

NORTHWEST ARCHITECT

Official Publication, Minnesota Society of Architects

LOUIS C. PINAULT, ST. CLOUD, President

We Need

COMMON GROUND

Growth is mankind's greatest characteristic out of which has come marvels causing our thinkers in each decade to exclaim that this is the greatest decade in history, and each decade has been—and is. But growth is not nurtured by isolationism — it is brought about through maintaining contacts with those who will that growth be achieved. Conventions of those engaged in like occupations are the ultimate in contacts.

At the convention we meet on common ground, we have ample time to discuss our individual and common problems and through the seminars study solutions developed by those with perhaps wider or more specialized experience and in return give to them of our own knowledge and experience. Of equal importance is the spirit of good feeling and fellowship which will be generated which is bound to promote co-operative effort and mutual understanding of our common problems in the year to come. So it is that our growth as individuals and our growth as members of a profession comes about when we find and use to its fullest the common ground of the convention.

This year the annual convention of the Minnesota Society of Architects, to be held June 23 and 24 in Duluth, holds great promise of great good for all of us. That makes attendance a "must."

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Seminars Feature

MINNESOTA SOCIETY OF ARCHITECTS DULUTH CONVENTION

Featuring seminars in which some of the state's leading architects will present distinctly Minnesota building projects for consideration and discussion of members, the annual convention of the Minnesota Society of Architects will be held in Duluth, June 23 and 24.

Under guidance of general chairman for the convention, M. N. Willis, Duluth, committees have worked out a precise program which presents much to interest every architect in the state, no matter what his specializations. Special invitations have gone out to all A.I.A. members of the Minnesota, Minneapolis, St. Paul and Duluth Chapters and a special effort was made to obtain attendance of students of architecture and associate members of the chapters. Otto M. Olsen is president of the host group, the Duluth Chapter of A.I.A.

The convention will be held in the Hotel Duluth and out of town members and their parties have reserved ac-



General Chairman
M. N. Willis

commodations in the convention hotel. President Louis C. Pinault, St. Cloud, will preside at all sessions.

The Twin Cities chapters planned the program, which was announced as follows:

Friday, June 23

9:00-10:00 a.m.—Registration.

10:00-11:45 a.m.—Seminars

1—A. Reinhold Melander, Duluth, "University of Minnesota, Duluth Branch."

2—Eino A. Jyring, Hibbing, "Itasca County Courthouse."

11:45 a.m.-12:30 p.m.—Inspection of exhibits of Producers Council.



President
Louis C. Pinault

12:30- 2:00 p.m.—Luncheon and business session. P. C. Bettenberg, St. Paul, will speak on "Cold War and the Architect."

2:30- 5:00 p.m.—Seminars

1—Carl H. Buetow, St. Paul, "Modern Milk Plants."

2—Stuart Rothman, St. Paul, "The State Redevelopment Program."

5:00 6:00 p.m.—Inspection of exhibits of Producers Council.

6:00- 7:00 p.m.—Cocktail hour courtesy of Producers Council.

7:00 p.m. —Annual dinner.

Saturday, June 24

9:30-11:30 a.m.—Seminars

1—Harlan E. McClure, assistant professor, University of Minnesota, Minneapolis, "Schools of Architecture."

2—Edwin H. Lundie, St. Paul, "Domestic Architecture on the North Shore."

11:30 a.m.-12:15 p.m.—Inspection of exhibits of Producers Council.

12:15- 1:00 p.m.—Luncheon.

1:00- 2:00 p.m.—Business session.

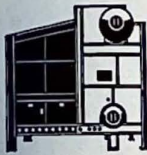
2:00 p.m. —Final adjournment.

The exhibits have been arranged by a committee under the chairmanship of Theo. R. Hidding, president of the Minneapolis Chapter of the Producers Council, and show new developments in building methods, new

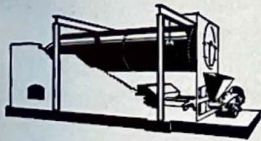
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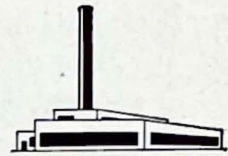
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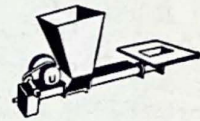
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All sessions, it was announced, will be open to persons other than architect members whose work covers the fields of design and building. This will give them an

opportunity to obtain important information as to architectural trends so they can better co-operate with the building designers and will also give them an opportunity to extend their detailed knowledge to the architects in session.

For the ladies special attractions and activities are being planned by Mrs. A. O. Larson, Minneapolis, and Mrs. Otto Olsen, Duluth, wife of the president of the Duluth Chapter.

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WHAT IS THE PRODUCERS' COUNCIL, INC.?

The Producers Council, Inc., is a national organization representing manufacturers of all major types of building materials and equipment. It was formed 28 years ago—in 1921—for the principal purpose of encouraging the wider use of quality building products and of stimulating the adoption of programs and techniques designed to lower the cost of building.

Through the council, manufacturers today work together to maintain a healthful climate for construction, to advance the industry technically and to develop wider markets for their products.

The council is affiliated with the American Institute of Architects, having been founded as the result of a request from architects for an organization that would provide them with authentic factual information about building products.

In the council's *Technical Information Bulletin*, which is reviewed by the technical staff of the A.I.A., members of the council place the facts about their products before the nation's designers in authoritative form.

In addition to its national office in Washington, the council has 30 chapters, located in the nation's largest markets, which work co-operatively with chapters of the A.I.A. and other local industry groups.

Through the joint sponsorship of modular co-ordination by the American Institute of Architects and The Producers' Council, the Industry Engineered Housing Program and similar projects, the council has made important contributions to the building industry as a whole. Currently it is conducting on behalf of the whole industry a program to improve public attitudes toward the building industry and its committees are at work developing and perfecting other programs designed to forward its basic objectives.

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The brilliance of the window is seen in the night shot above (note the fixtures cannot be seen). At the right is a view showing fixture arrangement, baffle placement and other parts of the arrangement



Twin Cities Designers Win National Lighting Award

Four Twin Cities designers and suppliers have received shares in an award in a national planned lighting contest conducted by the General Electric Company's lamp department.

The award was one of eight made in the commercial-industrial division for cities over 100,000 and sharing in its honors were V. W. Furey, lighting representative for the Northern States Power Co., St. Paul, A. Natalie, salesman for the G. E. Supply Corp., St. Paul, M. C. Balch, manufacturer's representative for the Pittsburgh Reflector Co., Minneapolis, and G. L. Gripfen, salesman for the Hoffman Lighting Co., St. Paul. Each received \$100 and Mr. Furey received an additional \$150 for submitting the winning report on the installation.

The winning entry was a shadowless window project for Field Schlick, Inc., St. Paul store. Management of the store said passersby had paid more attention to what was in the windows since installation of the new lighting and it was particularly pleased with the fact there are no shadows in them and even the smallest details of sewing, hemstitching and embroidery show up clearly.

The installation was designed for flexibility and unobtrusiveness and the degree and color of the light can be varied to meet certain moods of the exhibits in the window and compete with intrusive light from outside.

Lighting can be built which is general and even or it can be accented.

"A commonly accepted fact in lighting for merchandising is that the lighting system should not compete with the merchandise for the prospective purchaser's attention. This installation achieves that result in that it is completely concealed and is nowhere in evidence," its designers pointed out.

Basically, the lighting installation consists of a series of cavities formed at the top of the window by baffles running parallel to the window glass, within which is concealed the lighting equipment. At the window glass line a row of concentrating mirrored glass incandescent reflectors has been installed separated by individual baffles to provide a build-up of illumination in the zone adjacent to the glass, an area where there is a considerable drop off in intensity normally. In each of the three cavities behind the mirrored glass reflectors, a single 2-lamp 96 inch 425 MA Slimline fluorescent fixture and an 8 ft. wiring channel with porcelain receptacles on about 12-inch centers has been installed; the Slimline fixtures to provide general illumination and the channel, in conjunction with the use of swivel socket adaptors, to provide accent and modeling effects through the use of projector and reflector spots and floods as well as for the plugging in of special display lighting equipment such as baby spots, etc.

Architects Serve Internship

In Hospital Design During Conference

A golden opportunity to serve a design "internship" in hospital planning was taken in stride by hundreds of Northwest architects who attended the Architects Seminars held during the Upper Midwest Hospital Conference in Minneapolis, May 18 and 19.

The program, as presented in our last issue, contained many valuable talks and attendance at the sessions ranged from 175 upward. The seminar approach, so valuable in giving the audience a chance to raise moot points and have them threshed out by the experts, was invaluable and discussions frequently waxed quite emphatic.

The committee which arranged the seminars, headed by co-chairmen Thomas F. Ellerbe, Ellerbe and Co., St. Paul, and Roy N. Thorshov, Long & Thorshov, Minneapolis, also had as members W. H. Tusler, Victor C. Gilbertson, Arnold I. Raugland and Eugene D. Corwin. Edward H. Noakes, Minneapolis, was executive secretary of the committee.

Complete transcripts of all the talks and discussions were made and these are being printed for general distribution. They form a unique document in giving the complete backgrounds of hospital design and associated problems as brought out in the seminars and



The Architects' Exhibit at Conference with Jack Loveless, Edward H. Noakes and Curtis H. Green, surveying their work of planning the displays.

are valuable to architects and others dealing with the planning and construction of hospital buildings. Copies are available for \$5.00 from Mr. Noakes, c/o Long & Thorshov, 400 Metropolitan Life Bldg., Minneapolis, Minn.

Outstanding among the top-drawer talks was the speech given at the dinner on May 18 by Robert Cunningham, executive editor of *Modern Hospital*, on "Hospitals of the Future."

"It is the unremitting obligation of science to be dissatisfied with things as they are," Mr. Cunningham told the architects. "This is true of all science at all times. The greatest scientist of our time, Albert Einstein, was dissatisfied with one of the greatest scientific discoveries of our time—his own general theory of relativity. As a result he has now produced the unified field theory, which may prove to be as much more significant than relativity as relativity was more significant than Newton's Laws. But, without dissatisfaction, without the kind of dissatisfaction that urges change, we should never have had either Einstein or Newton and our knowledge of the physical universe today would be elementary and accidental.

"Of course, medicine is not a science and the physician operates under restraints that don't apply with



The panel of Thursday afternoon's session (left to right)—Robert Cunningham, Thomas Ellerbe, Robert Hanlon, Dr. Carl Walter, Dr. Helen Knudsen, W. H. Tusler, Carl Erickson, and Paul Fessler.

