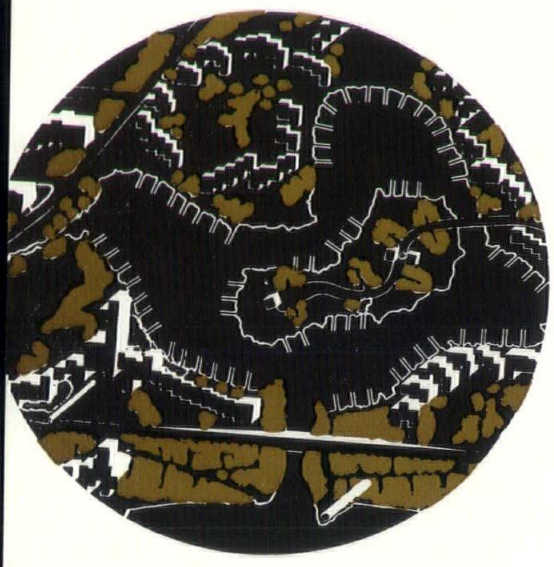
Special Concrete Section

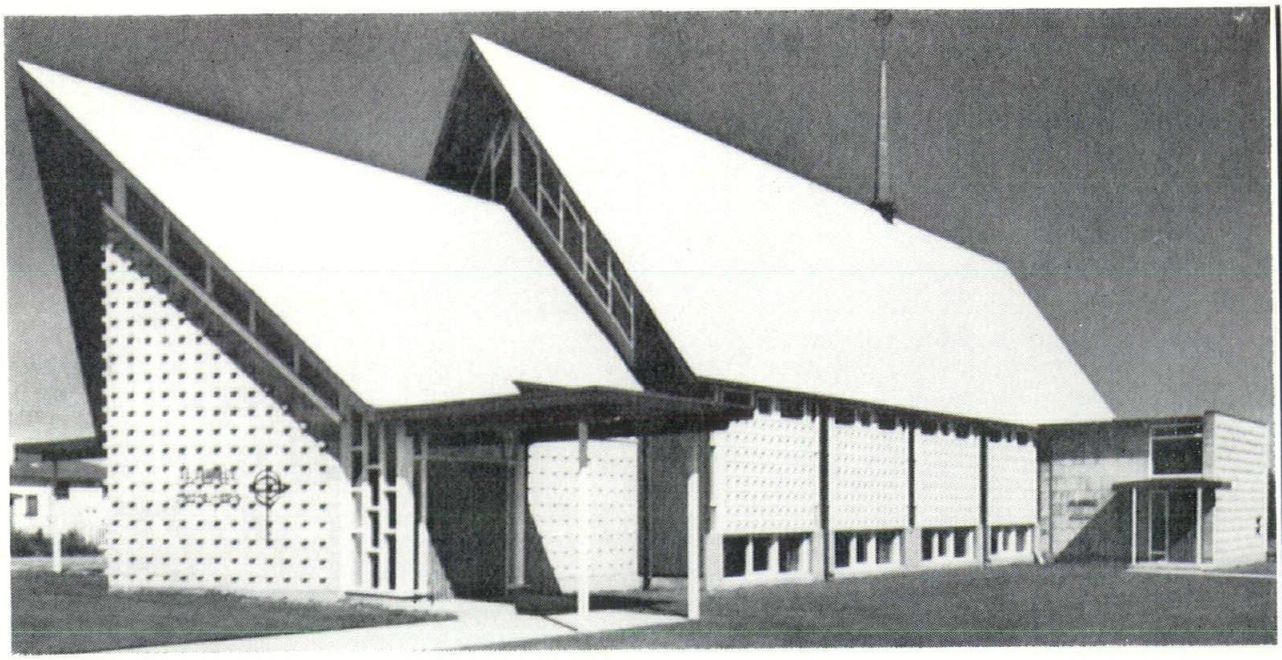
Architectural option in environmental design program

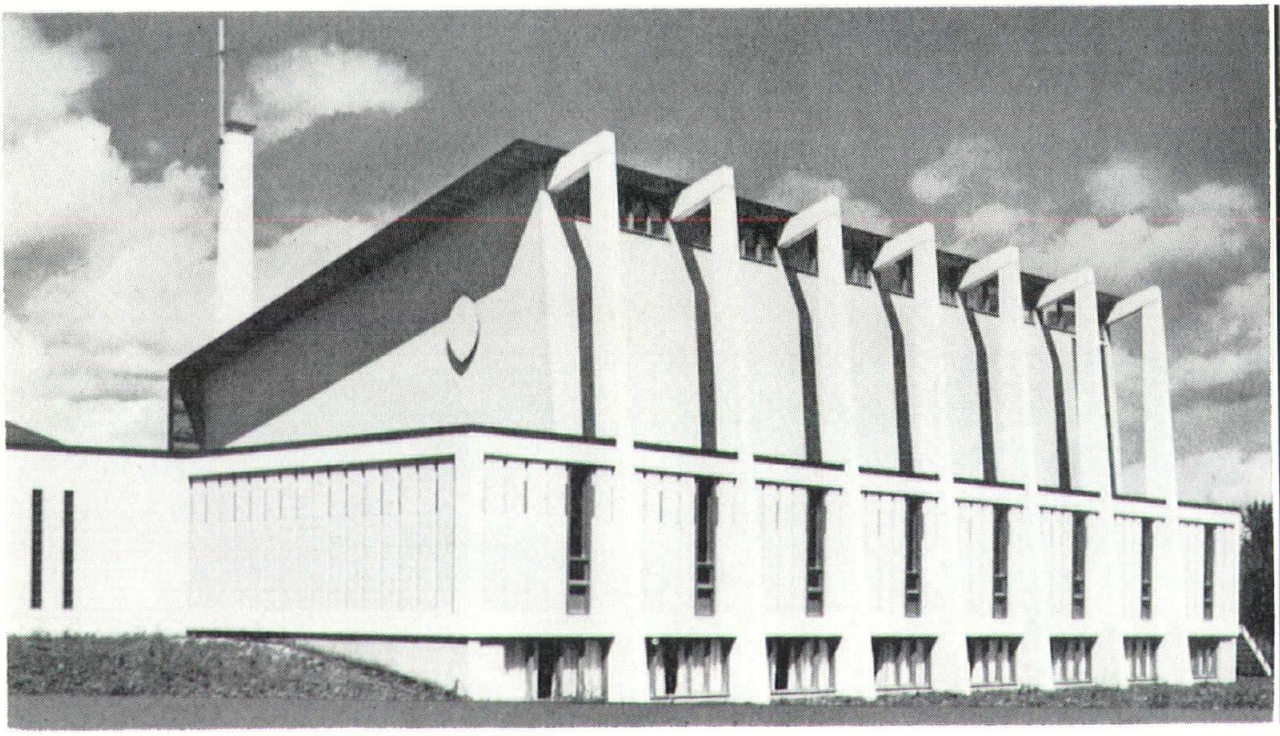
authorized at the University of Wisconsin

wisconsin architect

february/1966







Concrete block is among the most popular building materials for houses of worship. Its uncanny latitude allows the expansion of the architect's imagination to reach far beyond the limits of other materials; never restricts him from having full authority in fulfilling his lines, curves and angles in the most efficient and fluid manner. Concrete block is modular and offers such an unusually large assortment of dimensions for design purposes that almost any wall expression can be realized with perfect linear scale within its four corners. You can obtain a wide variety of solid shapes, ornamental screen units; even mix them. Block has infinite versatility. There are virtually thousands of different church wall patterns that can be created.

Q BLOCK is the new national standard of excellence for the highest quality concrete block in modern day design.

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"We built this one for ourselves" . . .

said the people at The Austin Company, Designers, Engineers, Builders. After 88 years of designing and building for others, they chose Badger Mo-Sai for their own office building housing both their Chicago District Office, serving fifteen Midwestern states, and their Process Division, serving the world. Window units were cast in 37-foot-2-inch-high by 7-foot 4-inch-wide by 2-foot-deep units spanning two floors. Coarse-textured dark brown Badger Mo-Sai panels conceal a 65-car parking area on the ground area, contrasting with exposed Polar White quartz aggregates on the two upper floors. The textured white Mo-Sai forms a pleasant backdrop for the Austin Company's monogram on each end of the building.

Photo by Cabanban Studios

Design and construction by The Austin Company, Des Plaines, Illinois

Badger CONCRETE COMPANY
437 MARION ROAD OSHKOSH, WISCONSIN

New ideas in **concrete** add striking interest to high-rise design

Prestressed structural units, spanning wider spaces at low cost, further broaden the uses of concrete

Prefabricated columns, beams, girders and other prestressed units are being used in structures of every type – from impressive multi-story buildings to attractive bridges spanning broad Interstate highways. New ideas are shaping concrete into forms of infinite variety and efficiency.

Improved production and distribution methods make concrete available to builders when needed, in the form needed–transported by ready mix trucks for casting in place or delivered as plant-manufactured units for on-schedule assembly.

Contributing to important advances in concrete are the research, engineering and educational services of the Portland Cement Association, sponsored by the manufacturers of portland cement.

Portland Cement Association

735 N. Water St., Milwaukee, Wis. 53202

An organization to improve and extend the uses of concrete, made possible by the financial support of most competing cement manufacturers in the United States and Canada

THIS STRUCTURE WON A 1965 FIRST AWARD IN THE PRESTRESSED CONCRETE INSTITUTE'S ANNUAL AWARD PROGRAM.

The nation's tallest precast, post-tensioned concrete building, headquarters for the North Carolina Mutual Life Insurance Co. in Durham, has exposed concrete columns and trusses. Architect: Welton Becket & Associates, Los Angeles.

wisconsin architect february/1966

Volume 34, No. 2

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notes of the month

The Women's Architectural League of Milwaukee and the Southeast Section of the Wisconsin Chapter, AIA, will hold a joint meeting on February 22, 1966, at 6 p.m. at the Milwaukee County War Memorial. Featured speaker is Harold Spitznagel.

Urban Design, a two-day conference on March 11 and 12, is co-sponsored by the Wisconsin Chapter, American Institute of Planners, the Wisconsin Chapter, The American Institute of Architects and the American Society of Landscape Architects, to be held at the Pfister Hotel in Milwaukee. Registration opens on March 11, 10:30 a.m. Registration Fee of $15.00 also covers two luncheons and the banquet. Prominent guest speakers will be announced at a later date. For further information contact: Mr. Carl Quast, Milwaukee 271-2978.

Masters of Environment, The Milwaukee Art Center Art History Seminars, are available to members without charge. Membership fee is $10.00 a year. Seminars are held in the lower galleries on Tuesdays at 10:15 a.m., repeated at 1:45 p.m. and 8:15 p.m. Scheduled are the following: February 8 — Antonio Gaudi (Architect 1852-1926), "Integrity and the Modern Era." February 15 — Victor Horta (Architect 1861-1947), "Vitality and Art Nouveau." March 8 — Dankmar Adler (1844-1900), Louis Sullivan (1856-1924), "Imagination and Industrial Society." March 15 — Frank Lloyd Wright (Architect 1867-1959), "Idealism and Industrial Society."

1966 Wisconsin Chapter AIA Honor Awards Program — all entries shall be buildings designed by registered architects who are members of the Wisconsin Chapter, AIA. Buildings may have been erected anywhere in the United States or abroad and shall have been completed by January 1, 1966. A maximum of five projects from any one given firm will be eligible for entry. CLOSING DATE: February 16, 1966. All entries must be received by the Wisconsin Chapter, AIA, 3902 N. Mayfair Rd., Milwaukee, Wis., NOT LATER than FEBRUARY 16, 1966.

WAIA

Education Committee Report

Everyone reading the following exciting and significant report by the Wisconsin Chapter, AIA Education Committee, is strongly urged to discuss it and its implications with students of immediate acquaintance since it is doubtful that the students, who are most immediately concerned, are informed about the recent and rapid developments of such important consequence to themselves as well as the entire community of Wisconsin.

EDITOR

On December 10, 1965, the Board of Regents of the University of Wisconsin adopted the following resolution:

"That authority be granted to proceed with the establishment of the professional architectural option in the Environmental Design Program, and to present recommendations for implementing the architectural program in the 1967-69 legislative budget."

EDUCATION COMMITTEE REPORT

On December 3 the Wisconsin Chapter AIA Education Committee met with R. L. Clodius, Vice-President of the University of Wisconsin, to discuss and recommend to the University the best way of accommodating architectural education needs in the State of Wisconsin. All members of the Committee were present.

Significant actions taken in recent years toward that goal were reviewed. These included the two volume AIA Education Committee Report of 1960; the October 1, 1963, Wisconsin Architects Foundation request and offer of assistance toward establishing an architectural program at the University of Wisconsin; the 1964 University of Wisconsin proposal to establish an Environmental Design Center with an accompanying Master of Science Architectural Design degree option; a descriptive brochure of the M. S. degree program in Environmental Design now being offered by the University of Wisconsin; a recent working copy of a suggested Study Program leading to a four-year Bachelor of Arts degree in Liberal Arts designed to fulfill entrance prerequisites into the Architectural Design option of the Masters degree program; an April 20, 1964, joint resolution of the Wisconsin Chapter AIA and the Wisconsin Architects Foundation endorsing the new approach to architectural education being initiated by the University of Wisconsin; recent legislation entitling Wisconsin residents of up to $500 per year non-resident tuition aid if enrolled in architectural programs in other states; recent action by the University of Wisconsin Board of Visitors requesting establishment of a School of Architecture, and; a current document advocating a five-year undergraduate professional degree program in architecture at the University of Wisconsin.

Three hours of Committee discussion resulted in the following consensus:

1. The Committee commended all efforts to date to establish an educational program leading to preparation and licensing for the practice of architecture.
2. The Committee strongly endorsed the 4 + 2 educational concept under development by the University of Wisconsin. (Four years of undergraduate preparation leading to a Bachelor degree in Liberal Arts plus two years graduate work leading to an M. S. degree in the Architecture Design option of the Environmental Design program.)
3. The Committee concurred unanimously that the concept of the 4 + 2 program at the University of Wisconsin is an approach better suited to present and future architectural education needs than the traditional five year professional degree curriculum.
4. Recognition of the 4 + 2 program to meet Wisconsin licensing examination requirements is considered to be not insurmountable. Joint effort, on the part of the profession and educators directly involved in the program, can result in the needed recognition — first for state licensing and then NCARB recognition.
5. The AIA Education Committee offer of continuing services to work with the University architectural faculty toward developing curriculum content to meet the above objectives and maintain mutually beneficial relationships was accepted by the University.
6. The Committee expressed its desire for a major presentation of the new degree program to Wisconsin Architects. Such presentation could be an integral part of an annual WAIA convention or at a special meeting of architects in the State.

In summary, the December 3 Education Committee actions recommend a seemingly radical but desirable departure from traditional architectural education. The recommended educational sequence provides a broad base of undergraduate coursework in the physical and behavioral sciences as well as the arts and

humanities. Graduate studies involving design principles and techniques are compatible with recognized academic objectives. The combination of the two degrees is to contain all of the technical coursework found in typical architecture programs, yet gives the individual the opportunity to pursue further work toward a Ph.D. if desired.

The Committee members expressed their conviction that the architects of the State of Wisconsin would join in the efforts with the University of Wisconsin to establish and maintain a position of leadership in education and practice.

