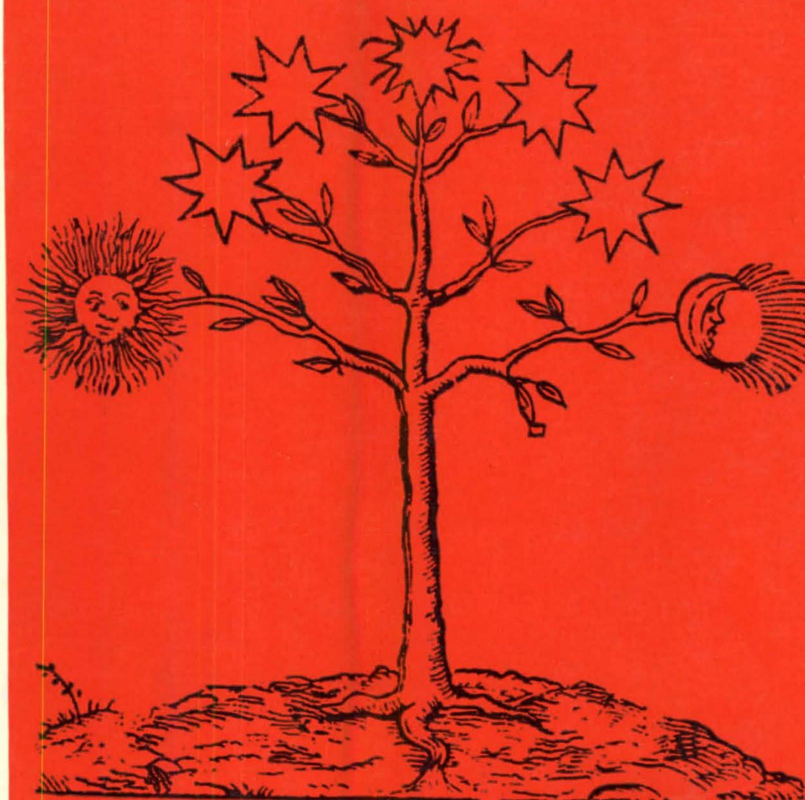
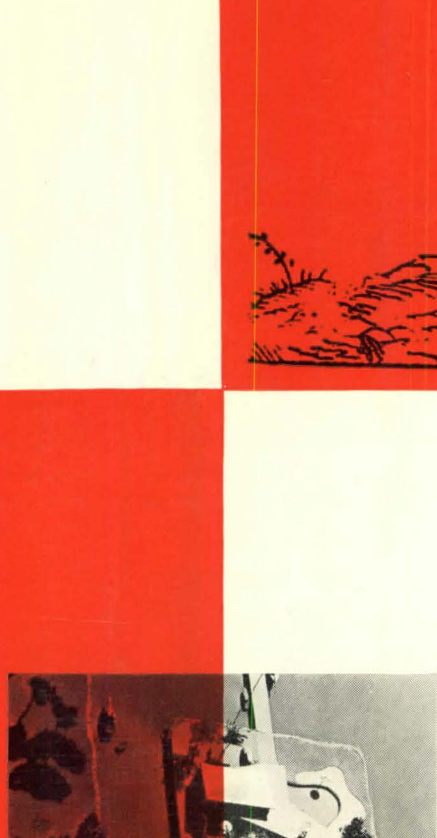
Progressive Architecture



more leisure time



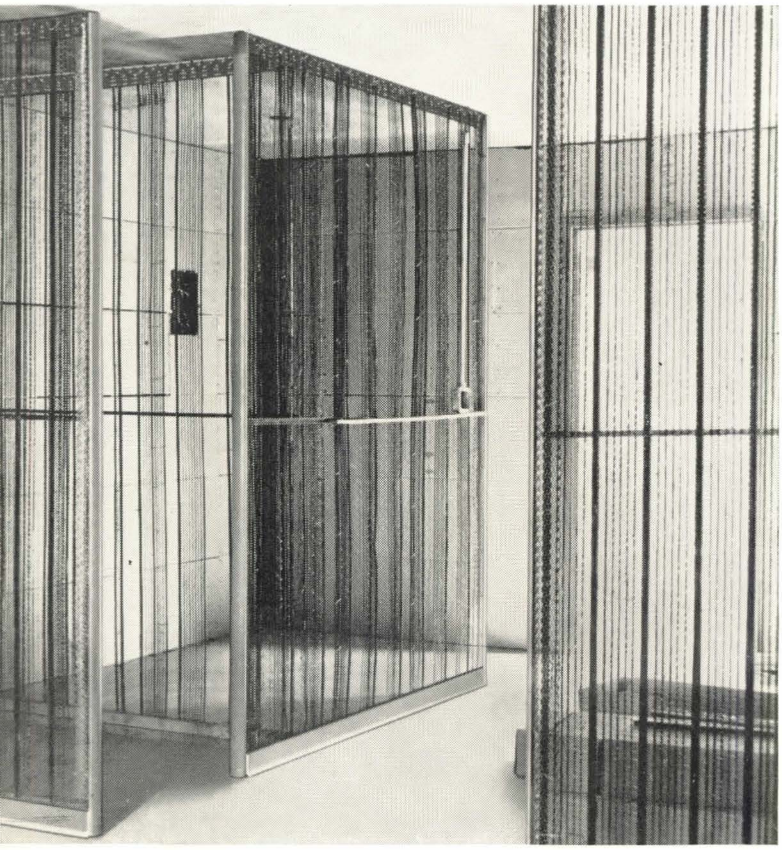
ld's largest architectural circulation

3

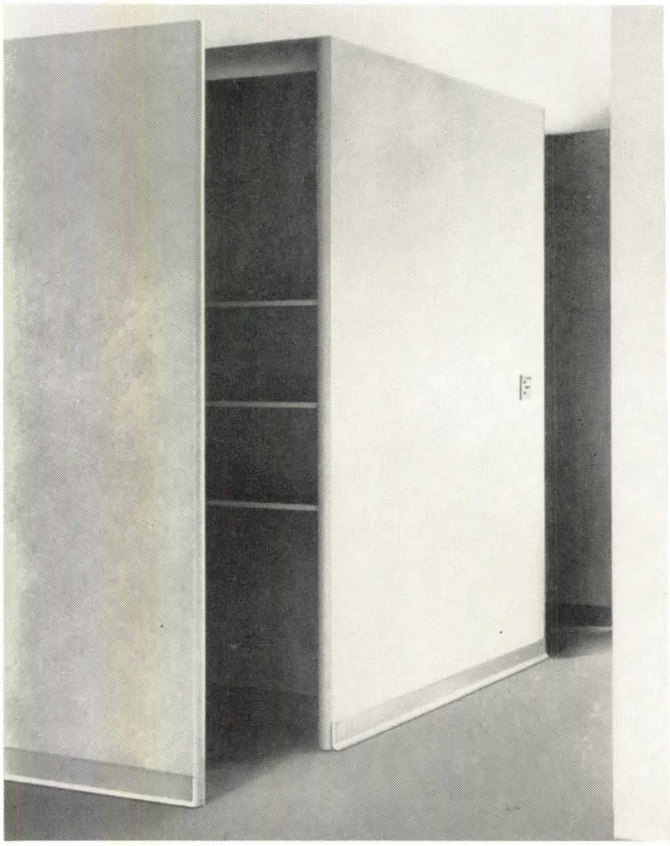
march 1954

MILCOR* Studless Partitions

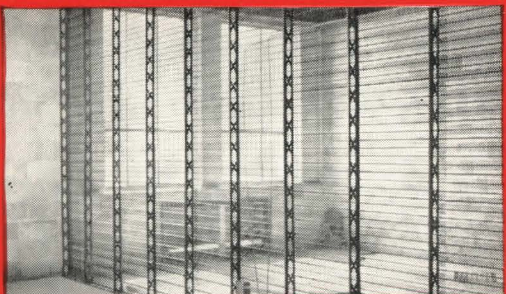
for solid-plaster strength, erected at low cost



Milcor Stay-Rib Metal Lath reinforces the partition vertically. Milcor Housing Base acts as plaster grounds and eliminates the need for base screed.



Partition is plastered on both sides of the metal lath to two-in thickness. Milcor Bull-Nose Corner Bead is used as partition ca



Hollow partitions go up fast with MILCOR Steel Studs

Milcor Hollow Partitions have several basic advantages: (1) A partition-strength equal to, or greater than, that of tile or gypsum block of equivalent thickness; (2) Fire-safety; (3) Exceptional insulation value; (4) Sound transmission loss of 46 decibels (using Milcor 3/8" Rib Lath); (5) Earthquake resistance.

The versatility of Milcor Hollow Partitions commends their use where there are long lines of horizontal conduit or service piping and ducts . . . as enclosures for vertical pipe chases . . . as bathroom and corridor partitions . . . as elevator enclosures.

No studs to cut and install . . . Lathing is quick and easy . . .

Milcor Studless Partitions make 2" solid-plaster walls extremely practical from a cost standpoint — and extend the following advantages to all types of buildings: (1) Saving of floor space; (2) Full one-hour fire rating; (3) Resistance to impact; (4) Reduced floor load; (5) Reduced sound transmission.

Material costs are less, because there are no studs. Instead, Milcor Stay-Rib Metal Lath is erected so that its ribs provide vertical reinforcement. The lath fastens to a ceiling runner and a floor runner — or to a ceiling runner and Milcor Housing Base.

Milcor Studless Partitions are increasing in popularity as non-bearing, subdividing partitions . . . as enclosures . . . as free standing furring walls.

Consult the Milcor Manual in Sweet's Builders' File for helpful information. Write for bulletin.

Metal lath for strength — plaster for beauty.

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p/a newsletter

March 1954

Announcement of $32,500 competition for redevelopment of Chicago's downtown business district has been made by John T. Pirie Jr., President of Carson Pirie Scott & Co., Chicago store. Competition, with $20,000 first prize, is open to "architects, city planners, engineers, persons engaged in allied professions, and college students of these professions, who are residents of continental United States." Professional advisor will be Chicago Architect Howard L. Cheney; Jury of Awards will be made up of recognized Architects, City Planners, and Engineers whose names will be announced after winning solution has been selected.

Pietro Belluschi, Henry R. Shepley, and Ralph Walker have been asked by U. S. Department of State to serve on Foreign Buildings Architectural Advisory Board, recently formed to assist in architectural design of government overseas buildings and to advise Department's Foreign Buildings Operation on location of projects and best types of material for overseas construction. Board will be headed by Col. Harry A. McBride, former Administrator of National Gallery of Art.

Shortly before his retirement from chairmanship of Yale's Department of Architecture, George Howe was honored by surprise ceremony at Yale attended by more than 200 friends, colleagues, and former students. Among members of Yale faculty present was Howe's successor, Paul Schweikher, who assumed his new post on February 1.

Panel discussion on U. S. Gypsum Research Village proved to be one of the high lights of January National Association of Home Builders' Convention held in Chicago. Participants included architects and builders whose low-cost homes will comprise project (see PROGRESS PREVIEW). Architect-builder co-operation has been given further recognition by "Parents' Magazine's" Fourth Annual Builders' Competition for Best Homes for Families with Children. Merit Award winners: Jones & Emmons, Eichler Homes; E. Don Spinney, Place and Co., Inc.; George Nemeny, Irwin W. Chess and N. S. Siegel; Donald H. Honn, Howard C. Grubb; Anshen & Allen, Eichler Homes; and David H. Horn and Walter D. Lucas, Rahlves Company.

For 15th consecutive year, AIA membership has grown—present total stands at 9708, approximately six percent higher than at this time last year. South Atlantic, Texas, and Northwest Districts show largest percentage increases.

Newly organized National Council for U. S. Art, Inc. will endeavor to place contemporary American art in United Nations headquarters. Council's plans are to raise $250,000 through gifts from individuals, corporations, and other groups for purchase of paintings and sculpture by U. S. artists. Boston Architects Nathaniel Saltonstall and George Brewster are members of the Council.

U. S. Departments of Labor and Commerce report expenditures for new construction put in place totaled $34.8 billions in '53—highest volume *recorded in* 39 years data has been gathered. Only types of private work to show decline last year were industrial plant, farm construction, and hospital building.

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Turn page for **WASHINGTON PERSPECTIVE**

newsletter

Frederick Gutheim

Washington Perspective

The chance of any significant economic slump still appears remote. An unmistakable sag in prices and employment will develop. But the Eisenhower Administration, as its position was outlined in the messages to the second session of the 83rd Congress, now stands firmly committed to measures to support the economy during its adjustment following the Korean war. The form which such compensatory measures may take, the skill with which they may be employed, the nature of economic activity they will take — all are secondary to the great fact that the Administration has taken its stand. If a serious depression should develop, in such a managed economy, it could only be the result of incredible mismanagement. Indeed, we seem to have reached the point predicted by the late J. M. Keynes, where the economy is virtually depression-proof. Economic problems may shrink to smaller proportions among the concerns of mankind but in their place will arise question of health, leisure, education, and culture.

Such a rosy view does not seem to me threatened either by international insecurity or by politics. Bipartisan support for the Administration's foreign policy and related international programs of trade-and-aid and mutual defense seems assured. Closely linked to this position is the level and nature of defense expenditures. More should be heard from the President on the subject of thermonuclear weapons, both our own progress in this field and Soviet capabilities. But in this general sector there can be little doubt that the President and Secretary Dulles are finding strong support in Congress. In these chancy and perilous times, it is a strong foundation upon which to build. One's estimate of the strength of an Administration which holds such a slender nominal balance in Congress is much higher because of it.

This curious political situation, with its mixture of stability and insecurity, is the key to understanding the President's domestic program. It explains both the endorsement of liberal measures in housing, health, education, and related fields, and the fact that this endorsement is not immediately followed up with large programs in these fields. This "bargin basement New Deal" is really a stand-by program. Programs are being sympathetically revised, legislation is being kept on the books, skeleton organizations are maintained but little work will be undertaken in the present transition to a hard-money economy. (This change was rather neatly defined the other day as a move from cheap money to easy money — from money "easy to get" to money "hard to resist.") The pay-off will come when a Congress, in which the President appears to have a clear-cut bipartisan working majority, sets the final character and levels of activity in the Administration program.

For architects, it seems to me, the main fact is not government jobs in defense work, hospitals, housing and public buildings. It is continuing stability in the economy, relatively firm prices, productivity. Whether this is enough, in the face of our rapidly growing and dynamic country, with its problems of adjustment and development, and with its future potentialities, looks like the political issue for this fall and, still more, for 1956. The question is no longer whether or not. It is how much, or even, how.

On specific programs of architectural interest, hospital building seems still to be the most important. Thanks, apparently, to Nelson Rockefeller, the growing, unmet need for hospitals has been effectively presented. Rural medical centers, mental hospitals, ambulatory facilities, and other particular deficiencies are being recognized. The outlook now is for a Federal aid program nearly double that of previous years. Far from enough, doubtless, but still a surprising change from last summer when the entire Hill-Burton program seemed headed for the scrap heap.

The housing program seems likewise a clear gain, although far from what many architects might recommend. Under the banner of "home ownership" we are creating a new form of tenure, a fluid legal status suited to the disposable house with the 40-year amortization. Housing in this sense becomes another industrial product, like cars or television sets, to be easily acquired and paid for out of current earnings, neither a vehicle for savings nor an item that is expected to retain its value. The ominous consequences of this deserve further discussion.

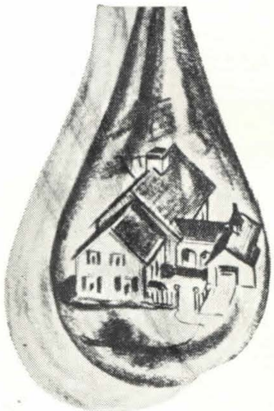
The third item in the late Senator Taft's domestic agenda —Federal aid to schools—also seems to have good prospects. Certainly, it has a high priority among the anti-cyclical measures entertained by the President's economic advisers. Definite action here now seems to be held back more by politics than by Administration policies.

A Federal building and post office program is still shaping up. It should not amount to much in terms of capital outlay, but a large modernization activity is in prospect and the outlook for the lease-purchase program is still good.

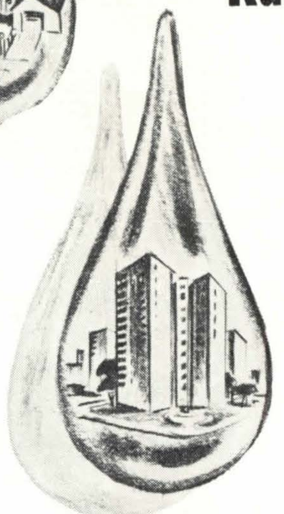
PROGRESSIVE ARCHITECTURE

pa

March 1954



Little Drops of Water (Condensation) Ruined a Fine Home - - - Cost over a Million Dollars to an Apartment Development



They thought they would move their fine country home to a new site. The state highway was coming through. They could not! Account of condensation inside the walls, the sills had rotted away.

The owners of a path-breaking apartment house development in a great city had to pay a repair bill of more than a million dollars for ripping out condensation-soaked insulation and replacing damaged, plaster walls.

Today's tightly-built, high humidity houses create new problems of vapor pressure and vapor retention within. Sometimes excessive flow of vapor into building spaces occurs, and the formation of destructive condensation is enhanced, where a vapor barrier is lacking from the insulation or there is one with too many breaks in it, or one which while waterproof is not vapor-proof.

But there now is a new multiple accordion aluminum which forms a continuous, edge-to-edge blanket of uniform depth between studs or joists, giving the entire area maximum protection against condensation formation as well as against heat loss or intrusion.

Multiple accordion aluminum's surfaces have high radiation or heat ray reflectivity (97%); low absorptivity (3%); and low emissivity (3%). Conduction is low because of preponderant air spaces of low density. Aluminum and fiber layers retard convection, outer and inner.

The aluminum sheets, 500 ft. and 750 ft. long, are impervious to water vapor. Infiltration under the flat, stapled flanges is slight. Condensation formation on or within this type of insulation is minimized by the scientific construction of multiple layers of accordion aluminum, fiber and air spaces. The commercial form of multiple accordion aluminum is Infra Insulation, Types 6-S*i* and 4-S*i*.

The U. S. Housing & Home Finance Agency has prepared an interesting study of methods of Condensation Control by means of vapor barriers in new and existing construction. Obtain a copy at our expense by using coupon.

INFRA INSULATION, INC.
525 Broadway, N. Y. C., Dept. P-3
Please send ☐ Samples of Infra ☐ HHFA pamphlet "Condensation Control in Dwelling Construction."

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COST OF INFRA INSULATION INSTALLED
in new construction between wood joists, material with labor,

Type 6-S*i* under 9½¢ sq. ft.

Type 4-S*i* under 7½¢ sq. ft.

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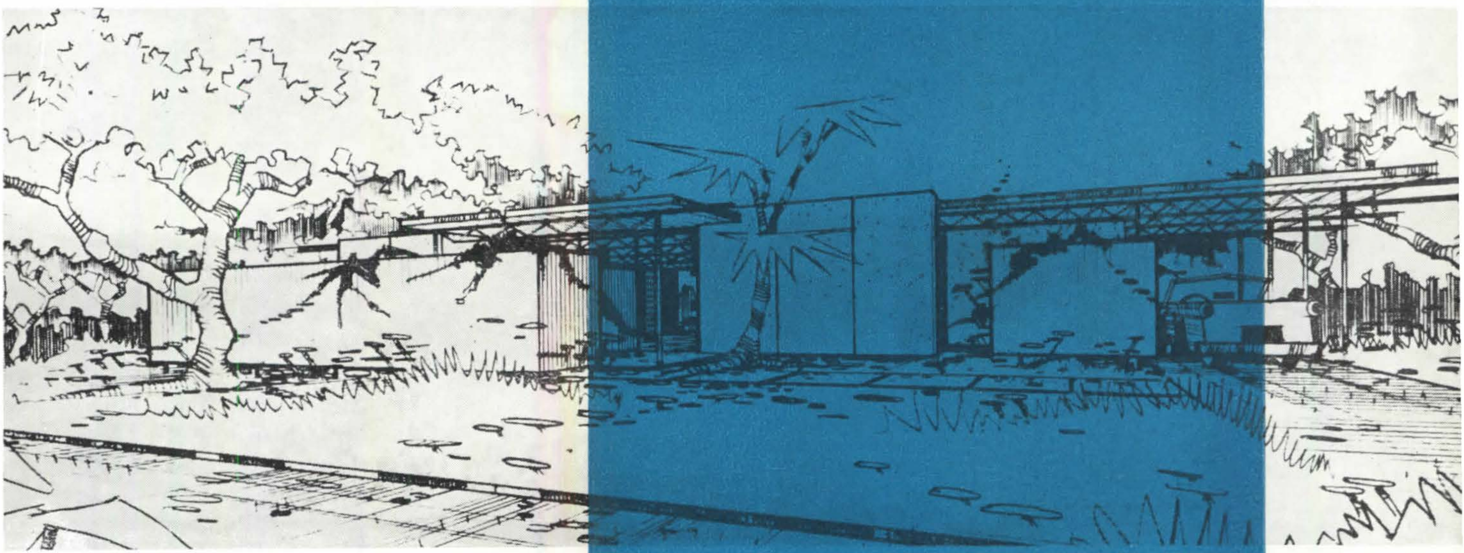
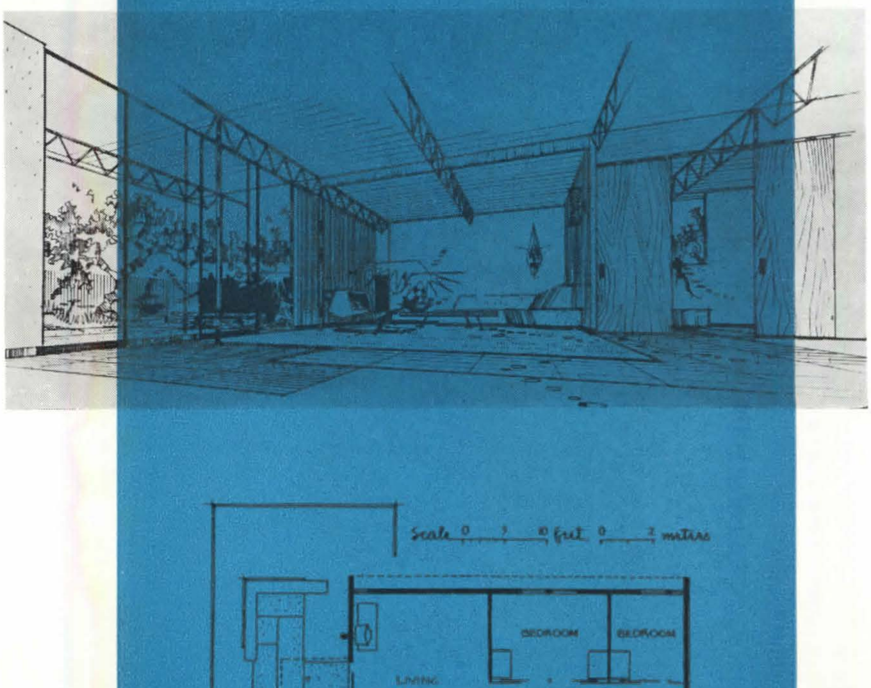
research village: architect-builder collaboration

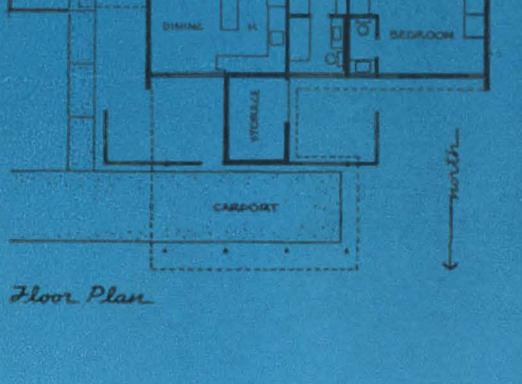


One of the most significant developments found at the 10th Annual Convention and Exposition of the National Association of Home Builders, in Chicago last January, was the "Research Village" program conceived and nurtured by the United States Gypsum Company. This building materials manufacturer, having originated a project designed to give the home builder a strong competitive selling edge, prudently called upon the resources of the architectural profession for assistance and guidance.

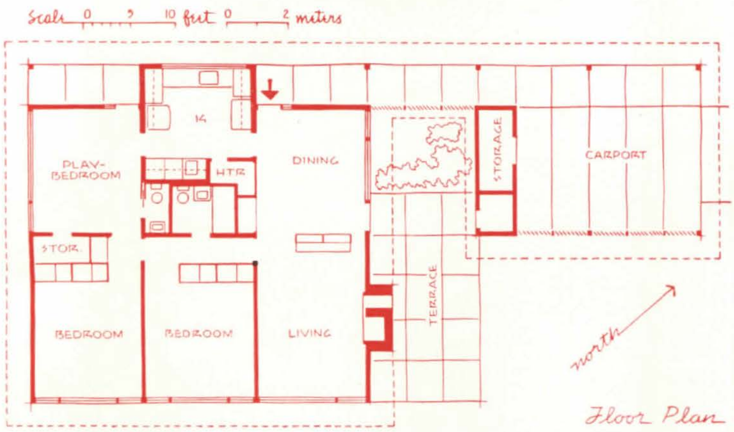
Primary objective of the "Research Village" project was to team up outstanding talent in the architectural and building professions to achieve the following: (1) to contribute new design and construction ideas, particularly for the project homebuilder; (2) to create new uses for building materials; (3) to create more livability, comfort, safety, and value for the homeowner.

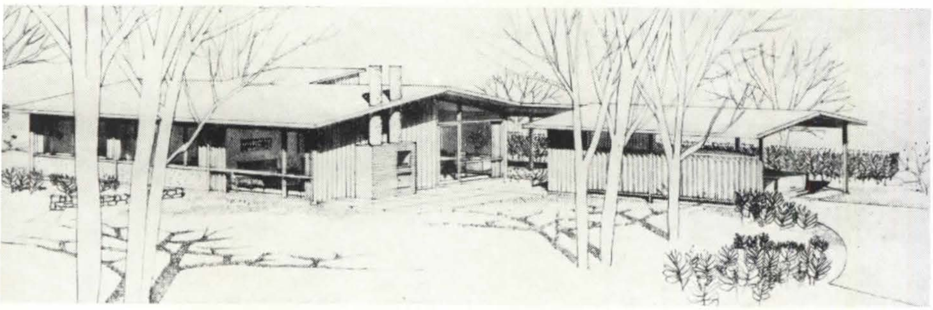
At the annual directors' meeting of the NAHB at Seattle, September 1952, the board officially endorsed collaboration with U.S.G. in the development of this





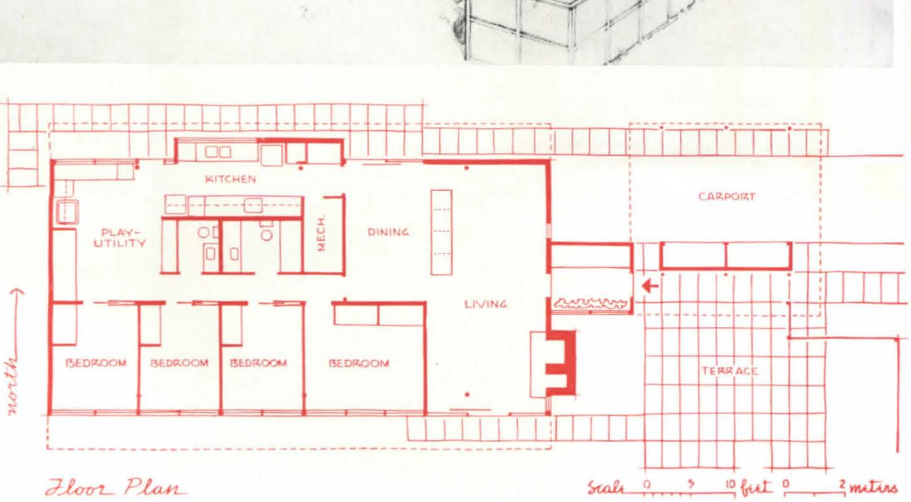
Jones-Eichler house, containing 1395 sq ft, was designed on a 7' module. Open-web joists, carrying metal roof decking, bear on perforated-steel studs so that entire roof load is supported independent of partition arrangement.





Lethbridge-Luria house (above left) *has three variations. Plan shown occupies 1089 sq ft of floor area and has three zones: utility core, living-room area, and sleeping-recreation area for children with master bedroom used as sound buffer.*

Ford and Robertson emphasize wall and partition flexibility that is possible through lift-slab construction for roof (below left). *Very economical for projects of 50 or more homes, lift-slab can be built for about $1.35 per sq ft. Partitions easily changed to suit family needs.*



project and under the leadership of Alan Brockbank, then president, established an advisory panel. An architectural advisory panel also organized at about the same time included Chicago Architects L. Morgan Yost, John Root, and Richard Bennett. Named to a manufacturing advisory panel were Graham J. Morgan, E. E. Ellwood, B. George Pomfret, all of U.S.G., and J. G. Maynard, president of Fulton & Morrissey advertising agency. Through meetings of these advisors, six architect-builder teams were eventually grouped and each accepted the challenge to contribute the greatest possible number of new ideas for low-cost houses. Team members were: *Hugh Stubbins, Jr.*, Lexington, Massachusetts, with *Leonard Frank*, Hempstead, New York; *Francis D. Lethbridge*, Washington, D. C., with *Eli Luria*, Arlington, Virginia; *Gilbert H. Coddington*, Columbus, Ohio, with *Alex Simms*, Dayton, Ohio; *Harris Armstrong*, Kirkwood, Missouri, with *Don Drummond*, Kansas City, Missouri; *O'Neil Ford* with *Frank Robertson,* both of San Antonio, Texas; *A. Quincy Jones,* Los Angeles, with *Joe Eichler*, Palo Alto, California.

At an early meeting, the architects observed that not only was such a research village desirable but it was also "long overdue." They further declared that: (1) Such a program, with each architect from a separate region responsible for the design of one house, would convey in one project the design influence of every region of the country, yet show how design need not be a barrier to construction in one climate area, such as Chicago. (2) Since the architects would be designing houses to be built adjacent to one another

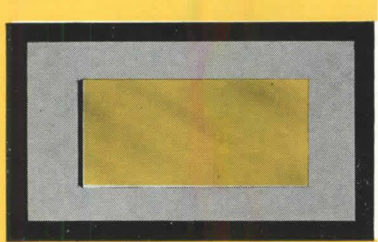
a new curtain wall idea

drastic cuts in job-site labor

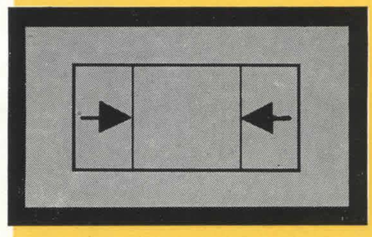
are achieved by new pre-assembled system;

steel-glass/insulated-metal-panel complex offers

unusual flexibility for functional design



Mirawal's colored, porcelain-on-steel facing panels—insulated



Steelbilt's horizontal sliding windows built integrally with complete wall frames

Colorado A & M Dormitories (model) Fort Collins, Colorado
architect James M. Hunter, AIA
general contractor Mead & Mount Construction Co.
Steelbilt dealer & erector K. C. Construction Supply

ess than 1000 man hours of job-site labor, three-story curtain wall units (11′-1½″ x -10⅜″) were installed—ready for finish—at Colorado A & M Dormitories.

h an estimated 60 cents of every struction dollar going into labor on this e of project—the resulting economy ignificant.

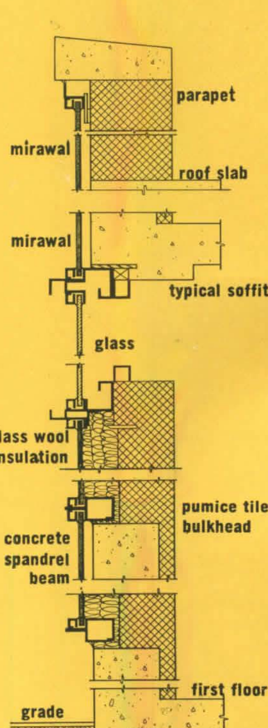
s attractive, light weight wall system was igned by James M. Hunter, AIA, in aboration with Steelbilt engineers. All nponents of each complete unit are -assembled and pre-tested at the factory—uding Steelbilt's top roller-hung, horizontal ing windows. Take-up allowances are vided at each joint to expedite faultless tallation. Units arrive at job-site knocked n into only four parts.

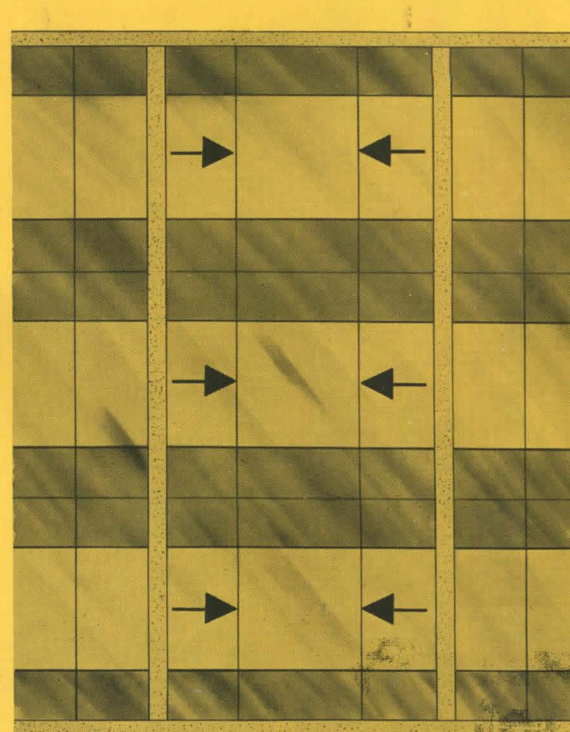
awal porcelain-on-steel panels lend beauty he wall design. Their color has exceptional th and lustre. They install quickly with elbilt's patented, rocker type glazing bead. els have been backed with 2″ of glass wool 4″ of pumice block and plaster to ieve a "K" factor of about .07.

erior Mirawal has a lifetime vitreous celain surface fused to #32 *gauge sheet* el. This is inseparably laminated to Masonite elwood, which in turn is laminated with 8 gauge galvannealed steel, as a seal inst moisture penetration.

iversity of wall systems can be designed n Steelbilt sections and Mirawal panels. es engineers are available for consultation.

catalogs and more detailed information te to:





STEELBILT

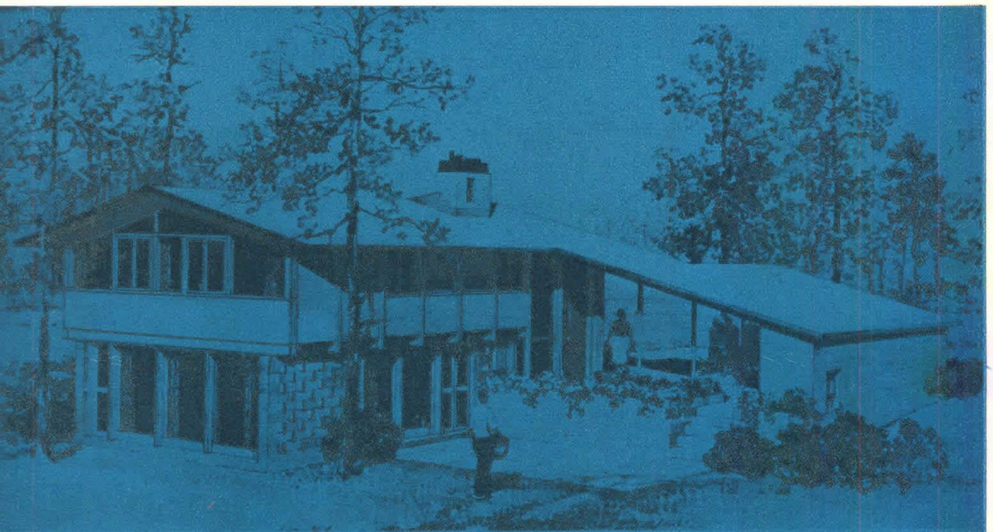
Mirawal & Mirawaltile Division
Universal Major Elec. Appliances, Inc.
P. O. Box 119, Lima, Ohio

Steelbilt, Inc.
18001 S. Figueroa
Gardena, California

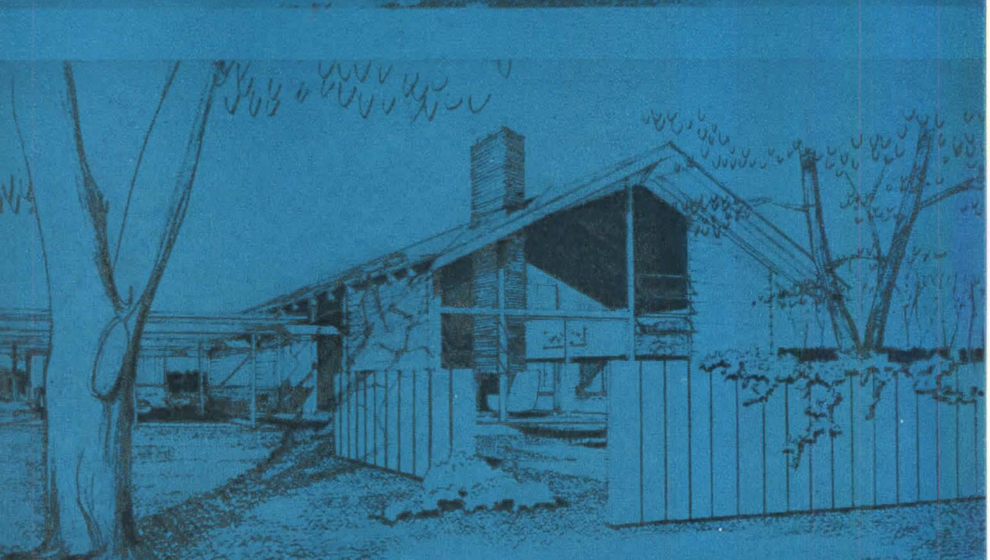
in the same project, the competitive spirit would motivate the best efforts that each could contribute.

Several planning sessions were called. U.S.G. exposed its entire line of building materials for the architects' study, although steadfastly insisted that these materials were not to be used unless they offered the best possible solution for the particular architect's problem. Each architect's plan was examined carefully by the builder teammate who double checked for construction practicability as well as idea contributions.

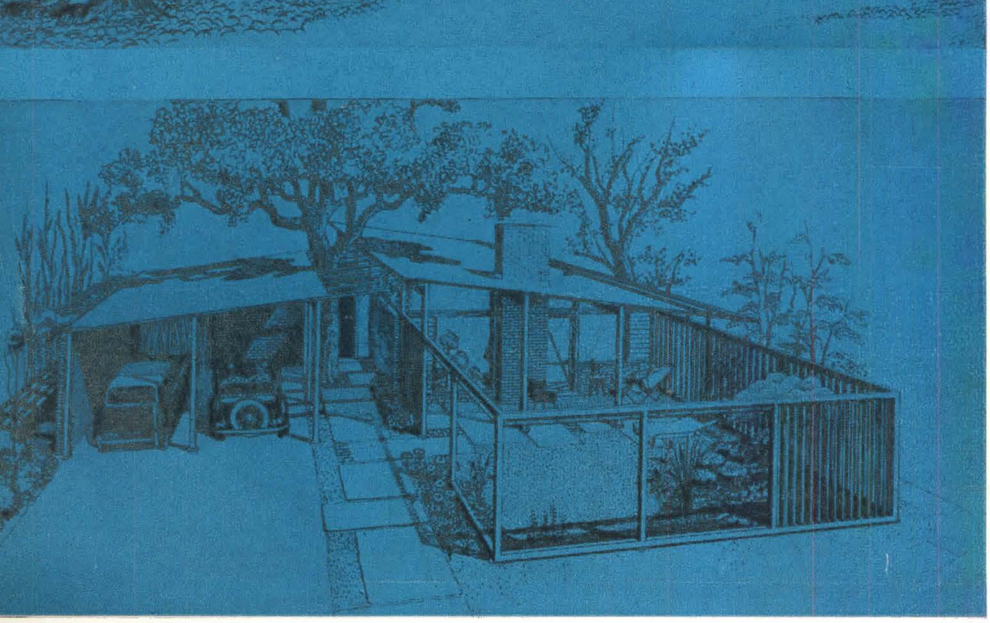
Barrington, Illinois, has been selected as the site for these homes to be constructed by the Maxon Construction Company. Present plans call for ground breaking this spring and all units to be completed and landscaped by fall.



Split-level home of Coddington and Simms occupies 840 sq ft of ground area. Grade level contains recreation room, study, and lavatory. Upper level features living-dining area, kitchen, two bedrooms, and compartmented bath.



Within a 32′ 8″ x 26′ area, Stubbins and Frank provide 1404 sq ft of floor space. Entering house one may either go down 3½′ to kitchen, dining-room, and multipurpose room with bath, or enter and go directly to large living room, or he may go up 3½′ to three bedrooms and bath.



Basic structure for Armstrong-Drummond plan includes 1174 sq ft of floor space. Single hallway makes each room in house easily accessible and design of kitchen allows wife to converse with her guests or family while preparing hors d'oevres or dinner. Privacy both indoors and out is accented.

1954 design awards program—"good quality and feeling"

Dear Editor: A most interesting issue you have gotten out! I cannot recall if it was last year or the year before that I was so perturbed over what had seemed to me to be a rather banal and mediocre character of work all over the country. How exciting it is to have seen this almost entirely disappear. Nearly all you show is of such good quality and feeling. I wonder what makes this sudden change?

HENRY HILL
San Francisco, Calif.

Dear Editor: My sincere compliments on the January issue of P/A. The presentation of the Back Bay Center was most satisfactory—a really professional and expert piece of journalism and layout. In fact, the whole issue is wonderful. Hats off to you . . .all.

HUGH STUBBINS
Lexington, Mass.

Dear Editor: I have read your January 1954 P/A about the Annual Design Survey, Business Forecast, and Engineering Survey, which I enjoyed very much. You and your staff are to be congratulated on such a magnificent edition.

MILTON A. SEDDON
Toronto, Ontario, Canada

Dear Editor: We received our copy of the Design Awards issue yesterday and were very pleased to study it. May we say that the Awards were presented in a most interesting way? We feel that the issue is one to which we will return over and over again.

VIOLET B. NESBIT
Administrative Assistant
PEREIRA & LUCKMAN
Los Angeles, Calif.

Dear Editor: On my return (from New York), I was very pleased to find January P/A awaiting and the office excited at your fine presentation. Congratulations! It looked excellent.

GEORGE KOSMAK
San Francisco, Calif.

Dear Editor: Permit me to congratulate you on the January issue of PROGRESSIVE ARCHITECTURE which is, without a doubt, one of the most interesting and informative published to date.

The designs of the buildings shown give an excellent cross-section of the types of structures being developed on the drawing boards throughout the country, and the trends which are evidenced in the character of these structures.

From an educational standpoint, the report on P/A's first Design Awards Program, will serve as a very significant aid in gearing architectural curricula in the schools to better prepare prospective graduates to fulfil the needs of the practitioner in both the areas of architectural design and construction techniques.

I shall look forward, with eagerness, to read the succeeding issues of P/A during the rest of the year.

HOWARD H. MACKEY, Head
Department of Architecture
Howard University
Washington, D.C.

Dear Editor: If the P/A awards are any indication, the coming year will be a promising one for architecture.

It is encouraging to observe the escape from the concept that an enclosing wall must be either all-glass or all-masonry. In the Boston Center and elsewhere there is evidence of a growing sense of assurance in handling walls which are glass and masonry in the proportion determined by the needs of the particular situation.

Furthermore, it is refreshing to see the imaginative ways in which materials such as brick and plywood are being used in structures like Stevens & Wilkinson's Professional Building in Atlanta, and Paul Rudolph's Recreation Center in Leesburg.

Congratulations to P/A on the new Design Awards Program.

WILLIAM T. ARNETT, Dean
College of Architecture and Allied Arts
University of Florida
Gainesville, Fla.

Dear Editor: The January issue of P/A has just arrived! I can't tell you how excited and happy I am about it. You see, this is the first time that I have had any of my work published nationally, and the first time since my student days that any of my work has received an award. To get such distinguished recognition and such nice publicity, all at once, overwhelms me. Believe me, I will always have a warmer spot in my heart for P/A because of this issue.

ERIC W. SMITH, JR.
Glendale, Mo.

Dear Editor: We wish to thank you most sincerely for the very beautiful presentation of our work on the Madeira School which the January issue contains—and also, of course, for the Citation itself.

A. M. KINNEY
Cincinnati, Ohio

Dear Editor: You are to be commended on the January issue of P/A. I'm pleased and honored to be included among those receiving awards.

WILLIAM CORLETT
San Francisco, Calif.

Dear Editor: In behalf of the architects of the nation, I wish to thank you for promoting the Design Awards Program. I am sure that this type of program promotes good architecture and has a very healthy effect on the progress of architecture. Our firm greatly appreciates these competitions and we are sure that we have gained immensely through the publicity which we have received and which you have helped to promote.

E. A. JYRING
Hibbing, Minn.

Dear Editor: That much-used word—fabulous—is the only one to describe your Design Awards issue.

Actually, you need not have presented all that fine stuff—the P.S. and Symposium were worth a full year's subscription.

FRANK V. GRIMALDI
Kansas City, Miss.

(Continued on page 16)

(Continued from page 15)

engineer collaboration

Dear Editor: Thank you for the Award Citation we received in collaboration with Fehr & Granger, Architects, on the Nurses Home at Wharton, Texas. We have noticed for several years that PROGRESSIVE ARCHITECTURE has taken the lead in giving recognition to the structural and mechanical engineers who are associated with the architects on various projects and we feel that you deserve a compliment for this service.

Fehr & Granger, as well as several other of our architect-clients, bring us into the picture at a very early stage and give us an opportunity to work closely with the designer. Even in this enlightened time, however, there are still architects who bring in the completed design and say, "Here it is boys, see if you can make it stand up."

Austin, Texas, is blessed with a lot of good architects, and a good architectural school also, and we love them all.

Keep up the good work in P/A and thanks again.

WORTH COTTINGHAM
Wilson & Cottingham
Consulting Engineers
Austin, Tex.

the human material

Dear Editor: It is great to see what is being planned this year. In 1925, I wrote a book full of optimism about what the U.S.A. would contribute to contemporary building design. There was the great quarry of technical organization and know-how, industrially produced supply on which I based my prophecies, which the magazines of that day did not support. They have come true, these predictions. And now in another book I am worried about what we designers should learn to know and take to heart—the best material there is, the human material. Many of your projects published January 1954 P/A show this tendency with great promise.

RICHARD J. NEUTRA
Los Angeles, Calif.

no lilies (yet)

Dear Editor: Compliments and flowers to you and George Howe for "Symposium" in January 1954 P/A. If, as one dreads to hear, either or both of you were struck dead by a Bolt from the Blue, on the day of publication, the flowers—wreaths of lilies for purity, I think—would still be appropriate.

