DOCUMENT RESUME

ED 083 690 EA 005 527

TITLE	Five Open Plan High Schools. A Report.
INSTITUTION	Educational Facilities Labs., Inc., New York, N.Y.
PUB DATE	73
NOTE	53p.
AVAILABLE FROM	Educational Facilities Laboratories, Inc., 477 Madison Avenue, New York, NY 10022 ($3.00)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Classroom Furniture; Construction Costs; Counseling; Curriculum Development; *Educational Innovation; Educational Philosophy; *High Schools; *Inservice Teacher Education; *Open Education; *Open Plan Schools; School Community Relationship; School Environment; Student Responsibility

ABSTRACT

To assist administrators in determining what they may need for their own districts, examples are offered of five high schools that operate open curriculums in open spaces. Photographs and floor plans illustrate each school's design, and the text relates the history of the educational program and community response to the open curriculum and open spaces. A separate section emphasizes the importance of retraining high school teachers in the use of open plan learning facilities and describes a program operated by the District of Columbia Public Schools for training those teachers entering open plan elementary schools. (Author/MLF)

EFL

Five Open Plan High Schools

A Report from Educational Facilities Laboratories

Educational Facilities Laboratories, Inc., is a nonprofit corporation established by The Ford Foundation to help schools and colleges with their physical problems by the encouragement of research and experimentation and the dissemination of knowledge regarding educational facilities.

Copies of this publication are available for $3.00 from EFL, 477 Madison Avenue, New York, N.Y. 10022.

Library of Congress Catalog No. 73-86667
First Printing, September 1973

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Foreword

In 15 years of publishing, EFL has never dedicated a publication, but this book on open plan high schools is an exception for it is offered in tribute to the late Henry Dreyfuss who served on the EFL Board of Trustees from 1958 until he died in 1972.

Dreyfuss contributed quietly and distinctly to the aura of the board that inspired the officers and staff to set their standards high and take pride in maintaining them. He wasn't widely known for his association with EFL although as an industrial designer he had influenced the shape, styling, color and usefulness of commodities used in schoolhouses. There aren't many well-designed manufactured articles that don't owe their superiority to a designer influenced by Henry Dreyfuss. And, of course, Dreyfuss himself designed many household articles—telephones, vacuum cleaners, clocks, irons, etc., in addition to buildings, industrial machinery and books.

Before beginning a design, he always tried to determine how the potential users would get the most benefit from the product. In one celebrated case in which he was commissioned to redesign a farm tractor, Dreyfuss discovered that the users' chief concern was in being comfortable while spending hours bumping over ploughed fields. The solution was to make the tractor seat as comfortable as working conditions would allow, and that apparently contributed to the sales of that brand of tractors. More important from a human point of view, the drivers of those machines suffered less during their working day than they previously had.

EFL dedicates this book to Henry Dreyfuss because it is concerned with schools designed for the comfort of the people working in them; students and staff. Some of the buildings even address the problem of sitting down for uninterrupted periods of time and use chairs that aren't often seen in "institutions". Such seeming luxury tells high school students that they too have the right to be comfortable as well as educated. Henry would have approved of that.

EDUCATIONAL FACILITIES LABORATORIES

Introduction

So much has been written about open education that another book on its philosophy or practice would seem to be redundant if not presumptuous. However, EFL delights in uncovering school buildings that offer scope for program specialists to practice their trade, and this particular publication shows the kinds of buildings that we believe encourage the best of the alternatives to traditional education. Alternatives is an apt word because although it may be assumed that "open curriculum" or "individual progress" programs are better than anything that went before, no one successful form has emerged. Because of the differences in students' attitude and aptitudes, schools operating these new programs still have to put some students on structured schedules similar to those the schools are attempting to leave behind.

Secondary schools with open curriculums and open learning spaces are still rare enough to attract visitors to see how the "new" education works. An investigative look before leaping is worthwhile because the necessary changes in the physical plant to switch from traditional education to open classrooms require a heavy capital investment. Although former commercial buildings can be converted easily to open programs and old schoolhouses can be gutted and refurbished, the ideal schoolhouse should be built specifically for the open education program.

To assist administrators in determining what they may need for their own districts, EFL offers these examples of five high schools that operate open curriculums in open spaces. We do not endorse any particular school as being better than the others or even of being the best solution to its constituents' requirements. Most schools evolve through a series of compromises to balance budgets and appease ideologies. But many not-so-successful schools would have fulfilled their promise if proper financial support had been given to the administrator who had the foresight to move a district into this current and sometimes bewildering stage of education.

The schools visited for this report (not all of which are included) have some aspects in common. Most of their principals regret that they were not given the opportunity to build the facilities they really wanted. They found that they were not given a teaching staff fully committed to the open curriculum, and many came to the new learning styles without the resources to train the teachers in their use.

It should come as no surprise that the way a school runs has as much to do with personnel as with facilities. But this is a publication about facilities, specifically, the large uninterrupted interiors advocated by those educators who believe this design is most likely to improve the traditional patterns of learning. Open-plan schoolhouses, they believe, offer the most flexible arrangements both for students working alone and for small groups. Larger groups must also be accommodated, but this is best achieved outside the open floor area. For a long time, the exhortation to administrators and designers to create flexible spaces fell upon skeptical ears that heard only the message to use moveable walls. Now, the reality of vast areas unencumbered by fixed or moveable partitions makes the early attempts seem wasteful of space and money. However, these large areas can still be subdivided by

head-high screens if the staff or students require them. There is nothing inviolable about open space. Isolating part of it for sound reasons reflects man's territorial imperative; but the large open space has to exist in the first place so that irregular areas of various sizes can be carved out.

Open-plan high schools followed open elementary schools by several years. The design came into use at the bottom of the age scale and worked its way up because it's easier to change the learning style of children who haven't had eight or nine years of experience in another tradition.

While open-plan schooling may seem an innovation, it carries on the tradition of the one-room schoolhouse, expanded to accommodate 1,000 students. The concept also attempts to instill in students the quality of independence that we admire in our forefathers and believe their successors were weaned away from by making teachers the directors of what, when and how to study. After educators began to overcome this cultural mismanagement of students they had to wait until the schoolhouse could provide sufficient space for open curriculum programs to flower fully. This is also a matter of the right kinds of space. Physical restraints set arbitrarily fifty years ago must be swept aside to make way for the ebb and flow of different group sizes during the learning day.

Unfortunately, advances in school design developed slowly, as it is obviously easier for an administration or a school board to accept changes in ideas, for which relatively little outlay is required, than to embrace the need for totally new facilities requiring an investment of several million dollars.

Many teachers in open-plan schools hold strong opinions on the design of the buildings they work in. There's a bitterness behind the criticisms stemming, for the most part, from the fact that teachers are seldom asked for advice, even on their own department's facilities. This apparent disdain for help from those who will actually use a building is not unique to educational facilities, but, especially since a school is in large part a process, the people contributing to it deserve to be heard during the planning and design stage.

While educators have been developing better curriculums, they have also been improving counseling services for students. One of the techniques is a counseling system that displaces the homeroom tradition and substitutes a daily discussion between about 20 students from all grades and an adult counselor. The same counselor works with a student throughout his life at high school. Counseling groups meet weekly, or at the start of each morning, to discuss topics ranging from academic and social performance to proposals for improving the school's program or facilities. Each counselor has a broad interest in the well-being of his charges, so that if a student has domestic problems the counselor may offer to do whatever is necessary to relieve the situation.

Counseling also includes guiding students in selecting their academic programs. This is especially important where programs are run at several levels of competence that range from students who are coached through the elements of learning without any choice of subjects or schedules, to students who have no fixed curriculum and decide daily how they will spend their time.

Wilde Lake

Wilde Lake High School 5460 Trumpeter Road, Columbia, Md. 21043

Wilde Lake

For many Americans, hopes for a better way of life ride on the success of the new town of Columbia situated in a formerly rural area of Maryland midway between Washington and Baltimore. It is certainly cleaner, quieter and more spacious than the unplanned urban areas we have grown accustomed to, but the quality of life in Columbia depends upon factors that are not visible to someone driving through its streets.

Education is one of these intangible aspects, although the "containers" for it can be seen, admired and photographed. Fortunately for the new citizens of Columbia, the county administrators responsible for the town's schools were not content simply to build as they had always built. Instead, they created a new elementary and secondary education system as well as the schoolhouses to accommodate it.

The speck of grit in the Maryland oyster that generated Columbia's pearl of education was supplied by the developer of the new town. A report paid for by the developer outlined an educational system for Columbia, but suggested that the county board would not be able to handle the proposed concept. The Howard County Board of Education rose to the bait. Aided by dozens of consultants and reports, the board provided Columbia with elementary and middle schools based on open-plan team teaching and then elaborated the technique in the high school.

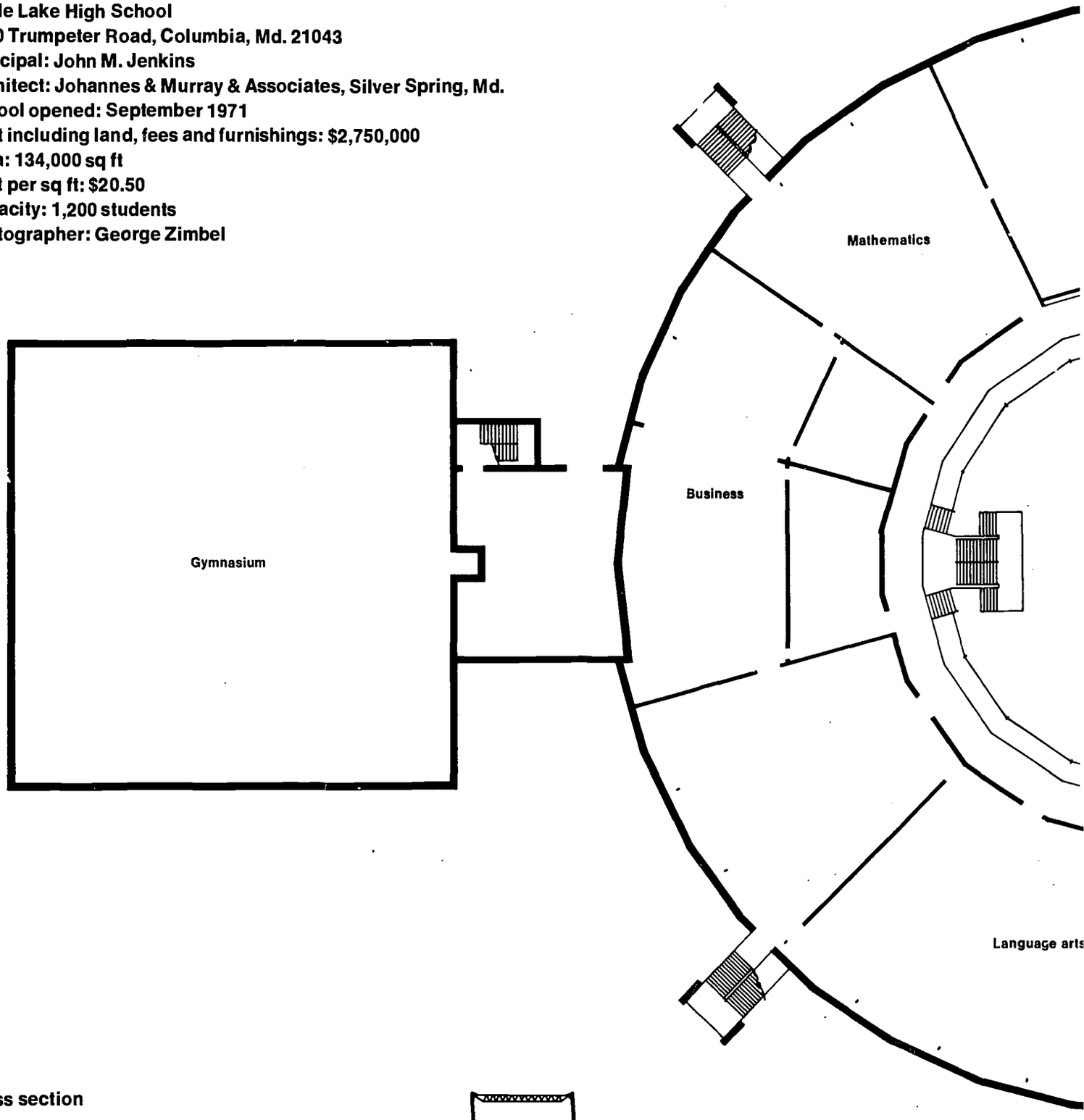
Wilde Lake High School was built for $2,750,000 (80% appropriated by the county, 20% contributed by the state), but it is not the school that some of its early supporters hoped for. The reasons stem from the relationship between the county and the new town in its midst. County standards for high school facilities were lower than the standards considered acceptable by people from cities such as Baltimore and Washington who were moving into Columbia.