Respectfully submitted,

Byron C. Bloomfield, AIA, Chairman
Joseph G. Durrant, AIA *Maynard W. Meyer, AIA*
Joseph H. Flad, AIA *Clinton Mochon, AIA*
James E. Galbraith, AIA *Allen J. Strang, AIA*
Paul H. Graven, AIA *Donald H. Sites, AIA*

Students of Architecture!

Legislative bill No. 158, effective as of July 1, 1966, entitles Wisconsin residents of up to $500 per year non-resident tuition aid, if enrolled in architectural programs in other states. Anyone interested in further details, contact AFTER MARCH 15, 1966: Coordinating Committee for Higher Education, 2 East Gilman Street, Madison, Wisconsin.

STATE OF WISCONSIN
Assembly Bill 158 Effective September 18, 1965
CHAPTER 257, LAWS OF 1965

AN ACT

AN ACT to amend 36.165 (2); and to create 20.776 (1) and 36.165 (4) of the statutes, relating to providing financial assistance to students studying programs not provided at public institutions of higher education in Wisconsin, and making an appropriation.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. 20.776 (1) of the statutes is created to read:

20.776 (1) NONRESIDENT TUITION PAYMENTS. There is appropriated from the general fund to the state scholarship committee, on July 1, 1966, and annually thereafter, $170,000 as a nonlapsing appropriation to reimburse state residents for tuition paid as approved in s. 36.165 (4). The administrative detail of disbursing such funds shall be handled by existing personnel of the University of Wisconsin specifically designated to draw on this account by the scholarship committee.

SECTION 2. 36.165 (2) of the statutes is amended to read:

36.165 (2) The scholarship committee shall select a chairman and secretary. The secretary shall keep a record of the proceedings and determinations of the committee. The committee shall establish rules and standards governing a scholarship program which it shall administer. Such rules and standards shall be consistent with law. Eligibility for scholarships shall be based on scholarship ranking. The committee shall encourage the creation of local scholarship committees in the counties and municipalities of the state and the raising of private funds for scholarships and for use by the state and local scholarship committees in carrying out their functions. Out of funds appropriated to or otherwise received by them for such purposes the state scholarship committee may establish and grant scholarships to persons eligible for scholarships, subject to such rules and standards and the requirements of *sub. (4) and ss.* 36.161 and 37.11 (12) and (13).

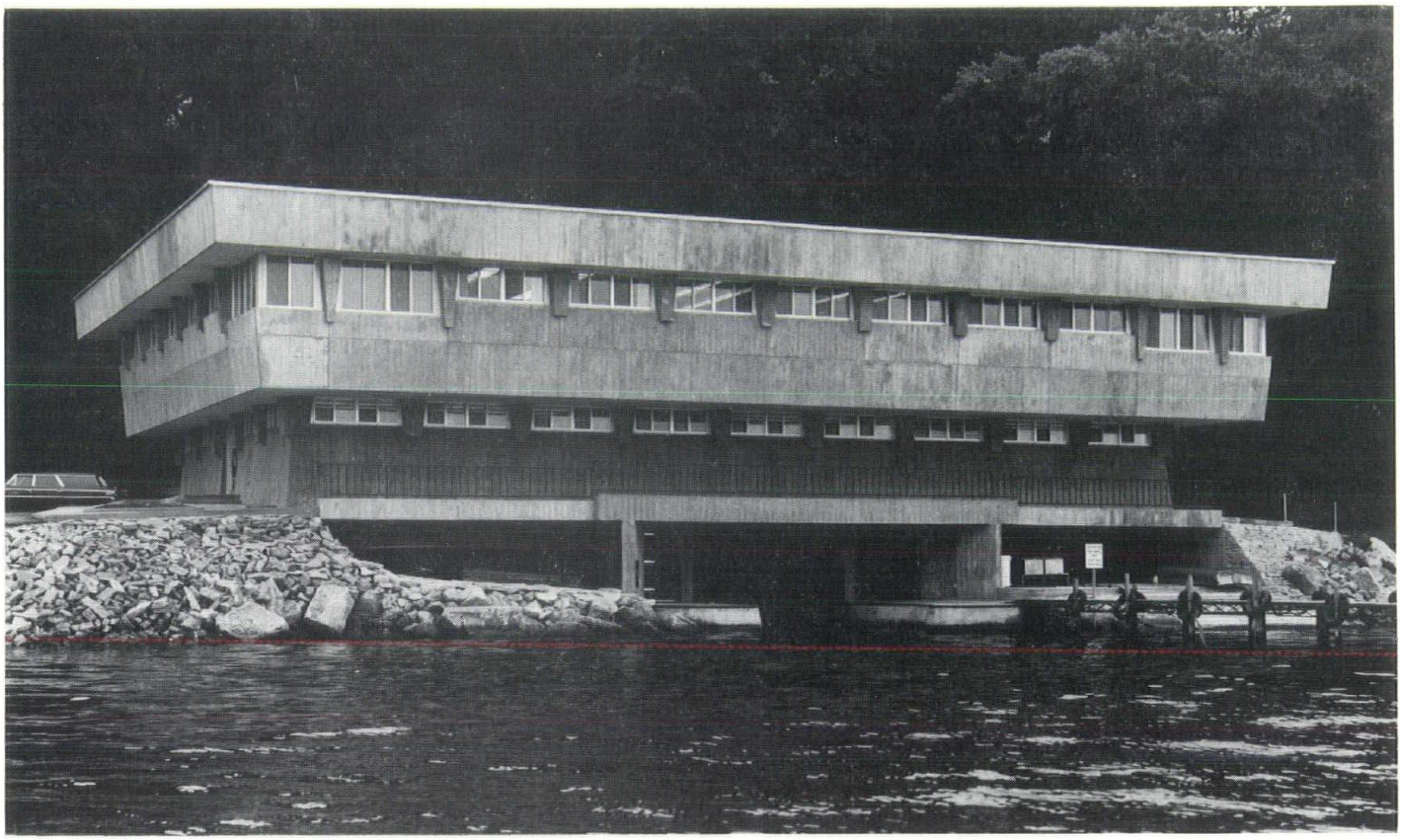
SECTION 3. 36.165 (4) of the statutes is created to read:

36.165 (4) Any person entitled to exemption from nonresident tuition as enumerated in s. 36.16 (1) (a) who has completed at least one year of collegiate work and who is attending or has been admitted to a public institution of higher education in another state or an institution of higher education in this state to engage in a first professional degree course of study in veterinary medicine, *architecture,* forestry or dentistry which is not offered in a Wisconsin public institution of higher education may apply to the scholarship committee for the difference between the tuition he is required to pay and the resident fees he would have paid as a resident student at the University of Wisconsin. If the committee determines that the applicant is eligible under this subsection and that his academic record indicates that he is capable of benefiting from the instruction, the committee may grant the application. Payments shall be made to applicants on the certification of the chairman and secretary of the scholarship committee. No payment for any one individual shall exceed $500 per academic year consisting of 2 academic semesters or 3 academic quarters.

close-up:

University of Wisconsin Laboratory of Limnology

Kaeser & McLead Architect-Engineer Associates of Madison



Since the activities throughout the laboratory required a considerable use of water it was logical to carry concrete up into the superstructure and for the finished exterior.

In detail, the use of concrete above the basement is as follows:

1. *The structural frame is reinforced concrete.*
2. *The floors are precast plank with concrete topping.*
3. *The roof deck is precast plank.*
4. *The first floor walls were poured in place, battered, and textured by the use of rough lumber forms.*
5. *The second floor walls and the roof fascia are precast panels, textured the same as the first floor walls.*

No coloring or other surface treatment was used for the exterior except the use of rough sawn form lumber. The concrete was all one brand, selected for its light color. It is expected that the surface will weather to a light pearl gray.

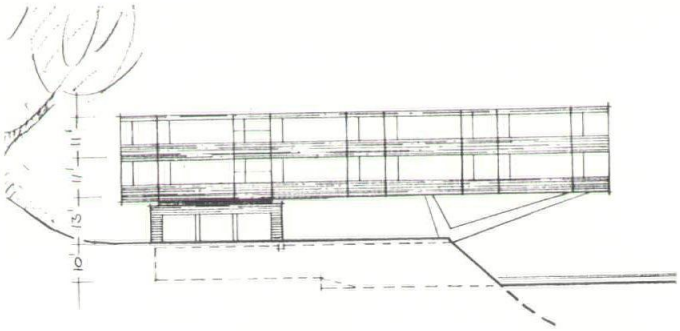
General Facilities

The new Laboratory of Limnology provides offices, laboratories, conference rooms, a library and supporting facilities for a staff of 35 people, as well as adequate fish-holding and storage facilities. The basement level encloses a boat slip opening to Mendota between concrete entrance piers. A large shop, rooms for gear and boat storage, fish holding tanks, small rooms for recording instruments, motors, and batteries, and a shower room with locker facilities complete the lower floor.

The first floor includes laboratories for graduate students and visiting personnel, for paleolimnology, the study of specialized waters, northern lakes studies, and hydrobotany and microbiology. A dark room, culture room, isotype room, instrument room and chemical laboratory are also included. The second floor consists of laboratories for the study of the behavior of fishes, physiology of fishes, zooplankton and benthos, physical limnology, and fishery biology. Offices of the director, secretaries, a library, large aquarium room, graduate laboratories, and offices for investigators are welded into a working unit. The laboratory was designed, not only for the needs of the students and faculty, but also to meet those of the visiting investigator, who often adds much to our program by drawing upon his varied background.

The architectural process is a fascinating type of evolution. It starts with a program of needed facilities, becomes a concept taken through design stage and finally through actual construction. Many times the architect must make concessions in all stages of development in order to bring a building to its completion.

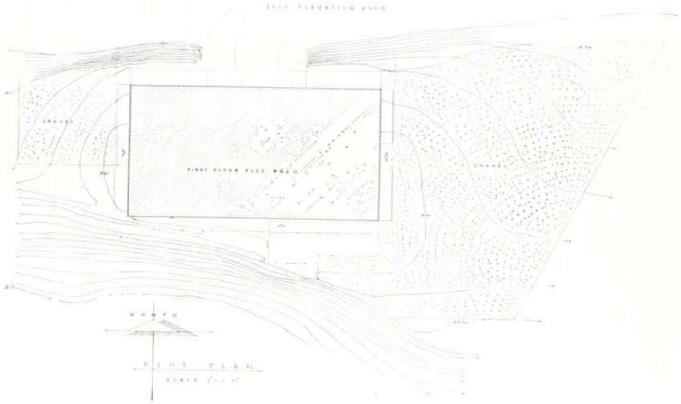
Architecture is the coming together then of many things. Laborious design and often redesign of which the physical form and space division is only a portion — because architecture is also economics and finance; and very often the market effects on the contract bidding result in modifications. And so the form of the building evolves and is influenced by what are not always strictly architectural considerations.



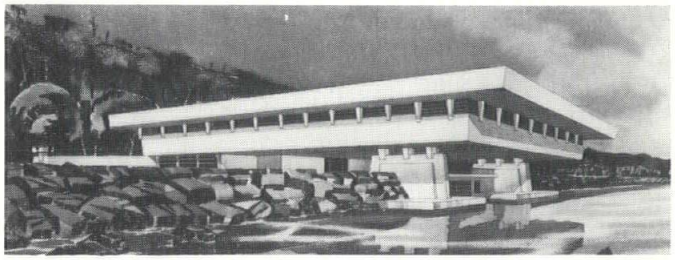
The building that houses the Laboratory of Limnology (fresh water studies) at the University of Wisconsin started with a concept developed by the wife of a visiting professor from Germany. Trained as an architect, she made some sketches of the building that Professor Arthur D. Hasler, Director of the Laboratory of Limnology, and his colleagues had been planning for some time. The site for this building is at the edge of Lake Mendota and at the foot of a wooded hill. The general level of the site was roughly one story above the lake. The site was narrow and there were ground water streams from the hill directly adjacent.

Besides these site restrictions, the building was to straddle what was formerly a public road running along the lake.

Architect William V. Kaeser, of Kaeser & McLeod Architect-Engineer Associates of Madison, was handed this site along with the preconception of the building provided by the wife of the visiting Limnology professor.



Both the preconcept and the narrow site had to be discarded in the early stages. The "V" supports at the edge of the lake presented difficulties from a structural standpoint and were too expensive for the limited budget. The provision of a concourse at ground level between the basement and the second floor also cut considerably into the budget.



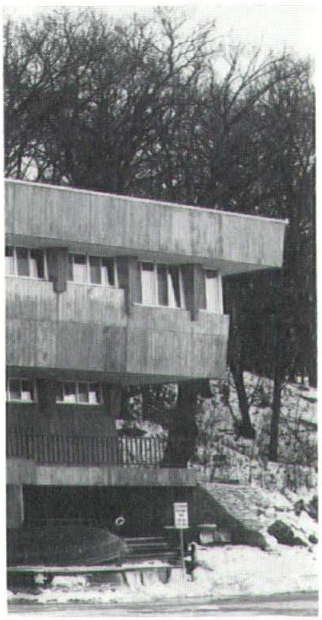
So rather than perch one portion of the building over the lake and imbed the other end into the hill on the narrow site assigned him by the university planners, as the original concept indicated, William Kaeser asked that the site be parallel to the lake rather than perpendicular to it. And within this framework he proceeded with his own concept. The design went through preliminary and construction drawing stages and was let for bids.

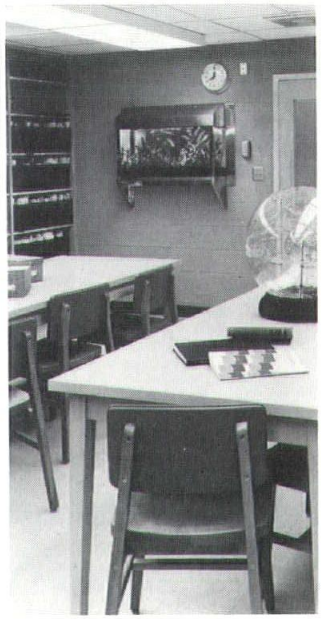
Many misfortunes can befall a building during its design and construction, but the capricious nature of the building market is often the most hazardous. Site conditions and designs can also cause builders various concerns, consequently the bids come in higher than ordinarily. This is especially true during active construction periods. The limnology building came up against this kind of situation. Thus the construction costs for this cast-in-place concrete building came substantially over the budget, and additional funds were not available.

So the architect had to redesign the building to suit the mood of the market. The pressure of deadlines for occupancy was another factor burdening the architect. The building as it stands today retains much of its cast-in-place form and appearance, but

many of the concrete materials, with the exception of the foundation and the first floor, are made of pre-cast concrete. However, the texture of the pre-cast reflects that of the exposed cast-in-place concrete of the first floor giving the building a strong and rugged, almost fortress-like appearance.