WELLS I. BENNETT, Dean
College of Architecture and Design
University of Michigan
Ann Arbor, Mich.

star in the crown

Dear Editor: Not you only but multitudes of your contemporaries are in George Howe's debt. If only it could be handed on to posterity, but that would require more extended chronicles, of which this gem would be the star in the crown—illustrated, I suggest by Aubrey Beardsley.

JOHN RANNELLS
New York, N. Y.

(Continued on page 20)

This is the second in a series of articles by the Office Manager for Mayer & Whittlesey, Architects, New York, on Office Management and Drafting Room Management subjects. This month Spiegel continues an analysis of Overhead in the architect's office, a subject he introduced in the previous article.

how to figure overhead

by Siegmund Spiegel

In last month's article, the importance of recognizing overhead factors and their hidden nature were discussed. This article will attempt to examine overhead costs in more detail.

The expenses of a typical architect's office fall into two categories: Direct Expenses and General Expenses.

Direct Expenses are all costs incurred in connection with specific commissions for which fees are received. They commonly include:

Direct Drafting Salaries (all salaries to technical personnel in connection with actual jobs);

Fees paid to Consultants;

Blueprinting and other reproduction costs;

Travel (if job is out of town);

Long Distance Telephone, Telegraph and Cables (where directly chargeable to an actual job);

Miscellaneous Items, including Building Department and other Filing Fees, Local Travel for specific jobs, Supplies, where chargeable specifically to a job.

All of these items can be allocated to individual jobs by means of simple bookkeeping record.

General Expenses are all costs incurred which cannot be allocated to specific jobs for which fees are received, but which must be absorbed by the "productive" jobs in the office. They commonly consist of:

- Indirect Technical Salaries, such as:
  - Promotional Drafting, work on brochures, etc.;
  - General Research, not in connection with a specific project;
  - Draftsmen's Vacation, Sickleave, Holidays;
  - Proportion of Office Boy's "General" Time;
  - Proportion of Office Manager's "General" Time.*
- Office Salaries, such as:
  - Secretaries;
  - Bookkeeper;
  - Proportion of Office Boy's "General" Time;
  - Proportion of Office Manager's "General" Time.
- Rent.
- Blueprints and photostats not pertaining to active jobs.
- Stationery and Supplies (Office and Drafting Room).
- Telephone and Telegraph (local).
- Taxes and Insurances, such as:
  - Unemployment Insurance;
  - Workmen's Compensation;
  - Disability Insurance;
  - Social Security;
  - Occupancy Tax;
  - Gross Receipts Tax;
  - Excise Tax;
  - Accident Insurance;
  - Fire Insurance.
- Accounting Services.
- Books and Subscriptions.
- Furniture and Fixtures.
- Travel and Entertainment.
- Miscellaneous items, such as:
  - Towel and Janitorial Services;
  - Postage;
  - Dues;
  - Contributions;
  - Christmas Bonuses.

To arrive at a figure for Overhead, in the case of architectural offices, *the total of General Expenses is divided by the Direct Drafting Salaries paid to technical personnel engaged in fee-producing work.*

The other Direct Expense items described above are not considered in computing this Overhead percentage because, as will be seen later, it is assumed that expenses of that nature are anticipated (in the case of consultants' fees definite commitments are made) so that they can be listed separately and accurately in arriving at a budget for a given job. This computation can be made graphically, as the illustration (*overpage*) shows.

In short, if the total General Expense is 70% of the total Direct Drafting Salaries paid within a given year, each dollar paid for Direct Drafting represents an actual cost to the office of $1.70.

In the previous article it was indicated how important it is to be able to estimate this Overhead percentage, and how difficult to arrive at an "average" figure. In the case of a newly opened office, it is particularly difficult to establish the ratio. As a number of General Expense items will occur only once a year, it is virtually impossible to assume a rate to be applied until a full year's business conduct is studied. It is also very likely that the first year's operation will show a higher

** In many instances the job of Office Manager is handled by a partner. Since partners, in most cases, have a drawing account rather than a straight salary, this item would not occur and would decrease the overhead amount. Many offices, however, do have employe Office Managers whose time is divided between productive jobs and managerial duties.*

Overhead due to purchase of more than the normal amount of furniture, equipment, instruments, and supplies.

As has been indicated, if there is such a thing as an average ratio for the medium-sized office, it seems to be around 70%—with fluctuations (depending on the amount of fee-producing business) ranging from 50% to a dangerous 90%. The reasons for the fluctuations are clear from a study of the graph. When an architect analyzes the ratio of Overhead to Direct Drafting, over a period of several years (and this can best be done graphically), he will note that the actual amount of General Expense will remain about constant, while the Direct Drafting Cost will vary depending on the number of commissions in the office. Thus the % relationship will also vary.

•

Finally, how can this estimated Overhead percentage be used in budgeting a job on which a fee must be quoted, or an offered fee gaged as to its adequacy? This is an extremely important procedure, if the office is not to lose money on a commission. Again, the new firm is at a disadvantage because a large part of the "budgeting" is done by using comparisons with previous commissions of a similar nature. Here the architect who has recently opened his office must rely on good sense and perhaps words of good advice from his colleagues with longer business experience.

The budget for any job will include:

Direct Drafting Costs. This will be arrived at by estimating the number of drawings required, the number of man-days required per drawing and, by applying the rates of personnel, the total cost for production of drawings on that job. Time for studies, sketches, conferences (which at times may be very frequent and lengthy), and preliminary drawings must be included, if the budget is to be realistic.

Consultants' Fees. Obviously, the quotations should be obtained *before* architect's fee is quoted to clients.

Blueprint Costs. (Estimate of cost of number of final sets to be furnished, intermediate printings and prints for interoffice use.)

Travel. All estimated travel costs for the particular job, on basis of number of trips anticipated specified in contract.

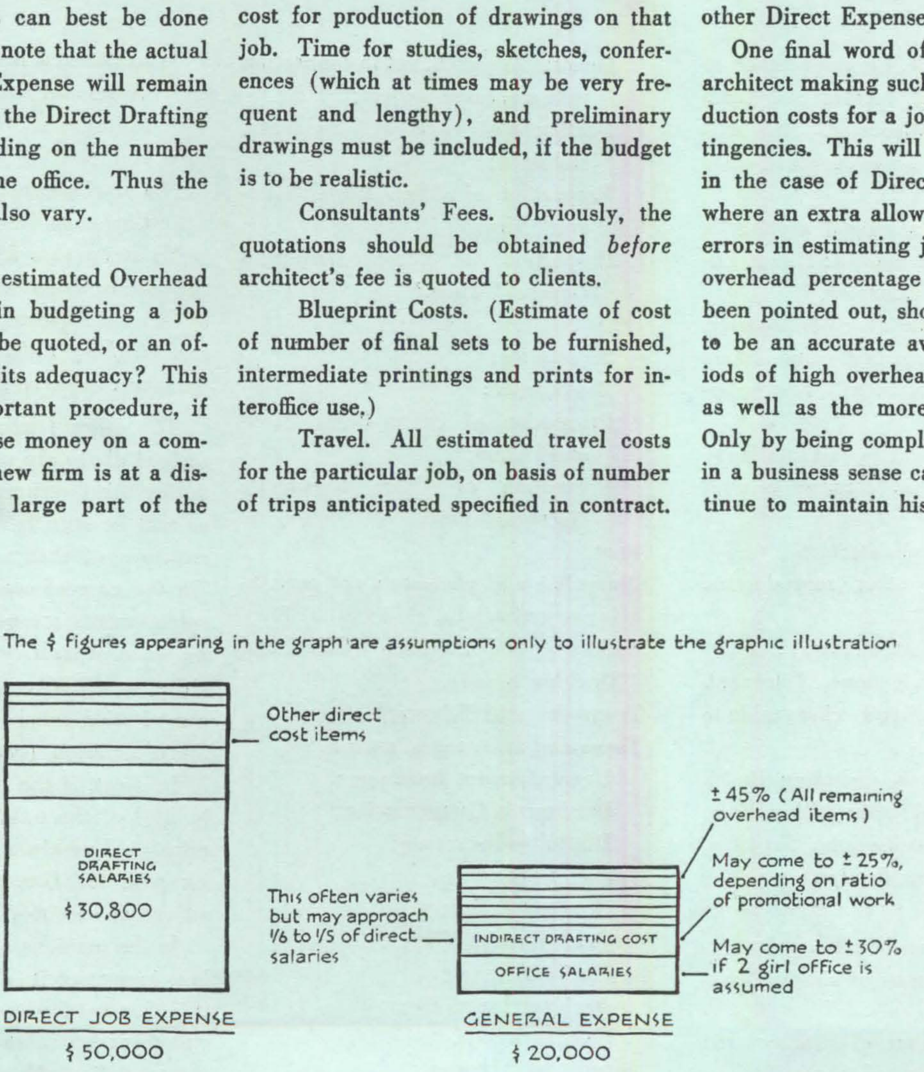
Telephone and Telegraph. Costs estimated for this job.

Miscellaneous Direct Costs.

The total of all these items will show the estimated *Direct Expenses* for the job under consideration. Now it is necessary to add Overhead—that is, the correct amount of Indirect or *General Expenses* —which will, as we have seen, be a percentage of the first item in the list above (Direct Drafting Costs). The estimated over-all production cost, then, is the total of all expenses—Direct Drafting Costs, other Direct Expenses, and Overhead.

One final word of caution. The wise architect making such an estimate of production costs for a job will allow for contingencies. This will be particularly true in the case of Direct Drafting Salaries, where an extra allowance will help cover errors in estimating judgment, and in the overhead percentage used which, as has been pointed out, should be high enough to be an accurate average covering periods of high overhead (low production) as well as the more "normal" periods. Only by being completely fair to himself in a business sense can the architect continue to maintain his office.

The $ figures appearing in the graph are assumptions only to illustrate the graphic illustration



$$\text{YEAR'S OVERHEAD} = \frac{\$20{,}000}{\$30{,}800} = 65\% \text{ of Drafting Salaries}$$

NOTE. In an actual graph, items would be listed similar to listing elsewhere in this text and actual dollar values shown.

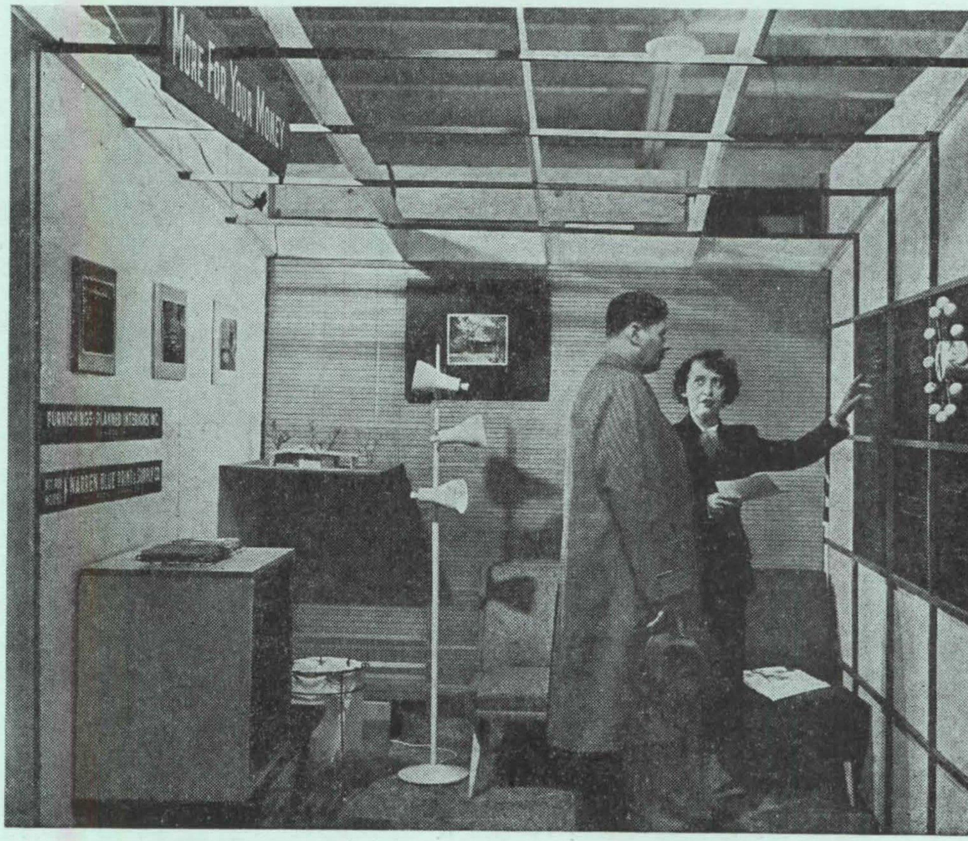
more for your money

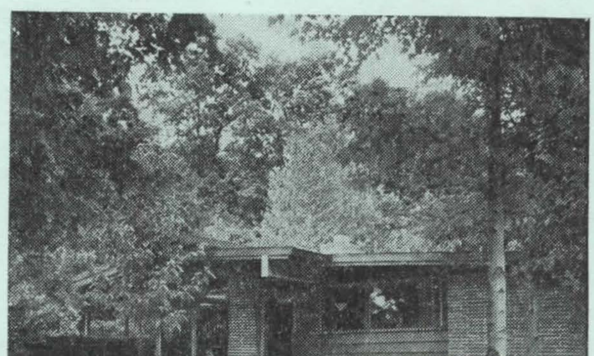
Public Relations efforts made by one architect help every architect in his community. P/A has heard of a heartening activity by two young architects in an Ohio town which appeals to us, somehow, even more than ambitious activities in larger communities. In Warren, Ohio, a town of about 50,000 population, not far from Akron, there has been each year a Home Show. Warren boasts five architects, so it has not been as easy for design participation as in larger urban centers. Last year, however, Robert E. Wachter and David Kerr, both architectural members of the Junior Chamber of Commerce, designed a "booth" in the cause of architecture, and feel that it was most successful as a community educational project.

The exhibit was small and simple. It was decorated with furniture "borrowed" from a local contemporary furniture outlet. A local blueprint company co-operated and was given a plug. Exhibits were photographs and plans (blueprints, of course!) of a small house designed by Kerr. A pamphlet pointing out the value of architectural services was distributed: "How you can get MORE FOR YOUR MONEY when you build," it is titled. On the fly leaf is the statement (only mention of the two initiators of the exhibit); "This booklet was prepared by Robert E. Wachter and David W. Kerr, Architects, to illustrate the value of architectural service."

The booklet is objective and well written. Kerr and Wachter feel that it was necessary, this first time, to emphasize economics, even though, "we, as architects, know that good design comes first." They felt they knew the people of the community and what would appeal to them; hence the theme—saving money—which is carried through to the last sentence of the pamphlet, which reads, "A competent architect may easily save you several times the amount of his fee simply through his skill in planning."

Home Show exhibit planned by architects Wachter and Kerr is simple, attractive.
Photo: Perc Kelty





House designed by David Kerr was exhibited in photographs (shot above was used on end wall) and blueprints of working drawings.

Bernard Tomson **it's the law**

May an architect file a mechanic's lien for *preliminary* drawings only?

The general rule is expressed as follows in *Architectural & Engineering Law*, Tomson (Reinhold 1951):

"Architects or engineers, who prepare plans for and supervise the construction of buildings and other structures, are generally entitled to a mechanic's lien under statutes which give a lien in general terms for material and labor furnished in the erection of a building.

"The mechanic's lien is purely statutory and is given to those who perform labor or furnish material in the improvement of real property. There has been much litigation as to whether an architect or engineer is entitled to protection under these acts. The courts have reached different conclusions, depending on the interpretation of a given statute, and the court's views as to the architect's or engineer's duties and the character of his work."

Architects have been given (or denied) mechanic's liens dependent on criteria such as the following:

1. Did the architect supervise construction?

2. Is the lien for supervision only?

3. Does the statute permit a lien for the preparation of plans without supervision?

4. Is a lien permitted for plans never used for construction?

A novel question was raised in New York, where an architect's services were engaged in connection with the proposed construction of four buildings and garages. He was later informed that the owners had decided to abandon the proposed project. The architect filed a lien in an amount representing the reasonable value of his services in preparing preliminary studies, plans, and drawings.

The owners filed a petition to vacate the lien, contending the preliminary studies and plans were insufficient to support a valid mechanic's lien under the New York Lien Law.

The applicable provision of the New York Lien Law, Section 2, Subdivision 4, reads as follows:

"The term 'improvement' . . . shall also include the drawing by any architect or engineer or surveyor of any plans or specifications or survey, which are prepared for or used in connection with such improvement."

The Appellate Division of the Supreme Court of New York affirmed the architect's right to a lien and set an important precedent for other states which have similarly drawn Lien Laws.

Said the Court, in *Matter of Bralus Corp.:*

"Prior to 1916, an architect was not entitled to a mechanic's lien for services rendered solely in preparing plans. . . . By Chapter 507 of the Laws of 1916, Section 2 of the Lien Law was amended to permit a lien for the drawing of plans, even though no building was erected on the property. . . . By Chapter 608 of the Laws of 1934, Section 2 of the Lien Law was further amended by broadening the definition of the term 'improvement' to include the drawing of plans 'prepared for or used in connection with such improvement.' The amendment must be deemed to have been intended to include the drawing of preliminary plans because work in drawing final plans was lienable prior to the amendment."

A dissenting opinion adopted the owner's argument that the statute did not contemplate preliminary studies and plans:

"Buildings are not erected on 'preliminary' studies and 'preliminary' plans. The statute must be strictly construed, and I believe it never was the intention of the Legislature to provide for 'preliminary' service which, as such, could not be the basis for the improvement of the property."

The owners-appellants endeavored to distinguish earlier lower court cases where the architect's right to a lien was upheld by pointing out that in none of those cases was the plans referred to as "preliminary."

In one case, the plans were "filed" with the Building Department; in another case, the lien was in part for the drafting and preparation of "completed sketches"; in a third case, the services included "both preliminary and final" plans; and in still another case, the lien was for preparation of "working drawings."

The owners relied strongly upon a case where the architect's notice of lien was discharged. The notice of lien had stated the following:

"The labor performed was inspection, analysis, and recommendations as to alterations of the premises, 301 West 138th St., and the drawing up of preliminary sketches embodying the recommendations—financial analysis."

The Supreme Court, New York County, held in that case as follows:

"Such labor does not come within the category of 'plans, specifications or survey,' which are prepared for or used in connection with an improvement (Lien Law, Section 2), and cannot give any 'right to a lien.'"

The owners are presently contemplating an appeal to the highest court of the State, the Court of Appeals, whose determination will be here reported.

Projects are so often abortively terminated after preliminary plans are drawn that to exclude them from the statutory definition would set serious limitations on an architect's opportunity to recover for a costly part of his operation from a client who often does not appreciate the expense to which the architect is put in the preliminary stage.

The importance of this case lies primarily in the emphasis placed on the precise language of the statute. Each local architectural society should check the law in its own State and determine whether any action is indicated to broaden the protection to which an architect is entitled.

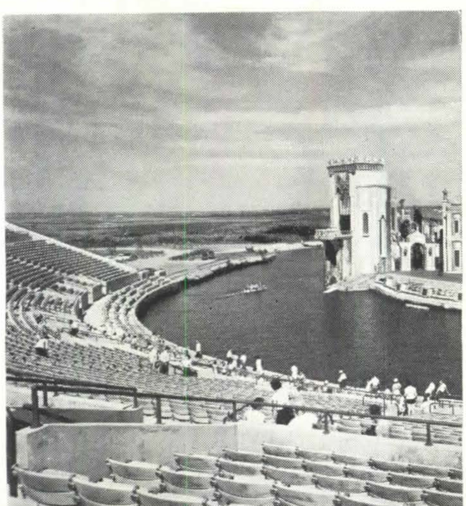
more leisure time

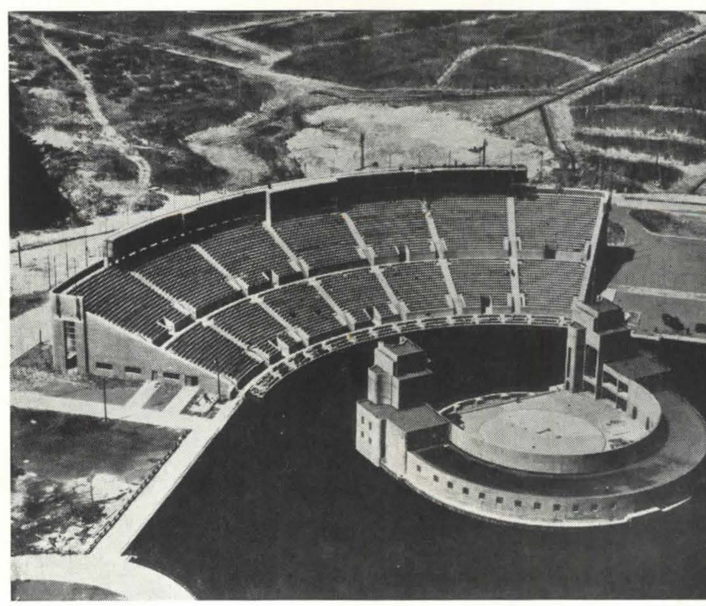
Third in P/A's 1954 series of studies of ARCHITECTURE FOR THESE CHANGING TIMES, this month's issue analyzes the effect on architecture of more leisure time. Almost everyone today has more leisure at his disposal than ever before. The 40-hour work-week is a commonplace, and in many occupations it is becoming even shorter; vacations with pay are customary, and retirement plans have been adopted by many businesses; labor-saving devices and improved methods of food distribution have cut the hours of labor needed to keep a home going.

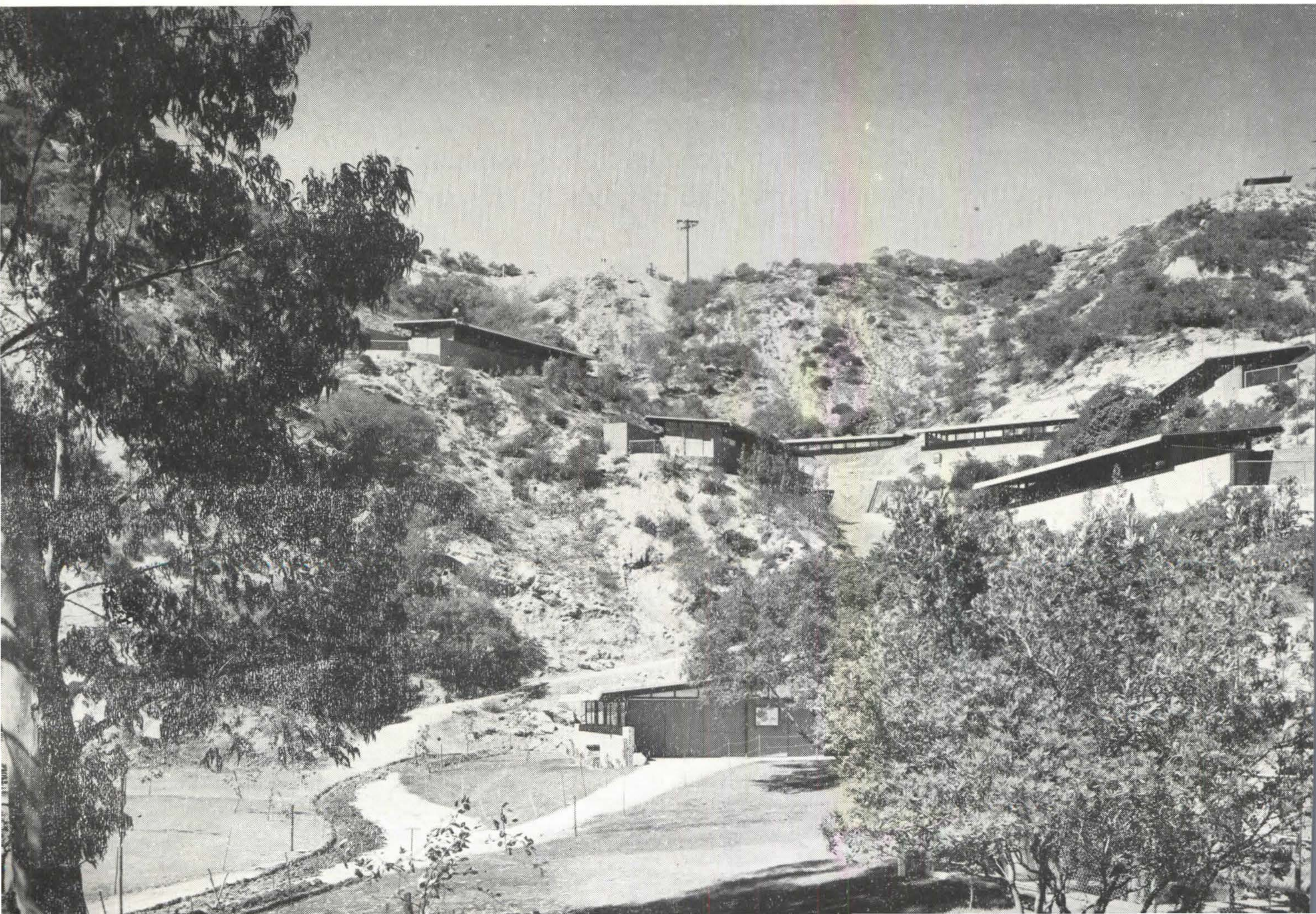
How we use that time is of increasingly serious concern to many individuals, agencies, and organizations. Intelligent, restful, recuperative uses of our leisure require buildings specifically designed and constructed to serve these ends. This implies, for the architect, new thinking about common building types; and also the development of entire new categories of buildings.

The group of projects shown in this issue seems fairly representative: a beach stadium, a holiday camp, a co-operative resort for study and recreation, a community center, a home built around outdoor activities, an all-weather public swimming pool. But this list could be extended almost indefinitely—ranging from employe lounges in big-city offices to provision for TV reception in the home; from recreation facilities in churches and schools to drive-in movies; from concert shells and playground structures to country clubs. They contribute to an impressive effect on architecture from the increased leisure we all enjoy.

Jones Beach Marine Stadium: *Long Island, New York. Original design: William E. Haugaard; supervising architects: Skidmore, Owings, & Merrill. Most recent addition to New York's great, oceanfront park, the steel, concrete, and brick stadium seats 8200 spectators. An underwater tunnel joins the stadium with the stage structure, which is 100 feet offshore. In the center of the 104-foot-wide stage is a revolving area 76 feet in diameter.*







escape for city children

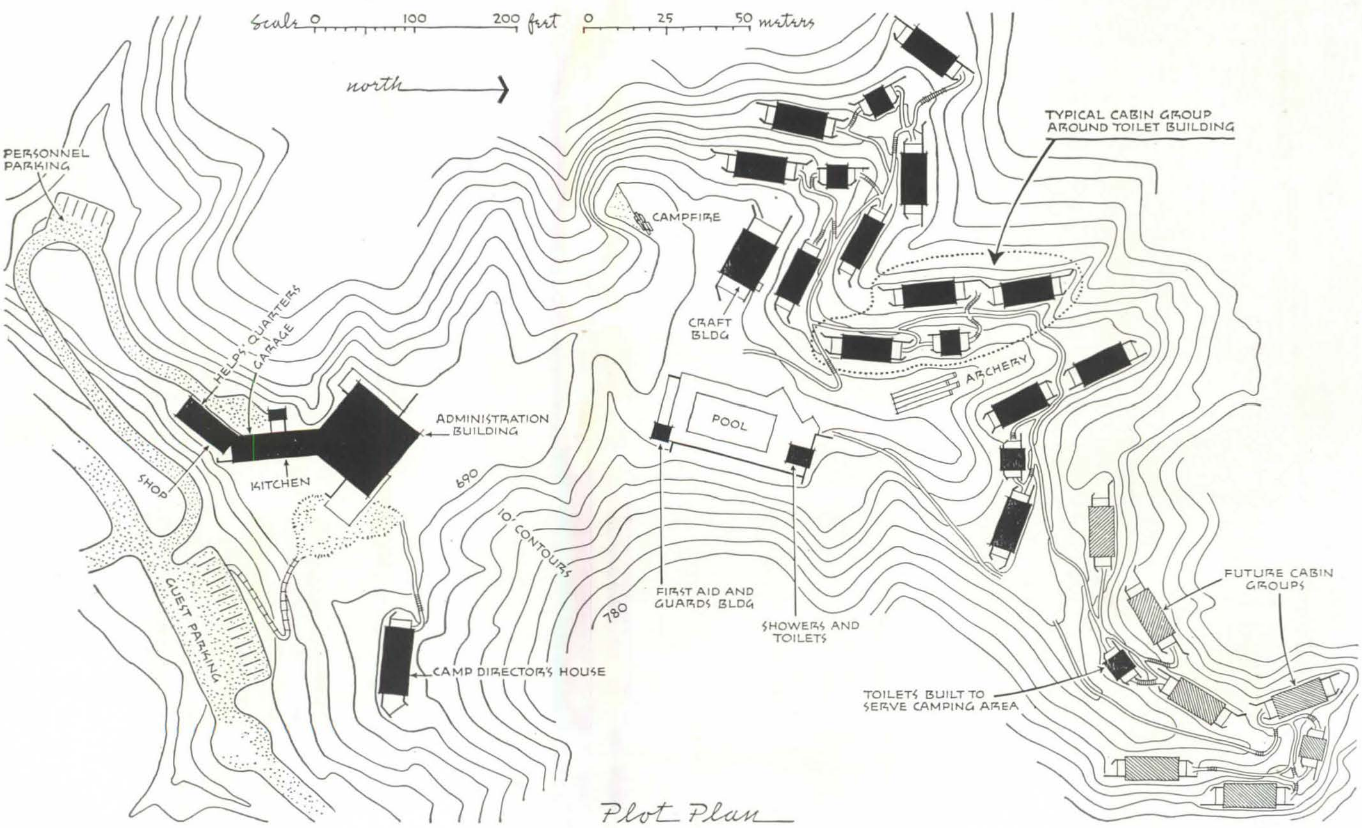
type	girls' camp
location	Los Angeles, California
architects-engineers-site planners	Whitney R. Smith, A. Quincy Jones, and Edgardo Contini
supervising architects	Smith & Williams
mechanical-electrical engineer	Roger Ojeda
general contractor	Oltmans Construction Company

Between the folds of Griffith Park's miniature mountain range the Los Angeles Department of Parks and Recreation has *built a permanent* summer camp for girls. Operating in five-day cycles, the camp is open to all girls of Los Angeles over seven years of age and accommodates 150 girls per session. Although Griffith Park is surrounded by urban development, it is large enough (3015 acres) to offer the youngsters most of the benefits of outdoor life. From all appearances, the camp could be miles from the city; only from the director's house can any part of the city be seen. The only road in the camp is a service road which comes up to the administration building. Again, the children are seldom aware of the city's proximity.

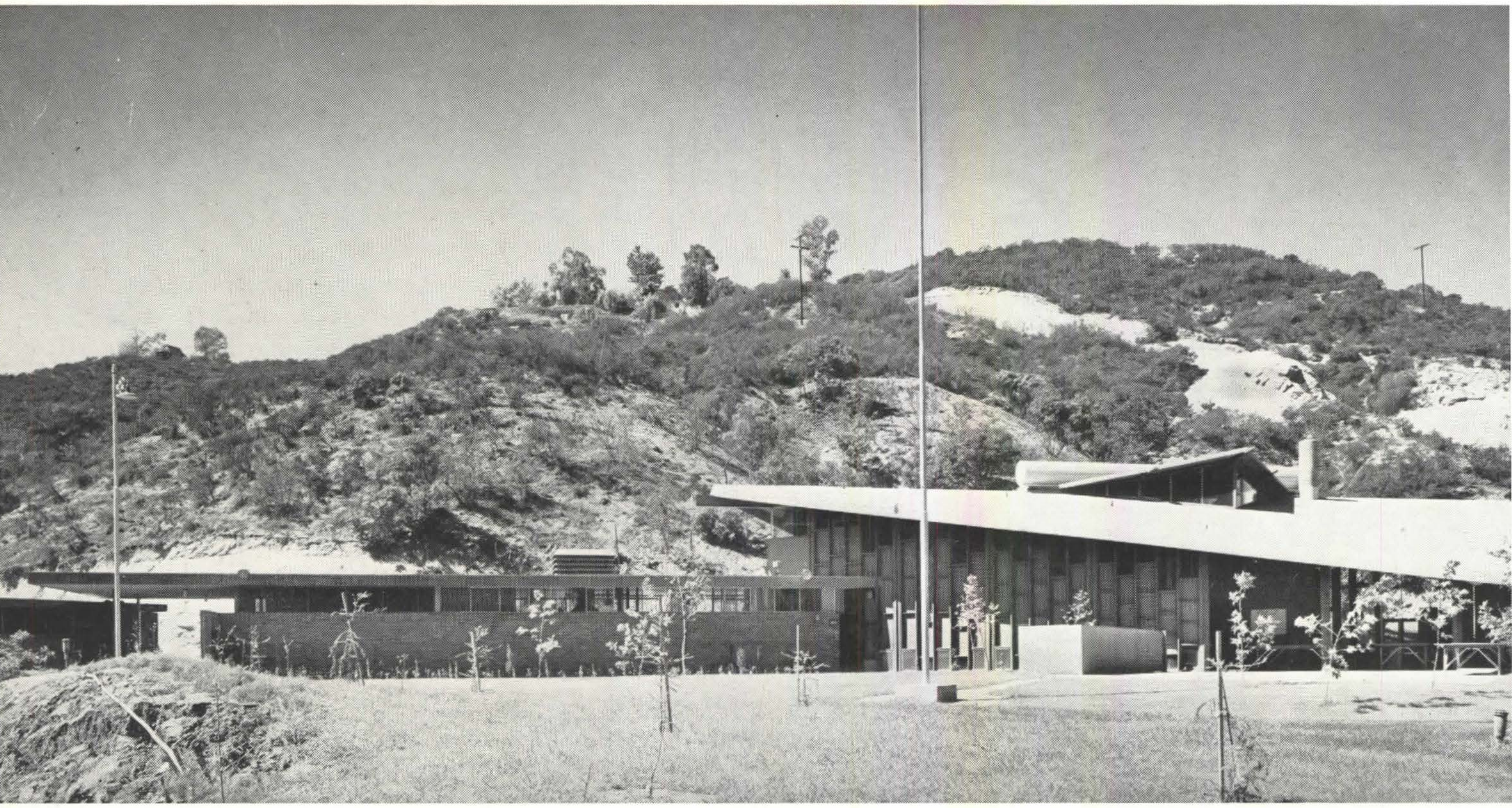
The camp grounds consist of a small valley almost entirely surrounded by rugged slopes; and the architects felt that in order to utilize and best express the natural beauty of the site, the buildings should be spread casually over the valley and up onto the hillsides. Informality and openness in planning, together with a natural and logical use of materials, were thought most desirable. Large buildings were generally to be avoided not only for esthetic reasons but also for educational and social reasons. The small buildings required little excavation—costly and harmful to the site—and the children develop interest and independence more quickly in small groups. Furthermore, spreading the buildings out necessitates more walking, thus providing the children with more exercise. The cabins located at the high end of camp, are arranged in groups of three, each group with a separate toilet building. In this way, the supervision, instruction, and scheduling of different age groups is facilitated. While one group is occupied at the arts and crafts shop, another goes swimming, and another rests or gathers at the archery range or at the campfire circle.

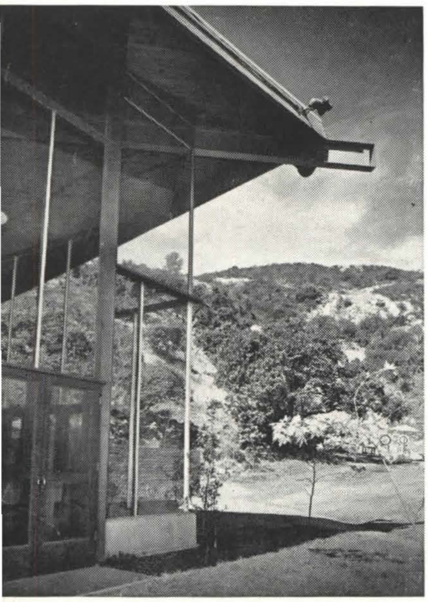
The structural system used throughout, except in the administration building, is consistent and uncomplicated. Fundamentally it employs brick walls which support monopitched roofs with window spaces between walls and roofs. The effect is considerable openness, with adequate shelter.

Three times a day the girls gather in the administration building for meals, recreation, and mail call. The main area



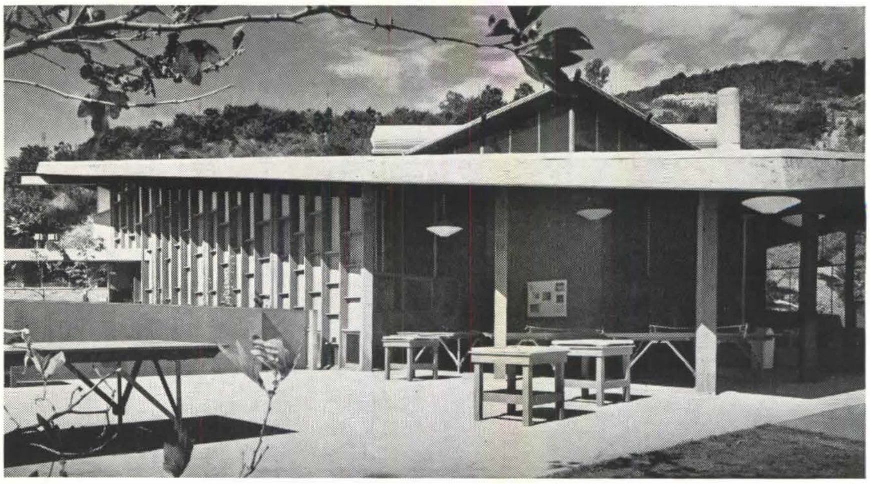
Plot Plan



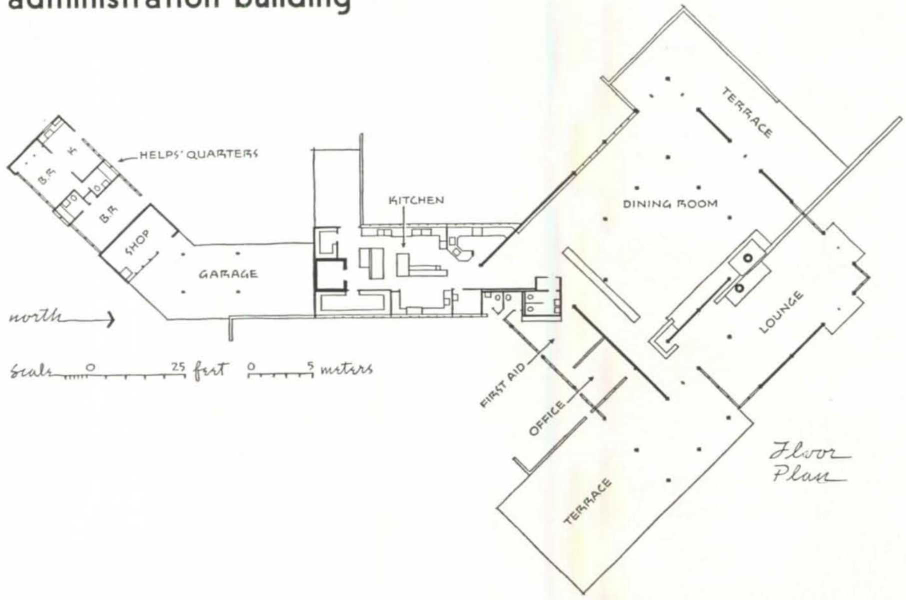


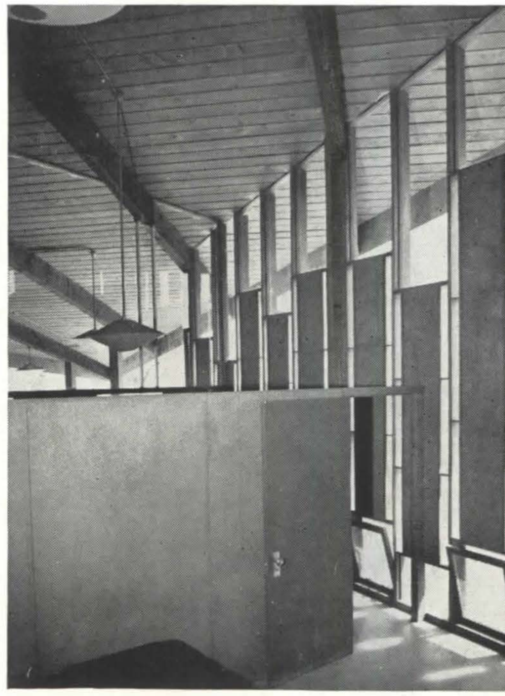
of this the largest building in camp is the dining room, which also serves as assembly hall. A raised concrete platform by the fireplace becomes a small stage for skits and entertainment. Adjoining the dining room is another large area, also with a fireplace, for lounging. This opens onto a concrete porch (*below*) where games are played before and after meals. Behind the lattice-like wall are the main office, a first aid station, and rest rooms. The service element—kitchen, food storage, garage—is contained in the low flat wing which joins the building at one of the corners.

With the exception of one steel girder (*left*) the construction is of wood, concrete, and brick.



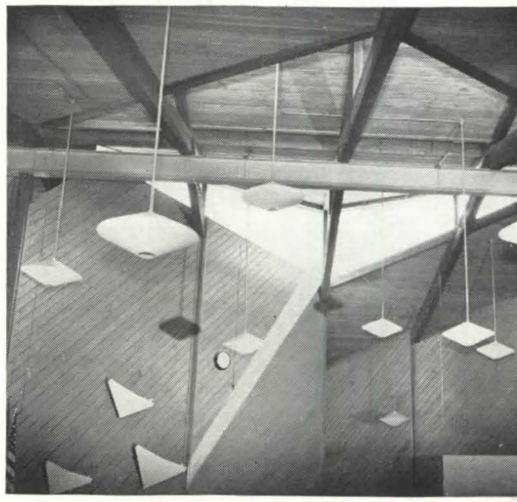
administration building





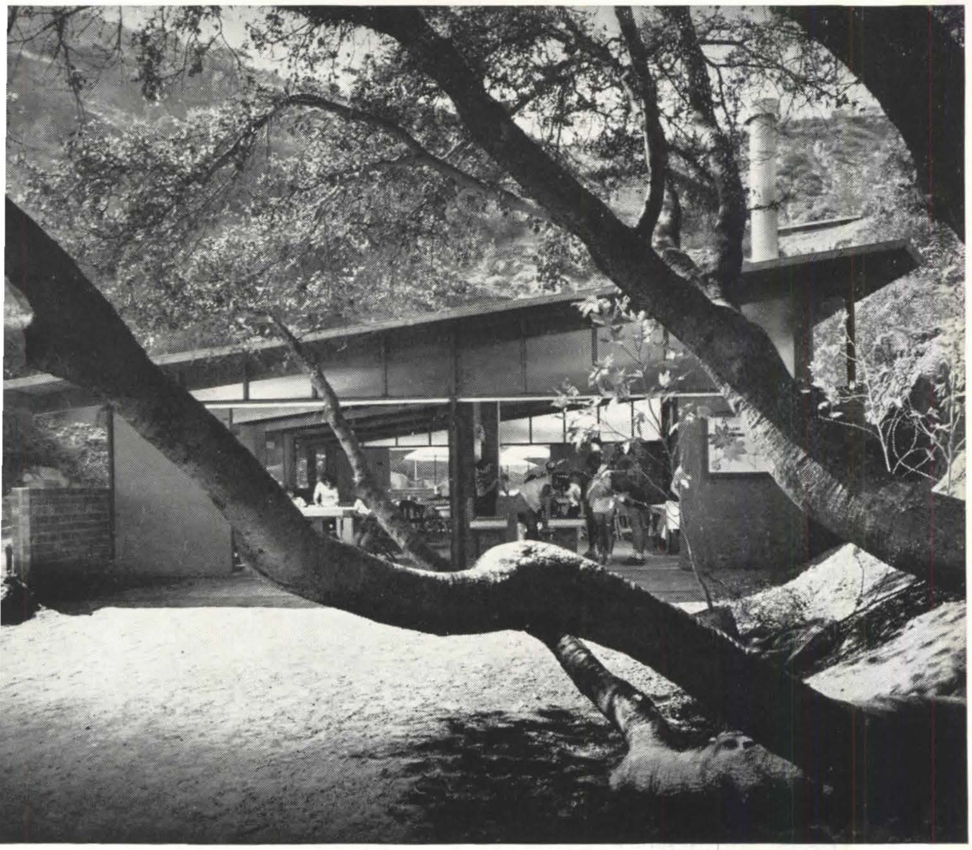
Three photos (right) show details of structure. Light wood members are combined with plywood panels and much glass to create airy, playful atmosphere. Steel girder is used at ridgepole, to keep interior columns at a minimum.

Photos: Julius Shulman



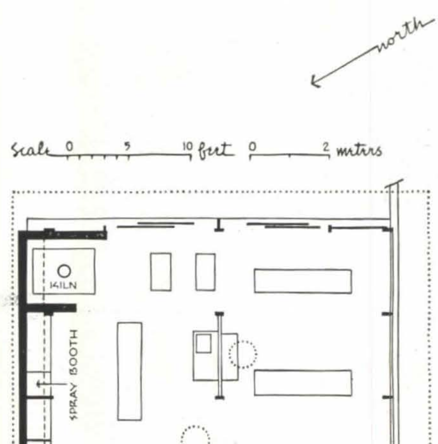
Dining room (above) accommodates all the girls (150) at one time. Round tables with lazy Susans were thought to be more "democratic" than rectangular ones.

Low brick walls supporting glass panels separate dining room from lounge (right).