However, since the county could scarcely spend more money on the newcomers than it had spent on its old residents, it computed an appropriation based on the predicted enrollment and the unit cost of existing high schools even though they lacked the amenities of the proposed school. (For instance, none had an auditorium and their libraries were about one-fourth the size of the one planned for Wilde Lake.) Thus the new school was locked into an inadequate budget for the facilities it wanted to provide. Some of the facilities recommended for the school never reached the drawing board, and many were reduced during the design stage. The major loss was space. Nominally designed for 1,200 students, the school had 900 during its first year and appeared to be operating near capacity.

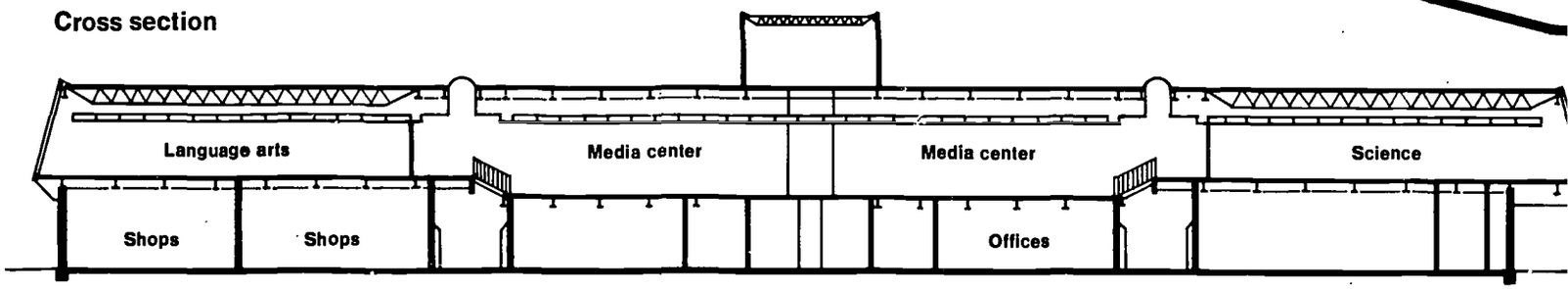
After the county set the budget, it established a high-school planning committee of county and state educators, high school principals, a university consultant, and two members of the architectural firm that had designed a middle and an elementary school in Columbia. This committee protested the restrictive budget and wrote educational specifications that included a number of recommendations for facilities that the committee members must have known could not be built. Later, the architects on the committee were retained to design the school.

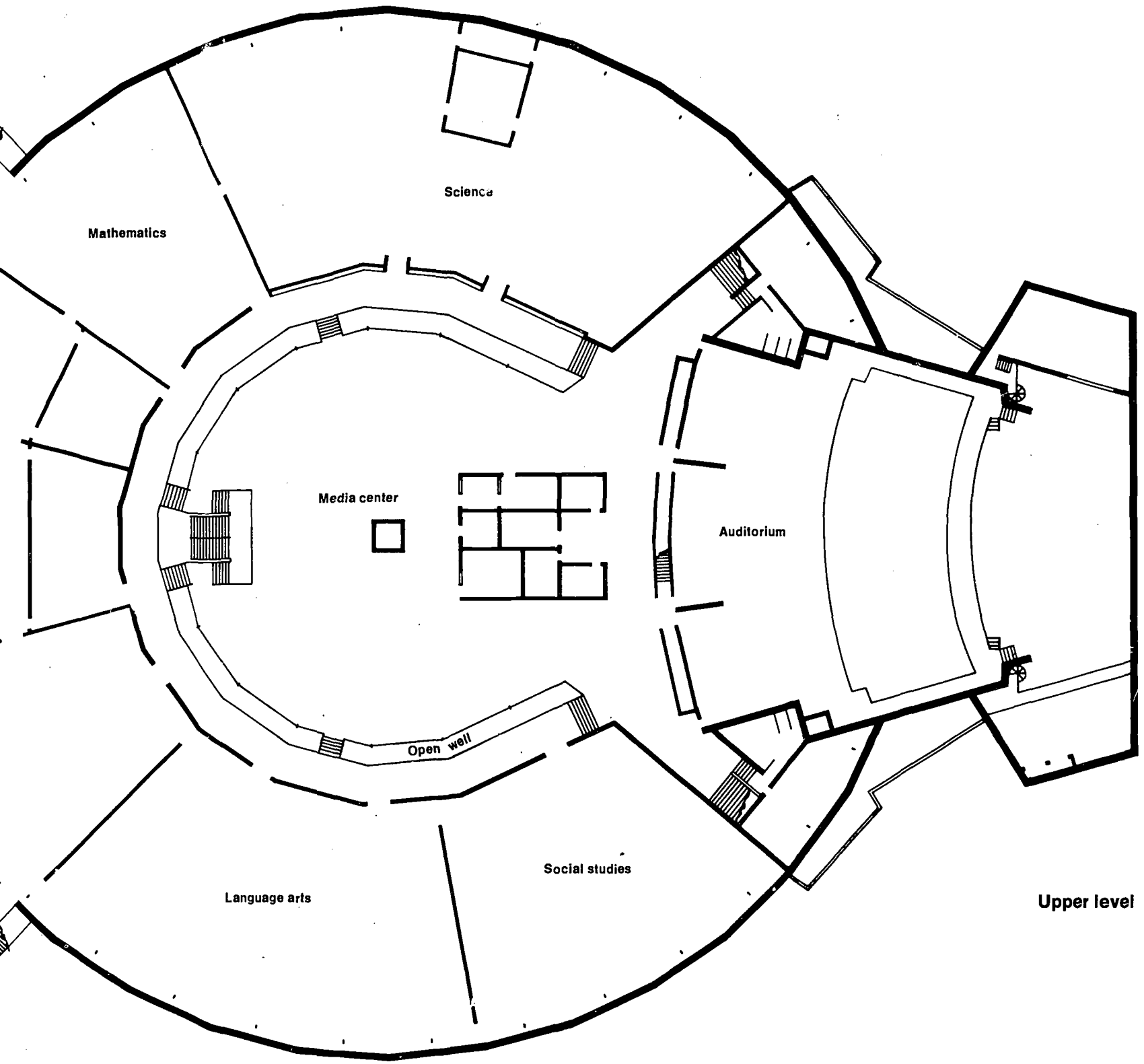
Although the schoolhouse is smaller than it should be, it sits uncramped on an ample 30-acre site free of fiscal troubles since school sites in Columbia are virtually given away. The developers of the new town sell each school site outright to Howard County for $1.00 each. This apparent largesse works to the developer's benefit in two ways. It frees more capital to be put into a school's physical plant, and the landscaped areas and playing fields around the schools contribute to the developer's commitment to keep 20% of Columbia in open space. Both features, of course, make Columbia more

Wilde Lake High School
5460 Trumpeter Road, Columbia, Md. 21043
Principal: John M. Jenkins
Architect: Johannes & Murray & Associates, Silver Spring, Md.
School opened: September 1971
Cost including land, fees and furnishings: $2,750,000
Area: 134,000 sq ft
Cost per sq ft: $20.50
Capacity: 1,200 students
Photographer: George Zimbel

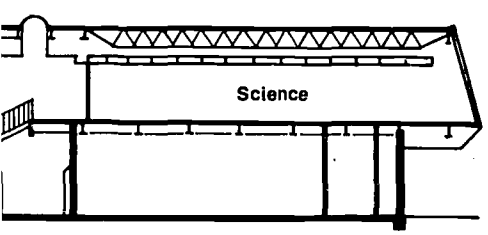


Cross section





Upper level



0' 40'

attractive to people contemplating buying or renting there.

Wilde Lake High School opened in September, 1971. The building is circular in plan with split-level floors. A media center occupies the center of the building and is located at midheight between the academic and nonacademic learning areas spaced around the circumference. The academic areas encircle the media center and overlook it: the cafeteria, shops and music rooms are under the academic spaces, and the administrative area is immediately under the media center. An auditorium and a gymnasium are on opposite sides of the circular plan and can be isolated from the main building for use by the community after school hours.

Wilde Lake appears to have a successful educational program, although at this writing it has not had time to finish its shakedown cruise. (Its principal estimated the program was only running at about 15% of its potential after six months.) But consultants hired by the county to review progress report well of the education process. The building, however, does not have the flexibility that is supposed to be the delight of new school designs. The architect attributes some of the deficiencies, such as block rather than moveable walls in academic areas, to budget restrictions. If flexible partitions had been installed, the school could enlarge one department and contract others to suit the number of students using each section. But block walls, which require a contractor and a great deal of inconvenience to relocate, were built instead. The architect says that the cost of partitions at the time of bidding equals the cost of building and subsequently twice removing and rebuilding the block walls.

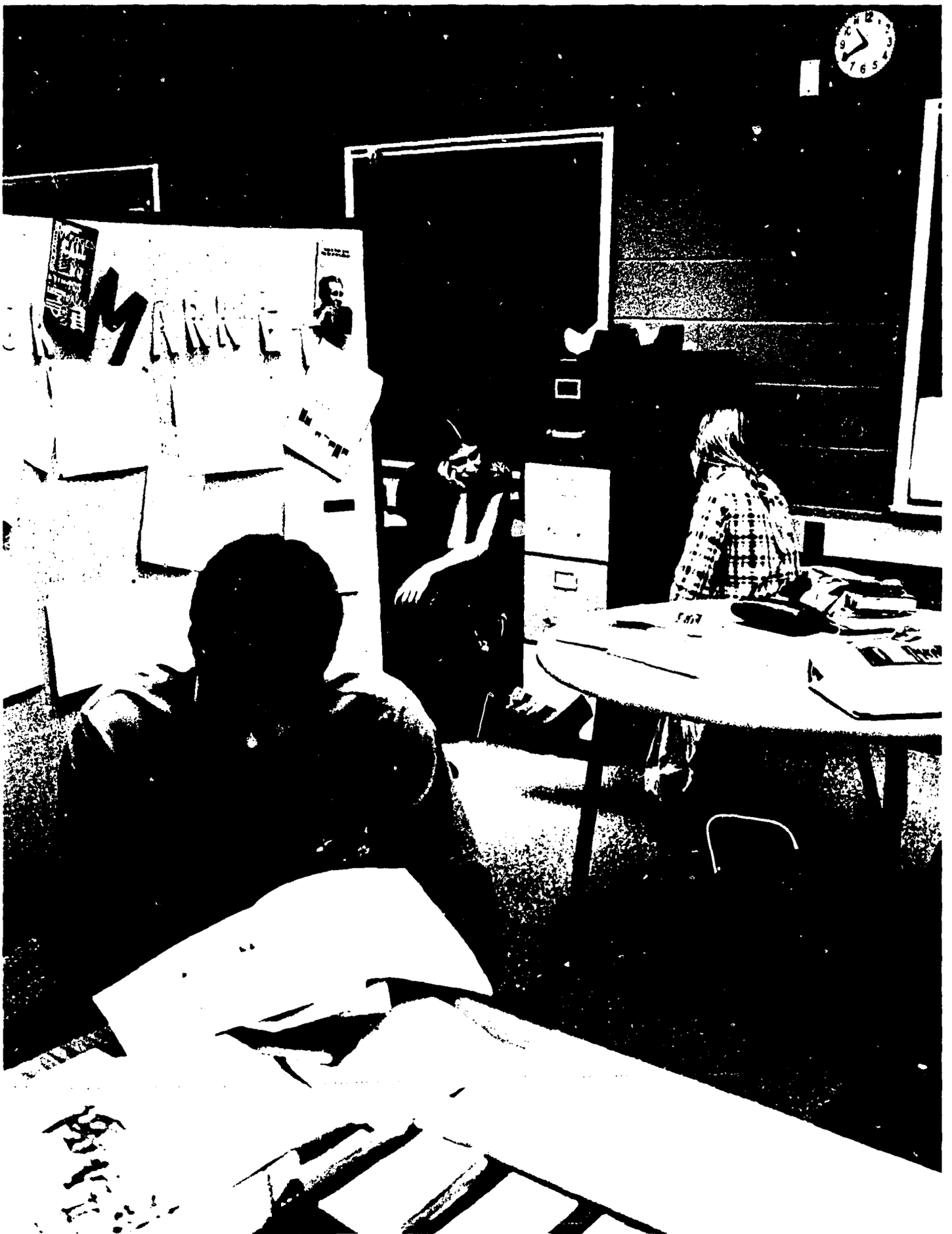
It's not only the academic areas that are locked into shape and size. The enrollment for crafts never reached the anticipated figure so that shops on the ground floor that could be put to another purpose stand unused. One of the difficulties of planning a school for a new town is that nobody knows the habits and predilections of the future population. Thus Wilde Lake underestimated the enthusiasm of students for languages and math, while overestimating their attraction to the gym and shops.