The conference scenes at the right show (left to right in each case) Dr. Helen Knudsen addressing a seminar; S. M. Harlan touching up details of the Western Mineral Products exhibit; James Tillitt and Alton Lepel in the Twin City Tile exhibit; Marble Co.'s booth; Architect Carl Erickson talking on and Moderator James W. Stephan; Bill Olson and Glenn planing; Twin City Brick Co., and the Hauenstein and Burmeister booth with William Turner and Robert Birkeland of H. & S. and D. C. and T. A. Gramling of the Northwest Marble Co.

equal force in the physical sciences. Whatever his dissatisfaction with things as they are, the physician is not at liberty to indorse change until the improved effectiveness of the new technique has been demonstrated beyond any question, because the acceptance in course of any untried methods at any time may involve a hazard to human life and the physician is not at liberty to undertake that hazard. Even with this restraint, however, the rate at which new methods are being introduced in medicine is simply phenomenal. The new knowledge that is emerging from the basic sciences that underlie the practice of medicine makes it obvious that the rate of change will be even greater in the future than it has been in the past.

"A noted pathologist in Chicago the other day observed that if you want to get a broad vision of the widening horizons of medicine, don't read the clinical journals but read the journals of physiology and physics and biochemistry and the other basic sciences that underlie medicine. It shouldn't be necessary, of course, to spell out to a group like this the reasons why changes in medicine are important in hospital design. Look on any blueprint and you will see spaces and functions that didn't exist in the hospitals of just a few years ago. Obviously, then, the hospitals of a few years hence will contain spaces and functions that are unknown today. Obviously, too, the hospital planners who make the most accurate judgment of what these spaces and functions are going to be in the future will do the best job of planning hospitals today. This, of course, is an enormously difficult task. Among all the new medical procedures affecting hospital design, you must select those whose effects you think will be lasting and build your hospitals to accommodate them.

Architect Makes Vital Decisions

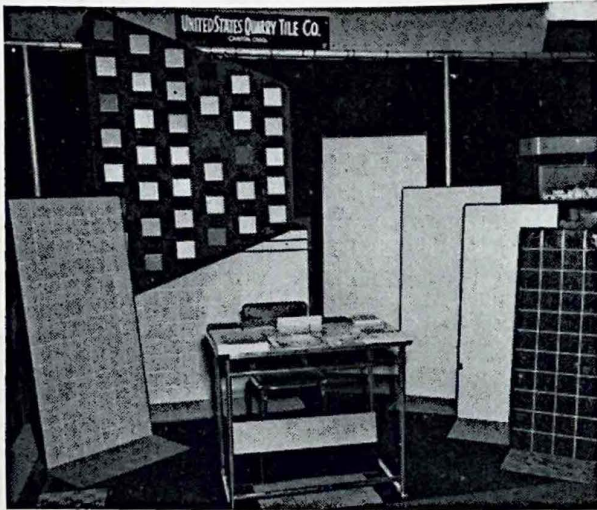
"Take a few examples from today's practice; you must decide whether rooming-in is a desirable new technique in obstetrics or a passing fad and whether rehabilitation is a coming routine function of the general hospital or a frill that will pass away in a few years. If you ignore these developments you may be serving the patients and doctors of your communities very poorly. Yet, if you embrace new techniques that don't prove to have the value of time, you will be wasting their resources. Of course, you have to be responsive to the judgments and opinions of the doctors in the communities whose hospitals you are planning and operating. Your judgments on rooming-in and rehabilitation and recovery rooms and other medical techniques can hardly be expected to prevail over theirs. Yet, you do have a responsibility that they don't have. They're practicing today, and at best for a few years more, but you are planning and building for their sons and successors who will be practicing for many years to come.

"What are some of the changes that are likely to affect the shape and efficiency of tomorrow's hospitals?"

ARCHITECT



Rooming-in plan for mothers and babies has already been mentioned. If you have been shrugging it off as something that doesn't merit consideration in today's planning, then you are simply unaware of the tre-



Romany Tiles by U. S. Quarry Tile Co., shown in the Rollin B. Child booth.

mendous weight of evidence that has been piling up in its favor in trials that reach all the way from New England to southern California. Unlike some techniques which may be right under certain circumstances and wrong in others, rooming-in plan, obviously, has fairly uniform applicability. If it makes sense for mothers

and babies in New Haven, it makes equally good sense for mothers and babies in Minneapolis. Probably, it is still too early to say unequivocally that you are wrong if you decide against rooming-in but the time is long past when you can possibly be right if you decide against it without giving it the most careful study.

"In talking about the changes that have taken place in medicine in recent years, it's become commonplace to call attention to the marvelous new developments in drug therapy. All of us have seen the advent of the sulfonamides and penicillin, streptomycin and aureomycin and we are familiar with the effects these agents have had on the treatment of infections and hence, of course, on hospital procedures. Probably most of you have also read about the even wider apparent effectiveness of chloromycetin and bacitracin and terramycin, which offer promise of placing some of the hitherto unsolved virus infections along with the bacterial infections, which are no longer a serious threat. Already the sulfonamides and penicillin are moving from the hospital into the home and office practice of medicine. If the other new drugs follow, the hospital may be virtually swept clean of infection in our time.

"The effect of any of these events on hospital design, however, must be considered only in their relationship to other changes that may also affect the nature and amount of nursing service needed by hospital patients. Among these we must certainly count the increasing use of oxygen as treatment in the support of therapy for a number of ailments and certainly we must also study trends in the use of parenteral therapy of all kinds. The many applications of blood and blood fractions and all the new materials and techniques that

(Continued on Page 27)

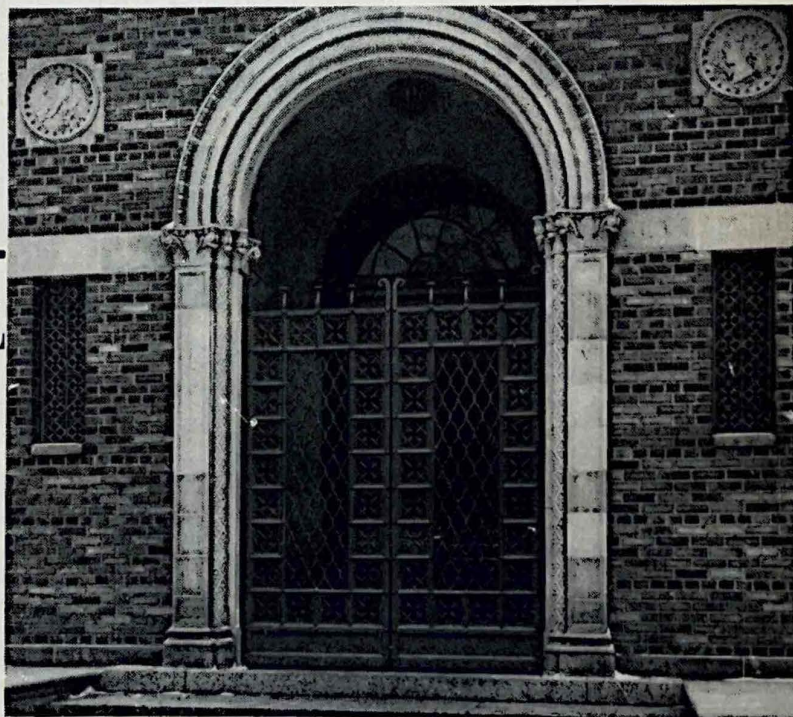
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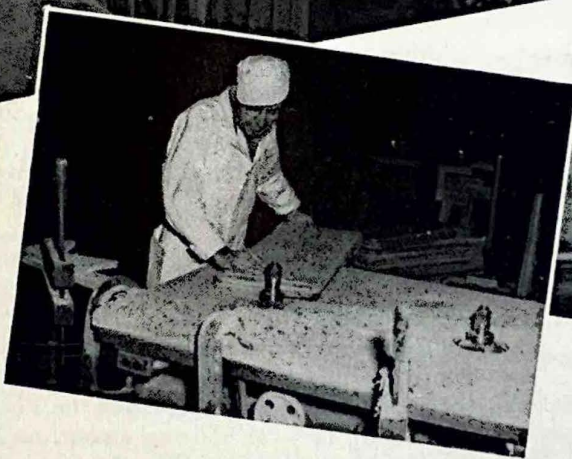
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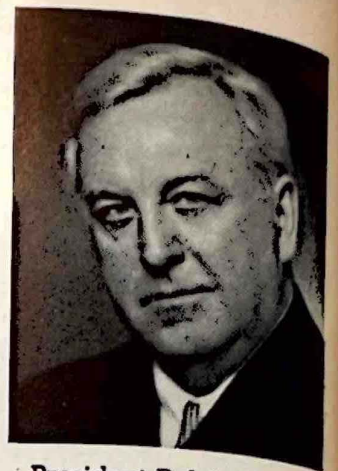
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ARCHITECT.

Re-Elects Officers Creates New Districts Presents Top Awards



President Ralph Walker

Officers of the American Institute of Architects were re-elected to serve another year by members attending the 82nd annual convention in Washington, D. C., the middle of May.

Ralph Walker, New York, was re-elected president and will have as his administrative associates for 1950 Glenn Stanton, Portland, Ore, first vice president;



Vice President
Glen Stanton

Kenneth E. Wischmeyer, St. Louis, Mo., second vice president; Clair W. Ditchy, Detroit, Mich., secretary; and Charles F. Cellarius, Cincinnati, Ohio, treasurer.

More than 2,000 A.I.A. members attended the four-day convention, during which changes in the by-laws created two new districts and brought the membership on the board of directors to 17. New districts created were the Northwest and Texas districts.

New members of the board, including those elected for the new districts, are: John N. Richards, Toledo, Ohio, Great Lakes District; C. E. Silling, Charleston, W. Va., Middle Atlantic District; M. H. Eichenbaum, Little Rock, Ark., Gulf States District; Irving G. Smith, Portland, Ore., Northwest District; and Thomas D. Broad, Dallas, Tex., Texas District.

A highlight of the annual banquet was the presentation to Sir Patrick Abercrombie, famed British town planner and architect, of the Gold Medal of the Institute.

Beauty and livability in a small but open plan characterized the winning designs in the honor awards competition, announced for both residential and commercial fields at the meetings. No award was made in the ecclesiastical field this year. First honor award

in residential design was for the home of H. C. Hvistendahl, California, designed by A. Quincy Jones, Jr., Los Angeles. First in commercial architecture was for the Davison Department Store, Augusta, Ga., designed by Harold M. Heatley and Ketchum, Gina and Sharp, architects, New York.

A.I.A. HAS NOT APPROVED PHA ARCHITECTS' CONTRACT FORMS

Aimed at clarifying the mistaken belief that certain architects' services contract forms being used in connection with public housing projects carry approval of the American Institute of Architects, the A.I.A. committees on fees and contract documents have issued a statement of interest to every architect working in this field.

"We are informed," the statement says, "that architects negotiating with local housing authorities for architectural services in public housing projects under Public Law 171 are under the belief that the A.I.A. has approved the contract forms covering the architects' services, apparently issued from the PHA in Washington, D. C., to local housing authorities, and known as documents PHA 1915, Rev. 2-1-50, and PHA 1915A, Rev. 2-1-50.

"The A.I.A. has not as yet approved any architects' contracts evolved by PHA or any other housing agency, for architects' services for public housing projects, though negotiations are going forward between PHA and A.I.A. towards an agreed-upon contract. Architects negotiating with local housing authorities should be guided accordingly."

