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A summary is presented of a conference of architects and educators concerned with the architectural implications of Images of the Future, a booklet offering ideas for the qualitative improvement of the nation's secondary schools. In the conference proceedings emphasis is given to implications concerned with the maturity of students and the flexibility of facilities. Also included is a series of new design proposals for high schools along with graphic illustrations which supplement the proposals. (FS)

NEW SCHOOLS FOR NEW EDUCATION

a report
from ann arbor

educational facilities laboratories

EDUCATIONAL FACILITIES LABORATORIES, INC. is a nonprofit corporation established by the Ford Foundation in 1958, with an appropriation of 4.5 million dollars, to help American schools and colleges with their physical problems by the encouragement of research and experimentation and the dissemination of knowledge regarding educational facilities.

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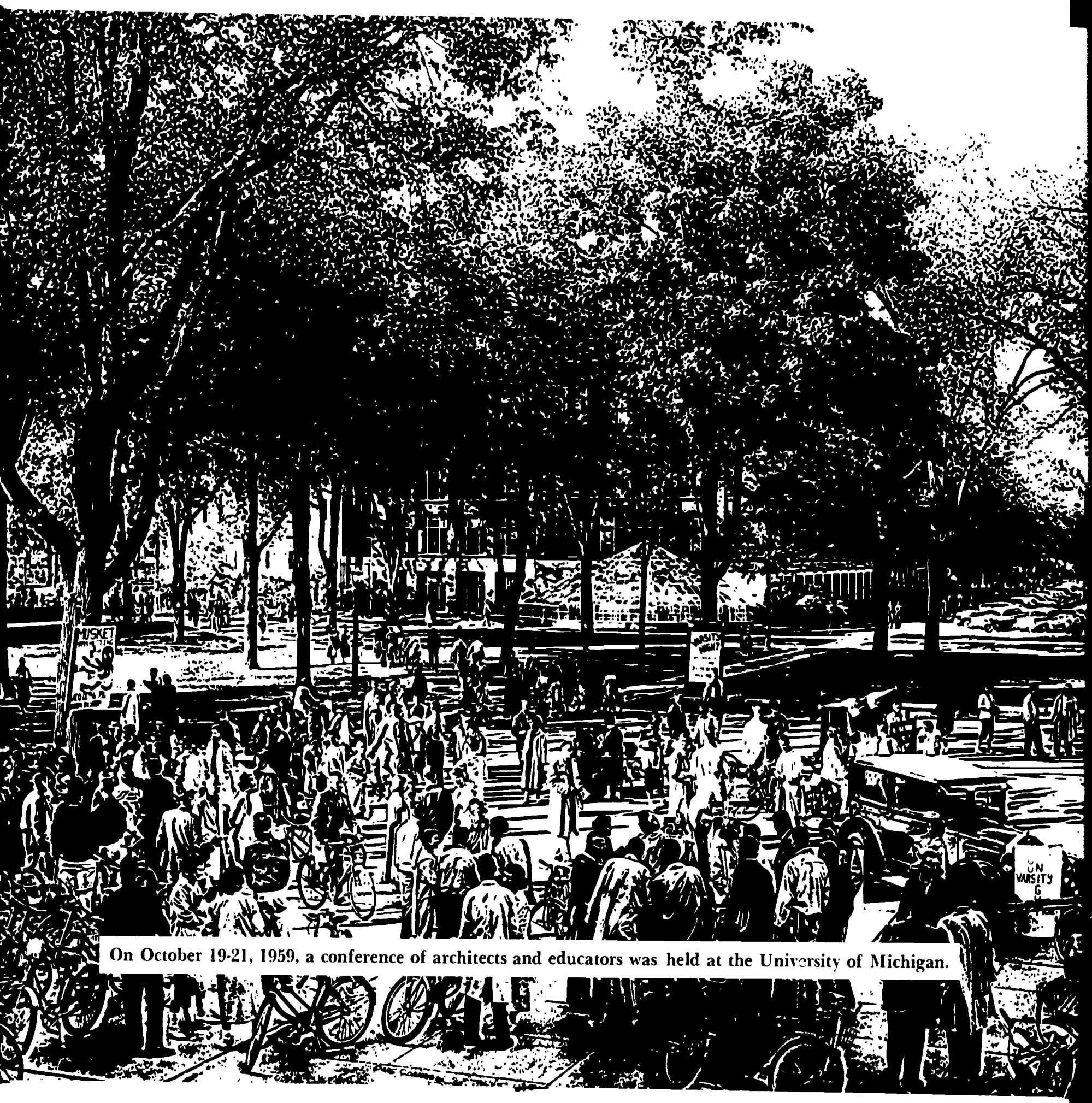
NEW SCHOOLS FOR NEW EDUCATION

CONTENTS

The architectural implications of *Images of the Future,* by J. Lloyd Trump

Based on the architectural workshop conducted by The University of Michigan

Educational Facilities Laboratories, 477 Madison Avenue, New York 22, New York



On October 19-21, 1959, a conference of architects and educators was held at the University of Michigan.

The occasion was the presentation by ten of the country's leading school architects of a series of new design proposals for high schools. These schemes were inspired by a document entitled *IMAGES OF THE FUTURE,* otherwise known as THE TRUMP REPORT. This small booklet was the work of Professor J. Lloyd Trump of the University of Illinois, Director of the Commission on the Experimental Study of the Utilization of the Staff in the Secondary School of the National Association of Secondary-School Principals (NASSP).

Supported by the Ford Foundation and the Fund for the Advancement of Education, a distinguished group of educators had worked for more than two years with Dr. Trump to evolve ideas for the qualitative improvement of the nation's secondary schools. Their most important suggestions may be summarized as follows:

1. REORGANIZATION OF INSTRUCTION: — Most instruction should be ordered so as to provide more opportunity for individual study, more participation in small discussion groups, and increased attendance at large classes given by gifted teachers.

2. REARRANGEMENT OF CURRICULUM AND CLASS SCHEDULES: — In the high school of the future these elements should be much more flexible. There should be less reliance on the standard 40-45 minute period, and adult supervision should be available as needed.

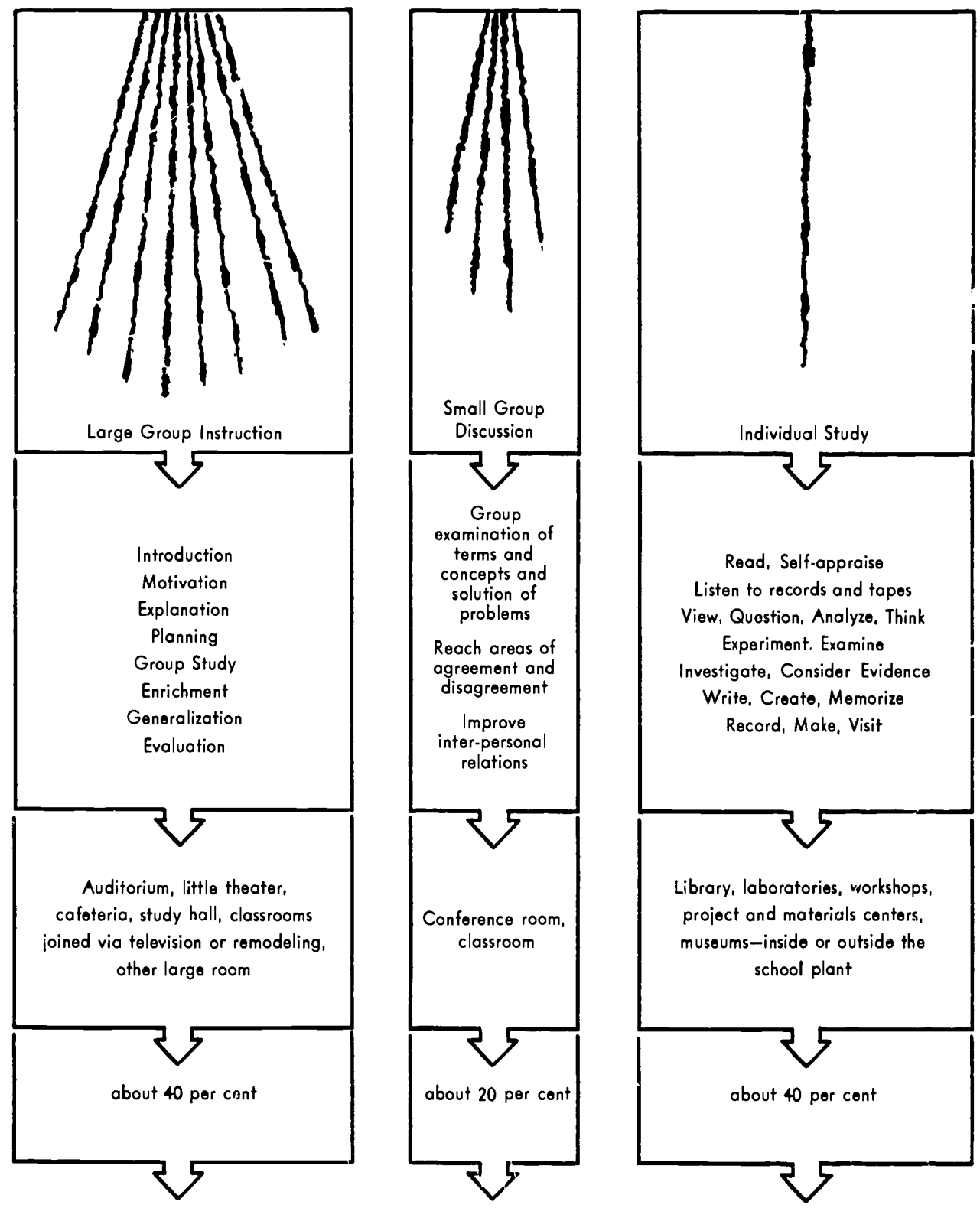
3. CHANGES IN STAFFING PATTERNS: — Much greater utilization of instruction assistants, clerks, general aides, and other types of relatively unskilled educational labor is foreseen. There should be greater reliance on team teaching and the highly skilled specialist.

4. MORE EXTENSIVE USE OF TECHNOLOGICAL AIDS: — Clearly we are at the beginning of a period in which television, tape recordings, teaching machines, and electronic devices of all kinds will be enormously significant.

Some of these notions may sound *fairly radical,* but it should be emphasized that nearly all of them are actually in use in American high schools today. The report is, in fact, the product of men actively engaged in grappling with the overwhelming problems of secondary education in our time. The Trump Commission is no band of dreamy theorists brooding away in ivory towers. Its members are mainly high school principals who took time out from their demanding jobs to participate in its work. *IMAGES OF THE FUTURE* is their sincere attempt to envisage what the educational form of the American secondary school of tomorrow may be like.

Educational form invariably has architectural implications. The officers of Educational Facilities Laboratories and the Department of Architecture at the University of Michigan soon realized that these implications ought to be explored, and they quickly agreed upon the idea of holding a workshop conference to do this. Funds were made available, and, with the enthusiastic collaboration of the University's School of Education, the enterprise was undertaken.

With THE TRUMP REPORT as an educational and architectural program, each architect was asked to imagine what the physical form of the future American high school might be like. There was no limit on the design tools to be employed nor on the manner of presentation. Some architects brought blueprints and photographs of buildings already completed or under construction, others brought sketches and slides, while one showed a rather elaborate model. An hour and a half was allotted for each presentation and the comments which it evoked. Most of the sessions resulted in lively discussions, and these were recorded on tape and later transcribed. This record, along with the graphic presentations submitted by the architects, is the basis of the present report.



ORGANIZATION OF INSTRUCTION

from IMAGES OF THE FUTURE *by J. Lloyd Trump, Director,*
Commission on the Experimental Study of the Utilization of the Staff in the Secondary School

CONFERENCE SUMMARY—PART 1

Dr. Trump and the NASSP REPORT

The conference opened with a talk by Professor Trump himself. Commenting briefly on the recommendations of his committee, he remarked that for high school students three new types of space appear to be indicated:

A. Spaces where individuals can keep their materials, study, use teaching machines, read, draw, listen to music, write, and engage in manifold other activities. At present the only place which a student can call his own is a steel locker, and a locker "is not a very good place to study, develop a spirit of inquiry, and exercise independent responsibility for learning." Students must have places with privacy and accessibility—probably about 300-350 such areas would be needed for every 1,000 students.

B. Spaces where 12-15 people can gather for small group discussions. For this purpose the typical 30′ x 30′ classroom is costly and wasteful. In a school with 1,000 students about 15-20 such spaces would be required.

C. Spaces where large groups—100, 200, 500, or more, depending on the size of the school—can meet. For 1,000 students, 5 spaces for large groups might be needed. One might be a cafeteria and one an instruction center (formerly called an auditorium). The center should permit presentations to two to four groups or to a single group depending on the arrangement of its constituent spaces. Shops, libraries, art areas, and laboratories will, of course, also have to be provided, but will be changed to serve students in the new patterns of instruction.

"Secondly," said Dr. Trump, "we need space for teachers." This requirement is ignored in many modern buildings. The traditional teacher's desk simply will not do any longer. Teachers need individual cubicles for privacy and must also have spaces for small group meetings. Furthermore, clerical help must be easily available, facilities for making instructional aids must be present, and books and other kinds of materials must be on hand.

Finally, there must be much greater emphasis on the accommodation of technological aids. Television, tape recordings, and teaching machines are relatively recent inventions, and it is difficult to predict the course of their future development. Obviously some degree of flexibility must be built into our schools to provide for this factor.

PROCEEDINGS

Ten different architects were found to approach THE TRUMP REPORT in ten different ways, and it is therefore not surprising that the presentations to the conference showed enormous variation. While summaries are inevitably a bit unfair, they have to be attempted, and so, with a grateful acknowledgement to the conference rapporteur, Dr. Ralph Gerard of the University's Mental Health Research Institute, here are abridgements of the reports.

1. Chip Harkness, of The Architects Collaborative, Cambridge, Massachusetts, showed the evolution of the Wayland, Massachusetts, High School, now under construction and probably the closest approximation in the country today to a high school designed along the lines recommended in the report. With drawings, blueprints, and photographs, he demonstrated various stages in the planning development of this school. It is only fair to say that both he and Superintendent Anderson think of this school as a *transition*. It is not yet a "Trump high school," but it is a move in that direction.

2. Bill Brubaker, of Perkins and Will, Chicago, emphasized the need for space suitable for individual study. As one possible solution, he showed his firm's development of the *Q-Space* (*"Q"* for quest).

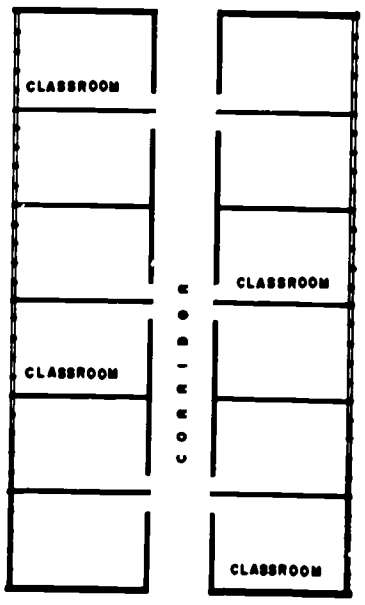
3. Bill Caudill, of Houston, Texas, stressed *adaptability*. With a series of magnificent cartoons he showed the teacher breaking out of her traditional, boxlike space and entering a classroom which could be converted to a variety of uses.

4. Phil Daniel, from Los Angeles, proposed that modern mathematics be applied to educational problems in new and radical ways. Outlining some possible problems which might be solved with game theory and value theory, he suggested the utilization of computing machines. We may term his approach the *experimental*.

5. Don Barthelme, from Houston, Texas, focused primarily on the *educational problem*. Noting th many of our present customs have arisen for the convenience of administrators, he offered a school in which the pupil would take first place and in which the courses of studies would be integrated to an extraordinary degree.

6. John McLeod, of Washington, D. C., concerned himself especially with the school as an *instrument* for the transmission of learning. Accordingly he presented two schools done by his firm in Hagerstown, Maryland, which were designed for maximum use of educational television. His analysis of these schools clarified many of the questions raised by this particular visual aid.

7. John Lyon Reid, of San Francisco, viewed the future school primarily as *loft space*. After showing the possibility of converting two existing schools to the Trump plan, he demonstrated a school in which the various spaces advocated by Trump were almost completely achieved. So thorough was his investigation that he was able to state that a Trump-style school would probably be somewhat more costly per square foot than the conventional building. It would, however, offer a greatly strengthened educational program.



Cells and Bells Layout

8. Charles Colbert, from New Orleans, emphasized the *educational process* taking place in a "Trump school." Viewing the school as a gigantic tool for learning, he was one of several architects who remarked that Trump was taking the best of the typical college organization and putting it into the secondary school.

9. Eberle Smith, of Detroit, proposed a school which was notable for its close *integration with the community*. The conference was much interested in his observation that THE TRUMP REPORT seemed to call for a school with a different relationship to its social and economic base than the ones to which we have been accustomed.

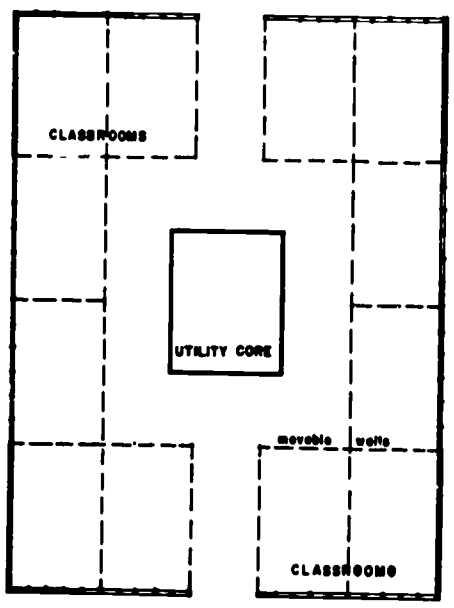
10. Samuel Homsey, of Baltimore, stressed the importance of creating *volumes* which would be congenial for teachers and learners. With slides of the Tatnall School in Wilmington, Delaware, he demonstrated some steps in this direction.

MAJOR ISSUES

In the course of the discussion it became clear that two issues were uppermost in the minds of the conferees: *maturity* and *flexibility*. Both of these are slippery words and require some definition.

MATURITY refers to stages in the physical, mental, and social growth of the student. Educators have long recognized that children develop at different rates in different fields, but for a variety of reasons there has been a strong tendency to treat all children alike. Don Barthelme remarked that a random group of individuals labeled as possessors of school diplomas will vary enormously though they may have taken the same courses, have attended the same study halls, and even have come from similar family backgrounds. The key to the situation lies in the varying degree of maturity among the students. Because of this factor they have reacted to the high school experience in many different ways.

THE TRUMP REPORT is an optimistic document in that it assumes a greater degree of intellectual maturity in the ordinary student than most educators have hitherto been willing to grant. The justification for this assumption is contained in the remarkable work done in numerous experimental programs all over the country. Perhaps the best known of these is the ADVANCED PLACEMENT PLAN by which superior students can earn college credit for equivalent work taken while still in high school. This scheme enables them to avoid the customary duplication of the freshman year and effectively breaks the lock step which has so long been the curse of American education. In most cases the plan involves a substantial amount of independent study, and it clearly places a premium on the responsibility assumed by the individual student. THE TRUMP REPORT obviously contemplates the extension of this kind of approach to a much greater number of students. It seems fair to say that it presents a new concept of intellectual maturity.



Total Flexibility Layout

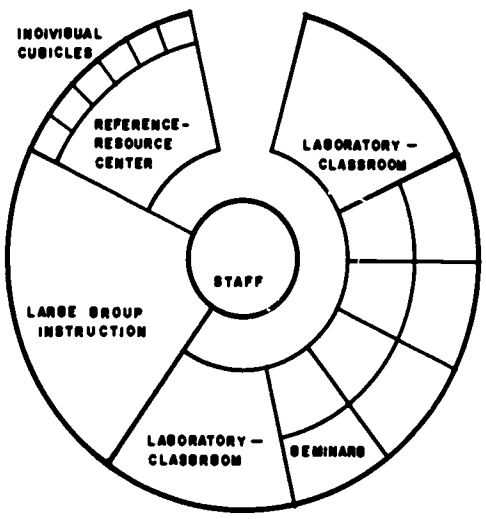
FLEXIBILITY is a more complicated idea; it is a word whose meaning is extremely elusive. It is also a word which can awaken spirited reactions. After hearing other architects and educators extol the virtues of this notion, Don Barthelme commented, "Flexibility is a myth, an expensive dream, a snare, a delusion, and only a word with which to fill the mouth. It's high time we architects spoke truthfully and advised our clients to save their money, and to save the damage done to good planning in its name." These remarks provoked equally spirited rejoinders. Douglas Haskell of the ARCHITECTURAL FORUM observed that in his experience as an editor he had "watched a parade of certitudes come across the screen for many years," and that all of these had had to be modified in the course of time. John Lyon Reid announced that he had admired Barthelme's presentation greatly, but that he was "in complete, unequivocal, and total disagreement with everything you said about flexibility." It should be noted that both Barthelme and Reid are outstanding designers who have done distinguished work in the school field and that Haskell is a widely respected editor. Obviously flexibility is a word which presents semantic difficulties. Admitting that the term is perhaps ultimately undefinable, we still need a working definition and the following paragraph is therefore offered to this end. As used by the architects at the conference, *flexibility* appears to have these components:

1. *Expansibility* for exterior building changes. This quality has to do with the capacity of a building to accommodate additions to the original structure without undue expense. An expansible building must obviously use a modular structural system.

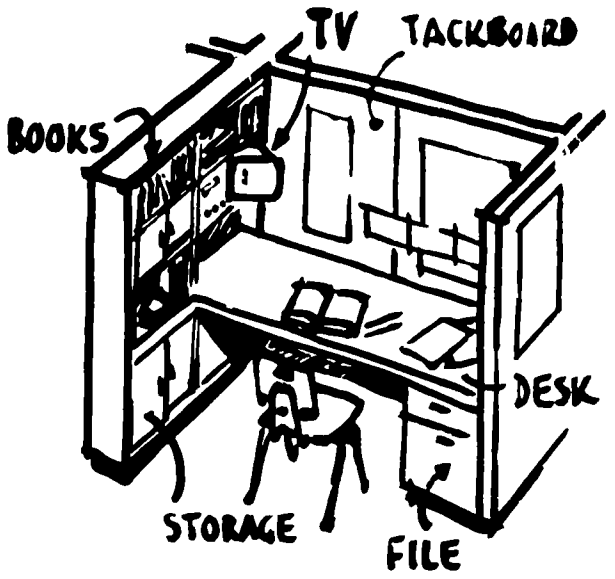
2. *Convertibility* for interior changes. We need schools in which the interior spaces can be altered at will in accordance with the changing needs of teachers and students. Essentially two orders of convertibility are needed: convertibility at the immediate wish of the teacher and convertibility by maintenance men. Clearly all kinds of partitions and spatial dividers are appropriate. This requirement very clearly implies that structural systems dependent on bearing walls will be inadmissible.