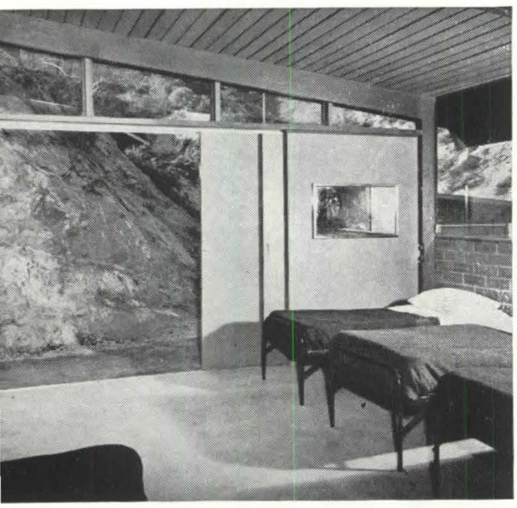


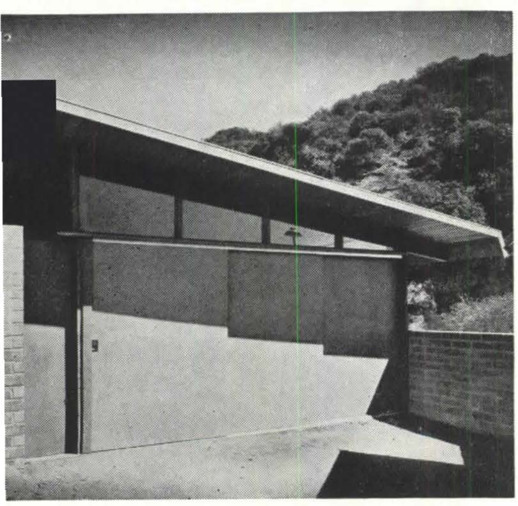
arts and crafts building

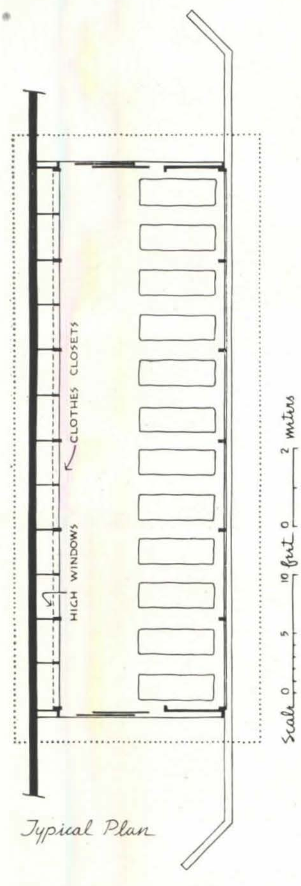
Sliding doors open the arts and crafts shop to the outdoors, making it just a roof over work space. Smokestack in corner is from the kiln, where girls fire their projects in clay.



dormitories

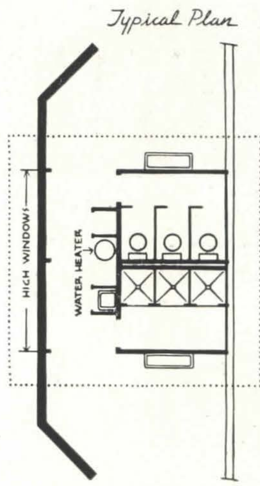


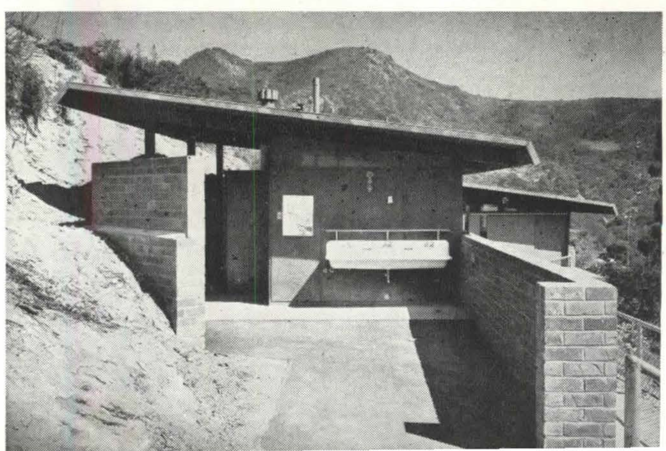




Typical cabin (above) *is quite simple in plan and can be thrown open at both ends. Glass keeps out dampness on cool nights. Waxed concrete floors can be swept quickly and lockers are sufficiently large to hold a week's supply of clothes.*

Toilet building (bottom) *has the same roof and brick walls as cabins.*





cultural holiday facilities

type	resort
location	Tamiment, Pennsylvania
architects	Robin & Vogel
landscape design	Three Point Gardens
general contractor	Harold Riedmiller

An extensive cultural-recreational resort in Pennsylvania's Pocono Mountains has retained Robin & Vogel, New York architects, for a number of buildings in an expansion and modernization program. The architects having pleased the management with, among other earlier projects, a large clubhouse, they were asked to design new sleeping quarters to replace several small obsolete cabins.

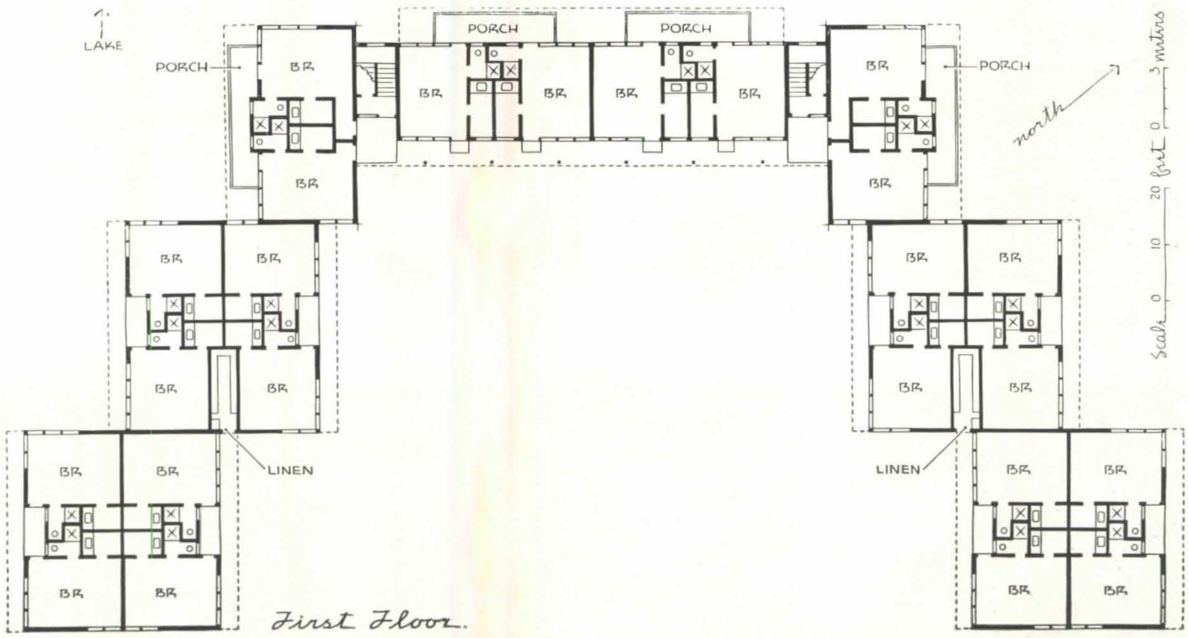
It was apparent, for economic reasons, that the new accommodations were to be within one building and that at least part of it would have to be two-story. Since this building was to be on the water's edge—between the lake and other small buildings—the architects found it necessary to preserve the vistas enjoyed by those in the buildings behind. In order to economize on shore line, they decided upon a U-shaped layout and to open the U away from the water, with the two-story element close to the shore. This way the up-hill patrons are able to see over the top of the new building; and, by staggering the wings slightly, the architects have provided some of the one-story units with views of the lake.

Since the rooms in this addition to the resort are planned for sleeping only, the building is essentially an extended hotel wing. Facilities for dining and entertaining are located in the resort's central area. The management presumably provides so much cultural and recreational interest that guests are not expected to spend many waking hours in their rooms. They rise in the morning, walk to the dining hall for breakfast, spend the day playing tennis or listening to music and lectures, return to their rooms to dress for dinner, and then spend the evening dancing or lounging. Finally they return to their rooms to sleep.

In plan, all the rooms are alike, except as they face the view; and a few of them have porches overlooking the lake.

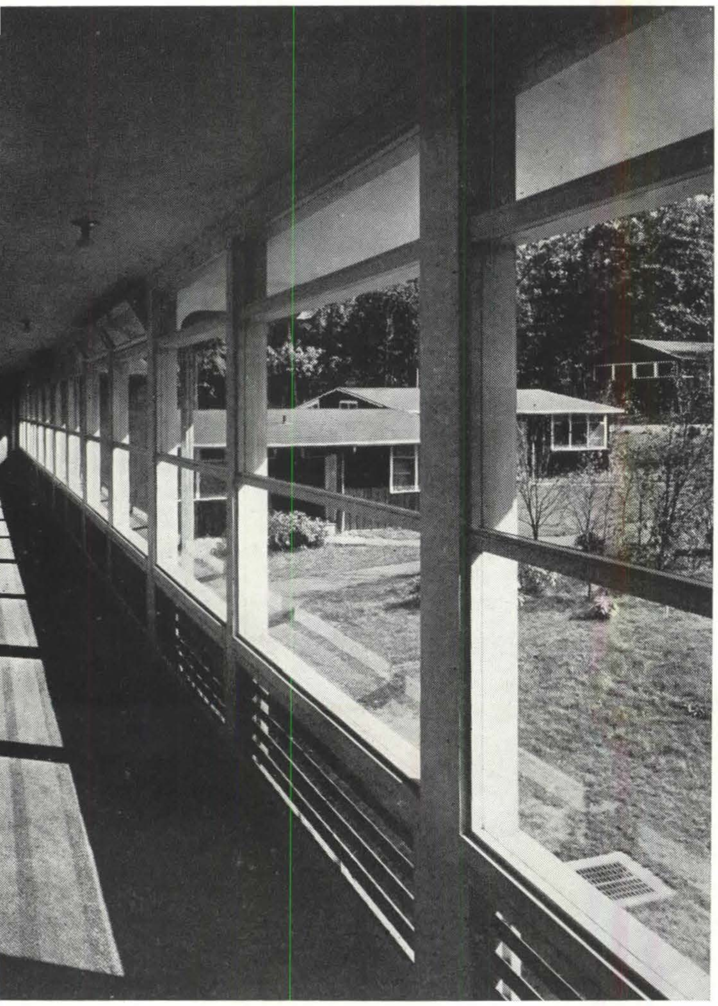
To a large extent, the structure and appearance of the building were determined by other buildings in the resort. Wood framing, covered with resawn fir boards and battens, and trimmed in white, has become characteristic of the camp; and the architects felt no need to depart from that system here. Wood floors, gypsum panels, and fiber-board ceiling tile were used inside. Insulation consists simply of aluminum foil between the gypsum panels and sheathing, and no heating units were required, since the building is used only in summer.

Thus, the architects' problem was primarily one of site planning instead of structural or room-planning innovations.



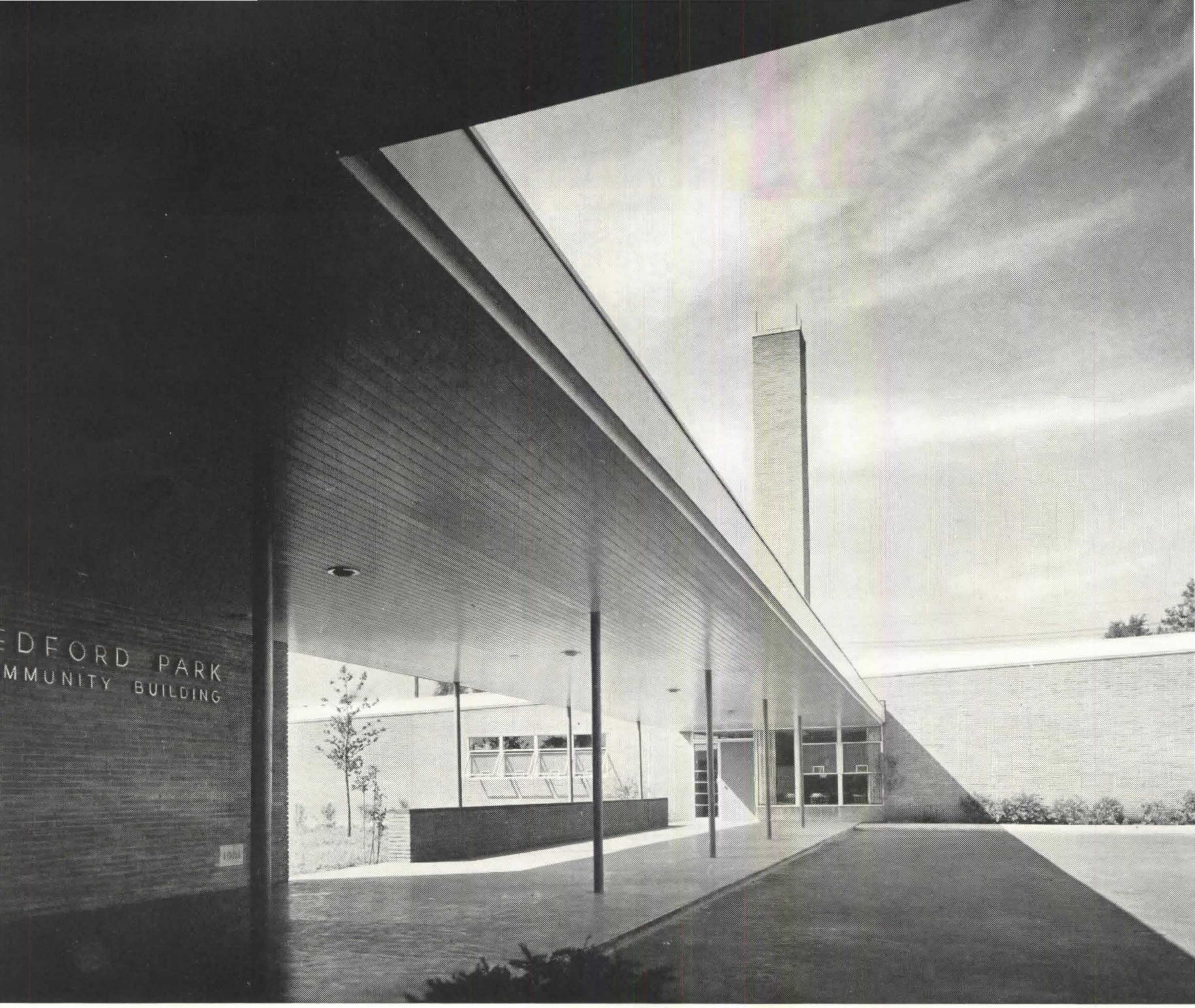
Second-floor corridor on the inside of the U-shaped plan was first designed as an open balcony, but Pennsylvania codes required that it be enclosed. Large glass panels over open louvers give practically the same effect as an open balcony.

Clerestory windows (below) *balance the light from lake-side windows in upper bedrooms.*



Pipe columns (above) *are the only nonwood structural elements in the building.*

From second floor (left) *it is apparent that buildings on the hill behind overlook the new structure.*



centralized neighborhood activities

type	community building
location	Bedford Park, Illinois
arcitects-engineers	Perkins & Will
general contractor	Power Construction Company

When the old school building that was being used as a village hall for Bedford Park was closed, that small industrial suburb of Chicago was left without even minimum facilities for community functions. In addition to space for social and recreational activities, there was a desperate need for new offices for the police department, the water and light department, and the park commission—plus a new fire house. Thus, partly from necessity and partly from inspiration, it was seen that these functions could be centralized in one building or group of buildings. Public property on a dead-end street was available for this, just across from the village school (which, incidentally, was deficient in recreational and athletic facilities).

In a spirit of public responsibility and co-operation seldom found today, the residents of Bedford Park voted a bond issue for $475,000 to take care of this compelling need. And Architects Perkins & Will came forth with this unusually fine design—one which has not not only made the fusion of these apparently diverse functions a happy one, but has also resulted in new thinking on the nature of civic buildings.

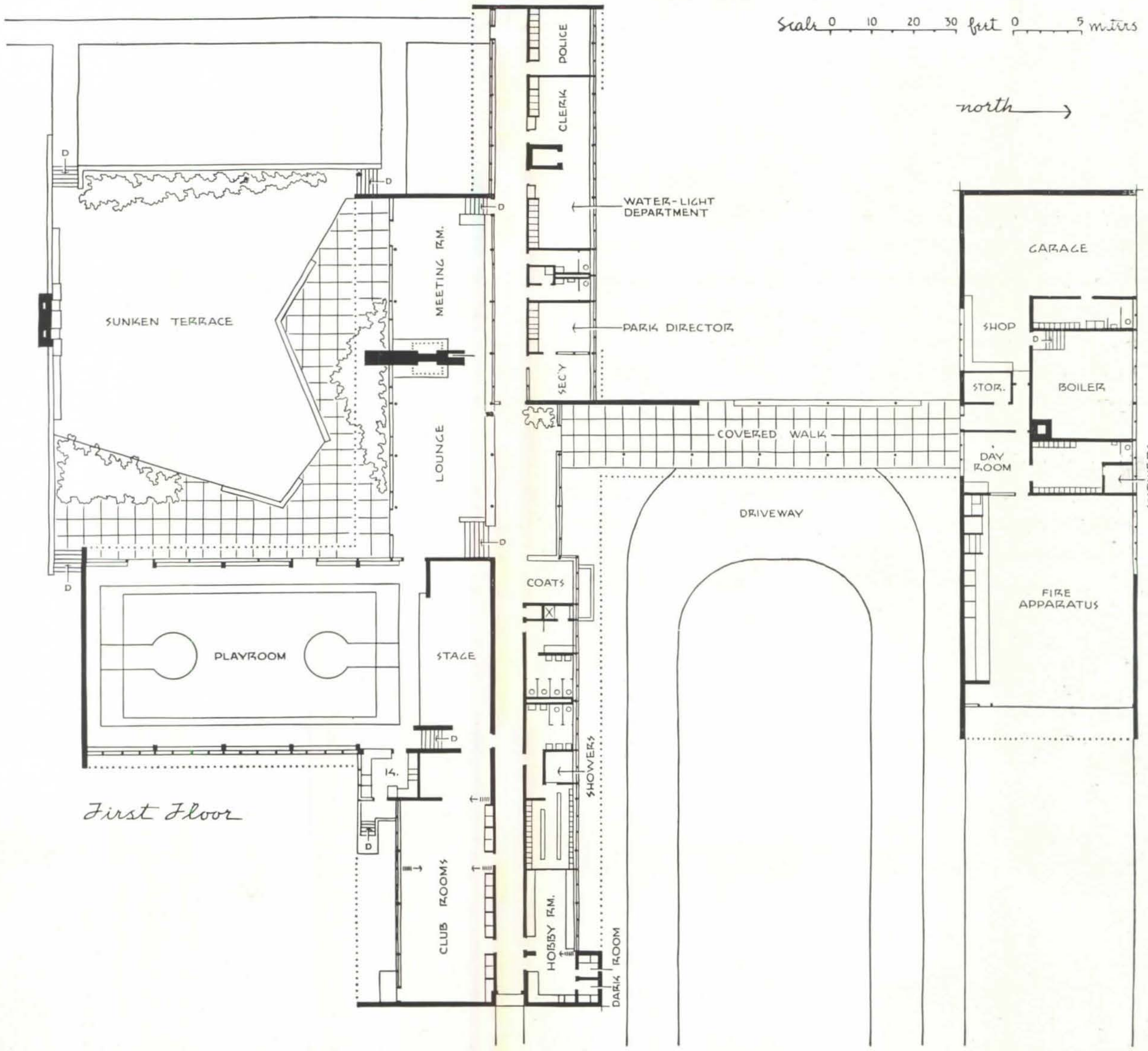
In general, the building is organized in three parts:

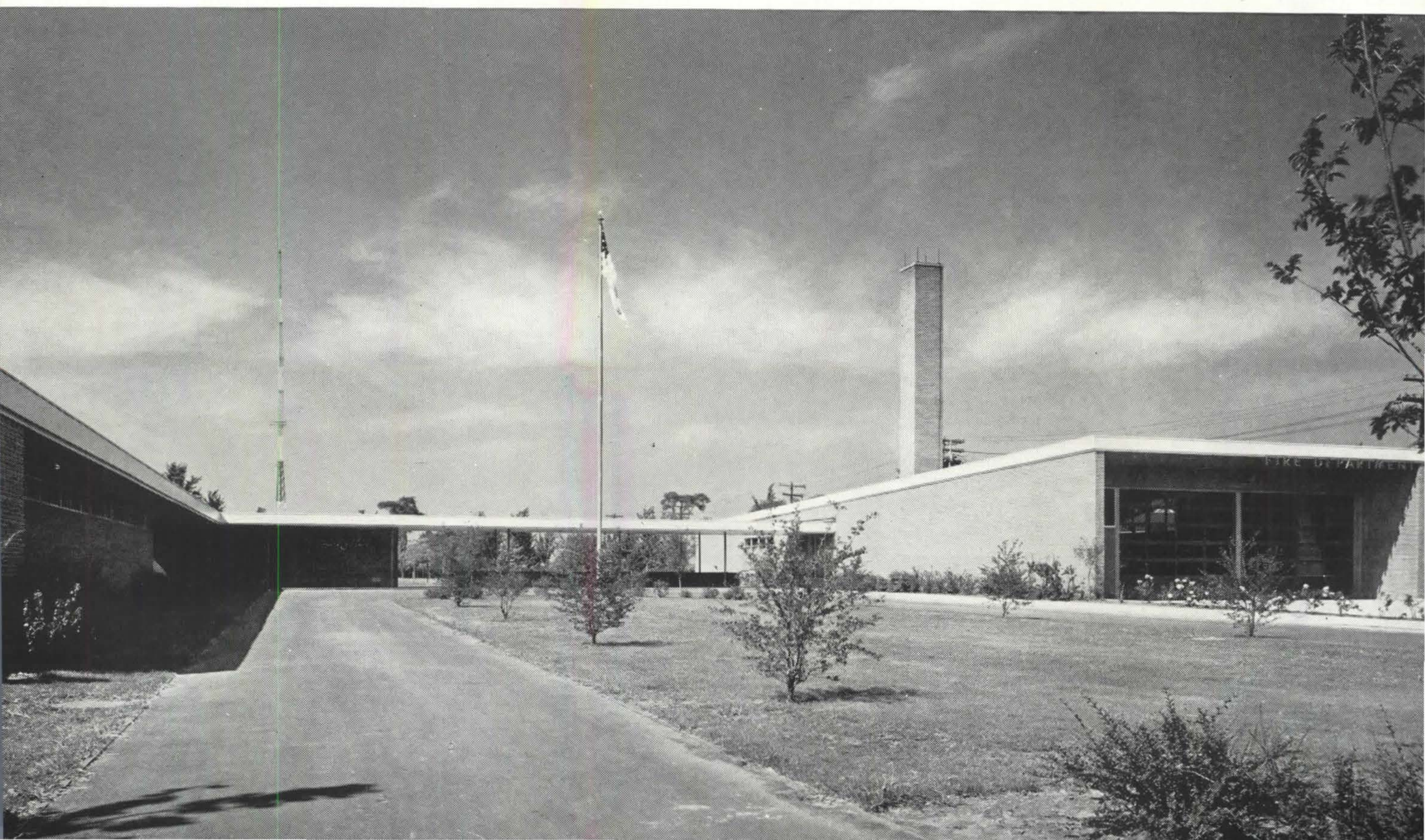
(1) a long, one-story element—containing civic offices, meeting rooms, lounge, and hobby shop—intersected by

(2) a large, gymnasium-like play room, and connected by a covered walk with

(3) a separate structure which is the fire house.

Circulation is such that there is no interference with the social and recreational areas, from the work-a-day traffic at the civic offices, including circulation between those offices and the fire house.


Scale 0 10 20 30 feet 0 5 meters
north
POLICE
CLERK
WATER-LIGHT DEPARTMENT
MEETING RM.
SUNKEN TERRACE
PARK DIRECTOR
SECY
LOUNGE
COVERED WALK
GARAGE
SHOP
STOR.
BOILER
DAY ROOM
SHOWERS
DRIVEWAY
FIRE APPARATUS
COATS
PLAYROOM
STAGE
SHOWERS
14.
CLUB ROOMS
HOBBY RM.
DARK ROOM
First Floor

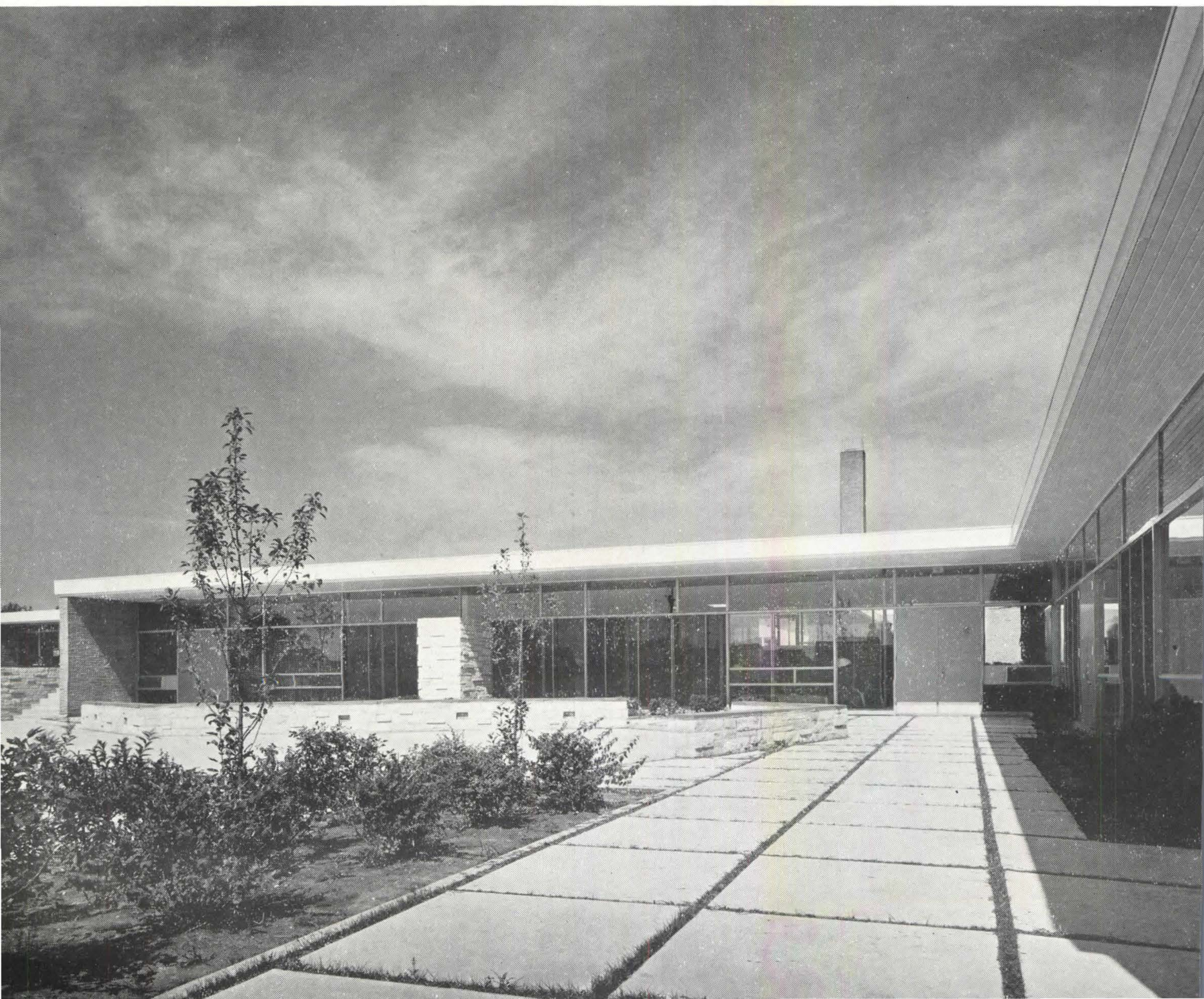


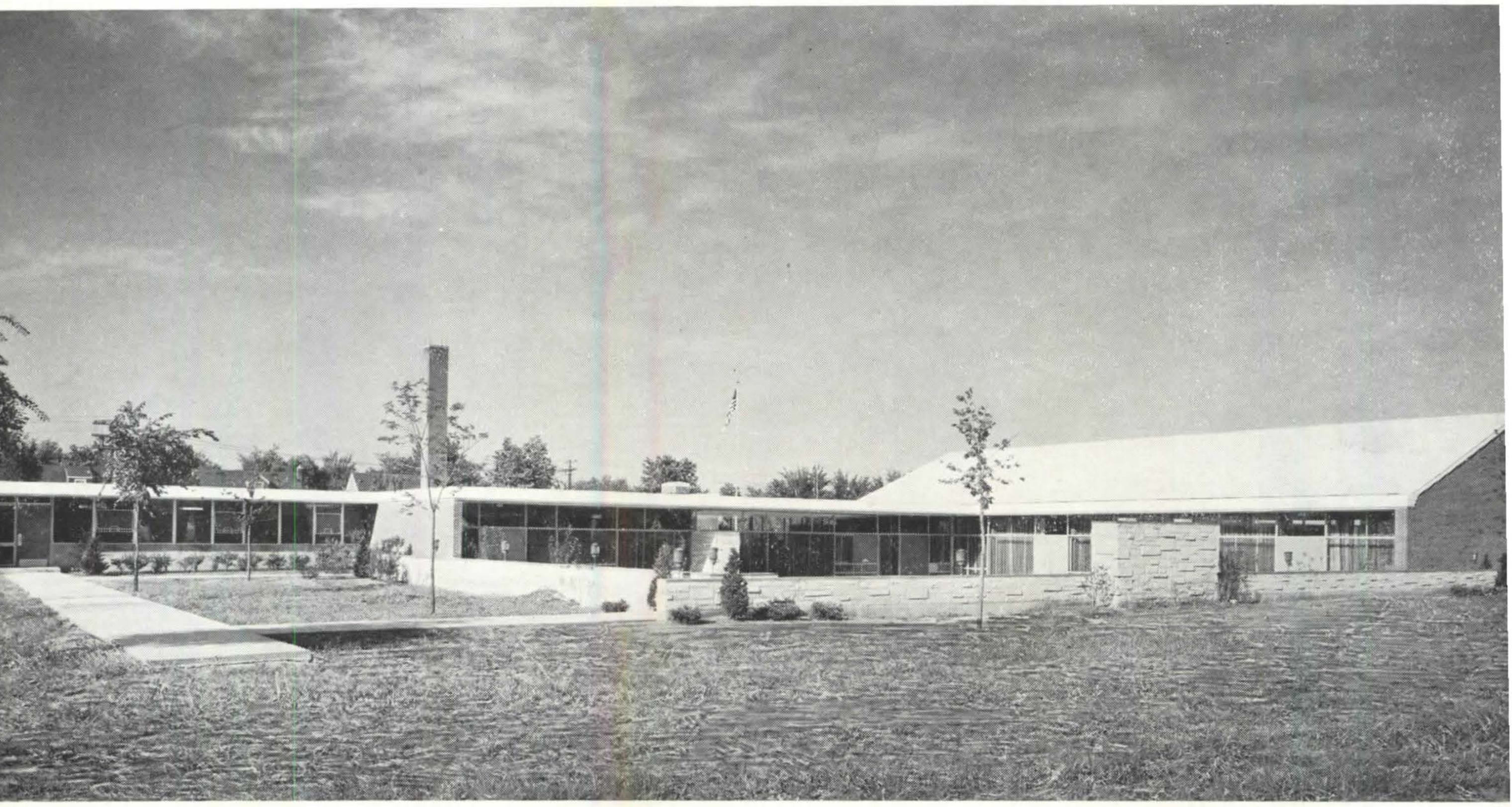
The office of the president of the park board, who is in charge of this building, is centrally located. The large playroom has become closely integrated with activities of the school across the street and can be used without interference to the rest of the building. This same convenience has been achieved in every area where possible conflict might arise; the club rooms, meeting room, and lounge can all be entered separately from the outside, as well as from the interior corridor. The main entrance, on the fire house side, is protected from northwest snow, ice, and wind by a brick fin and the covered walk to the fire house. The walk itself is kept clear of ice and snow by the heat from pipes running beneath from the fire house boiler room.

Deep overhangs protect the large glass walls *(below)* on the south side from excessive sunlight. Double doors open into the lounge, which is separated from the large meeting room by a stone wall and fireplace, an extension of which projects onto the terrace. In fair weather, the terrace is used for community dances, barbecues, and ice cream socials.

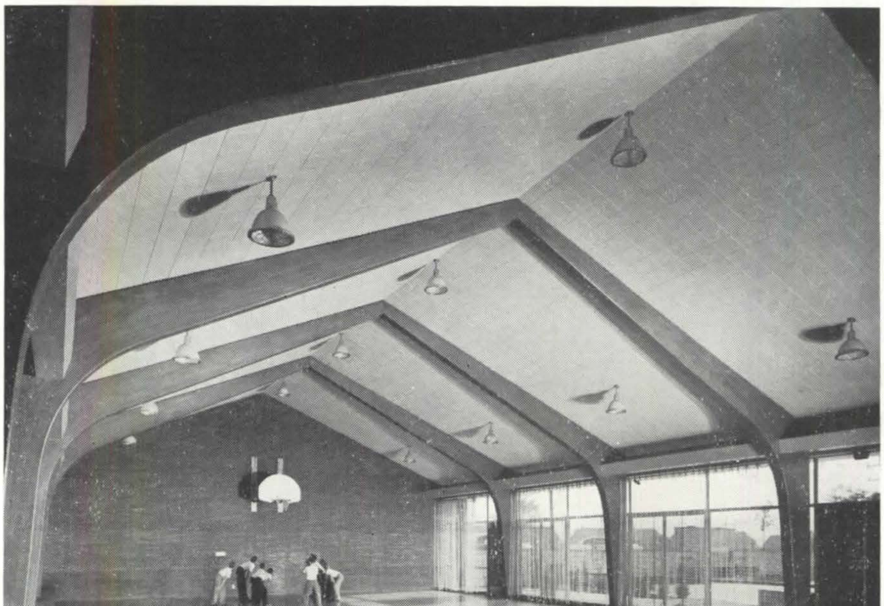
The juncture of the low main wing and the all-purpose playroom, with their common eaves line *(below* and *right)* is a refinement indicative of the excellent integration of elements throughout the structure.

For the most part, Roman brick facing on concrete block was used for the walls, and bar-joists with poured gypsum make up the roofs. Laminated wood bents, however, covered with gypsum slabs, form the structure of the playroom wing *(acrosspage, below)*.



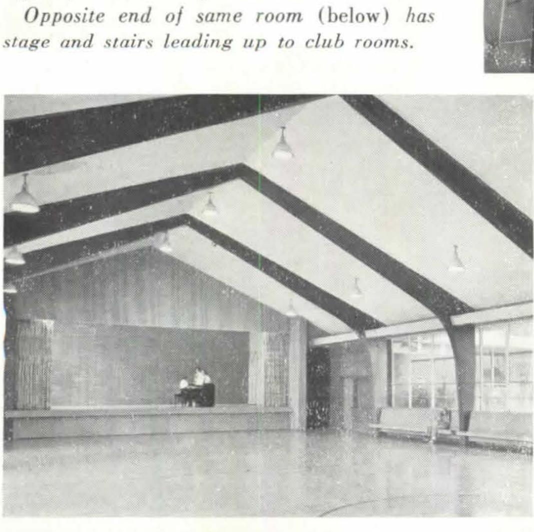


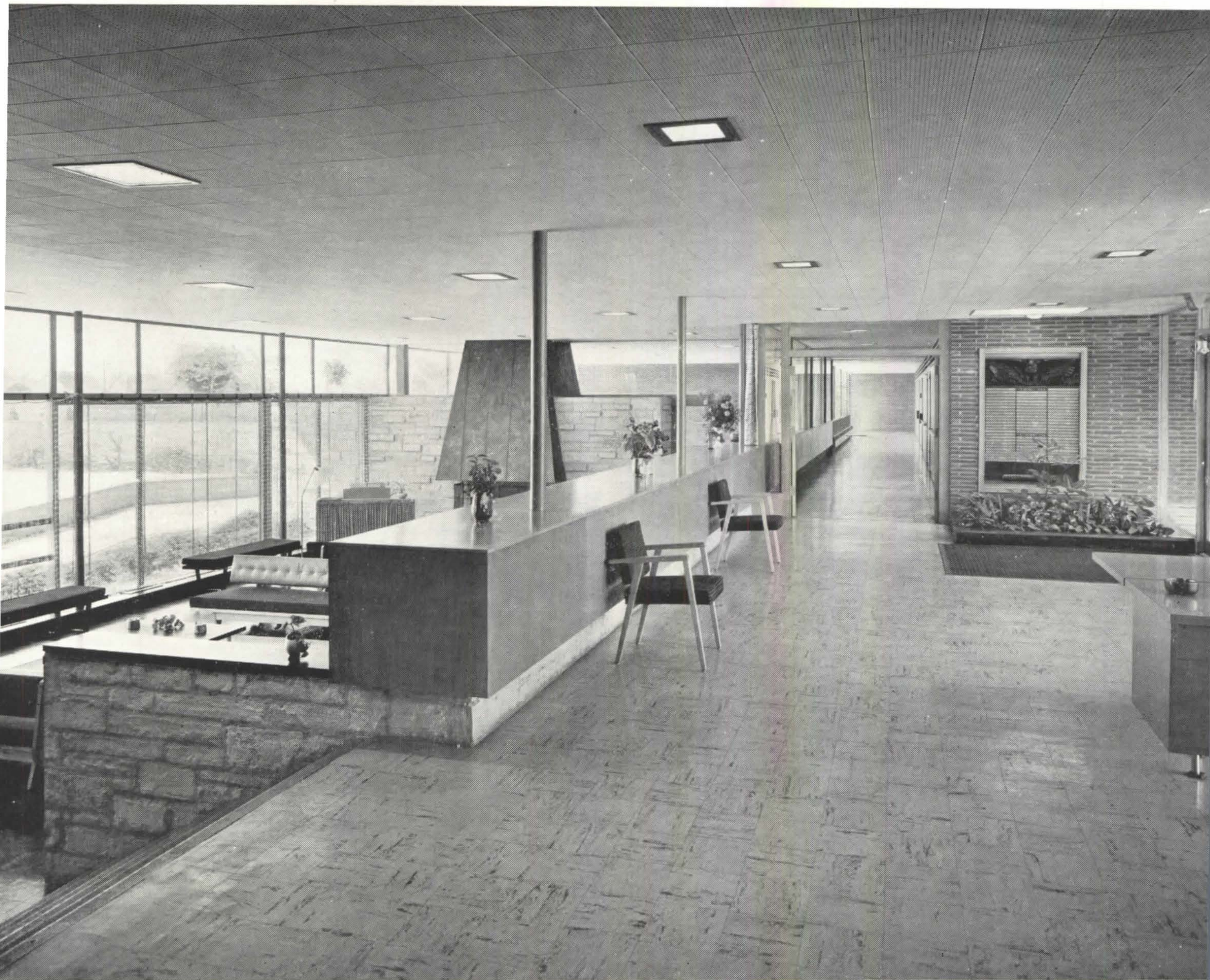
View from southwest corner (above); *civic offices at left; meeting room and lounge center; and playroom at right. Chimney in background is from fire house boiler room.*
Photos: Hedrich-Blessing

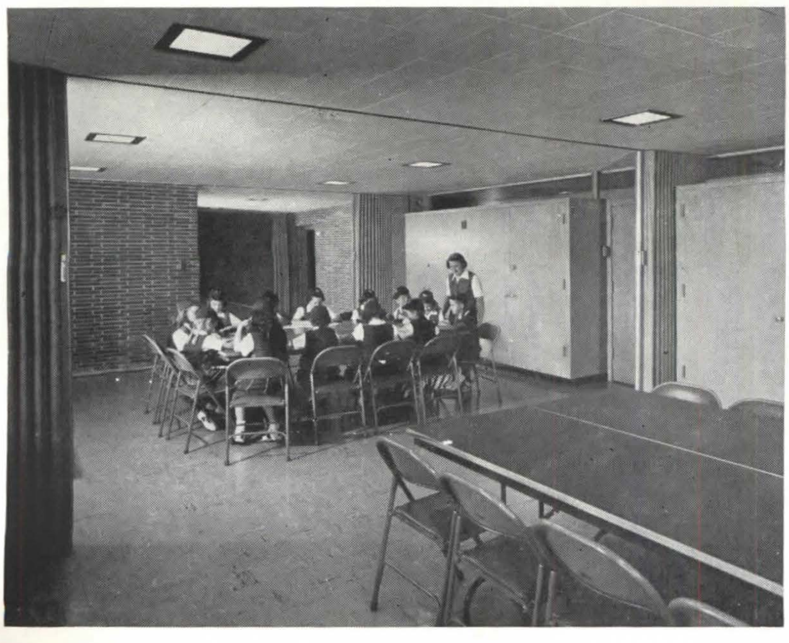


Playroom interior (right): *laminated wood bents; acoustical ceiling; and asphalt-tile floor with court markings inlaid. Terrace can be seen through glass walls. Some seating is provided along east wall.*

Opposite end of same room (below) *has stage and stairs leading up to club rooms.*

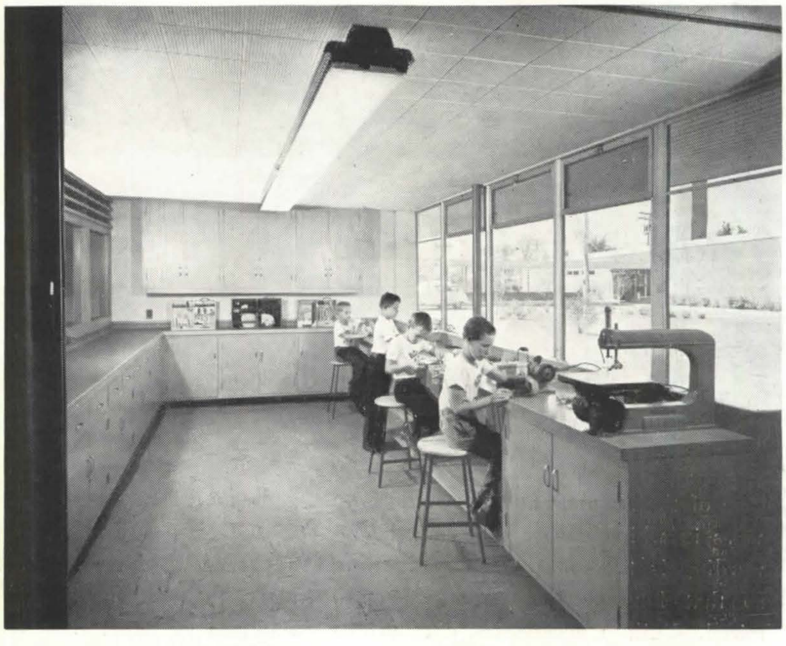






From main entry (above), *lounge and terrace can be seen. Unbroken ceiling and corridor add to spaciousness, while broken floor-level of the lounge adds interest and follows contour of site.*

Up the hall are civic offices; at other end are club rooms (left). *Acoustical tile is used on ceilings throughout, asphalt tile on floors.*



Office of park director (top) *next to main entry is typical in use of materials.*

Hobby shop (right) *at east end of building is across the corridor from club rooms. Noisy power tools are located in firehouse.*

Meeting room (bottom) *is across the hall from civic offices and separated from lounge by stone wall and fireplace. Windows give view of terrace.*

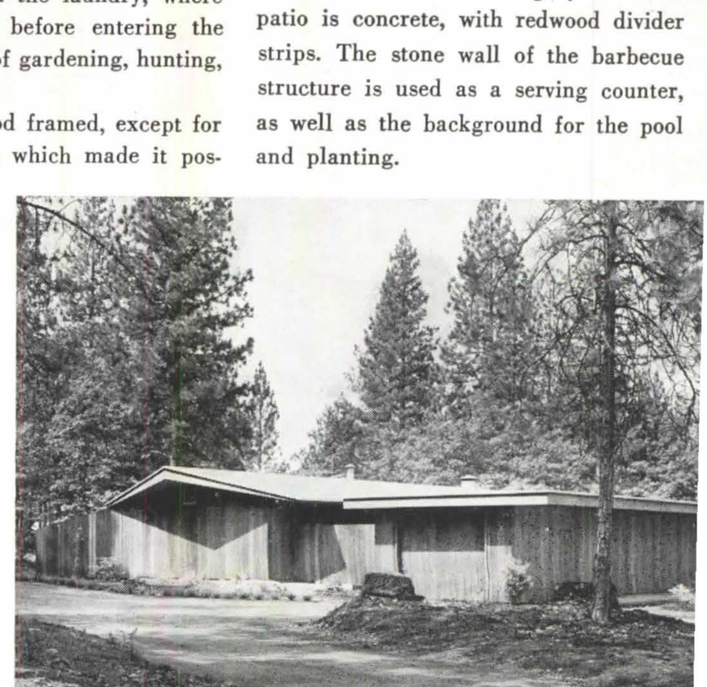
relaxed family living

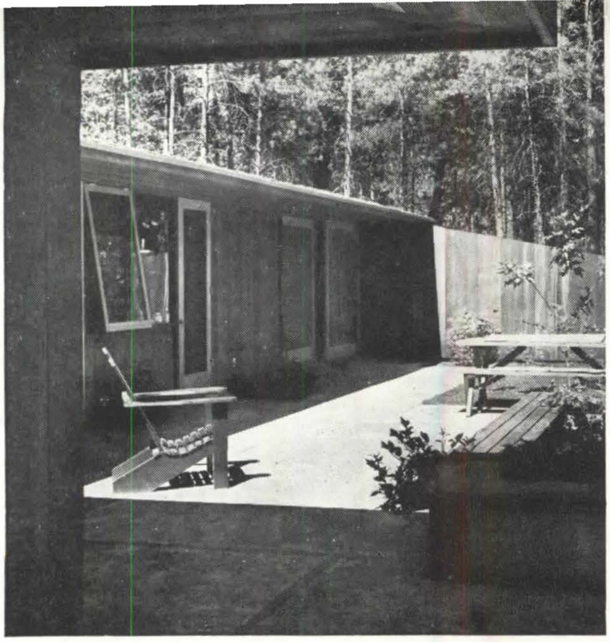
type	house
location	Paradise, California
architect	Roger Lee
heating engineer	George Brokaw
general contractor	Roy Holt

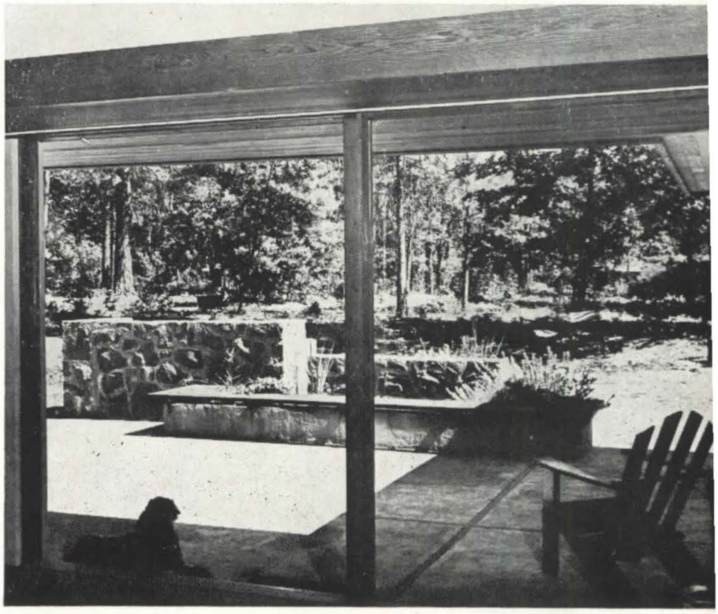
One of the simplest and least expensive ways in which leisure time may be rewarding is to plan the family dwelling so that housekeeping cares are minimized. Built-in accessories, outdoors as well as in, can make relaxed living and entertaining an everyday affair. Such a house, we believe, is this unpretentious home for a couple.