DUNWOODY SEEKS CONTACTS WITH ALUMNI

In July the Dunwoody Industrial Institute of Minneapolis, Minn., will start a drive to contact as many as possible of its 120,000 alumni, the drive being conducted through the Alumni Association and Fund, according to Morgan H. Potter, president of the alumni.

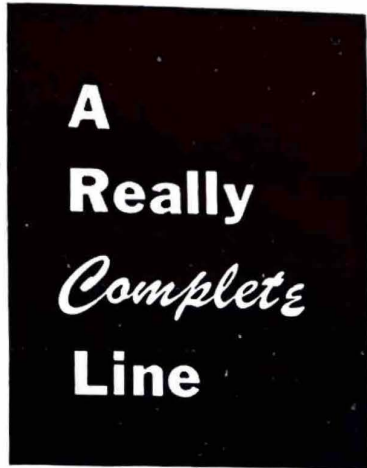
"We want to bring all alumni up to date on Dunwoody, their friends of Dunwoody days and the work of the school and obtain their aid for the fund," Mr. Potter said. "Those who send us their names and present addresses will be placed on our mailing lists for the association's publications and news letters."

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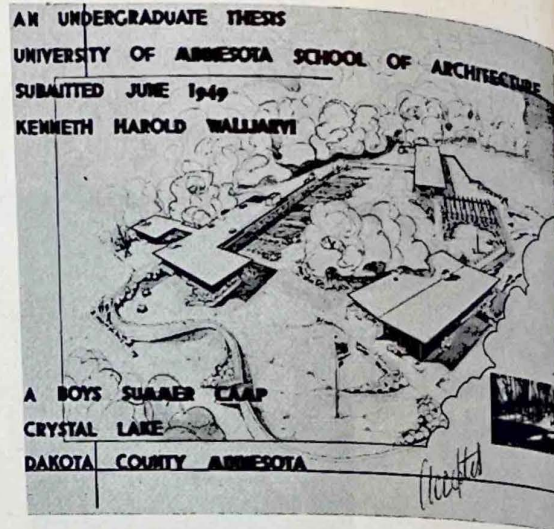
I chose this type of problem as my thesis for several reasons. Practically all of my leisure hours are spent in outdoor sports. Most of all I enjoy being at a lakeshore cabin, both in summer and winter. I had in mind an excellent site that I have been familiar with for some time.

It seems that few articles have been written on summer camps. Therefore it represented a challenge to tackle a problem that is rarely studied in detail. I will probably never again get the chance to make as comprehensive a study of this problem since youth organizations generally operate on a limited budget and rarely complete their camp sites as originally planned.

Actually, the problem has been limited to only the four major buildings—recreation hall, dining hall, craft shops and beach house. It seemed to the author that if a thorough study of the island were made, considering contours, firm ground, wooded areas and accessibility, so that a workable over-all scheme might be developed, then all of the smaller buildings could well be studied at a later date as to the particulars of their design. Consequently a detailed study of the four main buildings, with emphasis on the recreation hall, is presented as a thesis and all other buildings are considered only as they relate to these buildings and to each other on the plot.

SITE AND LOCATION

The site selected is an island 30 acres in area, 2,200 feet by 1,800 feet in its greatest dimensions and 34 feet above lake level at its highest point. It is located approximately two miles east of U. S. Highway 65 and 25

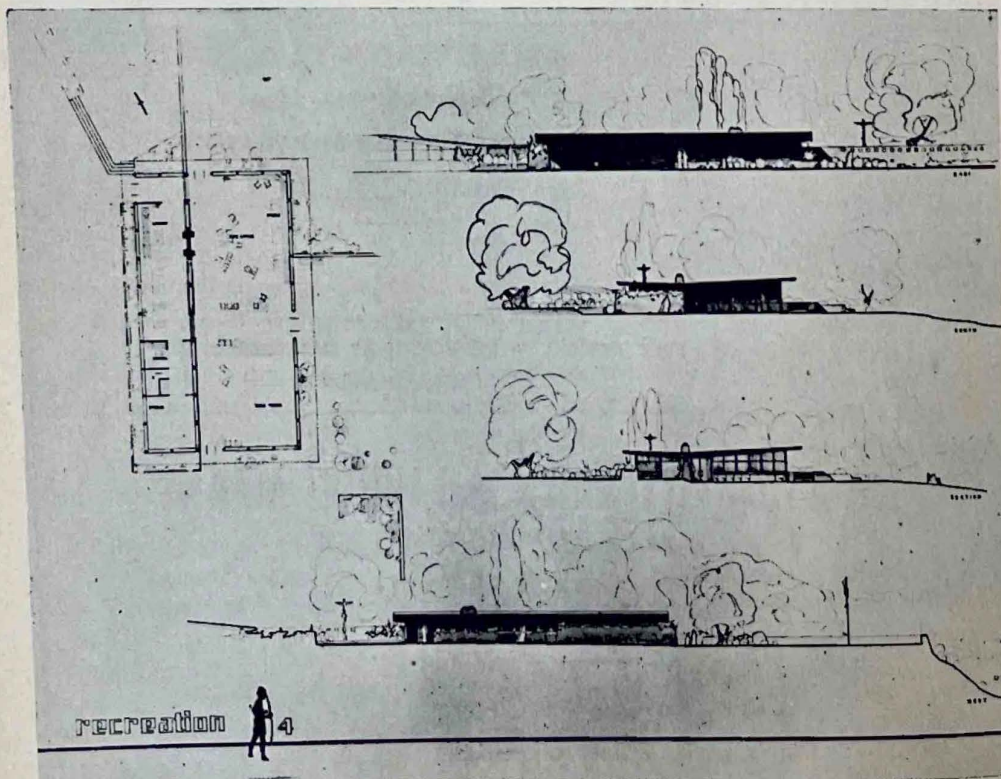


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miles south of downtown Minneapolis in Dakota County.

It seems an ideal spot for an organization such as the Big Brothers, Inc., for whom this design is hypothetically conceived, to establish their summer camp. The area is familiar to most people and is within easy and quick access of the Twin Cities by train, bus or automobile and yet it possesses a northwoods character. The boys can be confined to the island during their stay and not be in danger of prowling animals, forest fires or wandering off into the wilderness.

Crystal Lake is approximately 2 miles long and $\frac{3}{4}$



The
Recreation
Hall

mile in width. It is a spring fed lake situated in the high bluffs above the Minnesota River Valley. The lake bottom is generally sandy and the water is clear throughout the year.

The character of the soil composing the island is gravel, seemingly glacial deposit, with a good covering of sandy loam and numerous boulders. The island has never been exploited by realtors and apparently has served only as pasture land for cattle since there is no evidence of the remains of a permanent structure on its shores.

In all, there are approximately 18 summer homes on the entire lake and the greater majority of these are on the north shore. More important, there are no commercial establishments of any type exploiting the natural attractiveness of the lake.

OVER-ALL PLAN

Several schemes were considered before deciding on the one presented. Two or three seemed just as good and perhaps one of these might have proved to be better had it been developed into its final stage. However, a simple reasoning method of recording the advantages and disadvantages and weighing these against each other helped in selecting the final scheme. It must be noted that it is realized by the author that there are other schemes suited to the program as stated.

The first consideration for the camp layout was to have a minimum of vehicle movement on the island. It was not considered practical to prohibit vehicle traffic on the site entirely so a scheme was devised whereby public traffic was confined to a short entry road and parking area. The service road continued further into the island and constituted a physical barrier, along with buildings and garden walls, dividing the area occupied by the camp personnel and the campers. Since this section would then be restricted, it seemed a desirable site for the infirmary.

The next consideration, within this restricted zone, was the caretaker's residence. The caretaker most generally would be an elderly man, and his wife, who

would remain on the premises throughout the year. It followed that he then should be given a site within easy reach of the main road. The director and personnel quarters were also designed in this area.

The location of the recreation hall, dining hall, craft shops and beach house will be covered in detail later.

The cabins have been located on high, dry land, offering a good view of the lake, open to breezes and yet possessed of privacy. They have been placed near the center of the three major land areas comprising the island.

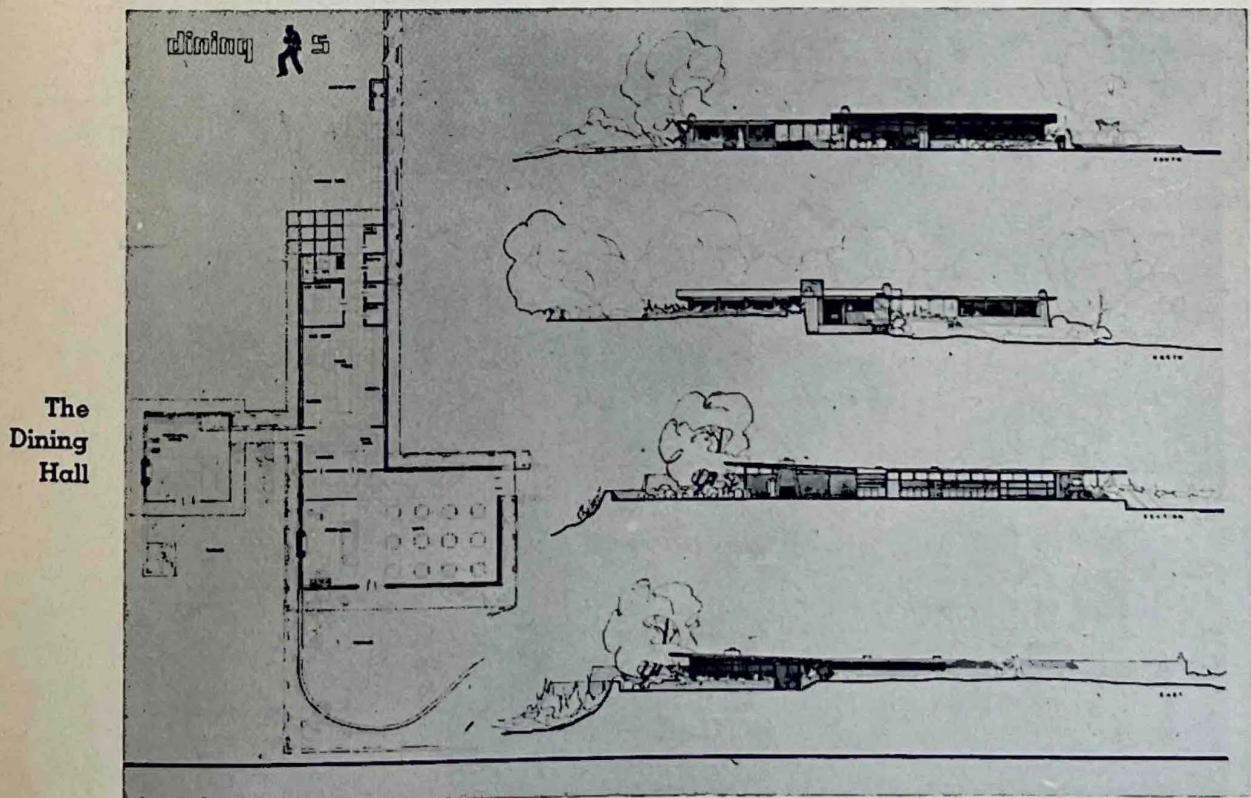
The only area suitable for a general playground seemed to be well situated to all of the buildings. It separates the recreational building from the cabins and provides a place of physical exertion between the sleeping quarters and the active quarters. The individual types of athletic sports then assume their places because of popularity, land contours and danger to others. The Indian Circle is very popular at summer camps. Actually it is simply a natural amphitheater provided with crude timber benches and used to conduct religious services, performances, song fests and many other such group activities.

