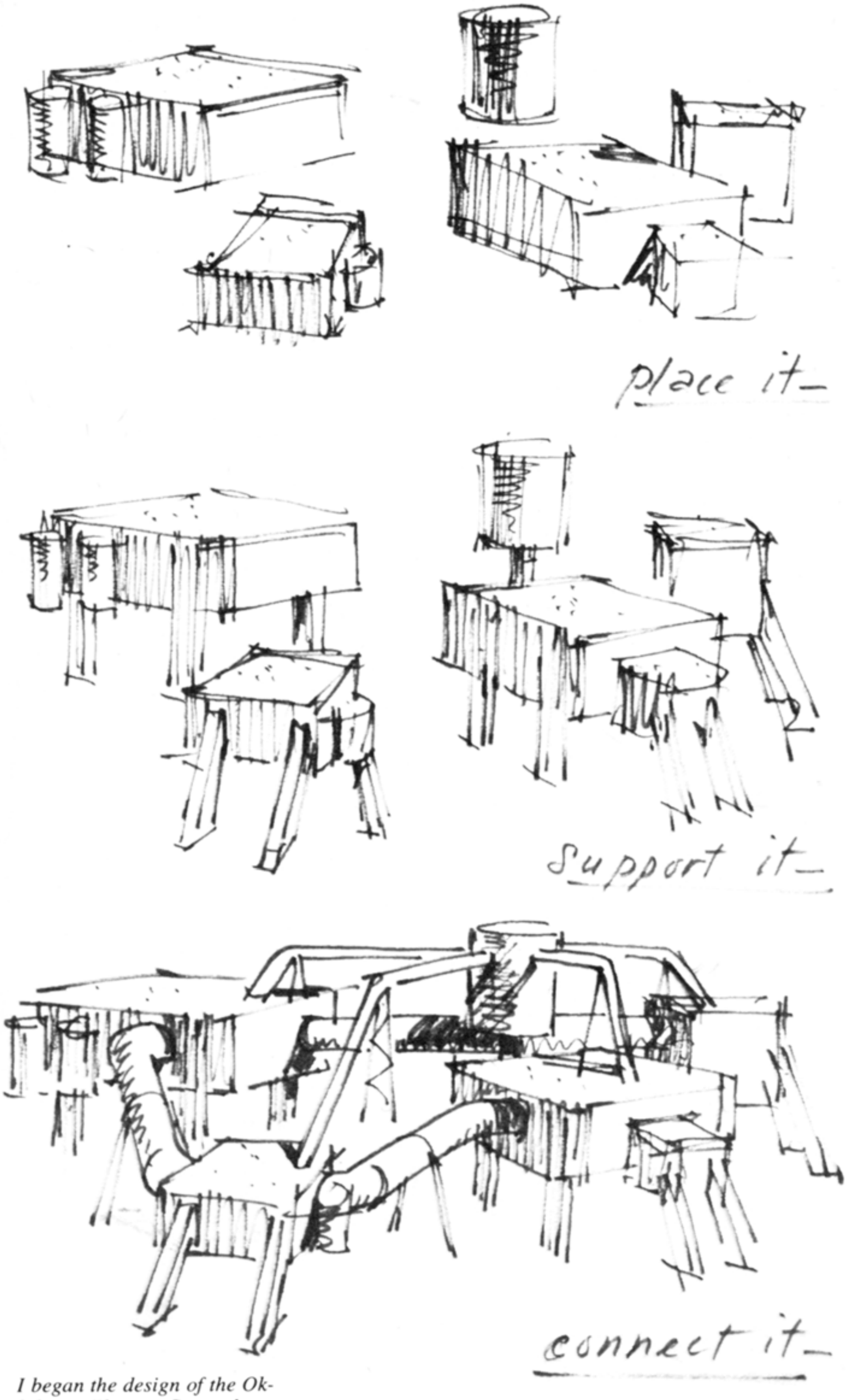
In the design of the Oklahoma Theater Center in Oklahoma City (begun in 1966 and completed in 1970), the three theaters comprise major com-




*Based on the ordering principles of circuitry, a building can be split into the structural chasis, the functional components, and the circulation and servicing harnesses.*