The doughnut-shaped plan of the school creates a completely different circulation pattern from a rectangular plan. The Wilde Lake resource center is centrally located, but circulation among academic areas skirts the center instead of passing through it. There are some planners who believe that a resource center should be placed like a notions counter in a department store where all the traffic has to pass through it. The open circular balcony at Wilde Lake makes a pleasant promenade but it goes around the resource center. On the floor beneath, however, the corridor circulates between banks of dreary steel lockers creating an austere atmosphere despite the carpet.

John Jenkins, the principal, had no influence on the form of his school since he was not hired until after construction started. He had to watch the building being completed around him and tailor his educational plan to fit it. Although educational specifications had been prepared for an open plan program before the building was designed, he preferred to develop a new set that represented his own philosophy for the forthcoming school.

Yet overall, Wilde Lake High School comes through as a warm and lively place for youth and for learning. While it is less than it could have been, it is nevertheless among the best of its vintage. Further, possessing able and stable leadership, as it does, Wilde Lake will grow organically through the years, and will find inventive ways to overcome the barriers to freedom and openness imposed by the original budget.

Ground floor corridor is overlooked by media center (left) and upper promenade (right).



plan academic areas can provide quiet corners for study.

Juanita

Juanita High School 10601 N.E. 132nd, Kirkland, Wash. 98033

Juanita

The most open floor plan of any secondary school known to EFL is in an amorphous suburb of Seattle. The learning area of Juanita High School is a square of about 250-ft side that is uninterrupted by any barriers that cannot be looked over by an adolescent of average height. It's a large space by any standards, and its distinctive scale is complemented by the elaborate complex of theaters, shops, labs, etc., surrounding it. Juanita appears to have all the facilities that other school principals say they can't get because budgets force them into compromises. But Juanita was built in 1971 for $25.75 per sq ft which made it the second most economical secondary school in Washington that year. The economy resulted partly from not having to build partitions between classrooms or corridors between them. Further savings resulted from bidding the $5.3-million school in two contracts—shell and interiors—to increase the number and competitiveness of contractors eligible to bid on the smaller contracts.

Taxpayers in the school district were not as concerned with construction economy as might be expected since they only had to raise 20% of the capital. They benefited because the state pays 80% of school construction in a community with a 15% annual growth rate. Naturally the state limited building size and costs, but it made concessions that worked to the advantage of the school. For instance, an extra 5,000 sq ft was added to the state formula of 100 sq ft per pupil when the school agreed to build a fieldhouse at half the cost of a regular gym. The extra space provides better facilities for community use of pools, courts and physical education equipment in a district that previously had no identity or unity. All the physical education facilities are separate from the schoolhouse so that they can be operated independently outside schools hours and at the weekends.

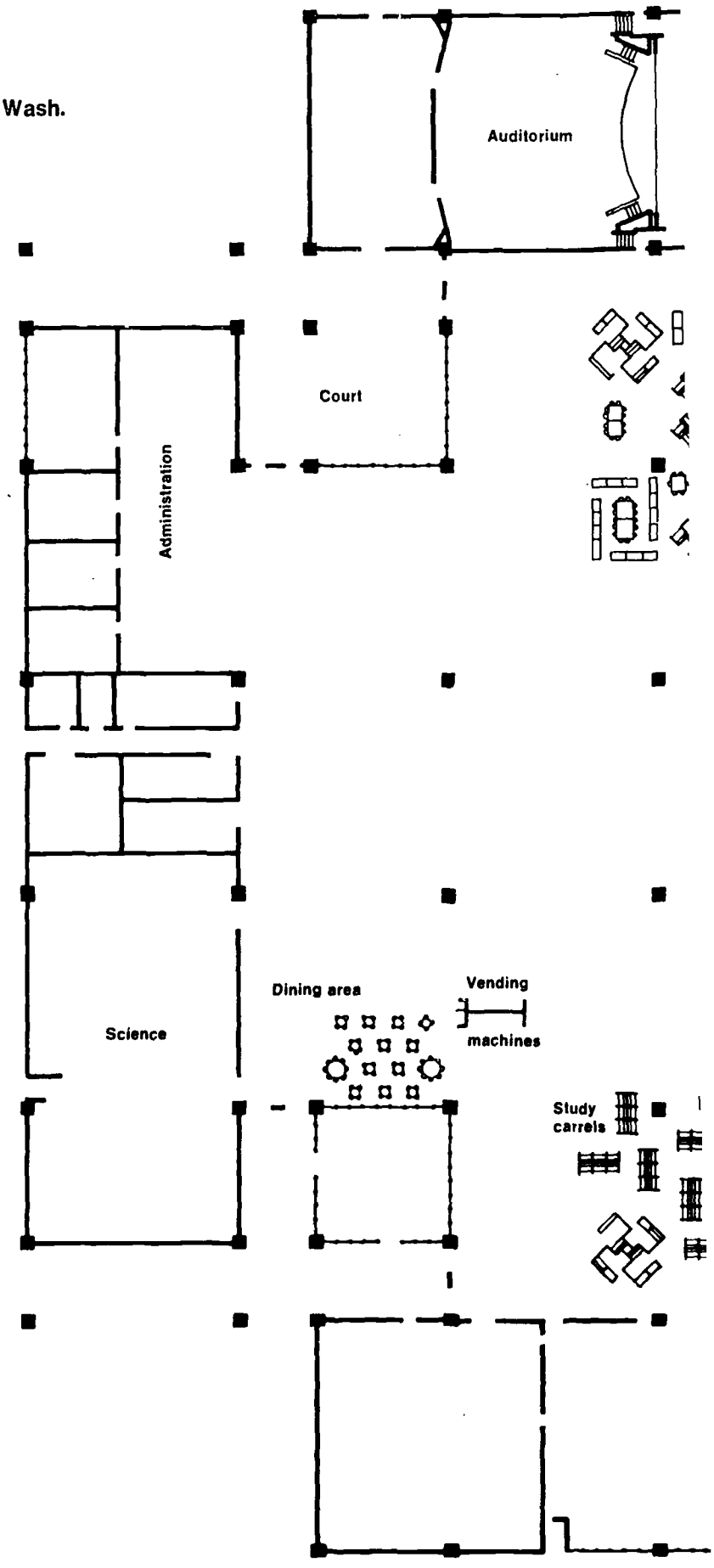
Juanita's enviable facilities would be useless without the remarkable support the school has had from the district administrators. The school board set aside $200,000 to support the new principal, who is called the "building leader," and nine others for a year while they wrote up all the job descriptions, materials lists, schedules and programs. But even before the detailed educational planning, the board had hired John Strauss to be the building leader. Six years before the school opened he went to work to help mold the building design to fit his educational philosophy. Strauss was fortunate to be teamed with an architect who could translate the programs and concepts into spaces at economical cost without penalizing the quality of design. It may seem an obvious sequence to hire the future principal early in the planning stages, but this is a rare occurrence.

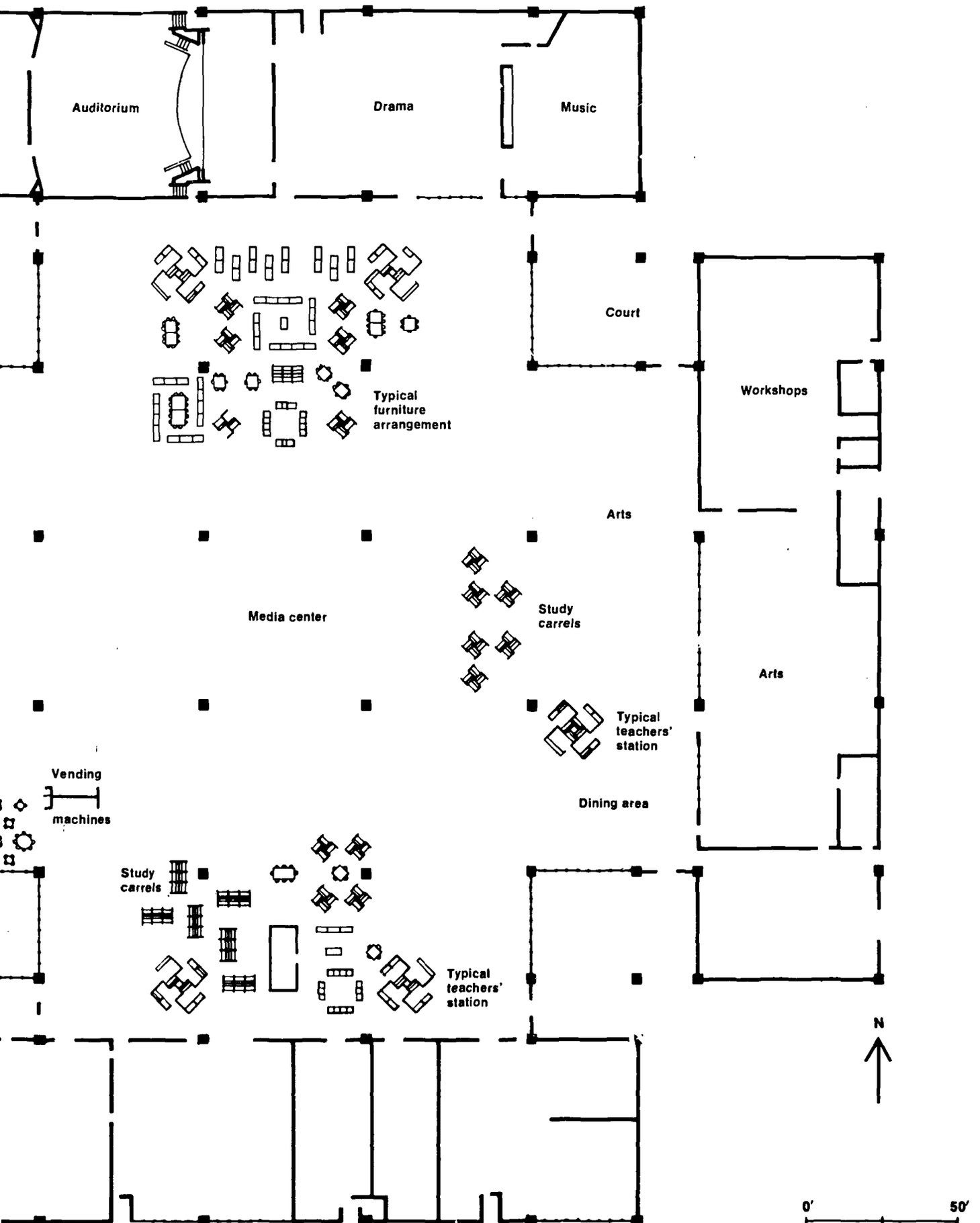
Planning for the new school continued right up to opening date. For one month the teachers met in an old school building to train in teaching the new curriculum and familiarize themselves with the objectives and interrelationships of the programs. Then for the first two days in the new school the students and staff carried out an intensive orientation period before settling down to the new ways of learning. From this came a student project to hang signs from the ceiling to identify the different subject areas of the learning space.

The open plan includes the eating areas. Three corner areas are equipped with tables and chairs for eating; two areas have food and drink vending machines for day-long use and the other is close to a kitchen serving lunches. These areas serve as social centers for students on free time, which in the first year reached 50% of a student's school time. Free time was reduced to a maximum of 25% in the school's second year, and this may help reduce the noise from the eating areas. Transparent barriers around the eating areas to cut down on the noise have been proposed.

Because there are no doors in the academic area, the administration kept

Juanita High School
10601 N.E. 132nd, Kirkland, Wash. 98033
Building Leader: John F. Strauss, Jr.
Architect: Kirk Wallace McKinley AIA & Associates, Seattle, Wash.
School opened: November 1971
Cost including land, fees and furnishings: $5,360,000
Area: 210,000 sq ft
Cost per sq ft: $25.75
Capacity: 1,600 students
Photographer: Ron Partridge




Auditorium
Drama
Music
Court
Workshops
Typical furniture arrangement
Arts
Media center
Study carrels
Arts
Typical teachers' station
Vending machines
Dining area
Study carrels
Typical teachers' station
N
0'
50'

the same standard of openness for its own offices. The building leader and his two assistants sit at desks, rather like bank officers, in an open office area. No student has to go through a door at Juanita to talk to an adult. If the need for private consultation with staff and students or parents arises, room is available in what traditionally would have been the principal's and vice principal's offices.

Storage units separate seminar space from food vending machines.

Administration area is completely open; Leaders' desks are in front of far wall.

Teacher work station at left. The school is designed to give access to handicapped students throughout the building.