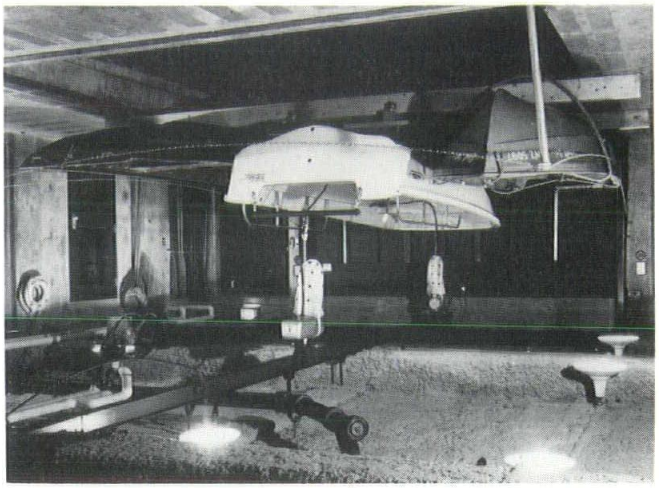
The small windows ringing the building at the upper portion of the walls on each floor contribute to this appearance. This fortress-like quality is also seen in the cast-in-place concrete pedestal. The inward splayed base exaggerates the cantilever structure above. Sitting on heavy columns at the edge of the lake, it becomes an integral part of it; for the basement accommodates a pool of water, used as a boat slip. On misty days especially, the building takes on amphibious qualities and gives the appearance of the superstructure of a battleship ready to float out to sea. Architect Kaeser made the most of both the lake and forest setting and gave his building the form, massing and proportions suitable to the site.





The limnology building today is occupied by satisfied clients, Professor Hasler, the Director of the Limnology Laboratory, is more than pleased with its appearance and function, for it suits the needs of his colleagues and students engaged in research. Because of its modular design the building is made quite flexible. The use of demountable partitions contributes to the required flexibility of the facility.

The intended austerity of the interior is demonstrated by concrete block construction of the permanent walls and corridors. Exposed pipes and conduits running along the ceiling lend further to the simple treatment, flexibility and easy maintenance. The floors are generally covered with resilient tile or left in concrete. The influence of economy is also reflected by simple iron railings protecting the stairways.

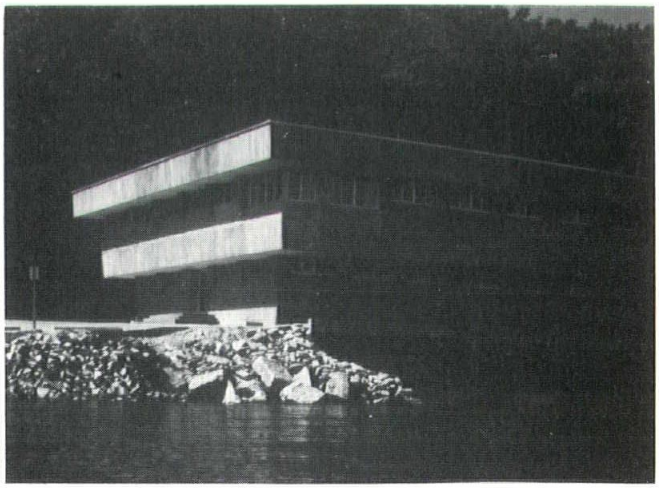


The building provides a pleasant place to work and excellently serves the needs of the Lake Studies Laboratory.

Coupled with Spartan exterior qualities, this unpretentious building presents an excellent example of the influences of economics on the architectural design.

Finally, the true test of good architecture is that the building stands on its own and can be appreciated without any critic's description of it and without the knowledge of its evolution. The architect has produced an original work and given the structure a life of its own. Appearing to be moored there it peers out onto the lake, watching over it and awaiting the arrival of the men it sends out to study the mysteries of the lake. It is indeed one with its natural setting — a creature of the lake, but of the land.

Dr. J. F. Mangiamele



AIA Convention Speaker

C. Herbert Wheeler, AIA

C. Herbert Wheeler, AIA, Architect and Associate Professor of Architectural Engineering at the Pennsylvania State University, will speak at the State Convention of the Wisconsin Chapter, AIA, in Delavan on "Emerging Techniques in Architectural Practice."

Before joining the Penn State Faculty, Mr. Wheeler was in charge of building systems and products development at the Curtiss-Wright Corporation of Caldwell, New Jersey. He served additionally as manager of environmental and medical systems and as chief shelter systems engineer.

Mr. Wheeler's work at Curtiss-Wright included the design of a germfree surgical isolation system, the design of army surgical hospitals and the development of medical and environmental systems and planning for radiological decontamination in post-attack periods.

At Curtiss-Wright and in prior industrial architectural work, Mr. Wheeler has been in charge of designing buildings for nuclear reactors, electric power generations, radio transmitting stations, airport terminals, radar equipment assembly and related facilities.

He is a registered architect in Pennsylvania, New York, New Jersey and Michigan. He is registered for licensing in any state through certification by the National Council of Architectural Registration Boards (NCARB).

Mr. Wheeler has lectured at Harvard University and Michigan State University. For several years he taught the course of contemporary housing trends in the Pennsylvania State College adult education program.

He served as a consultant to the Surgeon General, U. S. Army, the National Academy of Sciences, National Research Council Harbor Project, and the Office of Civil Defense. He is now consultant to the Housing Studies Committee of Michigan State University.

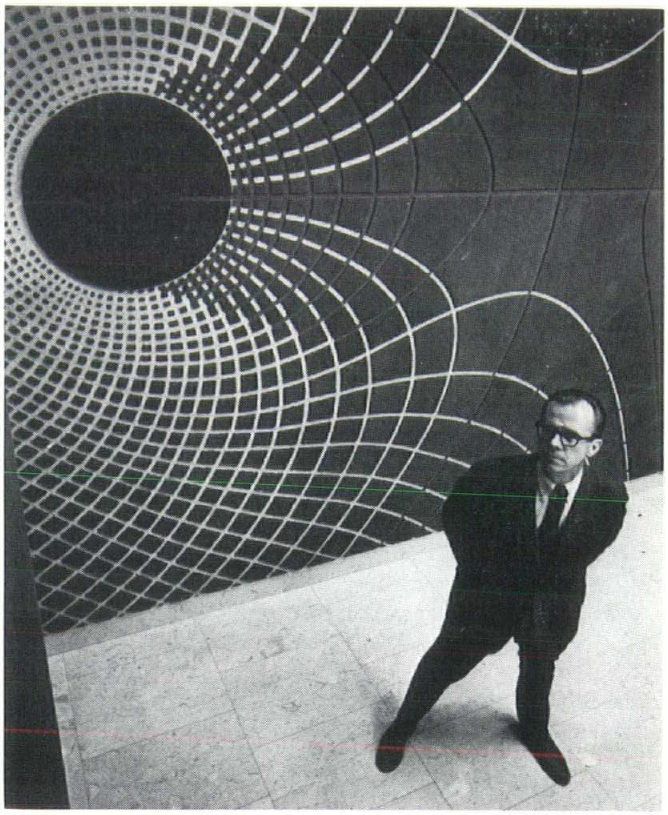
A native of Merchantville, New Jersey, Mr. Wheeler received his bachelor of architecture degree from the University of Pennsylvania. He won the Alpha Rho Chi medal for all-around ability, the Arthur Spayd Brooke gold medal for the highest record in the five-year course in design, was president of the Hexagon Senior Honor Society, and a member of Tau Sigma Delta, honorary architectural society.

Mr. Wheeler holds the master of science in architecture degree from Massachusetts Institute of Technology. During his studies at MIT, he won the Boston Society of Architects Medal, the F. W. Chandler prize for excellence in design, and his master's thesis was selected for the highest award in the class.

Mr. Wheeler is Director and co-author of *"Emerging Techniques in Architectural Practice,"* prepared under a Research Grant from the American Institute of Architects.

In November of 1965, Mr. Wheeler went on an extensive tour, reporting on the findings of the above mentioned study.

franklin boggs



Franklin Boggs in front of concrete cast mural, Cutler-Hammer Office Building, Milwaukee, Wisconsin. Sand-blasted obsidian sand with recessed lines of white and brilliant blue 3-M granules. Eschweiler, Eschweiler, and Sielaff.

Studio of artist showing some of his experiments in cast concrete.

Beloit College artist-in-residence Franklin Boggs has turned his creative talents toward the exploration of concrete as an artistic media. His paintings and large murals have long been well known for their strong architectural qualities. They now enhance buildings in seven states and one in a foreign country — Finland.

While on a Fulbright grant in Scandinavia, Boggs saw a concrete wall on which designs had been sand-blasted immediately after the forms had been removed. The fact that the mural and the wall thus became one, greatly appealed to Boggs. Upon returning to Beloit, he soon found it necessary to build a new studio where he could continue to explore the aesthetic possibilities of combining sand, gravel, and cement into pre-cast concrete panels. Job site casting has many possibilities, but pre-casting gives the artist more flexibility and greater control over working conditions, according to Franklin Boggs.

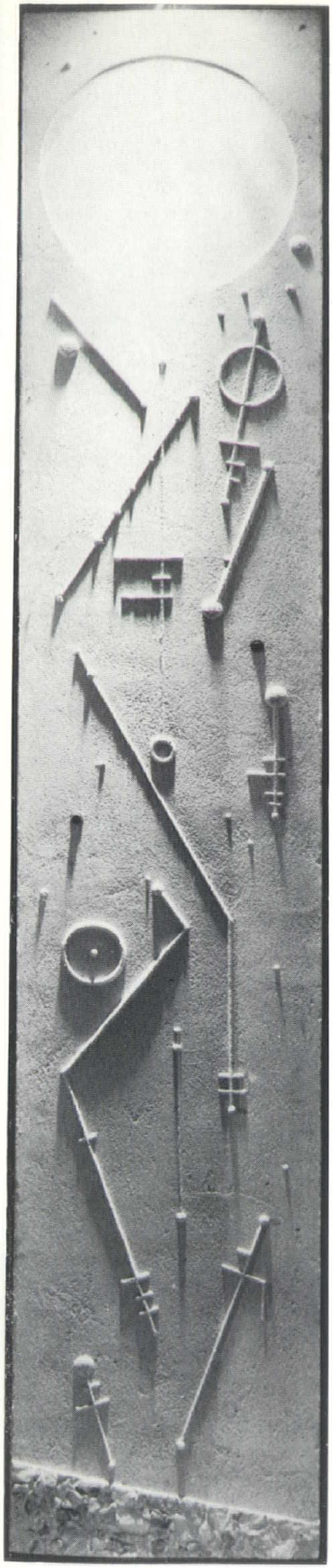
Various colored aggregates, some domestic and others foreign, synthetic sands and epoxies are some of the ingredients the artist uses in his work. The wet cement mixture may be poured into any one of a variety of molds. These molds are made of various materials including sand, plywood, styrofoam, plaster, and cement. Retardants composed of synthetic sugars are often used to paint the molds thereby making it possible to expose the natural beauty of the aggregates in the mix otherwise discolored by sand-blasting. "Sand-blasting can be very effective in obtaining a sgrafitto line by using a two layer mix with obsidian sand and white quartz," says Franklin Boggs.

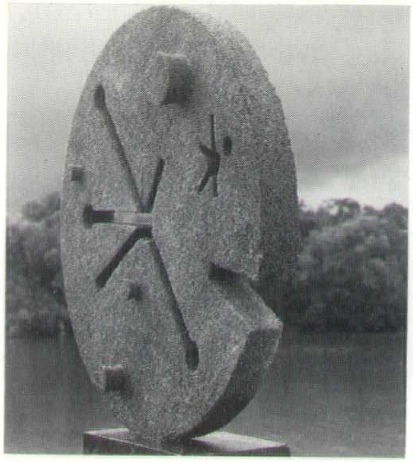
Because of the great weight of concrete, he limits his surface experiments to one square foot samples. He then applies the knowledge thusly acquired to designs which are cast in larger panels weighing as much as 1000 pounds. These panels give a better idea as to what their actual appearance will be within the concept of a building. The finished panels are cast in a concrete manufacturing plant where heavy equipment is available to lift them as they may weigh as much as four to five tons apiece. It is possible with present production methods to bring to the job site very large wall panels with finished surface designs on both the inside and the outside of the wall and steel reinforcements and insolation sandwiched in between.

In the past several years Boggs' research and preoccupation to express himself in concrete as an artistic media has made him a pioneer in the development of new architectural surfaces. Both architects and people involved in the field of concrete alike are greatly interested in his work. Seven buildings in three states now bear his designed panels. AIA groups in Chicago and Detroit have heard Franklin Boggs lecture, and the Northern Illinois Chapter of the AIA held a meeting at his studio in Beloit to permit members to view some of his work and experiments first hand.

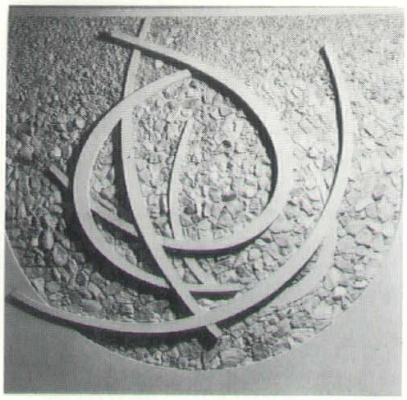
In his work Boggs pays tribute to man's scientific achievements and at the same time expresses his own respect for the natural organic aspects of man's environment by allowing rough natural sands and gravels to play against severe mathematical curves and hard edged symbols. These characteristics are to be found in his murals on the University of Wisconsin's new mathematics building by John J. Flad & Associates. The new office building of Cutler-Hammer by Eschweiler, Eschweiler, and Sielaff, is a magnetic field design with a relief background of sand-blasted obsidian sand. On the University of Wisconsin in Milwaukee classroom building by Von Grossmann, Burroughs, and Van Lanen, an inch deep line pattern of washed gravel in a field of amberlite sand and chunks of quartz depicts the energy of forms in outer space.

Artist Boggs feels that he has only begun in his search to discover the various possibilities of concrete, permitting him to make it the vehicle for his artistic expression.

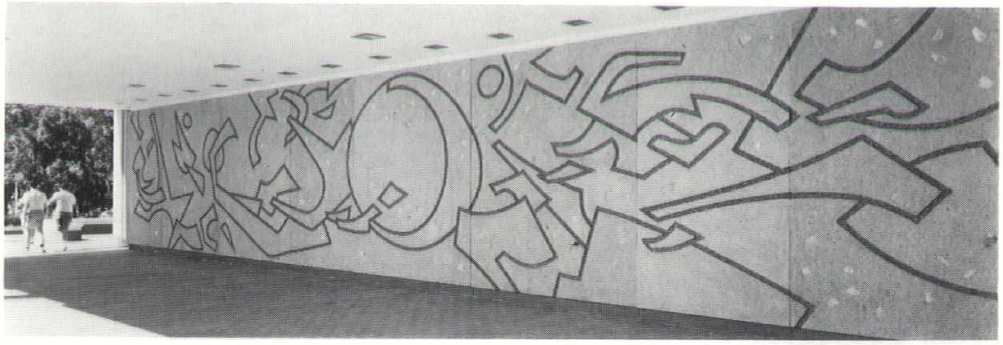




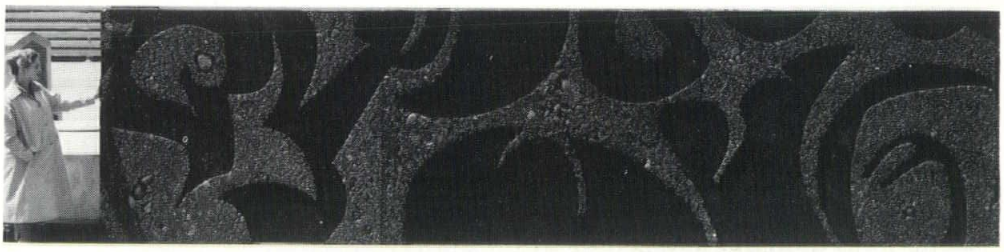
Sun Disc — sand-blasted obsidian sand.