*Roof plan of the Oklahoma Theater Center shows how the three major theaters are linked by circulation and servicing circuits.*




*I began the design of the Oklahoma Theater Center by locating the major functional components where they would be most appropriate. Then the structures were selected from catalogs (like the rest of the building materials). Finally, the components were connected by their ducts and circulation tubes.*

ponents with subcomponents—lounges, offices, toilets—attached to them. The three components are plugged into a base or chasis. The circuiting is intricate and made up of five subcircuits: (1) a corridor layout in the base connecting all understage areas; (2) a confluence of paths by means of bridges connecting the sidewalks over the roof of the base to the public gardens; (3) the automobile circuit passing under these three bridges, connecting entrances, parking, and service; (4) the theater-goers tube system which leads from ticket office and lobby to the three theaters and to "seating trays"; (5) the overhead distribution of chilled water from the cooling tower to the three air conditioning units above each theater. Each component, its structure, and circuit perform in a way as a group, or "subset," with utter disregard, in a formalist sense, for the other. The subset is recognized as a working unit—"pattern recognition," to use an IBM term. What might have been architectural chaos is held together and governed by the strength of the ordering device. The aesthetic impact results from a rich spatial effect of freely assembled parts; parts which with some variation still clearly represent their category and explain what their performance is.

## *Ad Hochism: Assembling the Parts*

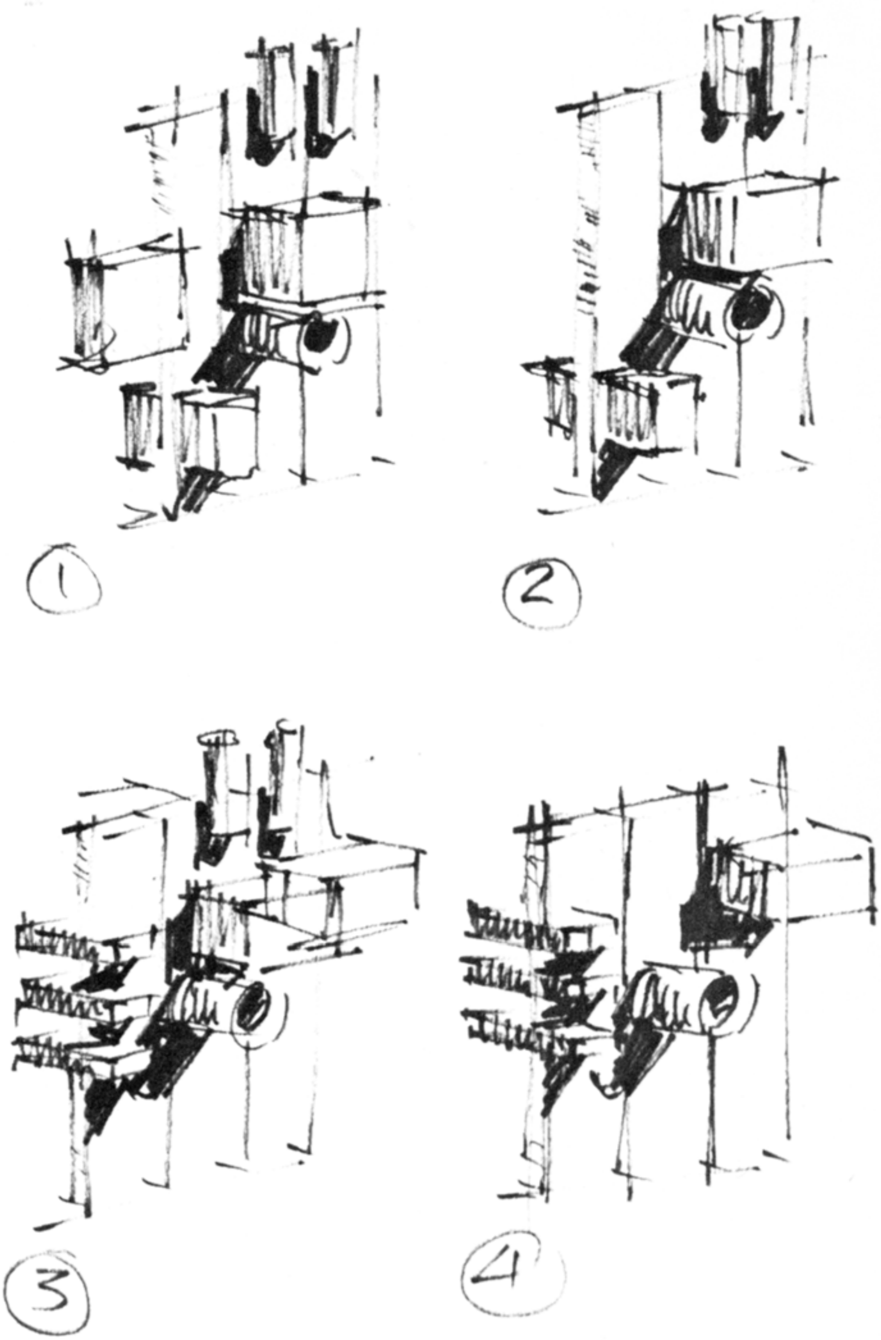
