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From Maine to California, and from the far north in Canada to Mexico, you'll find new, modern industrial and commercial buildings sporting bright, attractive exteriors of Mahon Aluminum or Stainless Steel Curtain Walls. In a few short years, the trend has swung definitely to this economical, light weight curtain wall construction... one large manufacturer has built seven complete new plants—including powerhouses—with Mahon Insulated Metal Walls. Several others have built two or more plants employing the same construction. In the Public Service Field, thirty-five power and steam generating plants have been built with Mahon Insulated Metal Walls. This is truly nationwide acceptance. Every day, more and more architects are giving their clients the benefit of this modern wall construction. Before you plan your next building, investigate the savings in material and labor costs, and the cumulative savings deriving from reduced construction time, which is always a plus factor when buildings are enclosed with quickly erected insulated metal curtain walls. Mahon Insulated Metal Walls can be erected up to sixty feet in height without a horizontal joint—a feature of Mahon Walls which is extremely important in powerhouses, auditoriums and many other types of buildings where high expanses of unbroken wall surface are common. See Sweet's Files, or write for Catalog W-56.

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P/A Office Practice article on the legal aspects of the investigation into the causes of the collapse of concrete work in the New York Coliseum.

On rare occasions there is dramatically demonstrated the vital service which the architect renders. Such an occasion may advance the architect's cause with more effect and with more impact than carefully planned public relations programs, extensively financed and pursued.

Such a situation occurred on May 9, 1955, when the temporary structural support of the New York Coliseum collapsed, causing the death of one laborer and injuring more than fifty.

The investigation into the cause of the collapse by the District Attorney's office revealed the inadequacy of present Building Code Regulations and recommended a requirement that plans for temporary structures be drawn by a registered architect or engineer.

The District Attorney's inquiry showed that metal jacks resting on 4"x4" timbers were used to support the main floor where concrete was being poured. These timbers were braced horizontally, but there was little cross-bracing and no bracing at all on the jacks. In the opinion of the District Attorney's report, the temporary support was apparently designed only to sustain the dead load of reinforced concrete and collapsed under the thrust of pressures exerted by the activity of motorized buggies transporting cement, concrete-agitating machines, and other construction operations going on at the same time.

To pour the concrete, motorized buggies weighing about 3000 lb fully loaded were used to transport fresh concrete to the main floor. When dumped, the concrete was spread and vibrated by concrete-agitating machines. Just before the collapse, there were about eight such buggies transporting concrete, several of which might dump their contents at the same time. In addition, other construction work in various phases was being speeded in order to meet the schedule on the project's completion.

The District Attorney's report also found that the inspector assigned to the project by the Department of Housing & Buildings did not have an engineering background, but rather had been a bricklayer. It further reported that this inspector visited some 15 building sites each day in a wide city area and had last inspected the Coliseum site four days before the collapse.

The report concluded that the Contractors had not been guilty of criminal negligence. It found that the applicable New York City Building Code and Charter provisions did not afford adequate protection to workmen and the public, in certain respects. The New York City Building Code presently provides that, in the pouring of concrete, "forms shall be substantially and sufficiently tight to prevent leakage of water; and shall be properly braced or tied together so as to maintain position and insure safety to workmen and passersby." It was recommended that this be changed to require that an engineer or architect design the temporary structure and that the plans be filed with the Department of Housing & Buildings to insure compliance by the builder.

The New York City Charter requires that the Inspector of Carpentry & Masonry shall have at least five years' experience as a mason, carpenter, architect, or engineer, at salaries ranging from $4200 to $4800. The report called for the presence of a properly compensated engineer to inspect projects which involve great quantities of reinforced concrete.

Although revision of building codes will provide an added safeguard, such revision is a long process and one which rarely reaches every community. In the meanwhile, there would seem to be a professional obligation on the part of architects and engineers to try to prevent such costly losses of life and property as occurred in the collapse of the New York Coliseum. Such an obligation depends on whether it is enough for the architect simply to design the structure, or whether he should also have a professional concern for the construction hazards created.

If the architectural profession is properly concerned with these hazards, then perhaps the immediate solution is to insist on a clause in builders' contracts requiring the use of professional services on the design of temporary supports. Such a clause would be an excellent stop-gap measure until such time as building codes are revised. And, if such a clause becomes a widespread and standard provision, it may even obviate the need for revision of existing regulations.