3. *Versatility* to accommodate a variety of functions. The most common example is the high school gymnasium which can be adjusted to accommodate all kinds of sporting events and formal or informal dances as well. This principle must now be extended to the other spaces within the school building. Our technology is advancing so rapidly that we need laboratories which can be used for education in several different technological disciplines. An entirely new attitude toward the installation of mechanical equipment is indicated.

Not all of these components of flexibility will, of course, be equally necessary in every case, but architects and educators will have to consider them all in designing the high school of the future. To neglect such considerations would be an almost criminal abdication of responsibility.



Planned Variability Layout



Perkins and Will and THE Q-SPACE

"We all agree," said Charles Brubaker, "that learning is something that happens quietly in one person." With this notion in mind, the office of Perkins and Will has produced a suggestion for a space which the student can call his very own. It is known as the *Q-Space*—"*Q*" for quest. This is a place where each student can keep a few things—his own books, posters, notes, and sketches. For most students it would probably be book oriented, but it might also contain machinery or even lab equipment. Obviously these *Q-Spaces* can be grouped in numerous ways, and it becomes possible to secure a variety of relationships with the teacher's desk or studio. Moreover, as Brubaker observed, if students can have individual places such as this, there is no longer any reason to segregate them by grades or ages. Each year the student should become more independent and more self-directed until, as a senior, his methods of work are very much like those of a college freshman.

Questions about the *Q-Space* came thick and fast. Bill Clapp wanted to know if it was to be used by only one student, and Brubaker quickly answered: "Right. That means it's not going to be used too efficiently. Obviously the bright students and some senior students are going to spend a good deal of time there. For paying the price and providing this space, it looks as if you might get a pretty good return on your investment by letting each student see what his neighbor does and having personalities and individual characters expressed openly instead of being all hidden in steel lockers." Bill Clapp also noted that the school day might have to be extended, and Dr. Trump observed that some individuals need a "highly structured situation" more than do others.

There were numerous comparisons to the various kinds of facilities provided in professional programs at the college level. Brubaker himself remarked that a good many of the things he was discussing were being done

in law schools, and Walter Taylor noted the conventional requirement that each architectural student should have his own desk—a notion hard to sell to university administrators.

Paul Fitts wanted to know about the level of noise tolerable in the *Q-Space*, and Brubaker replied that "where the general over-all acoustical perfume is high enough, you get a noise level that masks out individual sounds." The sense of the meeting was that the problem of sound was difficult but soluble.

The discussion grew quite warm when Frank Carioti invited the educators to take off their gloves and express some frank opinions of the *Q-Space*. Referring to the architects, he said they were agreeing that the student body could be split up into groups of one and that contact between individuals could still be maintained. Physically, it would be impossible to do this. "What is your reaction to this?" he challenged. "Are you just accepting the concept of the individual student in a *Q-Space*? Can you get to him? What are the holes in it?"

These remarks provoked much comment on the subject of individual versus group creativity. Dean Olson remarked that a new publication on the dynamics of instructional groups would stress the individualization of learning, and Bill Clapp said that a great many creative tasks were accomplished by groups.

Superintendent Anderson summarized the reaction of the educators nicely: "It is highly desirable, I think, for youngsters to learn to work independently as early as humanly possible. Group work is essential, too, but I feel it's been a good bit overdone. But I'm not completely sold on the idea of the *Q-Space* as the way to do it. I look upon a laboratory as individual work space. This doesn't mean that students are isolated from other people, but it does mean they can work independently. These are serious questions we have today, and the individualization of education is probably the major problem that we are going to be faced with over the next decade." The real question, he added, is HOW we are going to achieve this much desired individualization.

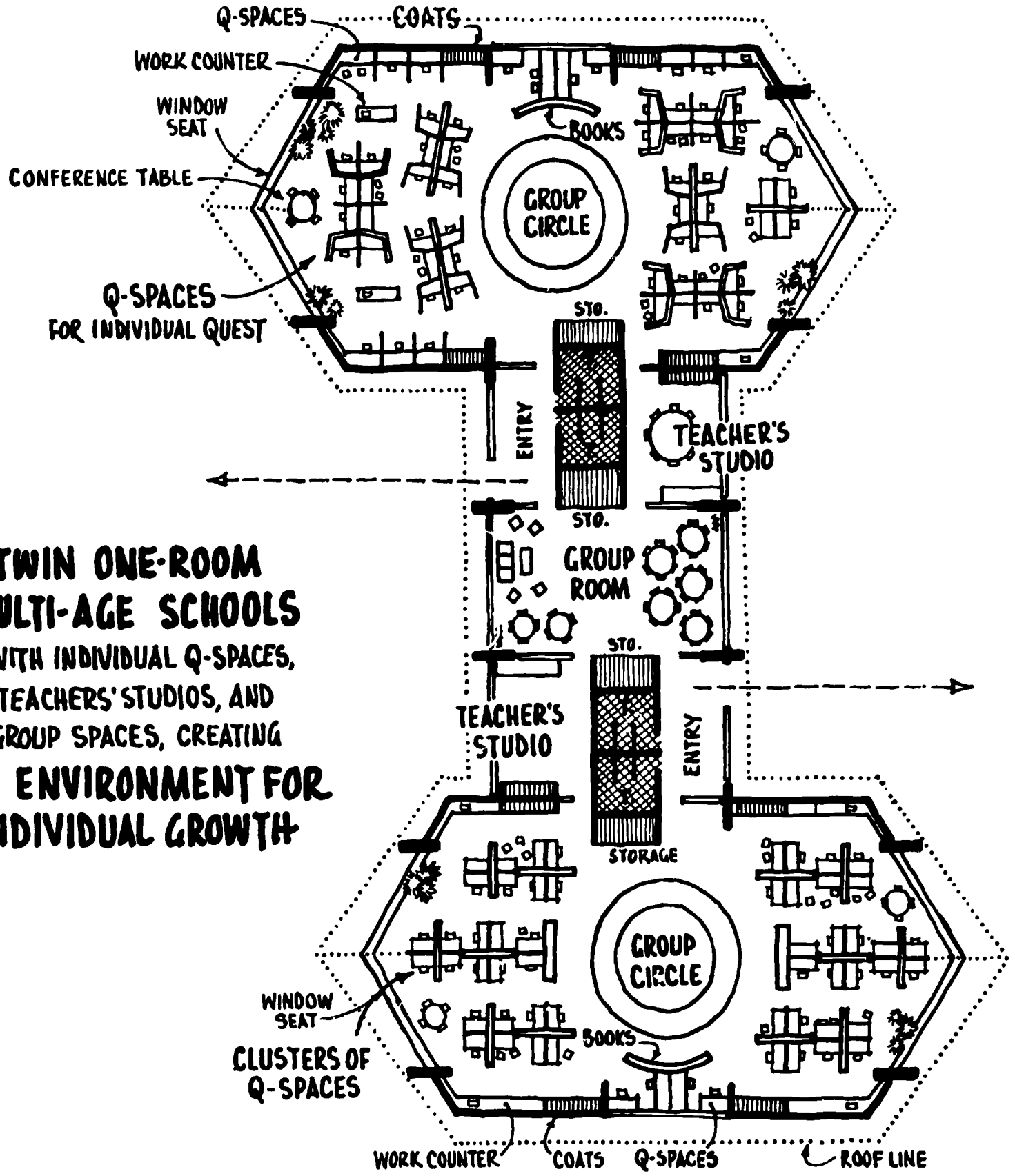
Anderson also noted that both educators and architects were talking about imposing a college pattern at the high school level. College students, he felt, are ready for instruction based on large group lectures, small seminars, and individual study. He bluntly asked: "Does the high school student have the social maturity? I think of some suburban communities where I could see this, but I'm not sure in many of the high schools whether or not they have the emotional and social maturity to be on their own to this extent."

Other educators likewise raised doubts as to the universal applicability of the *Q-Space*. Mary McMullen of the San Diego High School stated she would like to have *Q-Spaces* for those students who were mature enough to use them, but she certainly would not want spaces for all of them. In short, the *Q-Space* appeared to be a promising avenue of approach rather than a final solution.

TWIN ONE-ROOM MULTI-AGE SCHOOLS

WITH INDIVIDUAL Q-SPACES, TEACHERS' STUDIOS, AND GROUP SPACES, CREATING

AN ENVIRONMENT FOR INDIVIDUAL GROWTH



Bill Caudill and THE CASE OF THE BUSTED BOX

In the architectural profession and among schoolmen, Bill Caudill is well known for his graphic ability and his sparkling sense of humor. It was, therefore, no surprise to the conference that his presentation was beautifully and amusingly illustrated. Caudill's own comments on the accompanying series of drawings are so much to the point that they are quoted, at length, on page 18.

Once again the discussion revolved around the issue of maturity. Johan Eliot remarked that he was bothered "by the simple observation that except at the graduate level in the university, the carrel is not generally popular. Where it is popular with the undergraduate, it usually betokens a student of graduate potential." Eliot went on to note that a level of mental concentration which is able to function in isolation is obviously mature and that many high school students voluntarily seek each other out to study. Very often the individual student will turn on the radio to obtain a background of sound; he seems to want a situation in which he can see his fellows—an arrangement which will reinforce the collective studying impulse.

Jim MacConnell added that one of the major problems is that we now have more types of people and levels of comprehension than ever before, and Howard Jones stated that the fundamental problem was: "What do you want that you don't now have in the typical classroom? Are there some aids for study and learning that we don't have?" He doubted that there was a need for television in every individual area, but did mention the requirement of a larger number of learning materials. The increased individualization of instruction means the elimination of the single textbook. MacConnell also mentioned the need to take into account the rapid changes in our entire society. Experience in California has shown that far too many facilities for agricultural education are being built at a time when decreasing numbers of the population are being employed in this field. In Honolulu half of the agricultural teachers have to be "retreaded" because there are no jobs for them.

Professor Trump quite rightly pointed out that "when we talk about independent study, we are not thinking only of a youngster in a study carrel with a book or listening to tape. We are also thinking of him in a variety of independent study activities—in shops, or science labs, or perhaps outside the school itself." Like many others at the conference, he also emphasized the enormous differences between individual students and the need for greatly strengthened guidance programs. All the educators seemed to agree on the necessity of looking at students as *individuals* and of adapting school programs to their manifold needs. More than ever MATURITY looks like a key word for the high school of the future.

"The drawings simply point out that the 1-to-25 ratio and the box which houses this group is sacred in the minds of most educators and architects. And when you start busting up the box and the size of the 25 group, you've got problems. On the other hand, a cluster of these precious classroom boxes simply won't do the job of housing an up-to-date program, regardless of how they are arranged, whether strung out in rows on one side of a hall or on both sides of a hall, or whether grouped in three's or four's or simply put back to back. It seems that what we're really looking for is large loft space that can be converted at will into innumerable small spaces of different sizes. Dr. Trump's report certainly drives home this concept. As a matter of fact, for decades educators have been dreaming of a truly functional, convertible, loft-type teaching space.

"A school built in 1895 on 140th Street in New York City was an attempt toward this quality of convertibility. In this school, sliding partitions made it possible for the entire area covered by six classrooms and their connecting corridor to be thrown open for assembly purposes. Hundreds of churches built in the twenties also had this sort of arrangement. The first school our firm ever did had large sliding doors allowing two classroom spaces to be thrown together. So the problem isn't new. Unfortunately neither are the solutions. Most of the movable partitions today have the same flaws as those built at the turn of the century, the main flaw being that they are not good sound barriers. It should be pointed out here that there are a great number of educators and school architects who believe that it is not necessary to have soundproof partitions. They argue that in an up-to-date elementary school classroom, where generally two or three 'little classes' are going on at the same time, there seems to be no sound problem. These same people also say that teachers keep their doors and windows open a great deal of the time; so the best soundproofed partitions would not keep extraneous noise from going through the doors and windows into the classrooms. Our own firm has had considerable experience in designing these so-called open plan classrooms. The best known example is the high school at College Station in which there are not only no doors, but there are no partitions on the corridor side. The firm has built at least ten open plan elementary schools. It should be said here, too, that the majority of these seem to work quite satisfactorily. This does not mean that we believe sound interference is no problem. It simply means that some of our clients have been willing to tolerate the sound in order to have flexibility. In fact, we're very careful not to recommend open plan classrooms. However, we do believe that if the client wants them and honestly believes they will work, they generally do.

"There exists today another problem that we didn't have a few years ago. It's simply this: the classroom is becoming noisier and noisier each year. One reason is that there is a tendency toward the activity type of classroom where students are *learning by doing* instead of *learning by listening*. Where there is intercommunication among students, there seems to be a higher sound level. But the activities that have raised the sound levels in classrooms the most are those having to do with audio aids such as television, tapes, discs, movies, and radio. For some reason or other, the teacher or the class demands that the volume be turned much higher than the ordinary speaking level.

"You may gather from these remarks that there is a wide difference of opinion as to the feasibility of using movable partitions. Nothing could be truer. The problem isn't simple. There are no pat answers. There is a diversity of opinion even among the experts.

"We can't agree on solutions, but I think we can all agree that *the sacred box is busted.*

"The last drawing suggests a new kind of learning space, at least new to the public schools, but certainly familiar to boys and girls who have a nook in their attic, garage, or barn which they can call their own and in which they can pursue creative learning activities. It advocates the use of an enormous barn; good, cheap space that provides a large number of nooks, crannies, and cubicles for independent research projects. In essence, this barn for learning is a place in which to exercise creativity."

bill caudill

solves the problem of

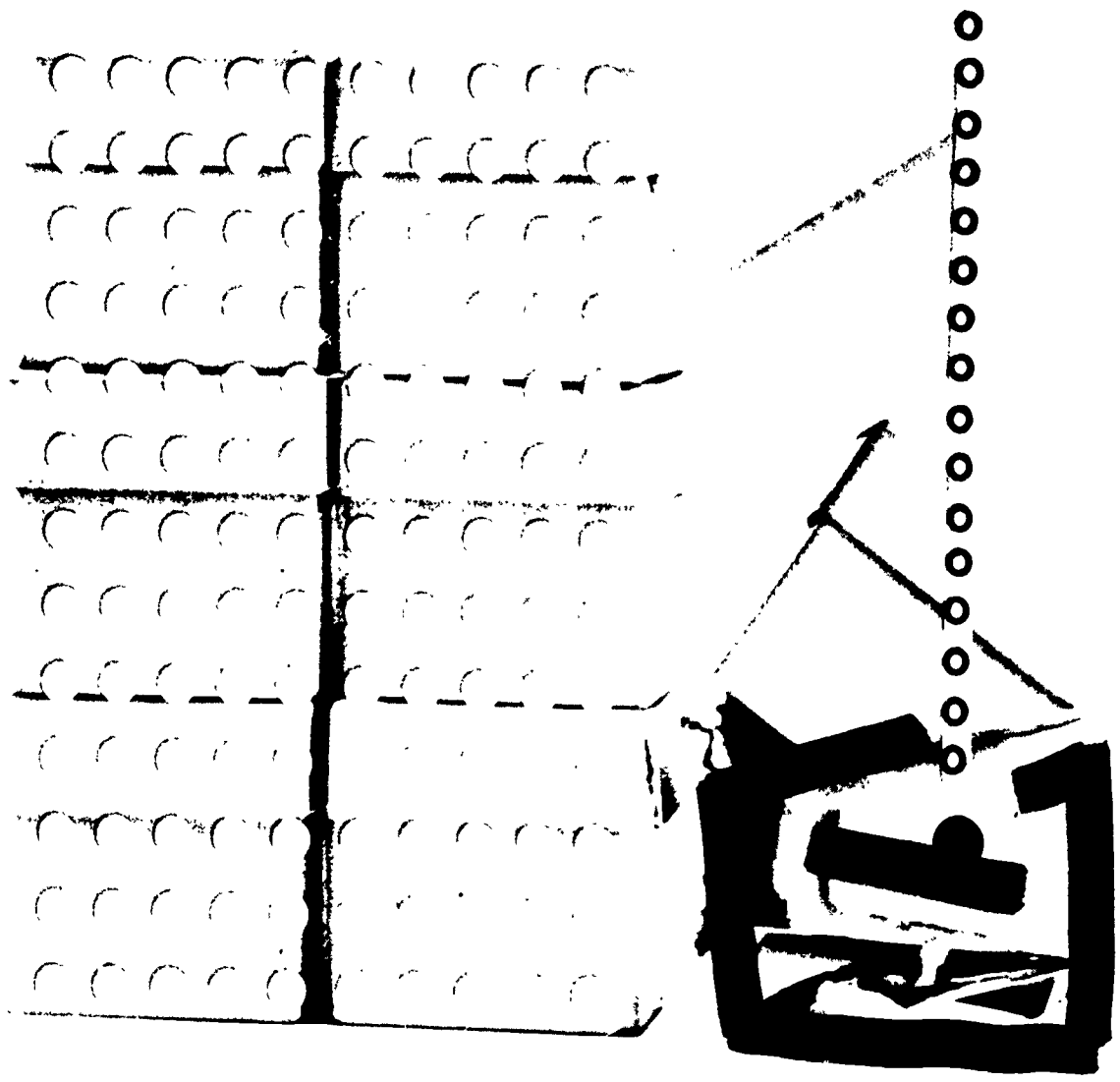
THE CASE

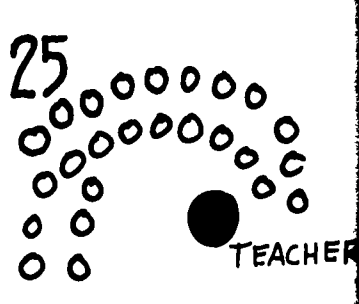
OF

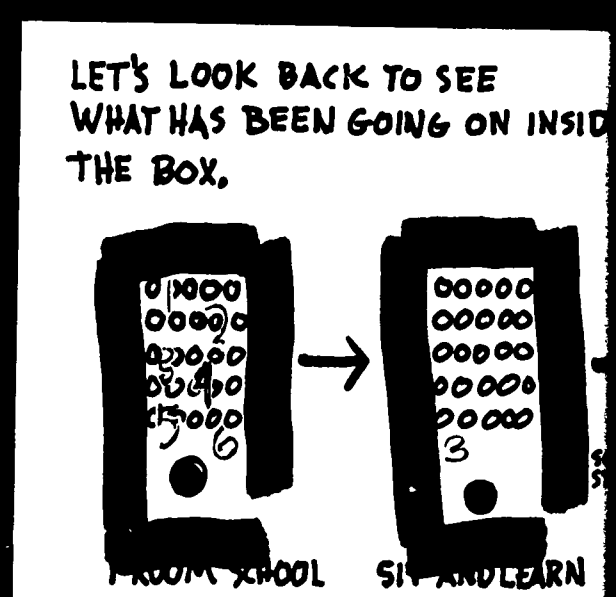
THE BUSTED BOX

The stately old house had stood with its ghosts for four hundred years. Good and evil, its dead lords lay in the vast family tomb—till the last owner was

TRUMPED

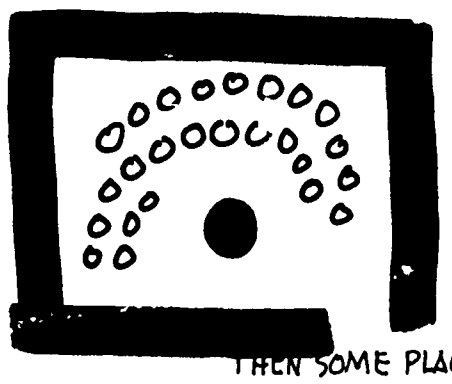






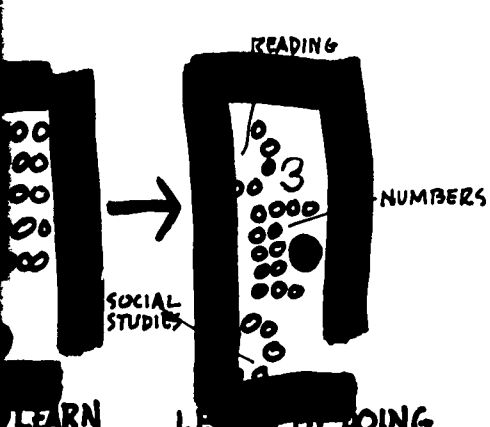
TEACHER

FOR CENTURIES WE FELT THAT THE BEST WAY TO TEACH WAS FOR A TEACHER TO GET TOGETHER WITH 25 OR SO STUDENTS.