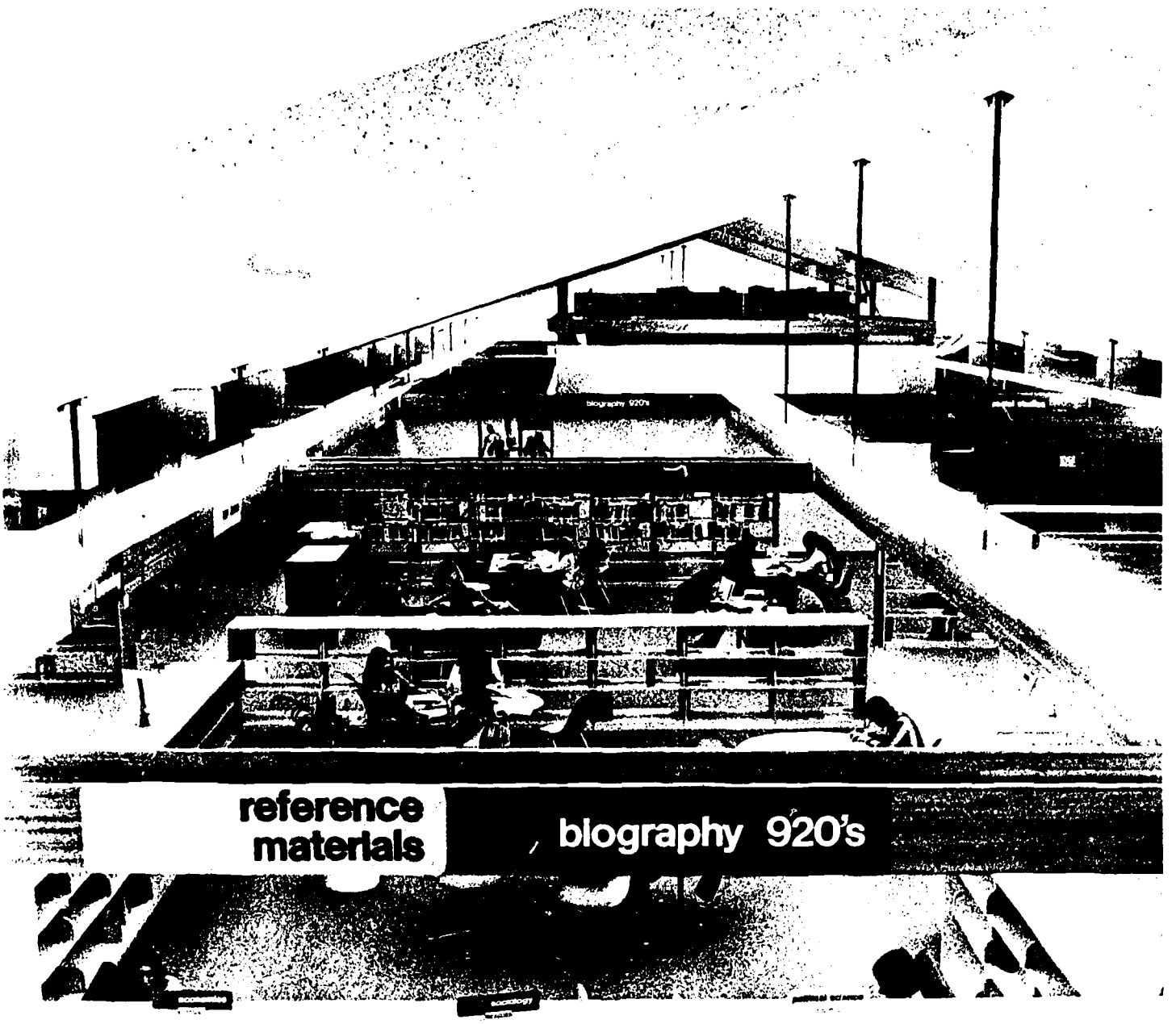
Center of building.

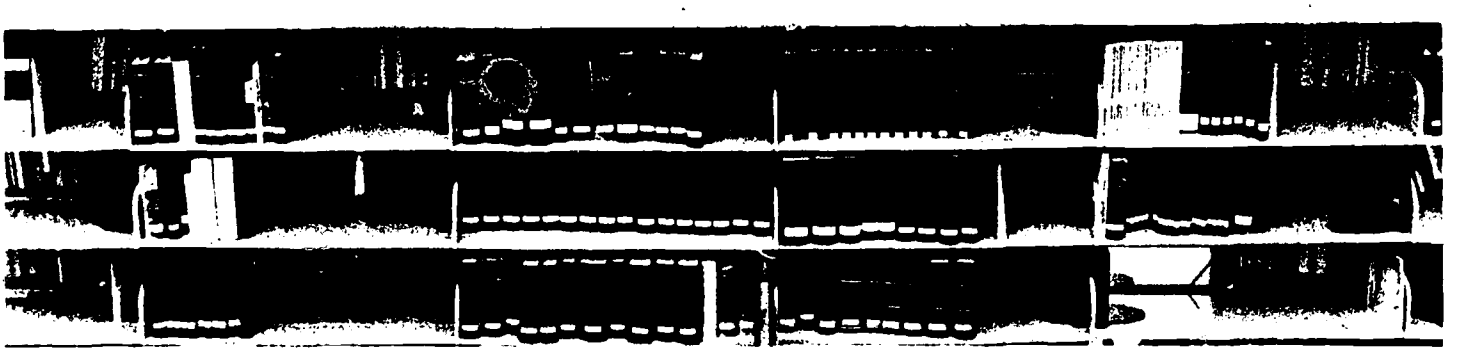
Tinted glass enclosure houses audio-tape center for dial-access service.

atics resource area and testing carrels.

Parkway North

Parkway North Senior High School 12860 Fee Fee Road, Creve Coeur, Mo. 63141





Parkway North

The marriage of architecture and education at the Parkway North High School near St. Louis hasn't been fully consummated, but there's no reason to believe they won't eventually settle down together. The school opened in September, 1972, and in its early months the education programs were geared more to traditional classrooms than to the open spaces that had been provided. However, the teachers are evolving an open curriculum in science and social studies, and the administrators are prepared to let the trend continue.

Parkway's open spaces are located on the upper floor of a two-story building because the columns can be spaced wider apart under a roof than when they carry floor loads. The offices, cafeteria, studios and shops, etc., are located on the lower floor. The upstairs academic areas cluster around a centrally located resource center. Because of the configuration of the floor plan, the academic areas do not run into each other. There is a feeling of openness, but nevertheless the areas are quite firmly marked off by partitions and walls around courtyards. The open feeling is reinforced by the exposed pitched roofs that allow the occupants' sightlines to rise above the customary 10-ft level.

Under the pitched roofs, the designers hung mezzanines that are used for teachers' work stations or for quiet areas above the resource center. The school seemed quiet when EFL visited it, but enrollment had only reached two-thirds of the 2,200 capacity for grades 10 through 12.

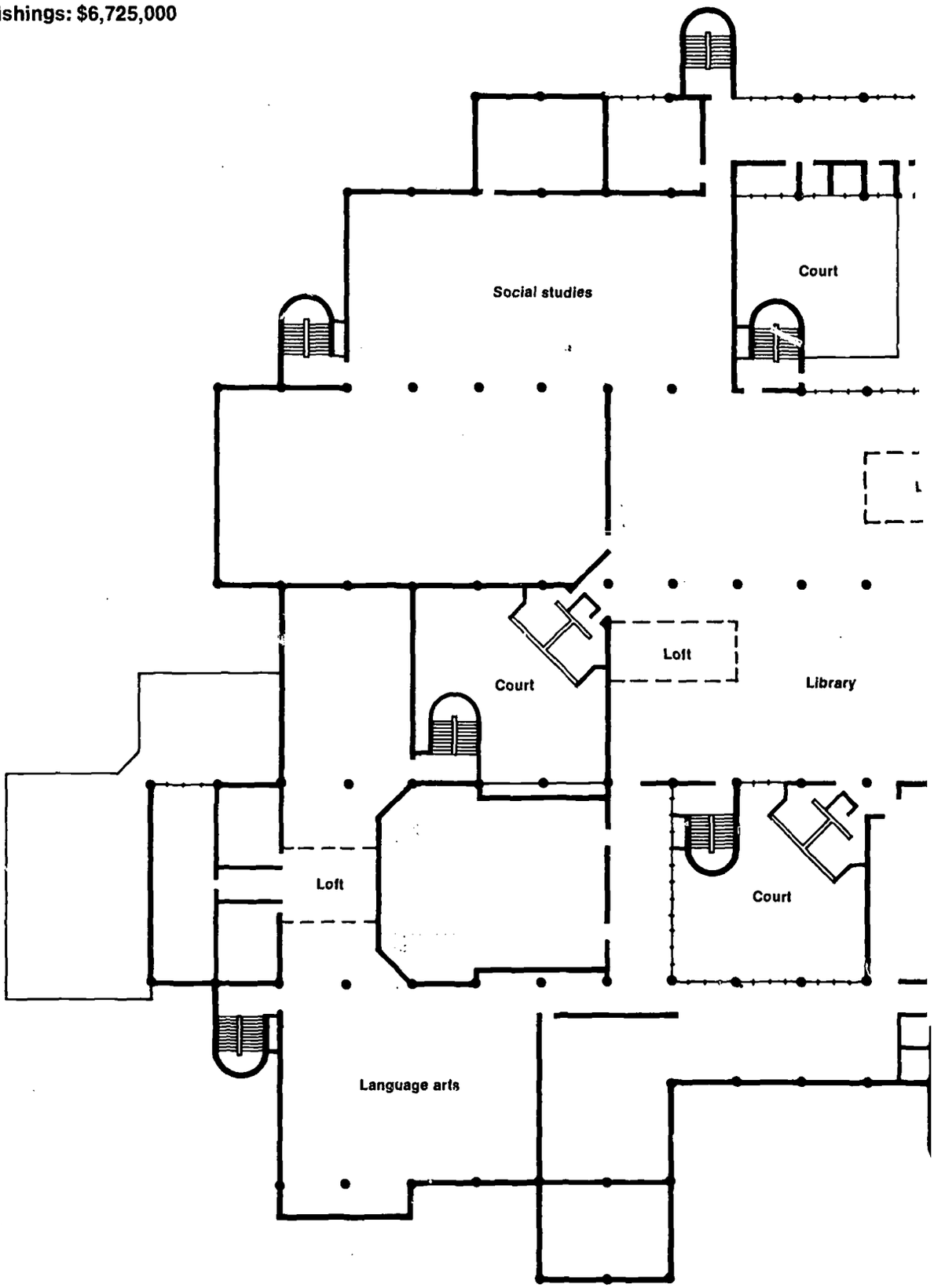
The students live in a district of housing subdivisions, most less than about 15 years old, whose residents are almost all white-collar workers with a high percentage in the chemical or aircraft industries. Most students expect to attend one of several free colleges within commuting distance.

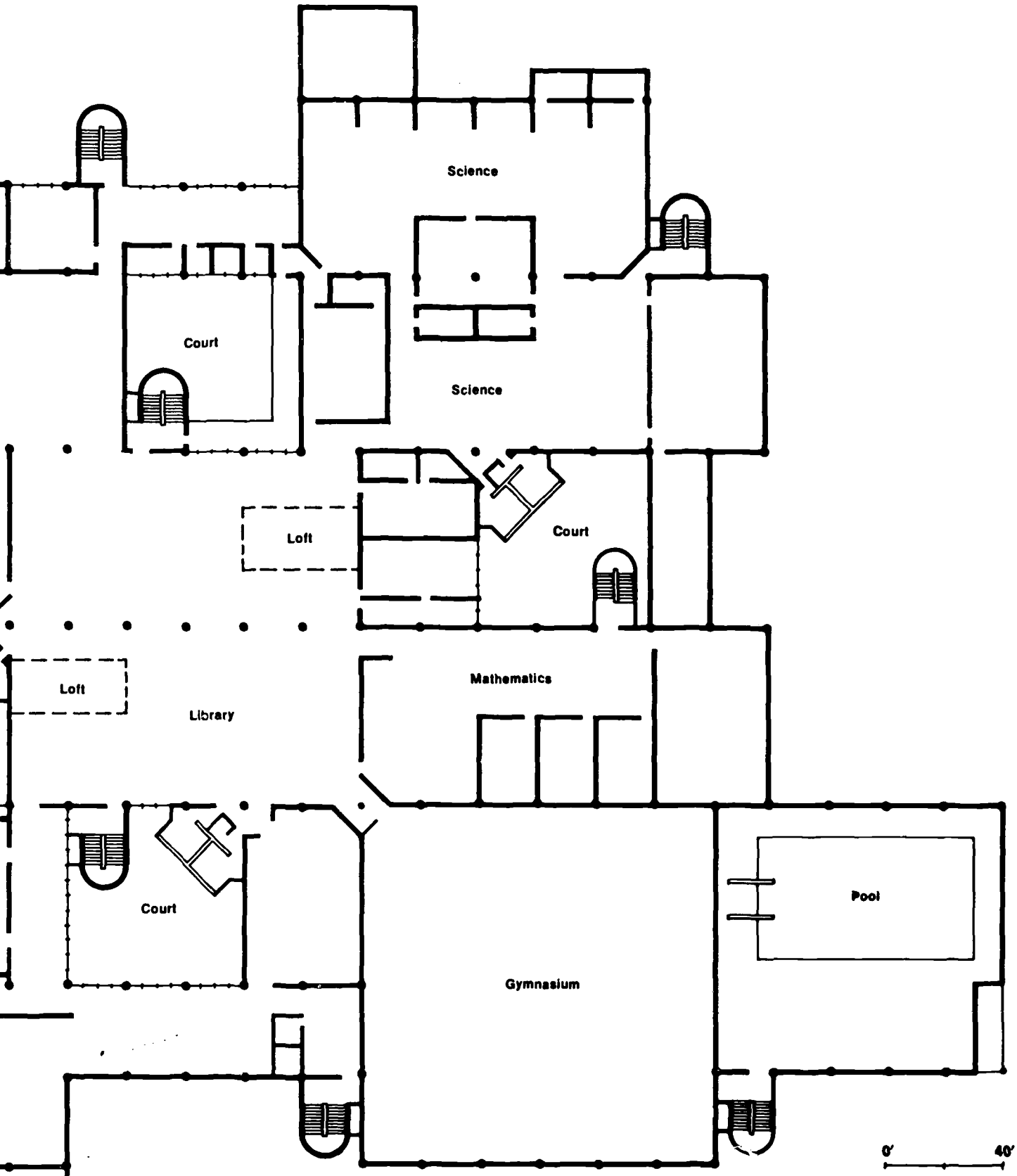
Parkway's principal, Russell Tuck, was appointed one year before the new school opened. This was too late for him to influence the general design of the facilities, but because of the flexibility of open planning he was able to affect the interior. So too were the teachers that Tuck hired to staff a 10th-grade school housed in another schoolhouse for the year preceding Parkway's opening. Some of these 32 teachers experimented with team teaching although their temporary quarters were in traditional classrooms, and in the final weeks before Parkway opened they were able to arrange their own pieces of turf while the building was being completed.