What is even more important, is that the public be made aware that the architectural profession is deeply concerned with the essential problems involved and that it, as well as the New York District Attorney, is making, and will make, specific recommendations to the Legislature, to those concerned with the drawing of contracts, to contractors' groups—to all those involved. In this way, the public will know that design of construction, the problems of construction, and construction itself, are the concern of the architect.
Mills Movable Walls provide space control, insure efficiency at Firemen’s Mutual

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MILLS Movable METAL WALLS
Mechanical Engineering Critique  
by William J. McGuinness

P/A Office Practice column on mechanical and electrical design in architecture is devoted this month to the subject, Decentralized Heating.

The improved efficiency of small heating units and the new geometry of school planning have combined to challenge the superiority of a central-heating plant.

When Architects Ketchum, Ginà & Sharp received bids on the Julia Traphagen School in Waldwick, New Jersey, early this year, the estimated budget was exceeded by approximately 12 percent. The need to cut costs gave the designers the opportunity to test a new idea; they believed that a saving could be effected by eliminating the boiler house and central-heating plant and substituting, instead, a furnace in each of the 10 buildings.

The original scheme called for two oil-fired hot-water boilers (using No. 2 oil for fuel) and two circulators. Distribution of water would be accomplished by means of a reverse-return system having the two insulated pipes laid in trenches. At each two-room building, hot water would rise to a small “attic” above the common entry and toilet space. Through heat exchangers, warm air could be produced and, by means of a fan, circulated down to a perimeter warm-air system with registers below windows. Air flowing through grills in the classroom doors would return through one grill in the entry. Domestic hot water would be heated in the boiler house by coils connected to the boilers and distributed through a pattern of pipes similar to that of the heating system.

By decentralizing the system—the boiler house, the heating plant, mains, insulation, heat-transfer coils, a 7500-gal oil-storage tank, and the domestic hot-water generator with its distribution system, were all eliminated. This new scheme retains the perimeter air system but substitutes local, forced warm-air furnaces for the heat-transfer coils as well as the octopus of supply and return mains and boilers to serve them. Gas, which competes closely with No. 2 oil in operational cost, was chosen. It was the first time that the State of New Jersey Department of Education permitted its use in such close proximity to classrooms. (Authorities were convinced, after some study, that gas is quiet, clean, and safe.) Free maintenance of gas equipment by the utility company was an added inducement for its use as was the prospect of natural gas, in the future, to reduce fuel costs further. Attic heater rooms in each building remained the same size and retained the concrete-slab floors already planned. Because of the presence of a firing unit, the walls of these attic spaces were changed from stud and plywood to gypsum-block and plaster; steel-deck ceilings were surfaced with vermiculite plaster as an additional safety measure. Gas piping, plain steel pipe with a light water-resistant cover, was installed to serve all furnaces. A $60 electric, plug-in, hot-water generator supplies domestic hot water at each building.

The original bid for heating—including trenches—amounted to $82,000; the bid for the revised scheme was only $31,000—a saving of $51,000 plus additional savings on the contracts for electricity and plumbing. The elimination of 600 sq ft of boiler house and 400 sq ft of covered walk to serve it, also represented considerable economies, slightly mitigated by the cost of fire-protective construction at the individual heater rooms and the relocation in another building of a small custodial office, which had been planned for inclusion in the boiler house.

Nothing was lost in convenience or efficiency as a result of these changes and the final scheme has a number of interesting features that contribute to economy and to the effective control of environment. Electronic controls—considered sensitive, compact, and inexpensive—are used instead of pneumatic controls. Modulated air temperature is achieved by mixing air that flows through the heater with cooler return air that is by-passed around the heater. The legal ventilation requirement of 10 cfm of fresh air per student is met (each furnace fan can circulate three times this amount). During the heating season, even when outdoor air temperature is as low as 40°F, cooling is sometimes needed to relieve the heat gain from sun and occupants; this is done by the circulation of unheated room air to which varying amounts of cooler outdoor air are added. When the classroom temperature rises to a range of 72°F to 74°F, air is circulated with the legal minimum of 10 cfm of outdoor air per student. When room temperatures are between 74°F and 76°F, air is circulated with outdoor air varying in content from the legal minimum to 100 percent. Combustion air, fresh air, and flue gases travel a minimum distance because of the location of heater rooms directly below roofs. The perimeter-air duct is fed by only one radial duct because the engineer has found that slab temperatures seldom drop below 68°F in any case. A truly remarkable achievement is the fact that the ratio of teaching area to total building area is 68 percent; in conventional schools using central-heating systems, this ratio is sometimes as low as 50 percent.