Built in the midst of a handsome grove of pine trees on a mountain ridge, the house turns its back to the street and all rooms open to the secluded south-facing patio at the rear. Here are a garden, a pool, and a barbecue fireplace, sheltered on one side by the study wing, on the other by a redwood fence. A plan refinement is the toilet-shower unit combined with the laundry, where one can clean up before entering the house, after a day of gardening, hunting, or fishing.

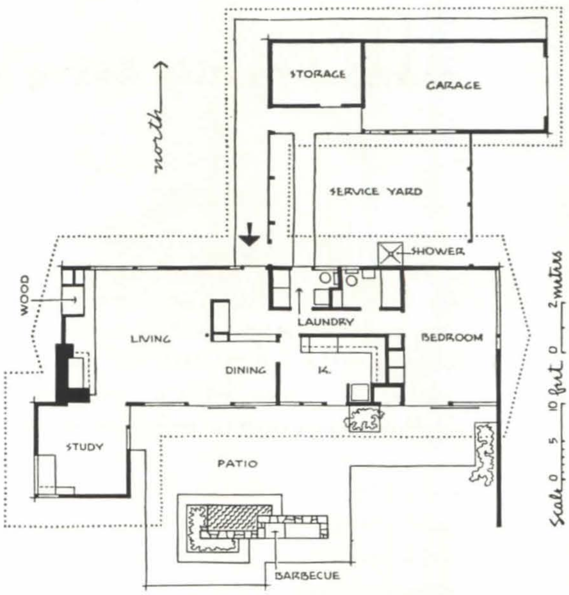
The house is wood framed, except for a steel ridge beam which made it possible to keep load-bearing partitions to a minimum. Both exterior and interior paneling are redwood, which is also used for storage walls and bookcases. The concrete-slab floor of the house contains an electric radiant-heating system. The patio is concrete, with redwood divider strips. The stone wall of the barbecue structure is used as a serving counter, as well as the background for the pool and planting.



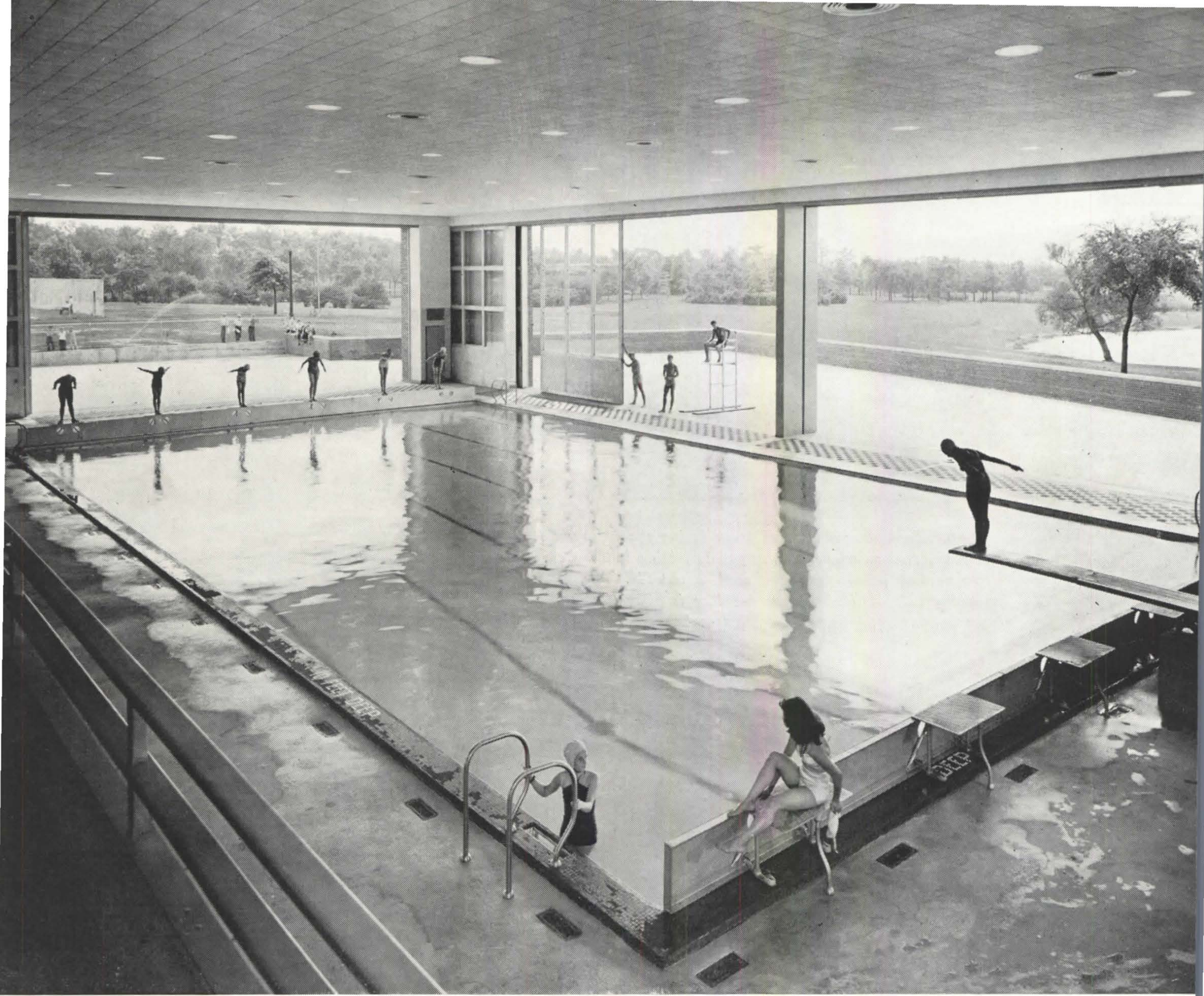




The whole wall of the living room facing the patio is glazed; room-height, sliding panels joining indoor and outdoor areas literally as well as visually. The cooking side of the barbecue fireplace is away from the house. Photos: Larry Kenney



In the study (right), as in all other rooms, walls are surfaced with redwood—which is also used for the built-in bookcase and desk. Floors throughout the house are waxed concrete.



year-round public recreation

type	swimming pool
location	Detroit, Michigan
associated engineers-architects	Giffels & Vallet, Inc., L. Rossetti
general contractor	Krieghoff Company

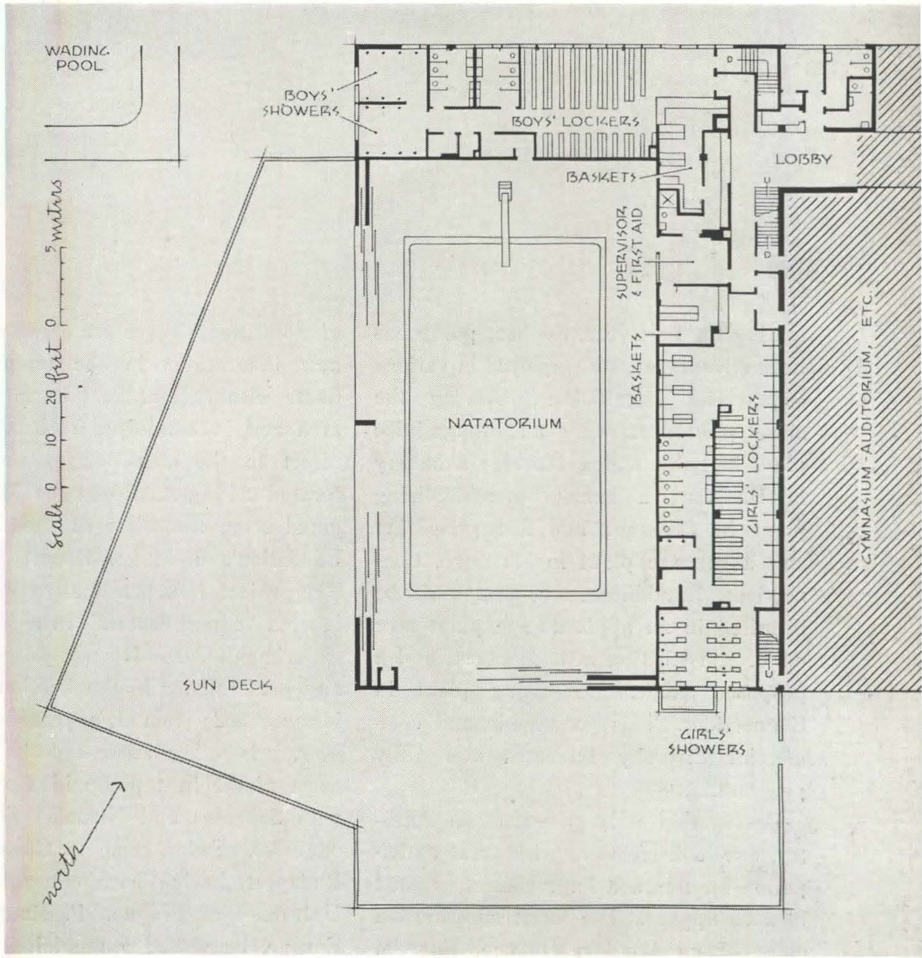
The General George S. Patton Memorial Pool is part of a combined-use facility for the City of Detroit Department of Parks and Recreation. Elements not shown include a combination gymnasium-auditorium and craft and social rooms (in a mass joined to the swim-pool structure, along its east side). In the basement of the swimming pool unit (which is at grade to the rear, due to the site slope) is a warming room for ice skaters and change rooms for young children who come in fine weather to splash in a large outdoor wading pool just west of the building.

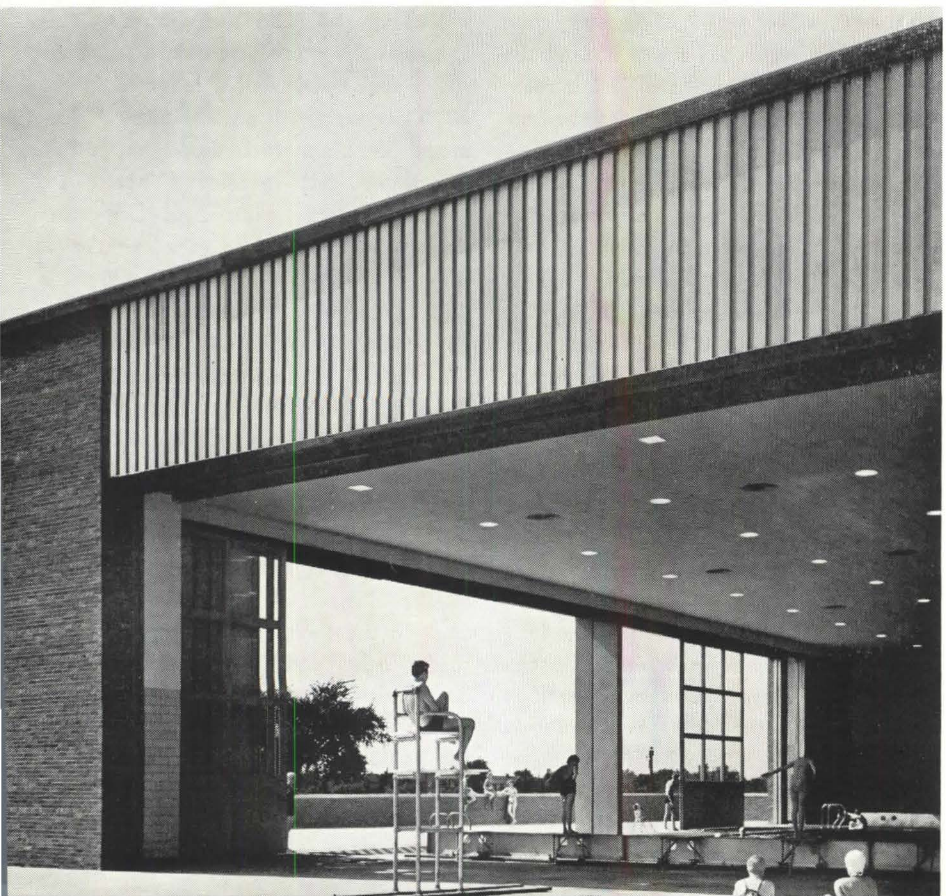
The pool itself was designed mainly for the use of city children, but the program required that it be standard AAU 6-lane size—42′ x 75′—to cope with occasional championship meets. Depths range from 3′6″ to 10′10″. It is of level-deck construction, lined with white ceramic tile and bordered with a 13-in. coping of nonslip, unglazed brown tile.

Solid walls of the room have a 10-ft wainscot of tile, with cinder block above. Because of the high humidity, sealed, recessed lighting fixtures are used, and the suspended acoustical ceiling that occurs over both the pool area and the spectator balcony (above the girls' locker-room area) is of cork.

Along the south and west walls, two parallel sets of sliding glass-and-aluminum doors roll back into pockets to open the pool area to an irregular-shaped outdoor sunning deck, 11,000 sq ft in area. This deck is of reinforced concrete finished with integrally colored green cement. The color was selected to minimize light reflection and—since the surface extends right to the coping of the pool—to assist the indoor-outdoor aspect of the design.

Basic construction consists of steel frame, brick and cinder-block walls, and metal roof deck with built-up roofing. Three separately controlled heating systems are involved—one that circulates warm air within the approximate 2-ft space between the pairs of sliding doors and also in the attic space above the ceiling; a second that services the locker-room areas; and the third that heats the natatorium. The system is designed to heat the natatorium to 85 degrees F., and 50 percent relative humidity (at an extreme outside temperature of 10 below zero with 75 percent relative humidity). Photos: Lens-Art





swimming pool heating

by Henry E. Voegeli*

During the past year, the heat pump has been advantageously employed in various commercial installations. Among the more prominent were an orange-juice plant in Lake Wales, Florida; a bakery in Houston; a banana merchandising plant in Chicago; and a supermarket and a sausage plant in Hartford, Connecticut. In addition, heat pumps will be installed in an apple-storage plant now under construction near Montreal and a proposed poultry marketing plant in Connecticut. This geographic and commercial diversity indicates a healthy progress.

During this early growth of an industry, one looks forward with great anticipation for the next improvement or good idea to appear. The latest contribution comes from London, Ontario, Canada, where the heat pump has been put to work in a $1-million addition to a commercial and technical high school.

The principal idea in the use of the heat pump in the London High School, located on the 43rd parallel 120 miles west of Niagara Falls, is that of reclaiming the heat from exhaust air in the ventilating system and putting the heat back into useful service. A simple method would have been to return it direct to the heating system for the building, but since heating is only a seasonal requirement and the heat pump is capable of rendering year-round service, it was decided to put the heat into water for the swimming pool and for the boys' and girls' showers. These services are in use both summer and winter, either by the school or by the people of the town—all of whom are entitled to the benefits of the large air-conditioned cafeteria and the facilities for swimming and bathing, operated in co-operation with the Board of Education. There are also interesting new innovations in the tempering of floors with radiant heat in the bathing area and in admitting fresh outside air direct to the classrooms through perforated ceilings. All of these ideas emanated from the office of the Board of Education's architect, Robert Schoales. The project, now practically complete, is labeled "experimental." In a sense it is experimental, so far as proportioning and performance in the London climate is concerned; from all appearances, however, it is rather a safe experiment. The germ of the heat pump idea originated with Schoales and Nicholas Foder, his engineer. Foder came to Canada from Budapest, having been educated at the University of Prague. Passing through Europe, he visited a municipal bath in Zurich, Switzerland, where a heat pump was used to heat water of the swimming pool and to warm the floors around the pool, and in the shower and locker room area. The idea was adopted for the London High School Building.

The mechanical equipment for the high school building embodies an original steam plant with an auxiliary heat exchanger for hot-water heating; a heat pump for summer-comfort conditioning in the cafeteria, as well as for reclaiming heat from the ventilating system, that would normally be discharged to the outdoors in winter; and a finned-tube coil to extract heat from outdoor air in summer. This involves a refrigerating air conditioner, two heat exchangers, Freon to water, and two shower storage tanks.

Efficiency in the operation of the heat pump deals essentially in dry-bulb temperatures. Therefore, summer-comfort conditioning in the high school cafeteria is justified by the fact that thermometer readings on the hottest day on record in London have been higher than those on the hottest day in Miami, Florida. Similarly, the idea of reclaiming valuable heat from vitiated air in the exhaust system of this public building, with a recommended winter design temperature of –10 F figured on four to six air changes per hour, is chock-full of common sense. Of course, London has the advantage, as in Zurich, of having relatively inexpensive hydroelectric power.

The summer air conditioner for the cafeteria and kitchen has 75 tons of refrigerating capacity. In hot weather, this will furnish a good proportion of the heat required for the swimming pool water, lavatories, and showers. As an auxiliary for use in spring and fall, when little if any air conditioning is needed, a refrigerating convector in a penthouse on the roof furnishes the heat for the swimming pool and the showers. This equipment is quite original in many respects and consists of a louvered intake 10′ 6″ square with an iron-mesh screen, metal filters, a motorized damper, and an evaporator coil measuring about 10′ square. A large centrifugal fan draws the outdoor air into the penthouse through the convector and discharges it direct through a louvered opening 10′ 6″ x 6′ 0″ in the opposite wall (*see illustration*). In this way, the outdoor air does not enter the building but only passes through the penthouse where, on its way through the evaporator, it gives up a calculated amount of heat.

The heating system for the building consists of convectors under the windows of the classrooms and radiant heating coils in the floors around the pool and in the locker and shower area. There is no provision for recirculating stale or partly vitiated air. Instead, there is a gentle flow of outdoor air entering the classrooms at all times, by induced draft

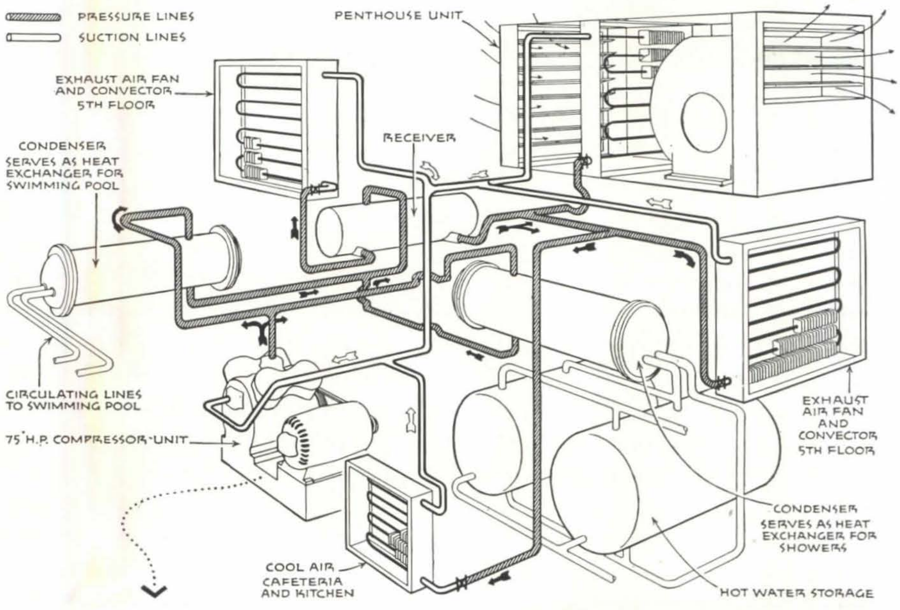
** Development Engineer, The American Brass Company, Waterbury, Conn.*

RECLAIMING HEAT FROM EXHAUST AIR

created by suction from the exhaust fans at the top-story level, where the foul air is discharged to the outdoors and where a great part of the invested sensible heat is removed by the heat pump. This is accomplished by interposing a large heat absorber or refrigerating convector between the exhaust fan and the stormproof louver in each of the two fan rooms. The reclaimed heat is thereby returned to the compressor where its temperature is raised and the amount increased by the heat of compression, ready for use in heating water.

Freon 12 is the refrigerant used in this heat-pump system and the piping is of copper tube ranging from the small-size capillary tube for temperature and flow control to the 4⅛" O. D. copper tube for the refrigeration lines at the compressor. There are new ideas of layout and construction wrought into the assembly which deserve special mention. The method of connecting small tubes to large ones by silver soldering or brazing, without the use of fittings, is quite unique.

This installation of the heat pump is noteworthy because it belies the claim that such a machine is not for cold climates. It is also important because it demonstrates its usefulness in a ventilating system in practically any climate. It can do a valuable service in either heating or cooling, while the cost of operation is offset by the benefit obtained from the double-work cycle of the machine. In summer it removes heat from the interior and from incoming air, in spring and fall it takes heat from the outside air, and in winter from the outgoing or exhaust air which in a public building represents more than half the total heat input. This heat can be stored in water or in the ground so that it can be drawn upon for various uses inside a building.



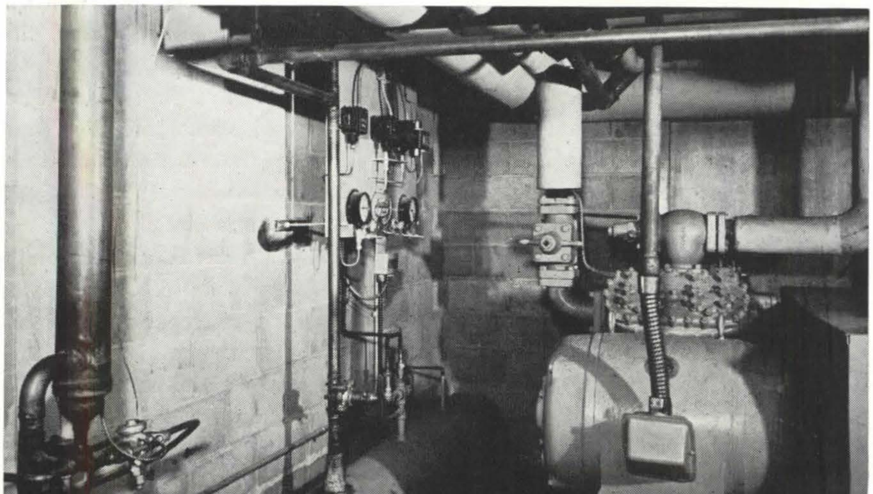


Diagram of heat-pump installation at London High School, London, Ontario, Canada (top). *Unit reclaims heat from exhaust air in ventilating system and puts it into water for swimming pool and showers.*

Power unit for heat pump consisting of 75 hp compressor (bottom). *Note receiver and heat exchanger for subcooling of liquid refrigerant.* Photo: Arthur A. Gleason Ltd.

the architect and his community

Don Hatch (left) and Michael Hare, partners in both Oficina Don Hatch, Caracas, and Hare & Hatch, New York City, study a model.

Both the aerial photo and map acrosspage show how Caracas crowds its mountain-rimmed valley. Last remaining free area for development is a 1,200-acre tract to the east, where Oficina Don Hatch is doing the entirely new residential community of La Urbina. The map also shows the location of a number of the projects presented on subsequent pages.

Aerial photo: Hamilton Wright

Anyone who still thinks of Venezuela as a slow-paced, cocoa- and coffee-growing country has overlooked one of the most sudden and dramatic developments that has occurred anywhere. For in the early '20s, an oil gusher whooshed in the Maracaibo Basin area of this tropical, mountainous country—and today, Venezuela is second only to the United States among the largest producers and exporters of petroleum in the entire world. In 1947, the United States Steel Company found mountains of high-grade iron ore—sufficient resource, it is estimated, for the next 50 to 100 years. And even more recently, there has been either discovery or development of other of the enormous natural resources of the land—gold, diamonds, nuclear minerals, sulphur. In the Orinoco River Valley, there is a vast hydroelectric program going forward.

As Don Hatch, partner in charge of the Caracas firm of Oficina Don Hatch, comments: "Venezuela is a boom country, where the national pastime is literally 'grabbing a bull by the tail'—and I like it."

Oficina Don Hatch is but half of an exceptional, two-part-two-country office setup—the other half being the firm of Hare & Hatch in New York, which handles commissions in the United States as well as working closely with the Caracas office. The dual firm was formed in 1949 "to provide an organization capable of bringing the requisite professional technical skill to bear on building problems in Venezuela and to have the necessary staff available in New York or Caracas, as the need arose." Michael Hare, who is usually at the New York office, and Don Hatch, who lives in Caracas, are principals of both partnerships. The two served together in aviation, U. S. Marine Corps, during World War II and have been in close association ever since: "The Marine Corps, following the alphabetical rule, landed HAre and HAtch in adjacent bunks," Don Hatch points out, "and we've been there ever since!"

In the Caracas office, Dr. Claudio Creamer, an associate of the firm, is in charge of all structural engineering. Among the New York engineers who frequently serve as consultants are Henry Werner, on structural work, and Frederic E. Sutton, for special mechanical engineering.

Hatch went to Venezuela in 1948 for the Venezuela Basic Economy Corporation, a Rockefeller project, as chief architect for their construction program, involving at that time 15 to 20 projects—refrigerated warehouses, ice plants, supermarkets, and retail stores. When the program and management policy changed in 1949, Hatch took over completion of the program on his own and opened the Caracas office.

"Whereas, stateside, an architect's community may be his city, its environs, and his state," Hatch comments, "in Venezuela, Caracas is my house, but my community is all Venezuela. . . . Since I am a foreigner, I miss the stimulation of political activities. My community contribution, God willing, will be helping to find an architecture for Venezuela." The following pages indicate not only how successful his search has been, but also to what a wide range of building types he has applied his findings.

With the enormous growth in the country, swift changes have also taken place in things architectural. "The fine old hacienda houses are nearly gone. Most of the old Caracas town houses have disappeared, and what is left is going." Inevitably, the fast growth of

Oficina Don Hatch: Caracas, Venezuela

(Hare & Hatch, New York)

Caracas has brought typical problems in its wake—smaller lots, higher rents, the banalities that quick money invariably produces. Not the least of the city's problems is its physical limitations, confined as it is in the valley setting among mountains that it can't climb.

Until about 1948-49, the sort of professional architectural service that is familiar in the States was almost unknown in Venezuela, the nearest thing to it being engineer-contractor offices that were the main source of building design. There were also a few Beaux-Arts-trained architects, who worked mainly for the government. At about the time that Oficina Don Hatch was established, several young U. S.-educated Venezuelans and a number of Europeans also opened architectural offices there. Today, "there are probably 20 to 30 architectural firms in the country."

Since the way a North American architect's office operates was generally unfamiliar, achievement of well finished buildings has required a continuous process of explaining and educating each new client, each new subcontractor, and, in not a few instances, the workmen themselves—"quite a safari," Hatch calls it. "One gradually builds up a fair list of those 'in the fold,' " he goes on, "but there is considerable mortality among the 'educated' who wander off on their own after short instruction . . . certain of the subcontractors do not relish our strict supervision, and one job with us is enough for them." Hatch does feel that patience is establishing for the firm a reputation for integrity and professional ethics. Nonetheless, he still wonders if it may not eventually be necessary for the firm to do its own building. "What AIA would say is obvious," he comments.

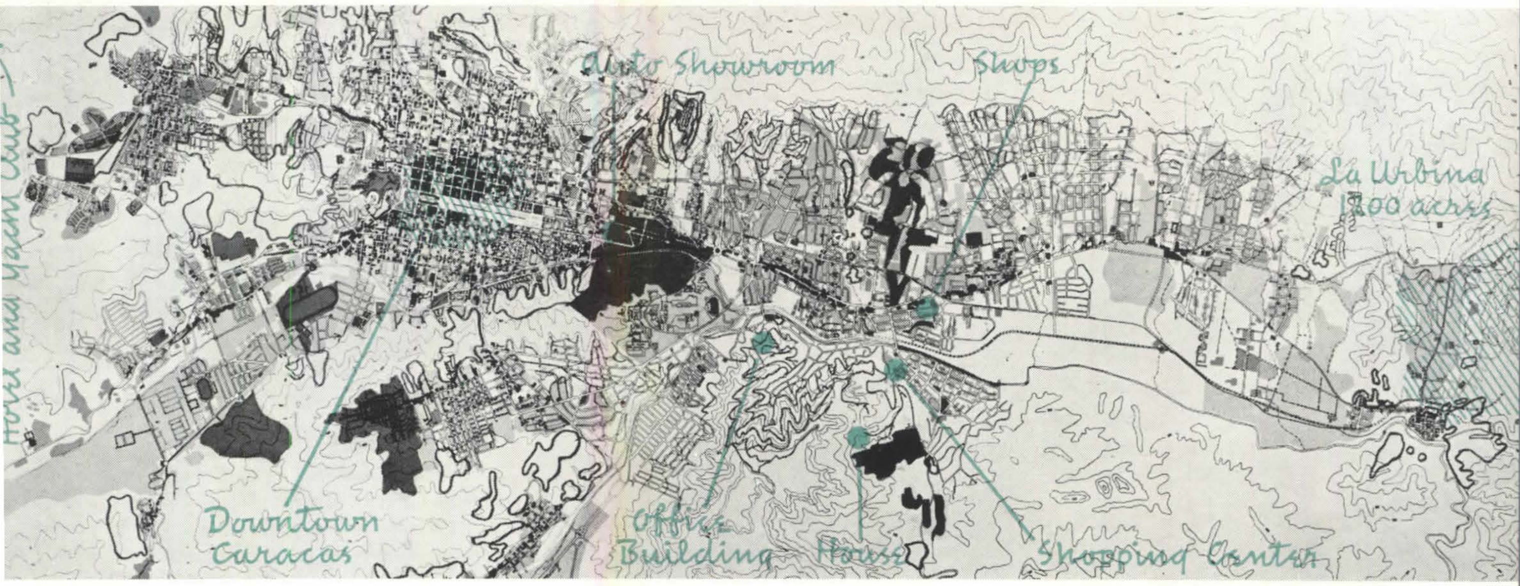
Oficina Don Hatch started out with just Hatch as the architect and his wife as secretary. Today, they have a sizable staff, efficient personnel mostly acquired in Caracas, since Hatch found that imported U. S. draftsmen and/or their families lacked the frontier spirit and soon wanted to return home.

"We have a little United Nations in the office," Hatch says. "The head draftsman is Canadian; the designer is a Russian without portfolio; draftsmen are a Panamanian, a Yugoslav, an Englishman. The engineer is an Ecuadorian; the office boy, a Venezuelan; one secretary, a German with a Guatemalian passport; the accountant a Trinidadian."

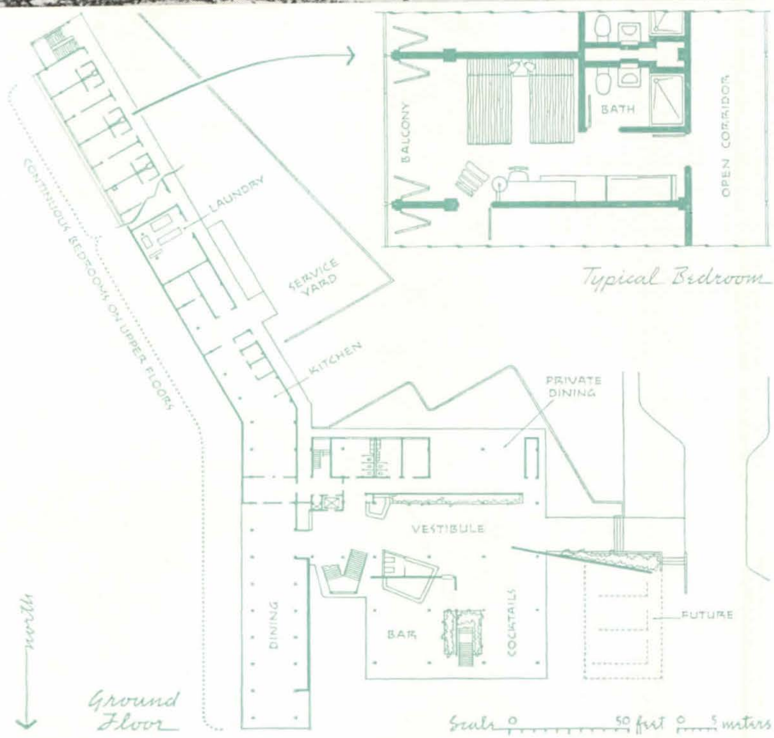
In developing a project, he explains, there is little differentiation between designing and production of working drawings. A very thorough preliminary study is made, usually involving models as well as sketches. With this detailed early study, working-drawing production is simplified, and work fast progresses to complete detailing, selection of materials, textures, colors, finishes, the lighting and landscaping, all developed as working drawings. Dr. Creamer, the associate engineer, keeps "working things over" and refining for better integration of structure and design. "All of our bones show," says Hatch, "and we are careful of their appearance": the structural drawings are "something to see." Each bar is shown, its position in the slab, beam or footing; its size, length, etc., all dimensioned on the drawing.

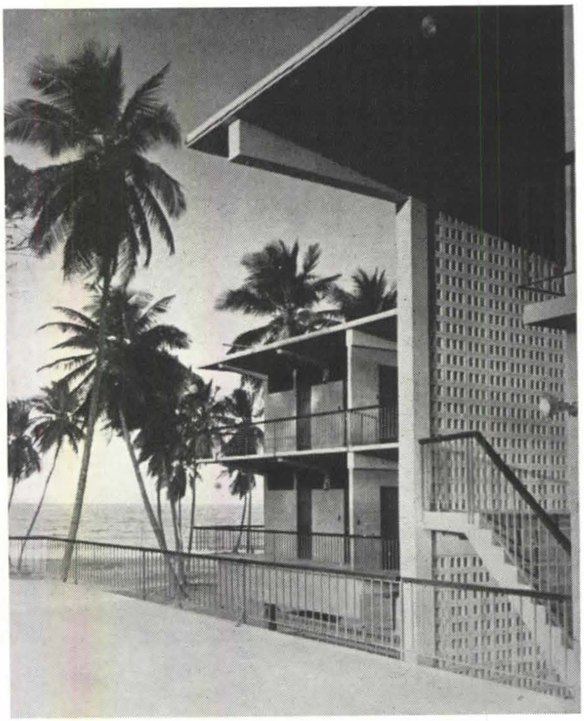
Oficina Don Hatch usually takes sealed bids from a selected list of contractors, based on exceptionally complete drawings and specifications, with the low bidder awarded the contract, on a lump-sum amount. In some cases, though, "we have successfully used a contract with a guaranteed top and a distribution of any savings, between owners and contractor—this again by competitive bidding."

In the study that follows we show several of the recent jobs from Oficina Don Hatch drafting boards—a hotel, an automobile showroom; a group of shops; an office building; a house, a yacht club, and a shopping center.



hotel

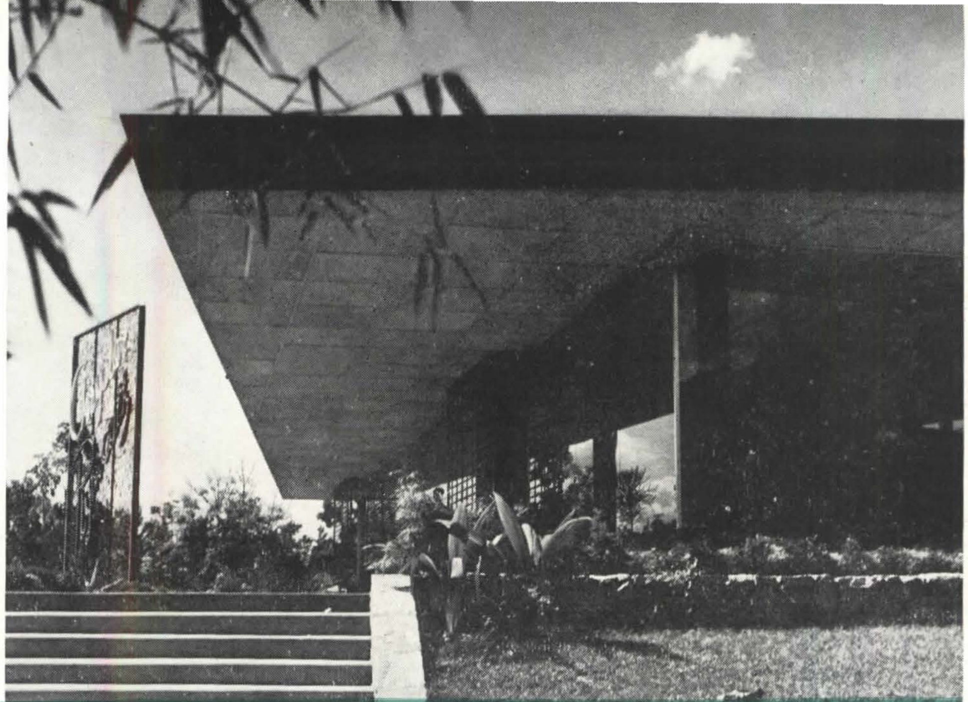


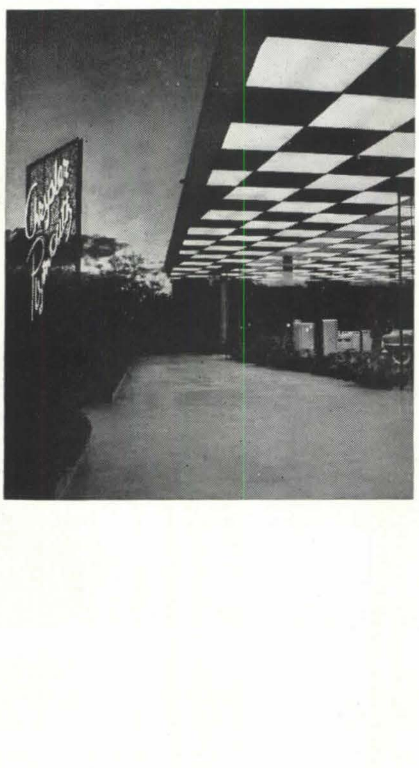


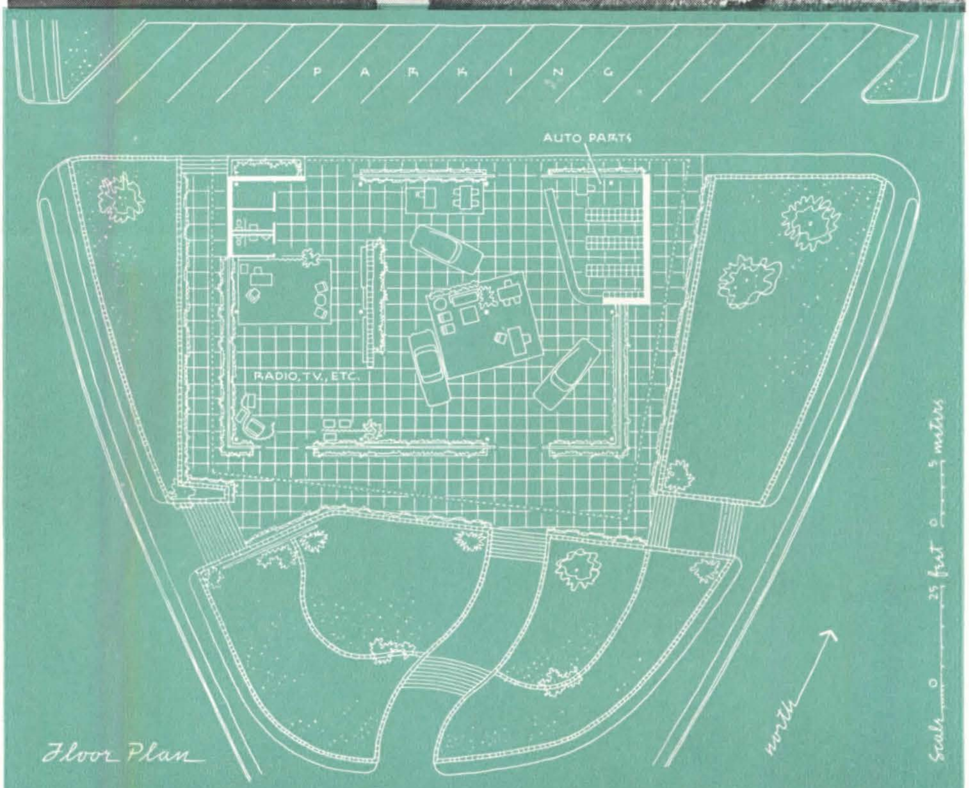
The Hotel Balneario is in Puerto Cabello, on the seacoast west of Caracas. To provide a 50-bedroom hotel within a $450,000 budget, strict economies had to be observed—no plaster or glass; minimum of metal; cement floors. Bedroom wing is oriented to take maximum advantage of the prevailing east-northeast breeze and also to enjoy view of sea and harbor; bedrooms placed for seclusion from noise of late activities around bar and cocktail lounge. Construction and services were designed for an additional bedroom floor of 25 rooms. Construction: reinforced concrete frame and solid slabs; floors: cement in bedrooms and public areas; terrazzo in toilets, kitchen area, and shower compartments. Filler walls: concrete block unplastered, tooled joints lined vertically; some walls with openings left for ventilation and light. All woodwork—fixed louvers, doors, wardrobes, etc.—local mahogany. Cost, including all furnishings and equipment (exclusive of land, landscaping, and fee): $1.28/cu ft or $11.30/sq ft. Cost per room: $9400.

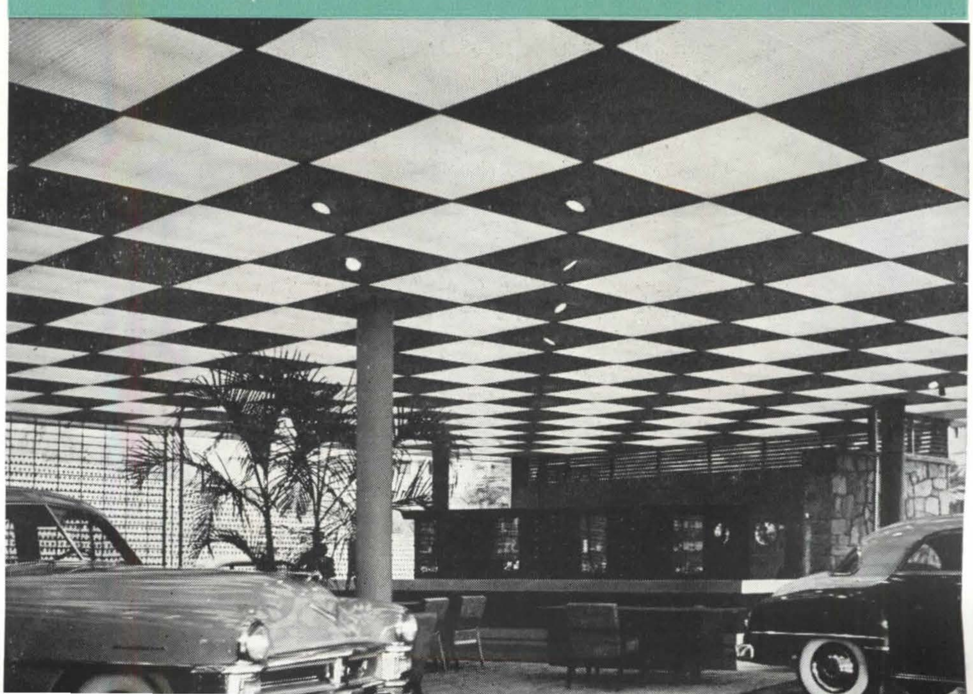
automobile showroom

Requirements for this Chrysler-Plymouth showroom were for exhibition space for three to five cars; a parts-sales department; separate display for radios and television; and parking for 15 cars. Framed in reinforced concrete, the building has an 8-in.-thick roof slab, with two-way reinforced concrete ribs and 5-ft-wide beams contained within the slab depth. Columns are spaced 32 ft on centers. The long cantilevers are 20′ 2″ from center of column to end of beam. The ceiling and soffits of terrace overhangs are made up of 4-ft squares, of alternating vermiculite plaster and plastic eggcrates with fluorescent lamps above. The supporting steel-tee grid is 12 inches below the underside of the roof slab.

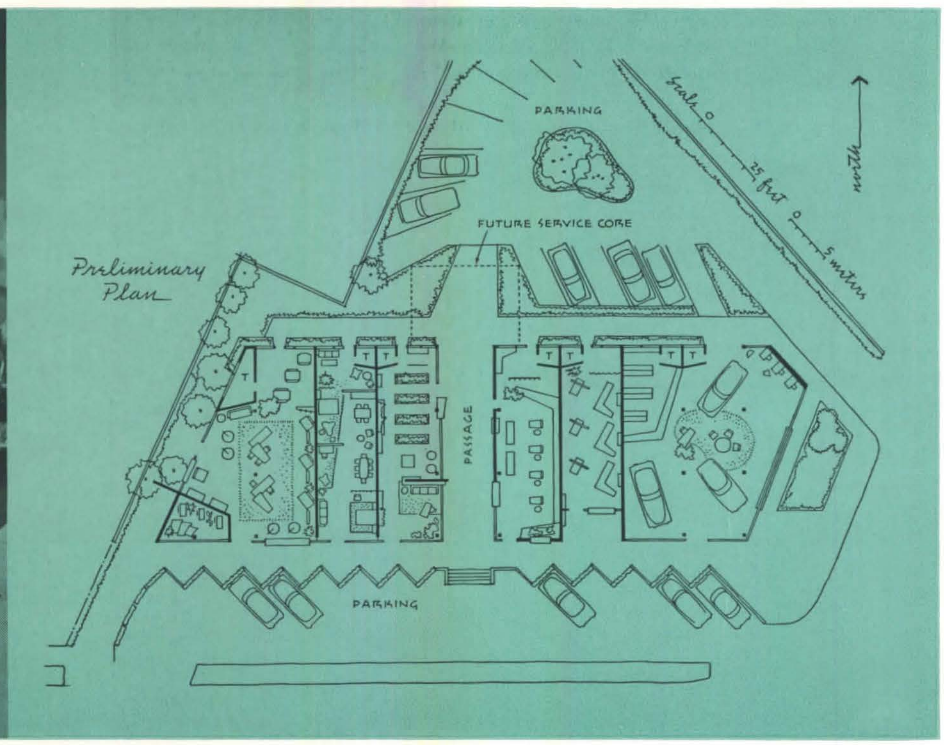








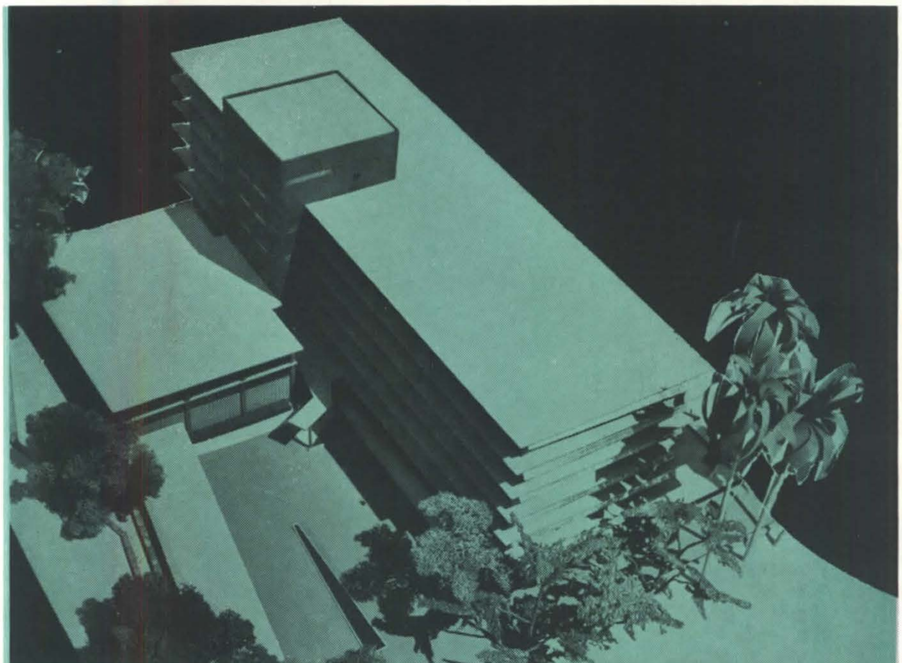
the architect and his community: Oficina Don Hatch



This is the ground floor for a future seven-story office building (for which foundations and columns are calculated). Fire stairs, toilets, and elevators will be in a service core to the north. First tenants of the building, which is in a new suburban shopping area, were Christian Dior, Cartier, and Cadillac Motors. Most recent tenant is Don Hatch himself, who has established the Galleria Don Hatch, which will handle Knoll fabrics, ceramics from Sweden and Finland, crystal from Italy, Finland, and Sweden, Finnish lighting fixtures, Haitian sisal rugs, and Danish silver. The shop will also show work by local painters, sculptors, etc. Structure is reinforced concrete with waffle slab; terrazzo floors.