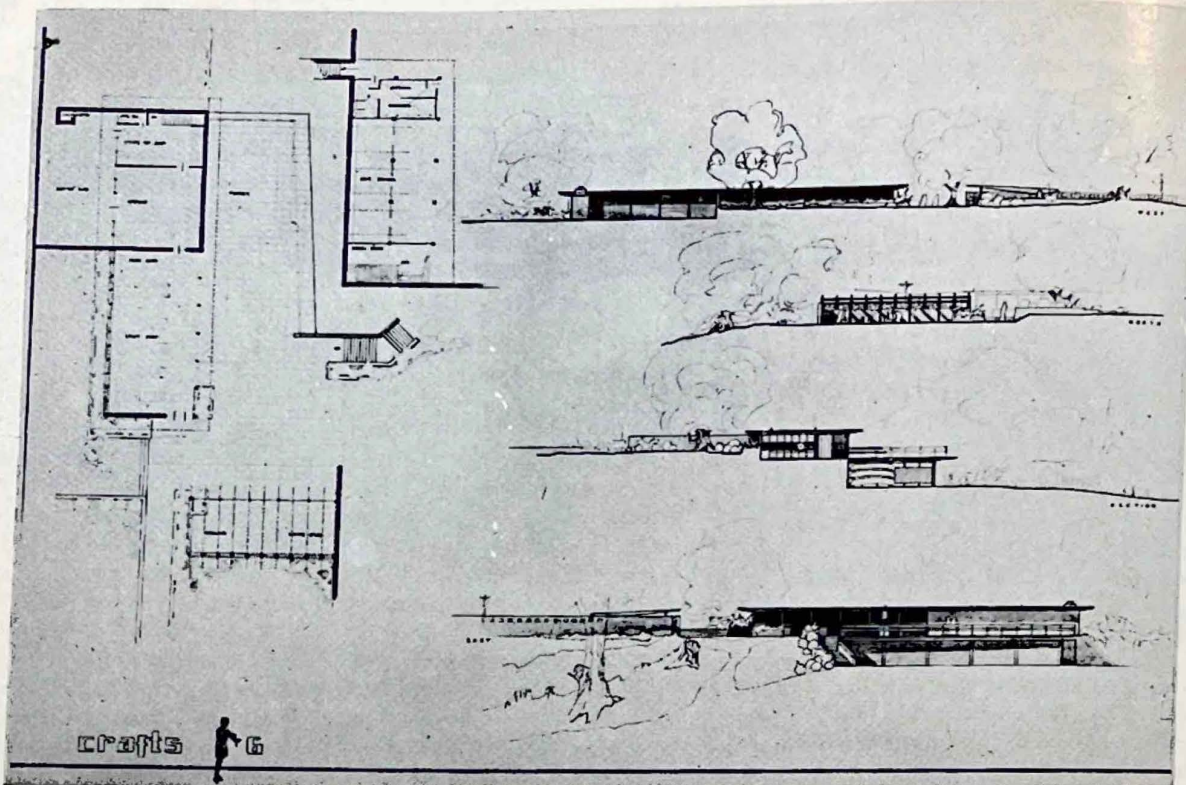
At most camps, the Indian Circle becomes surrounded by totem poles which succeeding groups of boys design and carve. As a result, it becomes a very important show place and social area for the boys as well as for the guests and requires a prominent place in full view of all visitors to the camp.

MAIN BUILDING LAYOUT

The chief location for the recreation hall, dining hall, craft shops and beach house involve three major considerations. First, the relationship to associated outdoor activities and camp layout. Second, the type of activities carried on within the building so that a relatively similar influence might be cast onto the occupants by the panorama and activities viewed from within. Third, the contours of the land itself.

It was decided that all of the buildings, except the beach house, should be located on the same level, on high ground overlooking vast areas. At one time it was considered that





The
Crafts
Building

perhaps one or two or even all of the buildings might be physically connected or even contained within one building. However, since the campers are young and carry their activities to extremes, an excellent opportunity was offered to plan a pleasant grouping about a common garden area and provide easy and adequate open circulation to all of the buildings.

The idea evolved into the plan presented. The recreation hall overlooks the playing field as well as the open grass terrace on the south. The dining hall has a pleasant view out over the placid waters of the lagoon. The craft shops are placed near the beach and waterfront and, of course, the beach house is at the waterfront.

The shape of the interior court resulted from the desire to

place the buildings on approximately the same level with a quick, adequate, well paved path system that the boys would use with a minimum disturbance to those occupying the buildings.

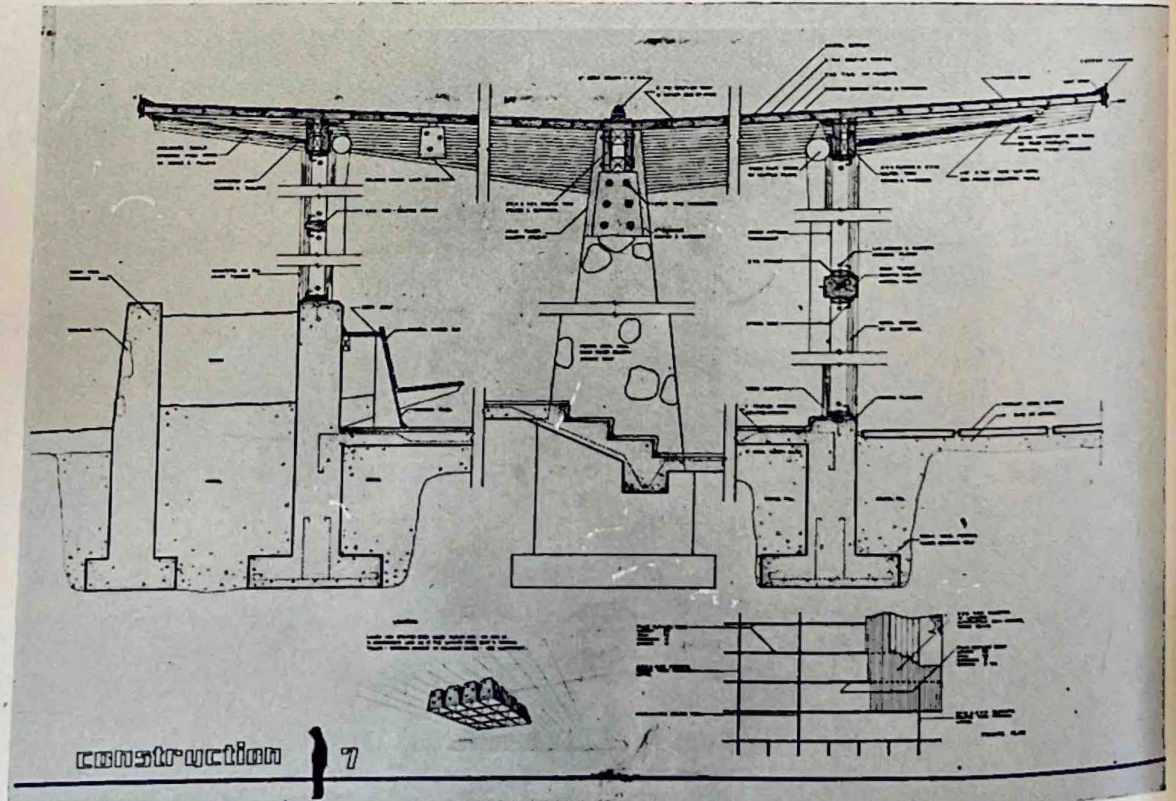
The result is that all buildings face on a related activity area and are backed by a quiet garden around which the major public and service traffic flows.

RECREATION HALL

The recreation hall represents the center of camp activities. The campers gather in the hall upon their arrival and their departure. During their stay, it is estimated that the boys

(Continued on Page 31)

Details
of
Construction

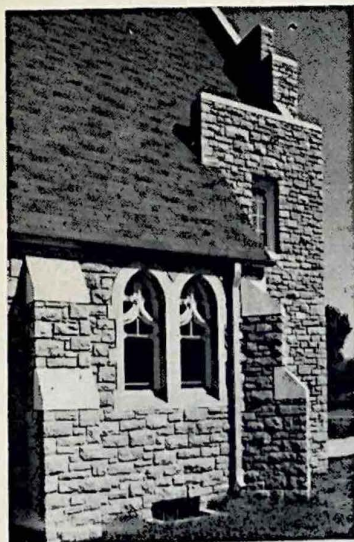
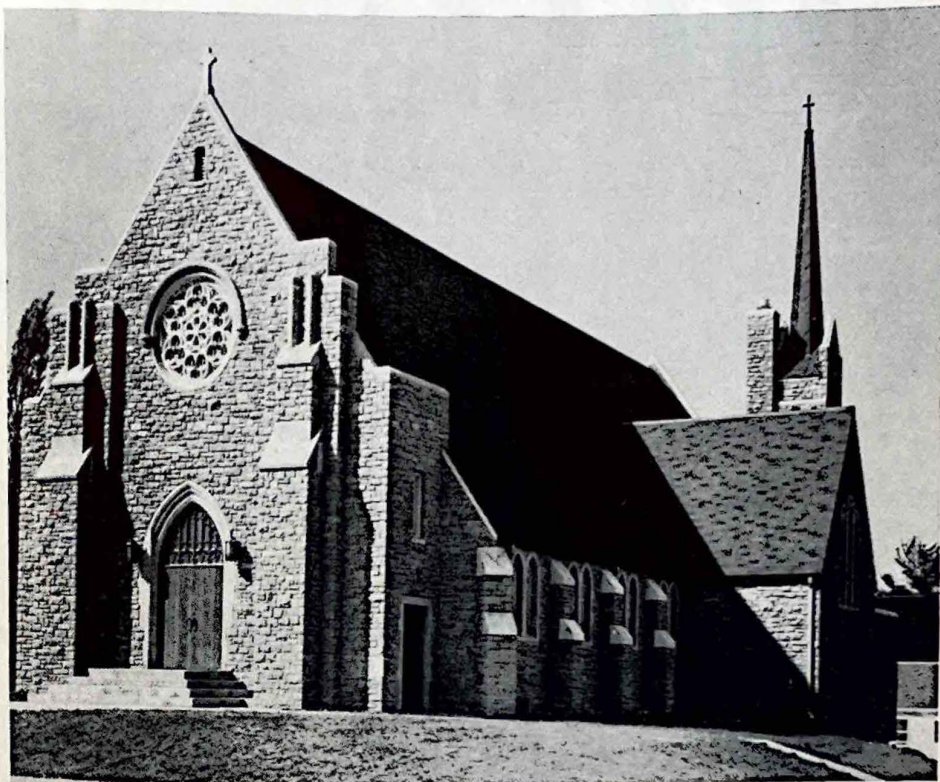