THEN SOME PLACE DOWN THE LINE WE CALLED THIS GROUP OF **25** A "CLASS." ABOUT THE SAME TIME WE STARTED BOXING IN THE CLASS AND WE CALLED IT A **CLASSROOM**. AT THE TURN OF THIS CENTURY, WE EVEN PASSED LAWS WHICH SPECIFIED EXACTLY WHAT THIS **BOX** SHOULD LOOK LIKE

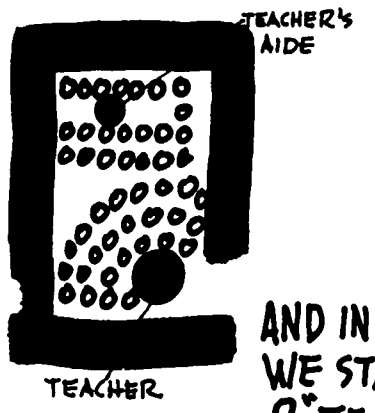
N INSIDE



LEARN

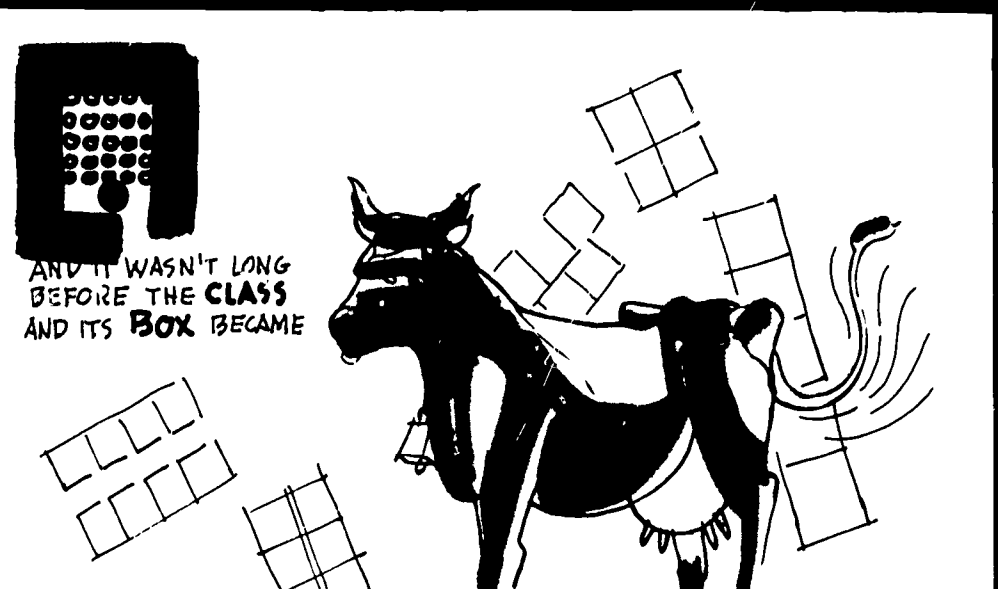
LEARN BY DOING

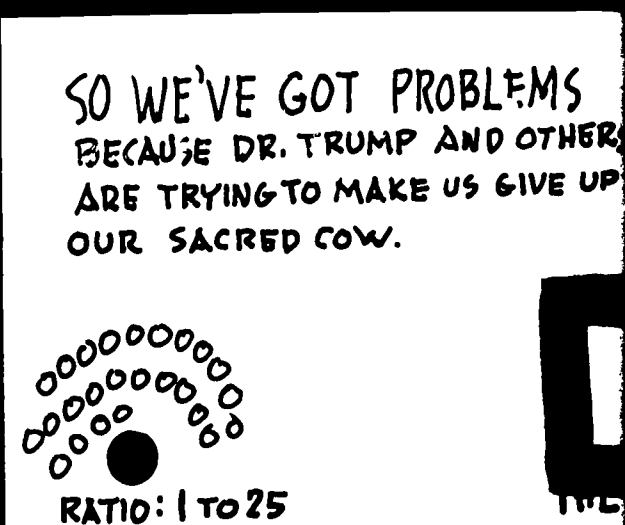
HERE WE HAVE 3 "CLASSES" IN ONE BOX.



AND IN BAY CITY WE STARTED PUTTING 2 "TEACHERS" IN OUR CHERISHED BOX!

A
T


AND IT WASN'T LONG BEFORE THE CLASS AND ITS BOX BECAME
A SCRED COW
3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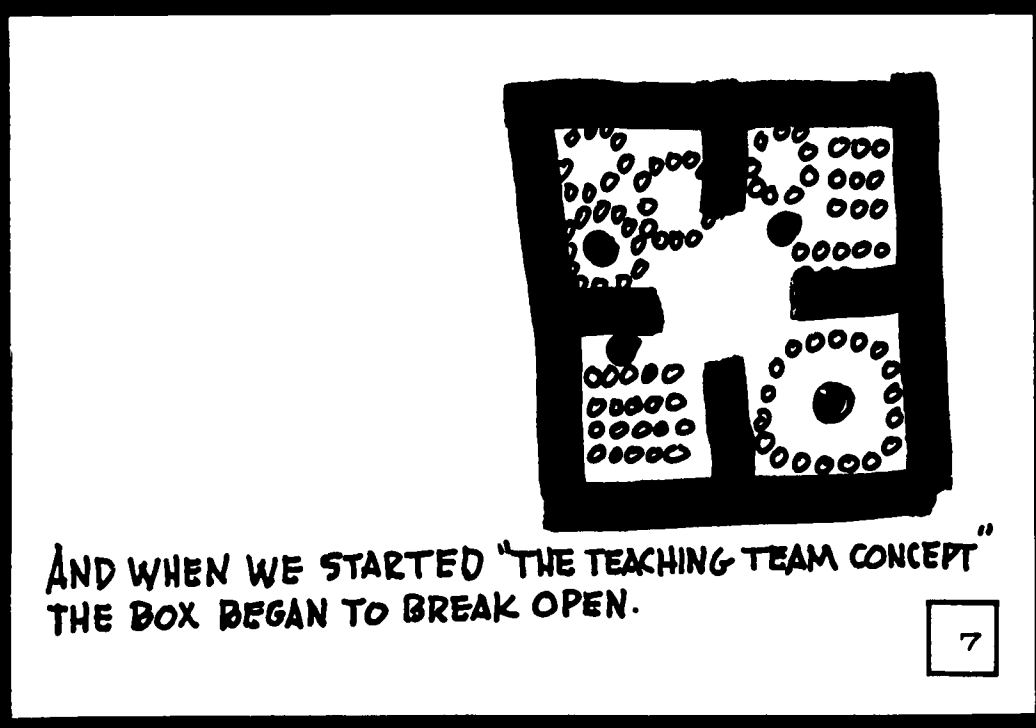
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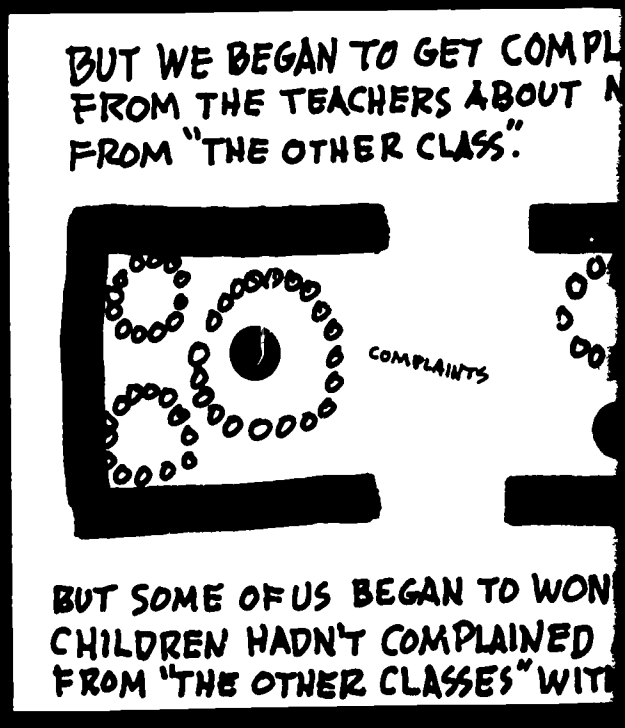
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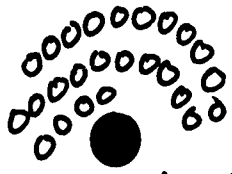
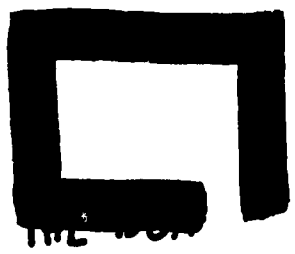


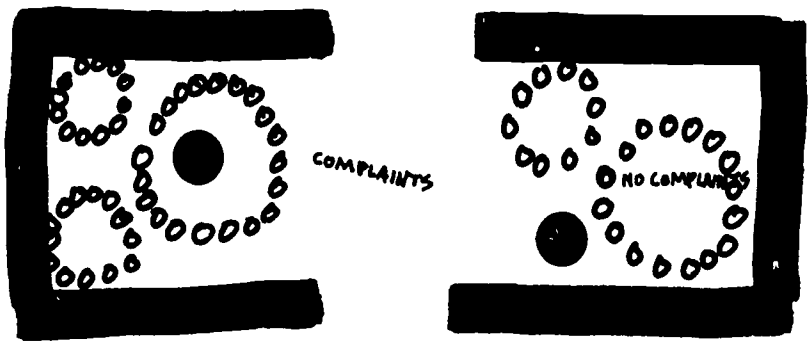
RATIO: 1 TO 25



FOR YEARS THE TEACHER HAS OWNED HER BOX AND SHE IS NOT GOING TO LIKE THE IDEA OF GIVING IT UP.

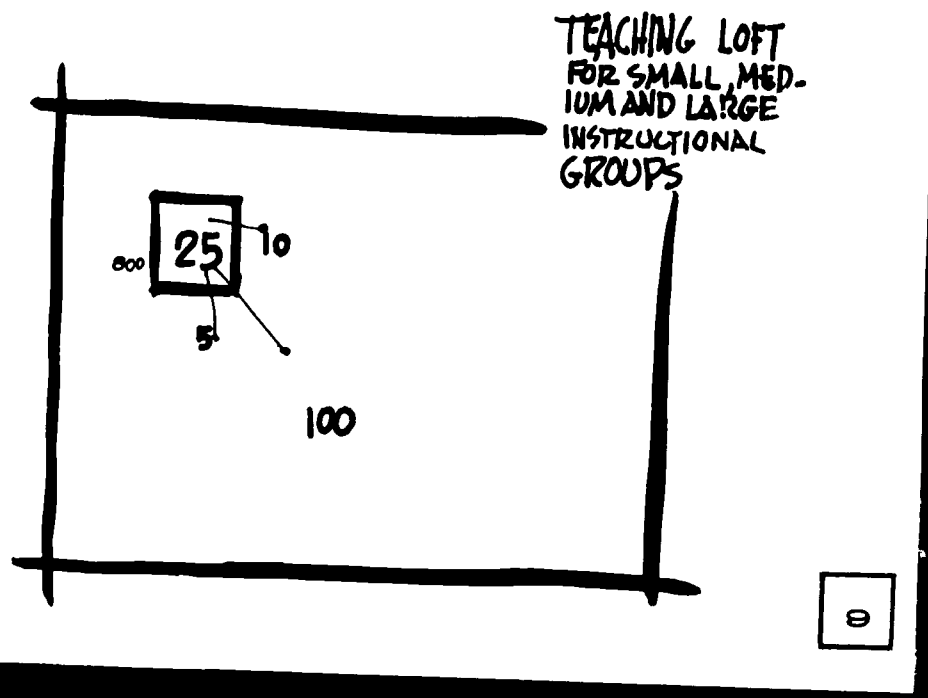
4

BUT WE BEGAN TO GET COMPLAINTS
FROM THE TEACHERS ABOUT NOISE
FROM "THE OTHER CLASS".



BUT SOME OF US BEGAN TO WONDER WHY THE CHILDREN HADN'T COMPLAINED ABOUT THE NOISE FROM "THE OTHER CLASSES" WITHIN THEIR ROOM

8



bill caudill

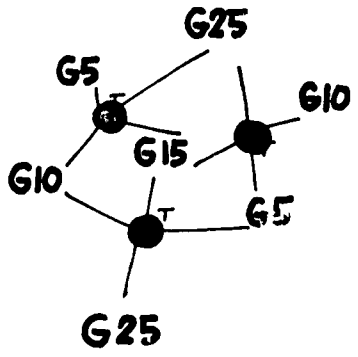
solves the problem of

THE CASE

OF

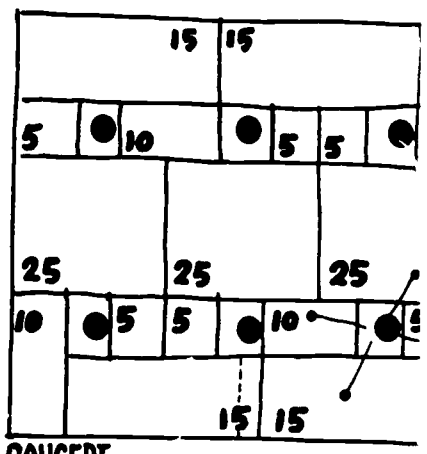
THE BUS

TYPICAL – TEACHER OWNS CLASSROOM AND OPERATES 3 GROUPS IN ONE OPEN SPACE. DISTURBANCE FROM SOUND?



NEW TYPE – TEACHER SURROUNDED WITH 4 DIFFERENT SIZE SOUND PROOF COMPARTMENTS

10



CONCEPT: DESIGN SPACE FOR SMALL GI
INSTRUCTION. PROVIDE TEACHER'S OFFICE
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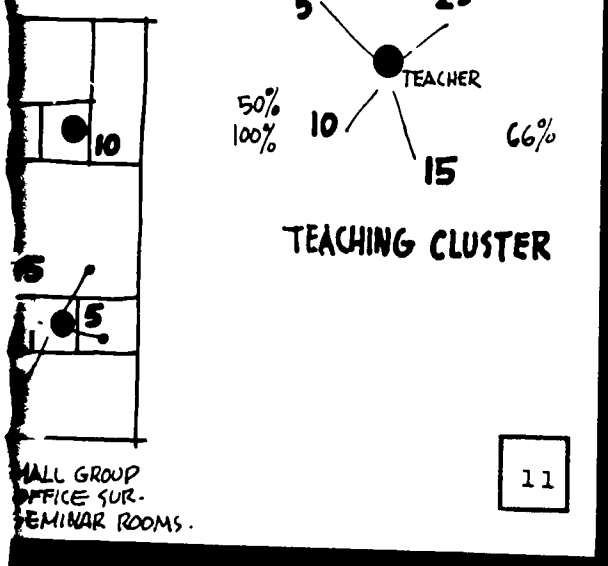
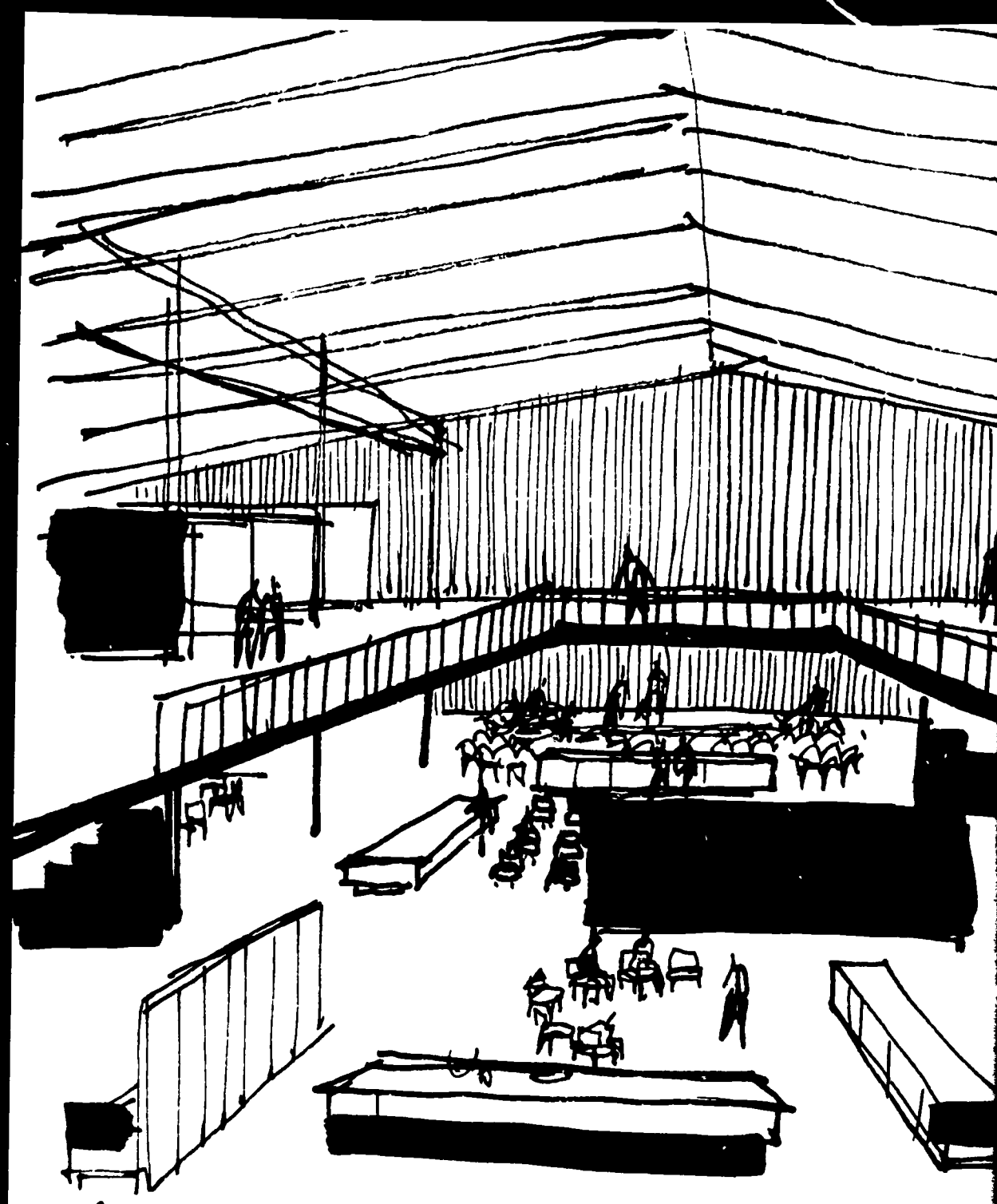
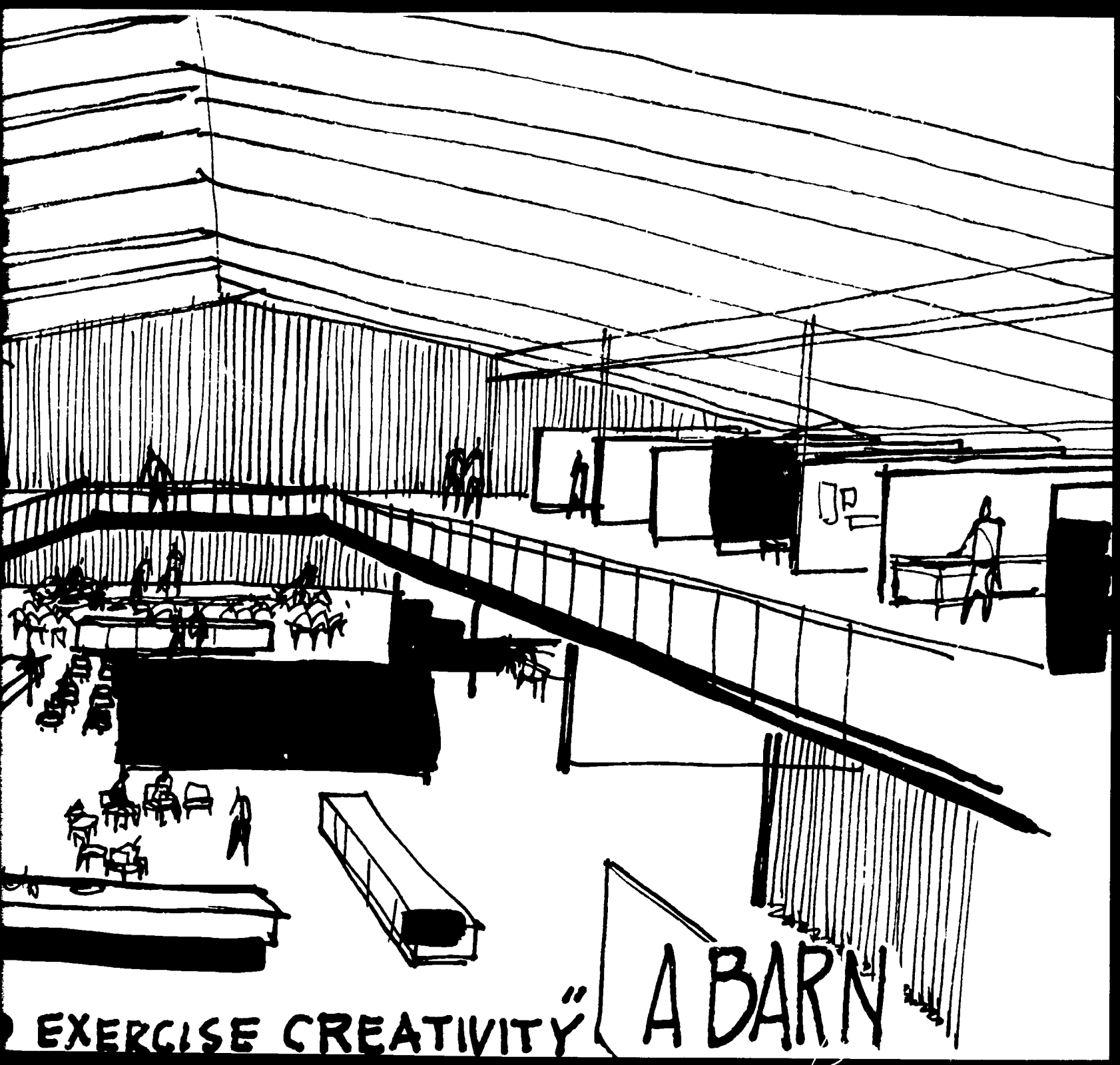




"A PLACE TO EXERCISE CREAT


EXERCISE CREATIVITY"
A BARN

Don Barthelme

and

THE FUGGER FUROR

Don Barthelme observed: "Conventionally, the pupil in our secondary schools is presented with a group of unrelated bodies of information—labeled 'History' or 'French' or 'Biology'—and asked to transfer his attention from one to another when a bell rings." He went on to note that the tight compartments in which we have placed knowledge have an immediate and disastrous effect upon learning. A premium is placed upon not caring, since in 50 minutes a bell will ring, and however interested the student may be in biology, he must proceed to the study of something else. The good teacher is defeated by the system and the interested student is frustrated. "To be successful in this kind of environment," said Barthelme, "the student must make of himself a kind of machine. His highest functions are gathering, retaining, and repeating information. His peculiarly human functions—thought, for instance—are made secondary. His goal is simply completion of the course." To overcome these difficulties Barthelme proposed what he called THE SITUATIONS METHOD. While Don gave several fine examples of this approach, nothing could be more illustrative of its radical quality than his staff memo. (See pages 22 and 23.)

Let us examine the problem further. Barthelme argues most persuasively for his own method. "Under this system the student is placed in a situation in which action is required. He is presented with a set of circumstances which locate him in time and space, with a description of the problem he faces in this particular situation, and with a set of specifications which outline what must be accomplished by his solution. The duration of the problem is four weeks; at the end of that time he presents his solution, which is then evaluated by a panel of teachers. He is then given the next situation.