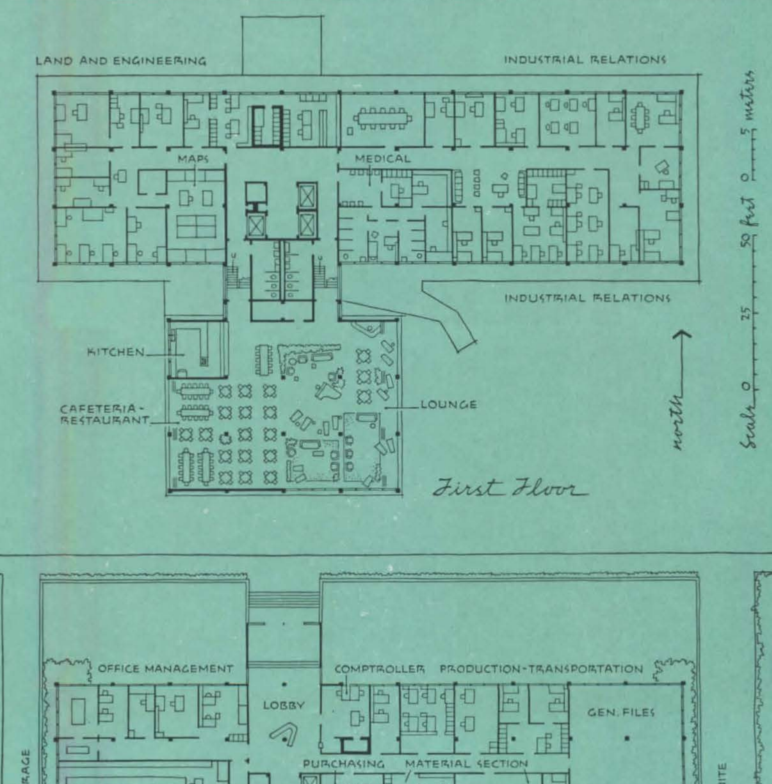
shops

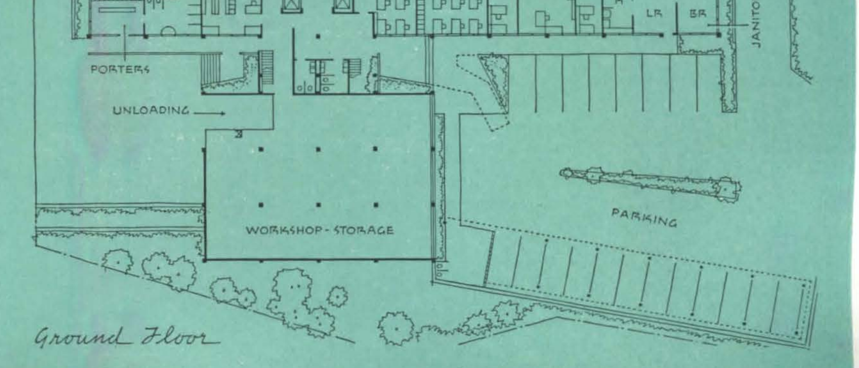
office building

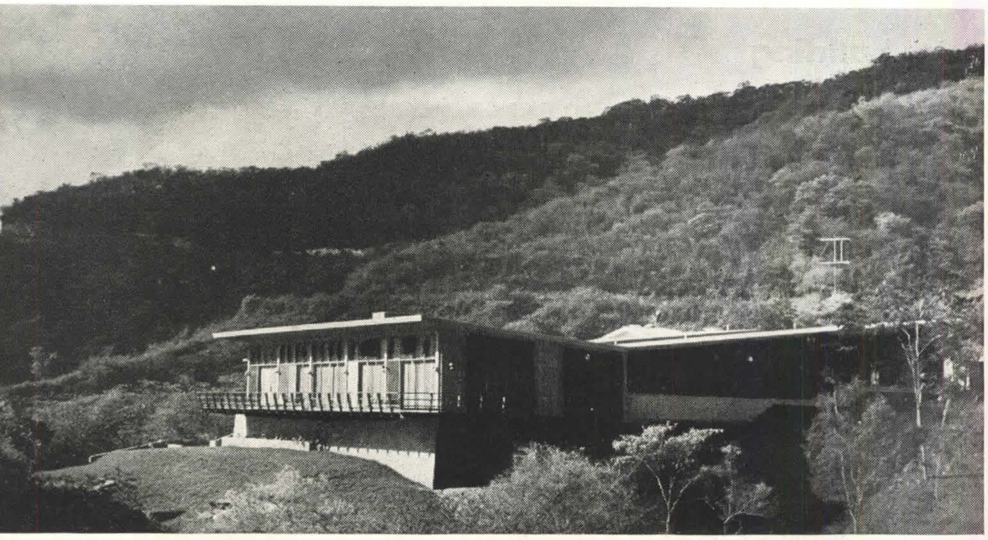


Proposed offices for an oil company of Venezuela occupy this six-story structure of reinforced, two-way rib slabs supported on reinforced concrete columns. A module of 4'4" was adopted, based on the requirements for the typical, minimum private office. The typical concrete bay consists of four by four modules, within which the minimum office is two by four modules, or 8'8" x 17'4". The terrazzo floors continue onto the concrete eyebrows for sun and rain control. Voids between columns and slabs are entirely filled with steel frames, containing glazing or louvers. Plan is developed around a central service core, with offices arranged around the desirable north and south long façades and across the ends. The two-story rear extension contains storage and shops (ground floor) and employes' lounge and cafeteria on the first floor. The central bay of the building is furred down to form a supply plenum for a forced ventilation system. Air temperature and humidity conditions in Caracas provide comfortable working conditions with forced ventilation of 30 to 40 air changes. This also allows the perimeter offices to have fixed, glare-reducing glass vision panels with exhaust louvers top and bottom that eliminate draft disturbance.

This building, one of the larger commissions in the office, called for consulting engineers under the direction of the New York office of Hare & Hatch—Henry Werner, on structural matters; Frederic E. Sutton, for electrical, plumbing, and ventilating work.

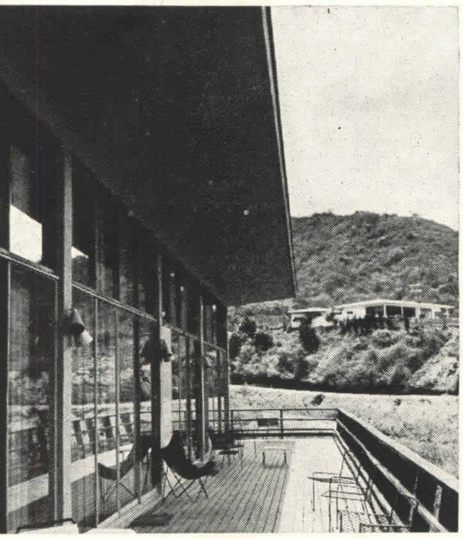


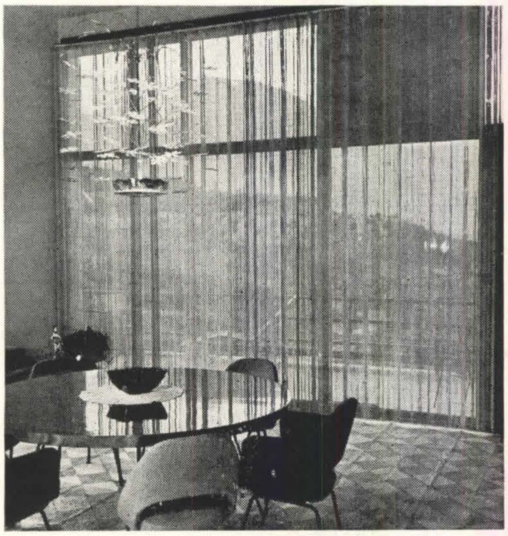


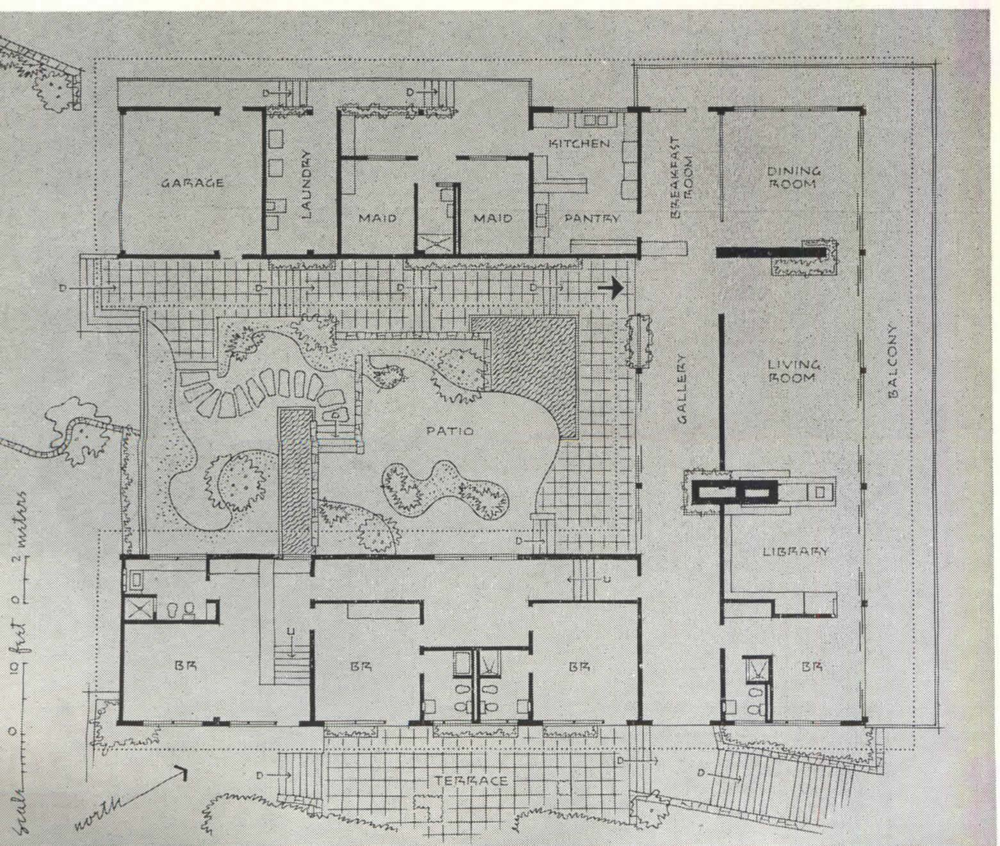


house

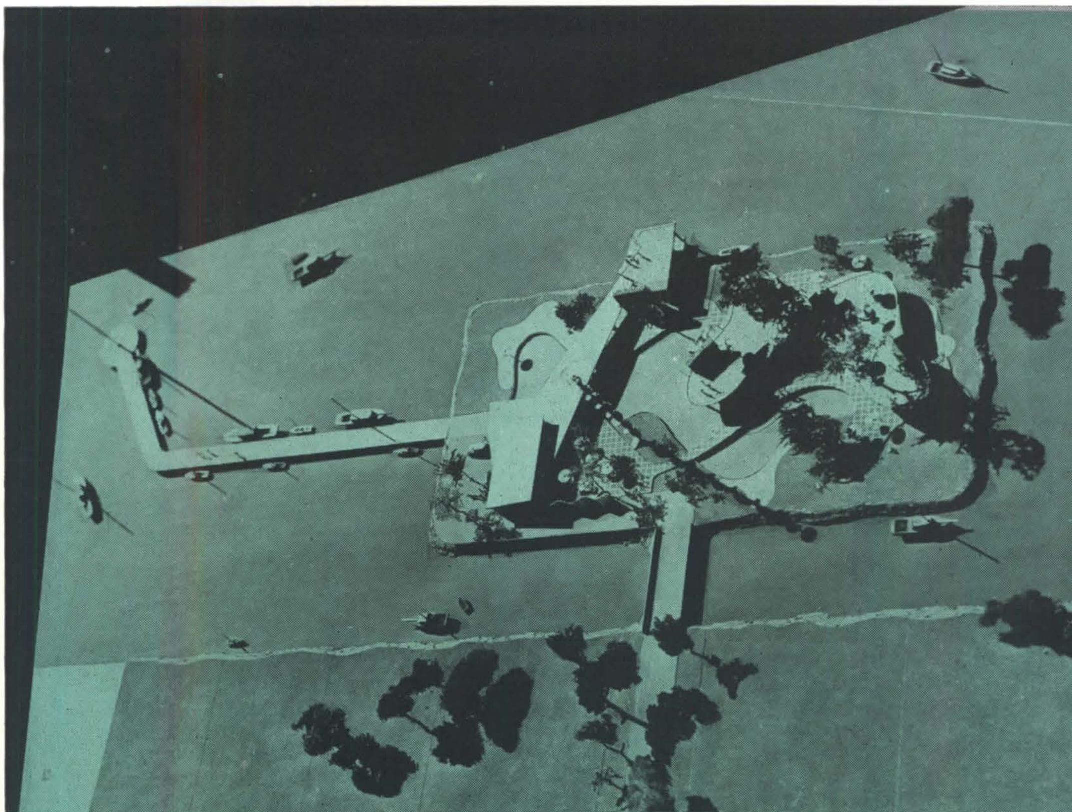
Built overlooking a golf course and a mountain range to the north, this commodious house is the home of parents, two young daughters, and a son. Their wish was for quiet family-living surroundings but with facilities for entertaining small or large groups. Organized around a richly landscaped courtyard, the house is planned so that the main family living rooms all face the dramatic view and are bordered by an outside lounging deck; family bedrooms occur in the east arm of the house; kitchen, servants' quarters, laundry, and garage are in the other wing. Framed in reinforced concrete, the house has slabs 8 in. thick, with two-way, reinforced-concrete waffle grid. Flooring is mainly terrazzo; local cement tiles are used in service wing and garage. Exterior walls are mahogany and glass, with certain areas of local stone and concrete block. Steel casements are equipped with manual operators. No heating system is required; domestic hot water is produced by electric heater and circulating pump on hot-water loop.

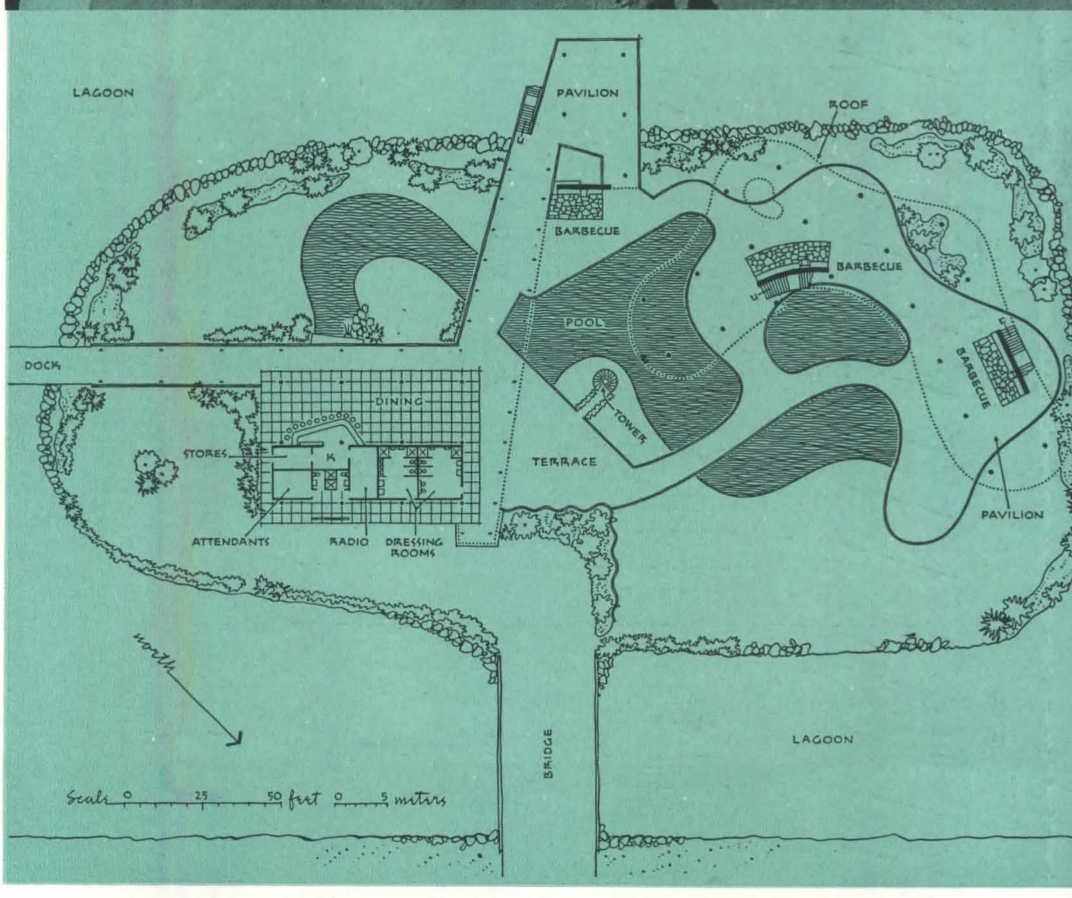




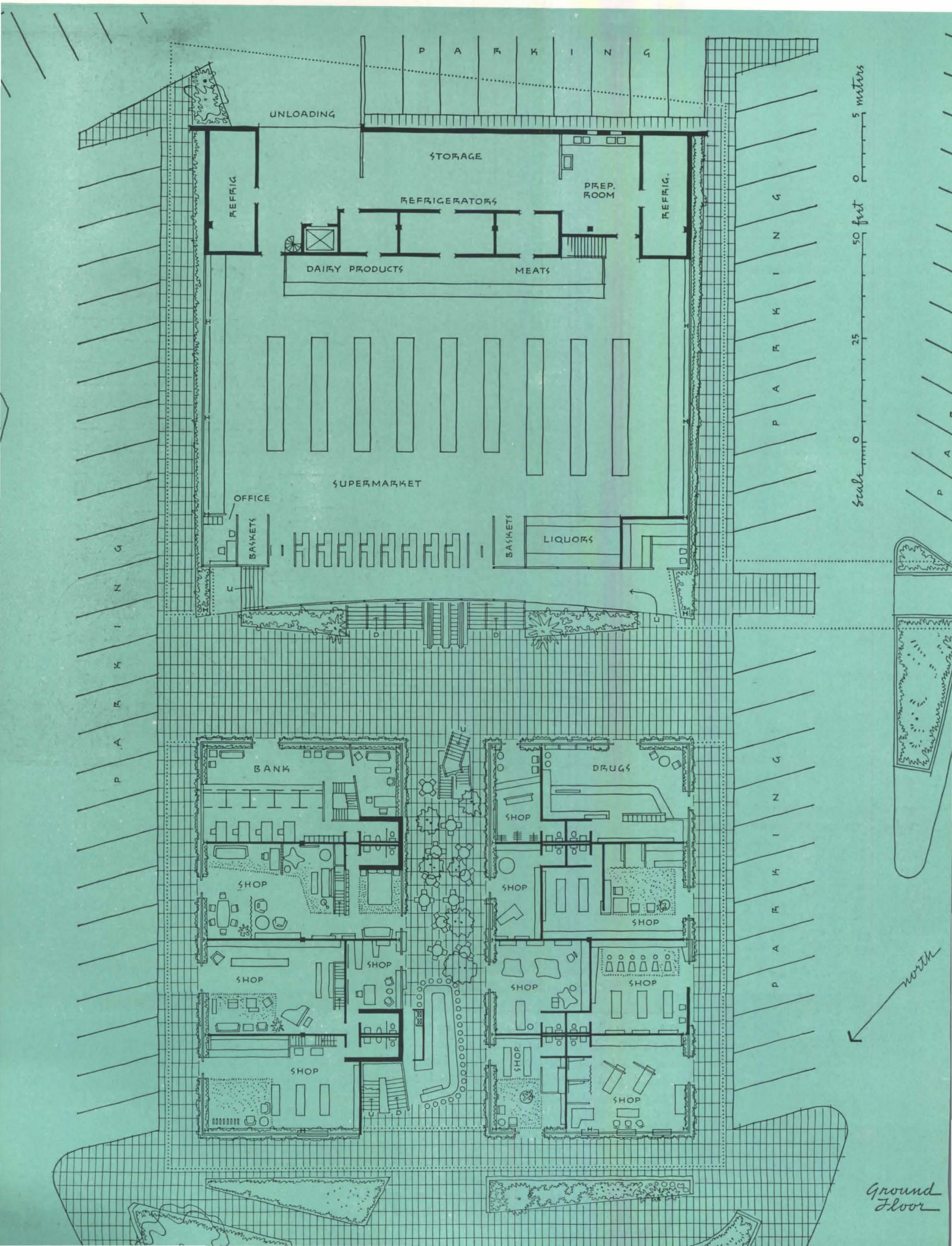


yacht club





The yacht club, located on the shore east of the port of La Guaira, is on a small island in a lagoon that is large enough to berth up to 100 club boats and yachts. The plan is conceived as a shaded park around open, landscaped pavilions, stepped-down reflecting pools (through which water flows slowly), breezeways, and barbecue fireplaces, where informal groups gather around the fires for drinks and broiled fish or meat. Only enclosure is the building containing dressing facilities, attendants, quarters, storage and repair shop for fishing gear, and snack bar. Structures are reinforced concrete, with walls of the building of unplastered concrete block. Terrace floors are brick, laid in a basket-weave pattern. Model and plan illustrate two early stages of the design.


PARKING
UNLOADING
STORAGE
REFRIG
REFRIGERATORS
PREP. ROOM
REFRIG.
DAIRY PRODUCTS
MEATS
SUPERMARKET
OFFICE
BASKETS
BASKETS
LIQUORS
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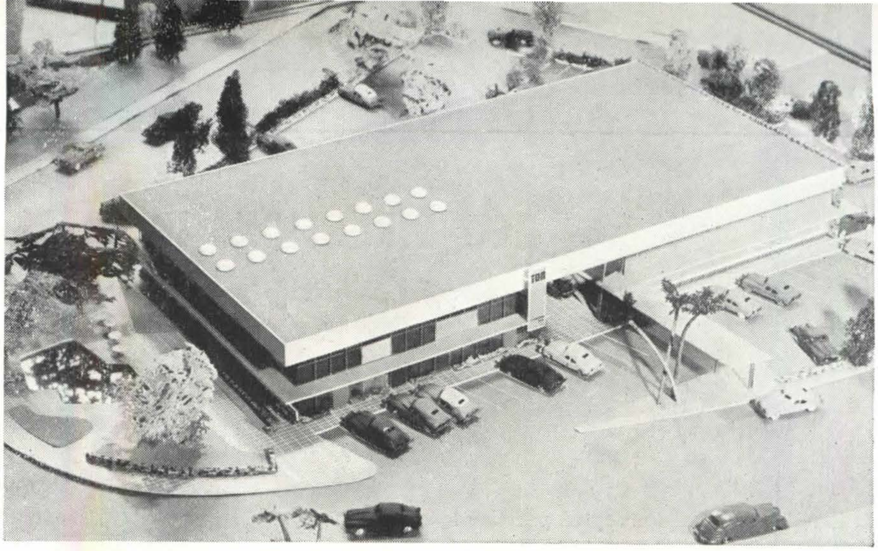
SHOP
SHOP
SHOP
SHOP
SHOP
U
D
PARKING
PARKING
Scale 0 25 50 feet
0 5 meters
north
Ground Floor

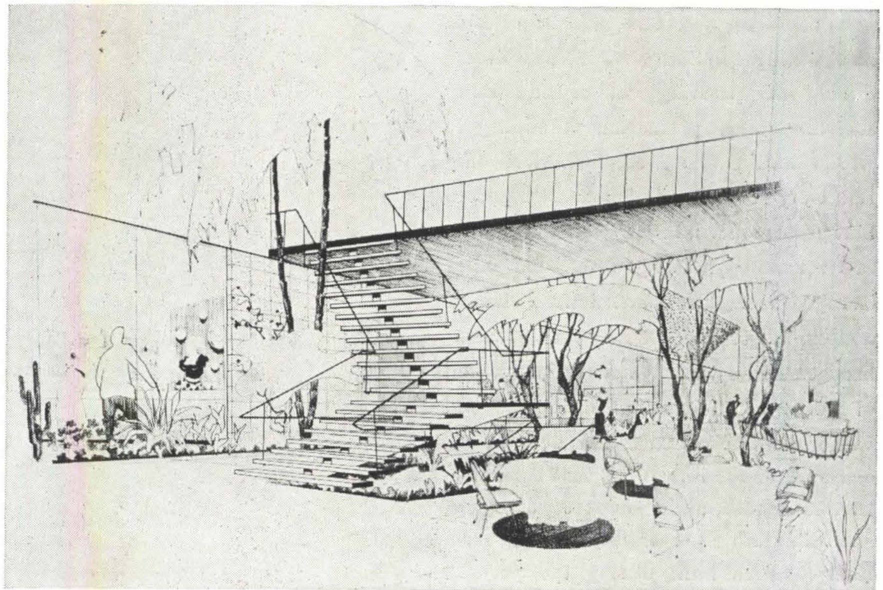
construction

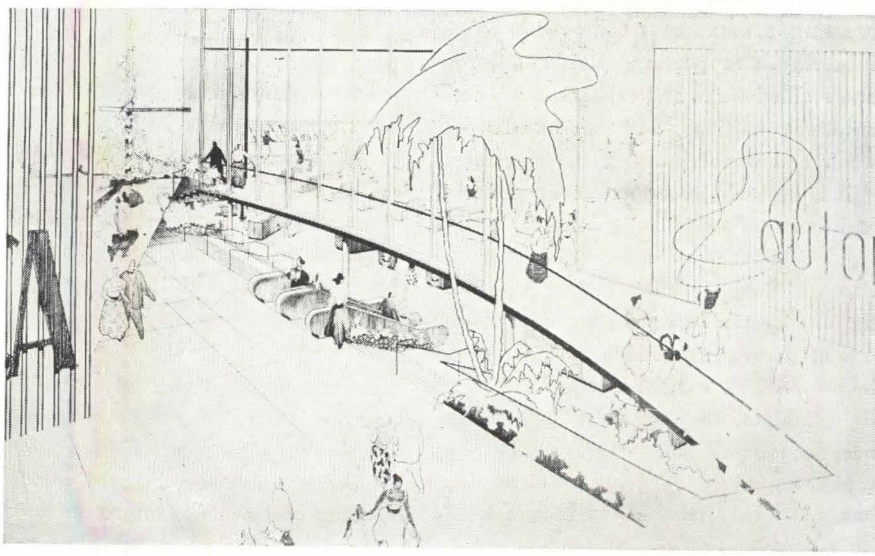
Foundation, floor, roof, framing: foundation and floor slab: reinforced concrete; steel framing—Bethlehem Steel Company; roof: steel trusses, roof deck (open-web steel joists)—Truscon Steel Company. **Wall surfacing:** exterior metal panels—Detroit Steel Products Company, Truscon Steel Company; rest rooms: ceramic tile, stone. **Floor surfacing:** terrazzo; metallic-aggregate cement—The Master Builders Company. **Ceiling surfacing:** concrete and plaster. **Roof surfacing:** felt and gravel roofing—Johns-Manville Corporation. **Waterproofing and dampproofing:** membrane—Johns-Manville Corporation; waterproofing admixture and plaster coat—The Master Builders Company; integrally-colored calking—Tremco Manufacturing Company. **Insulation:** acoustical plaster—Zonolite Company; thermal: 2" vermiculite over roof deck. **Roof drainage:** wrought-iron gutters and downspouts, roof drains—Josam Manufacturing Company. **Partitions:** interior: masonry, mahogany, glass; toilet: tile and masonry. **Windows:** steel sash; 1/4" plate glass, 7/32" heat-absorbing glass—Pittsburgh Plate Glass Company; aluminum store fronts—Aluminum Company of America; glass-block skylights—Kimble Glass Company. **Doors:** steel interior and entrance doors—Detroit Steel Products Company; electrically-operated aluminum overhead doors—The Kinnear Manufacturing Company. **Hardware:** brushed-chrome casement hardware—Detroit Steel Products Company. **Paint and stain:** interior and exterior lacquer—E. I. du Pont de Nemours & Co., (Inc.); masonry coating—A. C. Horn Company, Inc.; interior finish—The Sherwin-Williams Company.

equipment

Elevators: freight and sidewalk elevators—Otis Elevator Company. **Moving stairways:** (future installations)—Otis Elevator Company. **Circular steel stair:** Duvinage Corporation. **Lighting fixtures:** commercial fixtures with plastic eggcrate louvers—Leader Electric Company; recessed fluorescents—Smithcraft Lighting Division; canopy spotlights—Gotham Lighting Corporation. **Electric distribution:** combination switch and fuse distribution panelboard—Westinghouse Electric Corporation; panelboards—Bulldog Electric Products Company; wiring—General Electric Company. **Plumbing and sanitation:** sump pumps—Chicago Pump Company; water closets, lavatories, flush valves, showers—Crane Company; water pressure system—Peerless Pump Company. **Ventilation:** filters—Farr Company; diffusers—American Warming and Ventilating Company; centrifugal fans and floating fan bases—Buffalo Forge Company; sheet-metal ducts; manual controls; five hp, two-speed motors—Century Electric Company.







An all-under-one-roof shopping center in the rapidly growing Las Mercedes district of Caracas, this 115' x 245' rectangular structure is on a pie-shaped lot, the bordering streets allowing perimeter parking. Focus of the scheme is the 115' x 115' supermarket at the south end of the building, beneath which is a bargain basement that handles household equipment and furnishings. One covered shopping mall transects the approximate center of the building; at right angles to it, leading out to the terrace at the north end, is a two-level mall, with shops on the ground floor, offices upstairs; dome skylights of English glass admit shafts of sunlight. The building's steel frame includes 115-ft-long trusses 23 ft on centers that provide column-free space in the supermarket and second-floor offices.

NEW DIRECTIONS IN THERMAL INSULATION: PART IV

by Groff Conklin

It is today generally accepted practice to provide all new homes, even the least expensive, with a certain amount of roof and wall insulation as a means of reducing the operating costs of the heating and air-cooling plant and of adding to winter and summer comfort. But only relatively recently has it been recognized that this modern improvement in building technology, along with such other changes as tighter construction, smaller houses, flat or low-pitched roofs, etc., has brought in its wake a new problem, that of moisture condensation during the cold winter months. Absence of a clear understanding of the difficulties that condensation can cause, and the consequent omission of suitable preventive measures from many houses built during the past 20 or more years, has led to an ever-increasing amount of trouble with paint blistering and peeling, plaster failures and stained walls and ceilings, mold and mildew conditions, and deterioration of wood and metal parts of the structure.

It is perfectly true that most architects and builders today know that the problem exists. It is also true, unfortunately, that in many instances they are not thoroughly familiar with the best methods of preventing condensation, or that, in the case of smaller homes built to a tight budget, they refuse to spend the necessary small amount of money (and time) to assure adequate condensation control. This combination of lack of knowledge and unwise economy is resulting in an ever-increasing number of home owner complaints and an ever-mounting bill for remedial measures that add unnecessarily to the costs of maintaining the house—costs that might never have become necessary had suitable protective measures been taken when the homes were originally built.

It is the purpose of this series of articles to summarize the general problem of condensation in homes and to describe the most effective and practical techniques for coping with it.

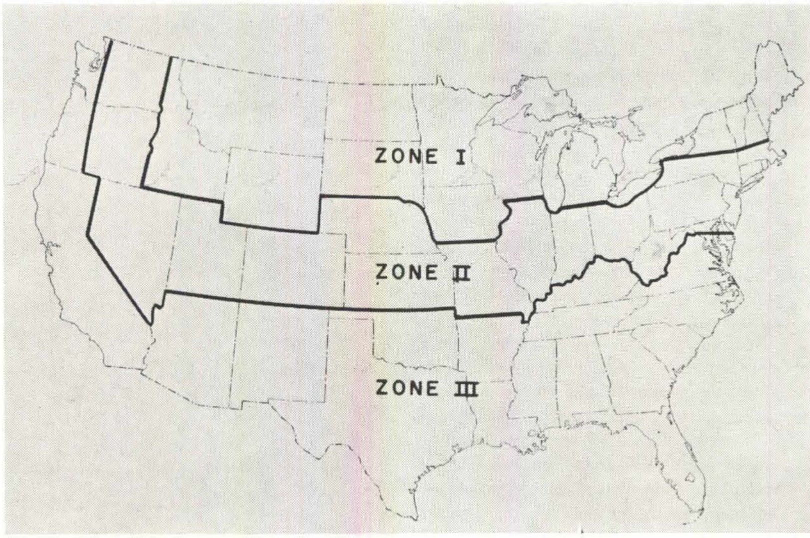


Figure 1—Zone I includes (approximately) the areas with design temperatures ranging from —20 F downwards; Zone II covers the region with design temperatures —10 to 0 F; and Zone III southern United States with design temperatures above 0 F.
From page 13, Condensation Control in Dwelling Construction, *HHFA (1949).*

what is condensation?

Vapor condensation—or, better, moisture damage—is likely to arise from any one of three major sources: too-high humidities inside the house in cold weather; too-damp basements or unprotected slabs or crawl spaces; and snow backup or ice dams on the roofs of homes with no roof overhangs or very shallow eaves. In the latter case, of course, the problem is not really condensation, it is leakage; more often than not, however, the trouble is wrongly diagnosed as due to condensation. The same thing may be said of the much less common water damage resulting from wind-driven rain penetrating the outer walls of the house, a trouble encountered only rarely in most parts of the country, but usually with considerable severity when it occurs.

Extensive experience with house building throughout the United States during the past two or three decades has indicated that moisture damage arising from high interior humidities and from snow backup is most serious in Zone I (*Figure 1*). It also occurs with considerable frequency in Zone II. It does not occur often in Zone III—and then only rarely with sufficient frequency to result in damage to the structure. Yet even in the Tennessee Valley Authority region of Zone III, condensation arising from too-high interior humidities has been known to cause trouble, particularly in small, tightly-built houses.

Moisture arising from damp basements, slabs and crawl spaces, of course, can damage a home in any climate where such earth conditions exist.

Although this series of discussions has been limited to condensation control in residences, most of the principles are applicable to other types of structures as well.

The Problem of Condensation in Residences

In general, some protective measures against condensation arising from high interior humidities as well as from ground moisture should be provided in all three zones—not just the two coldest. This holds true even for Zone III and the reason is that (except in certain restricted semi-desert regions) one can never predict with accuracy just what unusual weather conditions may occur. It is always better to be on the safe side and protect the dwelling when it is built, rather than to have to resort to expensive remedial measures after the fact. The cost is extremely low and the safety insurance value very high.

Condensation Due to Excessive Interior Moisture

The pamphlet, *Condensation Control in Dwelling Construction,* published by the Housing and Home Finance Agency (1949), sums up the basic reasons for the existence of the condensation problem due to high interior humidities as follows:

"High prices, the scarcity of building materials, and other economic conditions of today favor the building of small, compact houses. Improvements in the machining of wood parts, new materials, and the use of weatherstrips and storm windows now make both new and old houses tighter than formerly by restricting air leakage or infiltration. Humidifiers, when used indiscriminately, sometimes add greatly to the condensation problem, especially during cold weather. Thermal insulation is also used to a greater extent than formerly, and as a consequence outside wall surfacing materials (sheathing and siding) are somewhat colder than those of uninsulated construction. The conditions thus produced are more favorable to moisture accumulations . . . People of today also make more extensive use of water and of appliances discharging water vapor into the living space than formerly, thus making condensation control more essential."

The average amount of vapor produced by various causes inside the typical home is shown *(Table I).*

Condensation occurs primarily when outdoor temperatures are low and indoor temperatures and humidities are relatively high. Since it is a natural property of water vapor to migrate from warm areas to colder areas, the vapor invisibly suspended in the air inside the house tends to enter the outer walls and the roofs or cold ceilings of the structure.[1] Before the wide use of insulation, weatherstripping, and storm windows, and the development of tighter construction methods, this vapor usually escaped through cracks in the structure and up fireplace chimneys before the temperature became low enough to condense it into water droplets inside the walls and cold ceilings or roofs. There have always, of course, been conditions, even without insulation and so on, when paint failures and other damage have occurred because the vapor condensed in the sheathing or siding; but condensation damage in general has become much more common in the newer type of houses. In such dwellings the dew point, or the temperature at which the water vapor condenses into droplets, has been "moved inside" the walls and roof, with the result that unprotected insulation, wood and metal structural members and sheathing, exterior painted surfaces, and interior plastered areas (most often in ceilings where condensation above the ceiling drips down) become saturated and extensive damage can result.

Table I: Moisture Production for Various Domestic Operations*

Operation				Pounds of Moisture
Floor mopping (8' x 10' kitchen, 0.03 psf)				2.40
Clothes drying indoors				26.40
Clothes washing				4.33
Cooking	From food	From gas		
Breakfast	0.34 plus	0.56 equals		0.90
Lunch	0.51 plus	0.66 equals		1.17
Dinner	1.17 plus	1.52 equals		2.69
Dish washing				
Breakfast				0.20
Lunch				0.15
Dinner				0.65
Bathing	Shower			0.50
	Tub			0.12
Human contribution, family of four			per hr	0.46
Gas refrigeration			per hr	0.12
House plants, each			per hr	0.04
Humidifier, when used			per hr	2.00

**From* Research in Home Humidity Control, *by S. C. Hite and J. L. Bray, Purdue University Engineering Experiment Station Bulletin Research Series No. 106, p. 24, 1948.*

[1] *An excellent, nontechnical summary of the mechanics of vapor migration is presented in the article "Humidity Conditions in Modern Houses,"* Housing Research *No. 6, October 1953, Housing and Home Finance Agency, available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 35 cents.*

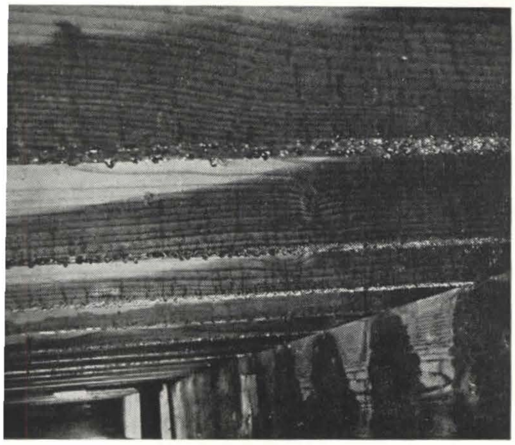


Figure 2—moisture condensation on sill and joists. This is common during winter months in the Eastern U. S. in houses built on moist sites, especially when vents are closed to keep crawl spaces warm.

Photo: U. S. Department of Agriculture

Condensation Due to Excessive Moisture Under the House

The HHFA pamphlet previously referred to puts the problem of ground moisture as follows:

"People are inclined nowadays to omit basements in low-cost construction, and often leave an enclosed crawl space below the building. This crawl space may be damp and thus contribute large quantities of water vapor which, due to stack action, may find its way up into walls, attics, and living areas." It also may saturate the floor joists *(Figure 2).*

Much the same condition can occur in houses with basements, when the basement walls and floors are not correctly waterproofed, and there is either standing water in the basement or at least a great excess of dampness in the air. It is also common in homes with part-basements, mainly in the unexcavated area. The problem thus is not limited to low-cost, basementless houses; it can arise in any home in which care has not been taken to assure dry conditions throughout the foundation area. For example, in many homes the part of the basement containing the furnace may be thoroughly dry while an adjoining section, used perhaps for laundry or for the storage of foods, may be damp enough to cause serious trouble.

Incorrectly-designed and built slabs under homes built on such earth-contact floors may also cause dangerous concentrations of moisture, particularly around the perimeter of the structure, that can damage walls and ceilings and also cause cemented wood floors to buckle and rot. Slab construction has become particularly common in recent years and the addition of radiant heating lines or perimeter heating system ducts to the slab has further complicated the problem.

Water Damage Due to Snow Backup

An increasingly common cause of paint and plaster failures and wood decay in areas of severe winter conditions is the backup of melting snow or ice at the roof eaves. This condition does not often occur with homes that have moderately wide roof overhangs, for in such dwellings the melted snow or ice is not likely to back up so far that the water will collect on the part of the roof over the building's walls. However, a house with no roof overhang may suffer severe damage to the exterior paint and also to plaster, paint, and wallpaper inside the house, as the backed-up snow or ice begins to melt and the water seeps down into the walls.

As will be seen in a later article in this series, the cure for this is a simple one, *provided* it is included as a part of the original design of the building and does not have to be applied after the damage has happened.

Water Damage Due to Wind-Driven Rains

Failing of exterior paint and some damage to the structure resulting from wind-driven rains is occasionally a problem. In regions where such storms are known to occur even infrequently, it is good practice to specify types of siding that are normally water-resistant and that have, furthermore, wide overlaps. The condition resulting from unusually heavy storms, though sometimes a serious one, is not properly a part of this discussion; it is mentioned here only because there have been several times in recent years when such damage has erroneously been attributed to vapor condensation resulting from inadequate protection of the building walls and roofs from interior humidities, rather than to the real cause. Obviously any architect designing a home in a part of the country that is known to be subject to severe storms will provide the kind of exterior surfacing—siding, shingles, or masonry—that will prevent or greatly reduce damage from this source.

condensation control in new buildings

From the architect's point of view, the technique of condensation control can be summarized as follows: the correct design of details and specification of materials that will keep dangerous concentrations of moisture out of the floors, walls, ceilings, and roofs of the structure, *and* the careful and ever-vigilant supervision of the work as it is done, to make sure that it is performed as specified.

Early in 1952, the Building Research Advisory Board of the National Research Council held a conference on "Condensation Control in Buildings" in Washington, D. C. It was an extremly informative meeting, albeit at times a rather confusing one, as the published *Proceedings* indicate.[2] Out of the confusion and debate, however, came two over-riding warnings that set the tone of the whole meeting. These were: No one device or material will guarantee foolproof condensation control, and, no device or material for such purposes will be of any use if it is incorrectly or carelessly applied. Vapor barriers, whether paint or membrane, will fail wherever there is incomplete coverage by the paint film, or tears or gaps in the membrane. Means of ventilation will not work if they are too small, too tightly screened, or so located that they can become clogged with leaves or snow.

Therefore, in the following discussion of materials, it must always be borne in mind that correct specifications alone is only half the job. Proper supervision of application or installation is essential if future trouble is to be avoided.

Problem of Specification

As pointed out above, the architect has

[2] Condensation Control in Buildings. *Building Research Advisory Board, 2101 Constitution Avenue, N.W., Washington 25, D. C. $3.50.*

two major tools at his disposal when specifying materials and techniques that will prevent or at least minimize the condensation problem: vapor barriers and ventilation. And in analyzing the problem, one basic fact about the occupants of the home should always be remembered — moderately high humidities indoors during winter are often desirable for human comfort and not infrequently for human health.[3] A too-dry atmosphere can be extremely uncomfortable, as everyone knows who has lived in a steam-heated apartment or house in which insufficient means of humidifying the air in cold weather has been provided. Worse yet, such dry conditions can cause parched throat and nasal tissues, themselves encouraging the onset of cold and influenza. Indeed, steam-producing devices are often used to alleviate the discomfort resulting from infections of the upper respiratory tract; these devices are intended to add humidity to the air of the room in which the sick person is.

Many people in the building industry, not realizing these facts, urge that the cure for condensation difficulties is to reduce the moisture-producing conditions that cause them. In the case of moisture arising from damp crawl spaces, uncontrolled humidifiers, unvented appliances, and similar conditions, they are perfectly right. But if a family finds it both more comfortable and more healthful to live in conditions of moderately high interior humidities, you cannot persuade them not to by telling them that the dampness is going to spoil the paint or rot the house. The only way to reduce damage caused by high interior humidities is to design the structure so that the vapor in the air will not get into the parts of the house where it can cause trouble. In other words, through effective and well-installed vapor barriers and through carefully designed and correctly built means of ventilation.

Of course, a certain amount of ingenuity in the layout of the floor plan can help reduce some of the worst dangers from spot condensation. For example, whenever possible there should be a utility room, or a space in the basement, large enough and well-ventilated enough to the outside so that laundry can be dried in it without adding to the moisture in the main parts of the house.

But, generally speaking, it is not the architect's job to change people's habits; it is his job to design a house in which those habits can be pursued without causing damage to the structure. And this is not always a simple task.

For one thing, no material or technique is entirely foolproof. For another, we do not know, even today, what level of interior humidity is "safe"—physiologically—in the modern house located in cold climates. Despite the fact that many research laboratories are trying to develop standards, it is more than likely that they may never actually be able to put them down with any accuracy. The reason is that people's requirements differ remarkably. One family may not need an interior humidity of more than, say, 30 percent in cold weather to be comfortable. Another family, because of habit or of actual physical requirements, may demand as much as 45 or even 50 percent.

From the point of view of the architect, then, there is only one course to follow: to design the house for the worst possible condition and be thankful if the occupants do not test the design to its utmost. This means that he must specify *both* adequate vapor barriers throughout the house *and* ample ventilation, natural or forced, at strategic points.

Vapor Barriers

But what constitutes an "adequate" vapor barrier? To discuss this problem in detail would be both profitless and tiresome from the architect's point of view. The confusion on vapor barrier standards and methods of testing that reigns among professional testing laboratories and engineering experiment stations on this question is almost unbelievable. In the report of the BRAB Conference previously mentioned, E. J. Dunn, Jr., of the National Lead Company, lists seven separate and distinct types of units for measuring water permeability, such as "grams per square meter per 24 hours for test conditions" and "grains per square foot per hour per inch of mercury;" and 11 different methods of testing materials for their permeability!