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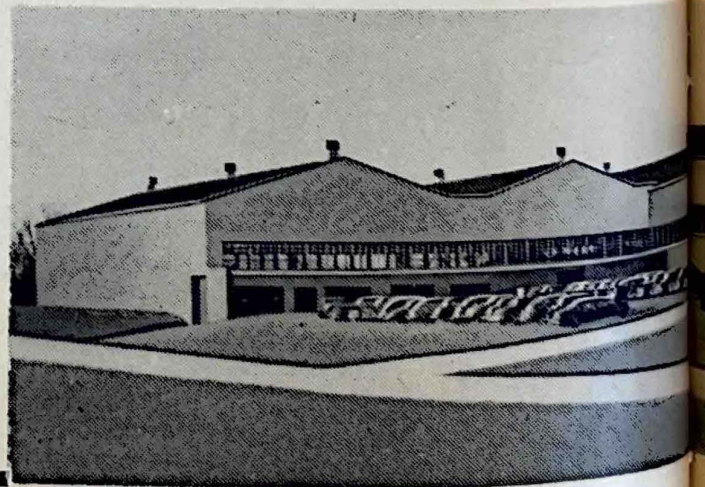
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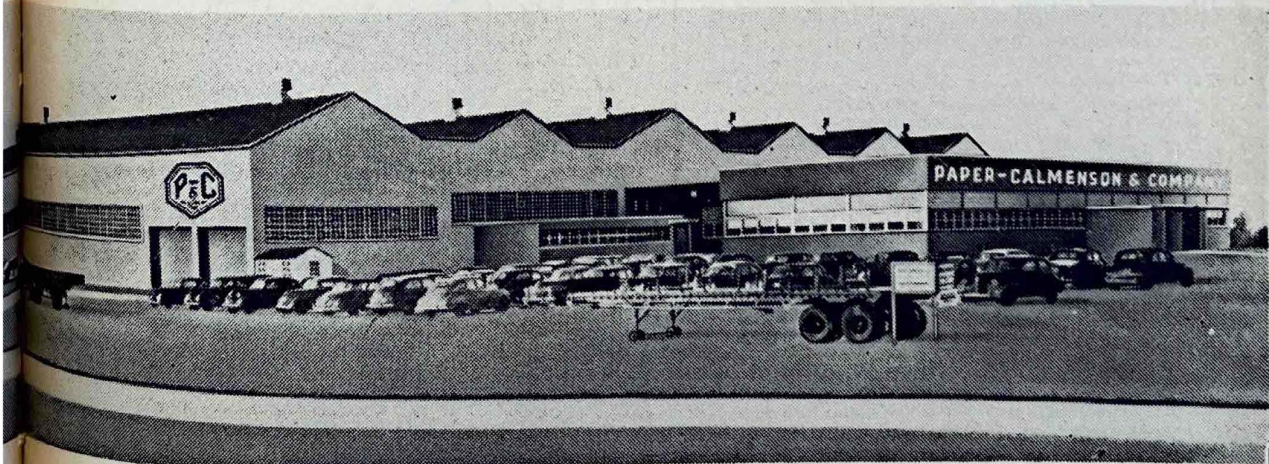
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Wire Mesh

Structural Steel

Form Rods (bolts)

Nails—Wire

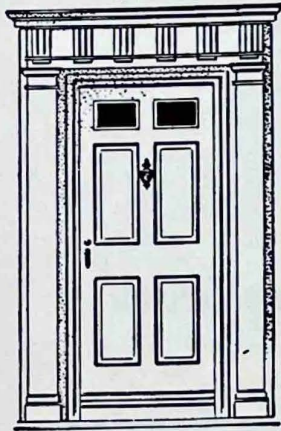


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Mr. Thorshaw

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Other officers elected by the Minneapolis Chapter included James J. Brunet, first vice president; David J. Griswold, second vice president; Harlan McClure, secretary; Clair Armstrong, treasurer; and Sidney L. Stolte and Donald P. Setter, directors.

**NEW COVER DESIGN GETS WIDE
 APPROVAL AMONG READERS**

Our new cover design was dropped into our readers' laps without fanfare and allowed to speak for itself. That it did—and the response to the clean design with its definite accents has been generous and approving. So, to the designer of that cover, Bruce Abrahamson of Long & Thorshov, Minneapolis, congratulations on a fine bit of work and our heartiest thanks!

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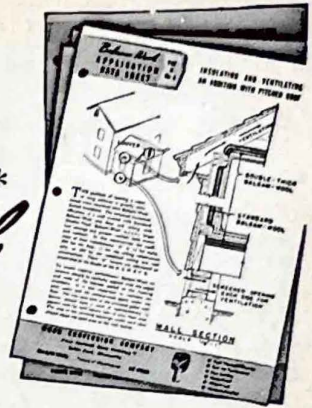


Mr. Abrahamson

age, he is a Navy veteran of the last war, graduated from the University of Minnesota in June, 1949. He worked for Long & Thorshov a year before his graduation on a part-time basis, became a full-time staff member when finished with his schooling.

Next fall he will begin work for his Master's degree in the Graduate School of Design, Harvard University, where he won a scholarship. He is married and lives in Minneapolis at 3527 Pillsbury Ave.

Reaction to the new cover has been widespread and approving, with readers in the Northwest being joined by those in the far west, east and other sections in approbation of the design. It is typographically strong, has good balance and enough movement to prevent stagnation.



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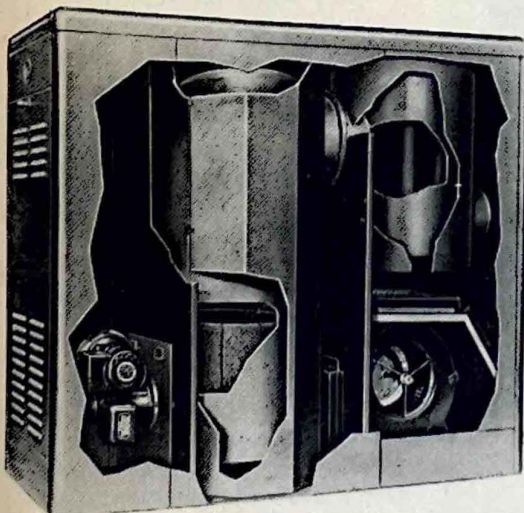
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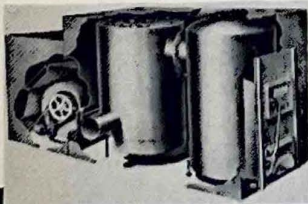
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Watertight Masonry Walls Vital to Structures In Tough Weathered Northwest

The weather of this spring has pointed up the vital needs for watertightness in masonry walls of structures in the Northwest as water levels sopped foundations in a constant soak of ground water. The architect as well as the actual builder must know the proper ways in which watertightness is achieved and in this connection a paper issued by the Structural Clay Products Institute gives some valued pointers based on research

and experience in the field.

The design and construction of walls to resist rain penetration should be based upon the exposures to which they will be subjected, the paper pointed out. These exposures vary greatly in different parts of the United States; the more severe in areas of high precipitation (over 30 to 40 inches of rainfall per year) accompanied by winds of high velocity (50 mph and over).

Variations in the severity of exposures to rain penetration frequently account for the differences of opinion which exist as to the relative merits of various types of wall construction. Two walls constructed with the same materials and similar workmanship may differ greatly as to their apparent watertightness. Often this difference in performance is due to the different conditions to which the walls are exposed.

Extensive laboratory tests indicate that, with controlled workmanship, it is possible to construct brick and tile walls which are watertight and will resist penetration of rains of 12 to 24 hours' duration when accompanied by winds of 50 to 60 mph velocity. However, the workmanship customarily obtained in commercial construction will not resist such severe exposure. For this reason, it is recommended that in areas subject to severe exposure, walls be designed on the assumption that some moisture will penetrate the exterior surface and that positive means be provided to conduct this water to a drain or to the outside of the wall before it reaches the interior face. Cavity walls and various structural tile walls, in which the units themselves contain drainage channels, incorporate this feature in their design and are recommended for such locations.

According to data published in the Building Materials and Structures Report BMS82 of the National Bureau of Standards, there are three principal factors affecting the watertightness of masonry walls:

1. Workmanship.
2. Suction Rate of Masonry Units.

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3. Water Retentivity of the Mortar.

WORKMANSHIP

In the Bureau of Standards' investigations, workmanship was found to be the most important single factor affecting the permeability of the walls tested. Data were obtained from tests on 140 wall sections representing 39 kinds of units, 14 kinds of workmanship and 10 kinds of mortar.

Typical "commercial" workmanship, characterized by deeply furrowed bed joints and only partially filled head joints, was found to be most susceptible to water penetration. All walls so constructed leaked badly.

On the other hand, when the mortar for the bed joints was spread to a uniform thickness and the head joints were completely filled by heavily buttering the ends of the stretcher brick and the sides of the header brick before they were placed, such walls were highly resistant to water penetration.

Another type of workmanship which produces walls of satisfactory resistance to water penetration is the parging of the back of the facing or the face of the backing, either position being effective. The performance of such walls was satisfactory even though only the minimum amount of mortar required for satisfactory appearance was used in the head joints.

In general, the types of workmanship which result in walls highly resistant to water penetration are those providing either solidly filled head joints or a barrier consisting of a continuous parging of mortar within the interior of the wall. A choice of methods for obtaining well filled head joints is possible. Perhaps the most common method is that in which the ends of the stretchers and the sides of the headers are well "buttered" with mortar before being laid in place. Another is that known as the "pick and dip" method in which a sufficient amount of mortar is placed on the bed immediately prior to the laying of each brick so that when shoved into place the brick will force the excess mortar up between it and the adjacent units, thus completely filling the vertical joints.

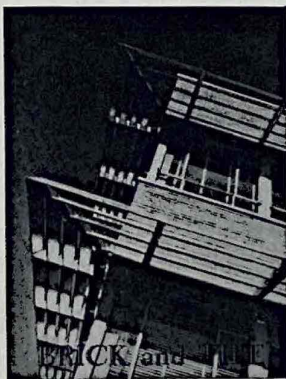
Still another method applicable to solid brick walls only is to lay the units with the minimum amount of mortar and to fill the open vertical joints, course by course, with grout. In building a grouted wall, the construction technique is relatively simple and depends somewhat less upon the human element than any other type of workmanship.

A fourth method, too commonly used, consists of "slushing" the open vertical joints with mortar as each course is laid. Unless extreme care is taken, however, slushing does

not produce full and tight joints.