MEMO II B:

THE SALVATION OF THE HOUSE OF FUGGER:

SITUATION: The year is 1558. A crisis has arisen in the great German banking firm of the House of Fugger. Huge sums advanced to Charles V without adequate security, equally large amounts loaned to the Hapsburgs, and generally rash fiscal policies have brought this once distinguished firm to the brink of ruin. Various members of the partnership are now anxious to liquidate their holdings; dissolution of the enterprise appears imminent. The bulk of the firm's capital is frozen in debts on which the partners cannot demand payment, for these loans have been made to the ruling monarchs of Europe, upon whose favor the firm is dependent if it is to continue its operations. A meeting of the Board of Directors has been called; the last hope of the firm resides in young Count Albert Fugger, who has been intrusted with evolving an over-all policy to meet the threat. You are this man.

PROBLEM: Evolve a broad general policy or plan for the salvation of the House of Fugger.
CONDITIONS: as follows —
1. No proposal which ignores the honor of the House of Fugger, or reflects upon or compromises that honor, will be considered acceptable.
2. Preservation of the House of Fugger as an entity, and of the size and scope of its operations at their present level, are to be considered vital aims.
3. No proposal that does not demonstrate a thorough grounding in and understanding of the prevailing world situation, including a knowledge of major political alignments, stresses to which these are subject, and likely shifts in the existing power structure, together with a knowledge of how these came about, will be considered acceptable by the Board of Directors.
4. No proposal that violates existing social mores, institutions, customs, laws, and habits of thought, that is, no proposal which could not occur to a creative sixteenth century banker, will be considered acceptable.
5. All proposals must be supported logically and in detail, with appropriate documentation: if a product, by a working model or other facsimile; if a new alignment of existing rules to the financial benefit of our House, by evidence that the various Powers can be successfully combined; if a new area of endeavor, by documents supporting the choice.
6. Two drafts of the proposal must be presented to the Secretary of the Board, one in English, the other in either French, German, or Spanish, these being the languages of the various members. In addition, an oral presentation must be made, of sufficient persuasiveness to sway the Board to the implementation of your plan.
BACKGROUND: The first transaction . . . of which we have record was in 1487 when Jakob Fugger II (1459-1526) made a loan of 23,627 florins to Siegmund, Archduke of the Tyrol, against the security of a mortgage on the silver mines of Schwaz. On this modest foundation Jakob II — affectionately called "The Rich" — built the House of Fugger, for a hundred years the preeminent financial institution of Europe. Jakob's operations were many and diverse, but they all followed an essentially simple pattern: the loan of ready cash, at high rates of interest, against guaranteed sources of revenue of the kind only princes, kings, and emperors had at their disposal. In its heyday, the Fugger firm—always a family partnership—dealt with nearly all the dynasties of Europe. It financed the purchase of titles and benefices, provided funds for the gorgeous ceremonies so essential to the exercise of authority at that time, raised the money that bought the election of emperors, and enabled the potentates of Europe to fight the wars that shaped the history of states and religions.

(From the Fugger Newsletters)

NOTE: Because of its failure to meet this crisis, and for other reasons, the House of Fugger did in fact decline after 1559. By 1655 Count Albert Fugger was reduced to selling the family library, which was purchased by Ferdinand III, for 15,000 gulden.

"The problems themselves are so constructed as to require the mastery of a given amount of material in a number of different fields for an adequate solution. As one situation follows another, the level of difficulty and the amount of knowledge required for an adequate solution are increased. At the same time, the areas of knowledge which are being investigated with the situation as instrument change as the problems change; emphasis in one situation may be upon mathematics, chemistry, shop, and art, in another upon home-making, physics, music, and English.

"The bright student cannot already know the answer from his previous or outside reading or experience. *There is no answer in this sense.* Nor can the lagging student decide, the moment the situation is announced, that he is hopelessly at sea, for from the beginning all of the students are equally unsure of ways and means. Each problem, typically, will immediately generate a number of ideas, which will be found upon examination to be inadequate. Thus the student discovers the need for programming, or working out his own approach to the solution. As the situation is studied, and it is found that facile solutions are not admitted, he becomes aware that a really adequate solution requires a great deal of knowledge which he does not possess.

"At this point he turns to the teachers, to whom he is immediately in a new relation. The teacher becomes a resource person who possesses information that it is absolutely essential that the student have. The pupil's problem is now to get the information out of the teacher, whereas previously it was the teacher's problem to get the information into the student. And the stage is set for learning. For the first time everything the student does relates, not to the dimly perceived completion of the course, but to the immediate present. Everything he learns has a bearing upon the problem; and his progress through the day becomes, not a lockstep from compartment to compartment, but hot pursuit of a carefully defined goal. Instead of having learning proceed in a linear pattern (world history from the pyramids to the present) with each line parallel to but never touching every other line, we have a series of waves advancing on a broad front in a concerted effort, each reaching a little farther than the last.

"Here instruction is supplied at the point of use; it is needed rather than gratuitous. Instead of being something that belongs to the instructor and is measured out in carefully segmented doses, *knowledge becomes the property of the student;* he has seized it, worked with it, used it; it becomes his own. The mode or vehicle of his learning has been selected by him; that is, he has programmed his own path to the solution of the problem, he has determined what he needs to know. He learns at his own speed; he combines with others, arguing the merits of various solutions. His own interests and values are reflected in his work. The problem is held in common with others, but the solution is his own."

Having designed a system which would overcome some of the things which bothered him, Don was ready to go to work on the problem of the school and its architecture. His superb presentation of a school adapted to THE SITUATIONS METHOD will be found in the latter part of this booklet, but before the reader turns to these pages, it is appropriate to comment on the discussion which he provoked by his skepticism about the concept of flexibility.

Don Barthelme voices SOME SKEPTICISM

Obviously Don's *FUGGER* problem, as set forth in the preceding section, gives the student credit for a high degree of maturity. His school, on the other hand, is designed around a rigid grid which he himself thought was not flexible. He was asked by Harold Gores to elaborate on "the snare and delusion of flexibility." His answer is emphasized in the margin.

As mentioned previously, this statement did not go unchallenged. Doug Haskell stated that it was foolish to let go of such a good idea as convertibility, but Phil Daniel came to Don's defense with some trenchant remarks to the effect that architects frequently put flexibility into a school only to have teaching staffs ignore it completely. Only too often movable partitions remain fixed in place. Haskell, however, returned to the attack with the observation that "the program of building America on which we embarked for a long period of time, as if we were all pioneers in a wilderness and forever building it all new, has shifted." Haskell went on to point out that since World War II we have redeveloped old buildings and other facilities and will certainly continue to do so. Because of competition from the Russians we will not be able to put unlimited resources into new buildings, and therefore convertibility (or flexibility) is a desirable quality. Walter Taylor of the A.I.A. seconded Haskell's comments and, like Daniel, reiterated that flexibility was ultimately undefinable.

It's something that all the educators say, "Yes, we must have flexibility," and most of the architects say, "Yes, we'll give you flexibility," and then they spend an ungodly percentage of their time worrying about flexibility, which they really know they can't accomplish anyhow because every means or device they have in their pack or kit has some greater disadvantage than the gains that would come from it. Meanwhile, they prejudice their plan; they group things together and make out that this is going to work and lose better opportunities. It's not only that you can't have it, but it leads you astray.

—Donald Barthelme

Archibald Shaw entered the discussion to defend Barthelme against the charge of inflexibility. "You took as given," he said, "the nature of people, how people learn, and the assumption that in considerable numbers they are going to come to a given center which we call a school. The one thing that you have left very flexible, as I observe it, is the organization of this learning." He added that the only solutions which Don proposed "lend themselves to an extremely flexible organization."

Barthelme himself remarked that allowance for flexibility in the organization of the learning process was his main point. If this could be managed, the structural system of the building itself was of small account. In any event, it was clear that all the participants in the conference felt that they owed him a debt of gratitude for scrutinizing this troublesome word so closely. It is always a healthy thing to challenge an established precept, and thanks to Don, everyone began to look at flexibility a lot more closely.

Chip Harkness

and

THE TRANSITIONAL SCHOOL

By common consent the Wayland High School in Massachusetts, designed by The Architects Collaborative in 1958-59, and now being constructed, is the nation's closest approach to a "Trump school." Its genesis is therefore of considerable interest. The story throws much light on the vexing question of flexibility.

According to Chip Harkness, his firm was brought into the building picture at Wayland in January, 1958, at a time when Superintendent Anderson and his educational consultants had already been working on plans for a new high school for six months or more. The questions which were put to The Architects Collaborative are illuminating. These questions are quoted alongside to indicate the awareness of future problems possessed by the Wayland School Board and to put the building in its social setting. In general, said Harkness, the Board wanted to know how his firm would go about planning a school "which would not be a strait jacket for a preconceived educational program." He added that he thought The Architects Collaborative had been asked to do the job precisely because they had no preconceived notions.

In the course of their discussions with the Wayland School Board, partner Don Mitchell came up with an analysis of school types illustrated on pages 11, 12, and 13. Type 1 he called a *cells and bells* school, a structure in which there are a group of compartments for learning, usually around 30-35 pupils for each room; these individual units may be hitched together in various ways, and the result will be good or bad depending on the skill of the architect in doing the hitching. Type 2 he called a *totally flexible* school. While total flexibility has much to be said for it, it has also certain inherent problems. Total flexibility is almost by its very nature more expensive than limited flexibility, and the acoustical problems which it presents are as yet far from solved. Total flexibility is also, said Harkness, "perhaps an abdication on the part of the educational people from determining what type of program they want."

As a transitional kind of expediency, Mitchell proposed a third approach which he referred to as *planned variability*. By this he meant that many of the recommendations of THE TRUMP REPORT would be a direction for the program. A school with planned variability would have large, medium, and small group rooms to provide a variety of relationships for students and teachers; through scheduling, a flexibility in the total plan could be achieved. This is the approach finally adopted at Wayland, and it is clearly reflected in the building itself (described more fully in Part 2 of this report).

The discussion provoked by Harkness's presentation was lively. The use of individual study areas in the design was one of the chief points of interest, and in response to an inquiry on this point, Superintendent Anderson stated:

"This is a very involved question because the concept of this educational program is highly individualized and geared to independent study, in which the school operates a minimum of eight hours a day, with youngsters in all probability assigned to no more than five of those eight hours. A cafeteria is assigned as a place to eat and as a common room, where youngsters can go at any time during the day. The laboratories are set up so that no classes would ever be held in them; they are individual work stations. . . . The resource areas and the libraries are open to any youngster. Over half of the student population could be accommodated in the areas outside of given classroom instruction at any given time."

Cy Sargent of Harvard also emphasized the assumption of the plan that a transition period was in order. This scheme, he felt, was as far as the community and faculty were prepared to go, and the enthusiastic support of both groups was, after all, a necessity.

Having stressed the transitional quality of the school, Anderson went on to discuss the startling number of Trump devices which are now in use at Wayland even before the new building is open. This is a high school which has made much use of large group instruction and in some areas has already reached 20-25 per cent in small group instruction. Anderson stated that there is good evidence that in science they will not be running regular size classroom groups at all. Another important feature of the Wayland educational effort is the attempt to break down subject lines. Thus there is much interchange of teaching teams between English and Music, between Science and Math, and so on. Mary McMullen, a high school principal herself, wanted to know: "How have you achieved this approach with your professional staff, before getting the building built? . . . In many areas the teacher wants to go ahead but comes up against a stone wall—we haven't the space for large groups or we haven't the facilities." Anderson replied that they had only been able to do so by making drastic alterations in an overcrowded 80-year-old structure, and the audience was left wondering: If Wayland can do this much with an old building, what will they accomplish with a new one?

Did we think that the ideal teaching situation was in all cases a teacher-pupil ratio of 1:35, and if this is not the ideal teaching relationship, what is this going to mean in terms of plant planning? Would we, in working on a job, wish to be given the program spelling out the exact sizes and relationships of all the rooms, which we would then juggle together in the usual fashion? What would be the effect of audio-visual aids, television, and such on the plant?

—asked of
The Architects Collaborative

Colbert and Nelson

and their

PERCEPTION CORE

This particular presentation was the product of a close collaboration between architect and educator, and it clearly demonstrated the concern of both professions with the question of flexibility. In Colbert's own account of their joint venture, he stated that he and Roland Nelson, Headmaster of the Metairie Park Country Day School, had tried to find "areas of mutual assent." Their first assumptions were that the school should be divided into three departments and that each of these should be composed of three grades. In order to bring the areas of knowledge together, they proposed a *perception core* and this notion was truly at the heart of their scheme. Here is the place where the school comes together as a whole or as a unit. It involves the interplay of work and recreation with emphasis on creativity.

A few other features in the background of this extremely interesting idea must be mentioned. Colbert and Nelson based their school on an individualized student program and stressed quality rather than quantity in education. They felt that all students should be exposed "in depth" to the highly skilled teachers envisaged by the Trump Commission. In this connection they disregarded the medium of television; "It is these teachers who can motivate the students strongly and help in the germination of the perception process." Personal contact is therefore essential.

Nelson is at present headmaster of a college preparatory school, and the building illustrated in Part 2 of this booklet is largely, but not totally, a prep school. In most cases it will not provide terminal education, although it could certainly do so. Also important is the fact that the school has three units of three grades; every element in the program is divisible by three so that the entire scheme has a mathematical consistency. Everywhere in this design the idea of order is very strong. The core itself is formed by the intersection of four concrete trusses so that the plan takes the form of a Greek cross which is, in Colbert's own words, "the essence of order."

The presentation evoked a number of important questions. Bill Clapp remarked that the plan glorified departmentalization, and was answered that the problem of compartmentalization was one of the main reasons for the *perception core*. Here there will be demonstrations of the work of all class areas, and in addition, formal scheduling of interdepartmental activity. Johan Eliot noted with alarm that Nelson was still using the old term "domestic science," and asked if the headmaster "really meant it." Nelson made the rather amusing reply that he did, since many of his girls were overprivileged.

For the most part, however, the discussion revolved around the issues of formalism and order, ideas ordinarily at the opposite pole from the concept of flexibility. Chip Harkness was worried that the formality of the Greek cross plan would act as a strait jacket on the further development of the school: "It is true, for example, that there are three divisions which require the same amount of space and make up with an entrance scheme a fourth equal area, and if it is true now, will it always be true? . . . What happens when you have a few more students? If you make a change in a scheme as formal as this, aren't you destroying the exterior expression of the thing?"

In reply Colbert admitted that his school was formal in plan, but denied that this was so in the vertical dimension. "We're two-dimensionally firm and three-dimensionally capricious," he stated, and added that the design had certain innate flexibilities. Still, compactness was a worthy objective, and with the concentration of structure along the concrete trusses, an appreciable saving in cost would be possible.

There was evidently a real split between Superintendent Anderson, who was worried about the idea of compactness, and Colbert. In reference to the latter's contention, Anderson remarked: "There is one thing which has always bothered me. I'm very much concerned when I go into a school and get a sense of a great many people in one place. I'm afraid of the compact school for this reason, and I've been in thousands of compact schools. This is why I think that we have to begin to utilize more area; four or five hundred youngsters just fill up so much space. The crowded conditions which exist around our schools have not been healthy for education. This is why I've steered very far away from compactness in education."

Colbert responded: "I am tired of 60-acre campuses that look like parks with no kids except on the remote horizons; a few are usually concentrated around one activity center. I think it's time that we built good schools in our cities." Archibald Shaw joined Harkness and Anderson in concluding that the school was an "overstressed expression of formalism," but Colbert himself posed a nice question when he answered: "The separation between formalism and order is awfully narrow."

To accommodate the variety of creative minds in architecture and education, the definition of flexibility must obviously be inclusive rather than exclusive—broad rather than narrow.

Some of them don't have an opportunity to cook with Mom because Mom doesn't know how to cook. Yet many will marry young men struggling through college or graduate school. So we've had quite a demand for cooking and sewing.

—Roland Nelson

John Lyon Reid

and his

SCHOOL OF THE FUTURE

Like the designers of The Architects Collaborative, John Lyon Reid observed that there are three general types of school building programs on which architects customarily work: "One is what you might call the 'bread and butter' program; the perfectly conventional, tried and true statement of educational needs, to which the architect is expected to fit his housing. Another one is what you might call the 'forward-looking, thoughtful, explanatory kind of program,' such as we saw in the very first presentation we had here—the Wayland High School. . . . The third one is 'way out in the future,' a space platform to be used as a navigational aid for charting courses on the turbulent sea of education. This last is the kind of program the architect practically never, except in rare instances, has an opportunity to work on." It was, however, as exactly such a program that Reid interpreted THE TRUMP REPORT. This document he said, is, "imaginative and forward looking . . . completely free of inhibitions and negative habits." Reid's comments on one aspect of school plant planning that has generally been ignored are printed alongside.

He also noted that very often a school planned around a conference table will not work out in practice. Adjustments must be made in the building if it is to carry out its original program, and yet teachers are often reluctant to go along with innovations which they themselves have suggested. Mary McMullen and several others touched on this point in earlier discussions. Reid therefore devoted considerable time to demonstrating the manner in which an existing building, the Mills High School in California, could be revamped to bring it into accord with the recommendations of THE TRUMP REPORT. He also, however, presented a scheme developed specifically for the conference (see Part 2). The nature of this space was inspired by the Trump proposal; it provides a maximum of flexibility to permit experimentation in teaching.

In the totally flexible school all sorts of technological problems are encountered, and most of the discussion of Reid's proposal turned on these. Chief among them was the difficult question of acoustics, which was uppermost in the mind of Russell Wilson. He stated: "Most of us who teach are aware that as much learning takes place by critical hearing as by critical seeing. I think that some of us should pause once in a while and remember that in terms of physiological handicap, abnormalities such as superhearing or deficient hearing are at about the same ratio in our student population as visual defects."

This was an exceedingly trenchant observation, since Reid had predicated his partitionless school on the idea of a uniform 61-63 decible noise level throughout. Don Barthelme also noted that the noise level "has a psychological pressure working on your students all the time, and they'll know this at the end of the day." The observer could not help wondering if total structural flexibility did not raise as many problems as it solved.

Chip Harkness likewise questioned the concept of total flexibility in the following terms: "In thinking it over, it seems to me that you have devised a system in this loft construction that is more or less optimum bay spacing and of a necessity flat-ceilinged and flat-floored. . . . When you divide this space into smaller spaces as recommended by THE TRUMP REPORT, do you get the optimum large room?" Harkness went on to ask if a stadium type of floor might be advisable and inquired if in this case flexibility might not be a form of compromise.

Reid replied in the negative: "I don't believe it's a form of compromise. With the stadium type of floor, you have something that is fixed. You just have to let it stand as a sloping floor area for all time unless you are willing to fill it and cover it over. The flat floor, I think, is part of that flexibility which I certainly would like to maintain."

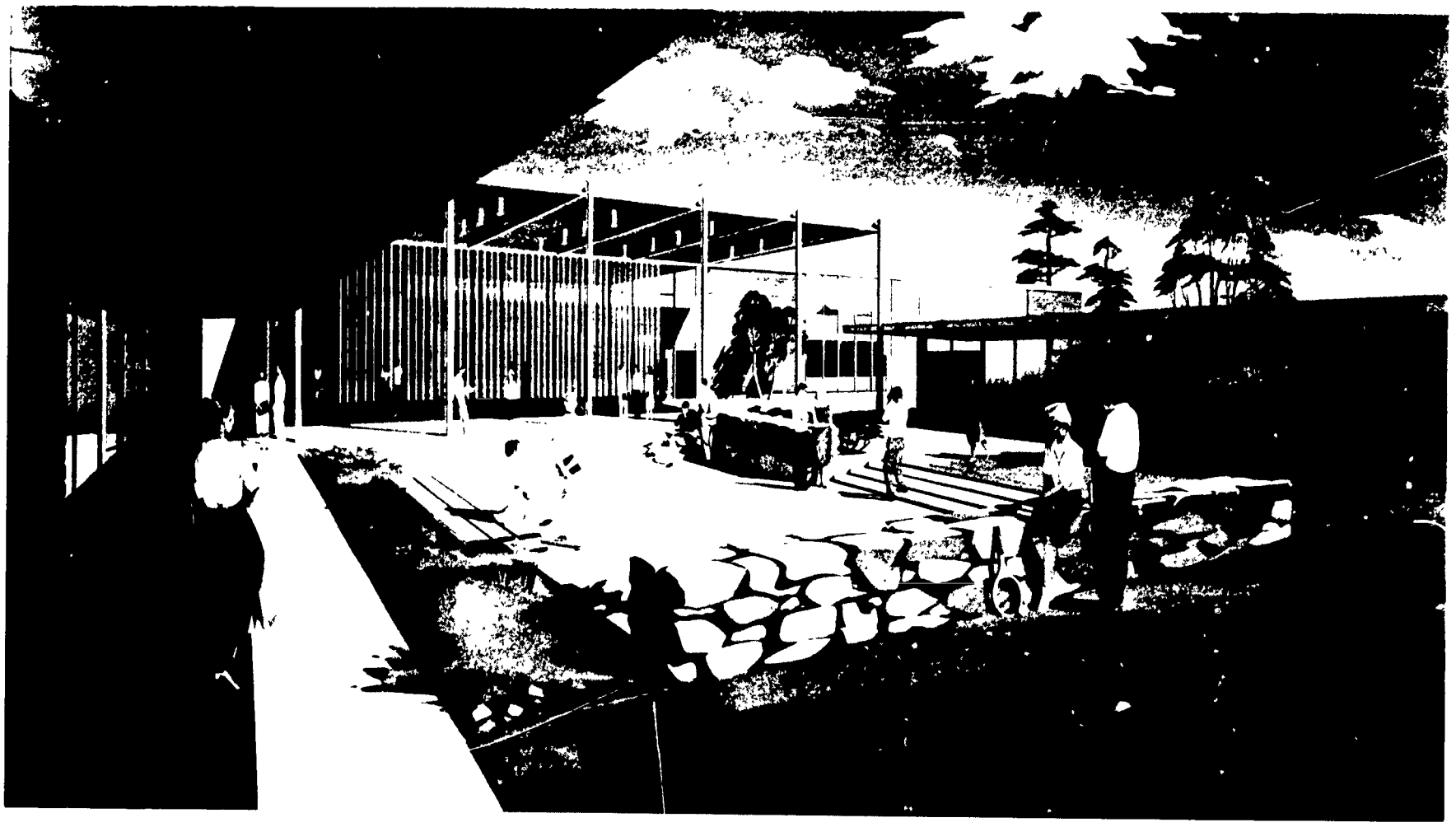
Here, as elsewhere, there was evidently room for honest difference of opinion on the meaning of flexibility. The entire conference, in fact, underlined the disagreements among architects and educators on the meaning of *flexibility*. At the conclusion of the meetings the word had probably been under much closer scrutiny than it ordinarily receives.