To quote Dunn, "These methods range from small scale equipment for routine determinations of the permeability of paint films, paper, paperboard, and sheet materials under specified constant temperature and vapor pressure differentials to methods that would include facilities for changing the relative humidity on either side of the test film; apparatus that can vary the temperature on either side of the film; apparatus that varies these factors in conjunction with air flow; apparatus that allows use of varying large-size specimens up to four and five feet square; and finally, the construction of small test houses with individual units in the various wall sections."

Some of this confusion is unavoidable. For example, one cannot test a paint film in the same way one can test a sheet of aluminum foil. Nevertheless, it is universally admitted that there are too many tests and too many units of measurement—and one of the outcomes of the BRAB Condensation Control Conference was the establishment of a working committee of experts to try and rationalize tests, standards, terminology, and practices.

But from the practical point of view of an architect attempting to specify a good membrane or paint vapor barrier, experience plus innumerable different types of laboratory tests have established certain materials or combinations of materials as sufficiently impermeable for use in residential construction. The commonly accepted unit for measuring the permeance of a material is a "perm," which Dunn defined as "one grain of moisture per square foot per hour for one inch of mercury" and the approved standard for a good vapor barrier is a material with a rating of one perm or less—preferably quite a bit less.

Membrane Vapor Barriers. There is general agreement that the following sheet or membrane materials, alone or in combination, are acceptable for the purpose if they are made by a reputable manufacturer and if there are no gaps, tears, or other defects left in them after installation:

[3] *"Humidity Control for Schools,"* July 1953, Progressive Architecture.

1. Asphalt-impregnated and surface-coated glossy sheathing papers, 35 to 50 lb per roll of 500 sq ft. The heavier type is superior. Perm ratings for these materials, as averaged from several competent sources, range from 0.15 to 0.727, depending on weight, on the manufacturer, and on the samples tested. None of the materials is absolutely uniform, so that there may be some differences in permeability in different pieces from the same roll. Common dull-surfaced asphalt-saturated felts do not perform well as vapor barriers and ordinary tar felts are wholly useless for the purpose.

2. Saturated and coated smooth-surface roll roofing, 200 to 300 lb per 500 sq ft. Many brands have been tested and show permeabilities ranging from 0.017 to 0.081 perms. They are thus excellent vapor barriers but their heavy weight and higher cost tend to limit their use to ground cover in crawl spaces or similar locations.

3. Duplex or laminated papers, with a layer of asphalt between two sheets of paper, the asphalt coating unreinforced or reinforced with fibers. It is stated that the types with reinforcing are somewhat more durable than those without. These papers come in various weights, ranging from "20-20-20" to "60-150-60," the first and last figures referring to the weights of the paper and the middle figure to the layer of asphalt, for a standard square footage. The weights of the paper in 500 sq ft rolls range from 11 to 50 lb. The duplex papers most commonly used as vapor barriers are the "30-30-30" and the "30-60-30." Perm ratings range from as low as 0.35 to as high as 0.512 for the 30-60-30 types and from a low of 0.57 to a high of 0.98 for the 30-30-30. Both are acceptable, if the manufacturer warrants that they rate less than one perm vapor transmission.

4. *Aluminum* foil, either as a foil vapor barrier, a foil-laminated-to-paper vapor barrier, or the inner sheet of an aluminum-foil reflective insulation. The foil should be of sufficient thickness so that microscopic holes do not permit a permeance in excess of one perm. When a foil is 0.001″ thick it is said to have zero vapor transfer. However, a foil of this thickness is fairly expensive; the types usually found on the market are between 0.00035″ and 0.0005″ thick, and these do sometimes have microscopic holes in them. If aluminum foil insulation is not being used, probably the best solution, if one wishes to specify foil as a vapor barrier, is to select one of the laminated products in which thin foils are asphalt-laminated to both sides of thin but strong paper. These products have permeability rates about as low as any other vapor barrier on the market, ranging from 0.068 to 0.21, and also have the added advantage, like all foil products, of providing a certain amount of reflective insulation performance, if so installed that there is an air space on one or both sides of the material.

5. Wall linoleums, glossy-surfaced cloths, and aluminum-surfaced wall coverings, used as interior wall finish. These materials have a satisfactorily low rate of vapor transmission (0.10 to 0.97, depending on type and manufacture) but they are difficult to install so as to give adequate protection around doors and windows and at baseboards. They are, of course, particularly useful for providing a vapor barrier in existing houses where moisture conditions have become troublesome.

Many of the above materials are used in combination with other building components. Examples of these combinations now on the market are:

1. Vapor-barrier sheets on one side of blanket or batt insulation. Several brands of insulation with such papers have been tested and have shown vapor-transmission rates of as low as 0.116 and as high as 0.583. However, few manufacturers actually state the permeability rate of the paper used. The architect should specify a vapor-barrier paper of less than one perm and perhaps demand a certificate or guarantee that the paper is of that quality.

Another difficulty that close supervision can eliminate is that workmen putting in the insulation sometimes ignore instructions and put the vapor-barrier side toward the outside of the house. An example of this was described at the BRAB Conference. The vapor-barrier side of the insulation was marked: "Install with this face toward the warm side." It happened that it was a very hot day and the inside of the house was considerably cooler than outdoors. The workmen not unnaturally were putting the vapor-barrier side of the blanket so that it faced outdoors, since it was "warmer!" Conscientious inspection of the work can, of course, eliminate this.

2. Asphalt coatings on one side of various fiberboard plaster bases, excluding the so-called insulating laths, which are not made with such coatings. If the coatings are obviously thick and continuous, and the side that is coated is placed against the studs or ceiling joists so that the uncoated side will be exposed for plastering, the material should be suitable. No vapor transmission ratings for these materials could be found during the preparation of this article; but if the manufacturer guarantees that the transmission rate is less than one perm, the product should be acceptable.

3. Aluminum foil on the back of gypsum wallboard. This makes an excellent vapor barrier and also provides a certain insulating value in the buildings' walls and, particularly in the summer, in the ceilings. Obviously, this material should never be used as sheathing.

4. Certain wallboard materials with asphalt lamina. Here again, if the asphalt layer is sufficiently thick, a good, and well-protected, vapor barrier will result.

5. The reflective insulation combinations *previously described.*

Paint Vapor Barriers. It has long been known that certain types and combinations of house paints are relatively impermeable to moisture. The usefulness of paint as the only vapor barrier in new construction is, of course, reduced by the fact that (as in the case of the wallpapers mentioned above) it is well-nigh impossible to assure a complete seal at windows, exterior doors, and baseboards. In existing houses, such materials are often the only economically feasible way of providing a moderately effective vapor barrier, as previously pointed out, but the greatest care must be taken to calk all open cracks between the woodwork and the plaster or wallboard and to make certain that there is a solid and continuous paint film covering both types of surface and the joint between them.

In new construction using a membrane barrier, paints with low vapor permeability can also be used for interior finish, since they offer an additional assurance that moisture within the house will not cause trouble in walls and ceilings.

Following are the types of paint application that have tested well, both in the laboratory and in actual use:

1. For sealing plaster, plasterboard, or fiberboard, use a *primer-sealer* as a first coat, instead of glue size, shellac, or self-priming flats. Glue size is useless as a vapor barrier and shellac is not much better, from the available evidence. Aluminum paints are not advised as primers, both because their vapor resistance in one-coat applications is not particularly good and because some finish paints do not adhere well to them.

In general, varnish-vehicle paints are superior to linseed-oil paints unless the latter are specifically stated to be compounded with water-resisting pigments, according to data presented by E. J. Dunn, Jr., at the BRAB Conference. Chlorinated rubber-base paints are not particularly good as vapor barriers, while emulsion paints are very poor indeed.

According to Dr. J. S. Long of Devoe and Raynolds[4] an architect specifying "a high-grade alkyd-resin primer sealer designed as a primer sealer" will be practically certain of getting a prime coat that has just about as good vapor resistance as can be obtained in a paint. Some results on various paint applications on both plaster and gypsum plasterboard are shown (*Table II*).

On woodwork which is to be painted with a gloss or semigloss finish, the architect should specify an "enamel undercoat" as the sealer before the finish coats of paint are applied.

2. For finish coats on plaster or plasterboard, and on fiberboard wall panels as well, any of the following types of paint can be used: standard flat paints, latex-rubber paints, and alkyd-resin paints, in ascending order of vapor resistance; also, any other type of paint on which the architect can obtain, either from the manufacturer or the dealer, a positive assurance that its permeability to vapor is satisfactorily low. According to many tests recently made, a one-coat application over a good primer-sealer will make nearly as satisfactory a vapor seal as a two-coat job, if (a) the paint is designed for one-coat use and (b) if it is applied generously and is not spread out too thin. Several of the experts at the BRAB Conference recommended using roller-coaters instead of brushes for such applications, since the roller-coater assures a thicker paint film.

Any reputable brand of gloss or semi-gloss paint provides good vapor barrier properties over a suitable enamel undercoating on woodwork. Care should be taken, of course, to make sure that the joints between the woodwork and the plaster or wallboard are thickly covered with paint as well as thoroughly puttied before painting, to minimize the danger of vapor leakage through these cracks.

If the architect has already specified a good membrane vapor barrier and is overly interested in providing a highly impermeable inner surface for his walls, he can, of course, use any type of interior house paint that is durable and with which he has had previously satisfactory experience. The combination of membrane and paint vapor barriers may be a bit like the man who wears both a belt and suspenders—but the fact is that such a man never loses his pants! Similarly, double protection in floors, walls, ceilings, and roofs would seem to be a wise precaution, particularly since the additional expense of a high-quality paint is also justified by its greater durability and ease of cleaning.

Table II: Vapor Permeability of Paints Applied to Two Different Types of Surfaces*

Paint application	Rate in perms Plaster	Rate in perms Plasterboard
No paint	8.75	34.34
1 coat primer	0.68	1.12
1 coat aluminum	2.07	6.90
1 coat rubber	2.35	0.53
1 coat emulsion	6.34	36.48
1 coat primer **plus** 1 coat flat	0.57	0.36
1 coat primer **plus** 2 coats flat	0.35	0.30
1 coat primer **plus** 1 coat gloss	0.51	0.36
1 coat aluminum **plus** 1 coat flat	0.58	0.54
1 coat aluminum **plus** 2 coats flat	0.55	0.25

**Revised from a table appearing in "Technological Aspects of Condensation Control in Building Structures," by C. E. Lund, MS (ME), Assistant Director, Engineering Experiment Station, University of Minnesota, as published in Condensation Control in Buildings, Building Research Advisory Board Conference Report No. 4, page 21, 1952.*

[4] *Private communication.*

Part V will appear in April 1954 P/A.

prestressed concrete by beam winding

A simple mechanical method for the application of prestressed-wire-reinforcement under tension to concrete beams, girders, and other linear members is now being offered to the American construction industry.

This development virtually eliminates the laborious, complex, time-consuming procedures involved in assembling, placing, stressing, anchoring, and grouting prestressing elements, as well as the costly bearing plates and anchorage assemblies required for present methods of linear prestressing. It also is more economical than pretensioning even for short elements. It thus permits the general contractor or the concrete products manufacturer to take advantage of the tremendous material savings inherent in prestressed concrete design and to keep labor costs to a minimum.

For beams under 50′ in length, the new method operates as follows: A concrete beam is cast and cured, or assembled from precast blocks, and then placed and secured on a turntable *(Figure 1)*. The high-tensile wire used for prestressing is received from the manufacturer on a reel which is set up to revolve as the wire is applied. The end of the wire is drawn through a die of slightly smaller diameter and attached to an inexpensive anchor bolt set in the side of the beam. A power unit then rotates the turntable which pulls the wire through the die and places it around the beam at the required design tension. As the turntable revolves, the successive wire wraps are placed in the desired pattern through deflectors which deposit them in notches preformed in the concrete *(Figure 2)*. When the number of wraps required by design have been placed, they are anchored and then given a protective coating of pneumatic mortar *(Figure 3)*. This coating protects the wire against corrosion and bonds it to the beam.

The wire-placing operation is rapid. The power-driven turntables rotate to apply the wire at approximately 500 fpm. A 48′ beam for a bridge designed for H-15 loads requires about 50 wraps (or about 250 lb) of #8 wire. Actual winding of such a beam can be accomplished in approximately 10 minutes and its placement and removal in another 15 to 20 minutes. Slabs 2′ to 3′ wide and 20′

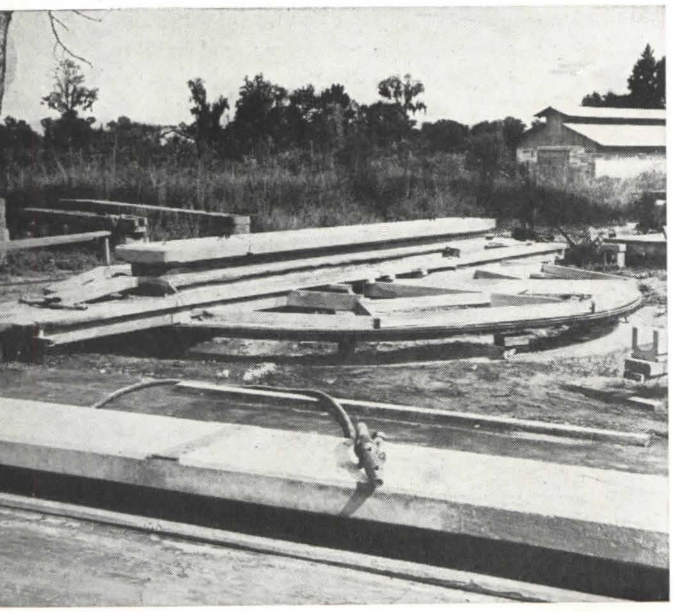
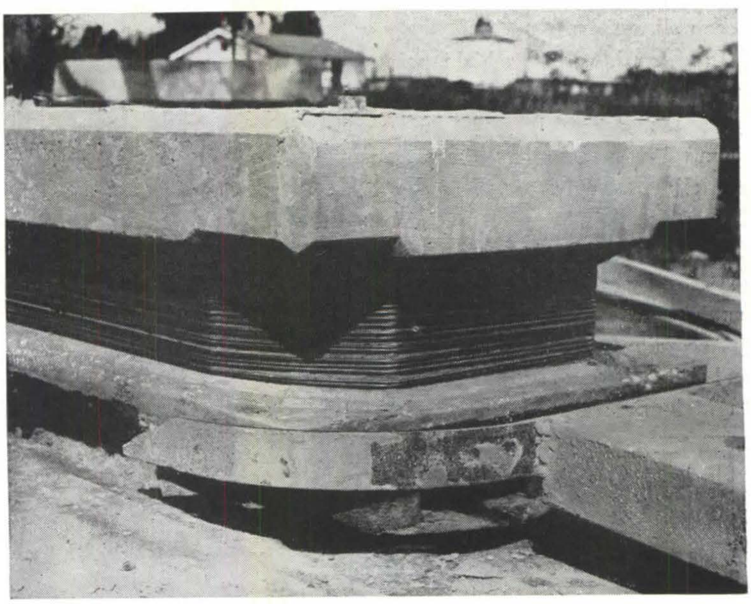


Figure 1—having been anchored to turntable, prestressed-wire-reinforcement is applied under tension to concrete beam (left) *as power unit rotates turntable.*

Figure 2—successive wraps of wire are placed in desired pattern in notches preformed in the concrete (below).



to 25′ long can be prestressed at a conservative rate of four per hour.

For beams more than 50′ long, a machine similar to the familiar lumberyard straddle truck is employed. This machine feeds the stressed wire into any desired position along the side of the beams by passing forward and back over it. The four wheels of the straddle winder serve as tractors which move the truck against the resistance of the stressed wire. The straddle winder places wire at approximately the same relative speed as the turntable but cuts down substantially on labor requirements, since beams do not have to be moved during winding.

This revolutionary mechanical method of prestressing was developed by J. M. Crom, one of the founders of The Preload Company, Inc., New York, and is known as the Preload-Crom system. The machines described above work on substantially the same principle as the wire-winding machines, also originated by Crom, which have been used by Preload to stress the horizontal reinforcement around the walls of hundreds of circular prestressed concrete tanks in all parts of the world.

To summarize—the advantages of this new method of linear prestressing are as follows:

(1) It permits the economical construction of prestressed members in the short lengths below 50′.

(2) In contrast to other prestressing systems, it requires no special bearing plates, lengths, or anchorages. There are no tensioning units to be fabricated, placed, and stressed by hand. Complicated stressing and grouting procedures are eliminated. The entire stressing operation is performed mechanically and the prestressing steel can be stockpiled.

(3) Positive anchorage is guaranteed.

(4) It permits the easy use of selected standard concrete-block units which are now economically mass-produced.

(5) It enables the contractor or the manufacturer of concrete products to stockpile standard linear prestressed members such as beams, girders, and slabs.

(6) It permits the prompt fabrication of special size units because no prior consideration of the length and number of prefab tensioning units is required.

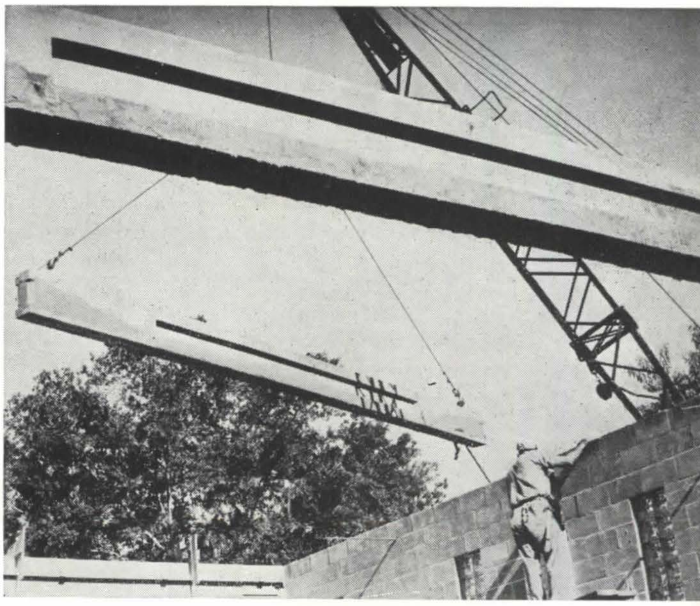


Figure 3—after required amount of wire has been applied, a protective coating of pneumatic mortar is blown on the slab (below).

Figure 4—27′ prestressed-concrete beams constructed by Preload-Crom wire winding method being placed in position (right).

central heating with high-temperature hot water

by William T. O'Reilly*

A recent trend in heating has been the utilization of high-temperature hot water (350 F to 400 F) as the distribution medium in a central-heating system. Hot water has been used previously for central heating of institutional-type buildings, but the temperature was in the vicinity of 200 F and the temperature drops quite low. This system resulted in large pipe sizes which caused the method to be discontinued in the United States in favor of steam as the distribution medium.

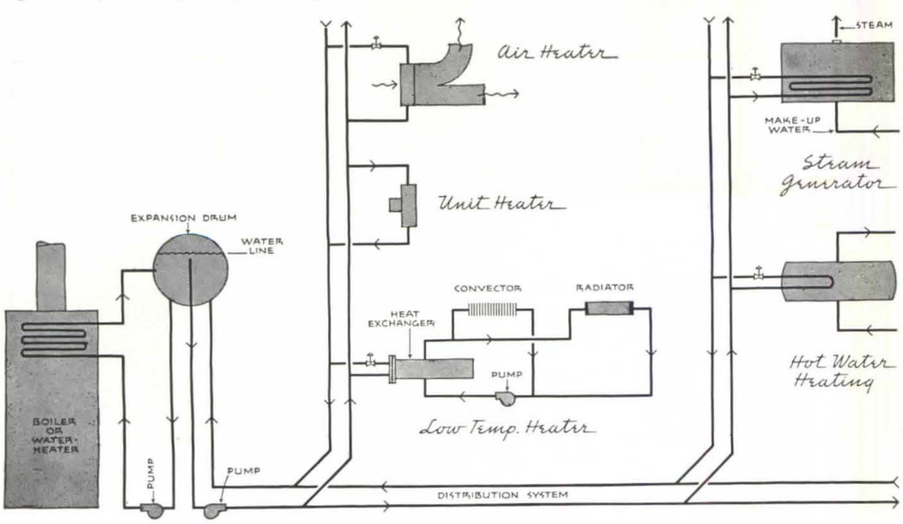
In Europe, however, economic conditions stimulated interest in the development of water as the distribution medium because of the high thermal efficiency of the closed-cycle water system. To offset the problem of large pipe sizes, water temperatures were increased to 350 F-400 F and temperature drops increased in some cases to as much as 200 F. This resulted in economical pipe sizes, often smaller than in the comparable steam system. At the present time, most of the new European central-heating systems are being designed to utilize high-temperature hot water and the use of low-temperature hot water (up to 200 F) as a distribution medium is being abandoned. The most notable of these installations are at Lyon-Villeurbanne and Toulouse, France, and Whitehall Gardens, London. There have also been recent installations in Stalingrad and Moscow, as well as in a number of Soviet-dominated countries.

During the development of high-temperature hot-water systems in Europe, only a few scattered installations were completed in the United States—and these were primarily for industrial uses. No great interest was shown here until the U. S. Air Force adopted this method for the central heating of some of its bases both in the U. S. and abroad. The impetus of this decision has awakened interest in the use of high-temperature hot water and many architects and engineers are anxious to learn about the merits of this method of heating distribution.

Primarily, the high-temperature hot-water system is the same as the conventional low-temperature system, consisting of a hot-water heater, circulating pump, and distribution piping. However, the utilization of the hot water in the heating system is different because of high temperatures and pressures. The schematic flow diagram of a simple high-temperature hot-water system is shown *(Figure 1)*. The high-temperature water is generally heated in water-tube boilers of the forced-circulation type (other schemes utilizing natural circulation boilers and various pump arrangements are also used). Water is circulated from the expansion drum through the boiler tubes and back to the expansion drum by the boiler circulating pump. The expansion drum's purpose is not only to provide space for the liquid to expand or contract on temperature changes but also to act as a heat accumulator. It stores heat during light loads and releases it during heavy loads, permitting the boiler to operate on an even load regardless of instantaneous demand. The distribution circulating pumps take their suction from the expansion drum and circulate this water to the system, where it flows through the using device and returns to the expansion drum at a lower temperature, having given up its heat to the system. The using devices at the buildings may be any of the familiar extracting units—radiators, convectors, hot-water heaters, unit heaters, heating coils, etc. How the high-temperature hot water is used will depend greatly upon the service to which it is connected. If the heating device is a radiator or convector, it is undesirable to introduce the high-temperature water directly into the radiator. In this instance, the high-temperature hot water flows through a heat exchanger. The heat exchanger is piped to provide high-temperature water flowing through the tubes which transfer its heat to the water of a lower temperature and pressure in the shell. This is similar to heating water with steam. The radiators are then connected to a conventional low-temperature water system. Unit heaters and ventilating units, when used, are either connected directly to the high-temperature hot-water system where the high temperatures can be tolerated, or to the low-temperature side of the heat exchanger as described above. An alternate method for unit heaters and ventilating units is to convert the high-temperature hot water to steam by using an evaporator. In this case, the units are connected as conventional steam units. High-temperature hot water (350 F to 400 F) can be readily used to generate steam for heating or process work and with an evaporator as shown *(Figure 1)* provides steam at almost any pressure up to the steam temperature corresponding to the water temperature. In most cases, economic factors limit the steam pressures to approximately 50 psi (when using 350 F to 400 F water).

* *Mechanical Engineer, Seelye, Stevenson, Value & Knecht, Consulting Engineers, New York.*

Figure 1—flow diagram for a high-temperature hot-water system.



Having discussed the general layout of the system, the next question is what merit has it over the present system of steam distribution? Briefly stated, the advantages are:

(1) The HTHW distribution system can follow the contour of the land, rising or dropping as the land slopes. The distribution pumps provide the necessary head to pump the water over any high elevations. This provides an appreciable savings in the installation cost over a steam system where the piping normally pitches in the direction of flow, causing deeper trenching.

(2) The HTHW system is a closed system and all the water leaving the central heating plant is returned to the central heating plant with the exception of minor leakage from packing, etc. With a steam system, the drips, trap discharge, flash-tank discharge, and blow-down discharge all remove water from the system with the resulting loss of heat. Depending upon the quantity of such loss and whether the condensate is returned to the boiler or wasted, the thermal efficiency of an HTHW system is much higher than a steam system.

(3) Because the HTHW system is a closed system, the cost of feed water treatment is much less than for a comparably sized steam plant.

(4) Because the HTHW system is a closed system, the problem of return-line corrosion is eliminated and the additional investment in special piping is unnecessary. HTHW piping can be standard black steel pipe.

(5) All steam traps and associated specialties required to drip steam lines because of pitch are eliminated. HTHW lines can pitch up, down, or run level, either when installed underground or run in buildings.

(6) Pipe size comparisons are difficult to discuss because of the ability to increase or decrease pressure drops for either system and so vary pipe capacity. However, it is the opinion of the author that with all factors considered the HTHW system has smaller pipe sizes.

(7) The HTHW system when filled with water has a high thermal capacity. This prevents sudden load changes reflecting themselves back on the boilers and permits steady boiler operation at high efficiencies.

The principle disadvantages of the HTHW system are as follows:

(1) Connecting of new services are slightly more difficult.

(2) Shutting down for repairs requires a slightly longer time.

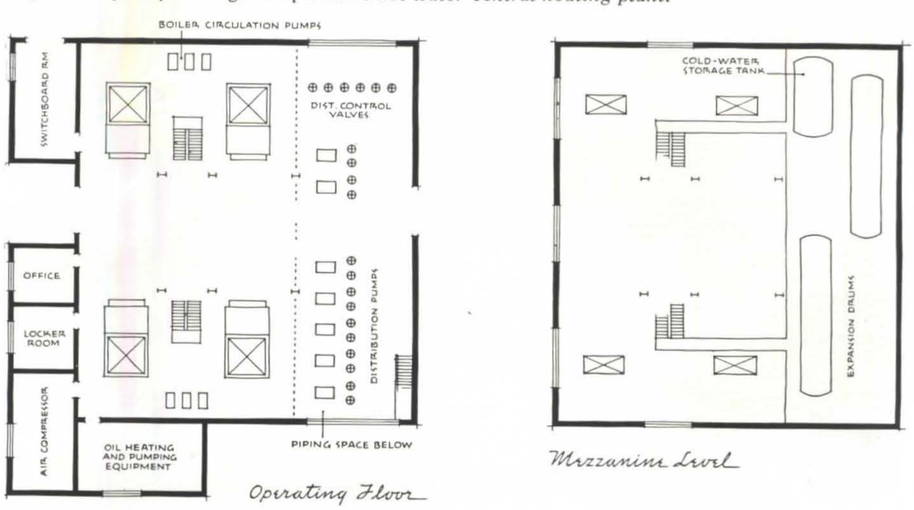
(3) For exceptionally high buildings or where service is required to an elevation much higher than that at the central heating plant, auxiliary equipment is required for pressurizing.

(4) Where steam is a necessity for heating or process, additional equipment for a steam generator or evaporator is necessary.

This method of heating distribution will find wide application for institutional buildings similar to colleges, hospital groupings, and in dispersed industrial plants and housing projects.

A typical HTHW central heating and distribution system has been proposed for the U. S. Air Force Base at Plattsburg, New York. This system will provide for the heating and process requirement of all the new buildings and will also provide for heating the modernized buildings of the existing Plattsburg Barracks. The buildings and facilities cover an area of approximately three square miles. The central heating plant is constructed on an expansible basis. Initially, the plant capacity shall be 100,000,000 Btu/hr supplied by two oil-fired forced-circulation hot-water heating boilers operating at 400 F-250 psi and of 50,000,000 Btu/hr capacity each. It will be expanded in a second step by an additional two (2) 50,000,000 Btu/hr boilers and may be ultimately expanded to a capacity of 600,000,000 Btu/hr by the addition of four more boilers. The distribution system is presently divided into two zones with a future third zone. Each zone is provided with two distributon pumps, one operating and one stand-by. The expansion tanks are two drums 8′ 0″ in diameter and 40′ 0″ long; the system's water content is 165,000 gal. The water treatment system is a zeolite softener of 17.5 gpm capacity and an internal chemical feed system of 20 gpm. The treated water is stored in a treated-water storage tank of approximately 10,000 gal. The underground distribution system will initially consist of approximately 2.5 miles of conduit with piping varying from 10″ to 2″ in size and will ultimately consist of approximately 5 miles of underground conduit. The general arrangement of the central heating plant and equipment is shown (*Figure* 2). Architects: Shreve, Lamb & Harmon Associates; Consulting Engineers: Seelye, Stevenson, Value & Knecht.

Figure 2—plan for a high-temperature hot-water central heating plant.



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REVOLUTIONARY PERFORMANCE of the AXIAL FLOW is indicated in this chart. Note the ability to overcome duct resistance – characteristic of *all* Trade-Wind ventilators.

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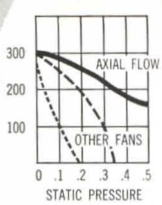

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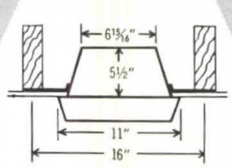
THE NEW Trade-Wind has been designed for the easiest installation. The mounting bars are quickly nailed between joists, the conduit box is fully exposed and the duct work takes any 7" round pipe.



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shocking

After reading Polly Adler's book on architecture, *A House Is Not A Home*, I got to thinking that we have done just about everything possible to concrete except tell it off-color stories to shock it. But wait—shocked concrete *is* made in Holland. They do it by slowly pouring low W/C ratio concrete into a mold secured to a steel table which in turn is lifted by eccentric rollers that cause the table to drop. The shocking is executed at a rate of 250 times a minute at a falling height of about 3/32″—this shocks the pants off the matrix and creates an amazingly dense concrete after curing. Shocked concrete is also suited for use in post-tensioned and prestressed concrete. Products made by this method include prefabricated wall and roof panels, partitions, window elements, trusses, stairs, balconies, railings, columns, beams, and the like. The compressive strength of an unreinforced 8″ cube is 10,000 lb after 28 days. I don't know what else I could add unless it is this Dutch summary:

1. dagelijks intensieve controle op de te vervaardigen onderdelen;
2. onafhankelijkheid van weersinvloeden;
3. eenvoudig transport;
4. snelle montage.

Don't fail to send for the 30-day free trial translation.

fine print

You are either born with a desire to read the fine print or you are not. Leases, insurance policies, and roofing bonds contain fine print. When you are faced with a potential extra and seek relief in the fine print, more than likely you come away penitent for not having had appropriate patience prior to penning your signature. I am spotlighting here several roofing and flashing bond clauses to give to those who never read the fine print an opportunity to see what goes on at this substratum.

(In connection with bituminous base flashings.)

"Under no circumstances shall the period of the Flashing Endorsement exceed the period of the bond covering the roof with which the flashing is used, nor does it cover failure, defects, or disintegration from any cause of the metal used as flashing." One company says to its applicators, "Follow in detail the application requirements covering the selected type (name of company) Bonded Flashing to be applied. Permit no deviations from the specifications covering each type as plainly outlined in the Bonded Flashing section of our specifications. As we are held responsible for the job, these supersede architects' or contractors' specifications. Insist that they be followed."

"No liability is assumed for failure of or defects in traffic bearing or promenade materials applied on this roof for any expense involved in removing and/or replacing any part of said promenade or traffic bearing material when such action becomes necessary in order to make repairs to the underlying roofing membrane in accordance with the provisions of this instrument."

"The maximum limit of bond coverage shall not exceed $5.00 per square."

"This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturers' Inspection Service except by special arrangement with the Manufacturer."

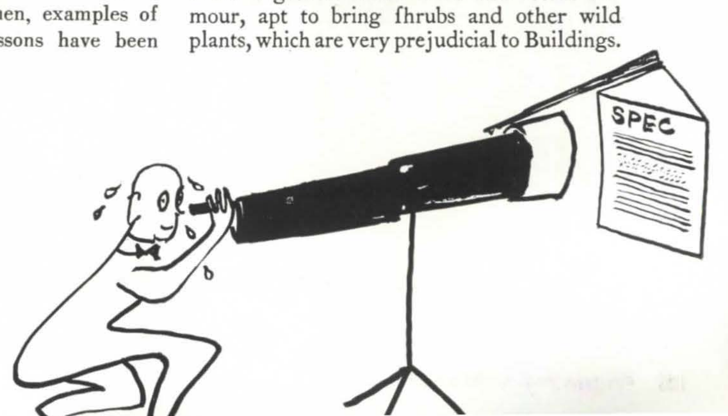
"Nothing in this guaranty or in this bond shall make (name of roofing company) or Surety in any respect liable for any damage sustained by the building to which said roof is applied, or to any contents of said building."

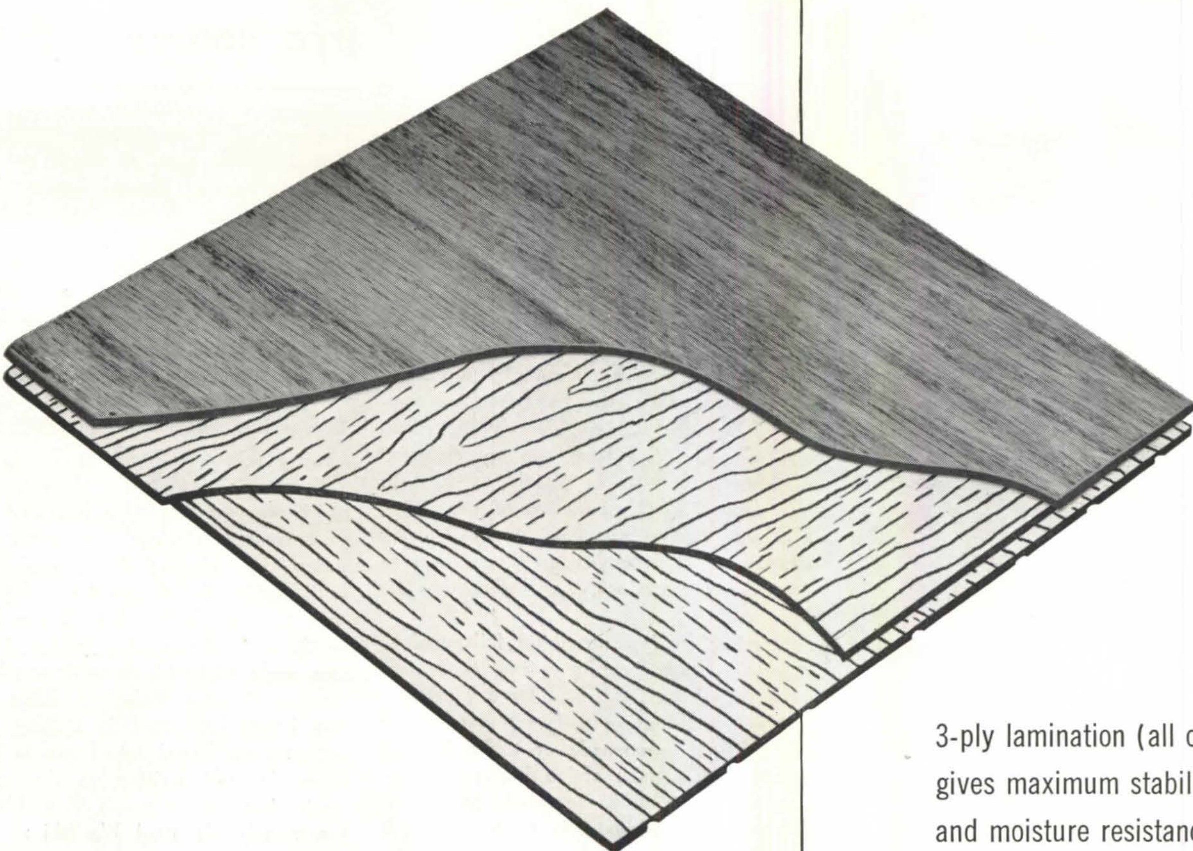
"Neither (name of roofing company) nor Surety shall be liable for any damage to said roof caused by the settling, distortion, or failure of roof deck or of walls or foundation of said building on which said roof rests or to which said roof is secured, nor for any damage to said roof caused by warping of sheathing, cracking of concrete, failure of material used as a roof base or insulation, or by cyclones, tornadoes, hail storms or other abnormal conditions."

Have we abnormal architects, engineers, specification writers, and owners had enough? No? Well, then, I probably should add that back in 1913, the Factory Mutual Companies voluntarily provided windstorm coverage as added protection for their policyholder members. Since then, examples of wind damage and their lessons have been emphasized from time to time in their publications. To prevent your buildings from blowing their tops, it would be well to write to Factory Mutual Engineering Division, 184 High Street, Boston 10, Massachusetts for *Bulletin 7.10, 7.13,* and *7.40.* I know I was somewhat surprised to learn that main building roofs with slopes not over 20° need to resist a gross uplift of 30 lb per sq ft which is based upon combined external and internal wind forces due to a wind velocity (5 minute average) of 67 mph and velocity pressure of 20 lb per sq ft.

After an unusually hectic day slaving over a simmering specification the completion of which was long overdue I settled into my trusty contour chair and promptly fell into a deep and troubled sleep. I pictured myself yearning for the good old days of lessened tension. Before long I was knocking on the door of one Giacomo Leoni, a Venetian, architect to his Most Serene Highness, the late Elector Palatine. After learning that I was interested in writing specifications Signor Leoni asked me to review a clause he had written on the subject of sand. I seem to recall that his version (unstreamlined) read like this:

Three ſorts of Sand are commonly uſed in Buildings; Pit-Sand, River-Sand, and Sea-Sand. Pit-Sand is the beſt of all, and is either black, white, red, or cindry; which laſt is a ſort of Earth burnt by Fire inclos'd in the Mountains, and very common in *Tuſcany.* There is alſo in *Terra di Lavoro,* in the Territories of *Baiae* and *Cumae,* a Sand by Vitruvius call'd Puteolana, which knits together very ſoon in Water, and makes Mortar exceeding ſtrong. It has been found by long experience, that of all Pit-Sand, the white is the worſt; and of River-Sand, that which is in the rapid ſtreams, and under falls of water, is the beſt, becauſe it is the cleaneſt. The Sea-Sand is the worſt of all; however it is ought to be blackiſh and to ſhine like Glaſs: the biggeſt and neareſt the ſhore is the beſt. Pit-Sand being the fatteſt makes the ſtrongeſt Mortar, and is therefore to be used in Walls and long Vaults, but 'tis apt to crack. River-Sand is very good for *rendring* and *rough-caſting* of Walls. But the Sea-Sand, being ſoon wet and ſoon dry, and apt to melt away by reaſon of Salt, is unfit to bear any weight. The beſt sand in its kind of any of theſe ſorts, is that which being handled and ſqueez'd between one's Fingers, crackles or makes a noiſe; or, if being put upon a white cloth, it neither ſtains nor dirties it. That which is mingled with Water makes it ſlimy and muddy, is very bad: as alſo that which has for a long time been expos'd to the Air, Sun, Moon, or Froſt; becauſe it gathers much earth and rotten humour, apt to bring ſhrubs and other wild plants, which are very prejudicial to Buildings.

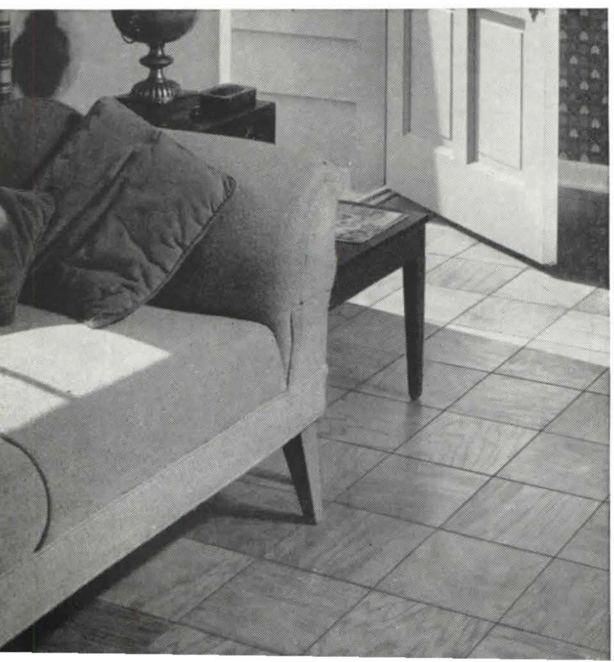




3-ply lamination (all oak) gives maximum stability and moisture resistance

NEW OAK FLOORING FOR USE OVER CONCRETE

Bruce Laminated Oak Block



Designed for modern construction

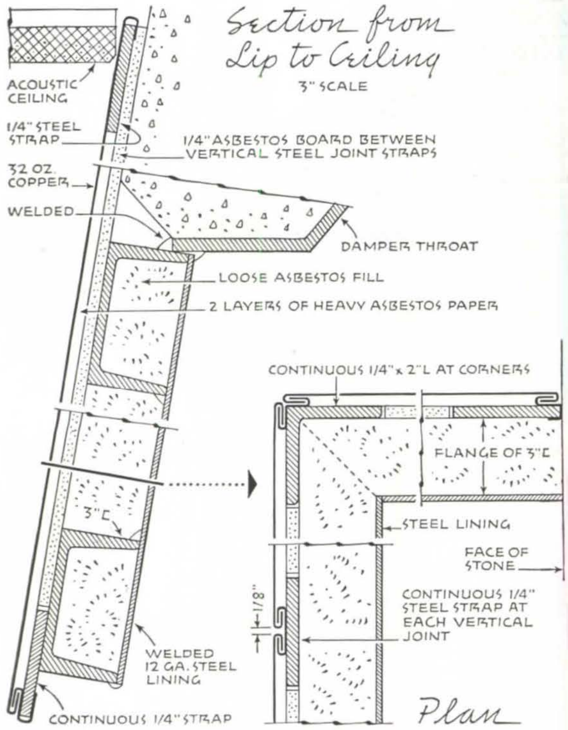
- Lay in mastic directly over concrete
- No expansion joints or spaces needed
- Selected oak for beauty and durability
- Laminated under heat and pressure
- Toxik-treated to resist termite and beetle attack
- No membrane waterproofing required except where dampness is suspected
- Factory-finished for long wear, easy care
- Parquet pattern for contemporary style
- 9x9 in. blocks—½-in. thick
- One grade only—all faces practically clear

LOOK IN SWEET'S—WRITE FOR LITERATURE

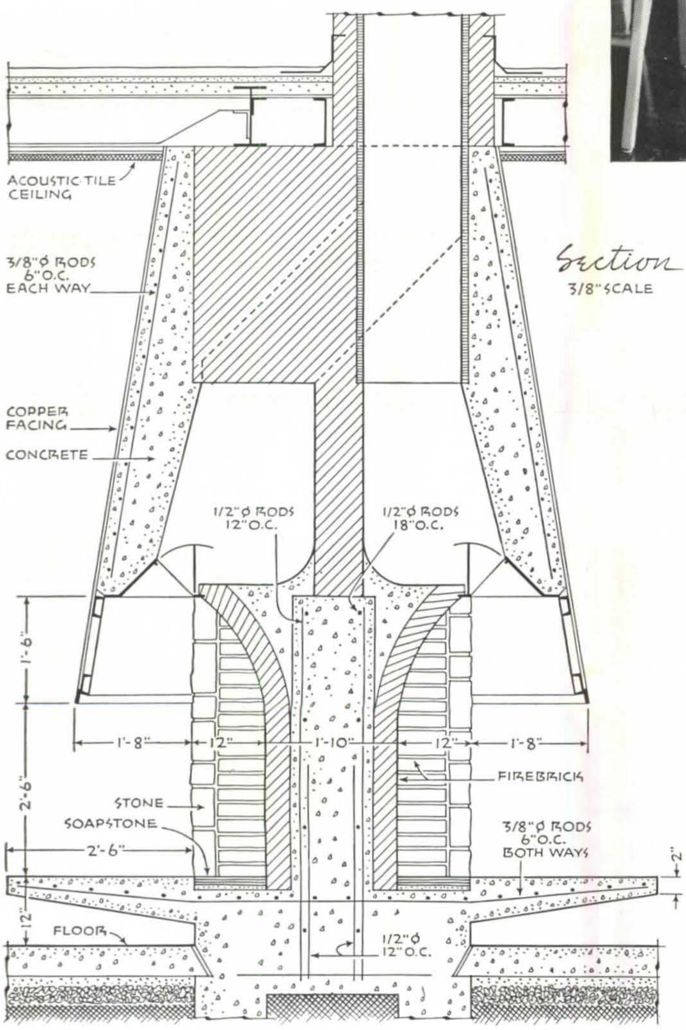
E. L. BRUCE CO., MEMPHIS 1, TENN.

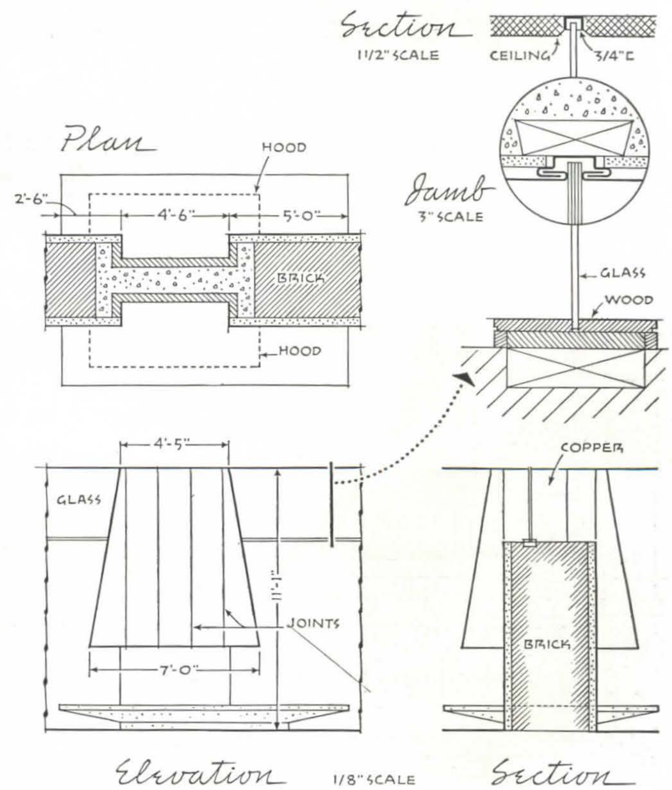
World's largest maker of hardwood floors

recreational building: fireplace



HEDRICH-BLESSING





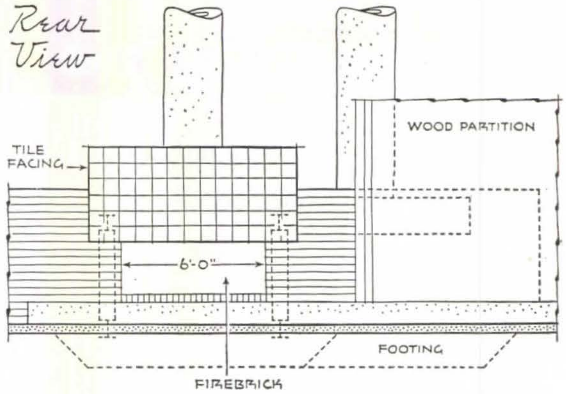
BEDFORD PARK COMMUNITY CENTER, Bedford Park, Ill.