Although the educational program of the school has not yet developed into a model for an open curriculum, the manner in which the building was designed and constructed could be a model for administrators discouraged by protracted building programs. Only 30 months elapsed between the day the architects first looked at the site and the day the school opened. The short design and construction time was achieved by overlapping the design and construction processes, which in turn succeeded because the architect served in two roles: designer and construction manager. (A construction manager takes the place of a general contractor and, for a fee, coordinates all the subcontractors.)

One subcontract that was handled differently from most school construction projects was for furnishings. The architects called for bids on the interior furnishings (lab counters, partitions, furniture, etc.) in a total package instead of from individual manufacturers. The products were not specified by name but were described in terms of how they had to perform. In this manner, one major supplier would recruit other suppliers to collaborate in meeting the performance specifications. The advantage to the school board is that one interior contractor is responsible for all the suppliers and that the size of the contract ($490,000 at Parkway) permits greater room for cost reductions than, say, ten contracts at $50,000 each.

Parkway North Senior High School
12860 Fee Fee Road, Creve Coeur, Mo. 63141
Principal: Russell R. Tuck
Architect: Hoffman/Saur and Associates, St. Louis, Mo.
School opened: September 1972
Cost including land, fees and furnishings: $6,725,000
Area: 240,000 sq ft
Cost per sq ft: $28.00
Capacity: 2,200 students
Photographer: Robert Pettus

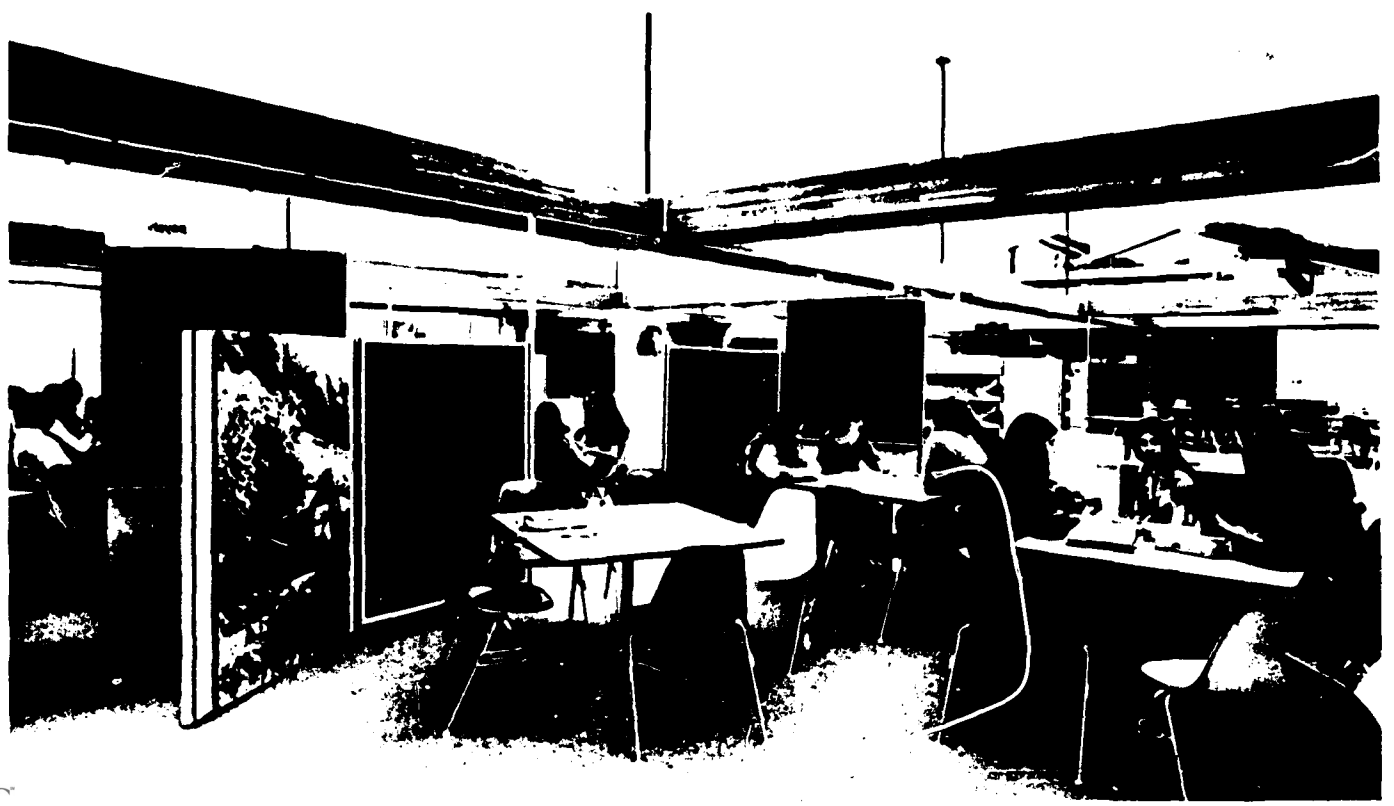



Science
Court
Science
Loft
Court
Loft
Mathematics
Library
Court
Pool
Gymnasium
0'
40'

Upper level

Over-all costs for the school are moderate: construction for the 240,000-sq-ft building was completed for $24.71 a sq ft; with furnishings added the school cost $26.85 a sq ft. Grading and landscaping was nearly $100,000. With all the construction and equipment costs totaled with management and professional fees, the district paid about $6.7 million.

Students listen to language tapes through underfloor "wireless" system.



Space dividers include high and low chalkboards.

Bright red airconditioning ducts combine art with utility.

Clerestories (top right) bring natural light into windowless interior spaces.

Lofts (at left) are used for teachers' work areas or for students' reading spaces.

"Power poles" plug into lighting channels (left) to provide outlets wherever needed.


misc paperbacks

Clear Creek

Clear Creek High School 161 Chicago Creek, Idaho Springs, Colo. 80452

Clear Creek

Because of perverse geology, miners spent years more than had been expected to tunnel two miles through the Continental Divide west of Denver. The job brought two benefits to the normally peripatetic construction workers. One, sustained employment, and, two, the opportunity for their children to attend a school that is attracting the attention of educators throughout the country.

Clear Creek Secondary School warrants attention because it has sloughed off the traditional approach to teaching and substituted a program that stands the students firmly on their own feet. They have the responsibility to learn for themselves instead of being taught by a teacher facing thirty desks. Such a program needed spaces unavailable in a schoolhouse with an ordinary classroom arrangement. So Clear Creek operates in a building designed for its educational program.

The schoolhouse is the only distinguished building in Idaho Springs, an otherwise unremarkable town in a valley in the foothills of the Rockies. (Its most famous son is Milt Caniff—hence the valley is sometimes called Steve Canyon.)

The school is built on four floor levels. The ground floor houses the gym, cafeteria, shops, offices, junior high school and a large lobby which spread out over a much larger area than the upper floors. Floors two and three contain the high school academic areas, and a theater that can be divided into small auditoriums sits atop the structure on the fourth floor. A spiraling ramp connects floors one through three and creates a space much more related to the floor areas than stairs could provide. It has also turned out to be helpful to the students who have accidents on the nearby ski slopes.

Two questions quickly form about Clear Creek School. How did a town where only one-third of the youngsters even essayed a college career develop an advanced educational system? And why did the town vote to spend money for a new school? Briefly answered, the town got the school because it hired an autocratic (self-styled) superintendent who campaigned for the school with messianic fervor and because two corporations using the natural resources of the county pay two-thirds of the school taxes.

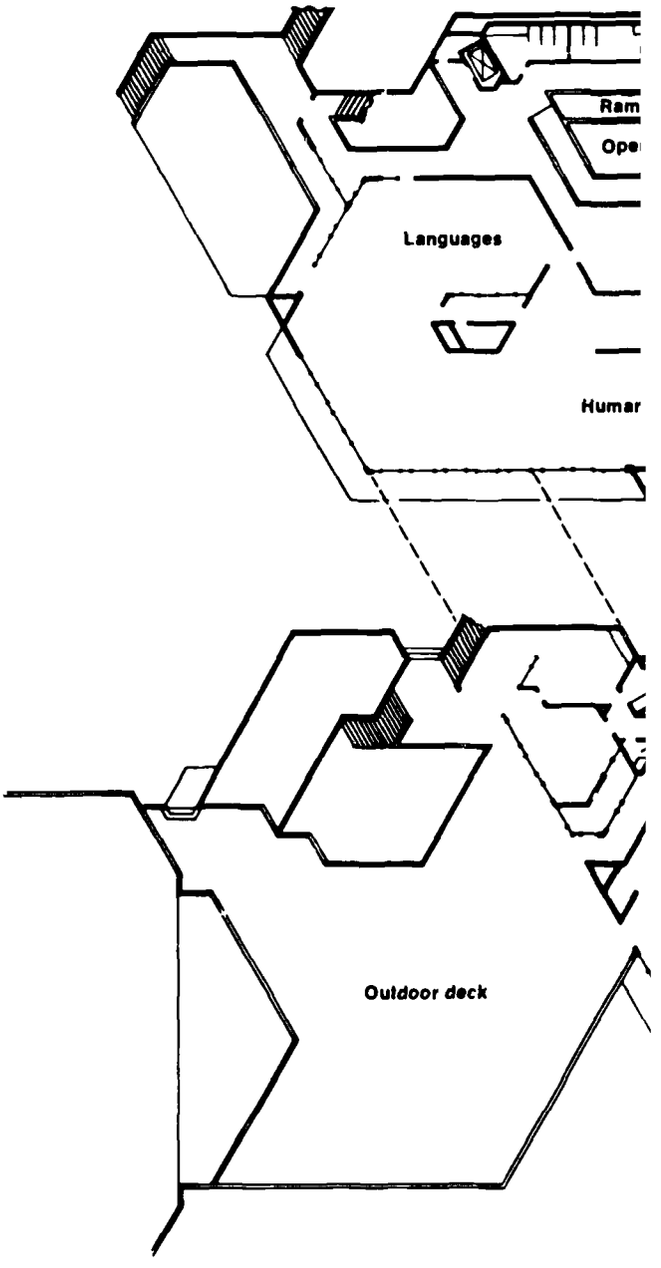
In 1964, Robert F. Metzler signed on as superintendent for one year with no obligation on either side to renew. For Metzler it was a long jump from teaching at Columbia University, but it was also a return to the state where his family owns a ranch. At that time, Idaho Springs must have seemed an unlikely town for major educational change, but Metzler had come to the town because he believed the school board would back him, and so he began his odyssey. It is worth noting that although Idaho Springs is basically a blue-collar town, its school board wore white collars: two superior court judges, an IBM executive, a contractor and a wholesale businessman. Later, a change in the state laws required the two judges to leave the board.