Another building of my design is the Columbus Elementary School (begun in 1967 and completed in 1969). In this organization prefabricated classrooms are assembled into three student age groups, connected by sloping tubes and articulated by glassed-in landings, or nodes. Each classroom group is also accessible by means of ramps at the periphery, carrying out the original intention of a "walk-to school." It must be said that this school and the Oklahoma Theater are intentionally ad hoc in execution. At a time when I was weary of pretentiousness, perfection, and eloquence in my work and that of other architects, I turned to improvisation, economy of means, direct solutions, even humor. "Ad hocism" may be said to describe this attitude and approach. It deals with immediacy, the here and now, with what most effective course of action can be taken without deliberation. In construction, the architect might design a building from locally available materials or of industrial predesigned and prefabricated products, even standard colors, selected from catalogs. Now what motivates the architect in this odd pursuit? First, there is the very practical advantage of producing a building more quickly, efficiently, and economically, particularly in remote or marginal site conditions. However, out of these very conditions and methods there develop challenges and demands for ingenuity, improvisations, which become exhilerating not only to the architect but to the viewer of the completed work. Out of adversity, ingenuity, directness, and immediacy develops an aesthetic value. In these two buildings, much care was given to the exact articulation of the connections. However most of the joinery was determined on site, in what might be called "in-situ detailing." God was not in my details, and I didn't at that time particularly want him, or her, there.