In retrospect the agreement which the conference achieved on major issues is remarkable. Despite semantic problems and differences in approach, both architects and educators were able to reach a consensus on the nature of their challenge. It was clear to everyone that *enormous changes are under way in the basic nature of the American educational system;* how to accommodate them is the pressing question. In this area there is room for legitimate differences of opinion. The presentations at the conference were evidence of great creativity among architects and educators, and the variation in their form is cause for real hope.

Education is a creative, thoughtful method of learning and is a fluid activity. A fluid might be said to take the shape of its container. If that is true, I think we might also say that the container should change its shape when required.

—John Lyon Reid

ARCHITECTURAL PRESENTATIONS—PART 2



WAYLAND, MASSACHUSETTS, SENIOR HIGH SCHOOL

Designed to meet a gradually increasing enrollment and a highly individualized program geared to independent study, The Wayland Senior High School, which opened this fall, represents a test case for THE TRUMP REPORT. Incorporated into the plan are a number of THE TRUMP REPORT recommendations with vestigial classrooms which act as transitional ties to an (already) advanced teaching program. The school, which opened to 450 pupils in the fall of 1960, is designed for the use of 850. The planning will allow for expansion to 1,200 pupils, with only minor modifications of the basic scheme (the addition of another serving line in the cafeteria). This planning also permits either a *transition* or a growth from one type of teaching program into another. At the opening, the pupils will be scheduled: 10 per cent large groups, 80 per cent middle-size groups (classrooms), 10 per cent seminars. Later scheduling will place the pupils into groupings as follows: 20 per cent large groups, 60 per cent middle-size groups (classrooms), 20 per cent seminars. The long-range planning calls for scheduling into: 30 per cent large groups, 40 per cent middle-size groups (classrooms), 30 per cent seminars. Each of these arrangements presupposes individual study time. This program is considered "a natural development of the educational process as it exists at the present time in Wayland, and a logical continuation of that system."

The architectural solution derives from a new approach to secondary education: "This whole approach," as the architect explains, "is one of not simply making a school building with some big rooms and some small rooms. I think it represents an entirely different attitude, first of all towards teachers, giving them a possibility of expanding their potential: and secondly, towards students, treating them not only from a disciplinarian point of view, but trying to bring out of them their best capabilities."

With 90 acres of a former gravel quarry and swamp as a background, the architects set the academic buildings onto a raised, artificial podium so that the visual environment, both inside and outside the buildings, was highly controlled. The magnitude of the school was minimized and humanized by the subdividing of the plan into five academic units: Math & Sciences, Social Studies & Business, Languages, Arts Center, and Administration, with the adjacent dome for Physical Education. Reflecting the planning of the interiors, the podium plan consists of a series of varied spaces relating one to another rather than to a series of corridors. The intent was the design of a circulation pattern which would separate—rather than funnel—the pupils in their progression through each building and the complex of buildings. Reflecting the educational program of a concentration by the pupil in an educational area, the five academic blocks are devoted to "area concentration," rather than "school-within-a-school" or "grade-level" groupings.

Central in each area are the reference and staff spaces, reflecting the spirit of (1) substituting the library's usefulness for preciousness, (2) making instruction and guidance accessible, and (3) allocating work space for the team-teacher program. Included in this nucleus, also, are the student study booths.

Sited so that they might be used by individual or united areas are the large group rooms: a 125 pupil lecture hall between Math & Sciences and Social Studies & Business, a 150 pupil lecture hall between Social Studies & Business and Languages, a 350 seat Little Theater in the Arts Center available to all, but unifying Languages and Arts Center. The cafeteria acts as a Commons or study/meeting room. Each area has classrooms in the traditional sense; each has conference or seminar rooms. Interchangeability of classrooms and conference rooms can be accommodated by a minimum of non-load-bearing partition changes. The laboratories of Math & Sciences and the Arts Center are designed primarily for individual investigation rather than classroom situations. Unique to this school is the use of the Arts Center. The educational program includes industrial arts, home economics, and arts and crafts, not in terms of isolated techniques, but as integral parts of an artistic educational and living experience.

While each area has its individual characteristics, all are unified by materials and a lift-slab, integral overhang. The Arts Center, most remote from the podium entrance, is larger in scale (two floors) and fronted with a high covered entrance. Planned expansion beyond the 850 pupil design base will be by growth towards the river (North) and expansion of the cafeteria facilities.

The architectural plan is the result of the study of, and the selection from, three basic types of schools envisioned by the architects and illustrated on pages 11, 12, and 13 of this book.

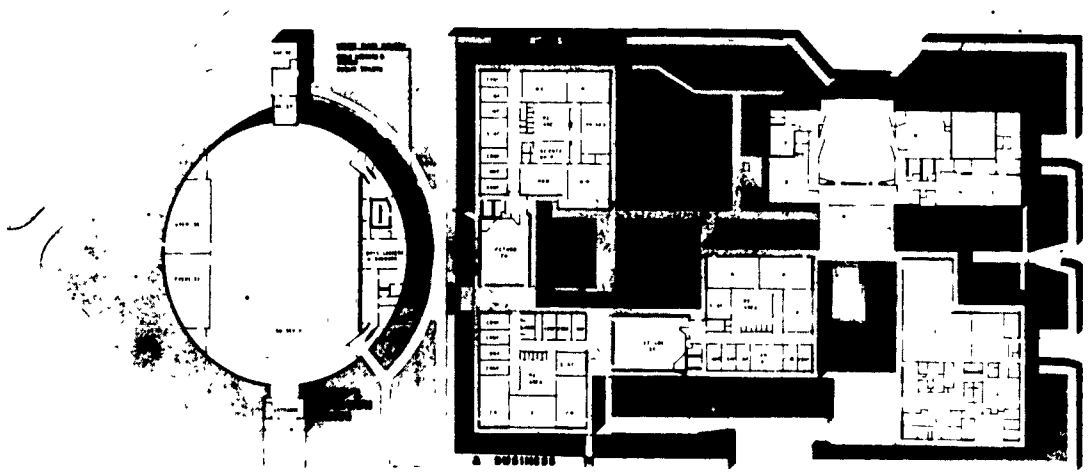
1—*Cells and Bells*—A group of compartments for learning, basically 30-35 pupils per room, connected achitecturally by interior or exterior corridors.

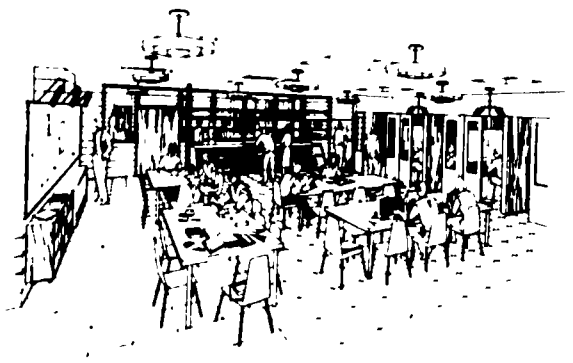
2—*Total Flexibility*—A major space subdivided as needed—"perhaps an abdication on the part of the educational people from determining what type of program they want."

3—*Planned Variability*—A combination of large, medium, and small group rooms, which allows a variety of relationships for the student and teacher, and through scheduling, a flexibility in the total plan.

To The Architects Collaborative, Type 3 represented the optimum solution to THE TRUMP REPORT and the needs of Wayland, Massachusetts.

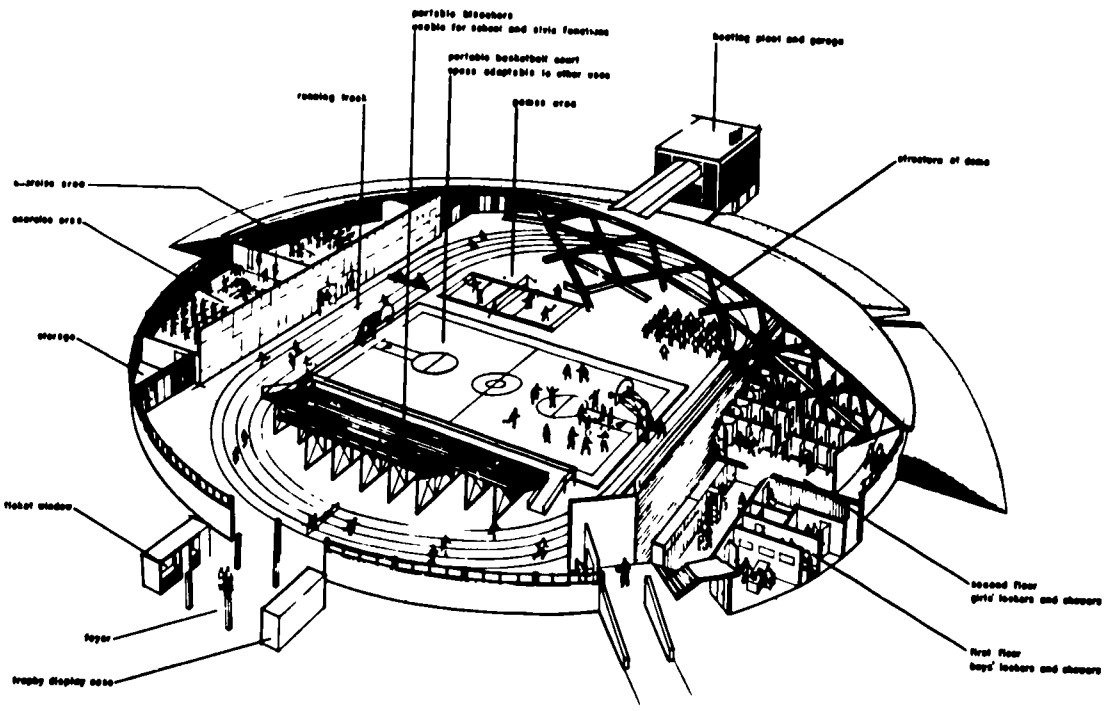
The Architects Collaborative, Architects in Charge of Design: John C. Harkness and Herbert K. Gallagher; Edward J. Anderson, Superintendent of Schools; W. Maxwell Griffin, Principal; Kargman, Mitchell and Sargent, Educational Consultants; Souza and True, Structural Engineers; Reardon and Turner, Mechanical Engineers; N.D.C. Construction, Inc., Contractors.



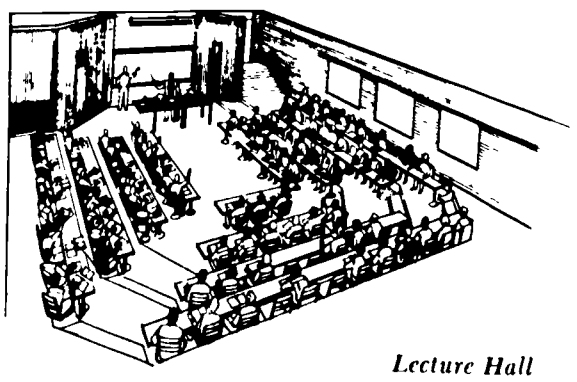


Reference Area

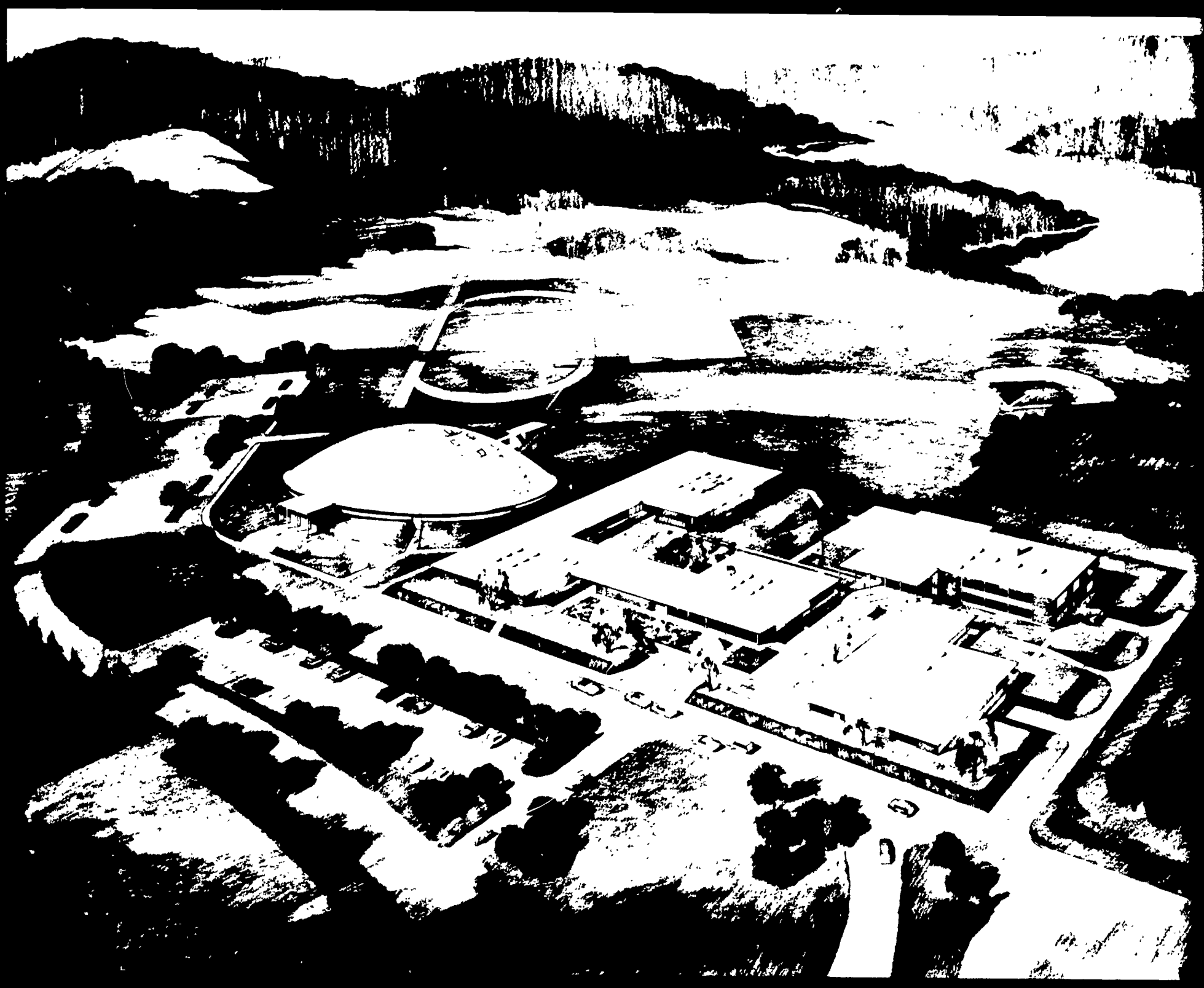
The Physical Education Center was designed with the laminated wood dome for maximum space within a minimum budget. The program emphasizes individual and group participation by the students rather than a concentration upon interschool basketball. The building provides an indoor dirt track, portable flooring, and portable bleachers. These last two items make the structure usable for town meetings and other school activities as well as for the school athletic program. Permanent facilities in the dome include exercise rooms and locker rooms for both boys and girls.

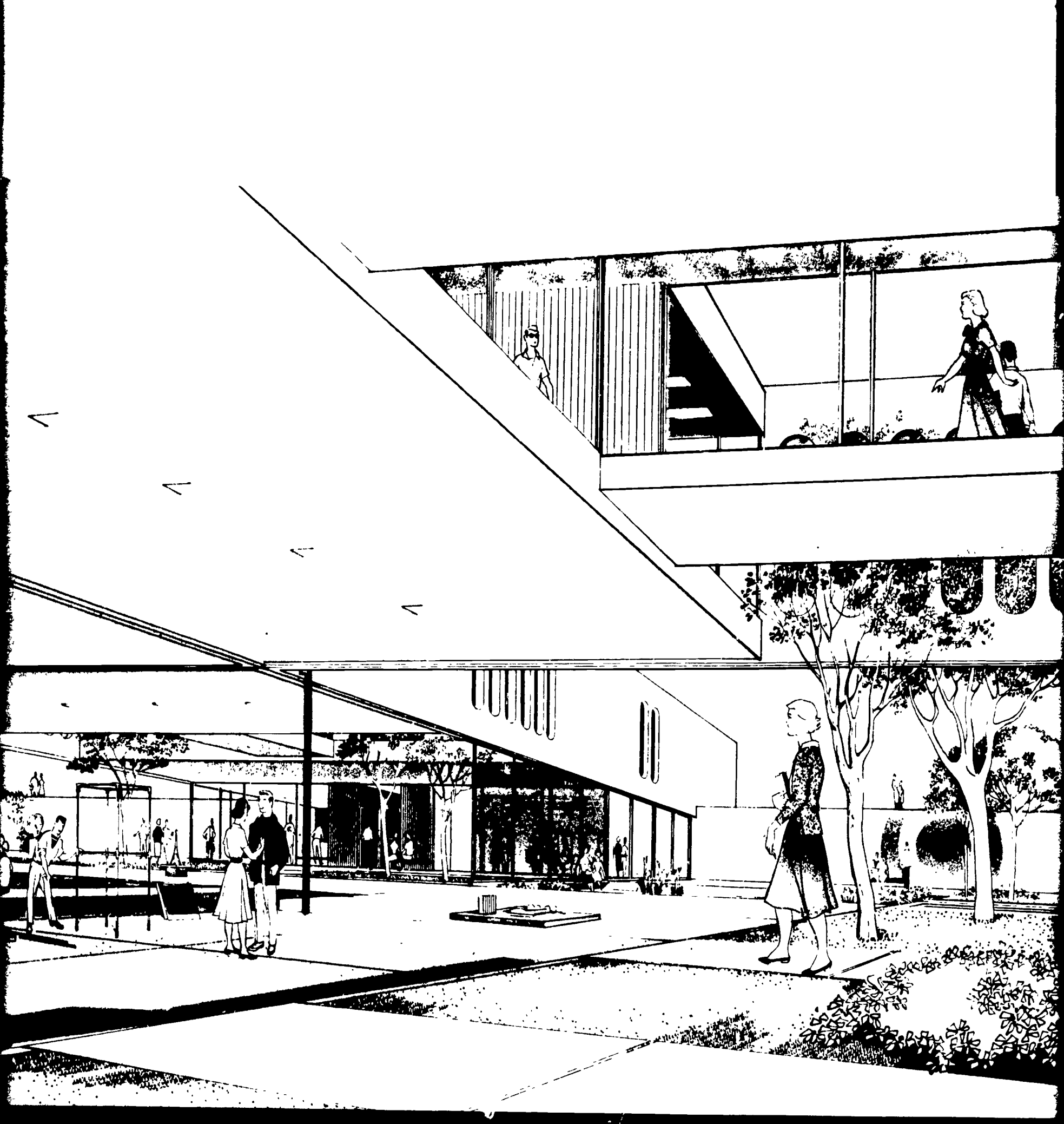


Diagrammatic Perspective of Field House

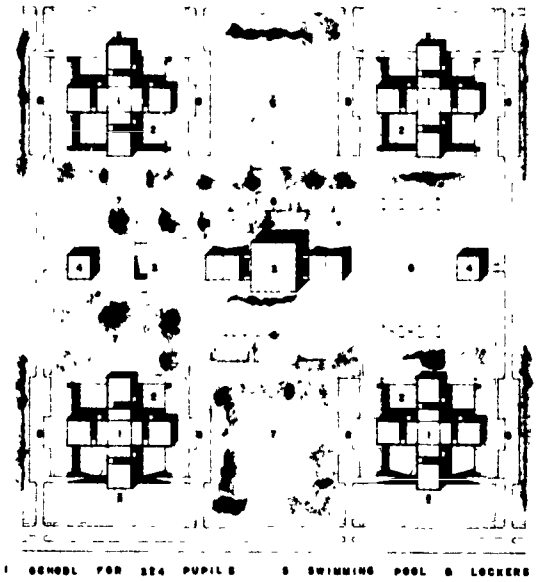


Lecture Hall





Over-all Site Plan

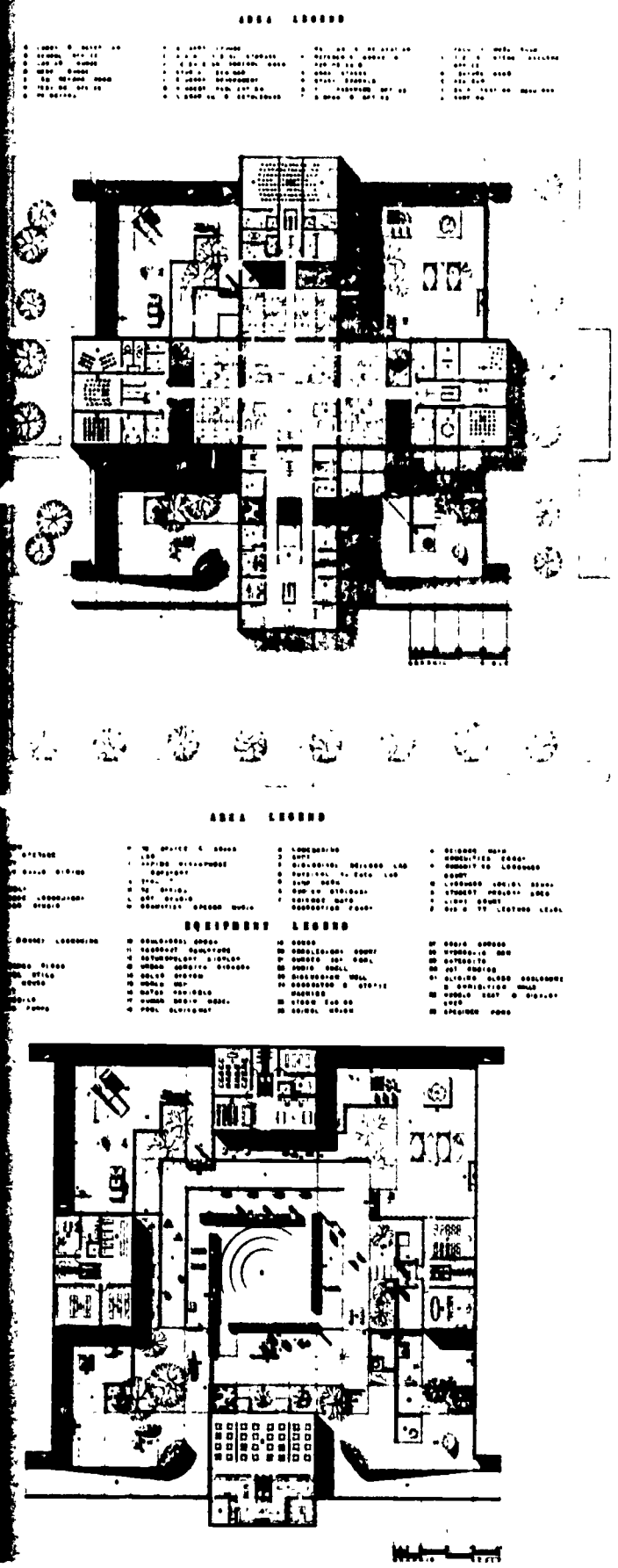


PROPOSED METAIRIE PARK HIGH SCHOOL

Colbert & Lowrey & Associates, Architects; Roland H. Nelson, Headmaster

"I believe," says the architect, "that architecture has a part to play in education and, in effect, environment does educate. In the learning process, a great deal of what we learn we are not conscious of; the first phase of learning is perception; we perceive first in either the subconscious, or unconscious, or some not yet understood threshold of knowledge. I believe that creative associations start at this subliminal level and that architecture educates through subliminal association. Architecture must teach an understanding, appreciation, and value of things—things, because they are the results of human efforts. . . . I think that architecture, first of all, must be human and deal with human values. Second, architecture must be dynamic, that is, of our time. It must attract and make the kids jump up and down once in a while. Yet, I think architecture must have an environment that soothes some of the tensions of the twentieth century life that we face."