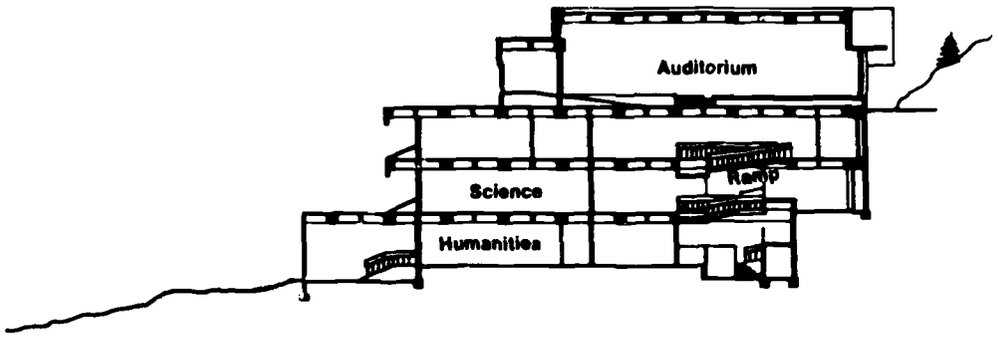
In 1964, school was being conducted in a 1937 schoolhouse and in rented offices and stores. Metzler immediately introduced the 20-minute modular system into the secondary school program and started talking to community groups about his philosophy of education. Carefully substituting the word innovative for "experimental" and "progressive," he slowly coaxed the citizens into agreeing to let the school try his new methods.

The program called for students to pursue learning actively instead of being taught. This is more than a semantic twist, for it puts a lot of responsibility onto young teen-agers to discipline themselves. Clear Creek School moved into this mode slowly because it still used premises designed for traditional classroom situations. But when the school building evolved from the new educational program, the two fitted together nicely.

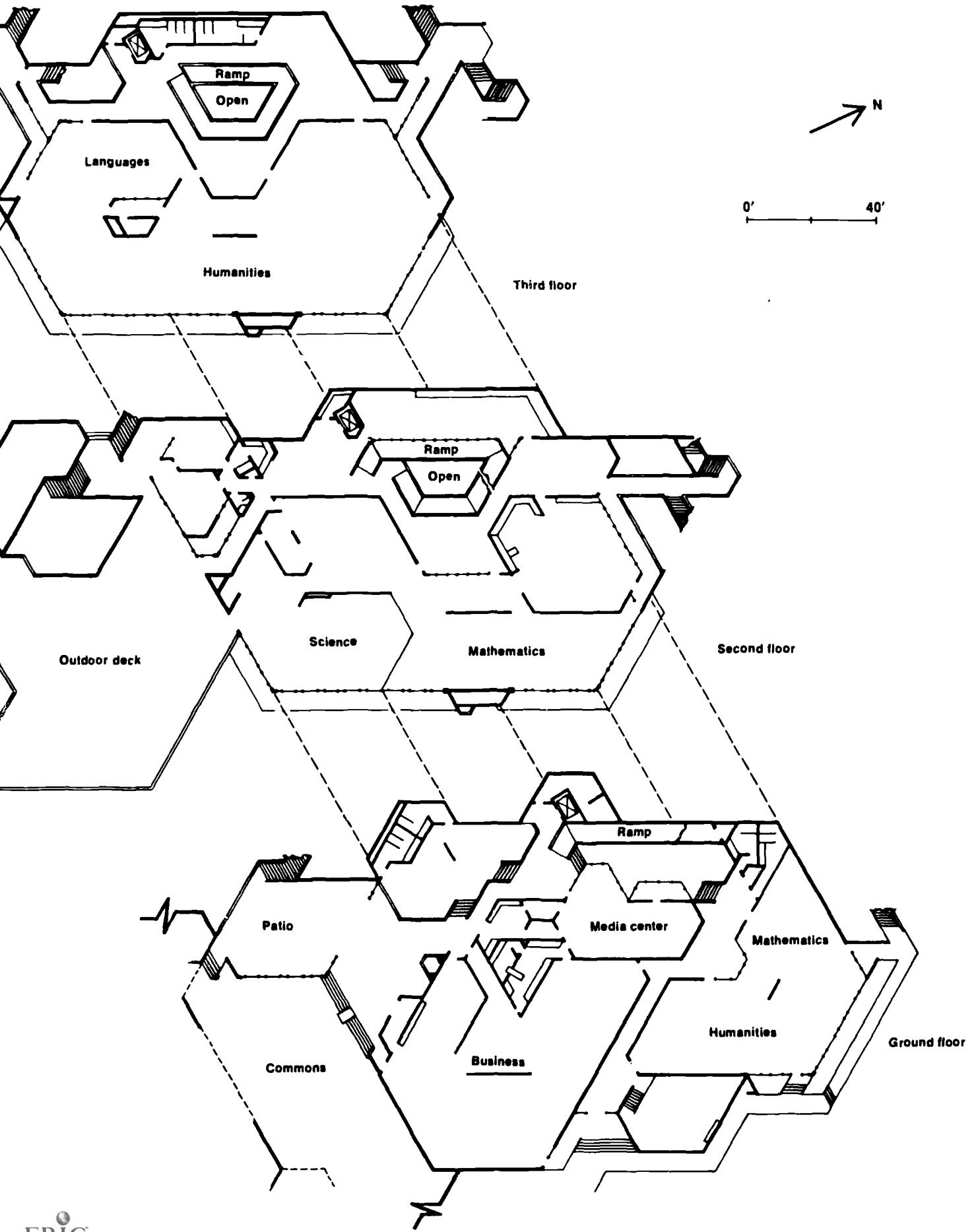
(Preceding page).
Ramp around open well brings the three academic floors together almost as one big space.

Clear Creek High School
161 Chicago Creek, Idaho Springs, Colo. 80452
Superintendent of Schools: Robert Metzler
Architect: Nixon Brown Brokaw Bowen, Boulder, Colo.
School opened: April 1969
Cost including land, fees and furnishings: $1,300,000
Area: 78,000 sq ft
Cost per sq ft: $16.69
Capacity: 600 students
Photographer: George Zimbel





Cross section


Ramp
Open
Languages
Humanities
Third floor
N
0'
40'
Ramp
Open
Science
Mathematics
Outdoor deck
Second floor
Ramp
Patio
Media center
Mathematics
Humanities
Commons
Business
Ground floor

Students make independent study contracts that put them into a variety of learning situations. They learn on their own, with a single advisor, or in groups of not more than 15 students. Because of this independence, the school day required the flexibility of the 20-minute module so that students could schedule long and short bursts of study appropriate to each subject.

During the first year of the program, many of the students carried their enthusiasm for it into their homes. But some parents and a large number of teachers who were less than enthusiastic complained to the state department of education. The new, and by that time controversial, superintendent survived the complaints and began to help find jobs in other schools for teachers who were unable to work with the new program.

The Clear Creek School is no eight-day wonder: 18 months of discussion preceded the preliminary sketches. Small groups of teachers used to meet in a ski cabin to pool their ideas on the philosophy of education—not on the facilities—so that a practical educational program could be evolved. And a large citizens advisory committee was formed to deal with the more mundane matters of what facilities should be included, how they could be adjusted to the available funds and where the building was to be located. The committee's main purpose was to sell the bond issue to the county, so a representative group was nominated to serve on it. It included parents and those with no ties to public education; it even included a county leader unfriendly toward the school system who later changed his views. Although this may seem an overly long process, in view of the resistance to change that had to be overcome, particularly since the proposed changes involved higher taxes, the time was necessary.

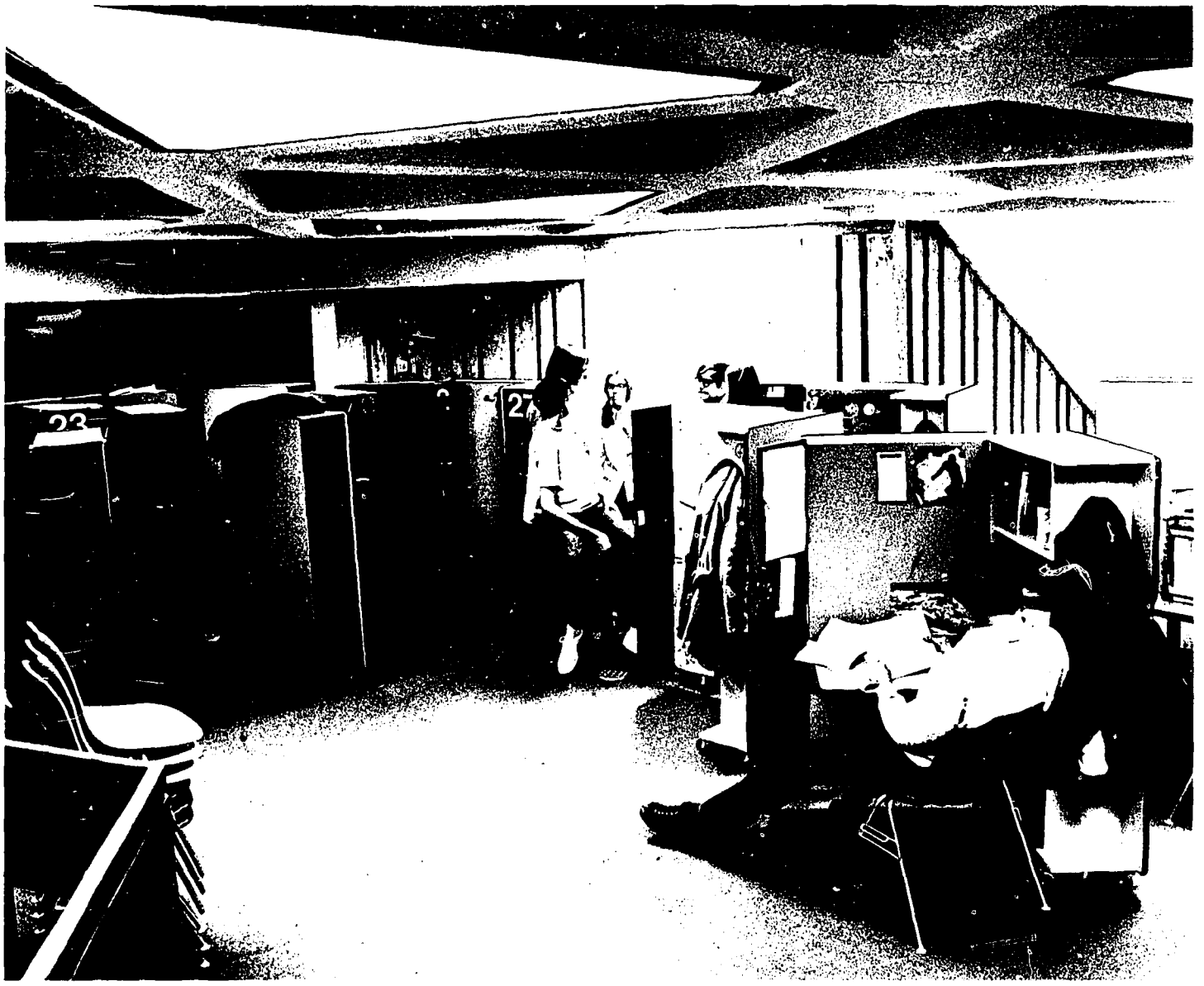
When the school board moved to hire an architect, the superintendent again led the way hiring a firm that shared his high regard for the earthy qualities of buildings by the late Frank Lloyd Wright. The board and its superintendent traveled outside the state to see recommended schools, but found none that incorporated Metzler's vision for Idaho Springs.

Metzler told the architect that he wanted a school that didn't look like a school, that would have no boxes or squares. He also wanted a plan that could accommodate a change back to a traditional classroom configuration if in a few years' time learning programs reverted to pre open plan methods. The solution was to base the plan on interlocking hexagons, so as to do away with square corners. Central to the circulation among floors is a ramp to expose the learning floors. Fire codes threatened to require walling off of the ramp well, but by pleading his case before the state's governor, Metzler was able to compromise with glass walls set back a few feet to separate the learning suites from the circulating space.

Although Clear Creek does not have the large uninterrupted areas that the name "open plan" calls to mind, it is open in spirit and it has successfully opened up three floors so that school activities flow easily up and down.

Audio-visual dial-access system enables students to study or relax during free periods.

Space dividers can easily be moved (above) to open up large areas (below).



Custom-made study stations provide spaces for clothes. They can be moved about on casters and locked when not in use.

Open cafeteria near entrance lobby.

Castle Rock

Castle Rock High School 5180 Westside Highway, Castle Rock, Wash. 98611

Castle Rock

A small West Coast school offers two interpretations of the open plan: in the familiar sense, it has an open-plan schoolhouse, and in its own sense it treats the whole community as an open plan learning situation where students may spend up to half of their school time. Both aspects of the school complement each other since the open academic area is necessary for the in-school curriculum which in turn evolves from the out-of-school programs.

The nature of the community led the school into its present program. Castle Rock is a rural bedroom community for two industrial cities south of Tacoma. Few of the young people move permanently out of the area, and less than 20% of its high school students complete a 2- or 4-year college program. Thus when engineers condemned the old high school as an earthquake risk, the administrators considered building a comprehensive school with career-training facilities. Fortunately, as it subsequently developed, the small size of the town kept it from financing a school with good occupational facilities. Blocked in this direction, the district created an alternative program in which students go out into the businesses and industries surrounding Castle Rock and learn their occupations in "real life" circumstances. All the town had to provide were academic and supporting facilities in a new high school.