To me, there has never been any doubt as to the greater importance of the message compared with the grammar used in conveying it. What these buildings lack in refinement and eloquence, they gain in direct, forceful expression of their performance. As there is slang in the literate world, defined as effective, brash, colorful, sometimes crude or impudent, so there is slang in the visual language of architecture. It is through acceptance of a new, more forceful speech that language, particularly the "American language," is continually updated and enriched. The same is indeed true for the language of architecture.

## *Permutation: Reshuffling the Parts*

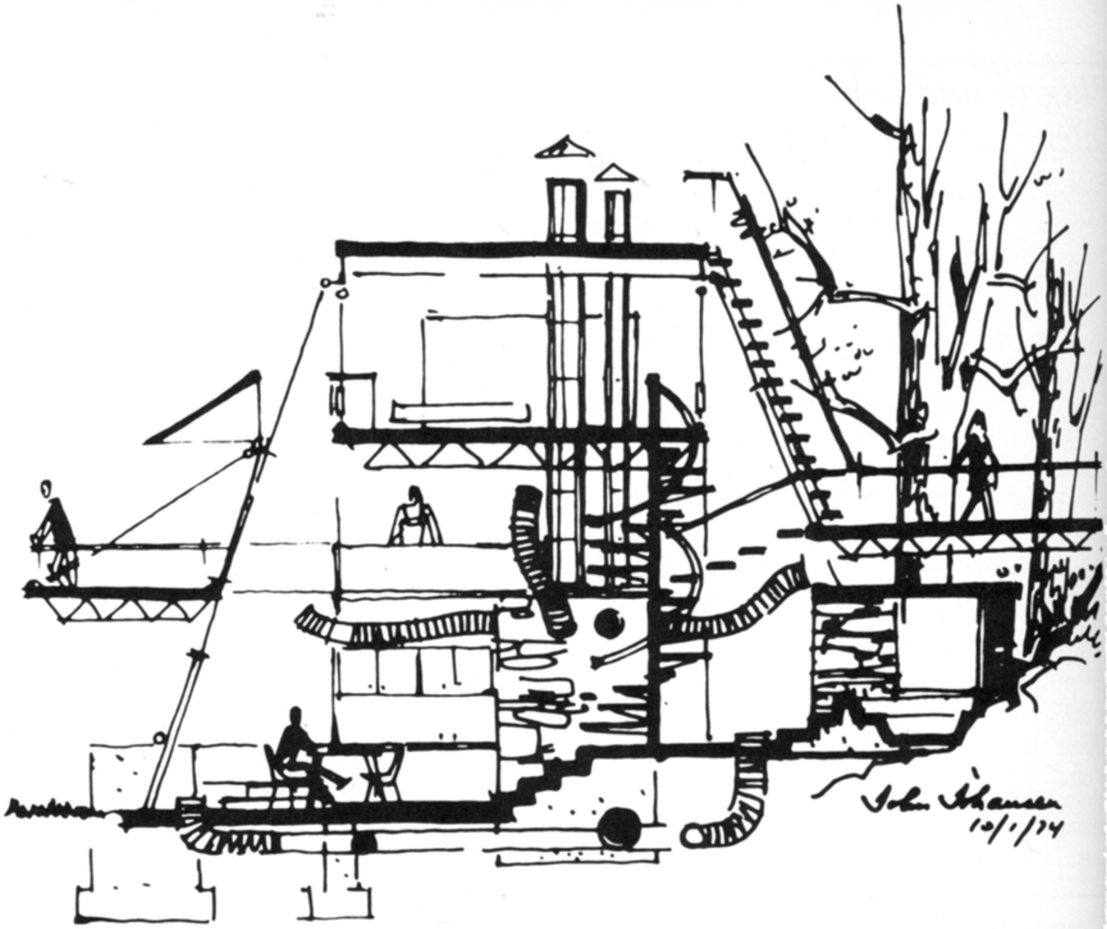
Increasingly, programs are being written with flexibility, adjustment, and growth possibilities. The unadmitted fact is that we cannot write a program for just the present without the building becoming functionally obsolete within a short time, which is also a poor financial investment. If we assume that the nature of our accommodation will change in the near future, then we must write programs not for the present, but for the future as well. Obviously buildings which follow such a program must also be capable of changing. This appears to be the familiar concept of "open-ended planning," in which we do not attempt to solve all problems or make all decisions now, but solve for various possible future requirements. Rare is the programmer or architect in a time of rapid social and technological change who can truly assume that he can deal with the present alone; a developer or financier who risks the sure possibility of functional obsolescence is surely short-sighted.

The next step in my search was toward "permutation," defined as the possible interchange of parts within a particular system. Permutation implies systems. As the theory of architectural de-




*A building reshuffling its parts was the next step in my search for an architecture.*

*My own house was designed to be an unsophisticated, permutable, inexpensive, and easily constructed building system.*