The method of finishing the exposed mortar joint has much to do with the resistance of the joint to water penetration. Tooled joints which compress the mortar tightly against the masonry units produce the best resistance to rain penetration. The "concave" joint is perhaps the best from this standpoint. It and the "V" joint are formed with special jointing tools after the mortar has reached its initial set. The "weathered" joint is formed as a plain cut or flush joint, finished

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Your monthly copy of BRICK and TILE, the photograph-packed brochure of what's building in clay products, will carry a new and important feature in 1950. Each month "TECHNICAL NOTES" will accompany BRICK and TILE, supplying authentic, factual information on recommended design and construction practices using brick and tile. An A.I.A. file number will be assigned so that you can make "TECHNICAL NOTES" a part of your permanent file of technical information. Volume 1, Number 3 will appear this month. We believe that you will welcome this valued reference data.

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with the joint of the trowel after the mortar has stiffened slightly. The "flush" or "plain cut" joint is less desirable as a weather resistant joint while the "struck" and "raked" joints are definitely not recommended for use in exterior walls since their weather resistive qualities are distinctly inferior to the first four joints illustrated.

Suction Rate of Masonry Units

In order that the mortar may reach its ultimate strength and develop complete and full bond with the units, it must have sufficient

water present for complete hydration. A masonry unit with a high rate of absorption will separate the water from the mortar before hydration is complete, thus weakening the bond between the mortar and the unit and making possible the penetration of moisture through cracks between mortar and masonry unit. Therefore, the suction rate of the brick or the tile when laid has a marked influence on the subsequent performance of the wall with respect to its resistance to moisture penetration.

The suction rate is defined as the amount of water, in grams, absorbed by 30 square inches when the unit is placed in water to a depth of $\frac{1}{8}$ inch for one minute, and can be obtained from the following formula:

$$S = \frac{W^1 - W}{A} \times 30$$

Where S=suction rate, in grams
 W=weight of unit, prior to partial immersion, in grams
 W¹=weight of unit after partial immersion for one minute, in grams.
 A=net cross-sectional area of surface immersed.

A standard method for determining the initial rate of absorption or suction is included in ASTM Standard C67-, Methods of Sampling and Testing Brick.

Data indicate that the suction rate of brick when laid should not exceed 20 grams (0.7 oz.). Brick with suction rate in excess of that should be wetted before being laid, and tile having absorptions (1-hour boil) of 12 per cent or more should also be wetted for the same reason.

Water Retentivity of Mortar.

Within a wide range, the type of mortar used had no appreciable effect upon the resistance to water penetration of the walls tested at the National Bureau of Standards. However, the workability and water retentivity of the mortar is of great importance. Good workmanship, described earlier, is more difficult to obtain with a mortar of poor workability which stiffens rapidly in contact with a highly absorptive unit, or tends to "bleed" when used with very low absorptive units.

The water retentivity of a mortar is, in a degree, a measure of its workability and, as such, becomes a very important property in considering the resistance to moisture penetration and strength of the wall in question. The water retentivity of a mortar is expressed in terms of "flow after suction." A standard method of test for water retention of mortars is included in ASTM Tentative Specification C91- for Masonry Cement. It is recommended that for best results a mortar shall have a water retention, or flow after suction, of not less than

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70 per cent. In other words, the flow after suction for one minute should be not less than 70 per cent of the initial flow. The flow of mortar is related to its water content and, generally speaking, for any given ingredients, the higher the water content, the greater the flow.

Summary.

The resistance of masonry walls to rain penetration is determined more by the workmanship or the method of forming the joints than by any other factor. Walls with solidly filled vertical joints, however obtained, or with a continuous layer of mortar in the interior are highly resistant. The completeness and strength of bond between the units and the mortar are greatest when the units, when laid, are as wet as possible without "floating" and the joints are completely filled with a water-retentive mortar mixed with the maximum amount of water possible to obtain satisfactory workability.

Certainly not to be overlooked is the matter of proper design of the walls, particularly in areas subject to severe exposures. Adequate and properly installed flashings at critical points in the wall and other means of diverting to the outside any moisture which may penetrate the outer face go hand in hand with good masonry workmanship and the proper selection and use of materials on the job.

Laboratory research, together with field experience, indicate that water-tight masonry walls can be built without paying a premium, if proper attention is given to the recommendations listed above.

Repairing Leaky Walls

While properly constructed clay masonry walls are remarkably free of costly repair and maintenance, the repair of a wall that has developed leaks because of poor initial workmanship or design is both difficult and expensive. Inadequate or improperly installed flashing is often a cause for such leaky walls; however, the trouble can, in most instances, be traced to the mortar joints themselves.

When such is the case there are three methods of repair that may be followed:

1. Cutting out and repointing all mortar joints

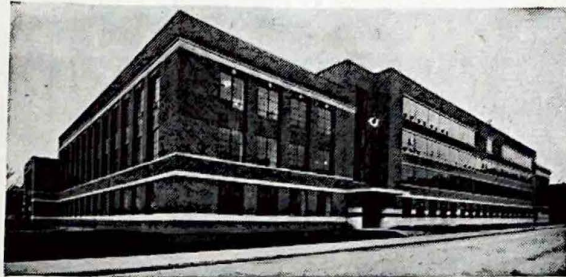
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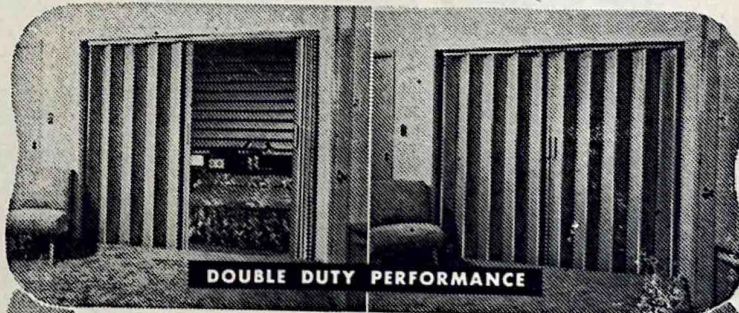
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2. The application of cement grout or cement-water paint to the joints or to the entire wall surface
3. The application of a transparent waterproofer.

The cutting out and repointing of the mortar joints in the affected area is the most effective but also the most costly of the three methods. The joints should be cut out to a depth of at least 1/2 inch and repointed or filled with proper mortar. In some cases it may be difficult to determine the defective joints by visual inspection, therefore *all* joints in the affected area should be cut out. This cutting may be done by hand, or when large areas are involved, by power tools. Care should be taken not to damage the units. When the cutting is completed, all dust and loose material must be removed by brushing or, preferably, with a water jet. The tuckpointing mortar should not be denser than the original mortar. The natural tendency to use a rich mortar should be avoided in order to eliminate excessive shrinkage and volume change after hardening. For the same reason it is recommended that the mortar be pre-hydrated before using. In the absence of information on the density and proportioning of the old mortar, a pre-hydrated mortar mixed in the proportions (by volume) of 1 part cement, 1 part hydrated lime, and 6 parts sand is recommended. The mortar should be packed tightly into the joints in thin layers and finally tooled to a smooth compact surface with a round jointer.

When mortar cracks and openings are small, a two-coat application of

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cement-sand grout brushed vigorously into the mortar joints will provide an effective and less costly waterproofing method. A typical recommended mixture consists of equal parts, by volume, of portland cement and dry sand passing a No. 30 sieve, with $\frac{1}{4}$ part of cement replaced by limestone flour, powdered flint, or fine hydrated lime. The joints should be thoroughly wetted before applying the grout and a template may be used to help keep the surfaces of the masonry units free of the grout.

Where changing the appearance of the wall is not objectionable, a less expensive method of waterproofing consists of a single application of cement grout to the joints, followed with two coats of cement-water paint applied uniformly over the entire wall surface. Tests at the National Bureau of Standards show cement-water paints to be highly resistant to water penetration and durable when properly mixed and applied.

Colorless waterproofing materials, of which there are numerous proprietary mixtures on the market, appear to be of little or no benefit as waterproofing when applied to walls that leaked badly according to the results of the tests at the National Bureau of Standards, reported in Building Materials and Structures Report BMS95. Where wall leakage was through fine cracks in the joints, some colorless waterproofers were effective for a period of a year or two, but after weathering, their effectiveness as a waterproofer became considerably lessened. There are colorless waterproofers on the market for which fine performance records are cited. Therefore, it is recommended that before using such a material, its performance on similar jobs in the area be investigated carefully.

HOSPITAL SEMINARS

(Continued from Page 10)

are emerging in anesthesiology. Each of these developments is having its specific effect on hospital design. Many of you are planning or building hospitals today with central oxygen supply systems and providing storage space for parenteral fluids or you are making room for the equipment that's needed in hospitals where they make their own fluids. The increasing demand for blood is reflected in the administrators' demand for space in which to draw, process and store it. Recovery room concept is developed partly from nursing economics and partly from the constant proliferation of new anesthetic and surgical techniques. Nearly all the methods that have been mentioned here and many others have added, of course, to the traffic and central sterile supply which has become a tremendously important space in the hospital which, on your plans of 15 or 20 years ago, didn't exist.

"More important than the individual effects of any of these new techniques, however, has been the total impact of all of them on nursing service. Like medicine itself, nursing has grown more and more complex. However much hospital people may regret the passing of the good old bedside nurse, who wasn't too proud to carry bed-pans and make beds and hustle trays and tidy up the room, the fact is that she isn't coming back. Not because she is too educated but because she is too busy. The division of function among professional and practical nurses and other auxiliary nursing personnel may permit you to keep abreast of changing

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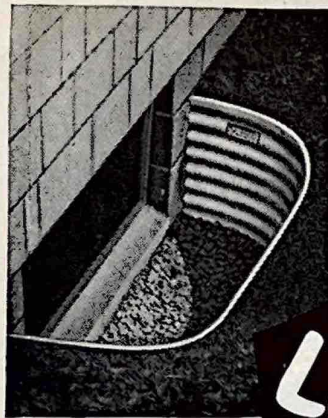
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medical developments without radically altering the size or design of the nursing unit.

"A recent study made by a member of Mr. Ellerbe's firm, I believe, of hospital nursing service resulted in the recommendation that nursing floors should be designed in the shape of a cross with patients' rooms in the wings and services located in a central core. Under this plan it was suggested it should easily be possible to include as many as 60 to 100 beds in the nursing unit. The facts of this study were persuasive and the economic logic of the recommendation was unassailable. Obviously, the need for comparatively high-paid supervisory talent diminishes as the area that can be covered by a single supervisor is enlarged. It is possible, however, that the limits of adequate nursing supervision may be established as much by the discipline of medical procedures as by the economics of space and distance and it seems fairly safe to predict that medical procedures are likely to get more complicated and time consuming rather than less so with the passing years.

"So far we have considered only those new techniques that are already in active clinical use and when we come to consider the clinical promise offered by methods that are still undergoing trial, the lid comes all the way off.