David Tukey, of Ketchum, Ginà & Sharp’s office, was project architect on this school; Robert Hanle represented Tectonic Associates, the Consulting Engineers.
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The surfaces of ordinary iron have about 4 times the reflectivity against heat rays that the surfaces of asbestos, asphalt, paper, brick, plaster, wood and other ordinary building materials have. Brass, gold, silver and aluminum surfaces have about ten times the reflectivity against heat rays that these non-metallic materials have. Aluminum surfaces, for example, have a 97% reflectivity for radiation, whereas the surfaces of most building materials have a reflectivity of only 10%.

Radiation (heat rays) is responsible for about 65% to 80% of all heat flow sideways in building spaces; 55% to 75% upwards; and 93% downwards.

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*Patent applied for.

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Progressive Architecture
The Candidate-In-Training Log Book

P/A Office Practice article describing the Log Book system being tested by AIA as part of a candidate-in-training program.

The relationship of a practicing architect, or an architectural firm, to the employees in the office is most important in the growth of a profession. For this reason the "gap" between architectural education and registration to practice architecture has been a troublesome one — to both employer and employee. The most complete study yet made of this relationship* prefaces its recommendations with this comment:

"For nine out of ten practitioners the practice of architecture involves the assembly of a staff of assistants to aid him in producing the professional services desired by the community he serves ... as in all enterprises which utilize the co-operative efforts of many individuals, the act of employing is inevitably linked in large degree with the provision of in-service training. . . .

"Thus the enlightened architect cannot conduct his office— even if he wished — solely for personal convenience or profit. Indeed, if, as an employer, he neglects to cultivate a concern for his employees' maximum growth in competence, he loses the most potent possible appeal for their maximum effort, loyalty, and personal interest in his own work. Without such motivation the best-intentioned staff suffers low morale and rarely achieves the quality of performance for which the employer himself should strive."

For some time, the Education Committee of AIA has been working on the production of a Log Book which might be the key to a carefully considered, tried, and generally approved program of candidate-in-training for architecture. The Institute's Department of Education and Research and the Committee on Chapter Affairs assisted and advised. In tentative form, the Log Book has now been produced, and during the Fall months was tested in several regions. Log Books were sent to last June's graduates of Architectural schools in New York, Alabama, Colorado, and Oregon for a "pilot run," with the aid of local Chapters and State organizations of the AIA. The test has the wholehearted support and good wishes of the Association of Col-

[Note: The rest of the text is not fully visible in the image.]
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New Service To Home Builders

P/A Office Practice article reporting a new approach to architectural design and supervision of operative builder developments.

Although there has been much improvement in the relations of home builders and architects in recent years, and a consequent raising of design standards in some parts of this field, the architectural profession generally finds it difficult to establish a professional, rewarding working basis with the home builder. Top firms who would like to do more of this work (recognizing the responsibility of the profession to improve design of the total environment) describe the difficulties as: desire by most builders for incomplete services; inability to enforce specification standards; lack of control over site planning; interest of too many builders in flash sales appeal rather than solid values; transient nature of much of the home-building industry, implying inexperience not only in technology and planning, but in management, merchandising, and efficient business operation as well.

The responsible architect, in other words, has such a concern with the end product of his services that he cannot afford to lose control over the implementation of those services, nor can he afford (for his peace of mind and his future reputation) to deal with a client who in any way lacks business competence or has less business responsibility than the architect himself.

A recently announced service for home builders, called ambitiously The Corporation of the Twentieth Century, indicates a new approach to the relationship which might point to a solution of these problems. The essence of the idea is this: a team of experts, from management counsellors, merchandising specialists, and economic analysts to architects, planners, landscapers, and engineers, will provide a "packaged service" for a home builder at a fixed charge per house. The charge, of course, depends on the size of the project. The Corporation will serve only noncompeting builders.