iew of Perception Core



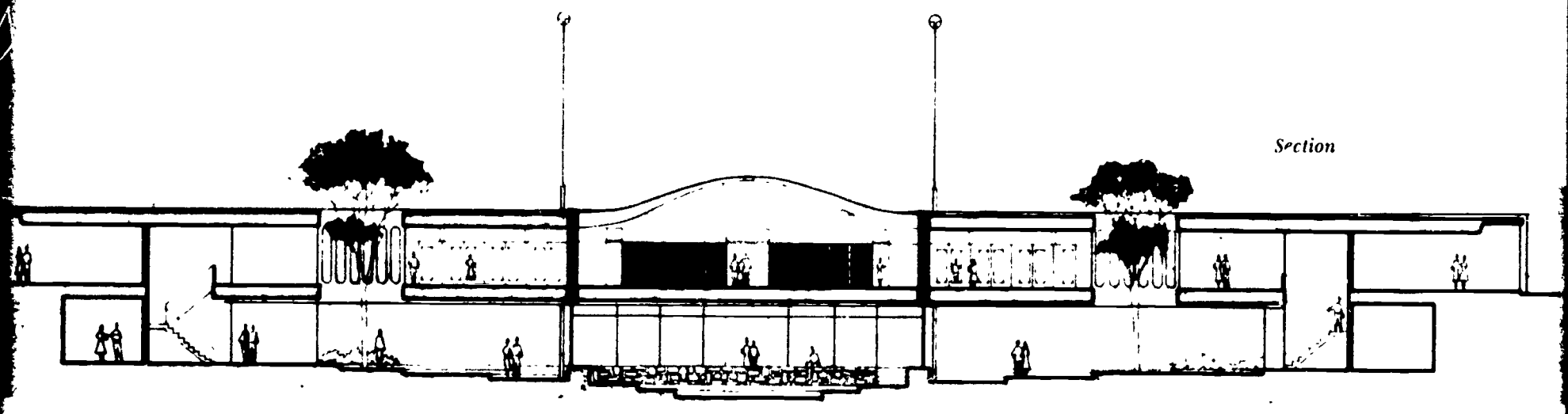
First Floor Plan

Court Plan

Using the ordered backgrounds of a Greek cross plan and a below grade, square court, the architect proposes a *Perception Core* as the central and unifying element of this school for 324 students. Here, in the core, is the interplay of recreation, dedication, accomplishment, and pride, of examples, of interest. In the surrounding courts are the "things of man" interrelating by proximity to the departmental education areas and concentrating by sectional terracing on the *Perception Core*. The core, itself an area for concentration, has on its perimeter spaces for the display and exhibition of student works. Visually a part of the total court area, the core is physically connected to the laboratory spaces and the dining room by the soffit and, when desired, by sliding glass walls.

Upon descending into the lower space by the corner stairs, or when walking between the departmental laboratories or to the dining room, the student is subliminally exposed to the designed spaces and the "things of man" therein. The water, the rockets, the autos are located show the interaction of departments. By exhibiting this overlapping of activities, the rigidity of the departmental organization is tempered.

The school is primarily a college preparatory school, not a terminal school. As such, it is divided into three grades, and three departments: science-math, humanities-social studies, and foreign languages. Using an individualized program, the student elects a major in one of the departments and spends the greater portion of his school time in the chosen area. He receives instruction, however, in the other two areas. This tri-departmental organization with interdepartmental communication is symbolized in the Greek cross plan. Each department is contained in one of the crossarms. The *Perception Core,* with its courts on the lower level and the library on the first floor, acts as a meeting ground. This program represents an application to a specific school situation of many recommen-

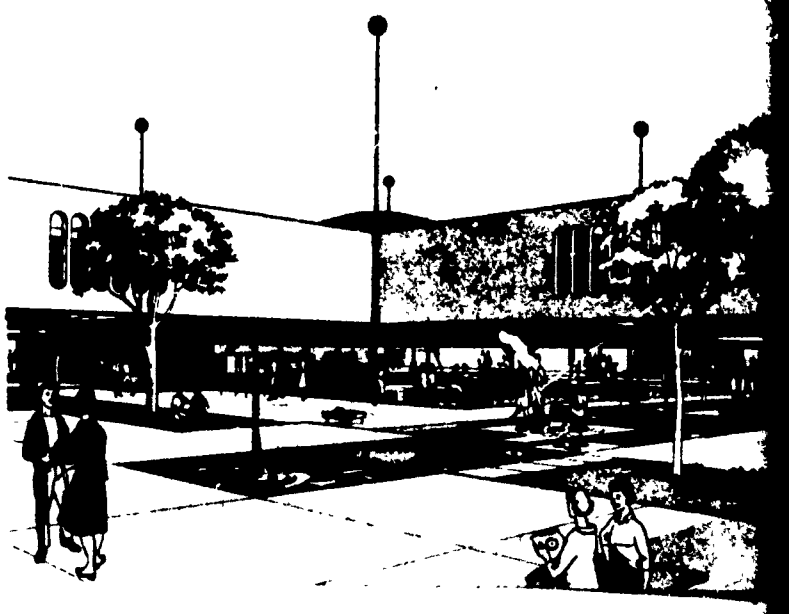


Section

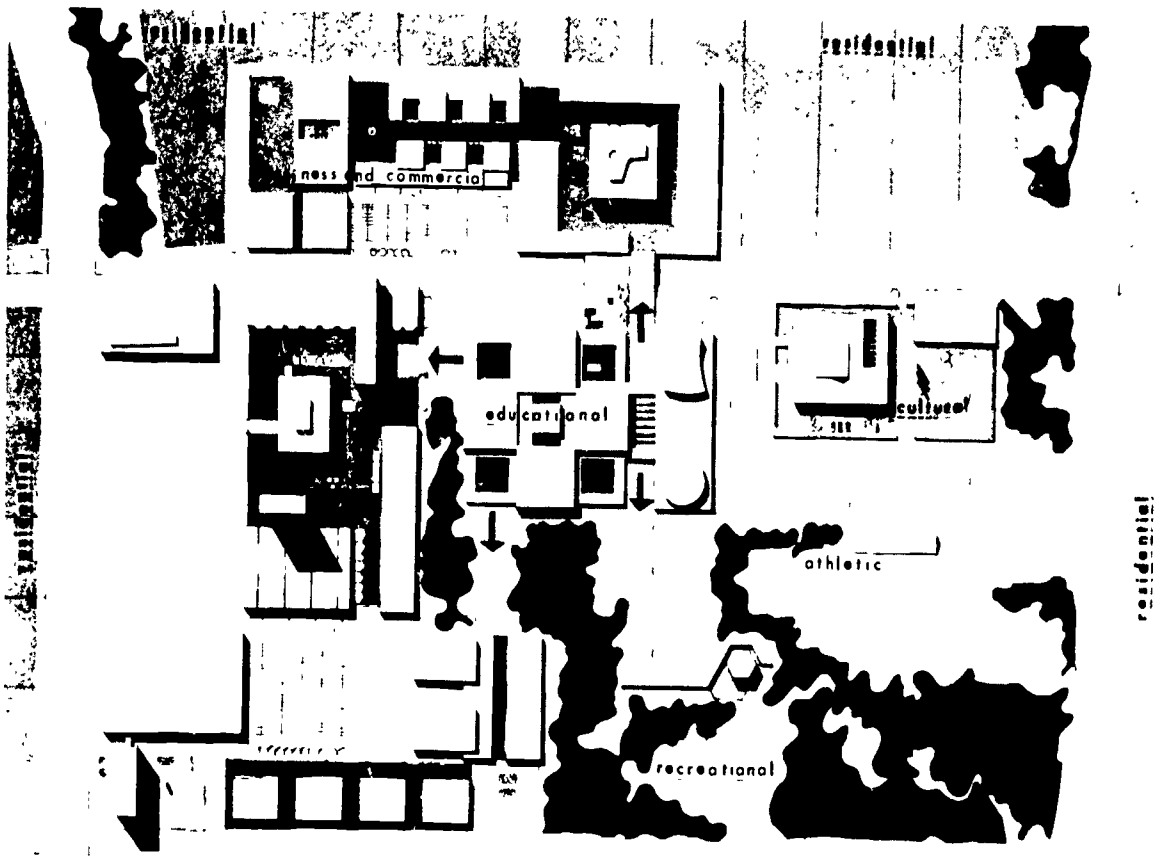
dations of THE TRUMP REPORT. Maintained, however, are the traditional 36 student classrooms in which students are directly exposed to a motivating teacher. This is but one of the four types of instructional groupings utilized by each of the three departments.

Other teaching methods are: (1) large groups of 108 students attend lectures, motion pictures, and television presentations in the space created by the combining of three 36 student classrooms; (2) seminars of no more than twelve, and preferably four, students are scheduled for discussion and intensified work of a specialized nature in smaller spaces; and (3) the student studies in a two-man carrel or confers with his teacher in the nearby teacher's office. Scheduling is done at two levels. The master schedule of the entire school is relatively simple and changes little from year to year. Scheduling within a particular department of the individualized programs requires a monthly evaluation of the student and changing of his program commensurate with his ability and maturity. Required for this operation is an IBM accounting system housed in the Administration crossarm.

The structure, with an over-all length of 256 feet, hangs within a framework of four post-tensioned, pre-stressed concrete trusses, 16 feet high and 18 inches wide. At the four points of intersection, the load is carried by billet stainless steel columns. "The resultant Greek cross," says the architect, "is the essence of order, giving some dynamism to space instead of a homogeneous mass between two planes." In the enclosed space of 38,900 square feet, one-third of the area is lecture, one-sixth is carrels, one-fifth is laboratories, one-tenth is library, and one-tenth is decentralized administration. Outdoor lecture space, lawn areas, and athletic areas surround. The courts contain 62,500 square feet of space, outdoor extensions of the departmental laboratories, and the subliminal teaching "things of man."



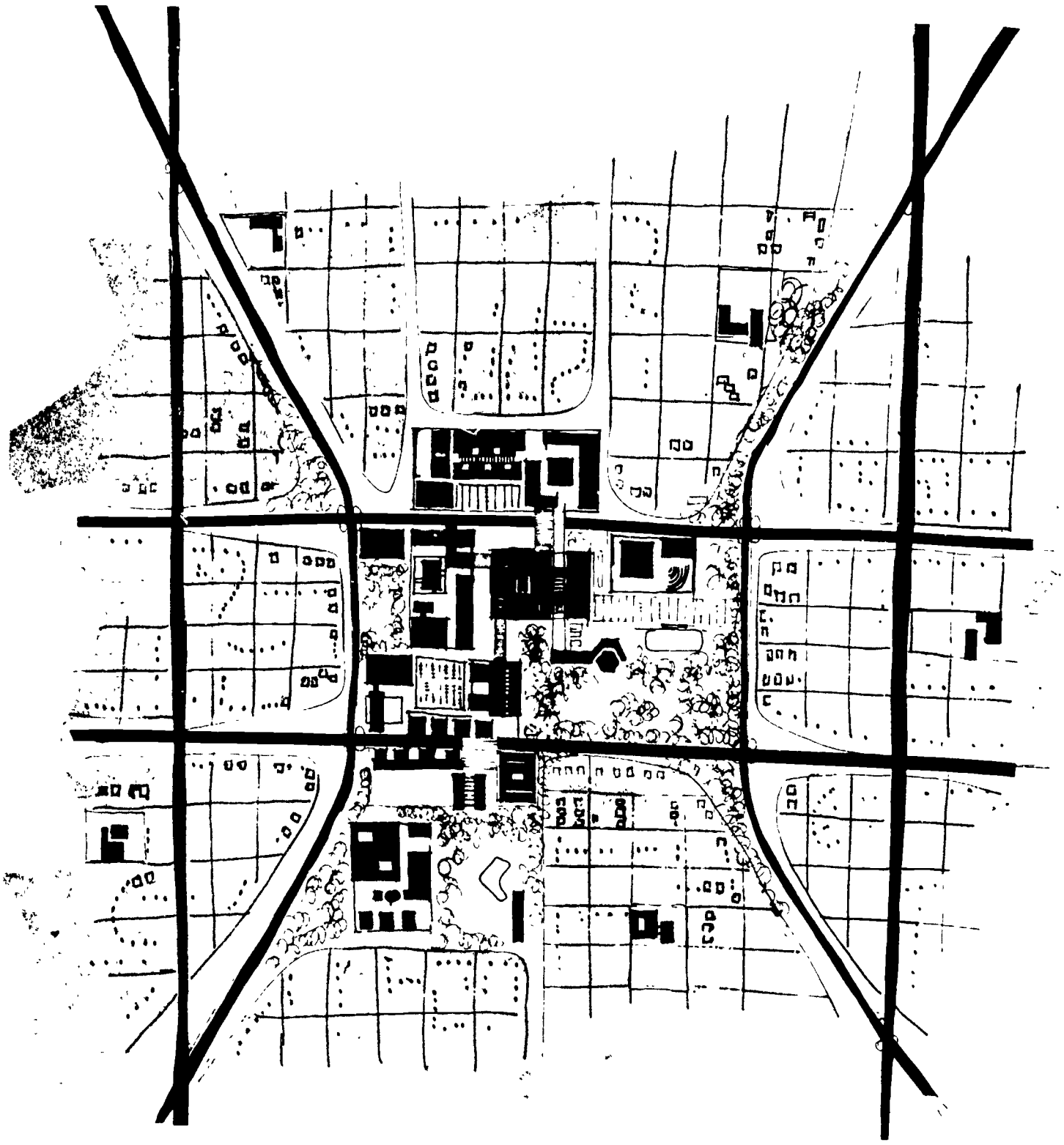
The Perception Core

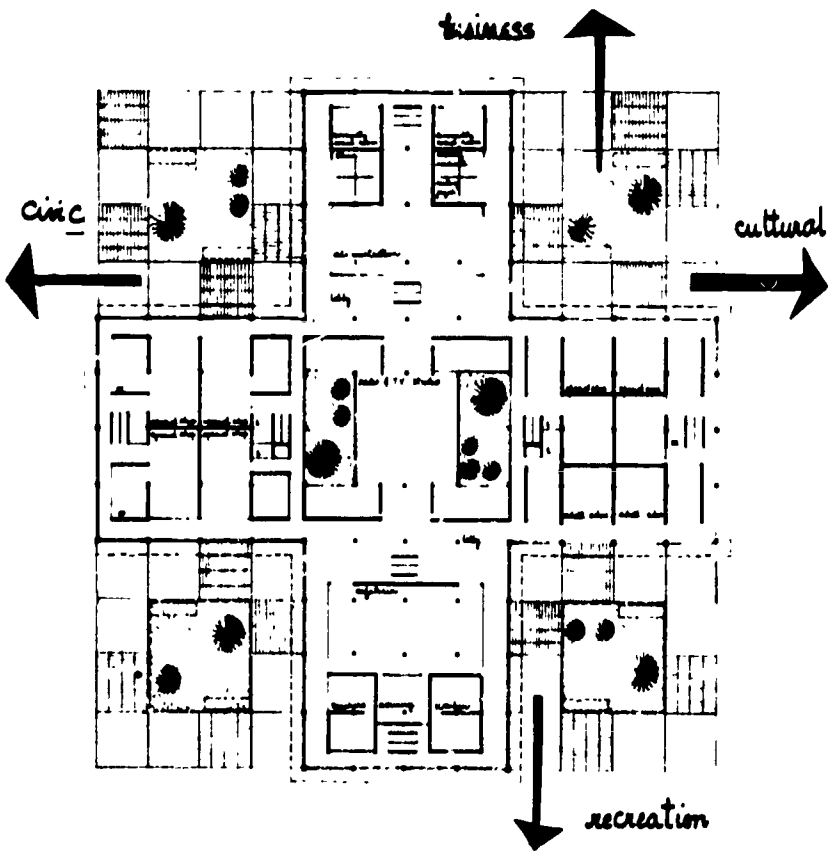


DESIGN FOR A COMMUNITY ORIENTED HIGH SCHOOL

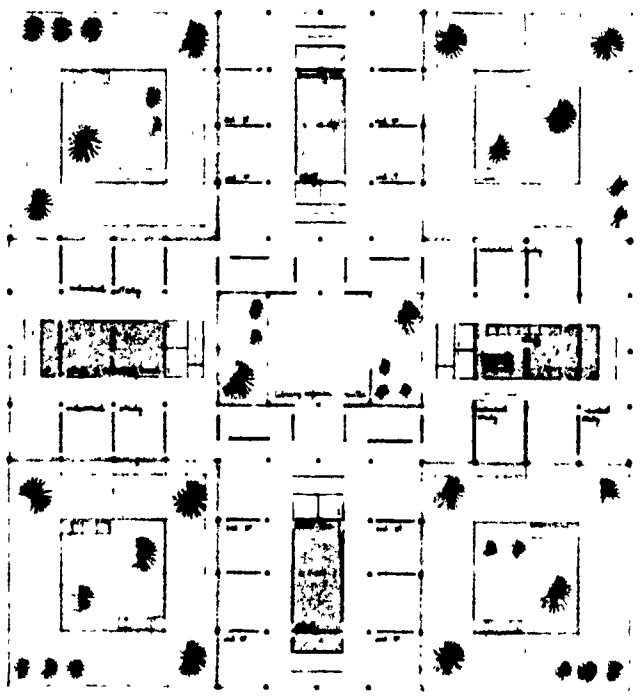
Placed in the core of the suburban community, this proposed high school integrates itself with the community life. For, surrounded by the business and commercial centers, the civic center and industry, and intimately connected with the cultural center, the student is, minute by minute, in communication with the adult life. This planning for the advanced maturity of the student was inferred from THE TRUMP REPORT by the architect. Also basic in this inference is the idea that the educational facilities are no longer only the school building and its grounds—a departure from the usual concept of high schools with chain fences isolating their 15 or 60 acres from the rest of the community. A corollary to the placement of the school for the benefit of the students is the *usefulness of the building for the members of the community*. An additional advantage is the proximity of the school to the community consultants.