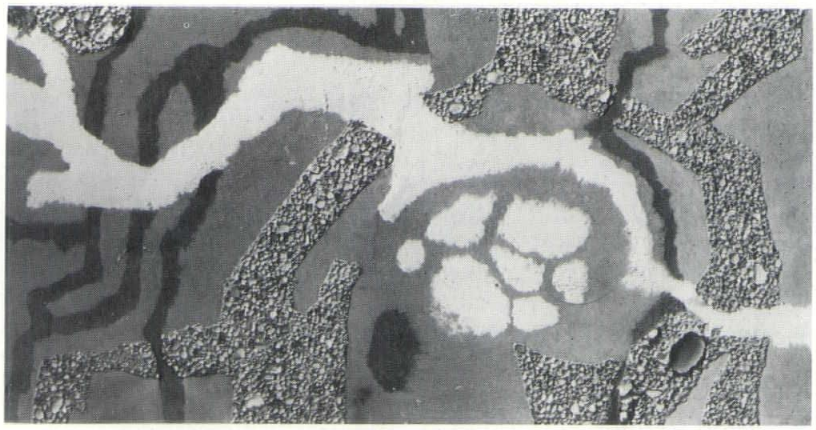
Lobby wall for University of Wisconsin Mathematics Building, Madison, Wisconsin, John Flad & Associates. Free forms of white quartz sand and white cement with large metronite stone background.



University of Wisconsin classroom building, Milwaukee, Wisconsin, by Von Grossmann, Burroughs, and Van Lanen. 230 running feet of panels of amberlite and mason sand with amberlite quartz; recessed line of washed gravel.



Free form mural for Janesville vocational school by Frelich, Angus and Associates. Black concrete with exposed local gravel.

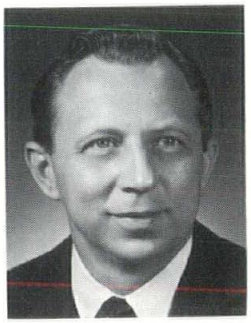


Sample panel of brown and white free poured cement with exposed natural gravel in gray portland cement matrix later executed for Winnebago State Hospital.

Above: Nine foot panel of white sand quartz cast from plaster mold. At the home of Mr. and Mrs. Phil Sprague, Michigan City, Indiana.

University of Wisconsin

CENTER SYSTEM



A. E. MANCL
Architect and planner, University Center System

Arthur E. Mancl, who joined the University of Wisconsin in 1964 as the Center System architect and planner, has a diverse background in the architectural field.

Mr. Mancl received his Bachelor of Architecture at the University of Michigan in 1949; in 1960 he was awarded the M.S. degree in urban planning from the University of Oregon.

Mr. Mancl taught architecture at the University of Arkansas from 1952-54, at Montana State College from 1954-57, and at the University of Oregon from 1957-59.

He has also been employed with various private firms, working on building design, community planning projects, campus planning, structural design, and community facilities studies.

He is a member of the American Institute of Architects, the American Society of Planning Officials, and the American Concrete Institute. Also active in outside affairs, Mancl is a committee chairman alternate for the Unitarian Society and a committee member for Boy Scout Troop 120.

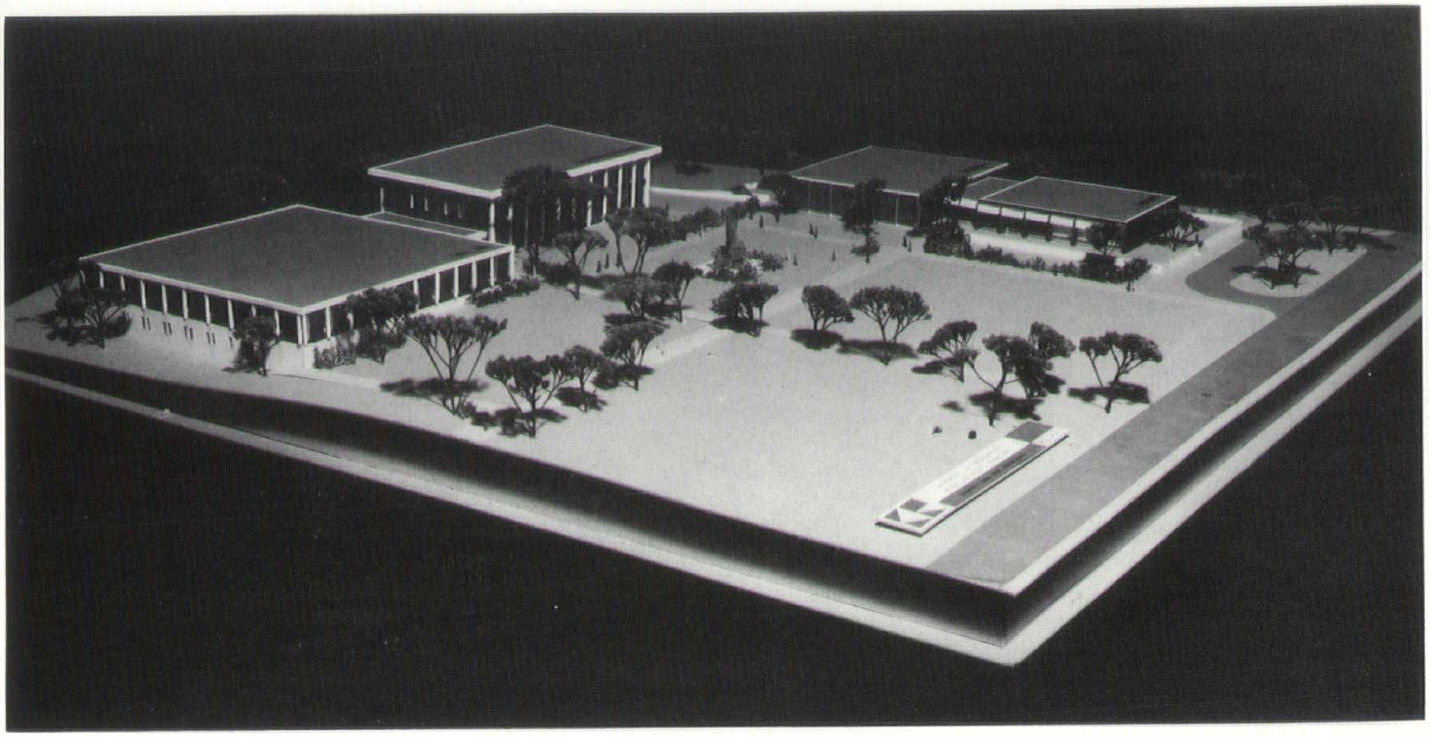
A native of Chicago, Illinois, Mancl lives with his wife, Helen, and their three children at 5209 South Hill Dr.

The Architect-Planner of the University of Wisconsin Center System is the coordinator of facility planning and construction at nine existing Centers and four entirely new ones in planning and under construction. Possibly the most important function is keeping a perspective among the numerous participating people and identifying responsibility for decisions. Throughout each project is a constant need for explanation of the project, dissemination of information and phasing-in of the contributions of participants. While Center projects have similarities, they have many differences, beginning with sponsors. Centers are financed jointly by local communities and the State of Wisconsin through the University. The local community, which may be a county, a city or a joint city-county, finances construction and part of maintenance while the University provides equipment, instructors and the remainder of the maintenance. A new factor of Federal Grants has recently been added to financing, with participation in the construction and equipping of Centers.

A project begins when the administration of a new Center has been assigned to the University of Wisconsin. The Chancellor and Architect-Planner of the Center System survey the needs of the local community and chart a course of action. The Architect-Planner assists the local community with architect interview procedures, choosing a site, budgeting and programming the construction. He interprets academic needs to the project architect and assists in master planning the site beyond the limits of present construction. Preliminary plan development is closely followed to ascertain if it answers to the needs of the University. With assistance of the academic departments, equipment layouts are furnished to the architect. If Federal Grants are requested, application is made in the name of the Regents of the University by the Architect-Planner and then the local community and project architect are assisted in complying with grant requirements. Last, but not least, the Architect-Planner squires the project through approvals of site, program, equipment and plans from academic departments, faculty planning committees, the University Administration and the Regents of the University of Wisconsin.

University of Wisconsin — Rock County Center

KNODLE-ROSE AND ASSOCIATES, ARCHITECTS OF BELOIT



UNIVERSITY OF WISCONSIN —
ROCK COUNTY CENTER

Estimated Enrollment — 500-550

A. Library Unit
   a. Library Office
   b. Conference Rooms
B. Eight Classrooms
C. Science Lecture Room
D. Science Laboratories
   a. Chemistry Lab
   b. Physics Lab
   c. Two Biology Labs
E. Geography Unit
F. Language Lab
H. Faculty Offices
I. Auxiliary Storage and Work Areas

Administration — Student Center Building

A. Administrative Areas
   a. Director's Office
   b. Field Office
   c. General Office
   d. Conference Room
B. Counseling Unit
C. Adult Education Room
D. Dining — Multipurpose — Music Unit
   a. Multipurpose Room
   b. Stage
   c. Music Practice-Dressing Rooms
   d. Serving Kitchen
E. Student Activities Unit
   a. Student Lounge
   b. Recreation and Work Areas
F. Auxiliary Storage and Work Areas

Primary emphasis was placed on the need for developing a campus setting rather than attempting to house all of the functions of an extension center in a single building. The initial buildings have been located to create a mall along the front of the administration building and terminating at the classroom building. A minor axis perpendicular to the mall will direct future building sites in this direction.

The site is 30 acres of rolling prairie dropping off toward the Rock River at the northwest corner of the site. The buildings are situated to take advantage of this change of grade. Entry from the mall is at this first floor level while entry from the opposite side is at a lower level. A lower terrace wraps around both buildings forming a link between the library and the student center. Considerable savings resulted from the utilization of this "basement" level opening onto the terrace.

In order to emphasize the "campus" effect, both buildings were designed as two units separated by generous lobby areas. The "Instructional Areas Building" is a two story classroom unit with the library below on the terrace level. The science wing consists of a large stepped lecture room at the center with the science laboratories wrapped around this core on two levels.

The "Administration-Student Center Building" is divided into the administrative unit and the student activities areas. Administrative offices are separated from the relatively noisy multi-use areas by a large lobby-exhibition area. Visual and sound isolation for the student lounge and recreation area is achieved by locating the student center below the dining-music areas with the lounges opening onto the lower terrace.

THE PROUD FACT: *No qualified Wisconsin resident is denied a place in a public institution of higher learning.*

The surge of post-war babies into higher education in recent years has caught many states without adequate public colleges and universities. Crash building programs and large expenditures of public funds have been the rule rather than the exception in order to meet the demands of our youth for post-high school education.

Not so in Wisconsin. Through a unique cooperation program among the University of Wisconsin, the State Universities, and local communities begun over three decades ago, every qualified Wisconsin resident who desires a college education will be accepted into a public institution.

The University of Wisconsin Center System began in 1933 with freshmen-sophomore Centers in a dozen cities around the state. Following World War II, the number of Centers reached thirty-four in response to local demands. As the "G.I. bulge" subsided, the system contracted.

Historically, the Centers have been closely allied with the vocational and adult schools. Seven of the present Centers once shared their facilities until separate quarters were built by the community.

Such branch campuses, with facilities provided by the local community, present a unique method of expansion within the Wisconsin systems of higher education. While the major University campuses in Madison and Milwaukee, and the nine State Universities, were growing by leaps and bounds, the University pioneered in creating new campuses around the state to accommodate increasing enrollments, rather than expanding its major institutions indefinitely. The pattern has proven so successful that it is providing the guidelines for future growth of the Wisconsin institutions of higher education.

The "grass-roots" support for the University Centers has been in evidence throughout their history. The original "clusters of classes" were begun and expanded at the request of the communities. Beginning in 1960, the eight communities which at that time hosted University Centers began the construction of separate and modern campuses for their Centers. New physical plants, owned and maintained by the community, have opened in Green Bay, Kenosha, Manitowoc, Marinette, Menasha, Racine, Sheboygan and Wausau. These communities have invested over $11 million of local funds to build a home for their Centers, and four of them — at Menasha, Manitowoc, Kenosha, and Wausau — have added to the original buildings as enrollments warranted.

The "big leap forward" came, however, with the opening of the Marshfield (Wood County) Center in 1964. This was the first Center to be built where there were no existing University classes — but where there was a need for higher education facilities and a willingness on the part of the community to provide the physical plant. Now in its second year of operation, the Marshfield Center has an enrollment of 311 students — a 133 percent increase over the first year. This indicates both the popularity and need for such branch campuses.

Two additional University Centers will be opened in September, 1966, in communities new to the University. The Waukesha County (Waukesha) Center expects about 380 freshmen; the Rock County (Janesville) Center predicts 225 freshmen will enroll. Sites have been approved for Centers in West Bend and Baraboo by September, 1968.

In each new Center community, the evolution from idea to reality follows a similar pattern. The location of a Center in the community is approved by the state Coordinating Committee for Higher Education and the University of Wisconsin Board of Regents. The decision is based on high-school student population, the proximity of existing higher education institutions, and the willingness of the community to provide the necessary physical plant.

Once approval is given, plans for site selection and construction of the Center are put into motion by the community. The University, through the office of the Center System architect, programs the needs of the University for site and physical plant. The com-

munity contracts with an architect, supervises the construction, and foots the bills. Under the Federal Facilities Act of 1963, substantial federal funds are available to communities for such construction, and the Marinette County (Marinette), Rock County (Janesville), and Waukesha County (Waukesha) Centers have received federal support for their construction program.

Once the Center is constructed, the University provides the equipment and staff. The community must maintain the physical plant.

The University Centers are unique because while they are locally owned and maintained, they are branch campuses of the University of Wisconsin. The Centers are not independent community colleges. Each new building, each faculty member, and each student must, and does, meet or surpass rigid University of Wisconsin standards. The same freshmen-sophomore curriculum is offered at each branch campus as is offered at the Madison and Milwaukee campuses.

Credits earned at a University Center are University credits, and may be transferred to any institution of higher education in the country. Admission standards are uniform for all campuses. The University Centers are designed to provide an education of the same caliber and scope as a student may pursue at the major campuses — but within commuting distance of his home.

A special incentive to students at the University Centers was approved in 1965 by the State Legislature when fees were reduced to $210 a year, less than the fees at the Madison and Milwaukee campuses. This "bonus" is expected more than ever to encourage students to begin their University education away from the major campuses.

The increasing popularity of such branch campuses is not to be denied. Enrollments at the University Centers have risen over 200 percent in the last ten years, and 39 percent in the last calendar year alone. This rate of expansion far surpasses any other system of higher education in Wisconsin. The new physical plants have also proven enticing to students. The Marinette County Center experienced a 160 percent enrollment increase when it moved to its new campus last fall; and the Racine Center enrollment rose 47 percent when the new campus was completed.