The services offered begin with marketing research. Housing needs in the area, as well as psychological, emotional, and practical factors influencing the buying of homes will be studied. As the brochure of the new organization points out, other industries "can't afford to be without" this sort of market research data. Except on a very sketchy basis, or in academic sociological terms, it has not been available to the merchant home builder. Hal Dunleavy, an expert in marketing research, will direct Twentieth Century's work in this field.

Next the organization offers advice in community and site planning. "Good planning in this phase of home building is relatively simple to achieve, and need not be done at the expense of efficient land use," the group points out. Here, Harold F. Wise, planner, and Edward Williams, of the landscape architectural firm of Eckbo, Royston & Williams, are the staff members in charge.

"Good architectural design is the single most important key to continuing success in home building," says the Corporation's literature. Architectural services are full: working drawings and specifications; "exclusive special design features for beauty and livability"; color planning; advice in materials and methods of construction; supervision. Making the point that the "I'm selling all I can build" attitude will soon be replaced by a "much more selective and competitive market," the Corporation of the Twentieth Century has a most impressive design team to offer the builder: Architect William Wilson Wurster, and his partner Donn Emmons; William A. Cyre, Lighting Expert; Don Knorr and Ann Knorr, Interior Designers; Matt Kahn, Industrial Designer; and C. W. Smith, for many years Director of the Division of Construction Technology of the Southwest Research Institute. George S. Nolte, Civil Engineer, is consultant.

Merchandising, including advertising, use of model homes, setting up a sales staff, and publicity and sales promotion, is next on the list of services. Two experts in this part of the business head the department. And finally advice and guidance on financing, FHA and VA commitments, and relations with planning commissions and other government agencies are included in the "package."

Management staff of the Corporation consists of James San Jule, builder and merchandiser; Delbert E. Becker, realtor; and Hal Dunleavy, research consultant.

This extremely impressive group, or "team" as they prefer to call themselves, would not be an easy one to duplicate in other parts of the country. And yet, it seems to the Editors of P/A, the idea behind the organization is such a sound one that it will inevitably be tried elsewhere, and architects, engineers, and planners who are concerned with this aspect of design may want to consider seriously the advantages of becoming part of—or even stimulating the formation of—such planning, design, and merchandising teams.

December 1955 11
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WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION
the "test edition"

Dear Editor: Your P.S. coverage of At Home With Architecture (October 1955 P/A, page 244) was almost as baffling as it was, on the whole, uncompromising. However, I do thank you for calling the first part (Kindergarten—2nd Grade) "excellent"; for your comment on the handling of the 5th and 6th school years as done "sensibly"; and labeling the entire book as "a good try." I am also happy to see you agree that the photokit that accompanied the manual is "a good selection."

On October 28, 1954, at a meeting of the National Public Relations Committee at the Octagon in Washington, D. C., you, as an advisory member of this Committee, were present when fourth-draft copies of the teachers' manual were distributed. At that time it was made clear that I, as Account Executive, Ketchum, Inc., was writing the manual with the aid of educators, the Public Relations Committee, and subject to review by the Subcommittee on Education. Since you had the opportunity at that time of reading and commenting on the manual and knowing that I was responsible for it, that seemed an appropriate time to comment on the handling of the 5th and 6th school-year level. In your critique of the manual:

1. The plan must be simple enough for a fifth-sixth school-age child to understand; simple enough that a teacher can draw the illustration on the blackboard.

2. The plan must conform to the floor plan used in theJones Family home included in manual copy.

3. The plan must take into account some earlier conversations with educators who were somewhat fearful that the home and plans included in this manual would be too grandiose and make the lower income bracket child feel inferior.

I agree with you most heartily on one point and I am joined in that agreement by George Bain Cummings, President of AIA, and John Wellborn Root, Chairman of the Public Relations Committee. This involves the floor plan used in the 5th and 6th school-year level. In fact, in a letter to Mr. Cummings back on August 17th I explained: "The artist had three things to consider before turning this (plan) out: "1. The plan must be simple enough for a fifth-sixth school-age child to understand; simple enough that a teacher can draw the illustration on the blackboard.