"Certainly some of the dizziest possibilities for hospital design lie in the use of radio-active materials in the diagnosis and the treatment of disease. Commenting on early experimental results in the use of radio-active iodine in the treatment of cancer of the thyroid, Doctor Lee Farr, of the Atomic Energy Commission's Brookhaven Laboratory on Long Island, recently pointed out that if these methods are successful hospitals may have to have a labyrinth of lead lined rooms for patients undergoing treatment.

"Radio-active materials are also being used in the treatment of leukemia and a recent report from Harvard Medical School indicated that a treatment using radio-active iodine had been successful in approximately two-thirds of a group of patients with myocardial insufficiency. Obviously, it wouldn't be sensible for you to look at a few of these preliminary reports and then rush out and start building hospitals with lead walls, ceilings and floors. On the basis of today's results, however, it would seem sensible for us to make plans which admit the possibility that atomic treatment rooms may be required during the life of the building. When you consider how recently any such statement as that would have been laughed out of the house, you get some idea that anything might happen in the next few years.

"A review of this kind can mention only a random few of the changes that are coming. Possibilities that might result in successful efforts to synthesize the hormone ACTH are suggested in reports of its promised effectiveness in the treatment of various forms of cancer, heart disease, hypertension, neuritis, gout, rheumatic fever and a long list of metabolic disorders. One can only guess at the effect that any such development might have on hospitals. If you convince yourself that the effect might easily be not only noticeable, but drastic, consider for a moment the altered ratio of surgical to medicinal facilities that will be required in the acute general hospital if a successful non-surgical treatment for cancer should emerge from any of over 200 research centers now concentrating on that problem . . ."

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University Jury
Weighs Values
Of Senior Theses



Toughest examination of the graduating senior in architecture is his presentation of a thesis problem's solution to a jury of practicing architects and instructors. They are the ultimate in practicality and bring to their discussion of the theses all the experience of hard years in the practice of the profession. It is the first time, in most cases, where the architectural student comes up against such a formidable array of critics. At the current jury meeting at the University of Minnesota's School of Architecture, these experts pooled their knowledge to decide the grades for the theses of 13 graduating seniors.

The jury was made up of Roy Jones, head of the department, G. Fred Keck, Chicago architect, and

members of the department's staff. In the picture are shown (standing, left to right) Brooks Cavin, Richard Hammel, Donald Heath, Norman Nagle, Mr. Jones and graduating senior Garry Tee, presenting his thesis, and (seated), Carl Graffunder, Winston Close, Gordon Heck, Harlan McClure, Rhodes Robertson, Robert Jones, Mr. Keck and Robert Cerny.

Graduating seniors who presented their theses to the jury were Donald Brown, Gene Greene, Arthur Haglund, Walter Hodgson, Richard Lewis, John Madson, Masao Matsumoto, William Miller, George Norman-din, Ira Rush Vernon Shogren, Garry Tee and Donald Wexler.

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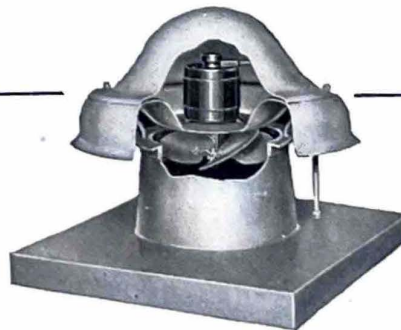
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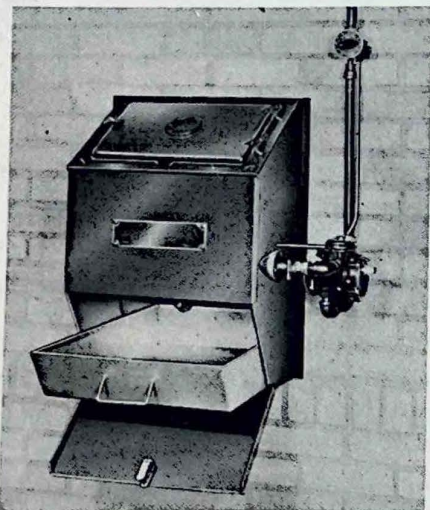
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HOUSEHOLD WASTE TO FERTILIZER IS POSSIBLE WITH NEW INCINERATOR

A household incinerator which reduces all combustible waste, both wet (like garbage) and dry, to a couple of quarts of ash which make good garden



fertilizer is the automatic gas unit made by Incinerator Products Co., 667 Post Ave. S., Detroit 17, Mich.

Called the Triomatic because it lights, shuts off and has a flame failure protection mechanism, all automatic, the unit is installed in the wall of the chimney at a height which eliminates need for stooping to load or clean. Waste baskets, garbage containers, etc., can be emptied directly into the receiver even when it is operating.

Ashes are removed by means of a tray at the bottom and the average family's monthly accumulation of ash is about two quarts, makers report.

HONEYWELL ADDS AERO ENGINEERING BUILDING

Indicative of the times and the increased importance of aeronautical engineering is the new aero engineering building built by the Minneapolis-Honeywell Regulator Co.

Ellerbe and Co., St. Paul, were architects for the two-story, 80,000-square-foot structure of reinforced concrete and brick, C. F. Haglin & Sons, Minneapolis, general contractors. The new building adjoins the company's aeronautical production plant, which contains 103,000 square feet. It was acquired a year ago.

Occupancy of the new building is planned for November 1, according to Alfred M. Wilson, aeronautical division vice president. The expansion was required by increased production of aeronautical controls such as autopilots, fuel gauge systems and turbo

regulator control systems as well as increased research and engineering developments for new products now in the design stage.

The new building has footings which would allow for construction of another 40,000-square-foot story.

INDIVIDUALIZED AIR CONDITIONERS INTRODUCED BY McQUAY

Individual room air conditioning is now possible with under-window units being introduced by McQuay, Inc., Minneapolis makers of heating, refrigerating and air conditioning equipment.

R. J. Resch, McQuay president, said the unit is available in three basic sizes and can be installed in either new or old buildings. Its fittings make installation easy. A damper on each unit allows for individual control for personal comfort and air intake can be had either through pipes from a central basement blower or from a unit-contained connection to the outside.

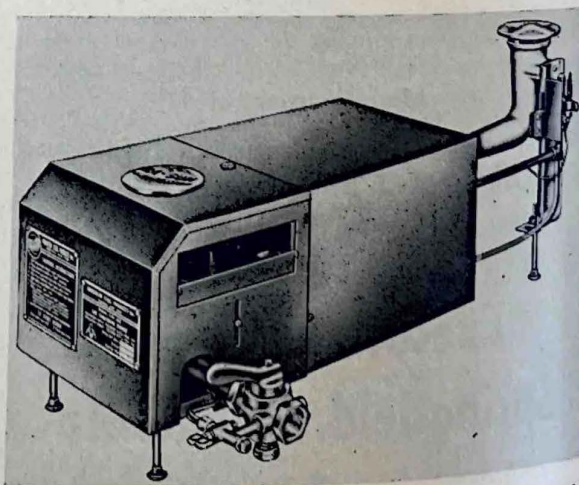
Finish is a prime coat which allows the unit to be painted to match its surroundings. All wiring and piping connections are concealed. Units can be installed without cabinets for complete concealment within walls and they can also be adapted for ceiling suspension. Servicing is easily done by removal of the cabinet sections.

Quiet in operation, the conditioner is smooth inside, keeps dust accumulation to a minimum.

MOR-SUN ADDS GAS CONVERSION BURNER TO PRODUCTS

To keep its line of products in step with modern trends in home heating, the Morrison Steel Products, Inc., Buffalo, N. Y., has added the MOR-SUN Gas Conversion Burner.

The makers report the new burner is ruggedly built and field tested, reasonable to install and has an input of from 75,000 to 150,000 Btu per hour, burning



natural, mixed or manufactured gas. Burner is a single port with high chrome content flame spreader plate. Flame is semi-luminous, has considerable operating economy.

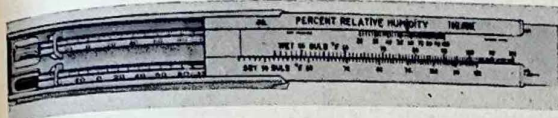
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shutters and thermostat are among other features of the burner. The burner is guaranteed for one year.

RELATIVE HUMIDITY EASILY READ WITH NEW INSTRUMENT

Relative humidity, vital in working with heating, ventilating, refrigeration, etc., in building design, can be easily determined by using the new TAG Pocket Humidicator put out by Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J. Contained in a box shorter than a pencil, the instru-



ment works on the accurate wet and dry bulb readings principle and application of a couple of drops of water before fanning the instrument is all that is needed. The temperatures on the two thermometers are correlated and the relative humidity arrived at by use of a simple slide rule which is the cover of the instrument's case.

The TAG Humidicator can be read in hand or mounted on a wall. Further details and prices can be obtained from the maker.

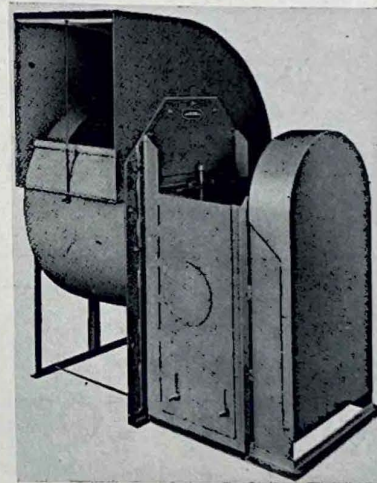
STREAMLINING COMES TO CABINET HARDWARE

Streamlining has come to the design of cabinet hardware with introduction of a rocket inspired drawer and cabinet pull by the Burkard Mfg. Co., Centerline, Mich. The new design, "Streamotife," is in chrome over solid base metal, is in several sizes to fit the needs of varying sized equipment. Details and prices can be obtained from the company.

VENTILATOR HAS PRECISE CONTROL, HIGH UTILITY VALUE

A completely redesigned utility ventilating unit whose precise controls give its user a wide range of air volumes to meet his particular needs has been announced by the United States Air Conditioning Corporation.

The ventilator's design allows it to be used indoors or outdoors with just the addition of a belt guard. Motor and bearings are well housed and cooled by air drawn through a slot in the bottom of the belt guard. Simple construction with rugged performance co-



efficient is the aim of the ventilator's designers, according to R. A. Nelson, manager of USAIRCO's blower division.

Unit sizes give volume ranges from 800 to 18,000 cubic feet per minute at various speeds and pressures.

BOYS' SUMMER CAMP

(Continued from Page 16)

will spend more time in the recreation hall than any other building on the grounds.

Each evening, before retiring, the boys gather to play games, perform or watch short plays, read, write letters or do most anything that may come to their minds. When the weather does not permit outdoor activity, the recreation hall becomes their major activity area.