2 *Eberle Smith Associates, Architects*





Common Activity Level

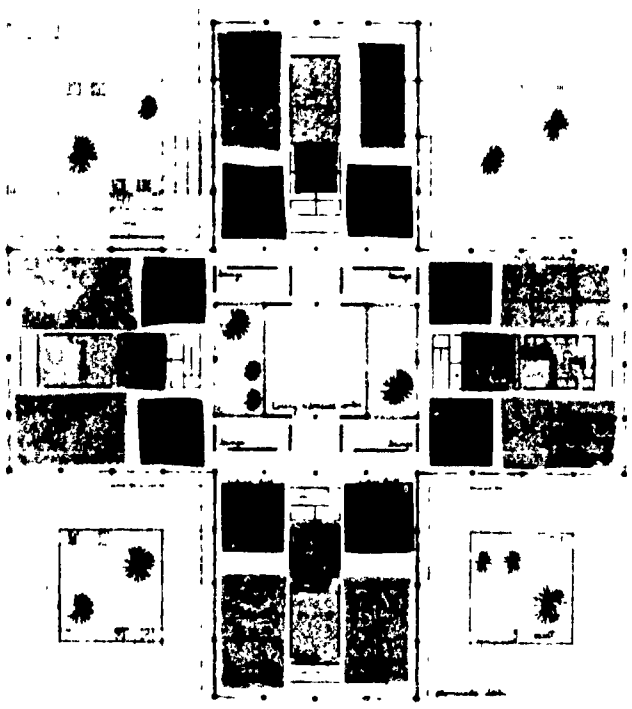


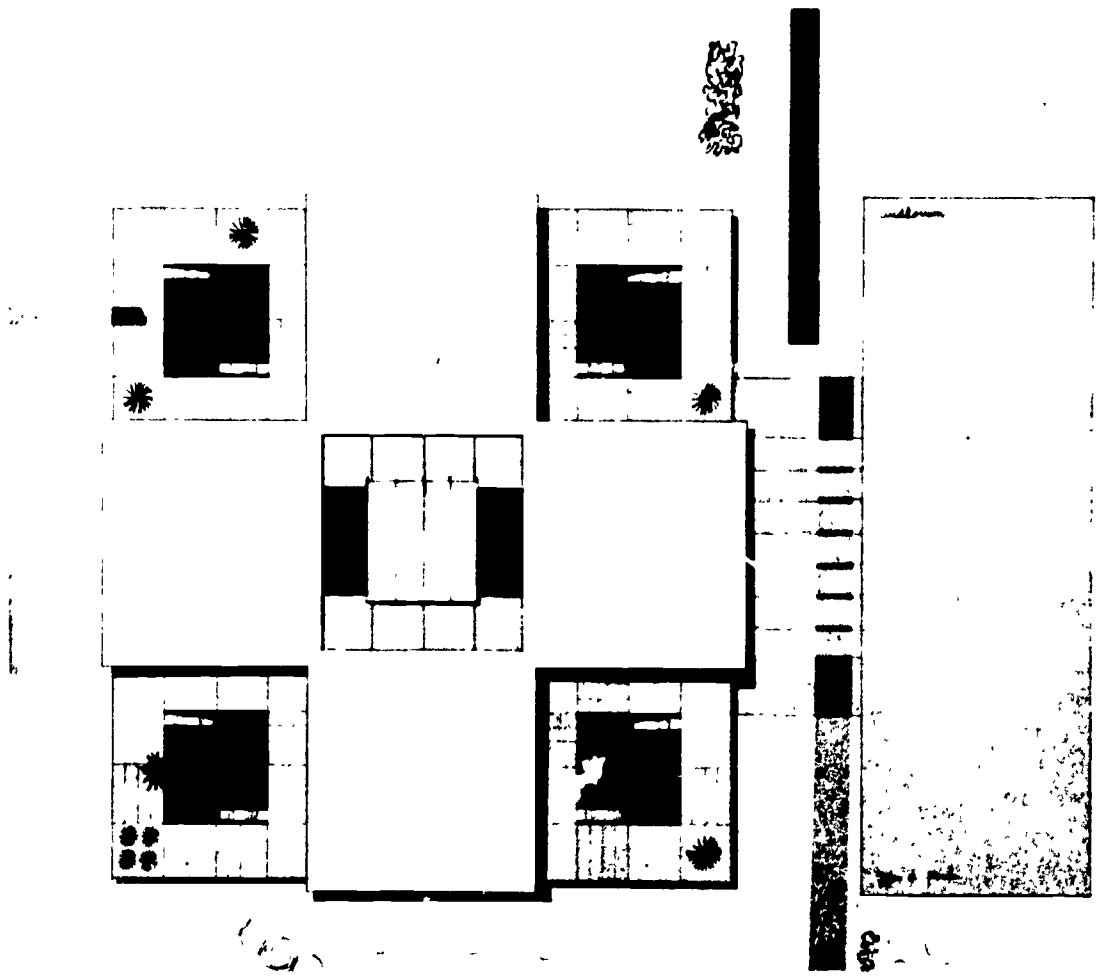
Individual Study Level

In plan, the school does not just sit amid the community buildings. The ground floor provides such facilities as might be of immediate use to the citizens: adult and special education classes; community social and meeting rooms; and civic workrooms. On this level, too, are the community contact offices of the administration, such shops as might require heavy equipment, the cafeteria, and, in the central communication core, the television and radio studios and laboratories. The last mentioned, the central communication core, reflects itself vertically into the library and resource centers placed on the second and third floors; student lounges and vertical circulation (physical communication) are on the core's periphery.

Fulfilling the recommendations of THE TRUMP REPORT, the educational spaces are allocated to allow for large group spaces (lecture halls), conference spaces for small groups, and individual study areas, with a close affinity of all three.

The uppermost, or third, floor has been designed as a major space (in reality, four large spaces in a like number of Greek crossarms), subdivided as required for predetermined uses. Only such spaces as might require sound and/or visual isolation have partitions to the ceilings. Otherwise, the space is left open, treated as one huge teaching area. It may, however, have partial partitions for visual privacy. The craft workshops and laboratories on this floor are considered individual study areas. Correlation of these teaching facilities, the lecture halls, the conference rooms, the library and the individual work spaces, is done by the centralized staff and community consultants. The greater portion of the space allotted for individual study areas is located on the second floor, again relating to the centralized communication core and the offices of the teaching and consulting staffs.



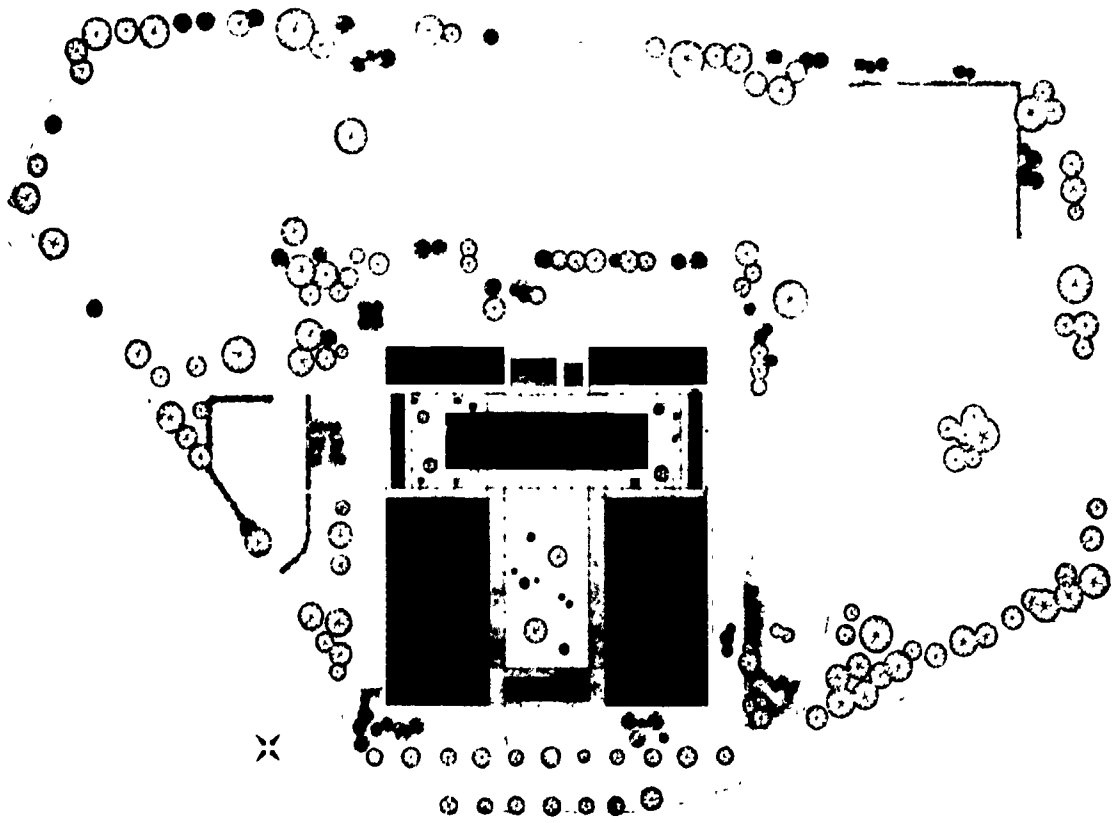


Lecture and Workshop Level

The potential of invention, the possibility of adapting or improvising mechanical and electronic equipment, makes the central communication core the vital resource link of the school building. The student, in his carrel, might have at his immediate disposal, by pressing a button, a visual or aural review of any type of lecture previously recorded on tape. He might, also, have direct communication with any lecture or student throughout the circuit. The carrel is designed as an office for the student, a place he might call his own or share with another student. Grouped together, several carrels might form a study unit. The student's principal learning instrument is the monitoring television set in his carrel. In the larger activity spaces, laboratories, or arts and crafts, etc., each student has a monitoring television so that he might watch demonstrations. The same television technique allows communication between lecturer and student, and between students in the lecture halls.

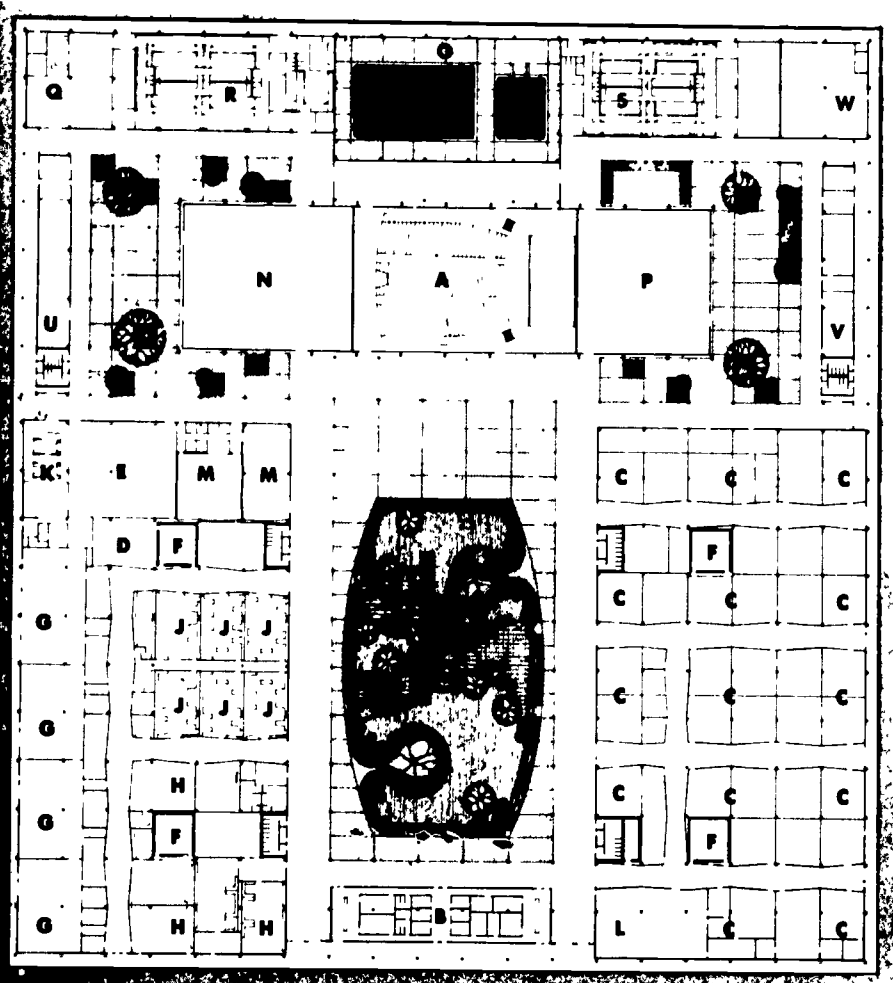
The two upper floors of the building are glass enclosed, but surrounded by a screen for sun control. Exterior promenade decks complete the square of the Greek cross plan. The interior, two-floor library looks onto interior courts.

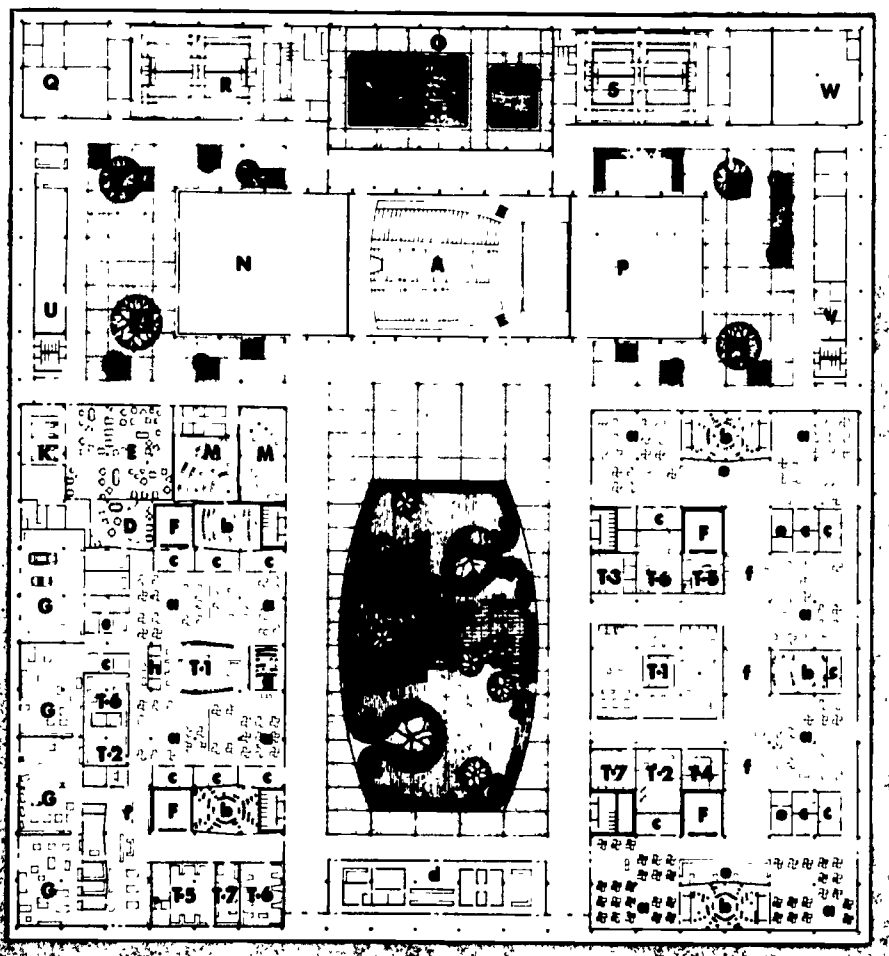
Adjacent to this building, and a part of the community core complex, is the gymnasium-pool and auditorium structure. Again, tied intimately with the community life, the auditorium is a part of the cultural center, while the gymnasium and pool and the athletic fields become part of the total community recreational center. Architecturally, through total planning and vertical scale, and educationally, through the utilization of community consultants and the provision of community spaces, this high school is a core within the core of the community, integrated into its daily life, supplying the students with a total education for living.



John Lyon Reid & Partners, Architects; Burton Rockwell, Architect Partner in Charge; Alexander Tarics, Structural Engineer Partner in Charge; Royston, Hanamoto & Mayes, Landscape; G. M. Richards, Mechanical Engineer; Daniel Fitzroy, Acoustical Engineer; William Laib, Electrical Engineer.

ADAPTATION OF MILLS HIGH SCHOOL



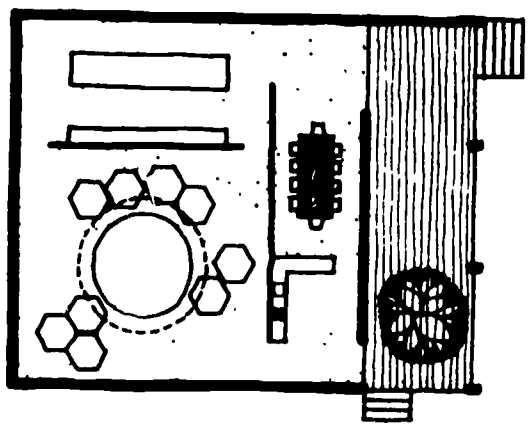


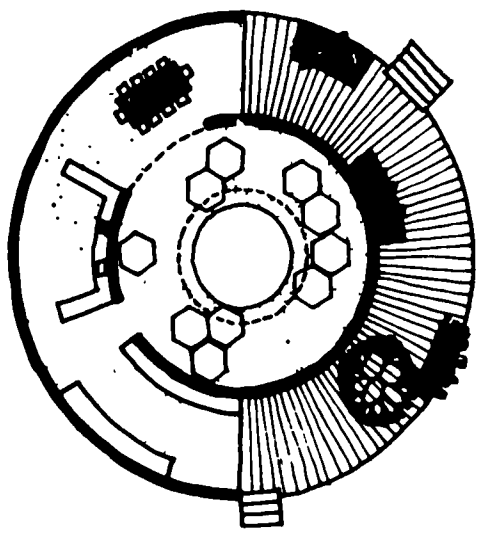
MILLS HIGH SCHOOL / EXISTING PLAN

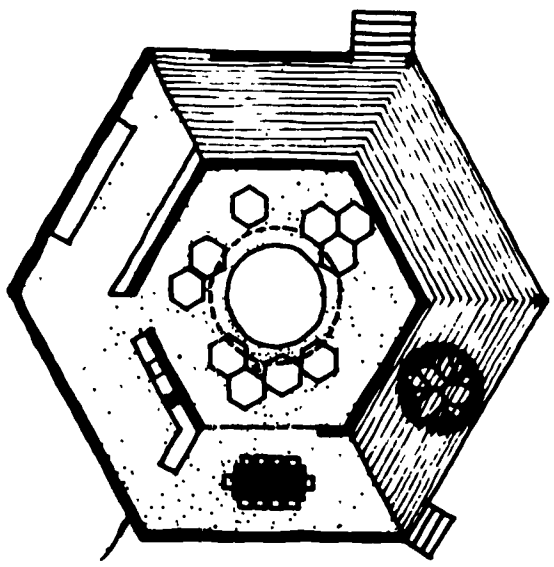
A Auditorium
B Administration
C Classrooms
D Teachers' Dining Room
E Cafeteria
F Fan Rooms
G Shops
H Homemaking
J Science
K Kitchen
L Library
M Music
N Boys' Gym
O Swimming Pools
P Girls' Gym
Q Special Exercise
R Boys' Lockers
S Girls' Lockers
U Student Store
V Health Room
W Mechanical

PLAN ADAPTED TO NASSP REPORT

a Instructional Areas
b Large Group Meeting
c Small Group Meeting
d General Administration
e Offices
f Exhibition
g Projection Room
h Listening Booths
T Resource Centers
T • 1 Library
T • 2 Crafts
T • 3 Printing
T • 4 Dark Rooms
T • 5 Homemaking
T • 6 Science Laboratories
T • 7 Business Machines







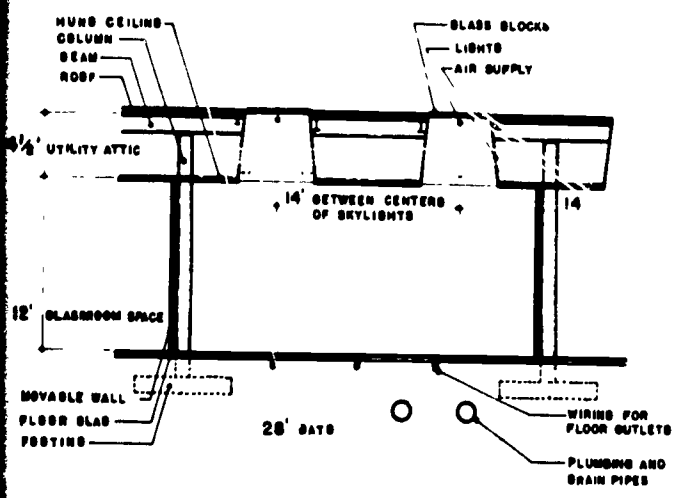
Design a school which must implement an existing educational system and, also, adapt to changing teaching methods and growth of educational philosophy. Specifically, fulfill the existing educational needs of San Bruno, California, and plan for the program requirements of *IMAGES OF THE FUTURE.*

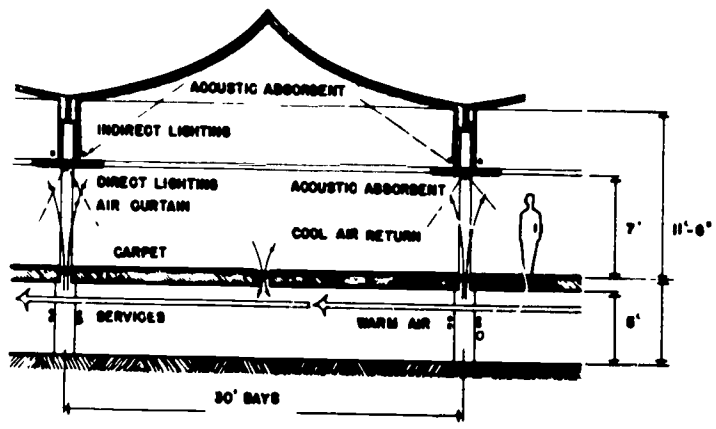
An architectural solution to these problems is proposed in the *flexibility* of the loft-space principles of John Lyon Reid; the school analyzed is the recently built (1958) Mills High School. This secondary school was designed to house approximately 2,000 students at the ratio of 33 students per classroom. The (generally) square building is sited on 47 acres of flat land, surrounded by playfields and parking areas. The perimeter of the building is, basically, glass fronting on the landscaping of exterior spaces and three interior courts. Two large academic areas are joined by the administrative offices at the south end of the major court and by the gymnasium-auditorium unit to the north. An outdoor pool is flanked by the locker rooms which also have direct access to the gymnasia and the playing fields. Based on today's conventional program, one major block of classrooms includes the academic classrooms and the library; the other contains shops, home-making, music, science, and cafeteria.

The whole is contained in loft spaces, wherein nothing except the columns and the few partitions, housing the fan rooms and blower units, the toilet rooms, and the transformer vault, are permanent. With 28 foot square bays, light wells puncture the ceiling on 14 foot centers. These are topped by 5 foot square prismatic light blocks with light tubes directly under the plane of the blocks. This combination of light sources, controlled by a photo-electric cell, supplies natural and/or artificial light from the same source and direction. The light well is, also, the source of the ventilation system, supplying 11 air changes an hour. Access to the overhead utility space is gained by lifting the acoustic ceiling panels. This allows easy rearrangement of any of the utilities and the eventual installation of television cables, if and when a television system might become desirable. The flat floor and the parallel ceiling with virtually all of the utilities suspended above are basic in this concept of *flexibility*. They allow the opportunity of thinking fully in two dimensions in the available free space. The movable partitions, of baked enamel faced steel with an insulating mineral wool core, are bolted to the aluminum ceiling grid and the floor. This system, being completely independent of the interior columns, increases the flexibility of the total loft space. The exterior curtain wall, like the interior partitions, permits change; doors and windows are interchangeable, as are the solid panels. This flexibility within a disciplined order allows the opportunity of remaking the plan to the requirements of any changes of curriculum.

The lott plan, simultaneously, imposes a different problem: the interior classroom. These had been designed by this same office in an earlier school, Hillsdale High School of San Mateo, California. Favorable reports of, and even preference for, interior classrooms have been voiced by Hillsdale's teachers. This ap-

Project Pavilions





Loft Systems
left- Mills High School
right—Hypothetical System

parent disadvantage became an advantage of the flexible loft school.