Aware of the success of, and the need for, such low-cost educational facilities throughout Wisconsin, the state Coordinating Committee and the Legislature have extended the "branch campus" concept beyond the University of Wisconsin Centers for the future. The State Universities will be establishing similar two-year campuses at Wisconsin Rapids, Rice Lake, and Richland Center in the next few years, also in locally owned buildings.

The development which foretells the greatest interest, however, is the approval by the State Legislature of four-year branch campuses for northeast and southeast Wisconsin. These will be administered by the University of Wisconsin Center System, which has had such succes with the existing two-year Centers.

These two new institutions will grow out of the existing University Centers in each area — Green Bay (Brown County), Fox Valley (Menasha), Marinette County (Marinette), and Manitowoc County (Manitowoc) in northeast Wisconsin; and Racine (Racine County) and Kenosha (Kenosha County) in southeast Wisconsin.

The new four-year institutions will differ slightly from the community-university-state cooperative approach used in building the two-year campuses, however. While the new four-year institutions were authorized as the result of local needs and desires, the site will be purchased and the physical plant built by the University with state funds. The high cost of specialized research and classroom facilities is beyond the means of most local communities. The existing two-year campuses in each area, owned by the community, will continue to be an integral part of the new four-year institutions.

The combined efforts and willingness of both local communities and the state to provide a college education for all of our youth at the lowest possible cost to the student has produced the branch campus system — and the proud fact that no qualified Wisconsin resident is denied a place in a public institution of higher learning.

waf Wisconsin Architects Foundation

End-of-Year Contributions

The Foundation's funds depend on substantial contributions received at the end of the year from organizations associated with the Architectural Profession in Wisconsin to further its program of Tuition Grants and the effort to promote the establishment of an Undergraduate School of Architecture. Each year the Foundation adds to its list of annual contributors.

A most gratifying letter was received from Rollin B. Child, Inc., indicating that their Christmas card would read: "In lieu of other Christmas remembrances, we will make a contribution to Wisconsin Architects Foundation to be used for tuition or scholarship grants, and continue our support of the Rollin B. Child, Inc., Education Foundation at the University of Minnesota School of Architecture," with the promise of a contribution of $250 or more in April, 1966.

We take this opportunity to thank *Western Builder* and *Daily Reporter* for publicity concerning the Foundation in these publications.

WAL

The ingenuity of WAL's fund-raising has provided welcome contributions for the Foundation's needs. The latest venture, illustrated in other pages of this magazine, involved a house tour in Milwaukee on December 5. The Foundation, besides thanking WAL sincerely for benefits derived, wishes to compliment the members for their time-consuming efforts with every detail beautifully executed to make the tour the success it was.

Other Chapter Foundations

The interest of AIA member chapters in other states in the organization and work of our Foundation has been manifested twice in recent months with letters of inquiry from the Indiana Society of Architects, AIA, and the Architects Society of Ohio. In both instances, the Foundation supplied detailed information as well as a copy of its Articles of Organization and Bylaws.

The Foundation in its work has achieved national recognition; but this recognition cannot continue without YOUR support.

In Memoriam

The Foundation is continuing to receive contributions in memory of Mr. Herbert J. Grassold, AIA, who passed away on November 29. We are grateful to Mrs. Grassold and her family for asking that memorial gifts be made to the Foundation and for their own personal contribution in memory of Mr. Grassold.

As in the past, through this column in the WISCONSIN ARCHITECT, the Foundation has endeavored to keep the Chapter members informed of its activities, often reiterating purpose and needs for those who may not be aware of the function of this ancillary organization. This time we offer the following as being said better than we can, the article published in *Western Builder* during December by Mr. John Keyes, Editor:

"The continued efforts of the Wisconsin Architects Foundation deserve praise and support from persons associated with the architectural profession. Each year the Foundation renews its pledge to establish an undergraduate school of architecture at the University of Wisconsin. Each year the Foundation solicits contributions to provide Tuition Grants for needy Wisconsin students who must pursue architectural training at out-of-state institutions.

"The Foundation has gained support for both of these programs from many prominent citizens and organizations throughout the State, but there is a noticeable lack of support from persons directly connected with the architectural profession and the construction industry. It would be edifying to realize wholehearted support of the Foundation's programs — members of the architectural profession and the construction industry should lead, not follow, in the drive to establish an Undergraduate School of Architecture at the University of Wisconsin and to encourage youth to pursue training in the architectural profession.

"The Wisconsin Architects Foundation is currently conducting its fund drive. This drive affords an excellent opportunity for the members of the construction industry to pledge undivided support for a most worthwhile cause."

We thank Editor Keyes most sincerely for these kind and appropriate words, and also for his company's contribution of $50.

In the matter of contributions in 1965, memorials totaled more than other gifts. This was due to the passing of a prominent architect, Mr. Herbert J. Grassold, and the thoughtfulness of Mrs. Grassold and her family to request Foundation memorials. Over forty contributions were received.

A number of organizations, which had been contributing to the Foundation annually, converted to memorials. In addition to those, which received formal acknowledgment, we express our gratitude for end-of-year contributions:

Best Block Company, $1000 (3rd annual contribution)
Osborne, Inc., $150 (4th annual contribution)
Milwaukee Area Bureau for Lathing & Plastering Inc., $100 (4th annual contribution)
Barber-Colman Co., $100
Sheet Metal Workers Local No. 24, $100 (3rd annual contribution)

The Northern and Southeastern Sections at meetings listened to messages of two Foundation Directors and collected $72. Three Directors themselves contributed a total of $400, and Karel Yasko, former State Architect, now occupied in Washington, D. C., sent his annual Christmas contribution.

The most unique contribution the Foundation has received was $40 from the Scout Troop of Post 200. This was a group of 35 boys from Brookfield and Wauwatosa who, in addition to their Scout work, were exposed to the architectural profession by Architect Richard W. Scheife as their advisor. When the group broke up, several to attend architectural schools

(Continued on page 37)

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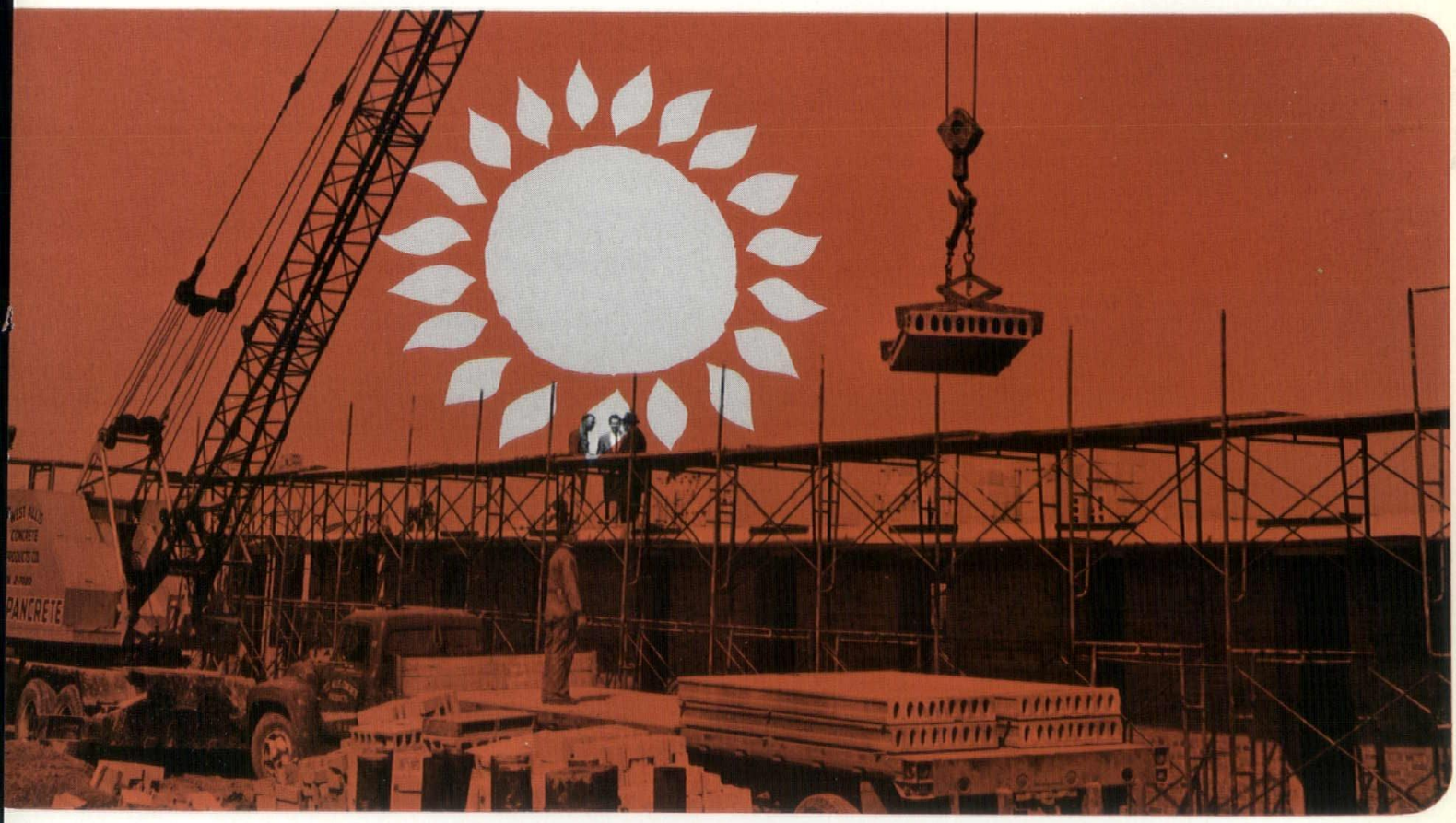

SPANCRETE

SPANCRETE INDUSTRIES, INC.
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A Brief Description of Caisson and Mat Foundations

Karl Roesser, P.E., Structural Engineer, Portland Cement Association.

Mat foundations and caisson foundations are used more and more because we find that good land is used up and we are forced to build on land which has a lower soil bearing capacity. There are, of course, several ways to support a structure best. The type of support for a structure will vary with the location and the soil conditions. A general statement that a particular type of foundation will be suitable for all buildings or structures cannot be made. In the last few years drilled, cast-in-place concrete caissons and mat foundations were used in Wisconsin more than at any other time.

I would like to stress the point that drilled caisson foundations or floating foundations are nothing new, except that we are now using more drilled caisson and more mat foundations. The use of drilled caisson and mat foundations has become a matter of economics, and it has been proven that in several buildings in Wisconsin, where the contractor had the option of bidding foundations, which were designed for piles or a mat foundation, the footings were 30% less for a mat foundation over a pile foundation.

For some buildings the foundations were designed for cast-in-place drilled foundations or piling and it was found that the cast-in-place drilled foundation caisson was less expensive and savings were in general up to 25%. Of course, it should be pointed out, that it is not always possible to design a foundation for a building in two different types of construction. Quite often the foundations must be designed for one particular type of footing to carry the structure.

A mat foundation has the advantage that it increases the foundation area. The mat will bridge over small, soft, or compressible pockets and it will resist hydrostatic uplift. It will give the maximum foundation area for a given building area and, therefore, profits the minimum contact pressure and gives maximum safety factor against soil failure.

Mat foundations can be designed on mud, soft clay, medium clay, peat and organic soils. If there is a hydrostatic uplift the very weight of the mat will provide some uplift resistance. The total load of the structure which is supported by the mat will also help to resist the uplift. Further, the mat acts as a water stop which can be a very important factor. If a mat foundation is very close to the grade, the edges can be deepened or a grade beam can be provided to prevent uplift from frost action. The thickness of a foundation mat depends on the load to be carried by the mat from the structure and the soil conditions.

Sometimes foundation footing mats are hollow and built like a concrete box girder. The design for a foundation mat is similar to an inverted floor design utilizing the same structural designs as other floor systems as i.e., a flat plate, flat slab, one way or two way concrete beam and slab systems, except that the soil pressure from below acts as a uniform load. If a solid mat is used for a foundation, only formwork on the exterior is required. In a case where the area around the columns has to be thickened, the thickening is done on the underside of the foundation below the mat by excavating the required area and eliminating formwork for this particular case. In cases where a one way or two way beam and slab system is used for the mat foundation, the beams are formed in the soil below the slab and generally there are no forms required. When a hollow box girder mat foundation is used, quite often inexpensive form material is used to form the voids and then after the concrete is placed, the formwork is left in place, which frequently is less costly than removing the formwork. The voids in the box girder mat can be used for piping and other mechanical uses. It is generally true, if the necessary foundation takes more than one-half of the building floor area, that it is less expensive to use a mat foundation.

In Wisconsin several buildings with mat foundations were built in the last several years.

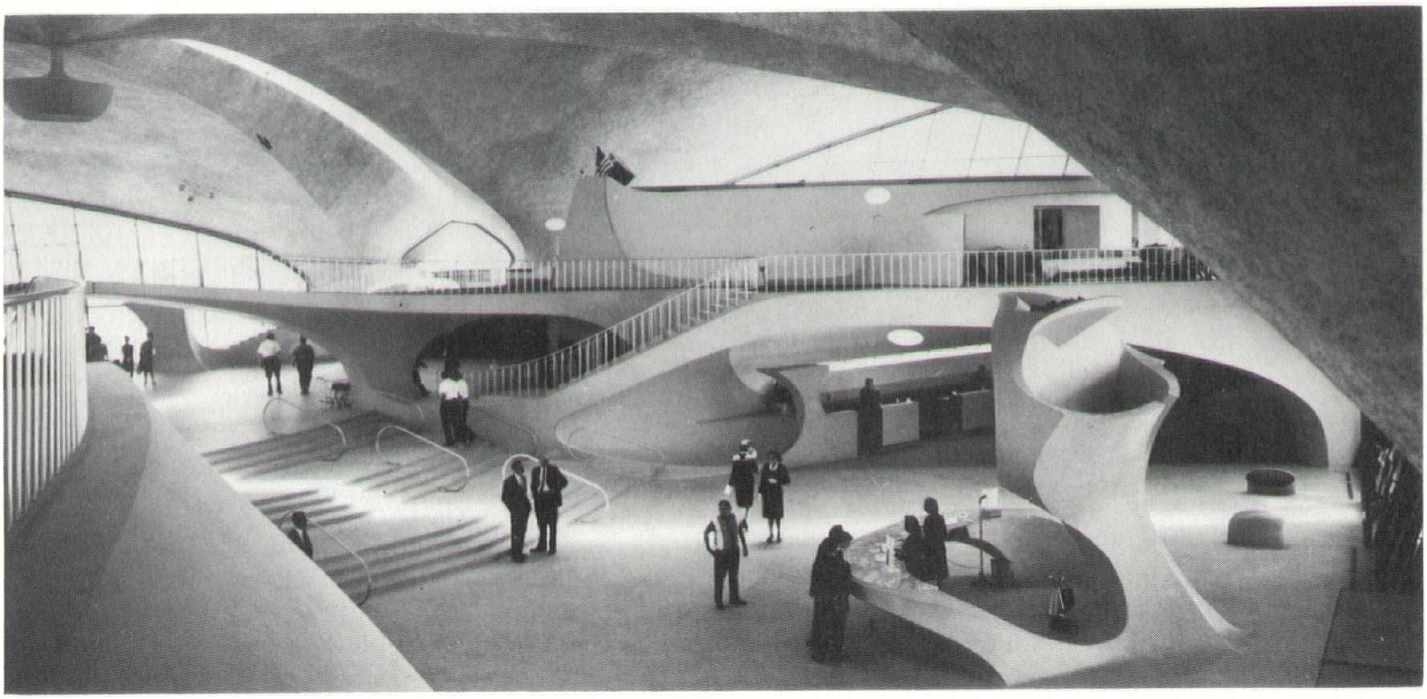
1. The 7th street Warehouse for the Milwaukee School Board has a mat foundation 90 ft. x 210 ft. x 2.5 ft.
Architect: Carl Lloyd Ames, Milwaukee.
2. The Beaumont Motor Hotel in Green Bay has a mat foundation which is three ft. thick.
Architect: Robert Surplice, Green Bay.
For this particular building the architect prepared two foundations, one for piling and one for a mat foundation. The mat foundation showed a tremendous saving over the piling foundation.
3. The Highland Park Housing Project has two multistory circular towers, built with a mat foundation.
Architect: Shutte-Phillips-Mochon, Milwaukee.
4. An Office Building for the Jared Corp. on East Wisconsin avenue has a mat foundation.
Architect: E. W. Kowalsky.
5. The Harnischfeger Corporation has a big mat foundation supporting heavy machinery.