2. The plan must conform to the cover picture and illustrations of 'on the job progress' plus descriptions of the Jones Family home included in manual copy.

3. The plan must take into account some earlier conversations with educators who were somewhat fearful that the home and plans used to illustrate this manual would be too grandiose and make the lower income bracket child feel inferior.

(Continued on page 14)
“Frankly, I am not wholly in agreement as to what the artist came up with in this particular plan, but it did answer fairly well the three requirements mentioned above.”

I repeat, this is a test but even so, at this stage on September 28th, a telegram from our Texas testing area included this bright phrase... “Reception wonderful.” In fact, this has been somewhat the general consensus of educators and architects, who have seen the manual. There have been many expressions citing a real need for such a book. The main criticism was, “Why hasn’t one of these been published before?” or “Why not one for the upper grades beyond ninth?”

Although there are return test-questionnaires out to the 3000 teachers who will receive this manual, and even though the University of Texas is running an evaluation measure on it, we would welcome your specific revisions to At Home With Architecture. As you pointed out yourself, “...it’s only through incomplete first attempts that a fully satisfactory answer will be found to this important business of getting people concerned about good design.”

ANSON B. CAMPBELL
Ketchum, Inc.
Pittsburgh, Pa.

difference noted!

Dear Editor: In October 1955 P/A (page 141) you have an article about “banks.” I presume Louise Sloane wrote your article on bank interiors.

We would like to call your attention to the fact that your magazine does not recognize the difference between banks and savings and loans or building and loans.

It is not proper to use the word “Banks” when you are really talking about savings and loans or building and loans. A savings and loan or a building and loan is not a bank. They do not accept deposits. The law clearly states they are not allowed to use the word “deposits” in their advertising or in any other manner. In a few rare cases in the United States, building and loans and savings and loans are chartered to receive deposits but 99 percent of them do not accept deposits.

The money that you invest in a building and loan or savings and loan is an investment, not a deposit. This means that you have purchased stock and you cannot get your money back on demand if they do not wish to pay it to you. They do not have deposit insurance because they do not have deposits.

They have their own insurance fund which provides for the eventual safety up to the amount of the in-
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Bank deposit insurance means you will get your money right away. We have to point out this difference because in many cases the building and loans and savings and loans use unfair advertising methods and get unfair publicity by making use of the word "deposit" and the people who are investing their money in them think they are making deposits when they are not.

On page 141 of your October 1955 issue and in the next few pages you refer to the Western Savings & Loan Association as a bank, and refer in it to their teller's cage for personal contact with depositors. Unless the Western Savings & Loan Association is chartered as a bank to receive deposits, the statements are incorrect.

Therefore, in your articles and statements on banks you should clearly separate them from building and loans and refer to them in their proper classification.

You may verify these statements by checking with the Financial Public Relations Association headquarters in Chicago.

RUSSELL B. STEWART
Yellow Springs, Ohio

notations

appointments

PRATT INSTITUTE School of Architecture announces appointment of IRVING Mogensen as graduate assistant. Appointment was based on an international competition.

UNIVERSITY OF ILLINOIS, Urbana, Ill., announces the following appointments in the Department of Architecture: HAROLD J. HORNEBAY, Associate Professor of Architecture; NORMAN D. TAYLOR, Instructor in Architecture; JAMES E. MACKNEY, Assistant in Architecture; NORMAN H. MEYER, Assistant in Architecture.

BOYD M. SMITH has been appointed to the newly created post of Associate Dean of the new School of Architecture and Design, YALE UNIVERSITY.

HOWARD J. SULLIVAN, New Haven, Conn., and WALTER R. FURY, Thompsonville, Conn., were recently appointed to CONNECTICUT ARCHITECTURAL EXAMINING BOARD. At the same time the following officers were elected: HAROLD H. DAVIS of New Haven, President; J. GERALD PHEL- AN, Bridgeport, Vice-President; and BRADFORD S. TILNEY, New Haven, Secretary.
ONLY GOLD SEAL GIVES YOU
THE RIGHT TILE FOR EVERY FLOOR on-grade...
EVEN OVER RADIANT HEATING!