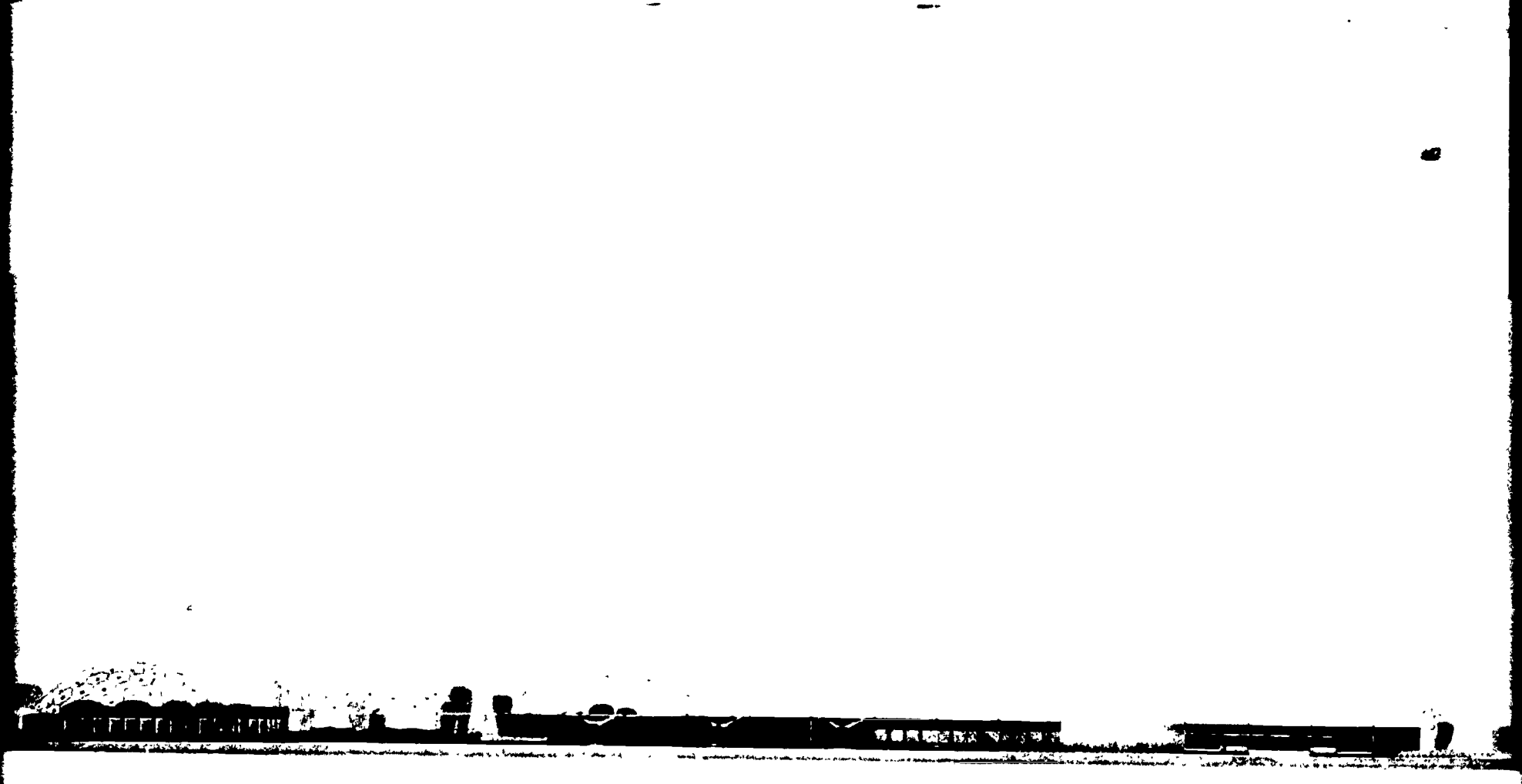
As practically all partitions can be moved and the spaces altered, the Mills High School was selected by the architects as a model for the drastic alterations of a conventional school into a "Trump High School." They did not TEAR OUT the partitions; they REMOVED them and REUSED them to enclose such varied spaces as are required by THE TRUMP REPORT. The revised plan illustrates the results: all student work spaces are on the periphery of the building, allowing the students views of the outside. Each pair of work spaces shares a divisible 80 seat group space and a resource center. Teachers' offices and small meeting rooms sit freely in the loft space, visually framing the exhibition and museum space which extends the length of the loft unit. The physical education plant, the auditorium, and the cafeteria were not revised, nor were the shops which are in the category of work spaces. The teachers' offices are in proximity to the work spaces because "they (the teachers) too, are sharing the learning process." Other open administrative areas for the teaching assistants and clerks make these personnel easily available to the students whose carrels are in the nearby work areas.

As adjuncts to the total loft space, project pavilions are supplied elsewhere on the site to meet the requirements of the group undertakings of 8-20 students. Three expressively individualized structures have been designed to house these highly individualized kinds of activity. Each includes a work area, a group area, and a work craft shop resource area. In addition, a kitchen is provided to minimize time lost because of meal trips to the main building.

THE TRUMP REPORT is visualized as only one of many possible educational changes between now and 1990, at which time the schools built today and 15 years ago will be in their prime of life. Whether such buildings can be adjusted to meet these changes will depend upon their flexibility. As quoted of Mr. Reid in the *Architectural Record*, "The function of the architect, then, is the design of a system, not the design of specifically programmed space. . . . We believe that this system may be regarded more as an instrument than as a building in the traditional use of the word; it is an instrument of education. . . . The advantages of the school's flexibility can be assessed only when significant changes of program require the plant to adapt itself to such changes." *(Architectural Record,* February, 1960.)

Pursuing farther the benefits of the flexible loft space, Mr. Reid has proposed a more open, hypothetical school. Its cross section is illustrated on this page. A loft space raised above the ground, the school has no interior partitions, no fixed elements except the columns between the floor and the acoustic plane at the seven foot level. For easy access, all utility lines are suspended in the five foot plenum below the floor; both direct and indirect lighting are installed at the seven foot level. The problem of visual distraction is theoretically solved by the configuration of the ceiling; the solution of sound control is more exactingly treated: each 30' x 30' space is considered as an acoustic unit within the totality of the entire space. The ceiling form, the acoustic treatment of this and other planar surfaces the carpeted floor, and the air curtain co nbine to insulate the smaller spaces from t.ansmitted sound. The acoustic treatment does not eliminate sound, but attenuates the transmitted sound into a background noise, against which an individual within the small space can hear or be heard, but by which he should not be distracted.

These last-mentioned ideas, being the exploration of principles rather than the design of a specific school, are presented to instigate further study.

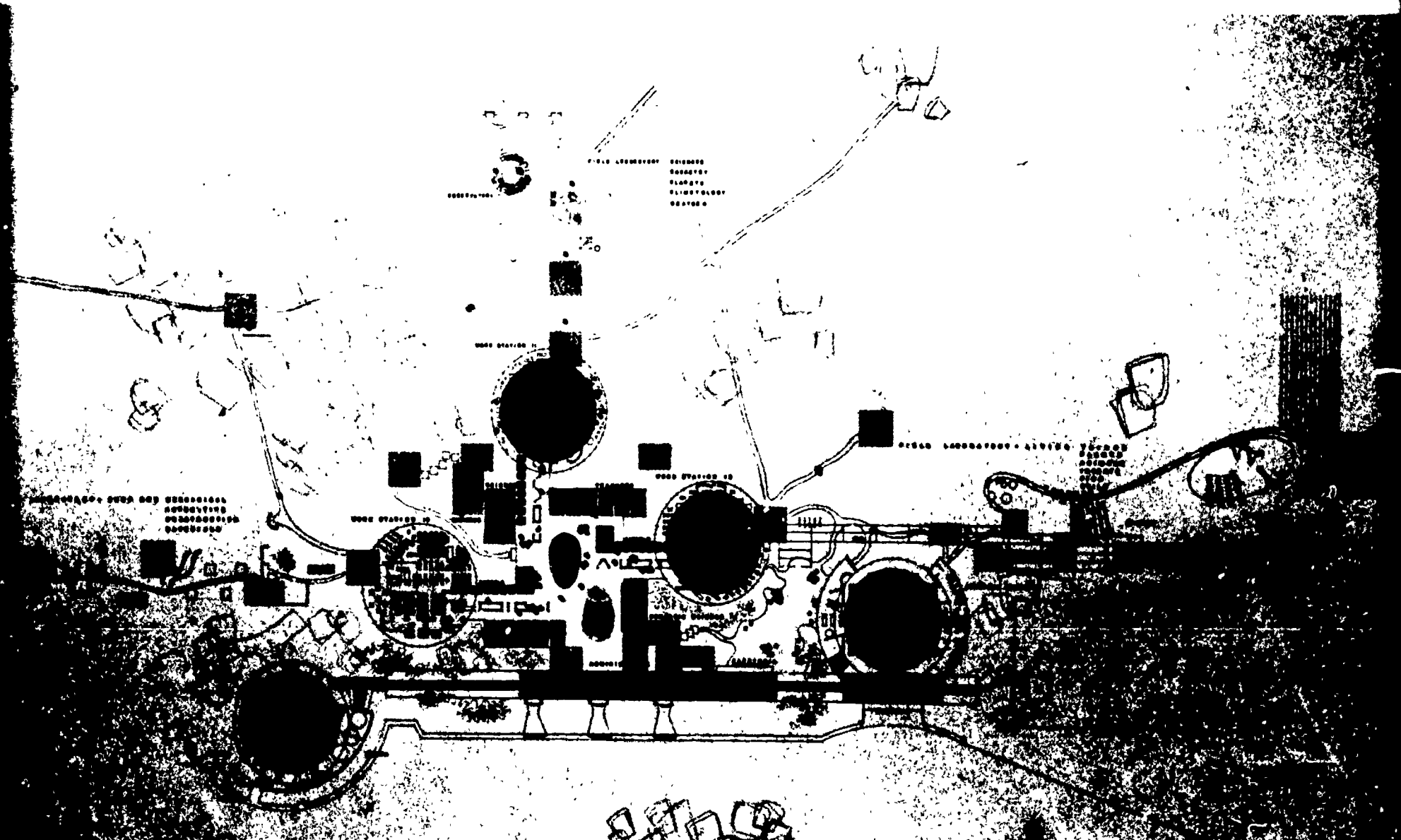


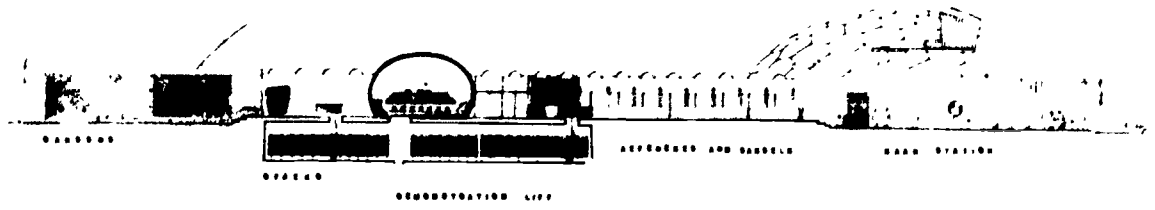
A HIGH SCHOOL DESIGN FOR STUDENT INITIATIVE

Donald Barthelme, Architect.

A school? Perhaps. But, in the words of the architect, "It is not a school building at all. It is not a unit as such, but a lot of units, an organism with parts — an ant colony, or a series of beehives—with a panoramic pattern of people finally providing the architecture. . . . Buildings should get out of the way of people; they should provide beginnings, not endings. However, we ask them for stimulation and excitement, both real and quiet, for variety and contrast, for color, for form, interest, and proportion, so that our activities and our lives are enhanced thereby."

That this concept has been followed in the planning, a look at the result will show. Five great domes rise in glistening relief against the sky, puncturing a domino grid. The domes themselves have no scale familiar to humans, being skydomes without the everyday scale of ordinary spaces. But, at the entrance, the three unloading shelters reduce the scale to human size. Here, the theater provides one visual terminus, and the gymnasium the other.





Section Showing Operation of Lifts

Inside the main entry are the cafeteria and a place of many uses, the Center Maze. This maze is designed as a living space, growing dominolike or shrinking, to reflect the life going on within, a space in which things are about to happen. The space, in varied form and dimension, evolves in quick sequence with unexpected changes of pace. There are no corridors, only spaces between things. Here the student lounges; seating in conversation areas along the way provides for long arguments and serious discussions, all mixed with the gossip and chatter that make teenagers what they are. An enclosure against such sound and vision is the "egg," a space for lectures or demonstration, for television or radio, for audio-visual work, and for anything where distraction should be excluded. Three reference desks, functioning as resource areas, with books and maps on their tops, grow from the maze into the work stations, supplied from the central library stacks underground. The stacks service the desks by mechanical lifts. Demonstrations arranged in the stack area can be lifted to the auditorium "egg." Alongside the reference counter are the locker alcoves and the carrels, small enclosed spaces for listening to tapes and records, for small group television viewing and language laboratory use.

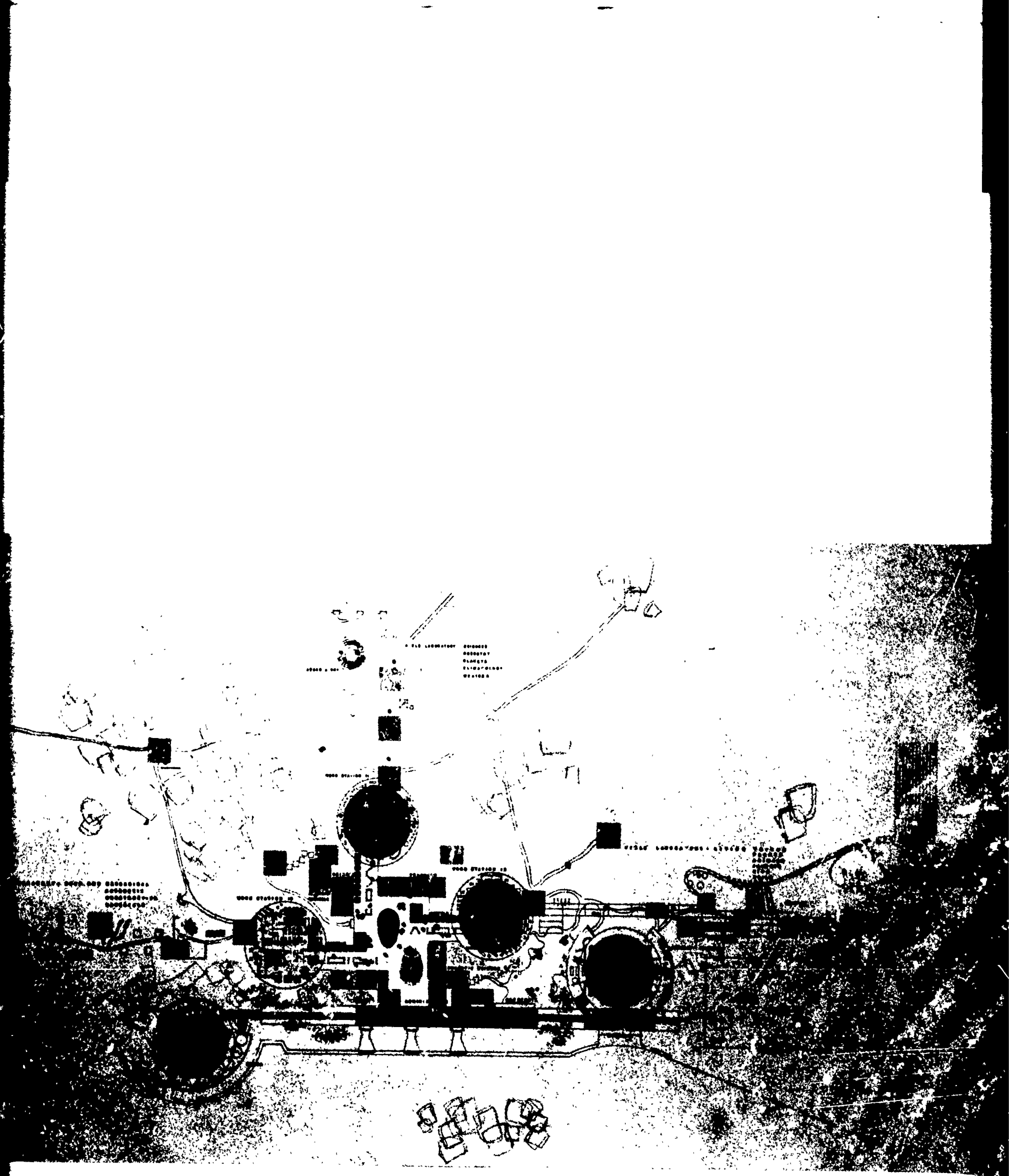
On the perimeter of the maze, the teacher specialist and the general teacher have their own stations, sufficiently large to house their own materials and to provide seating for 10-12 students of a discussion group. The net product is the bustle of activity or individual effort and direction, all within an educational framework which permits and encourages the unexpected, the unplanned, and the inspiration of the moment. Overhead, the grid orders the complexity below--of maze, of movement, of momentary reflection.

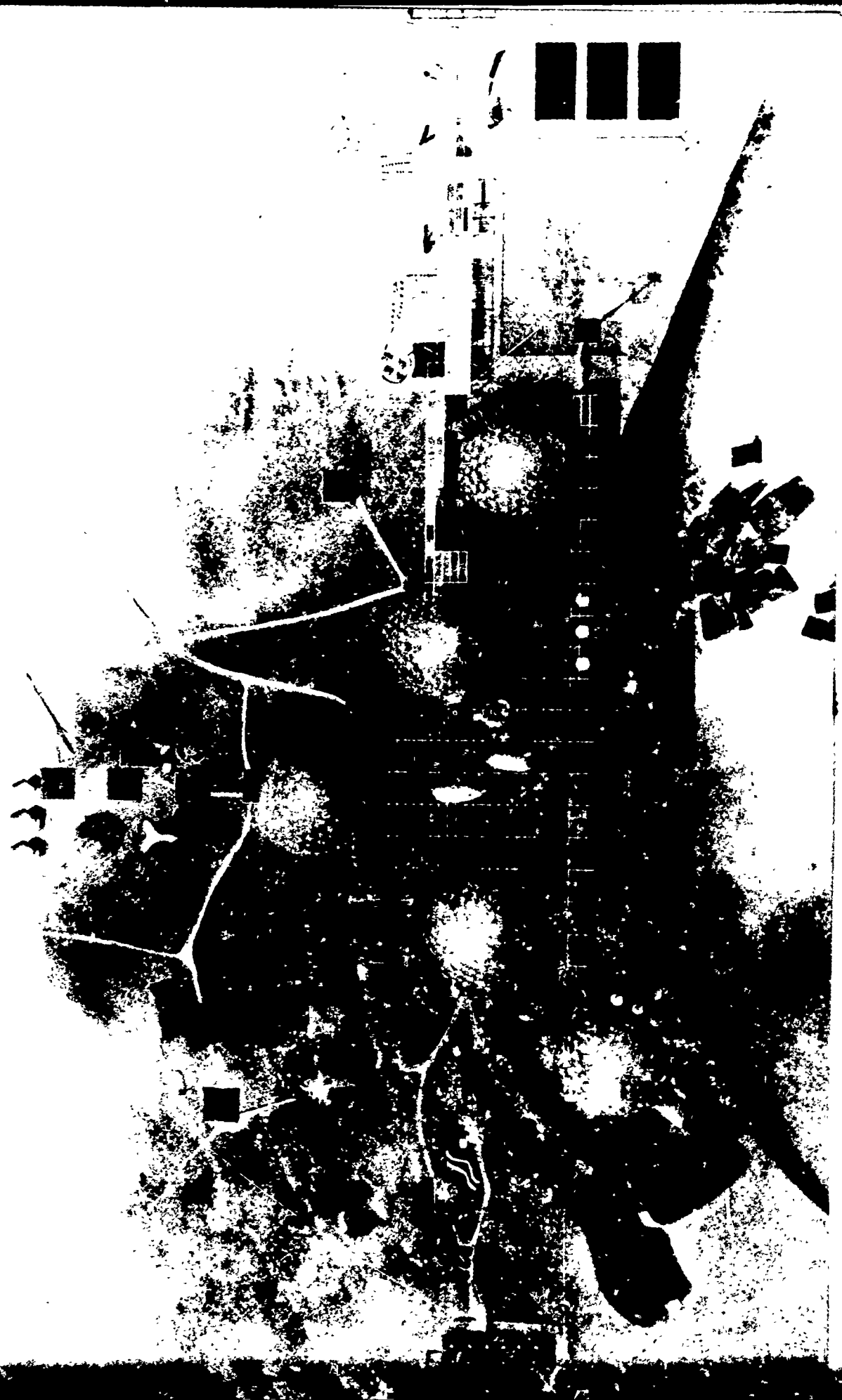
Home base for the student is in the work station, at a table located in proximity to his fellow students. The dome is no study hall, but a work room similar to a drafting room, where different and diffuse problems are solved daily. Here is the developing space for THE SITUATIONS METHOD which the architect proposes as the educational system. Strewn with models, reference material, and parts of presentations, the space becomes alive as students work in their exciting manner. There is a pulse, a sense of things being accomplished. Most demonstrations are provided by mobile laboratories, but areas exist for individual testing, and experimenting. Here, too, the instruction assistants, the teachers, and the community consultants come, moving from table to table, first in criticism, then, as groups gather, in general discussion. Here, also, are those assigned to consulting and remedial programs, helping, demonstrating, and working directly at the point of application. Suggestions spring unplanned; ideas flower and die; inspirations on the part of both teacher and student electrify the air. Typewriter pools and accounting stations are used for the tying down and presenting of student solutions.

From each work station there is a portal, an opening, an escape to the outdoors and to the field laboratory for work in the sciences and shops and with living things. These fields offer, as well, a chance for wandering down the garden path, for courting in the spring. Basketball draws its followers; and others, differently inclined, work out a situation in play form.

The great domes were chosen because, although practical and economical enclosures, they connote the skydome of all outdoors. Contrasting in size and pattern, they rise from a steel grid. The grid, too, is economical, and for the same basic reason: the use of repetitive mass-produced members. Speed of erection is a by-product; imaginative use, a necessity. The grid is spotted by top lights, shaded from the sun. The diurnal change of the outside is mirrored on the interior. Protected by time delay mechanisms, the artificial lights come on when required. The same daylight sprinkles the dome interior through small pinpoints pressed into each of its sections. Filtered through suspended horizontal screens, the light might be controlled at the aperture by a device such as a camera shutter.

The essential feature of Mr. Barthelme's planning, THE SITUATIONS METHOD and its inherent flexibility of program, is coupled with his concepts of living spaces. Together, they provide a medium for an educational system "with freedom and opportunity, where *we seek not what we know, but what we can find out.*"





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