The over-all dimensions of the hall are 48 feet by 80 feet, divided into two main portions by a low masonry wall. On one side the boys can play table tennis and other games or gather around the fireplace for religious worship, lectures and plays. The entire area is open and can be arranged in any manner for whatever occasion. A preferred arrangement is only suggested in the plan. The library, toward the back, actually exists as a lounge. It does not contain elaborate textbooks but rather periodicals and books on handicrafts, Indian tales, wildlife, camp life and such, through which the boys can find ideas for hand skills and have a means to occupy them in the evenings and during periods of inclement weather. The library desks are utilized as writing desks as well.

A small office and toilet are provided for the personnel and clergy where private discussions are held.

A storage room for athletic equipment and other bulky equipment is separated from the library by small storage cabinets in which can be stored games and such.

ARCHITECT

DINING HALL

The dining hall has been placed to one side where it is felt by the author to be sufficiently distant from the active areas so that it will not be surrounded by constant turmoil throughout the day. Yet it is near at hand so that it is accessible without difficulty. The main dining hall is open to the boys on two sides only. The west side and kitchen are the beginning of the barrier which restricts the boys from the grounds occupied by the camp personnel.

The boys are seated at tables in groups of four. The counselors are seated at a common table before the fireplace. This is typical of a scheme suggested where no one large group of boys are together and consequently hard to handle. The boys serve one another by groups throughout their stay, cleaning up as well. Therefore, the serving counter and dishwashing machine are operated by the boys and have been placed at one end of the kitchen where the boys may easily be confined and out of the way of kitchen help.

The personnel dining hall is connected to the kitchen only by a covered walk. A lounge space, dining facilities and a paved terrace are provided for complete privacy for personnel and guests.

The kitchen employs two or three men, a cook, baker and a helper. Refrigerators for meats, vegetables and dairy products are on one side of a short service passageway and a dry store room, office and toilet are on the other side. The kitchen proper enjoys excellent cross circulation and still maintains a great deal of privacy. Auxiliary ventilation is provided by overhead mechanical and natural ventilators. A spacious loading platform at the north end of the kitchen permits easy

movement of goods and provides more space for the well room. A permanent type of incinerator is incorporated with the architecture close to the kitchen so there need be no excuse for collecting refuse.

A well room has been designed large enough so it might accommodate the well, the water pump, water heater and bottled gas equipment. Directly above the well room, a storage tank of sufficient capacity is provided to supply a constant wa-

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ter pressure at peak demands when the pump or well might be overtaxed. Water employed in fighting fires is applied by an entirely separate system. The general practice is to use lake water because it would be too expensive to drill a well large enough to provide the quantities of water necessary.

CRAFT SHOPS

A craft shop is provided for the boys so they can have the opportunity to realize the enjoyment of actually making many things with their own hands. Here the boys are taught, or rather learn under supervision, the fundamentals of wood working, leather craft, ceramics and painting. They are not required to attend classes regularly; they are invited to enjoy the facilities under a competent director.

The craft shop is open on two sides, the east wall is formed by columns only and the west wall by a low masonry wall and columns. Individual tables are provided for work for the crafts other than woodworking. A long table or bench is provided against the west wall for woodworking. Project storage cabinets are under the benches and the tool storage cabinets form a wall between the craft shop and paint shop. Sinks are placed on the tool cabinet counter, one in the craft shop and one in the paint shop.

At first glance the storage area for materials appears too large. However, storage space is provided for materials and equipment required for maintaining the buildings and grounds on the island as well as supplying the shop. A regular overhead door enables a truck to back into the storage area to accommodate easy delivery of materials and transportation of equipment.

A caretaker's workshop equipped with complete facilities for maintenance work is given a choice and generous area within the building. Here the caretaker can work in private and exercise complete control over the stock and equipment. A heater room providing hot water to the lavatories in the shops and to the showers in the beach house as well as heat for the caretaker's shop in the winter consumes very little floor area in a position that is easily serviced.

Again an incinerator has been provided so that refuse will not collect and remain in the shops where the danger of a fire is a constant threat.

Ceramics and nature study, it was reasoned, might well be conducted out-of-doors since they do not employ elaborate equipment and furnishings. Therefore an open area, spanned by wood beams over which canvas sun shades could be easily manipulated to provide protection from the sun when necessary seemed to fulfill the requirements.

A paved terrace adjoining the craft shops and outdoor study area enables these areas to be expanded at will. It is conceived that the boys may like to do their carving, painting, etc., out-of-doors in pleasant weather. Here they can be restricted to the paved area under observation at all times. The terrace serves double duty as a sundeck for the beach as well.

BEACH HOUSE

The beach house is composed of boat storage, beach equipment storage, small office for waterfront director, dressing and shower room and toilet.

There is boat storage capacity for 12 rowboats and 8 canoes plus the assorted bulky beach equipment such as mooring buoys, ropes, posts, etc. Storage room for small beach equipment which may be distributed only by permission of the director is designed in conjunction with his office so he can exercise proper control. The waterfront director is also responsible for every boy on the beach. Each boy at the waterfront must register with the director upon arrival and departure.

A few showers and small dressing rooms, with adjoining

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toilets, seem desirable for obvious reasons. The partitions enclosing the different areas are of corrugated transite panels, neither reaching the ceiling nor extending to the floor. This design was employed for reasons of air circulation and cleaning. Overhead garage type doors enable the structures to be thrown completely open at will for convenient handling of boats and other bulky equipment, as well as enclosing any particular area or all areas, as desired.

CONSTRUCTION

Two major thoughts, other than design, influence the type of construction and material employed. They are the type of skilled labor available at a minimum cost and the type of materials close at hand. It was soon realized that the majority of skilled laborers were carpenters, as is common in rural areas, and that lumber was available in all surrounding areas as well as innumerable gravel pits throughout the countryside (one such pit is located on a farm adjoining the island). The abundance of boulders of all sizes on the island had its influence on the design and construction as well.

With this reasoning justifying wood construction, three competent men in the building field were consulted—Prof. Robert T. Jones and Prof. Joseph Wise of the University of Minnesota and LeRoy Cars of Wilco Products, Inc.

The fact was established that a laminated wood beam would not differ in price whether it were tapered or straight. It seems as though the saving of lumber at one end of the tapered beam makes up for the excessive lumber employed at the opposite end of the beam. The cost of fabrication is the same in either case. From here on, the problem is relatively simple.

As shown in the detail drawings, a laminated wood beam 38 feet in length and spanning 32 feet with an overhang of 6 feet and a spacing of 8 feet O. C. was used on one side of the recreation hall. Another laminated wood beam 20 feet in length spanning 16 feet with an overhang of 4 feet and also spaced 8 feet O.C. was employed to complete the roofing of the recreation hall. The minimum depth of the beam required to resist the maximum bending movement was found to be 16 inches for a width of 8 inches. It was then calculated that this depth would be more than that required to resist the shearing stress at either end of the beam. The shearing stress, it was found, could be resisted by a section 12" x 8", consequently the beam was designed with the gradual taper of 1 inch in 4 feet, resulting in the following depths for the 38-foot long beam: 20 inches at one end, 16 inches in the center, 12 inches over the load bearing column and 10 inches at the opposite end.

The structural bearing columns are of solid timber measuring 6" x 8". The load is transmitted from the beam to the column by a malleable iron cap and from the column to the masonry wall through a steel bearing plate, both equipped with shear plates and bolted to the different members. Four-inch x 6" non-bearing timber columns are spaced on center between the bearing columns to reduce the width of both the screens and the plywood enclosure panels.

The interior columns consist of tapering solid timber members that receive the load through bearing pressure and also two 2-inch planks on either side fastened to the column and

the beam by split ring connectors and bolts. The forces transmitted to the concrete wall are then received by steel bearing plates. The lintels consist of 2" x 10", 2" x 12" with 2" x 2" blocking and 2" x 14" with 4" x 4" blocking each bolted through as shown in the detail drawing.

The roofing is 5-ply built-up asphalt paper tarred and graveled with a 6-ply portion near the roof drains. The roof con-

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struction consists of 2" x 8" T. & G. fir planking 16 feet in length. Each plank alternately spans three different beams. Thus they assist each other in preventing sagging since they have a tendency to sag or deflect upward along adjoining edges on either side of their points of counterflexure. The

type of finished surface for the different members is indicated on the sheet of details. However, all surfaces are varnished so as to prevent absorption of water.

The enclosure panels consist of 1/2" 5-ply type "EXT-DFPA" plywood framed in oak. Where the oak frame is grooved to receive the plywood panel the joints are weathered, flashed with thin copper and caulked with marine glue. The panels are manipulated from within by a system of ropes and pulleys as shown and they can either be of the single panel type or folding panel type depending on the opening height they must close. Actually they are employed to enclose a building during the months that it is not in use but they may be used in extremely bad weather. A Ceco Steel Co. metal screen held in place by spring bolts is used because of its ruggedness and easy rescreening as many times as called for without apparent harm to the frame.

A wood slat shade manufactured by Warren Shade Co., Minneapolis, is used as a sunshade, again because of its durability and because it provides some air circulation.

Reinforced concrete footings are employed under load bearing columns only. In other cases a simple poured concrete footing received the floor load. The poured concrete partition wall dividing the recreation hall from the library and storage areas is solid concrete only under the bearing columns. Otherwise it is hollow.

Three-inch roof drains are spaced 8' O.C. between the roof beams. The down spouts are exposed to the interior of the building for a distance of 18" and disappear into the concrete wall and finally to a drainage field away from the building. It is reasoned that the pitch of the roof will gather the water at its center and dispose of it without cascading over the edges onto the campers or necessitating troublesome maintenance problems that are common with gutters.

The choice of lighting offers a heavy metal shade of permanent brilliance that will protect the lamp from breakage since it is contained well up within the shade. The lamps can be grouped in batteries or run in a continuous line depending on the extent of illumination desired.

WATER SUPPLY

Drinking water is obtained from a well located near the kitchen, as previously stated. The entire island is supplied with drinking water and water for other uses from a storage tank situated 45 feet above the lake level. The storage tank seemed to be a necessity for it is reasonable that there will be peak water demands when all of the boys are instructed to go to the showers, etc. Drinking fountains are located at intervals along the supply lines to the various buildings, thus they are located at the end of the playing field, between the recreation and the craft shops and at the beach and on the terrace between the recreation hall and dining hall.

Water for fighting fires is distributed by separate water line to various spots required by competent fire inspector. Lake water is used and pumped independently by a separate pumping station near the craft shops. This enables fire water to be completely independent of housing in a structure that may be destroyed by fire, thus rendering the equipment useless.

FUEL

Bottle gas is employed in the kitchen for cooking and hot water heating as well as hot water heating for personal purposes throughout the island. It has been discovered through research that cooks prefer gas in the kitchen to all other types of fuel. The slight extra cost seems justified when one considers the cleanliness, efficiency and lack of individual responsibility concerning supply.

CONCLUSION

The problem as presented in its final form makes the author humble for a great deal of time and thought was given to the problem and yet there are so many details, methods and even entire designs that remain to be studied. One wonders, particularly as a student, if he will ever experience the joy of saying, "I have completed this."

The "program" which prefaced this thesis has necessarily been omitted as its material repeats the discussions under the various divisions of the major problem.

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