The $2 million cost of these facilities (including land, equipment and fees) was shared almost evenly between the school district taxpayers and the state. The town raised a bond issue to its full capacity at that time and subsequently raised two separate special levies, each repaid in one year. The high school principal, Marvin Lam, recalls no particular difficulty in raising these bonds nor any opposition to building a new school. Lam, the superintendent and three of the board members visited contemporary schools in Washington and California before committing themselves to an open plan.

About 500 students are enrolled in the 4-year program, but at any given time about one-third are outside the school in a career-training situation. The school curriculum requires 24 teachers and 7 aides for individualized learning programs.

Castle Rock is described by the Institute for Development of Educational Activities, Inc., /I/D/E/A/, as one of the outstanding secondary schools in the country, and if it is, part of the credit belongs to an administration that secured Title III funds to train the staff. Most of the present teachers worked in the former secondary school, and, with $165,000 spread over three years they received in-service training for the individualized curriculums in the new school. Three colleges provided the training programs.

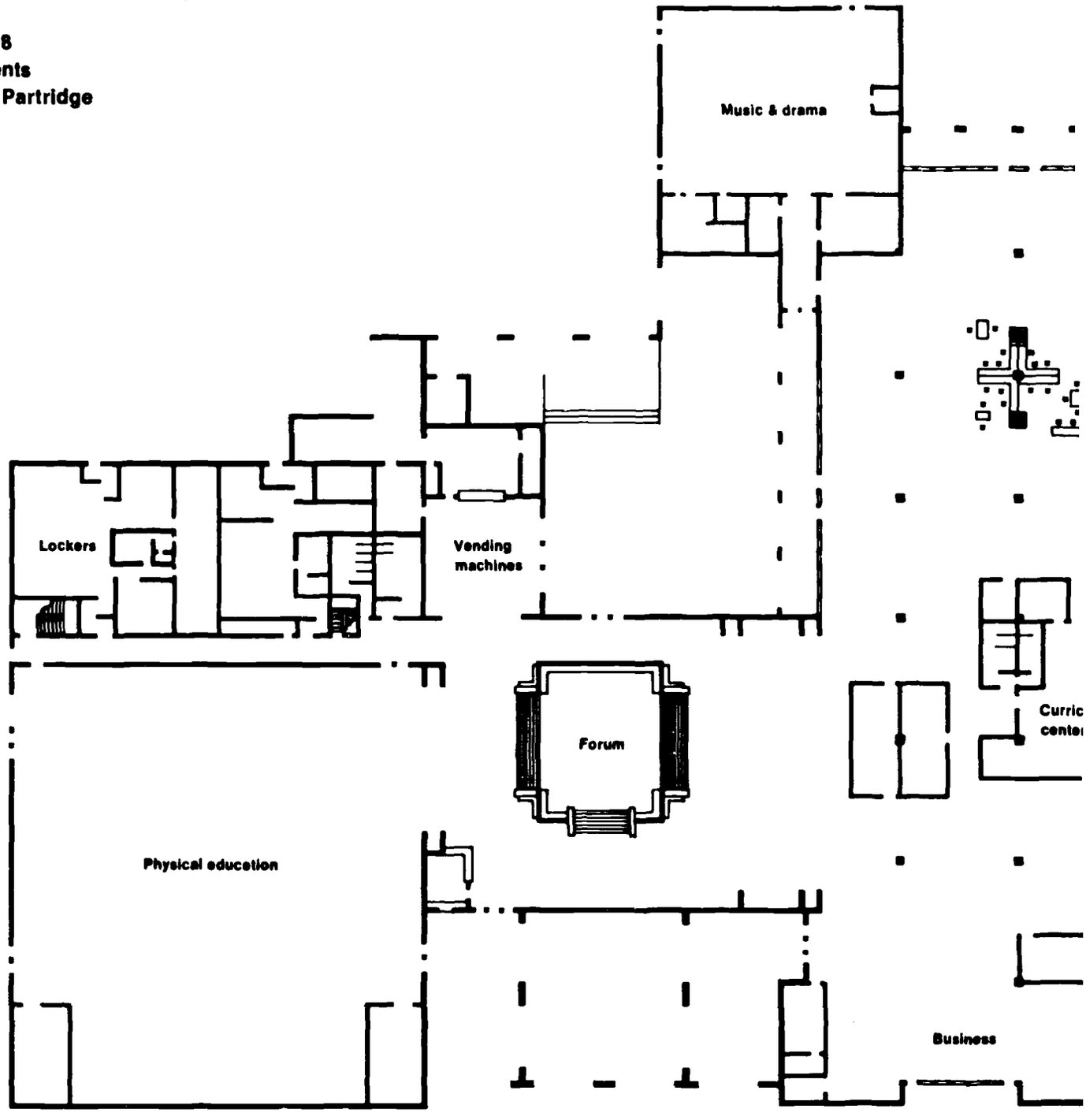
Castle Rock confronts the problem of how students can relate to an amorphous space without a "home room" or a room to call their own. It provides study spaces adjacent to lockers and groups them around columns. Thus students have a place to work on their own in an area identified by the number of the building column. The configuration of the study stations provides a place for small groups to socialize, and students also have the option of doing their independent work in other parts of the school.

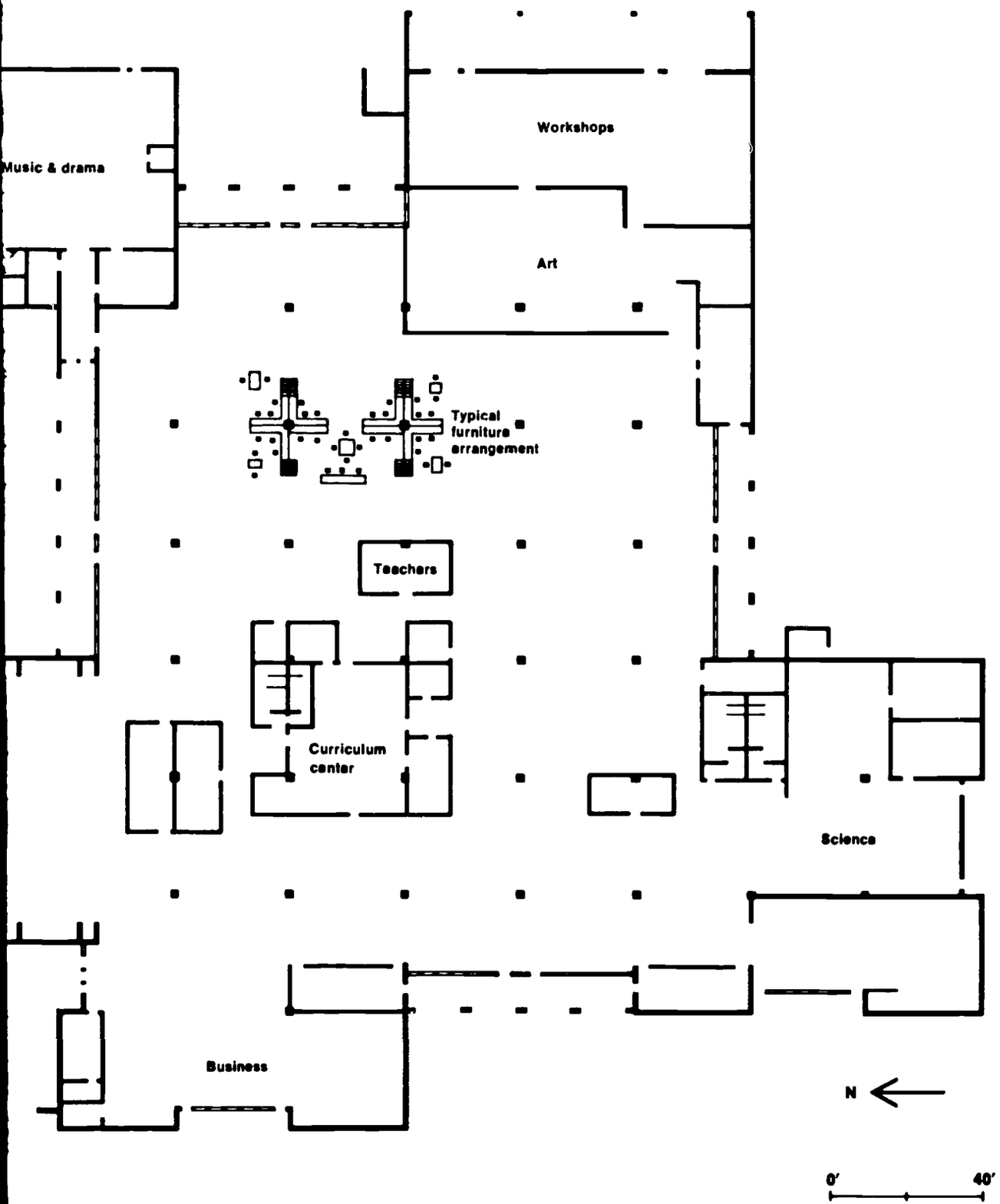
One of the design innovations was an attempt to provide power to the study stations without installing costly underfloor ducts. For this, the architect and a furniture manufacturer developed low dividers that carry electrical cables inside the top rail and plug directly into each other. The divider nearest the column is connected to a regular electrical outlet. In this way, the stations have their own lighting and outlets without cords trailing on the floor.

The social focus of the school is in the Forum, a raised floor surrounded by steps on all four sides. Curtains, pulled back to the corners of the area, can be

(Preceding page).
The Forum is used for eating, socializing, or as a bandstand or a [illegible] the performing arts.

Castle Rock High School
5180 Westside Highway, Castle Rock, Wash. 98611
Principal: Marvin Lam
Architect: Donald F. Burr & Associates, Tacoma, Wash.
School opened: September 1971
Cost including land, fees and furnishings: $2,042,000
Area: 70,000 sq ft
Cost per sq ft: $25.08
Capacity: 500 students
Photographer: Ron Partridge




Workshops
Music & drama
Art
Typical
furniture
arrangement
Teachers
Curriculum
center
Science
Business
N
0'
40'

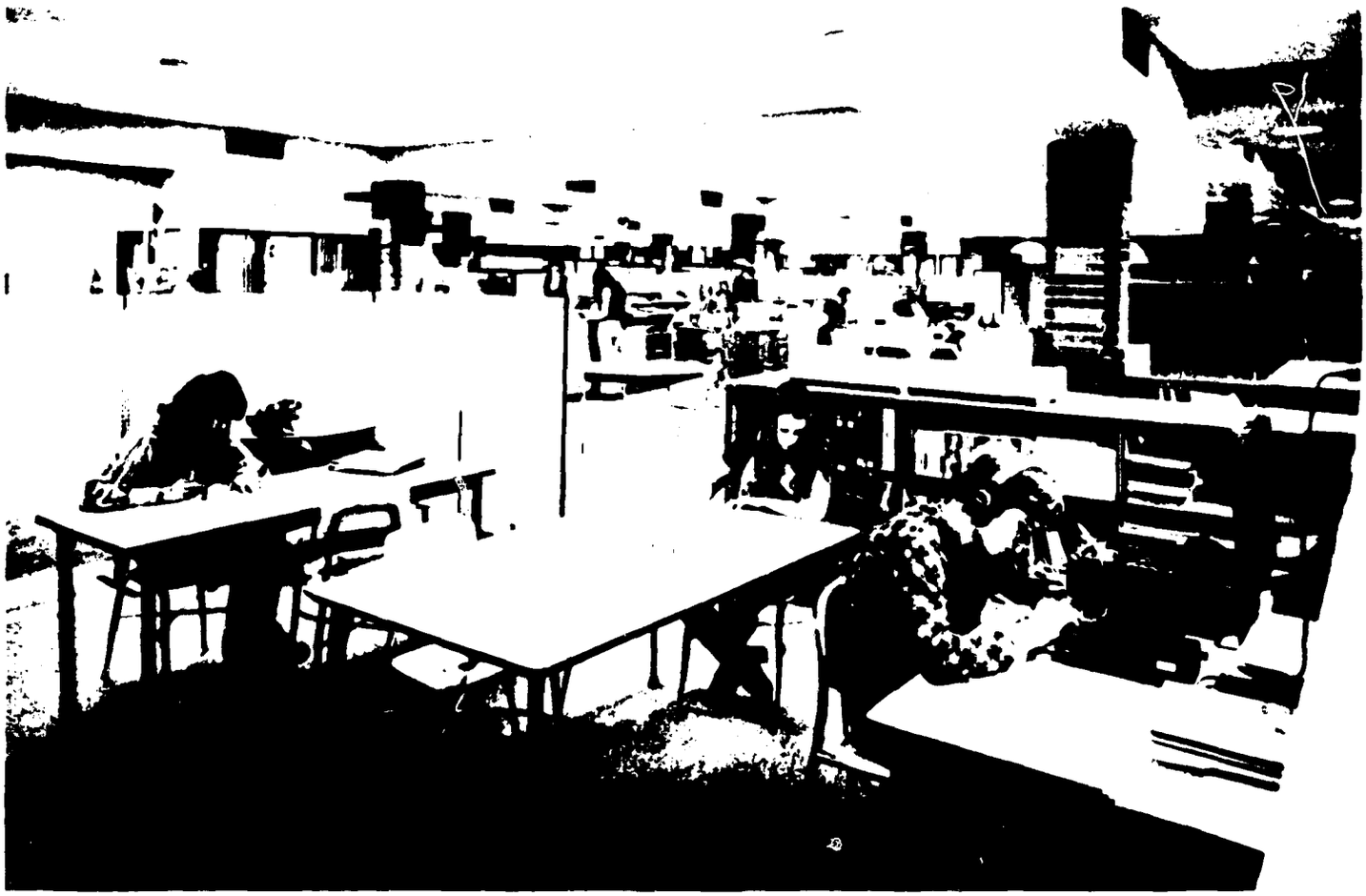
closed along any or all of the sides. During the day students use the Forum for lounging, eating and for council meetings. After school, it is used for a bandstand at dances. Nearby is a large alcove with food vending machines and two microwave ovens. Food service in a cafeteria would be uneconomical because work schedules take students out of school at irregular hours.