I earlier mentioned drilled caisson foundations. A drilled caisson foundation is a cylindrical foundation with or without steel reinforcing and with or without an enlarged bottom which is concreted in place after excavation is completed. Drilled caissons will transfer the structural load to the bedrock or a hard stratum.

Drilled caissons can be constructed up to about 120 ft. in depth. For some shorter depths drilled caissons can have a diameter for building constructions up to about four ft. in diameter, and can have an enlarged bottom up to 16 ft. in diameter. Drilled caissons are often used when a new structure is built adjacent to an existing structure and vibration must be avoided. Drilled caissons are also most suitable where a large layer of top soil, miscellaneous fill, or other unsuitable soil extends to a moderate depth and where spread footings had to be carried below this layer to a suitable soil. This would require additional cost for construction and back filling. Often the drilled caissons are short 15 to 30 ft. in depth and piling would not be suitable. If a drilled caisson is used, the opening can be inspected visually and tested physically, which is an important factor.

Structural Lightweight Concrete

by Karl Roesser, Portland Cement Association



The outlook for the construction industry for the coming years will be better than at any other time. This means that our natural materials, especially aggregate for concrete, will be used up faster. Fortunately enough, we in the United States started about 44 years ago to manufacture lightweight aggregate to be used for lightweight concrete.

Lightweight concrete can be manufactured as low as 50 lbs. per cu. ft. with a compressive strength of 300 lbs. per sq. in. and as high as 120 lbs. per cu. ft. with a compressive strength of 6,000 lbs. per sq. in. and more.

Lightweight concrete with a compressive strength from 200 lbs. per sq. in. to about 1,000 lbs. per sq. in. is used for insulating concrete. Lightweight concrete with a compressive strength from 1,000 to 2,000 psi is mostly used for fill and insulating concrete and the weights of this concrete range from 50 to 85 lbs. per cu. ft. Lightweight concrete used for concrete blocks weighs between 70 and 110 lbs. per cu. ft.

Most concrete used for structural lightweight concrete ranges from 85 lbs. per cu. ft. to 120 lbs. per cu. ft. and develops a compressive strength of 2,500 to 6,000 psi and even more.

Before going any further, it is necessary, to make clear what is meant by structural lightweight concrete. It is not a concrete with some unknowns such as an extremely high entrained air content, air voids or entrapped air to make the concrete lighter. It also cannot be a concrete using any lightweight aggregate. Structural lightweight concrete is made with a specific aggregate that meets rigid standards, aggregate that performs consistently from one job to the next job in any part of the United States and meets ASTM Designation C-330 "Tentative Specifications for Lightweight Aggregates for Structural Concrete."

There are about 250 different plants in the United States and Canada with an annual production for lightweight aggregate of 15 to 20 Mil. tons. Not all lightweight aggregates have the same names. There are about 150 different trade names for lightweight aggregates. Most of the lightweight aggregates are manufactured by one of the six members of the lightweight aggregate producers association: *Vermiculite Institute, Chicago, Ill.; Perlite Institute, New York N. Y.; Expanded Clay & Shale Association (Sintergrate producers), Allentown, Pa.; Expanded Shale, Clay & Slate Institute (Rotary kiln producers), Washington, D. C.; National Slag Association, Washington, D. C.; Pumice Institute, Sante Fe, N. Mex.*

For the use of lightweight structural concrete it is important to have excellent material specifications, mix designs, material handling, workmanship, curing and inspection to get good results.

Lightweight concrete has in general the same characteristics in manufacturing as normal weight concrete. Past experience has proven that ready mix manufacturers had no difficulty in manufacturing concrete made with lightweight aggregate. Certainly, knowledge of the properties of the particular lightweight aggregates used and their behavior in concrete mixes is important.

There are generally three methods used to design lightweight concrete mixes: 1. The volumetric method, which is the most common mix method used. 2. The absolute volume. 3. The specific gravity.

In general it can be said that the maximum size of lightweight aggregate is smaller than most normal-

weight materials. For expanded slag and shales the top size is usually 3/8 to 3/4 in. Some rotary kiln shales might make aggregate available up to 1 in. in size.

Often the cement content will vary with the shape of the particle. Some materials are very angular, rough and irregular and the surfaces tend to be pitted and harsh. Others may be angular or cubical with fairly regular surfaces and still others are rounded and smooth.

The specific gravity of lightweight particles is less than that of normal weight concrete because the particles have voids and dead airspaces. The specific gravity varies with the size of the particle, the larger pieces having the lowest gravities while the smaller particles are heavier.

The absorption of lightweight aggregate is high compared to that of normal weight material. Values in the range of 5 to 20% by weight are commonly encountered.

A properly executed mix design is usually based on trial mixes. Lightweight concrete obeys the same water-content ratio law that applies to normal weight concrete. However, the total amount of mixing water used per cu. yard of lightweight concrete is generally higher than that of comparable normal weight mixes. There is no cause for alarm if we realize that lightweight aggregate particles absorb more water than hard rock aggregate. The water which is absorbed by the lightweight aggregate is not available to the cement paste in the mix during the hydration process and therefore bears no influence on the water-cement ratio.

Water remains in the aggregate during the normal curing period. When the concrete begins to dry out the moisture in the aggregate becomes available to the cement paste as moisture equilibrium. The absorbent water in the aggregate is a built-in reservoir and becomes available after normal curing is discontinued for hydration and curing.

Experience has proven, and it is generally recognized, that the use of entrained air in structural lightweight concrete has improved in both handling and performance. The amount of entrained air needed for a given percentage will vary with the maximum size aggregate. It is recommended to have a minimum of 6% entrained air in structural lightweight concrete if exposed to the weather. It is also recommended to have a minimum cement content specified. Tests also have shown that fully saturated aggregates perform more poorly in freeze-thaw tests, whereas concrete containing aggregates less than saturated conditions withstand the internal stresses caused by freezing and thawing.

It is generally recommended that lightweight aggregate be mixed first with the water from 1/2 to 3/4 of the total water needed to permit the dry aggregate to satisfy its water demand.

Architects and engineers have learned through the design information available how to design structures with structural lightweight concrete, using the working stress or the ultimate strength design method. The manufacturers of lightweight aggregate have done a tremendous job of compiling technical data, extremely useful to the architect, engineer, lightweight manufacturer and contractor. Concrete manufacturers found that lightweight concrete is not difficult to control. Certain checking procedures which apply to normal weight concrete also apply to lightweight concrete.

In normal weight concrete the air is mostly checked with a pressure meter, the air in lightweight concrete is checked with a Roll-A-Meter.

Contractors and concrete finishers encountered no difficulty in the use of lightweight concrete for cast-in-place structural framing, floors and roofs. Concrete finishers are also acquainted with finishing lightweight concrete. It seems that there is no difficulty in finishing concrete floors made with lightweight concrete. Lightweight concrete finishers have learned that by overtroweling a lightweight concrete floor, the coarse aggregate will come to the top and make the concrete harsh. In normal weight concrete, when overtroweled, the fines will come to the top, the opposite reaction as in lightweight concrete. Some contractors also have pumped lightweight concrete with a regular concrete pump without difficulties by just having the right mix design for a particular concrete pump.

Much of the structural lightweight aggregate is used in manufacturing lightweight concrete blocks. Structural lightweight concrete is used for thin shell construction, folded plate construction, prestressed concrete, precast concrete, concrete tiltup construction, architectural concrete, reinforced concrete construction and bridge decks. In general, it can be said that lightweight concrete can be used wherever normal weight concrete is used.

High rise buildings are built with lightweight concrete up to 640 ft. in height such as the 1000 Lake Shore Plaza, Chicago, the tallest reinforced concrete building in the world. It has 58 floors.

Using lightweight concrete for the structural floors and normal weight concrete for the columns is the general procedure if lightweight concrete is considered. Some of the high rise buildings have used as much as 40,000 cu. yards of lightweight concrete for a single structure.

Because of soil conditions in high rise buildings — I mean buildings between 15 to 60 floors — the weight reduction is about 30% if lightweight concrete is used. Quite often the weight of the building determines how high it can be built.

By having all floors constructed with lightweight concrete, the column sizes, especially in the lower floors, are not getting too big and are not taking too much rental space away. By the use of lightweight concrete the construction depth of the floor is quite often less than the construction depth of normal weight concrete. In addition, the floor construction built with lightweight concrete has a better insulation value and a higher fire resistance. For most high rise buildings one elevator or crane during construction is used to supply all the construction materials. It is very important that as many cu. ft. of concrete as possible be lifted at one time, because machine time and labor are very expensive, while the materials are inexpensive. The time saved in bringing the concrete from the ready mix truck

to a structural floor quite often offsets the little cost increase in lightweight concrete over normal weight concrete, and quite often the use of lightweight concrete shows a saving over normal weight concrete. Lightweight concrete is used for many thin shell type structures. In thin shell type structures the insulation value, fire resistance and dead weight are very important; because most of the thin shell type structures are used for roof construction, where the ratio between dead load and live load is almost equal, or in some cases if lightweight concrete is used, the dead load even can be less than the live load which is exactly the opposite of warehouse construction where sometimes the live load is three times the dead load.

Lightweight concrete is also used for many other types of structural systems, especially where long spans are needed and the dead load has to be kept to a minimum.

In concrete shell construction the maximum column spacing is wanted in many cases. The column size also has to be held to a minimum. Here again lightweight concrete is helpful in getting results. In many shell type structures a moveable type form for the concrete shell is used during construction. If a lightweight concrete is used, naturally the formwork can be built with lighter structural members and therefore the formwork can be moved much easier. Lightweight concrete is used for a concrete shell dome spanning up to 240 ft. in diameter. In this particular case, the earth was to have the shape of the underside of the completed dome. Then on top of the insulation sheets the reinforcing and lightweight concrete was placed. After the concrete had its required strength the total lightweight concrete dome was lifted on its exterior columns about 20 ft. in the air and then held in position. After the dome was fastened to the top of the exterior columns, the earth from the inside was removed. In this particular case it was very important that the dead weight was reduced to about ⅓, otherwise the structure perhaps would have been built with a material other than concrete.

The reason for the use of lightweight concrete for folded plate construction is in general the same as in thin shell concrete construction. Again, the dead load has to be kept to a minimum so that spans can have a maximum.

In prestressed concrete, especially in the use of long single and double T members and others up to about 140 ft. long, which are mostly manufactured in a prestressed plant and transported close to 200 miles by truck or by railroad, the dead load of the individual member can be a very important factor. A very long single T or other prestressed member, made with normal weight concrete, gets to be too heavy and often cannot be transported by truck.

With the use of lightweight concrete, which weighs about ⅓ less than normal weight concrete, it is possible to manufacture prestressed units up to 140 ft. in length and transport them to the project site.

In the precast concrete industry, lightweight structural concrete made with lightweight aggregate is used for precast framing, for precast exterior and interior walls and for backup concrete where the face of the precast concrete wall usually has a normal weight concrete. Sometimes lightweight concrete is used at the center of a precast concrete wall and normal weight concrete on both faces for insulation properties. Exterior and interior walls can be precast on the project site or made in a factory. If the precast walls are made at the project site they are usually manufactured on top of the finished floor and then tilted in the vertical position by the use of a crane. The precast walls which are manufactured on the project site are mostly solid concrete walls and range from four to eight inches in thickness, depending on the height, lateral supports, or if the roof is supported on the wall or not or how much insulation factor is wanted.

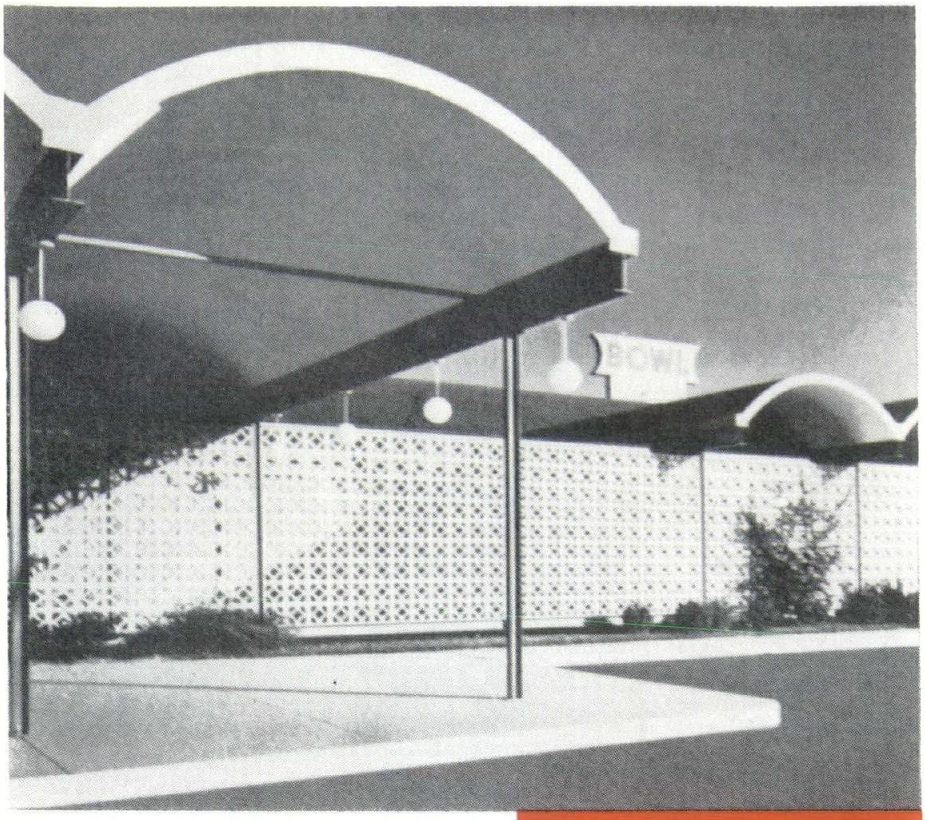
The weight reduction by the use of lightweight concrete will quite often result in savings during the tiltup operation. One of the biggest factors in the use of lightweight concrete for precast walls is of course the insulation factor, which in turn is important in a manufacturing building where humidity control is a problem.