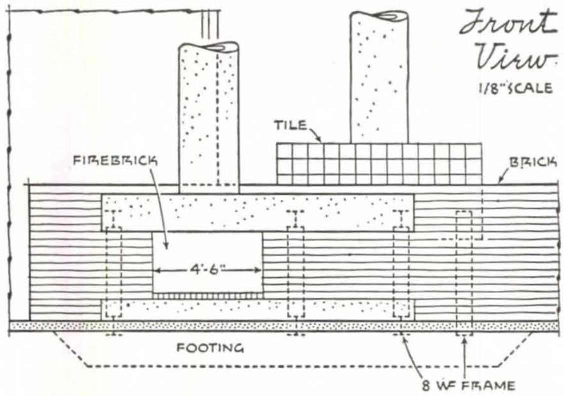
Perkins & Will, Architects-Engineers

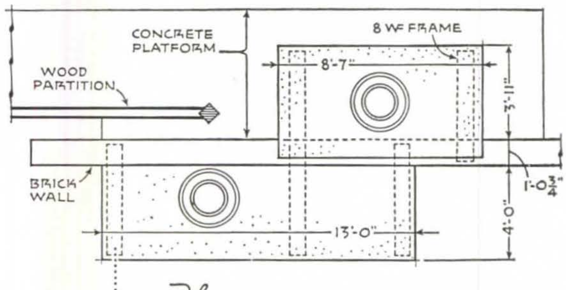
p/a selected detail

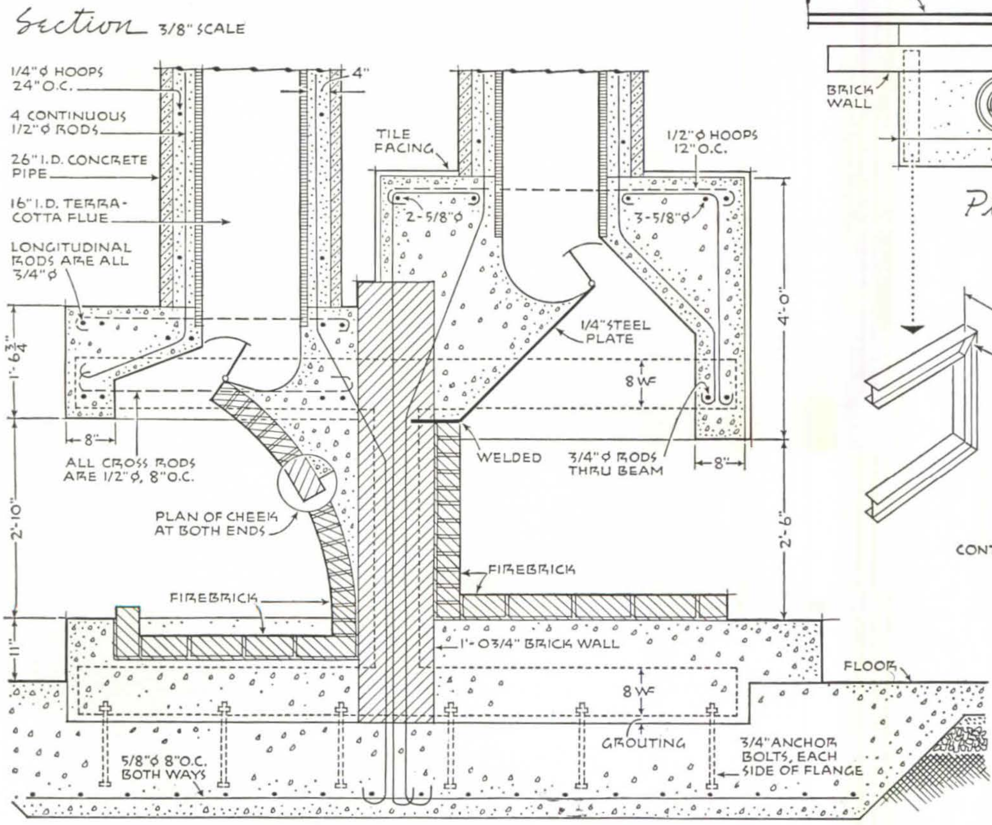
recreational building: fireplace

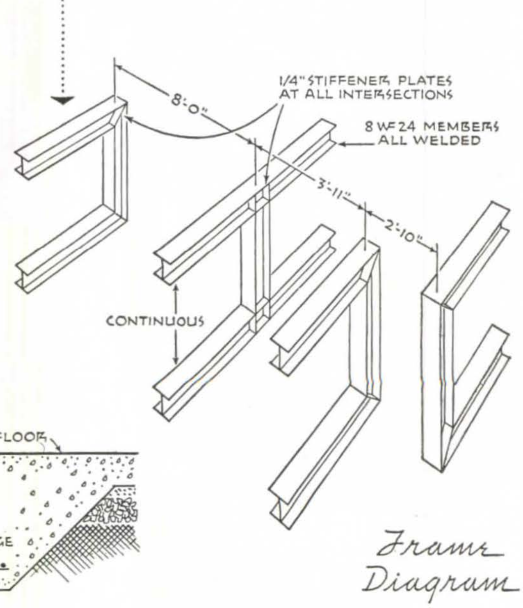
JULIUS SHULMAN







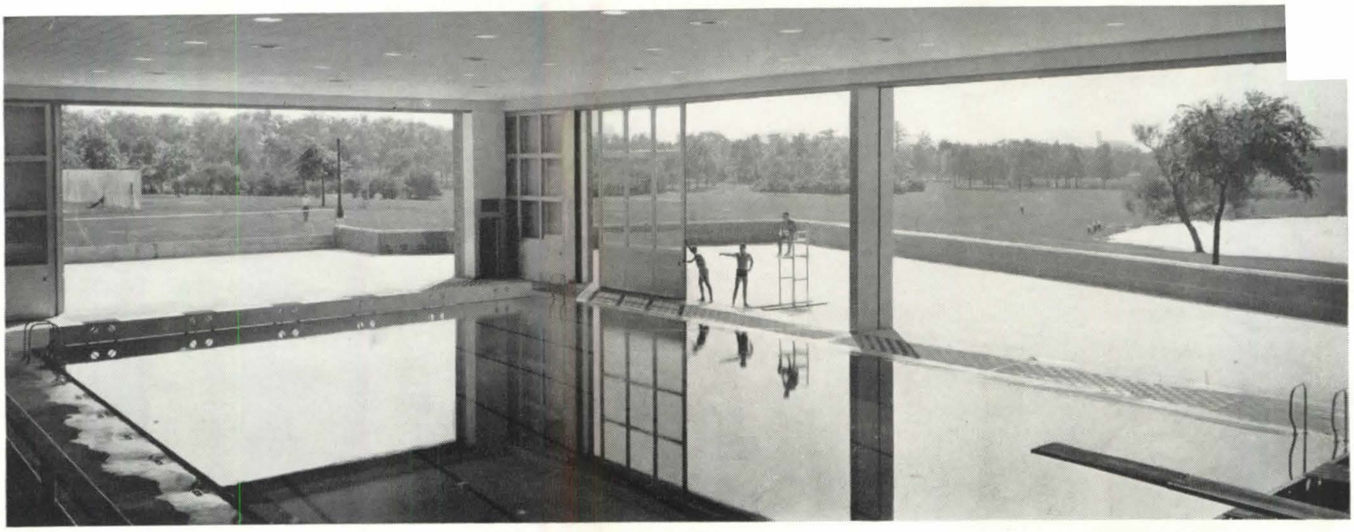




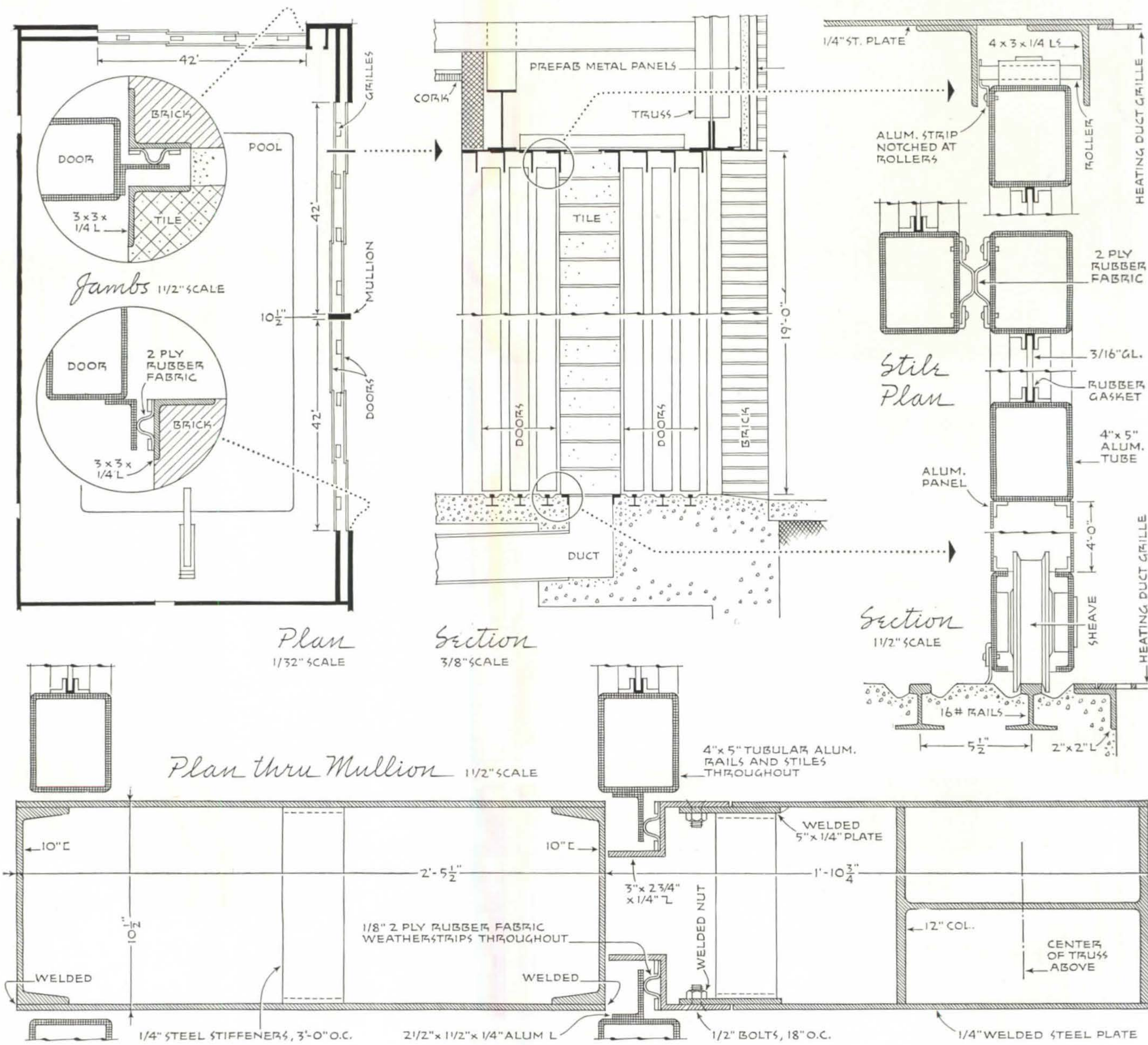
GIRLS' CAMP, Los Angeles, Calif.

Smith, Jones, and Contini, Architects-Engineers-Site Planners

recreational building: sliding doors

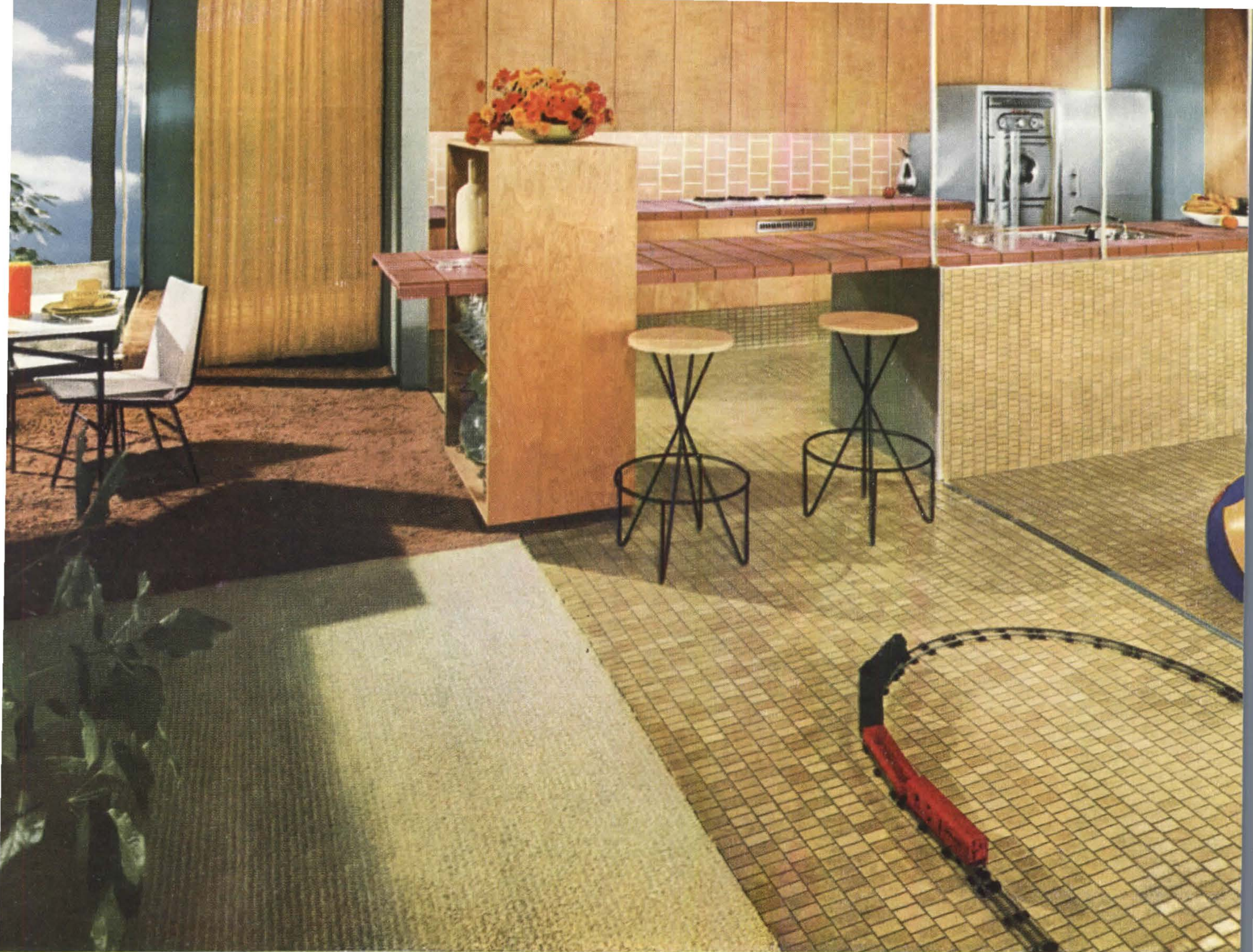


LENS ART STUDIO



GEORGE S. PATTON MEMORIAL SWIMMING POOL, Detroit, Mich.

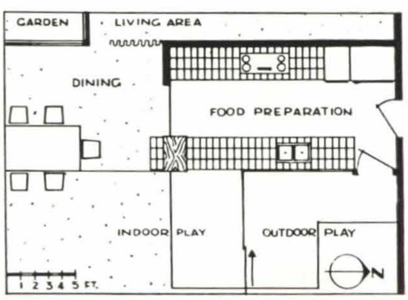
Giffels & Vallet, Inc., L. Rossetti, Associated Engineers-Architects



Design for kitchen-dining-play area by Richard Neutra, F. A. I. A.

"CLAY TILE CONTRIBUTED BEAUTY, UTILITY ...AND A TRUE TOUCH OF THE UNUSUAL!"

plan for kitchen and adjacent areas



This diagram shows you graphically how Richard Neutra floor-planned his ingenious design for comfortable living in his kitchen-dining-play area.

World famous architect Neutra used all of the virtues of clay tile in his design for a kitchen-dining-play area. The playroom and patio floors flow naturally from the ingenious "stepsaver" kitchen. Cheerful tile work surfaces invite food preparation. The rear wall wainscoting presents a glistening, easily-cleaned surface that cuts down on cleaning chores. Clay tile can add much to *your* next residential, industrial or institutional project: top color and design potential, durability, ease of maintenance and real long range economy. Be sure to check comparative costs before specifying a substitute material—your clients will appreciate clay tile!

Tile Council of America, Room 3401, 10 East 40th Street, New York 16, N. Y. or Room 433, 727 West Seventh Street, Los Angeles, Calif.

The Modern Style is

GENUINE CLAY tile

PARTICIPATING COMPANIES: American Encaustic Tiling Co. • Architectural Tiling Co., Inc. • Atlantic Tile Mfg. Co. B. Mifflin Hood Co. • Cambridge Tile Mfg. Co. • Carlyle Tile Co. • General Tile Corp. • Gladding, McBean & Co. • Mosaic Tile Company • Murray Tile Co., Inc. • National Tile & Mfg. Co. • Olean Tile Co. • Pacific Tile and Porcelain Co. • Pomona Tile Mfg. Co. • Robertson Mfg. Co. • Royal Tile Manufacturing Co. • Summitville Tiles, Inc. • United States Quarry Tile Co. Winburn Tile Mfg. Co.

Page Beauchamp

country clubs

One of the most difficult categories in which to find good interior design is Country Clubs, largely because few new ones have been built. We feel that we have selected three representative ones, but probably all readers know of two of the examples because they were not recently opened. Perhaps the members of some clubs indulge their individual whimsies to a degree where the design is no longer a well-integrated whole, and too often there is so much sentiment attached to "the good old club" that few new ones are ever wanted.

Primarily a club should be able to take care of small intimate seating groups without interfering with the general flow of traffic, so that one small group does not "take over" the entire area. Seating arrangement in open-plan, preferably allowing wide avenues of passageways, accomplishes this. Rearrangement of furniture according to need is simplest if seating is along the walls of the room. This also has the advantage of allowing the members to see the surrounding grounds, usually lovely. In the following examples, space has been divided by means of a fireplace wall, a light display-type room divider, and accordion folding walls, which may be opened easily or closed, as desired.

Large glass-wall areas are especially desirable to allow the view of out-of-doors and also to establish a certain informality through the openness.

A sound, serviceable material underfoot is necessary in the areas used by golfers with cleated shoes—in our examples flagstone was chosen.

Main considerations are accommodation for small groups, pleasant dining area, relaxing lounge area, adequate locker space—and a flexible plan to adjust to varying needs.

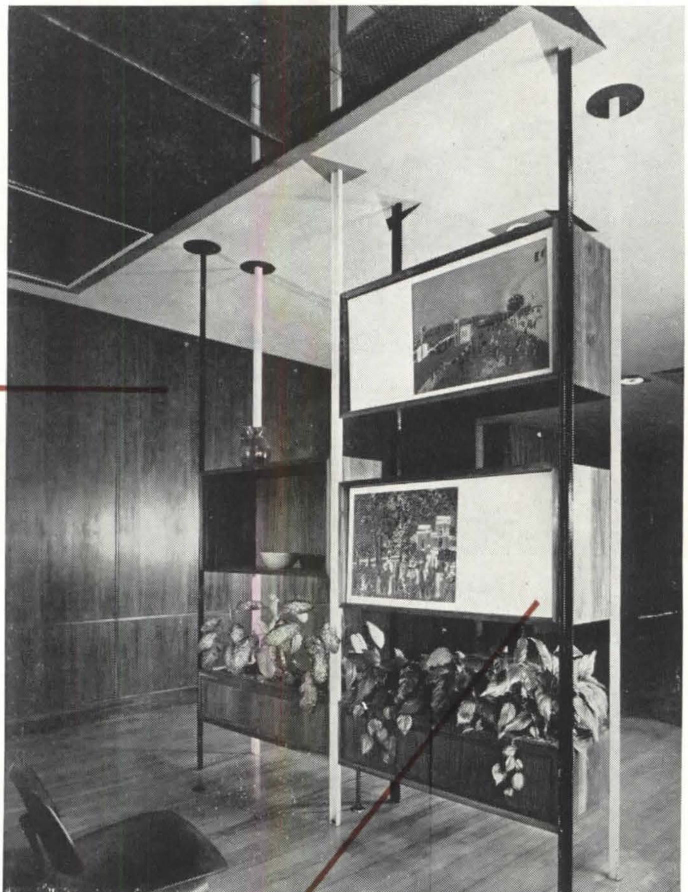
country clubs

location	Raleigh, North Carolina
architect	Wm. Henley Deitrick, Inc.

native stone

To take advantage of beautifully developed surrounding grounds and to join indoor and outdoor activity, entire walls of glass have been used. One's immediate reaction to appearance is that the design is most practical and workable, clean and straightforward with easily maintained materials. Yet warmth and informal ease have been achieved through use of native stone and the entirely flexible open plan. *Photos: Joseph Molitor*

walnut paneling



acoustical plaster

room dividers

data

cabinetwork

Display-Room Dividers: custom design by M. S. Nowicki/ executed by Herring Sash and Door Co., Inc., Raleigh, N. C., Peden Steel Co., Raleigh, N. C.

doors and windows

Entrance Doors: "Thinline"/ Kawneer Co., 1105 N. Front St., Niles, Mich.

Window Panels and Sliding Panels: custom design by architect/ executed by Peden Steel Co.

Intermediate Projected Windows: Truscon Steel Co., 1315 Albert St., Youngstown, Ohio.

furnishings and fabrics

Furniture: Knoll Associates, Inc., 575 Madison Ave., New York, N. Y./ Herman Miller Furniture Company, Zeeland, Mich.

Fabrics: custom design by M. S. Nowicki/ executed by Goodall Fabrics Inc., 525 Madison Ave., New York, N. Y.

lighting

Recessed and Directional Lighting: #63065, #63041, #63038/ Kurt Versen, 4 Slocum Ave., Englewood, N. J./ #NB-8, #HL-47, #L-7; General Lighting Co., 1527 Charlotte St., New York, N. Y./ #N. Y. S 21, #V. 28; Perfectlite, Cleveland 14, Ohio.

walls, ceiling, flooring

Walls: painted plaster, Wake County Native Stone.

Paneling: American walnut/ Herring Sash & Door Company, Raleigh, N. C.

Ceiling: acoustical plaster/ American Acoustics, Inc., Locust St., Keyport, N. J.

Flooring: white maple/ Geo. H. Roberts, Charlotte, N. C./ Carolina Bluestone flagging/ Benj. H. McClamroch, Raleigh, N. C.

country clubs

location	Ottumwa, Iowa
architect	Harold Spitznagel & Associates

asphalt tile

data

doors

Sliding Doors: designed by architect/ hardware/ Accurate Metal Weather Strip Co., 216 E. 26 St., New York, N. Y.

furnishings and fabrics

Sofas: #4678, foam rubber upholstery, walnut frame/ Herman Miller Furniture Company, Zeeland, Mich.

Sectional Units: #4682, #4681/ Herman Miller Furniture Company.

Chairs: #4674, #6-689/ Herman Miller Furniture Company.

Molded Plastic Chairs: #70/ foam rubber upholstery, lacquered metal frame/ Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.

Tables: #5058, coffee table with plant insert/ plastic top, birch legs/ #4662, glass top coffee table, birch frame, lacquered metal legs/ #635, end tables, walnut with colored lacquer tops/ #4634-L lamp tables, walnut with natural leather tops/ Herman Miller Furniture Company.

Drapery: #2656 Gelder check/ white and gray heavy linen/ Dan Cooper Inc., 30 Rockefeller Plaza, New York, N. Y.

lighting

Fluorescent Recessed Fixtures: Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.

Incandescent Recessed Fixtures: #63066/ Kurt Versen, 4 Slocum Ave., Englewood, N. J.

Lamps: #NS950, #NS907 floor lamps/ #NS922 table lamp/ Nessen Studio Inc., 5 University Place, New York 3, N. Y.

walls, ceiling, flooring

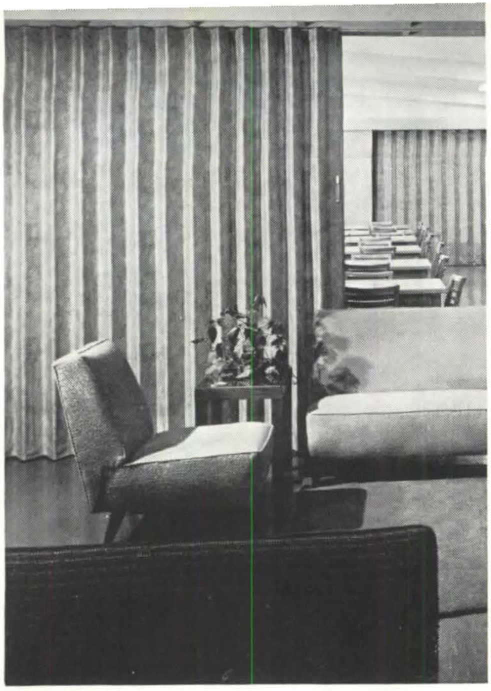
Walls: plaster/ paints/ Pratt & Lambert, Inc., 79 Tonawanda St., Buffalo, N. Y.

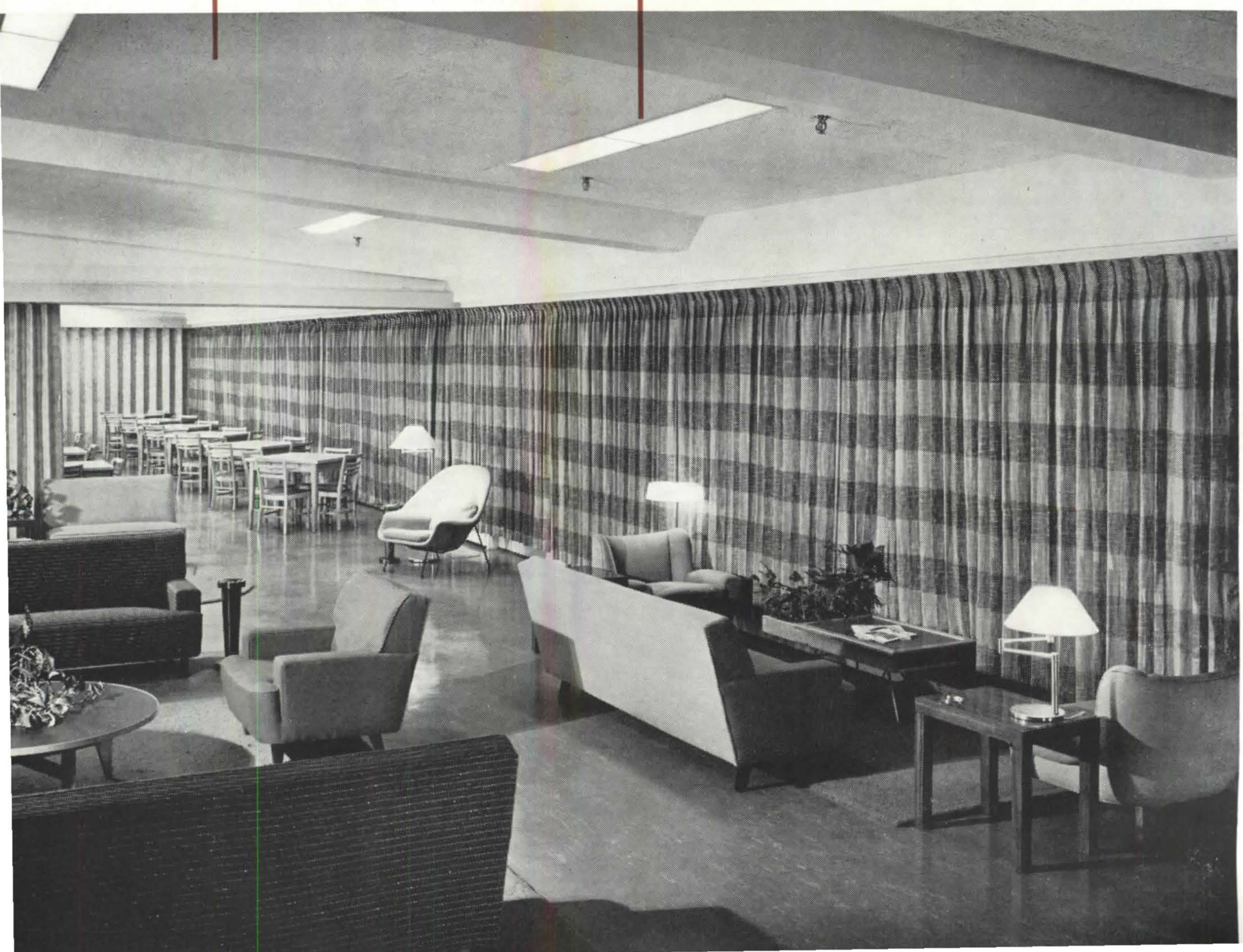
Ceiling: plaster, acoustic tile/ Armstrong Cork Company, Lancaster, Pa.

Flooring: flagstone/ asphalt tile; #C-761 gray/ The Tile-Tex Div., The Flintkote Co., 1232 McKinley Ave., Chicago Heights, Ill.

The central area in the lounge is the large fireplace wall. It divides space yet does not enclose, forming an important yet unobtrusive setting. There is seating also which commands a view of the club grounds. Space has been so arranged that the lounge and dining areas may become one or be completely separate, yet the room is a well-unified whole, organized by the use of the same drapery material throughout the area.

Photos: Hedrich-Blessing



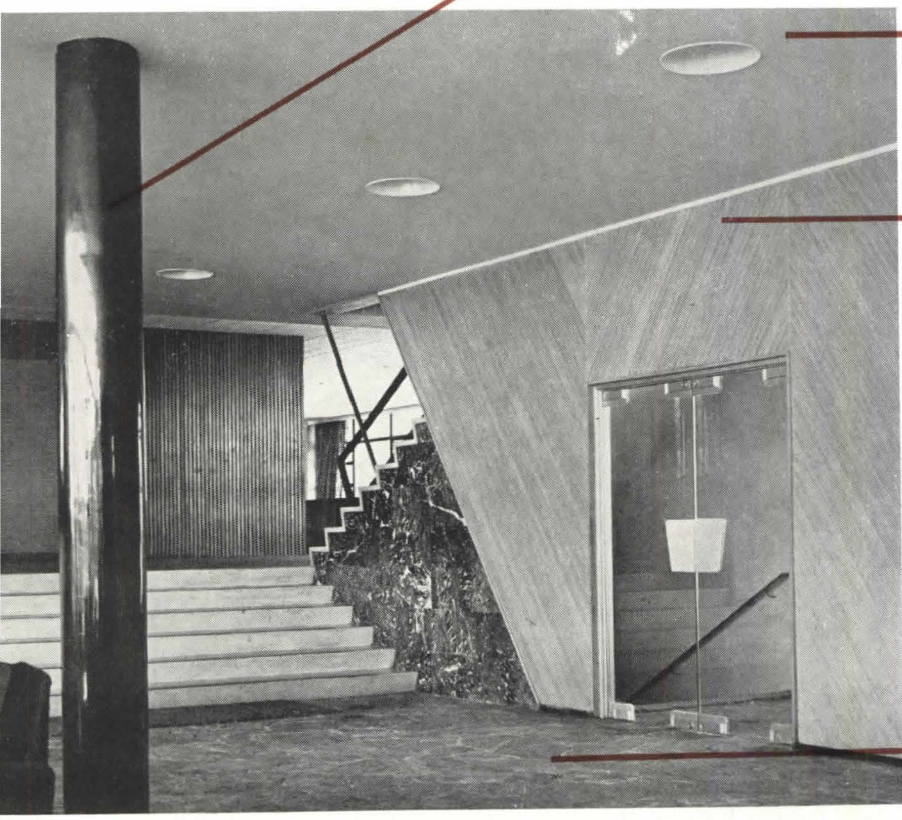

acoustic tile
recessed fluorescent fixtures

country clubs

location	Bogotá, Colombia
architects	Jorge Arango, Obregon & Valenzuela
interior designer	Jorge Arango

lacquered sheet-metal column

acoustic ceiling



flormorado

flagstone

mahogany

wooden trellis

data

cabinetwork

All Cabinetwork: custom designed by architects.

Bar: designed by Rafael Obregon/ wood with burlap and copper trim/ manufactured by Bierman, Bogota, Colombia.

furnishings and fabrics

Chairs: custom-designed by Jorge Arango/ natural color raw wool upholstery/ manufactured by Camacho-Roldan, Bogota/ leather upholstery/ manufactured by Artecto, Ltda.

Draperies: blue and white cotton print/ Tony Kale, Medellin, Columbia.

walls, ceiling, flooring

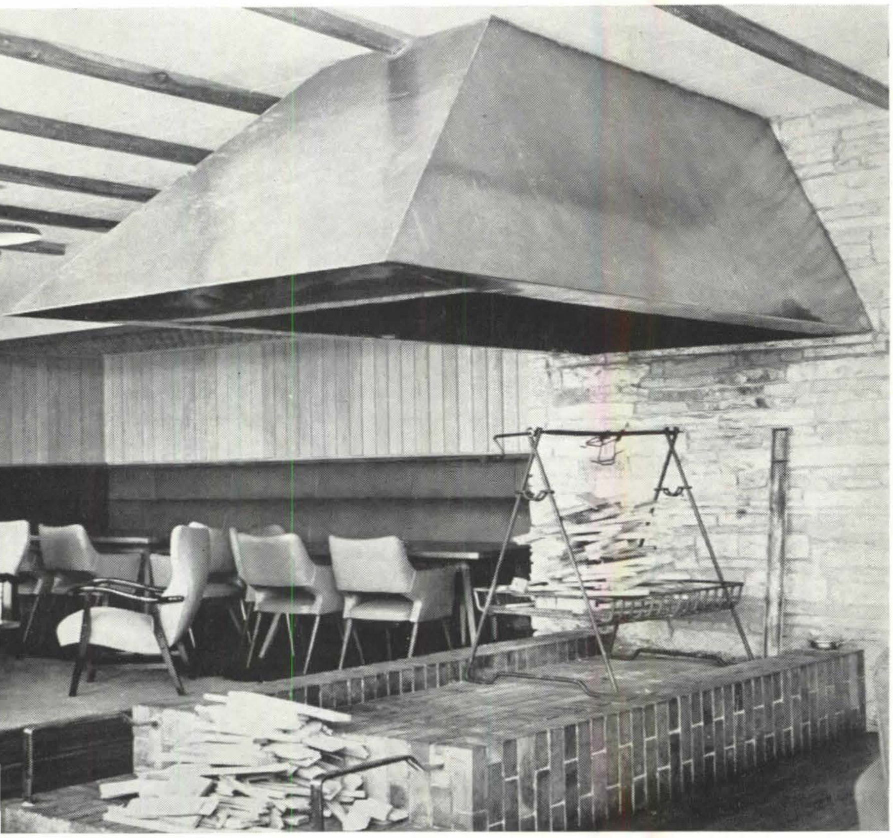
Walls: flormorado wood and mahogany/ Italian marble.

Acoustical Ceiling: Armstrong Cork Company, Lancaster, Pa.

Flooring: flagstone and Guayacan wood.

Columns: lacquered metal sheeting covering.

Doors: Herculite/ Pittsburgh Plate Glass Co., Grant Bldg., 632 Duquesne Way, Pittsburgh, Pa.



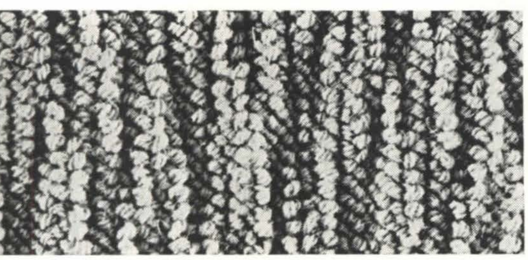
Space division has been well handled here because there are convenient accommodations for the small conversational groups which naturally gather in a club. There is ample room for flow of traffic. Flagstone flooring is used where golfers walk in spiked shoes.

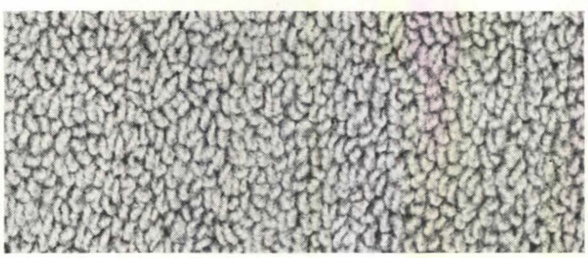
Practically all of the materials and products used were specially designed and made in Colombia, because nothing could be imported. However, it is a fascinating study in variation of textures, the combination of smooth marble and metal with wood paneling, and of balance of lightness and weight of masses.

p/a interior design products

Woven-Wood Window Shade: "Sunweave Shades"/ 1/10" wide strips of basswood/ diffuse light and exclude heat as well as reducing heat loss through glass/ stain-finished in soft, pastel colors/ upkeep possible with normal housecleaning implements/ custom-made to measure/ designed by Walter Dorwin Teague Associates/ **The Hough Shade Company, 1023-1059 S. Jackson, Janesville, Wis.**

Printed Batiste: "Seedy Weeds"/ chosen for January "Good Design" exhibition/ designed by Ruth Adler/ **retail:** $5.95 a yd/ **Adler-Schnee Associates, 7403 Puritan Ave., Detroit 38, Mich.**

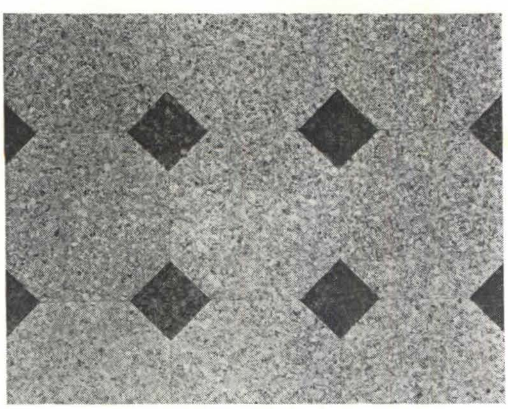




Carpet: "Cordripple" (far left)/ ripple texture in loop pile/ available in seacrest green, doeskin beige, dove gray, nutria, suburban green/ blend of wool and carpet rayon/ **retail:** $7.95 a sq yd/ **Bigelow Rugs and Carpets, 140 Madison Ave., New York 16, N. Y.**

Carpet: "Springloop"/ tufted, made of "Tufton" yarn, developed by American Viscose for floor coverings/ permanently soil-resistant/ **James Lees and Sons Company, E. 4 St., Bridgeport, Pa.**

Cork Flooring: "Custom Cork"/ 9" octagonal Mocha Tan tiles and 3" square Coconut Brown tiles/ 3/16" gage/ one carton covers 32-$\frac{1}{2}$ sq ft area/ **Armstrong Cork Company, Lancaster, Pa.**



out of school

"Art as a personal venture has difficulty existing for itself alone when applied to architectural concepts. . . ." The Professor of Art at the University of Theleme paused impressively and blew a cloud of smoke into the shivering Calder mobile, a tinkling sword of Damocles, suspended over his head.

"What do you mean by 'applied'?" I asked, taking careful notes for this article.

"I am not talking about art applied *to* architecture," he said, "but rather art as it is a part of architectural concepts."

"Oh, you mean the influence of Mondrian and Bracque on Van der Rohe, Eames, Wright, and other impressionable architects? I have always been fascinated by the attempts to translate two-dimensional, framed, color-and-line concepts into the three-dimensional hollow forms of architecture. One would have thought that Lipshitz and Henry Moore would have offered more intellectual stimulus and architectural source materials—even Calder . . ." and my eyes followed the monstrous shadows of the convoluting mobile, as they stretched their long nightmare fingers towards me, down the white plaster wall.

The Professor sniffed. "We no longer waste time here on the teaching of two-dimensional 'Art' circumscribed by frames or the limits of a canvas. Guernica was the final gasp of a worn-out art form. With Picasso, in this picture *(pre-1953 'period')* ends the essential personal expression of the art of painting beginning in the caves of Altamira, reaching its quintessence in the cave of the Sistine Chapel, and ending in a cave on the third floor of the Museum of Modern Art in New York. Studies made by a recent Ph.D. candidate at Theleme have proved conclusively that 97½ percent of all possible permutations of line, form, color, space, and subject have now been applied to two-dimensional, rectangular receptacles—usually made of wood and canvas. This leaves only three choices of action: first, copying or adapting; second, destroying all collections now in the museums and starting the art of painting all over again; or third, discovering and developing new art forms. Since the first is a standard activity in most schools; and the second, while desirable, appears impractical because of the highly developed 'pack rat' instinct still inherent in our culture; we have adopted the third."

The School of Architecture and Planning at the University of Theleme has been the subject of several articles in P/A. It is a constant source of wonder to me that this isolated educational microcosm should constitute so stimulating a locus in matters pertaining to the development of our ancient profession. May I refer my new readers to those earlier statements — or preferably they should visit Theleme themselves. Any number of readers of this column are sure that they can give directions for reaching this University, so I will not waste your time here with such instructions.

As in nearly all other universities, there is a close affiliation at Theleme between the School of Architecture and Planning and the School of Fine Arts. In some American universities, Architecture is administratively subservient to the Fine Arts or Schools of Design in the organizational hierarchy, as at Illinois and Harvard. In others, as at Pennsylvania and Columbia, the head of the architectural program also is charged with directing the Fine Arts and Design programs. In still other institutions, there is a partial or complete separation, depending on circumstances. At Berkeley, for instance, sculpture is in the College of Architecture, but the other fine arts are directed by a department in the College of Letters and Sciences. But do not be misled: what is on the books is not necessarily the case. At Theleme, as in most schools, a high degree of nebulosity of relationship exists. It was my intention, in talking to the Professor of Fine Arts, to find out if the situation was deliberate or accidental, political or philosophical, or just plain irrational. You may judge the results as we proceed.

"Art," the Professor was saying, as I was jotting down the last two paragraphs, "has been widely accepted as a fundamental to Basic Design courses in architectural schools. Now I am no architect. I just live and work in the stuff. Architecture is constantly imposing its ego on mine. Frankly, I don't like the finite nature of these man-made environments. I don't like going through doors, looking out windows, climbing stairs, and standing on floors. But the Ionic column does not annoy me as much as it does you. In the purely voluntary volute I find no personal antagonism. On the other hand, the walls and ceiling of this room remind me that I am still the troglodyte, or better, the trilobite struggling out of primordial mud to the light and air. Nor do I believe that the Parthenon would have been better if walled with plate glass rather than a peristyle of Pentellic marble. No, I feel that Art in whatever series of devices we invent is to be considered as natural to the device."

"What I came to talk to you about," I said, carefully choosing my words, as this was obviously a sensitive soul—undoubtedly Gemini—"is the relationship of art to education and in particular to the education of architects and city planners."

"What I have been saying is wholly germane to the subject," said the Professor of Art, severely. There was an ominous rattle in the mobile overhead. "In too many schools the student is trained by teachers whose own ambition is to be hung on the walls of the Metropolitan, Louvre, or Museum of Modern Art. A student at early stages is imbued with this exhibition complex. It is a competition between him and a jury. One could hardly call it education." The professor, pausing, picked up a magazine from the bookshelf behind him. "Let me call your attention to the excellent article by Kenneth Clark on 'The Ideal Museum' in the January 1954 issue of the *Art News*. He adds another sharp point to what I have just said:

" 'No doubt that in a large sense of the word the appreciation of art is educa-

(Continued on page 156)

out of school

(Continued from page 155)

tive. It gives us a fuller understanding of the human spirit; it greatly enlarges our capacity for life: and this, I suppose, is what education sets out to do. But these benefits are achieved by the enjoyment of the works of art themselves, not by information and classification. Often it has seemed as if the educative virtue of works of art consisted in knowing *about* them, not in experiencing them directly. This is surely an error, a sort of decadence in which the means has become the end, and, like the churches of a religion in which belief in God has died out and only the niceties of ritual remained, our art galleries might easily be swept away in a moment of spiritual revival.' "

"Then exhibitism and classificationism are your two most serious philosophical problems?" I asked.

"No, there is a third—self expressionism," responded the Professor, "and this seems to be our worst problem. Art is being used as a psychic medium in which the self-professed artist indulges in public confessional. It is exhibitionism—not exhibitism—one step higher than drawing dirty pictures on the walls of a public toilet and probably providing a similar emotional release. In a psychotic world of hypertensions, the emotional release of even just one individual may be justified. We are at this moment indulging in a worldwide Oxford movement using the medium of paint and some of the other minor arts for public-confession purpose. Music has always been the better vehicle for the pure science of personal but abstract release. And Architecture, like painting, is suffering from the personality problems of highly subjective designers, who mistakenly confuse their internal disturbances with matters of the public concern. The public, which is often emotionally disturbed itself, tries to translate such personal idiosyncrasies as are revealed in the arts into the generic psychic problems of the Age of Nuclear Fission. I am no psychiatrist and I must say I am puzzled in my approach to all of this, as a teacher. For instance,

(Continued on page 158)

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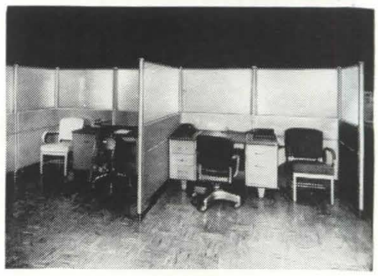

Since accelerated change is our way of life, architects know from experience that the office floor plan is NOT there to stay in its present state. Changing conditions, changing personnel mean the floor plan will have to change as surely as the pony express gave way to the telegraph, or the quill pen gave way to the typewriter.

Because office space division is not static, the new administrative building for the Bayway Refinery of Esso Standard Oil Company uses Arnot Partition-ettes and Office-ettes† throughout. This is the first structure ever to be specifically planned to accommodate modular, functional office furniture . . . and the world's largest installation of it is now being completed in this fully air-conditioned, elevator building, containing 100,000 square feet of space.

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out of school

(Continued from page 156)

look at the incredibly great political and military leadership the world has received from Sir Winston Churchill and President Eisenhower. They both find emotional release in painting (as did Hitler, for that matter), and I find their art quite dull and uninspired. On the other hand, I certainly would not place the destinies of the world in the hands of Picasso or Frank Lloyd Wright, whose political expressions apparently form an emotional relief from the pressures of concentrated creativeness in the fine arts."

"You mentioned a few minutes ago that you are developing new Art forms here at Theleme," I ventured, feeling that because of limited space in P/A I had better try to control the interview, interesting as the conversation was becoming.