The openness of Castle Rock, and all four of the other secondary schools in this publication, remove the inst' tional atmosphere of traditional dor and classroom buildings. It's pl ant to be in an open school—more like walking through a department store than through a place which teen-agers are required by law to attend for a certain length of time. The degree of openness cannot be prescribed, but should evolve from the educational program. There is, however, a mundane reason for making as much space as possible serve more than one purpose during the life of a schoolhouse. A truly open plan would allow the first users to enclose whatever sections suited their purposes and then allow the same freedom to those who come later.

Storeroom for individual learning packages and test papers.

Students buy food from vending machines and heat it in microwave ovens on center counter.

...ical student station with screens that plug together to carry power for lights under the shelves.



Preparing teachers for open space

If a school district bought a new [illegible] of office machine or a new h[illegible] system, the administration would p[illegible]ably send an employee to the manufacturer to learn how to use the equipment. Ironically, that same administration would invest a lot more money in a new type of learning situation and yet not be able to secure the funds to train teachers in the use of their new spaces. That's why some open-plan learning facilities are not used as they are meant to be: the staff simply hasn't been prepared to operate the new "equipment."

As the trend for open plan secondary schools catches up with the progress in elementary schools, thousands of high school teachers must be retrained. It should not be a matter of luck whether a high school has access to competent people to help its staff move out of traditional classrooms into the large arena of new learning arrangements. In some open plan schools teachers operate more or less in the same way that they did in a traditional classroom thereby leaving untapped the potential resources of open academic areas.

Some districts have organized training programs for teachers entering open-plan elementary schools. The largest program known to EFL is operated by the District of Columbia Public Schools which has 137 elementary schools, eight of them converted or built with open plan areas and another 10 projected for the next two years.

The district established a department, Training Center for Open Space Schools (TCOSS), with a staff of four working year-round on teacher training programs for the schools. EFL helped finance early planning of the program and a training facility, and ESEA Title III funds cover the annual operating costs. Thus far, TCOSS has used newly built or converted open plan areas for training teachers who will work permanently in the facility, but next year there will be a Demonstration Center where teachers will spend the first part of the training program before moving into a "real" school.

Training is usually concentrated into five summer weeks in a new or converted school that is due to open in September. During the first week teachers are shown the principles and mechanics of open space teaching, but no children are present. Then pupils are brought into the school and the training staff stays with the teachers for the next four weeks. When the program is conducted during the school year it is spread over nine weeks with pauses in between. When the Demonstration Center opens, pupils will be brought in after the teachers under training have been there one week.

In the summer of 1973, TCOSS ran training programs for 85 teachers and aides in two schools. The director of the department headed one program and the administrator in charge of TCOSS research and planning directed the other. Each had five assistants, called trainer-resource teachers, who are teachers who have been through the training program and work regularly in open-plan schools. The teachers under training receive a weekly stipend of $75 and their instructors receive slightly more. These stipends are paid from the Title III funds.

The TCOSS training program doesn't stop at the end of five weeks. Its staff follows the progress of recent graduates to ensure they have fully assimilated the open space philosophy and,

more important, are putting it into practice. Since open space teaching requires team approach, the staff regularly runs seminars for teachers and principals of schools with open space areas. There appears to be little chance of Washington's open space teachers reverting to closed classroom teaching techniques.

Desks have no place in an open learning area: most schools—whatever the grades—prefer tables and chairs although some use chairs with arms that serve as desks. A middle school in Haverford, Pa., decided against this traditional classroom furniture after the 7th and 8th grades used it in a one-year demonstration open learning area. The Haverford approach to open space was to convert a gymnasium into a learning area to test the furnishings and techniques before the school moved into new open space premises. Teachers and students found trapezoidal tables infinitely better than chairs with writing arms because they can be easily moved and grouped in versatile arrangements. Haverford also demonstrated that teachers needed fewer space dividers than administrators bought for them. An equally interesting aspect of the year was that the staff overcame the lack of casual furniture by making it themselves with foam rubber and heavy corrugated cardboard.

The trial period in the converted gym allowed the district to try out several kinds of furniture before committing itself to buying equipment for the new building. A similar arrangement in a gym enabled an elementary school in Chalmers, Ind., to establish its needs before spending too much money. Chalmers planned to remodel the entire school into an open plan program but before starting it decided to try out furnishings in the former gym. The school rented carpeting, borrowed furniture from a manufacturer and made its own furniture. The experiment helped the staff to determine the uses of carpeting, where the lighting should be and what types of furniture suited various activities. Simultaneously, of course, teachers were being trained in their new roles and refining the techniques so that when the school opened the staff was ready for it.

Schools around the country are contributing large and small advances to the development and refinement of using new types of educational spaces. It's not possible to cover all of them, but some generalizations can be made about what's going on in open-plan secondary schools. The EFL newsletter *Schoolhouse* reported the following:

- It is easier to run a traditional program in an open-plan school than an open program in a traditional school. Success of more advanced concepts of educational programming is more likely in an open facility.
- The most successful programs exist where a strong administrator has clearly detailed his policy as to what is expected of staff and students alike. It seemed more than a coincidence that in practically every case the chief executive of the school had been recruited from outside the district.
- There is a need for change in the furniture and furnishings available for open-plan schools. Individual chairs and desks are used less and are less appropriate. Instead, chairs, stools, and hassocks around a table for up to six students provide a better and more desired working environment. Students often squat on pillows or sprawl on the

carpeted floors, rather than use desks and chairs. This natural position seems to work well within open-plan spaces.

- Noise levels are less of a problem than critics contend. Although there is some acoustical spill from one group to another, and the potential for problem noise is there, students and teachers adapt quite readily to these problems. Simple good manners quickly become the norm.

- Visual cacophony can be a problem. Too much furniture, too many colors or patterns, too much variety in visuals can be distracting. In addition, it is necessary to create a sense of territory for groups and individuals. Variations in lighting levels, floor and ceiling heights, and types of lighting are all successful techniques. Movable displays can also serve to divert traffic, delineate space, and limit the view of roving eyes.

- Many of the open-plan schools had obvious advantages over their more traditional counterparts. Some were underpopulated, raising questions as to whether they will work as well when they have a full complement of students. Others benefited from long periods of training for administrators and teachers. Will districts continue to provide the necessary orientation as new persons take over? The new schools attract attention from nearby colleges (whose students are enthusiastic about working in them), from news media, and from the community as a whole.

Open-plan schools do accomplish their major objective. They do make it possible to open the curriculum, to open the school, to experiment, and to change. They adapt well to varying lifestyles and teaching styles. Because they are relatively new, they have a large share of unsolved problems, but it was clear that few of their users would willingly trade these new problems for the old standbys of the traditional school.

Reports

The following publications are available from EFL, 477 Madison Avenue, New York, N.Y. 10022.

CAREER EDUCATION FACILITIES A programming guide for shared facilities that make one set of spaces or equipment serve several purposes. (1973) $2.00

DESIGN FOR ETV—PLANNING FOR SCHOOLS WITH TELEVISION A report on facilities present and future, needed to accommodate instructional television and other new educational programs. (1960, revised 1968) $2.00

THE EARLY LEARNING CENTER A Stamford, Conn., school built with a modular construction system provides an ideal environment for early childhood education. (1970) $0.50

THE ECONOMY OF ENERGY CONSERVATION IN EDUCATIONAL FACILITIES Recommendations for reducing energy consumption in existing buildings, remodeled projects and future buildings. Explains the importance of including longterm operating costs in evaluating capital costs of electrical and mechanical systems. (1973) $2.00

EDUCATIONAL CHANGE AND ARCHITECTURAL CONSEQUENCES A report on school design that reviews the wide choice of options available to those concerned with planning new facilities or updating old ones. (1968) $2.00

ENVIRONMENTAL EDUCATION/ FACILITY RESOURCES Illustrates where and how students learn about the environment of communities and regions using existing and designed facilities. (1972) $2.00

FOUND SPACES AND EQUIPMENT FOR CHILDREN'S CENTERS Illustrations of premises and low-budget materials ingeniously converted for early education facilities. Booklet lists general code requirements and information sources. (1972) $2.00

THE GREENING OF THE HIGH SCHOOL Reports on a conference on how to make secondary school healthy. Includes the life-styles of adolescents and ways to accommodate them, open curriculums and alternative education programs. (1973) $2.00

GUIDE TO ALTERNATIVES FOR FINANCING SCHOOL BUILDINGS Chart and book explore conventional and unconventional routes for financing school construction. Includes case histories. (1971) $2.00

HIGH SCHOOL: THE PROCESS AND THE PLACE A "how to feel about it" as well as a "how to do it" book about planning, design, environmental management, and the behavioral and social influences of school space. (1972) $3.00

THE IMPACT OF TECHNOLOGY ON THE LIBRARY BUILDING A position paper reporting an EFL conference on this subject. (1967) $0.50

JOINT OCCUPANCY How schools can save money by sharing sites or buildings with housing or commerce. (1970) $1.00

PATTERNS FOR DESIGNING CHILDREN'S CENTERS A book for people planning to operate children's centers. It summarizes and illustrates all the design issues involved in a project. (1971) $2.00

PHYSICAL RECREATION FACILITIES Illustrated survey of places providing good facilities for physical recreation in schools and colleges. Air shelters, roofing existing stadiums, shared facilities and conversions. (1973) $3.00

PLACES AND THINGS FOR EXPERIMENTAL SCHOOLS Reviews every technique known to EFL for improving the quality of school buildings and

equipment: Found space, furniture, community use, reach out schools, etc. Lists hundreds of sources. (1972) $2.00

PLACES FOR ENVIRONMENTAL EDUCATION Identifies types of facilities needed to improve environmental education. (1971) Single copies free, multiple copies $0.25

THE SCHOOL LIBRARY: FACILITIES FOR INDEPENDENT STUDY IN THE SECONDARY SCHOOL A report on facilities for independent study, with standards for the size of collections, seating capacity, and the nature of materials to be incorporated. (1963) $1.25

SCHOOLS FOR EARLY CHILDHOOD Ten examples of new and remodeled facilities for early childhood education. (1970) $2.00

STUDENT HOUSING A guide to economical ways to provide better housing for students. Illustrates techniques for improvement through administrative changes, remodeling old dorms, new management methods, co-ops and government financing. (1972) $2.00

SYSTEMS: AN APPROACH TO SCHOOL CONSTRUCTION Documents the industrialized techniques and materials of systems construction. Systems are essentially an erector set from which a school may be built to suit the demands of any community. Includes case histories. (1971) $2.00

Newsletters

BSIC/EFL NEWSLETTER
A periodical recording developments in the systems approach to building educational facilities. Free

PLANNING FOR HIGHER EDUCATION
A periodical produced jointly with the Society for College and University Planning. Free

SCHOOLHOUSE
A periodical on financing, planning, designing and renovating school facilities. Free

Films

The following films are available for rental at $9.50, or for purchase at $150.00 from New York University Film Library, 26 Washington Place, New York, N.Y. 10003. Telephone (212) 589-2250.

NEW LEASE ON LEARNING A 22-minute, 16mm color film about the conversion of "found space" into a learning environment for young children. The space, formerly a synagogue, is now the Brooklyn Block School, one of New York City's few public schools for children aged 3-5.

ROOM TO LEARN A 22-minute, 16mm color film about the Early Learning Center in Stamford, Connecticut, an open-plan early childhood school with facilities and program reflecting some of the better thinking in this field.