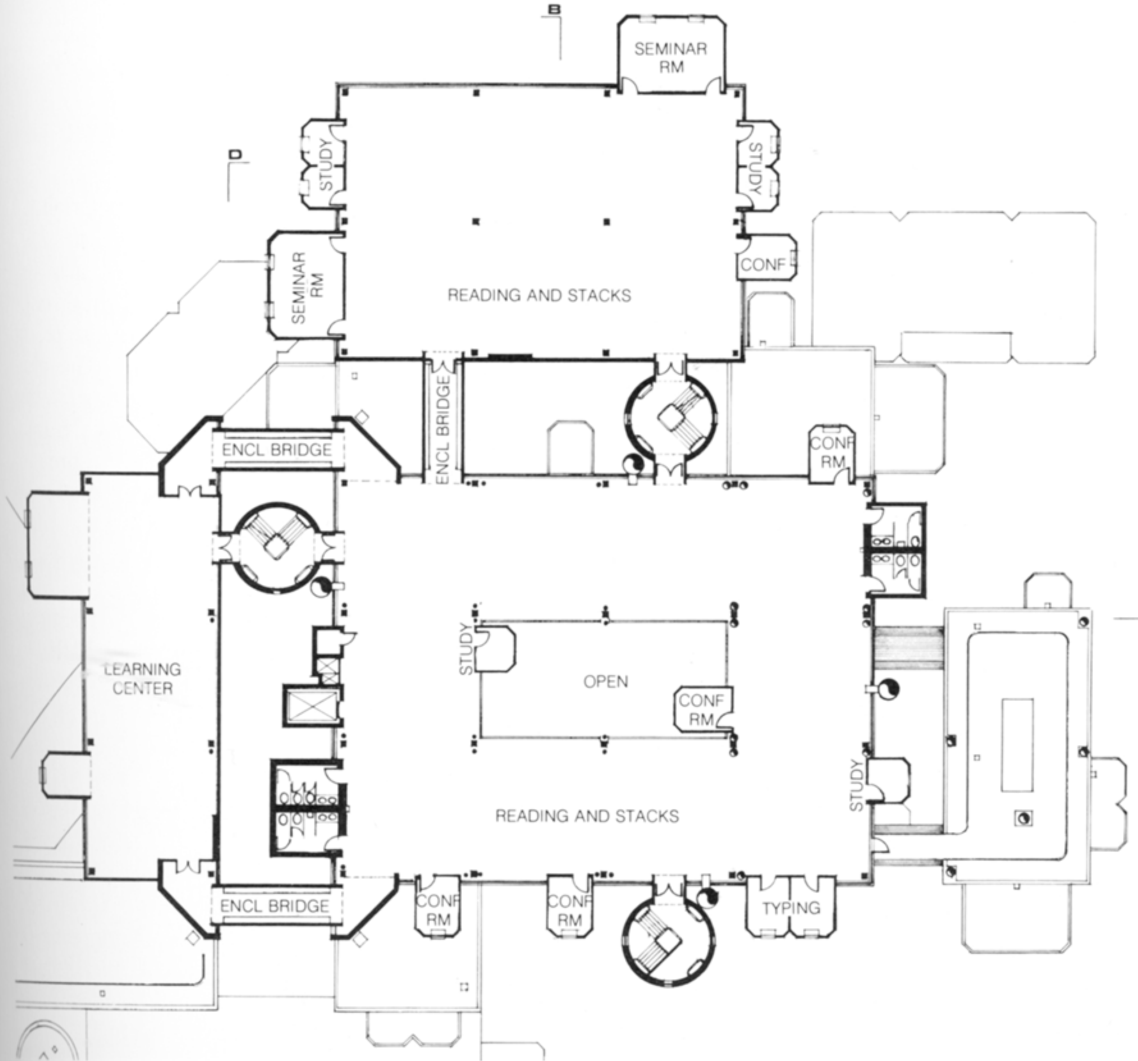


sign within systems—closed systems, open systems, mixed systems, and the "techno-aesthetics" of Archigram 1964—had already appeared, I turned to some of their proposals. In the 12 years since they introduced the principle of plug-in and clip-on, there has been no application of this in an actual or literal sense, with the exception of one or two works by Japanese architects. There is always the usual time lapse between design concept and its acceptance as part of the architectural idiom, just as there is between a concept in pure science and marketable products developed through applied science. In the case of plug-in, the building technique is easily within our reach and the aesthetic image has already been expressed, but most important are the advantages this concept offers in terms of greater functional accommodation and more profitable long-term financing.