If the precast wall panels are manufactured in a manufacturing plant, the weight reduction by the use of lightweight concrete will bring savings during handling and transporting of the finished product. Manufacturers of precast concrete are very much concerned about the weight of their finished product, because the transportation and handling cost of the finished product can quite often make the difference in cost, which will determine whether the project will go to precast concrete or not.

Lightweight concrete for architectural concrete is used for cast-in-place concrete or precast concrete. Sometimes the exterior face of the finished concrete is polished, so that the face of the concrete has a very smooth finish. Sometimes the architect requires that the lightweight aggregate be exposed by having a retarder sprayed against the concrete forms before the lightweight concrete is placed in the forms. After the forms have been removed, the lightweight aggregate is exposed by brushing and washing the face of the lightweight concrete.

Lightweight aggregate in lightweight concrete is also exposed if the exterior of the concrete face is sandblasted. The exposure of the lightweight aggregate is determined by the amount of sandblasting which is applied to the finished concrete. In some cases the architect chooses in addition to the exposure of the aggregate in lightweight concrete a particular color of lightweight aggregate to blend in with the architectural design. For some exterior architectural concrete, lightweight concrete is let as it came out of the forms. In short, it can be said that architectural lightweight concrete can give the same architectural appearance which could be achieved with normal weight concrete.

I also would like to point out that there are many bridges built which have lightweight concrete used for their bridge decks. In some cases the lightweight concrete is used as a wearing service and in other cases the lightweight concrete is covered with a wearing service. Lightweight concrete for bridge decks has been used as early as in the 1930's.



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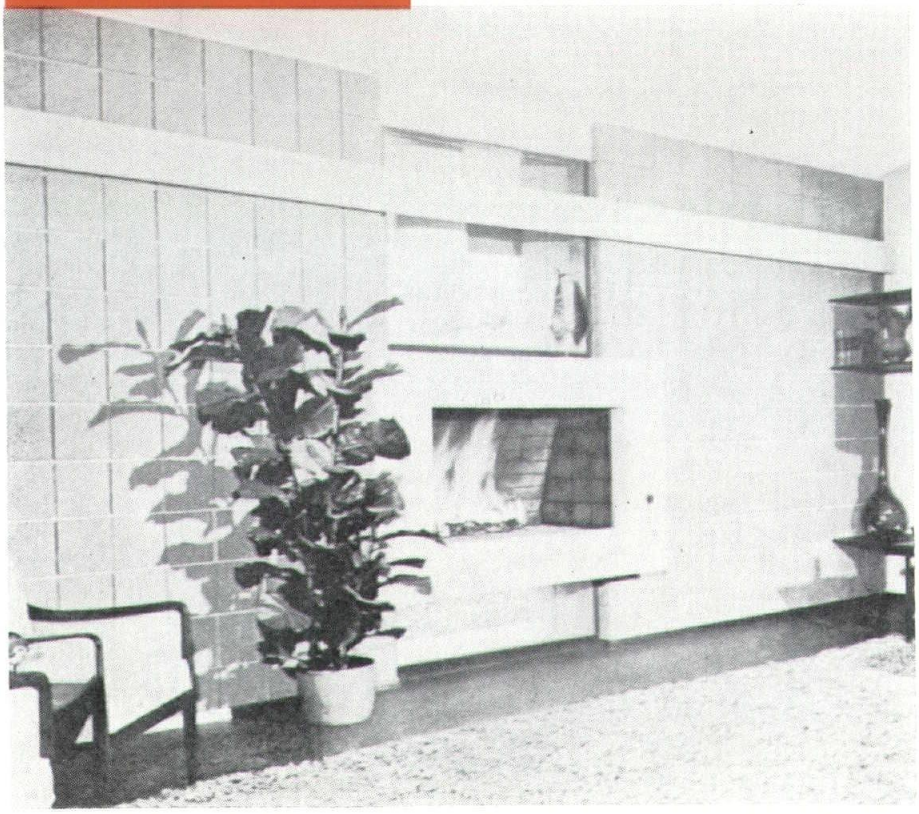

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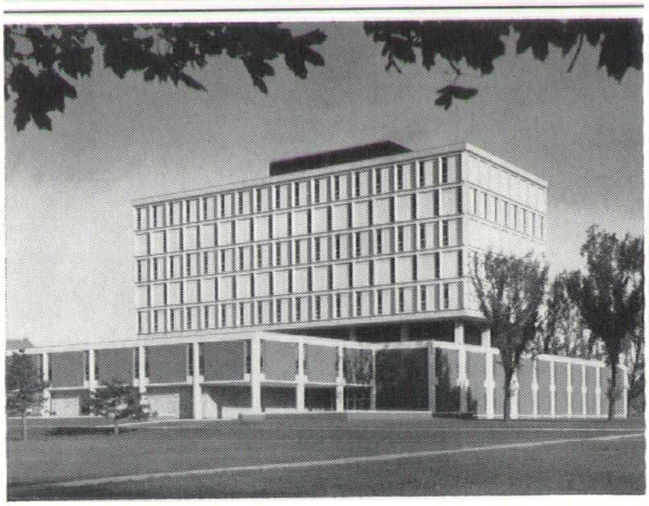

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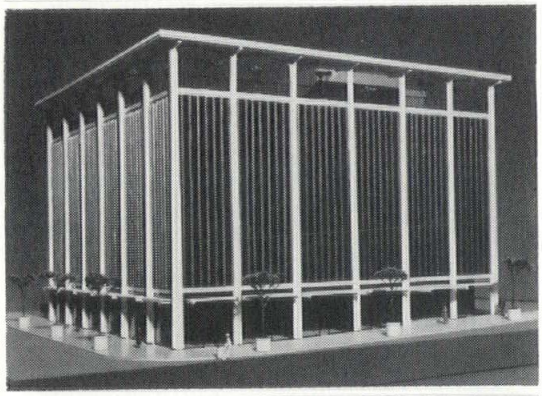

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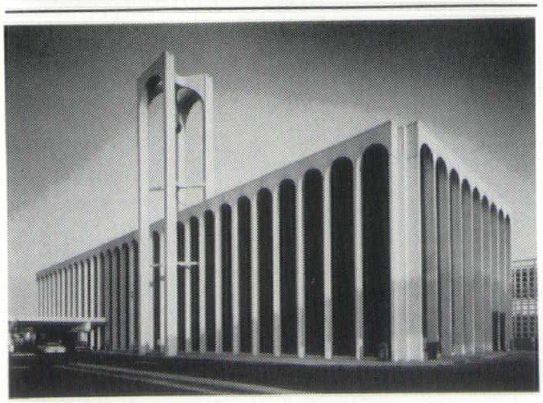

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Architect: Minoru Yamasaki
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B — Midland National Bank, Milwaukee
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General Contractor: Selzer-Ornst Co.

C — University of Wisconsin-Milwaukee
Bolton Hall
Architect: von Grossmann-Burroughs-Van Lanen
General Contractor: Kroening Engineering Corporation

D — Wisconsin Building, Milwaukee
Architect: Abendroth & Associates, Inc.

E — Union Depot
Architect: Donald L. Grieb Associates
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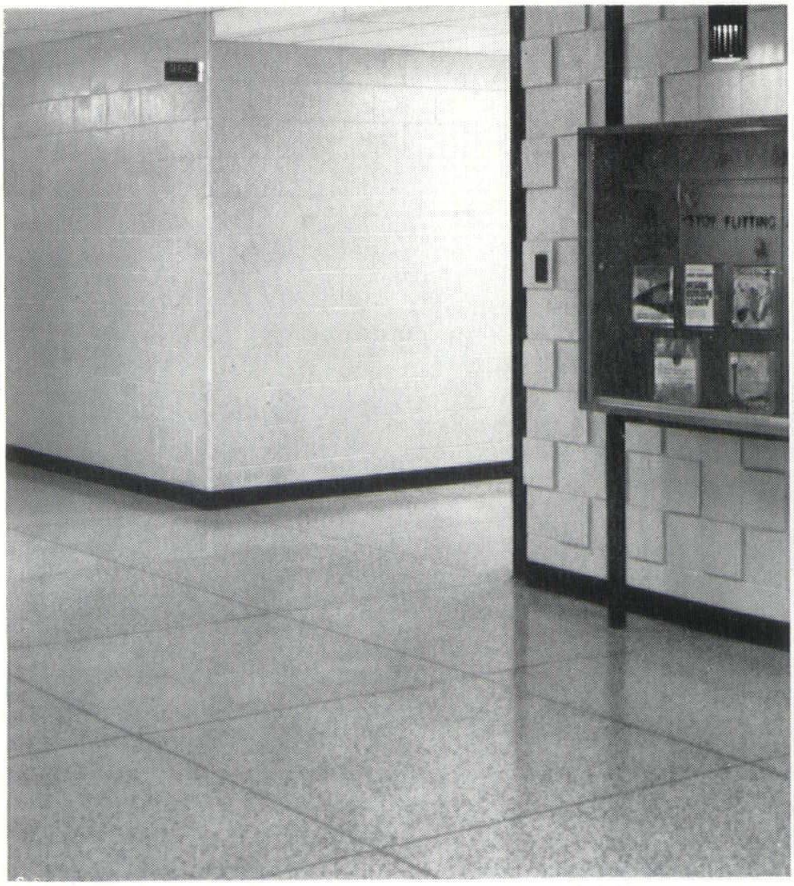

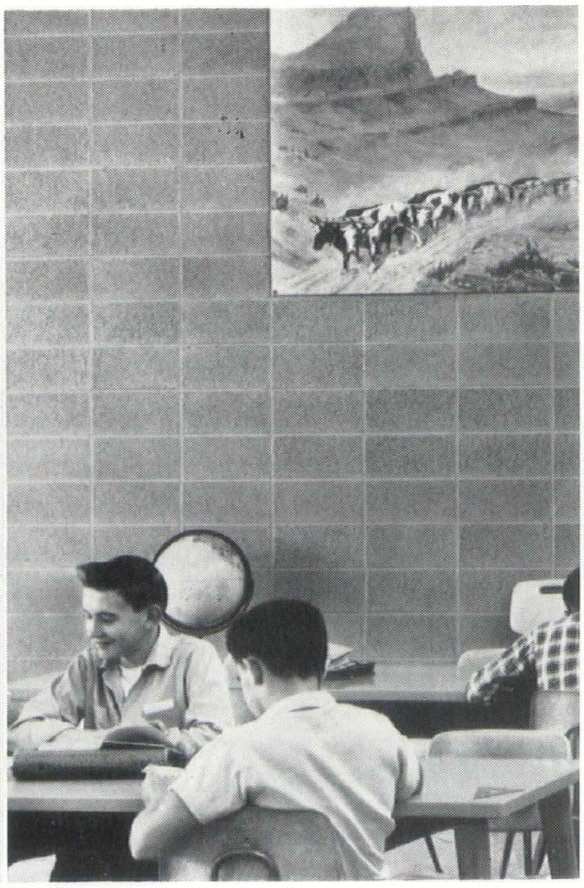

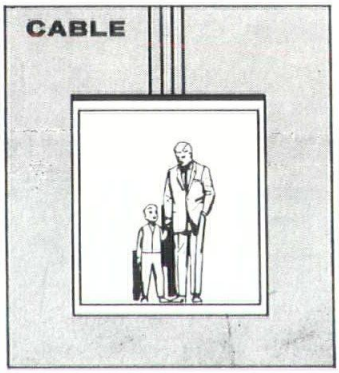

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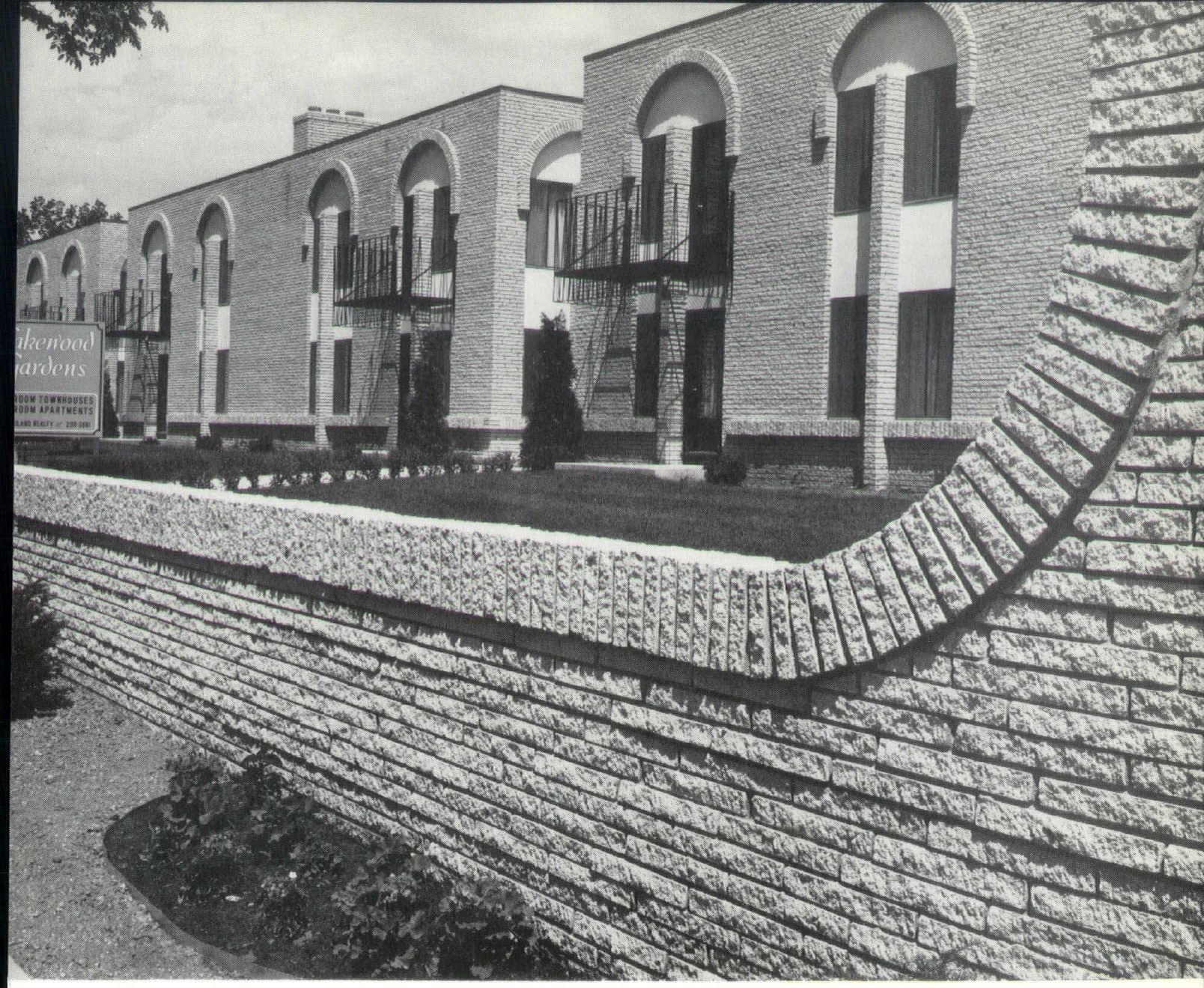