Gold Seal Ranchtile® is an exclusive floor specially developed and proven for on-grade installations. A "basic" floor for use throughout on-grade homes... it's resilient, quiet, comfortable. Longer wearing Ranchtile is easier to clean and more soil-resistant than any other resilient tile. 15 textured patterns. 9" x 9" tile. Standard gauge.

Gold Seal Vinylbest Tile® is today's best all-purpose tile for on, above, below grade... over concrete or wood. As acid-alkali-resistant as true vinyl. As dirt-resistant as linoleum. As color-rich as rubber. As moisture-resistant as asphalt. Unique foam marbleization. 9" x 9" tiles. 19 patterns in \( \frac{3}{8} \)" gauge. 19 patterns in \( \frac{5}{16} \)" gauge.

Gold Seal VinylTile® so successfully resists acids, alkalis, and greases... it's started a trend to light, glamorous floor colors... exclusive Bermuda Hues. Also marbleized patterns. Matching Vinyl Inlaids for walls, counters. 9" x 9" tiles. Standard gauge.

Gold Seal Cork Tile®... a new, improved cork tile with superior soil-resistance. Better surface finish and color. Natural insulator. Adds an invaluable luxury-look to floors and walls. Packed all light or random... light-medium-dark. \( \frac{5}{8} \)" and \( \frac{3}{8} \)" gauges.

Gold Seal Asphalt Tile cuts initial costs. Moisture-resistant. Installs where grease is not a problem... on, above, below grade. 28 marbleized patterns. 9" x 9", 18" x 24", \( \frac{3}{4} " \) & \( \frac{5}{8} " \) gauges. 12 "Sequin" tile \( \frac{3}{4} " \).

For home or business... you get the finest choice of all in...

Inlaid Linoleum  •  Ranchtile®  •  Linoleum  •  Vinyl, Vinylbest, Rubber, Cork, and Asphalt Tiles  •  Congowall®  •  Enamel-Surface Wall Covering  •  VinylFlor  •  VinylTop

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CONGOLEUM-NAIRN INC., KEARNY, N. J.

*Install these products with amazing new Gold Seal "Three-Twenty" adhesive. Satisfaction guaranteed or your money back.

For further information, write Architects' Service Dept., Congoleum-Nairn Inc., Kearny, N. J.
New Dawn in
Building Techniques
with Permalite®

With the new values which Permalite brings to building materials — lighter weight, greater insulation, fire resistance, good acoustical properties — architects and engineers now have the materials to realize their proudest ideas for modern lightweight design in the buildings of tomorrow. For complete, accurate, authoritative information on the many applications of Permalite, please write us.
Why specify the average when quality steel doors cost no more?

Everything considered ... product, installation and maintenance ... Ceco Bonderized Hollow-Metal Doors are as economical as wood doors. In specifying any building product you must consider three costs—product cost, installation cost and maintenance cost. Saving on any of these can be significant, provided there is no sacrifice in design or functional performance. All this Ceco took into consideration in developing the Ceco Door-Frame-Hardware-Partition package. Machine production cuts product cost, making quality metal doors available within any budget. Next, there are savings in installation time because Ceco Hollow-Metal Doors and Frames are factory-mortised for attaching of hardware. And since Ceco Doors and Frames are bonderized for paint adherence, the finish wears longer, thus saving on maintenance. But equally important is the quality of Ceco Doors and Frames. Better engineering means a better operating door—silent... safe... rugged... non-combustible. So, if you want quality doors at no extra cost, specify Ceco's Door-Frame-Hardware-Partition package. You can be sure you will get the very finest products of their kind.
ii-TV is a dramatic new tool for America at work. For ii-TV—the GPL industrial and institutional closed-circuit television system—makes visual communication as simple as the telephone made verbal communication. From his own desk, a viewer can confer face to face with colleagues across the nation, study a production line in a factory, read a dial in an unattended substation, consult files deep in a sub-basement. One person can visually demonstrate a subject simultaneously to widely separated groups. Or he can keep a watchful eye on the gates and aisles of a huge warehouse. An engineer can look safely into the dangerous depths of a jet engine test cell or observe the workings of a whirling machine. GPL ii-TV makes all these things possible—and hundreds more besides.