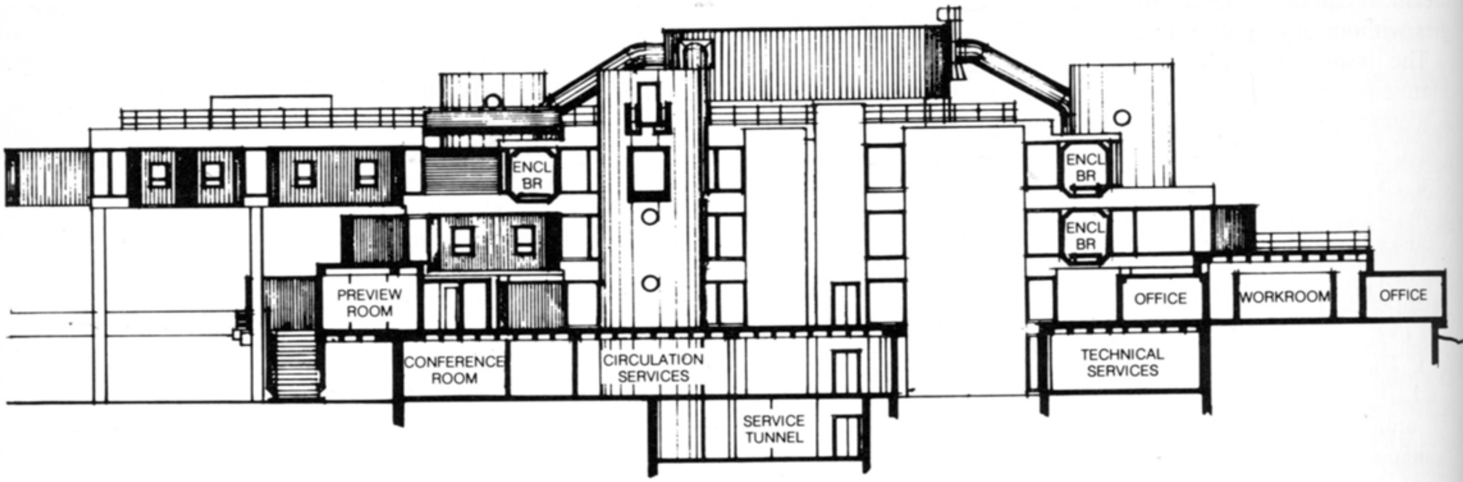
Because of this, the design of my own house in 1972 was to be a very natural, timely development in my continuing concern for the part. The design of this house was based upon two requirements: (1) that it be a system, not particularly sophisticated, yet involving permutation; and (2) that I could build it pretty much with my own hands. It was therefore to be simply conceived, inexpensive, and made of easily available materials. A steel frame, three stories high with square base and tapered sides, was devised with 64 attachment points, 32 on the interior and 32 brought through the plastic skin to the exterior. From these points platforms and rooms could be hung. The platforms could be erected in a few hours; rooms would take longer. To brace this basic steel frame, diagonal cross cables were placed to prevent wracking, as the weight might shift if platforms and rooms were to be moved about. One room is presently hung by two cables from the roof framing on the interior. Decks are suspended out from two sides, while one platform extends as a bridge from a second level to a rock ledge some 30 feet (9 meters) away. Future developments are probably a deck on the fourth side with stair to grade and possibly a midlevel platform in the living room. Instead of thwarting remodeling and change, the system encourages it. Life in this house becomes a game, played by people, making one move and then another in a lifespan, but always played according to strict rules which, in this case, are set within the steel frame and the rigging points. Again, it is noncompositional, and like a sail boat it performs and looks as well regardless of how the sails may be set or what tack it is taking.

## *Plug in and Clip on: Interchanging the Parts*

Sometimes, though not often, architects have the opportunity to persuade clients that permutative devices may be in their own best interest, even though that client or his professional program writer has neglected it. I had such an opportunity in carrying out the commission for a library and educational resource building for Staten Island Community College in 1974. The New York State Dormitory Authority had no requirement for phased construction, future growth, or changing use. However, the building complex was developed so that separate basic fixed elements could be built in phases and connected at various levels by bridges, with footings attached to short columns set for future additions. To these fixed elements of concrete construction could be attached many small, enclosed elements, that is, seminar rooms, faculty offices, and carrels, whose position would not be fixed or actually determined for the present or in the future. A system was developed whereby all these small elements were designed as light steel frame and steel clad boxes to be clipped on the periphery at any or all levels of the basic concrete elements. "Clipped on" is a glib statement, when in reality we had to design not only prefabricated boxes with lift points for crane handling, but attachment points for structural connection to any position on the periphery of the concrete frame. In addition, we arranged for tapping into a peripheral service distribution system to provide hot and chilled water for air conditioning units, telephone, intercom, and power for each of these boxes. Although we met construction budgets, won the final acceptance of a reluctant client, and secured the approval of the New York City Building Department whose standards we met, construction was delayed due to changes in educational policy. However, since we proceeded through working drawings with the building, we are able to speak with authority and assurance that a building that can truly be changed is no longer an impractical