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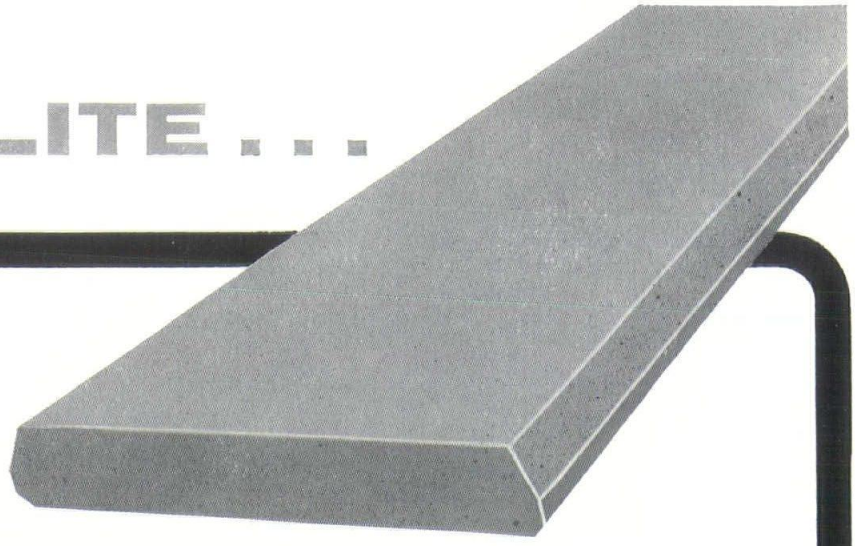

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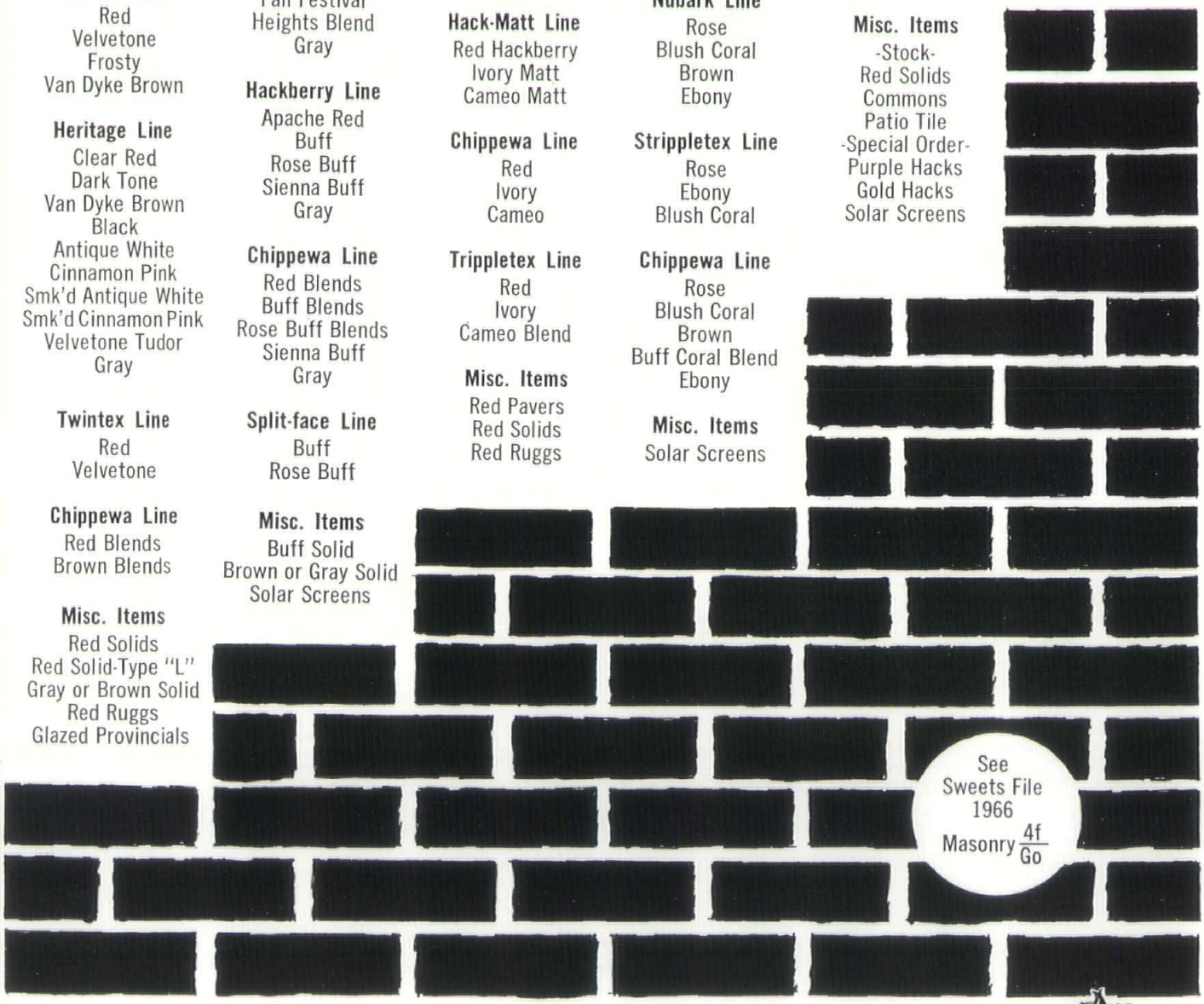

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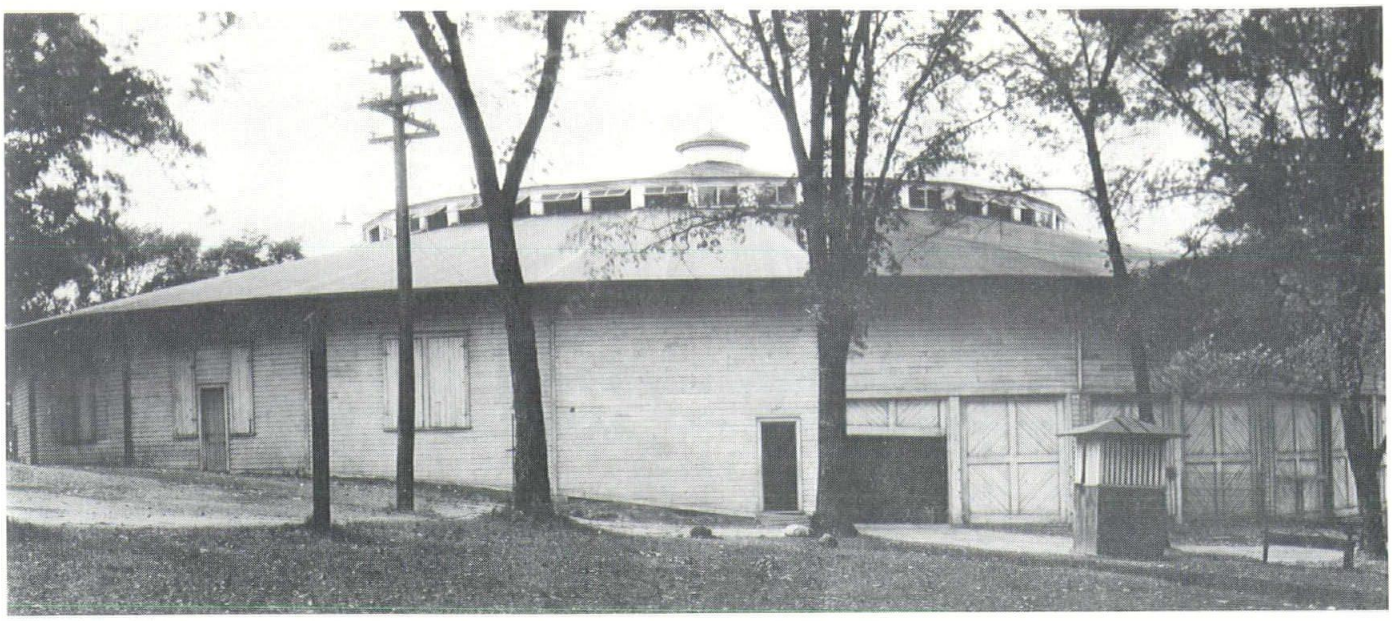

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producers' council

This is a big month for this Chapter. I refer to the National Producers' Council School Construction Seminar Caravan. It will be held on February 16, 1965, at the Tyrolean Town House in Milwaukee and the session begins at 1:30 P.M. There will be twenty major exhibits on display, all manned by National Producers' Council Members. These exhibits are geared to the latest in modern school construction. A keynote speaker, appointed by the national Producers' Council office, will open the session and will be followed by a local panel of architects, engineers, school people, a panel of people supplied by the National Producers' Council and a moderator of national prominence. This session should be of utmost importance to all architects, engineers, and school people in Wisconsin. If you do not receive the invitations, and would like to attend, contact Bud Rosier, Edward T. VerHalen, Inc., P.O. Box 2980, Milwaukee. Telephone: 463-7700. Bud is chairman of the program and I might add he has done a tremendous job.

Bill DeLind of L.O.F. is chairman of the Producers' Council Summer Picnic. He is shooting for Brown Deer Park and its beginning to like this will be really be a blast. So far the agenda shows free beer, softball, free beer, horseshoes, free beer, dancing, free beer, games for the kids, and oh yes, plenty of delicious "brats," hot dogs and the works. You will hear more about this one in the future.

Russell Sandhoefner

WAF from page 20

or some other training, their bank account contained $40 from 25c meeting dues, and at Mr. Scheife's suggestion that the money be contributed to the Foundation, the boys agreed because of our program promoting architectural education.

Memorials during 1965 were contributed in memory of:

Herbert J. Grassold, A.I.A.
Urban F. Peacock, A.I.A.
Nelson Carron
Edward P. Allis
John Waferling, A.I.A.
Fred C. Doepke
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Mrs. Eugene McPhee
Christian Madsen, A.I.A.-Em.
Robert Boerner
Herbert O. McDowell
Dr. James I. Passin
Esther Loeb Rosenthal
Mrs. Hanno Mayer

In 1965 the Foundation provided $5300 in Tuition Grants for thirteen Wisconsin architectural students for the two semesters. In June, four students graduated and they were replaced by four applicants in September. One student will graduate in February, 1966. There will be several new applicants to consider at our January meeting.

1965 Graduates:

Patrick K. Jadin — Green Bay — U. of Oklahoma (Graduate studies at U. of Pennsylvania)
Charles Tichy — La Crosse — Iowa State U. (Serving in Navy)
Dennis R. Heintz — Milwaukee — U. of Illinois (Inland Steel Co., Milwaukee)
William B. Bauhs — Milwaukee — U. of Illinois (Harry Weese, A.I.A., Chicago)
Student Recipients Continued from Previous Years:
Victor Aufdemberge — Berlin — U. of Nebraska
Ann Esch — La Crosse — U. of Washington
Roger F. Potratz — Oconomowoc — U. of Oklahoma
Charles J. Radloff — Oshkosh — U. of Minnesota
Thomas Orlowski — Milwaukee—U. of Illinois
John Kreishman — Wauwatosa — Washington U.
Michael J. Plautz — Willard — U. of Illinois
Jack Smuckler — Milwaukee — U. of Minnesota
David C. Adams — Milwaukee — Kansas State U.
New Student Recipients in 1965:
Robert D. Cooper — Greendale — Carnegie Tech.
William T. Meyer — West Salem — U. of Minnesota
Steven W. Bach — Manitowoc — U. of Oklahoma
Juhn H. Williams — Racine — Princeton U.

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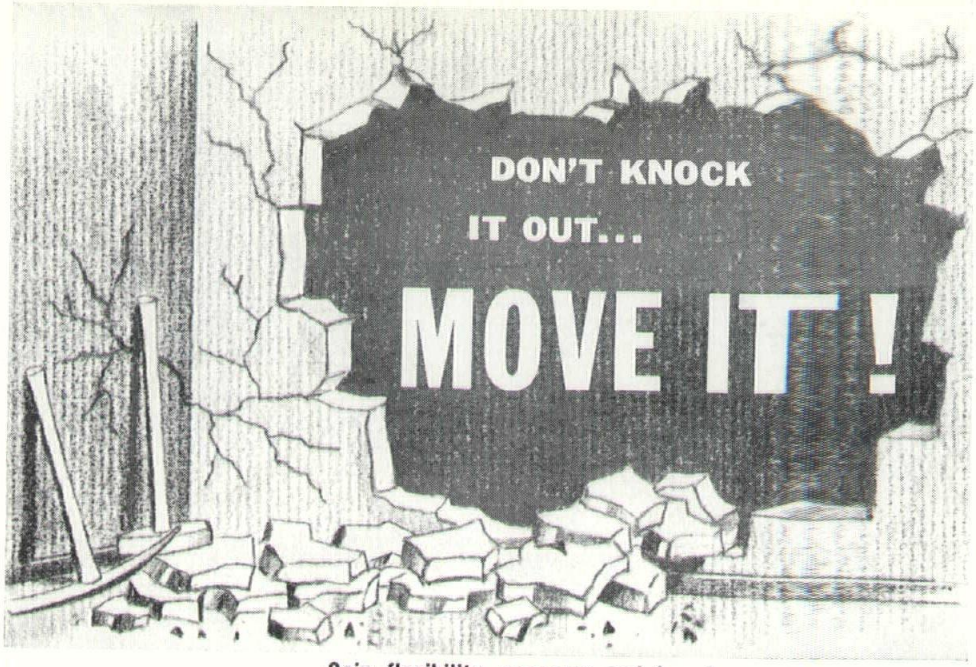

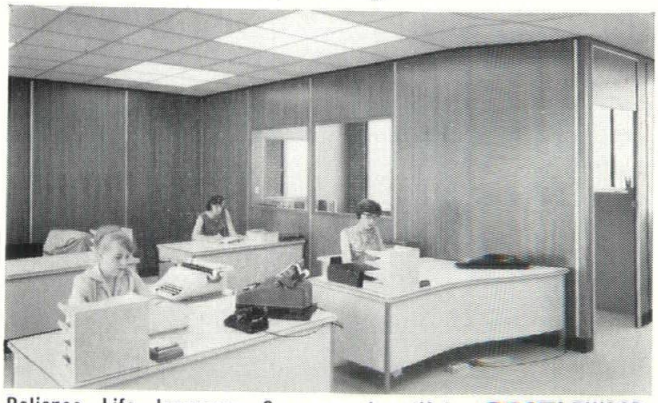

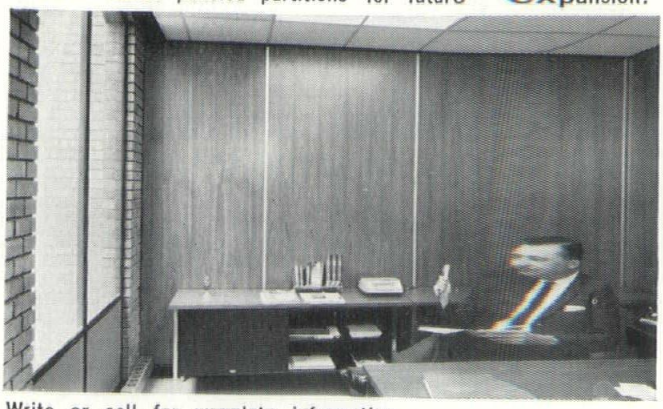

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