•

The Professor jumped up and grabbed his hat. "Come along and I'll show you a Design Lab that beats anything at Princeton, North Carolina, or anywhere else, for that matter." Philosophy was replaced by action and in a minute we were driving at top speed to the edge of the campus. Our first stop was at a large, rolling field on which were gamboling a number of bulldozers, sheepsfoot rollers, and caterpillar steam shovels. We sat in the car and watched their antics for several minutes.

"Here we see Art students being trained in the new tools of the times," said the Professor of Art. "An instructor in that radio car over there is directing them. This is a part of the training program allying Art with the Regional Planning Curriculum and with the School of Agriculture. The best way to study results, however, is from the air. 'Art and the Air Age' is one subject of study in our Laboratory."

In a few minutes we had taken off in a small plane belonging to the Design Lab. As we gained altitude, the Professor, who was piloting, continued, "I have always been impressed with the great terrestrial art form of prehistoric societies. The gigantic white horses, sgraffiti carved

(Continued on page 160)

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out of school

(Continued from page 158)

in the turf-covered chalk of the British downs, on hilltops best seen from the air, are of a scale and beauty challenging to the modern designer. The same can be said of the Great Serpent Mound and other gigantic sculptural forms in the Ohio valley and in the deserts of Peru. One wonders if pterodactyls had been domesticated and if our prehistoric ancestors enjoyed these great bas-reliefs from the air, as we now do.

"Now as we wheel here in the sky over the country surrounding Theleme you can see the results of our experiments. Working with the agricultural expert, we have designed a new and more beautiful pattern of fields and woodlots, shelter belts and duck ponds, farm groups, fences and windrows—a pattern which a conscious design has created. The textbook for these creations is Gutkind's wonderful book, *Our World from the Air.*[1] His chapter on "The New Fields," with its photographs of contour plowing as a visual expression of plastic and functional creativity, is without peer. But Gutkind omitted the great conscious land art of primitive cultures, and we are here combining the two traditions, using modern, mechanical, large-scale techniques. The most magnificent opportunity and material for creative art today is offered by the surface of the earth—and the sky."

"What are you doing with the sky?" I asked with some trepidation.

"Watch!" he said, and gave a few orders into his microphone. Immediately a dozen or more little jet planes zoomed up towards and above us. Then, weaving back and forth, up and down, in incredibly swift and graceful gyrations in every dimension, they wove in colored trails of smoke an immense pattern of line and cloud into the depths of the clear blue mat of the sky.

"Diaghilev with his choreography and Tintoretto with his Olympian world of the sky could together have created a true 'Ballet of the Supersonic World,'" said the

(Continued on page 162)

[1] *Our World from the Air*, E. A. Gutkind, Doubleday & Co., Inc. N. Y. 1952. $7.50.

out of school

(Continued from page 160)

Professor of Art, at the controls, "and its beauty, like that of music, is that it is evanescent but always possible of recreation. Art forms on the face of the earth are largely solids, despite all of the seasonal variations. It is true that the colors of wheat fields and corn fields change with each hour and each day, but here in the sky the slightest air current dissipates our design, and no harm is done if we make a mistake."

•

A little breathless with excitement we landed and returned to the Design Laboratory. "Our civic-design classes, also studying form from the air, are of course making models of their new towns and the redevelopment of old ones. Here again Gutkind (opus cited), Gibberd,[2] Rasmussen,[3] Saarinen,[4] Tunnard,[5] and other specialists in urban design give us much to study. The relationship of massed architectural form as large-scale abstract sculpture is a vital concept. The hit-and-miss approach of the great failures of New York, Chicago, Philadelphia, and our other big cities prove that there is much to be done. We are recommending for Art purposes that the Federal Urban Renewal activities include the removal of skyscrapers and other structures which are eyesores, or spoil the form or mass of building groups and tend to destroy the beauty and therefore the permanence and value of our cities."

"Rather expensive," I murmured under my breath.

The Professor of Art continued without hearing me (I think), "We are also assembling data and experimenting in mobile architecture-Calder combined with Fuller's Dymaxion ideas. A town that moves by electronic devices with the solar inclinations and declinations! Now that lightness and impermanence are esthetically possible and often desirable, we should be able to design and build cities which literally flap in the wind, the buildings taking advantage of every breeze and every desirable ray of the sun and any view."

This was getting a bit thick for me so I tried another tack: "What about decoration of buildings? Is there an art form still untouched which could serve as ornament or are we to contine to live and work in highly sterilized jewel boxes, doomed to endure our existence staring into the empty eyes of ebony masks from the Ivory Coast? Without two-dimensional painting and other customary art forms, what small-scale art is there left to tie into architecture?"

"In the first place," said the Professor of Art, relighting his pipe, "we are working with cold-cathode light. The Juke Box is the dominant object of the People's Art. The people are seldom right or wrong. The People accept and absorb.

(Continued on page 164)

[2] *Town Design*, Frederick Gibberd, Reinhold Publishing Corp., 1953.
[3] *Towns and Buildings*, Steen Eiler Rasmussen, Harvard University Press, 1951.
[4] *The City*, Eliel Saarinen, Reinhold Publishing Corp., 1951.
[5] *City of Man*, Christopher Tunnard, Scribner Publishing Co., 1953.

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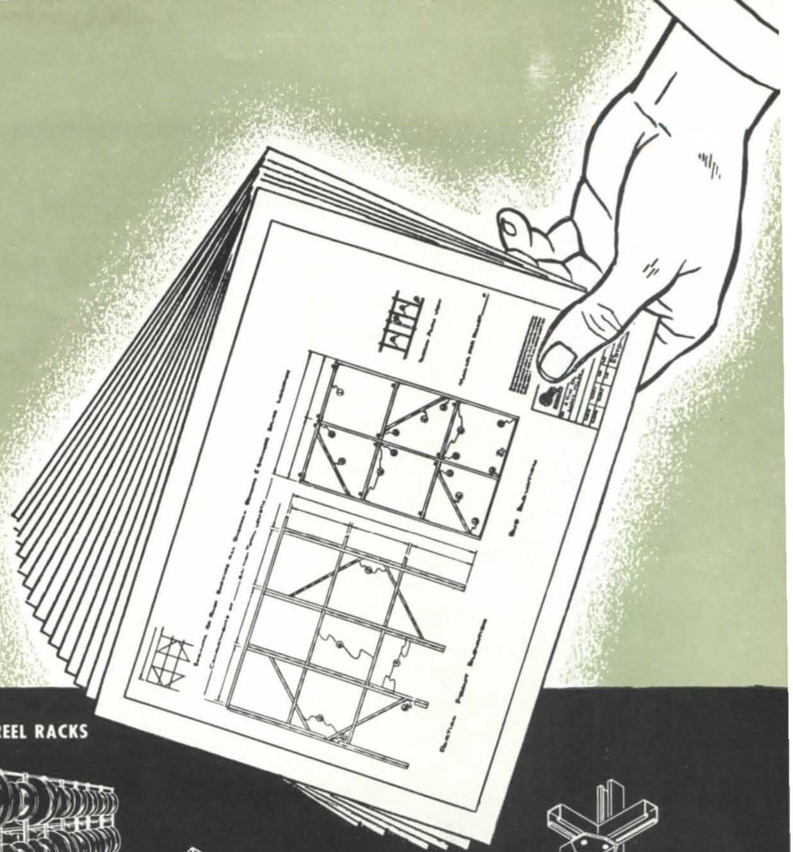

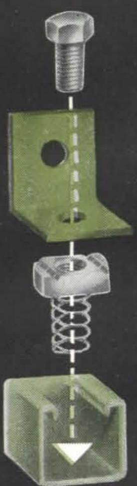

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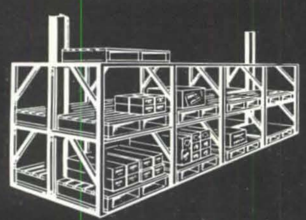

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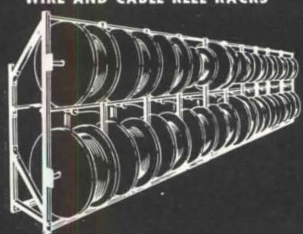

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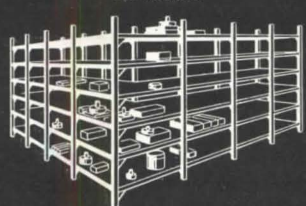

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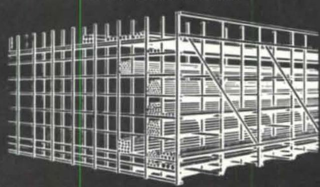

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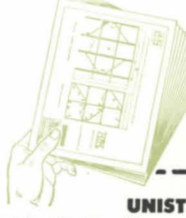

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(Continued from page 162)

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"What do you expect this concept to do to architecture?" I asked (mildly, for me).

"The opportunities are limitless," said the Professor of Art, blowing smoke rings into the mobile, now dangling jaded, spent, and listless in the still air. "We are taking field trips to see Times Square at night, the Christmas lighting of the Denver City Hall, the illumination of Niagara Falls, the neon infernos of the streets of Hollywood. Granted that these are all atrocities—super juke-boxes—still there must be something in all of them or they would not be so universally admired—except by architects and artists, of course. With this in mind we are teaching in our Basic Design the art of mural and façade embellishment with the use of neon and cold-cathode tubes. Students bend their own tubes, select the gases, and study the effect on all kinds of architectural glass and metal veneers. One of our first full scale projects will be the south side of the main slab of the Rockefeller Center—now a drab, soot-washed, gray limestone. When we are finished it will be more fluorescent than a thousand Niagaras. It could be good", he added somewhat wistfully.

"Perhaps our most interesting recent studies lie in the realm of sculpture. We have been debating Great Issues—like the

(Continued on page 166)

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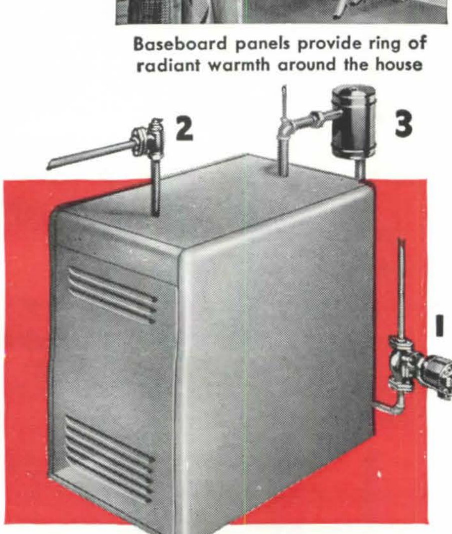

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out of school

(Continued from page 164)

Great Books. Our last was on the subject of the maximum number of Colossi which could be supported by any one locale—New York Harbor, for instance. Is one Statue of Liberty enough? What about another on the high point of Staten Island, or perhaps two at the Narrows? Not all the same, of course, but a good diversity of well-located colossi. If the idea takes hold, there isn't a city in the country that won't want at least one."

"Then we are studying ground-level sculpture in the motor age. The average statue on a pedestal is pedestrian, or at least equestrian, in concept. It dates from Classical and Renaissance methods of locomotion. It also depends on a direct or axial approach, which is almost impossible in a car (without wrecking it on the statue), particularly if the driver is really interested in art. After several student experiments, we arrived at an obvious solution—the Burma Shave signs. Why not? So we have arranged with the State Highway Department for a series of roadside exhibits. They are fairly simple to erect—a breast here, a thigh there, a head against a clump of dark foliage, an arm silhouetted against a rock—all spaced logarithmically in such a way that at 40 miles per hour they elide into each other to form Diana at the Hunt; at 55 miles per hour, Madonna and Child, at 70 miles per hour, Capital versus Labor . . . . Shall I go on?"

"No!" I said.

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Bernard J. Sabaroff & Harold C. Dow, Architects, 1179 Market St., San Francisco 3, Calif.

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Gordon Carl Pierce, Architect, 219 S. Pennsylvania Ave., Greensburg, Pa.

Don R. Livergood and Harry N. Caldwell associated as Livergood & Caldwell, Architects, 130 W. Main St., Decatur, Ill.

Charles Whitaker, Architect, 816 Lancaster Ave., Bryn Mawr, Pa.

Victor Abrahamson, Architect, 260 Kearny St., San Francisco 8, Calif.

p/a reviews

books received

Sir Christopher Wren. John Summerson. The MacMillan Co., 60 Fifth Ave., New York 11, N. Y., 1953. 160 pp., illus., $1.75

Display. Interiors Library No. 3. Edited by George Nelson. Whitney Publications, Inc., 18 E. 50 St., New York 22, N.Y., 1953. 190 pp., illus., $12.50

The House and the Art of its Design. Robert Woods Kennedy. Reinhold Publishing Corp., 330 W. 42 St., New York 36, N. Y., 1953. 550 pp., illus., $9

Oil Painting. Henry Gasser. Reinhold Publishing Corp., 330 W. 42 St., New York 36, N. Y., 1953. 128 pp., illus., $10

"soft" modernist

Modern Architectural Design. *Howard Robertson. The Architectural Press, 9-13 Queen Anne's Gate, S.W.1, London, England, distributed by The British Book Centre, Inc., 122 E. 55 St., New York 22, N. Y., 1952. 228 pp., illus., $5.50*

Whatever else one may say about Howard Robertson's approach to architecture or about his primer in its new form, one thing is sure: a book pleasanter to view and read, and one less dogmatic or narrow in its views would be hard to find. With one-track minds, all-outers, extremists, or even purists, our author is not attuned. His book is as free of dogma—some would say of direction—as is the output of his firm: changing with the times, sometimes a short step ahead of the public, "progressive" yet client-centered, afraid neither of new features nor of backward glances.* This very flexibility (or is it eclecticism?) is doubtless at the root of Robertson's recent election to the "leadership of the profession," as President of the Royal Institute of British Architects, marking the long-awaited triumph of temperate modernism in that conservative body. He had represented his country officially, perhaps one may now say represented its official architecture, as designer of the British Pavilion at the New York Fair of 1939, and once again as United Kingdom dele-

* *See the excellent illustrated article by Reyner Banham: "Howard Robertson,"* Architectural Review, *September 1953.*

gate on the United Nations Headquarters Commission.

Modern Architectural Design reveals the experienced architect and perceptive traveler, whose writings did much to introduce the modern movement to England in the 1920's. The plates offer an elegant, if safe, cross-section of European and American building of the last 20 years. Pleasingly printed, as is the text, they are all new. The text material has been "largely revised and reset" since 1932.

Modern Architectural Design is articulated into the following topics: program, organization and plan; the stiucture; materials for exteriors; expression; external details; interior decoration; the house; the modern movement; architectural education. In the limited space available for each of these, the author does a remarkably concise job, if I understand his purpose, in providing an introduction for students and laymen, and restating principles for practitioners who would like to contemplate things at a further remove. For professionals, however, the book no longer has the significance it may have had in 1932. Yet in some respects the significance remains.

"For the architect there are two programmes . . . the factual architectural problem which he is called upon to solve . . . his own aspirations and the nature of his architectural performance . . . Some architects are fully content with adequate performance . . . Others suffer from a divine discontent with their powers of design and execution . . . Architects of this category know instinctively that there can be a perfection in architecture that is nowadays extraordinarily elusive, the sort of perfection which pervades the architecture of the Parthenon." Keeping one eye on perfection and another on everyday problems of design and execution, Robertson manages, without sounding ridiculous, to get around to bread-and-butter matters: weathering of materials, the uses of cornices, or a handy list of "simple things often forgotten," such as access to valves in bathrooms or "a tap where a bucket can be filled."

A certain picture of the architect

(Continued on page 172)

(Continued from page 171)

emerges. "The modern architect must develop a tripartite individuality designer, technician, man of business. The designer's sensitivity, imagination, and inventiveness must enable him to play the entire gamut of feeling: The theatre auditorium, the hotel lounge, the showroom, the exhibition hall, the rooms in a private house should all be permeated by a single idea. It may be one of form, elegant, subtle, or emphatic. It may be one of conveying gentleness and calm, and the spirit of meditation. It may be one of light and transparency; it may be one of suggesting gracious culture; it may be one of intellectual scholarship."

One gains the impression that it is this side of the architect that Robertson, trained in the Beaux-Arts tradition, sees as paramount, since the engineering tasks may to some extent be delegated to others by the architect-administrator. "Character in architecture—and consequently expression—does not . . . principally derive from structural logic, from technical ability, from intellectual research into cause and effect, but from the creative gift of the architect in communicating his problem in terms not only understandable but interesting."

The third member of the triumvirate is the man of business. His duties include relations with the client, whose needs are the starting point—the human variable that calls forth the resources of the designer. "It is difficult to consider interior decoration from the standpoint of logic alone . . . a great deal depends on what is required from decoration, on whether the demand is for an expression of present day life . . . or for a piece of purely scenic decor which will create—as in the theatre—an atmosphere of illusion."

As one might expect Robertson's approach to detailing is relaxed. "The vocabulary of fresh effects is becoming very restricted and there is little left beyond clean and well proportioned austerity." For examples of detailing or enrichment properly exploiting the nature of materials, he sends his student to the Greeks, Persians, Mayans, Byzantines, to Frank Lloyd Wright and Mies van der Rohe. Like many other Englishmen, he deplores the absence of color in today's buildings, and cites the neglected possibilities of wrought iron, of signs, of lettering, of the heraldic shield of color, of built-in lighting, of imaginative street furniture.

It must now be clear that Robertson is to be placed in the "soft" rather than the "hard" school of modernism, and that his present outlook corresponds roughly to what has been called the New Empiricism. Good tempered throughout, he reserves his disdain for shams, fakes, and show-offs. "An assemblage of tricks, divorced from a background of reason and sincer-

(Continued on page 176)

reviews

(Continued from page 172)

ity presents one of the most unpleasant spectacles that the field of decorative art can offer."

One special use for *Modern Architectural Design* does suggest itself. At the low price for which it sells, could not the practitioner put a copy in the hands of each prospective client, initiating him to the possibilities of architecture and to something of the problems and importance of the architect. MARTIN JAMES

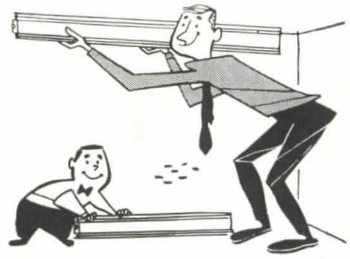
apparent—genius

Le Corbusier 1946-52 (Vol. 5). *Published by Boesiger in the Editions Girsberger, Zurich, Switzerland. Am. agent: Wittenborn & Co., New York, N.Y.*

This, the fifth volume on the work of Le Corbusier, is difficult to evaluate because never before has the dualistic, one is tempted to say schizophrenic, nature of his genius been so apparent. As in the case of his great antagonist, Wright, every enthusiastic acclaim echoes a great "but," and every objection is answered by a fervent "yet."

The present volume starts with a series of town-planning schemes: Saint-Dié, Bogota, Marseilles-Sud, Strassbourg, which—together with the earlier designs for La Ville Radieuse, Algiers, and others —are appalling in their uniformity. In spite of profuse lip service to "the site," identical skyscrapers in identical positions are linked by identical "free-form" green patches. This is a formula for living, indistinguishable from a party platform, that doesn't give a damn about differences in social tradition, ethnology, or geographic location. *Yet* at the end of this long line stands Chandigarh, the new capital of the Punjab. If one is to believe sketches and descriptions in the book, here Le Corbusier has finally succeeded in fusing his individual vision with all the demands of local tradition, climate, available materials and skills, and future political purpose. Without falling into the Mexican fallacy of superimposed ar-

(Continued on page 178)



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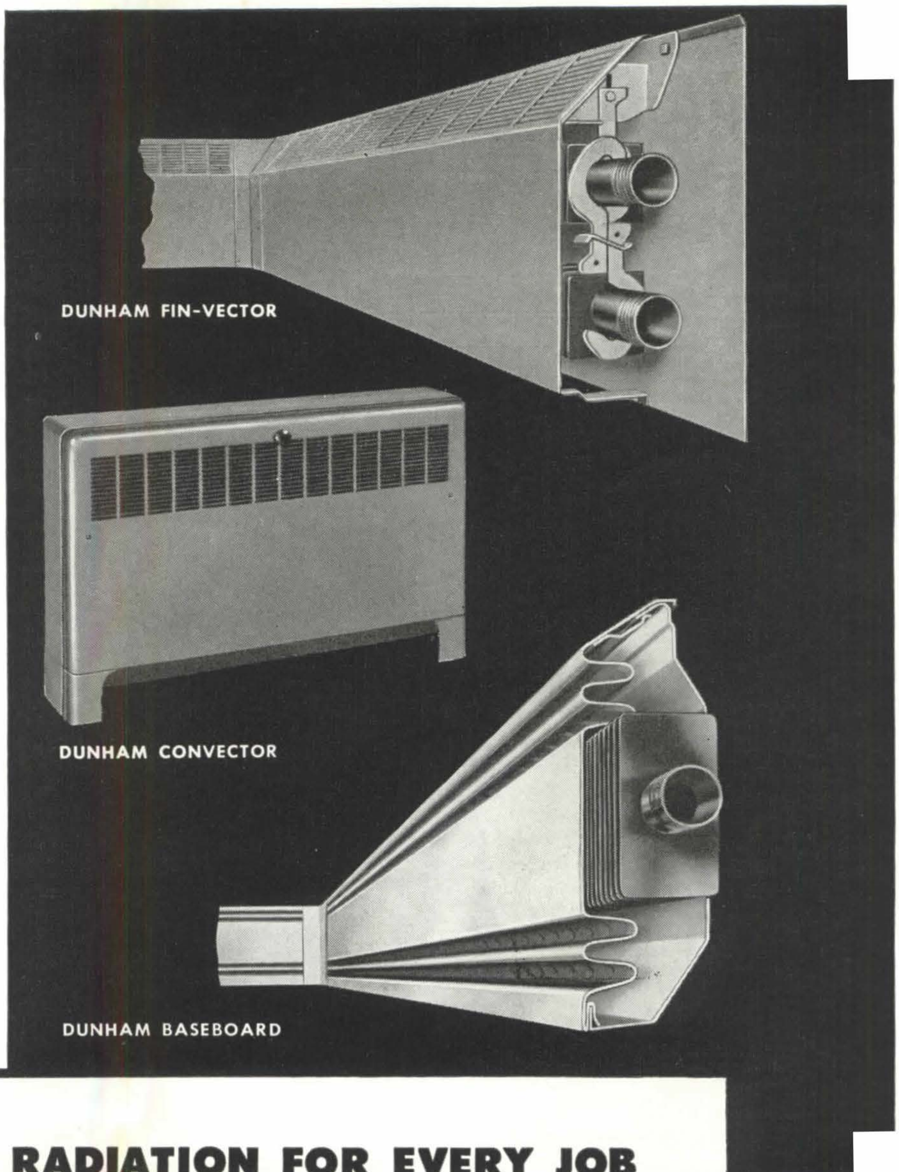

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reviews

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chaism, the buildings at Chandigarh seem uniquely Indian and yet uniquely of this century.

Why is it, then, that Le Corbusier's multiple dwellings, designed for his native Europe, arouse so much protest, even in those who agree that vertical density is preferable to horizontal spread in modern cities? We should be grateful for any honest and persistent attempt to see in a skyscraper more than a quick investment return. Perhaps we feel the ideological strait jacket in Le Corbusier's concept, even before we have read that "the population is divided into categories: A, B1, B2, C, resulting in x inhabitants to the acre. . . . 1. Living, 2. Working, 3. Cultivating the body and spirit, 4. Circulating: this order and hierarchy have brought, since the CIAM Congress of Athens in 1933, clarity and classification into town planning." And woe to the individualist who can't keep his disciplines apart, who works while circulating, cultivates body and spirit by merely living, and insists on a two-bedroom apartment without a legalized contribution to the propagation of the race! Like all reformers, Le Corbusier proceeds from the premise that man is a rational as well as a submissive animal, who will accept sound living by decree. Fortunately or unfortunately, however, no amount of dogmatic double talk can sell the preposterous assumption that with these 25,000 people-units, "things are once more to the human scale, nature is once more taken into consideration and men are established in natural surroundings. The machine is benefactor, producer, and creator of abundance. The planner will set out at considered distances vertical villages. Cars will arrive by roads which are specially reserved for them, while on their own roads pedestrians will once more people the friendly grounds. *And the Body and Spirit Will Open Like Flowers in the Sunlight, Space and Verdures.*" (italics ours)

With the romantic optimism of a dreamer, Le Corbusier asserts that several thousand families, living in vertical

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reviews

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"villages," will respect his precarious green spots and will not annihilate every blade of grass in a matter of hours; that in spite of the relentless proximity of man to man, with wafer-thin partition walls separating acres of bedrooms, and a continuous "Rue Interieur" passing every door, privacy and rest will be guaranteed by noiseless and time-regulated conduct; that the shops, schools, theaters, cafes, and gymnasiums of the self-sufficient Unites d'Habitation will uproot that urge to escape into anonymity and varying sensations which has distinguished the town dweller from the villager since the days of Ur; and—most of all—that pedestrians and motorists are a different breed, operating in unrelated orbits, assured that the one will never dash across the speedway where he is not supposed to cross, and that the other will never park where the flow of "continuous traffic" will be obstructed. In his younger days, Le Corbusier found solutions for city dwellings that corresponded to the planned economy concepts of those hopeful old days. The twin houses of the Weissenhof Siedlung in Stuttgart (1927), the Clarté Apartments in Geneva (1928), and the six-story apartment house in Boulogne (1932), were superb realizations, compared to which the recent European skyscraper plans are a regression.

Yet the development of architectural form in Le Corbusier's most recent buildings is a victorious story of continuous progress. His handling of form elements has reached a point of highest perfection. Here, and here alone, lies the salvation of style development. The road forward, instead of backward into an arid abstract academism, was blasted by Le Corbusier's structural-form language. It does not matter whether the multiple shapes given to concrete stairs, balconies, balustres, sun-breakers, towers, satisfy our individual taste. There will be many objections to the drooping and inconclusive shape of the misbegotten chapel at Rochamp, or the clumsy Open Hand at Chandigarh, which is a curious self-plagiarism from a proposed monument for Vaillant Cou-

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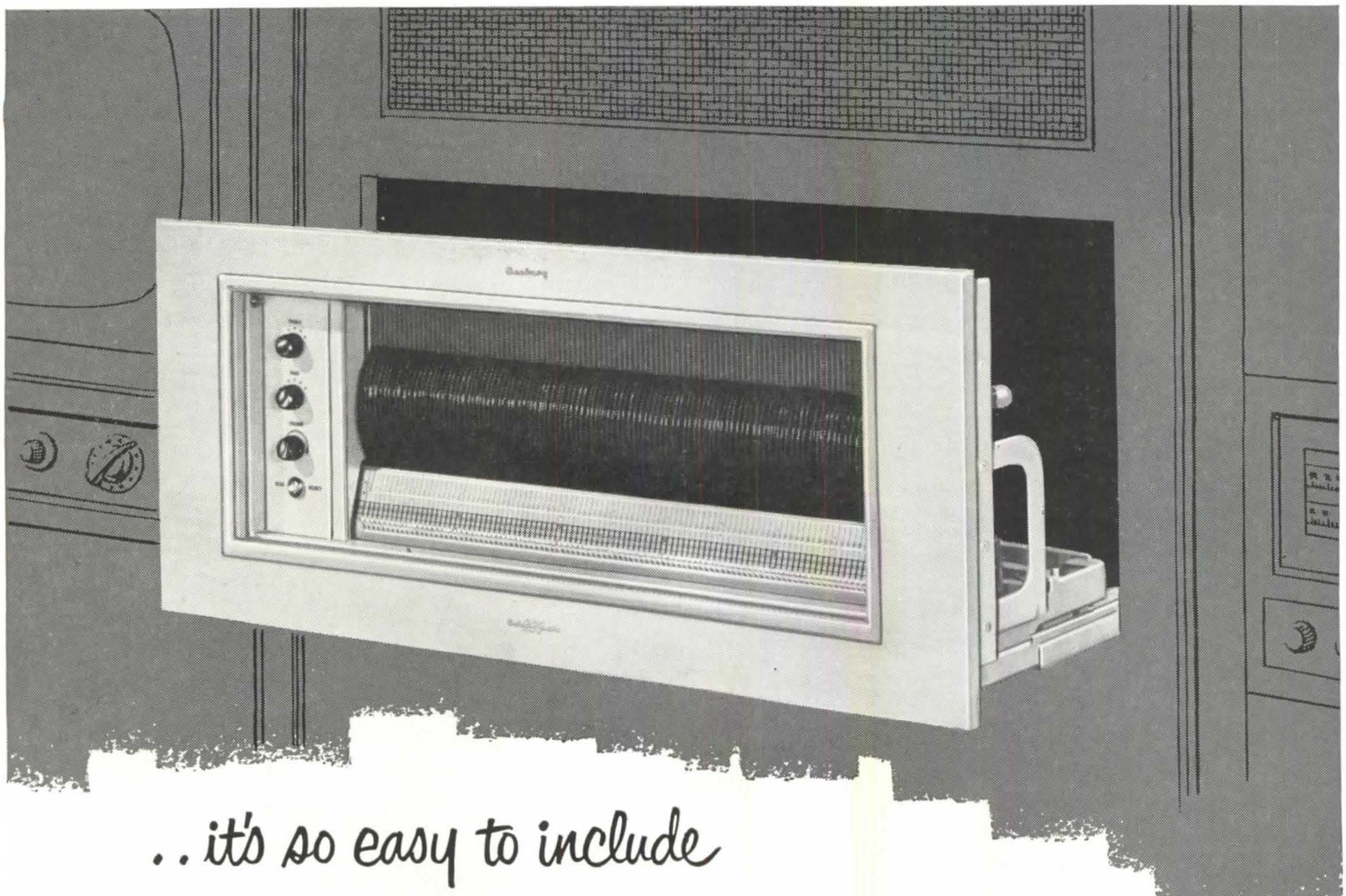

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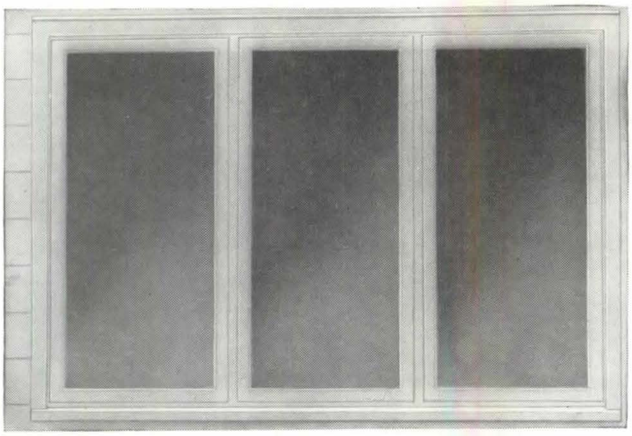

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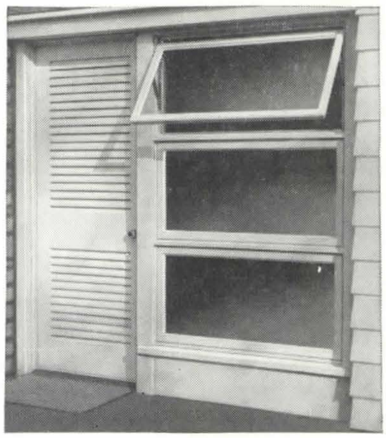

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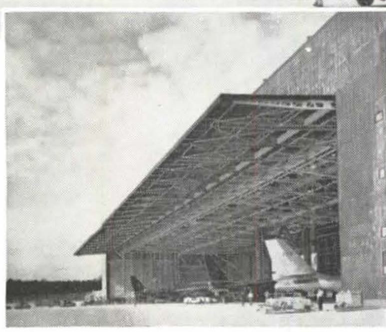

reviews

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turier, designed by Le Corbusier in 1939. The impact of a great creative genius remains, who has the rare gift of projecting sculpture and painting into architecture. It seems as if he had reached out and shaped each element with his own hand, so direct and immediate is the imprint of the artist. The Abracadabra of "Le Modulor," unwarrantedly claiming originality for an architectural convenience that started with Ictinus and ruled the Renaissance, becomes inaudible before the one forward-driving force: the integration of form and structure, of material and idea—the way only a Gothic master builder could make the stone of a buttress or a vault sing.

But where is the interior counter-point; where is the one great factor that distinguishes architecture from sculpture: the negative volume of the enclosed space, that is to receive and nourish human life? The apartment plans, presented in this book, show a deadly repetition of cubicles, rectangular, narrow, and of windowless depth. Cell block after cell block, these partitions stretch from Baume, to Strassbourg, to Nantes, to Marseilles, with each piece of furniture rooted to its prescribed spot by spatial confinement. Le Corbusier's plans are nightmares of regimented living that would have delighted Piranesi.

Perhaps it is the mark of a great teacher that he inspires through the sum total of his genius: both the good and the evil sides. The great art of Le Corbusier's architectural-form language establishes the first genuine integration of all visual elements. Here he is master and prophet. And his failure as provider of a truly human habitation could point the way toward a re-evaluation of the individual, as the beneficiary and not the victim of city dwellings. This fifth volume of Le Corbusier's work makes it quite clear that it is on his shoulders, more than on those of any other contemporary architect, that the next generation of builders will stand, reaching for the final synthesis of sculptured architectural form in concrete, with imaginative liberated architectural space. SIBYL MOHOLY-NAGY

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reviews

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meat of experience

Formes, Composition et Lois D'Harmonie. *André Lurçat. Editions Vincent, Freal & Cie, 4 Rue des Beaux-Arts, Paris, France, 1953. 362 pp., illus., 3300 fr. (paper-bound, 2600 fr.)*

This is the first volume of a projected five-volume work on architectural esthetics by one of the most distinguished French architects and city planners. Lurçat finds that modern architecture,

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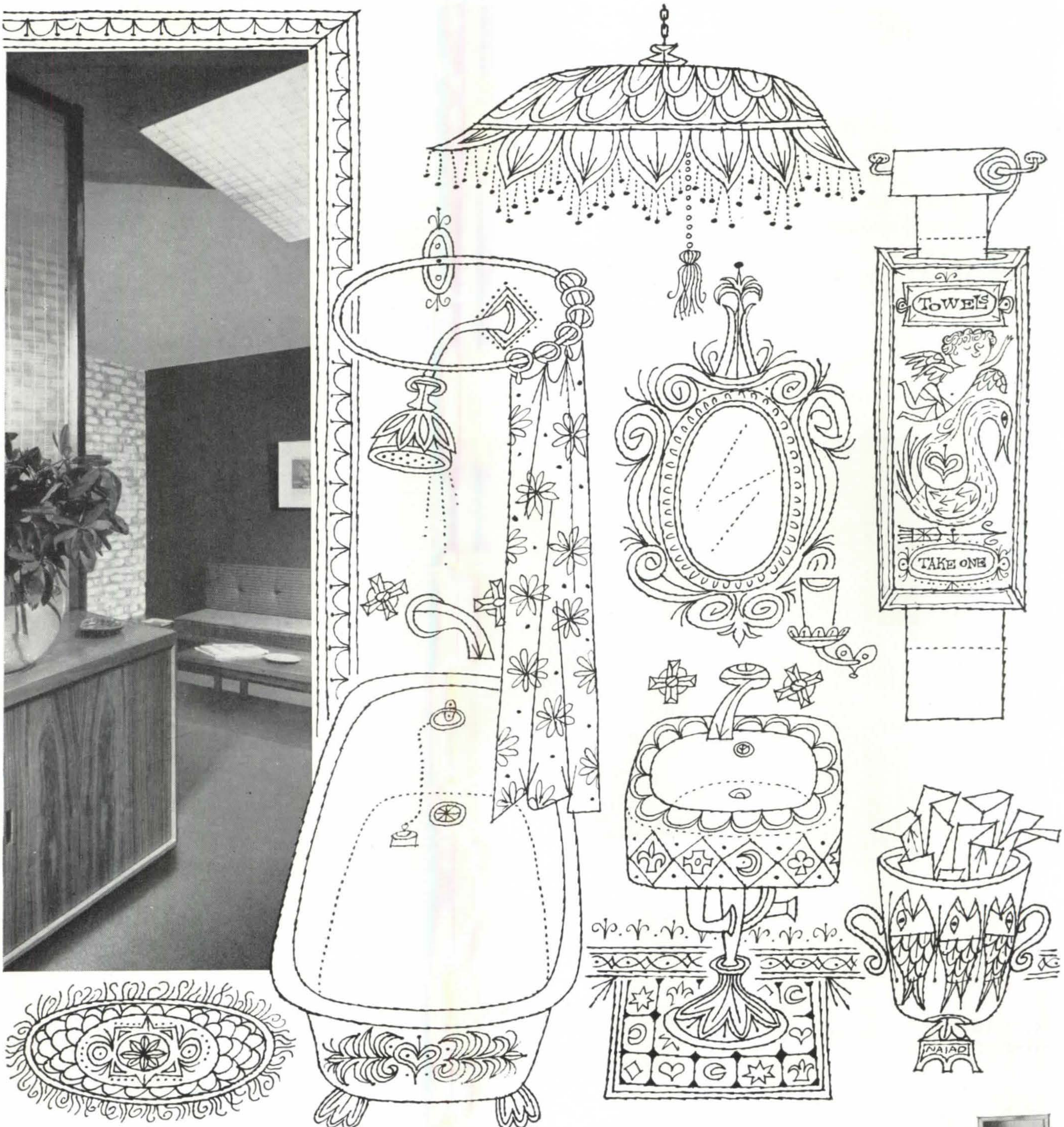
TOWELS
TAKE ONE
NAIAD

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cut off from tradition, exhibits a general uniformity of plastic solutions and a marked tendency toward formalism. Readers who share his conviction that architectural history can contribute to the enrichment of contemporary architecture will be interested in Lurçat's determination to crack the nut and extract the meat of past experience.

He begins with the exacting requirement that a study of architectural esthetics includes the whole wide range of factors which influence composition; culture and program, climate and geography, building materials and structural techniques, etc. The exclusion of any of these contributing factors can lead to a misunderstanding of the composition and a spurious conclusion. He rejects absolute values of esthetic judgment and proposes a "science of architectural esthetics" based on an objective evaluation of the forces which originally shaped the composition and the experience which it affords the living observer.

The chapters which follow the introductory statement of the author's objectives deal with general esthetic problems and conclusions drawn from examples (which are amply illustrated by photographs and drawings). Eight examples, for instance, are employed to demonstrate the relationship between Form and Content and include the Parthenon, a depot for locomotives, Manhattan Island, and the Temple of Horus at Edfu. Similar series of compositions are examined to reveal the influence of materials and structural systems, social conditions, the development of architectural ideas in time, and a cyclical theory of architectural evolution with illustrations of primitive, classical, baroque, and academic phases. The work closes with a "guided tour" of four important compositions and an analysis of the means employed in each composition. In these analyses, Lurçat is an interesting and inquisitive critic of architecture, whose observations throughout are acute and penetrating.

It must be observed, however, that his initial volume falls far short of the goal of objectivity and completeness which he has set for himself and holds little promise of "a science of architectural esthetics."

HEATH LICKLIDER

notice

exhibition

Pre-Columbian treasures of gold and silver, intricately woven tapestries, delicately painted paper-thin ceramics, and monumental stone carvings from South America will be on view through March 21 at the Museum of Modern Art, 11 W. 53 St., New York, N.Y., in the exhibition ANCIENT ARTS OF THE ANDES, installed by Rene d'Harnoncourt, Director of the Museum, who is an outstanding authority on primitive art and its relation to the art of our time.

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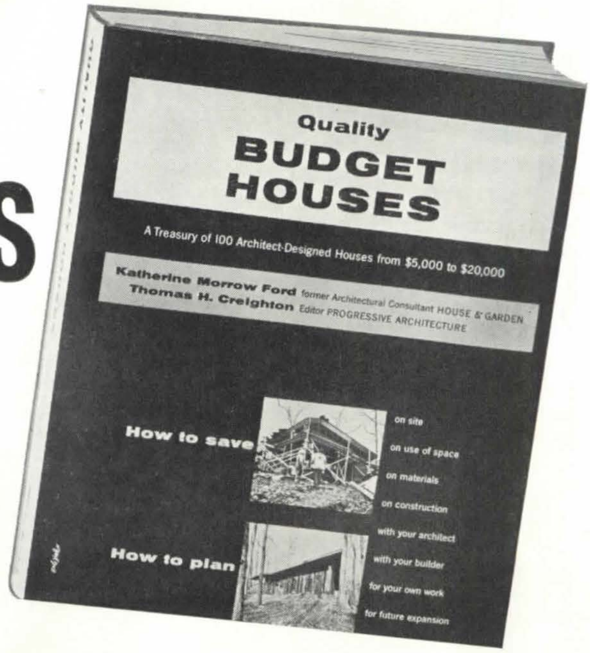

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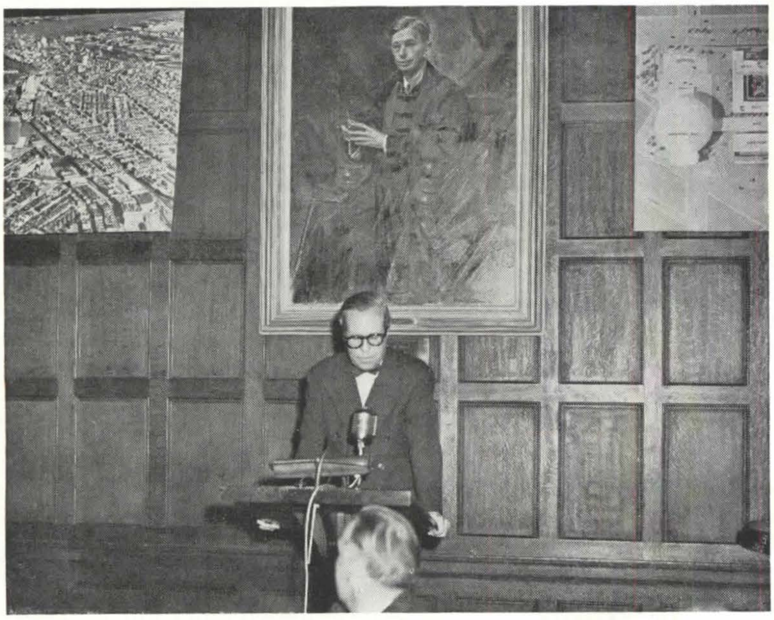
For Boston architects this is a big year. In a few months, the AIA Convention will take place in that cosmopolitan city, seat of practice for Gropius as well as Bulfinch, proud not only of its Coolidges, Lowells, Cabots, and Conants but also of its Belluschis and its Serts. As a foretaste of the influx of distinguished outsiders, P/A held its Awards presentation dinner there, late in January, with the Massachusetts State Association of Architects and the Boston Society of Architects acting as cosponsors and hosts. Jim Lawrence and Isidor Richmond, respective presidents of those two societies, started things off beautifully at the overflow occasion in the Boston Harvard Club; your Editor took over for the actual presentations; George Howe, internationally famous as author of "It Was a Great Symposium," spoke for the Jury. José Luis Sert, Dean of Harvard's Graduate School of Design, gave the principal talk, much to the point, on replanning hearts of cities.

Naturally, much of the evening centered around the Boston Back Bay Center project, a large, handsome model of which was displayed in the main dining room—since this was the First Design Award winner. Boston papers were full of it—a special supplement of the *Boston Herald* was devoted to the project that Sunday. All of its associated architects were there to hear the good things that were said about it, except for Walter Gropius of the TAC group, who was in Brazil receiving the São Paulo Award. (That world-traveling Award collector dropped me a note from the Brazil leg of his first South American trip to say, "You *must* visit here. Extent and scale of contemporary work dwarfs anything in the States.")



The Editor contemplates with interest the manner in which the Former President of Harvard (James Conant) is framed by the New Dean (José Luis Sert) and two illustrations of Progressive Architecture.

It was most impressive and gratifying to me, however, to greet the Award and Citation winners who had come from distant points. Graciously they accepted the fact that New England had been top regional winner in this Award Program—not only the First Award, but 10 out of 55 Total Awards and Citations—and that it was logical to hold the dinner there. I imagine Bob Anshen, of San Francisco, was from the most distant point, but Eino Arthur Jyring was there from Minnesota; Dick Aeck, James Wilkinson, and Joe Amisano of Toombs & Company, all came up from Atlanta; Moreland Smith traveled from Alabama; and Harry Tour, representing TVA, from Tennessee. Quite a delegation from the South! There came also Bill Metcalf, formerly of Sherlock, Smith & Adams's office in Montgomery, who has since become a second lieutenant in the Army Air Force, and who was released and authorized by his superior officers to travel to Boston from Dallas, Texas, to share the honor he had helped bring his former associates. Charlie Burchard, who had been teaching at Harvard until he went out to Ohio as Architectural Director of A. M. Kinney, Inc., came back for the occasion. Jim Mitchell and Dahl Ritchey were up from Pittsburgh; Emil Schmidlin from New Jersey. From Philadelphia a delegation arrived consisting of Vincent Kling, and young Jack Thalheimer (and his charming fiancee). From Chicago came Bertrand Goldberg. New York sent some distinguished winners: Abe Geller, Barney Gruzen, Walter Kilham, an impressive pair of partners from Skidmore, Owings & Merrill's office—Bob Cutler and Gordon Bunschaft—Jedd Reisner, and Chester J. Wisniesky, associate of Lewis Davis. And from nearby New England points came Conrad Green from Rhode Island, and Eliot Noyes and Richard Butterfield from Connecticut. All together, I think there were close to 300 people there, and to repeat George Howe, It Was a Great Symposium.

It is not possible to report yet on the public relations impact of the total Award Program. That, of course, is one of its principal aims—to help, as much as possible, the realization of these honored projects. It is too soon after the event to have gathered the published news items, although I begin to hear of local coverage (Henry Hill writes, "Several friends have phoned to say that they see in the evening papers that I was in Boston.") ; we know that metropolitan papers such as the *New York Herald Tribune* gave it a play, and that *Business Week* carried a large spread. Excuse us for glowing momentarily, but we consider the PROGRESSIVE ARCHITECTURE Design Awards Program a great success in its first manifestation—judging it by the number and quality of entries submitted, selections of the Jury, the magazine issue it resulted in (January, of course), the Dinner, and the attendant publicity for the Cited architects.

•

If you're interested in architecture, you just can't get away from it. We recently took a much-needed short vacation, and decided on a Caribbean cruise. Just rest and sun and good food—no architectural visiting, no busman's holiday this time. So we found ourselves one afternoon talking architecture with Monsieur Beauchamps, architect of the Ibo Lele Hotel, high on the hills of Petionville, looking out over Port au Prince in Haiti; and we found ourselves having a delightful lunch at Ed Stone's El Panama Hotel in Panama City, and so on. The El Panama, incidentally, is all that I had expected and more. The over-all plan (with a few minor quibbles), the design *parti* (particularly the scale of the open balconies), and the successful combination of privacy and openness in the individual rooms all convinced me that this is *good* architecture.

Thomas H. Creighton