*Even though growth and change were not programmed into the Staten Island Community College Library/ Institutional Resources Center, a plan was developed whereby concrete footings would be poured for both this building and possible future additions.*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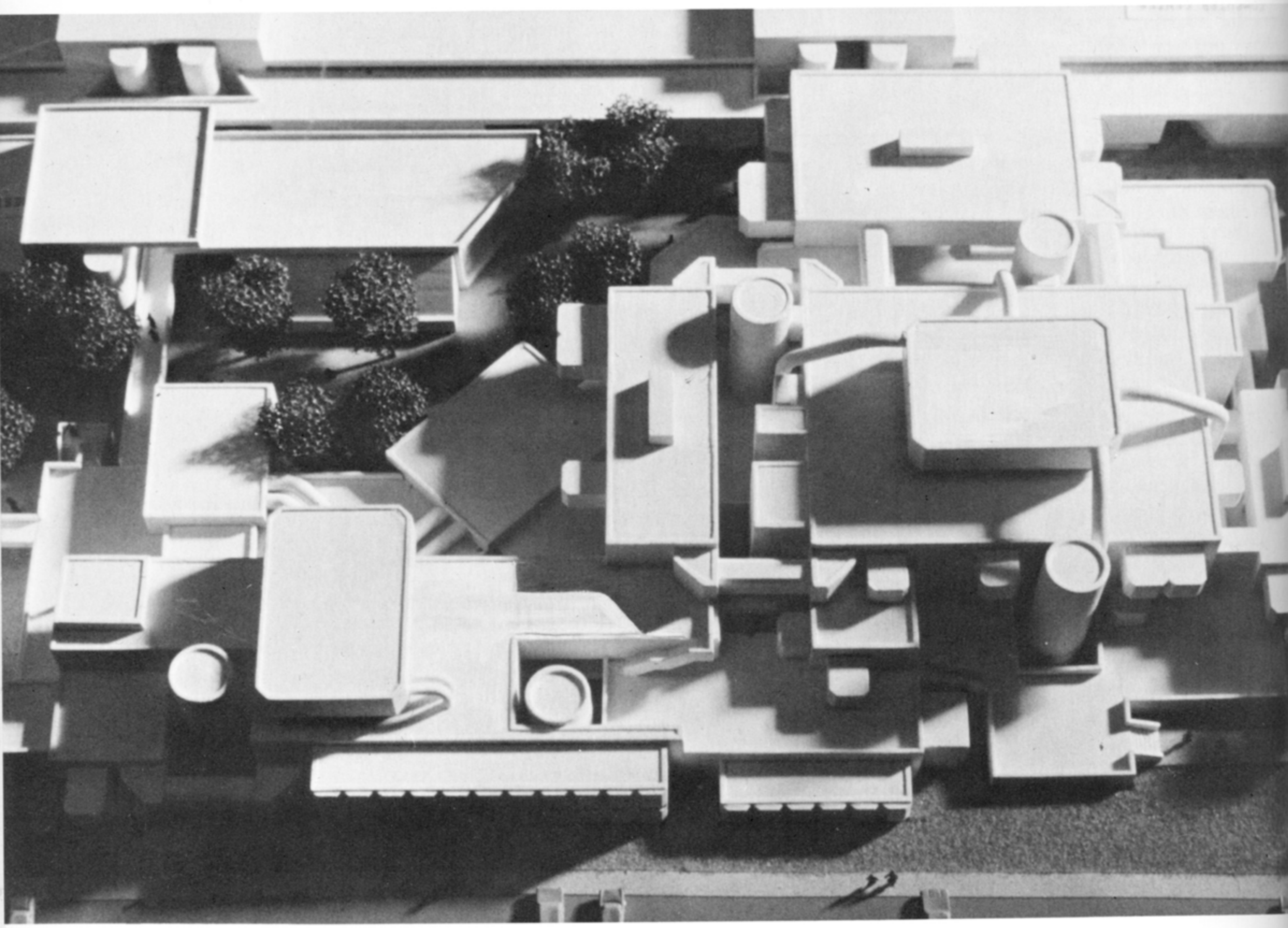

dream. It can be realized within current technologies without paying a premium.

The issues involved in this project can be summed up as follows: first, the life patterns of an academic community; second, a program of potential human needs to be assembled; third, an analysis of what is static as opposed to what may grow, change, or no longer be relevant; fourth, the technical devices by which change and growth can be accommodated; and fifth, the aesthetic or poetic qualities to be discovered in all the above and expressed in the final architectural realization. These issues all revolve about process. Behind all phenomena of nature is process. And for the architect to design, not by the Beaux Arts principle of "the tasteful arrangement of compositional elements," but through an understanding of processes, is not only to better accommodate man's physical needs, but to bring him closer to himself and to the nature of which he is a part. This provides perhaps a sixth, philosophical issue.

## *Kinetics: Moving the Parts*

Taking the idea of change or movement further, another dimension to achitecture is kinetics. We are now able to satisfy that basic fascination with movement, not by illusion, as in the Baroque period, but with the technology we now command, producing buildings which, in part, do indeed move. As the history of architecture bears out, most innovations are drawn from either humble or crude and vulgar utilitarian origins. The barrel vault and arch were known to the Egyptians and Greeks, who used them only for underground sewage, whereas the Romans and others for centuries later got a lot of mileage out of them. Hidden steel tension structures, which used to hold Renaissance domes from collapsing, have now come to be commonly exposed. Kinetic devices first appeared in industrial buildings in the form of such things as attached hoists, overhead conveyors, power scaffolding, pneumatic tube intercom, trackage, and self-erecting cranes. Now when an improved service is performed, sooner or later an architect will make it somehow publicly acceptable on an aesthetic level. Increasingly there appear kinetic devices, vividly expressed, in airports, supermarkets, and flashy hotels. Kinetics is here—to perform greater service and to delight in.

Except for the most usual moving elements such as elevations, I have not yet designed a kinetic building. However, following the sequence of my works and with my continuing interest in an architecture of parts, it is with kinetics that I now come face to face. And as the house as building type is always a good proving ground, I sketched in 1960 a house of parts which could be assembled and disassembled on railroad trackage. A central element containing the entrance, living room, kitchen, bath, power source, had other parts, such as master bedroom, guest room, studio, and a "folly or mood room," grouped around it. For the practicalities of domestic life, or for reasons of pure whim, this house's functional grouping could be changed by sliding one or another of the elements along the tracks. From an aesthetic point of view, this house is never a static composition, but enters that field of experience now limited to kinetic sculpture.

Required frequency of change and movement have much to do with the design of the moving element. In the domestic area, changes in family life cycle are gradual and movement infrequent. Seasonal adjustments governed by weather are more frequent, while daily requirements involving daytime and nighttime uses are still more so. Then there are motivations of whim, the psychological need for change, and the sheer amusement in seeing things move.

In any case, I believe kinetics is more and more a part of our lives. The fusion of transportation and the building, people-moving devices, theater technology, museum and exhibition display, the opening and closing of solar-heated buildings, all these current developments confirm the functional justification of movable parts. The public's delight in the exposed machinery of the Roosevelt Island cable car system, the exposed elevator cabs in the Portman hotels, the scenic railroad entering the hotel lobby in Orlando's Disney World, and now the super-Mannerists growing involvement with changeable facades and room liners confirm the aesthetic acceptance of kinetics as well.

The most important element in architecture, however, is still "the part." The part appears, first, in analysis of the program; then, in synthesis, in the typing of parts; then, in the grouping of parts—assembly, rigging, interchange, reshuffling—and, finally, in movement. This seems to be the basis of my ordering devices and organizing ideas. The vivid expression, articulation, detailed connections, and couplings are the poetic touches I give in the design process, thereby possibly making something more of problem solving and building technology. If I add my other concerns to this—our sense of life, our basic psychological motivations, newly awakened perception of the impact of our electronic age, and our historic derivations—I hope to come up with something which can be called architecture.

*Opposite page, top: At the Staten Island Community College Library/Center the prefabricated boxes had to be designed in such a way as to be easily erected by cranes and easily attached or detached from both the structure and the servicing.*

*Opposite page, bottom: The model of the Library/Center shows the circular core elements, the main functional elements, and the clipped-on parts.*