But to the architect GPL ii-TV is much more than a tool. By removing the necessity for physical proximity of things which must be seen, ii-TV frees the architect from limitations that have existed since building began. Like the elevator and the telephone, ii-TV promises to be a catalyst that will materially change concepts of building design. New uses are turning up every day. Already a list of buildings where ii-TV has applications is practically a list of the places where people work: schools, hospitals, office buildings, factories, warehouses, department stores, prisons, power stations, laboratories, libraries, banks, supermarkets, railroad stations, airline terminals—everywhere that man wants to see something that is out of sight, or show something to a distant viewer, instantly and accurately.

Here is a double opportunity for the architect. Modern buildings need GPL ii-TV. By planning for it as an integral part of buildings on his boards, he can make sure that his clients will use it with maximum efficiency. At the same time it offers to the architect a new creative dimension. For with ii-TV he can rise above many of the physical limitations that have controlled building design since the days of pharaoh's palace and find new solutions to the eternal problem of all architecture—the arrangement of space in the service of man.

Our engineers will be glad to supply detailed information and to consult with you regarding inclusion of GPL ii-TV in your plans.
for America's Architecture

IN HOSPITALS and other institutions, GPL ii-TV enables nurses to watch individual patients and supervise whole wards. Guards can monitor gates, corridors and other key points.

IN LABORATORIES, mills, factories, GPL ii-TV permits economical monitoring of remote or dangerous processes. Above, observer follows operation within a test cell. Other uses include plant protection and instructing workers.

IN BANKS, offices, stores, GPL ii-TV permits highly efficient use of space by location of records off business floors and wherever maximum economy dictates. Above, a bank teller verifies customer's signature and balance.

IN SCHOOLS and colleges, with GPL ii-TV one teacher can reach many classes in many schools simultaneously. Above, over-life-size pictures are thrown on wide screen by GPL TV projector.

General Precision Laboratory Incorporated
Pleasantville, New York

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AIR DIFFUSERS with DIFFUSING VANES

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A good piece of equipment is no better than the experience behind it.

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It's the original square and rectangular outlet...not just a poor imitation without distinctive features.

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Your local AGITAIR representative will gladly assist you in selecting the proper size and air pattern to meet the requirements of your job. In addition, the engineering staff and laboratory resources of Air Devices Inc., are available to you.
Quadrangle with reflecting pool. Faculty building left facing south has blue porcelain enamel panels, clear glass and blue green fibre glass drapes. Chapel, in center, with plastic sky domes is connected by stained glass cloister to school building right. North exposure of the school has clear glass and gold colored fibre glass drapes.

Dramatic 70 ft. high cross at main entrance is stainless steel. Drapes behind clear glass windows are blue green fibre glass. Yellow terra cotta panels have religious insignia in black. Colors throughout the buildings including the gym are attractive.

POWERS
Automatic Temperature Control

Is Used Throughout this Colorful Modern School
for the Heating and Ventilating System, Hot Water Generator and Shower Baths

Utmost Fuel Economy, Thermal Comfort and Convenience are assured here with a Powers Control System. Users often report 25 to 50 years of reliable service with a minimum of repairs.

For more than 60 years the name POWERS has stood for quality temperature control, proper installation and SERVICE if required.

Next time a problem of temperature or humidity control arises call POWERS. No other single firm makes a better line of thermostatic controls for heating, air conditioning, hot water generators and all types of shower baths.

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Over 60 years of Automatic Temperature and Humidity Control
marble

is best for wainscot or walls in public spaces . . .

Writes Architect Charles H. McCauley: "We have used marble extensively in the design of our buildings. In public spaces it gives everything that is needed – beauty, lasting qualities, and low maintenance, and we find it can be used for a very small percentage of the total building cost.

"In the Birmingham City Hall marble was used in the areas frequented by the general public. These include such as main lobby, corridors, and elevator lobbies on each floor, court rooms, public spaces within departments and stairways, all for a cost less than 4% of the total cost of the building.

"We believe it would be difficult to secure a substitute equal to marble wainscot or walls in public spaces."

For more complete data on the basic economy of marble write Marble Institute.

Birmingham City Hall,
Birmingham, Alabama
Charles H. McCauley, Architect

MARBLE INSTITUTE OF AMERICA, INC.
108 FORSTER AVENUE, MOUNT VERNON, NEW YORK
Every sheet of Anaconda Roofing Copper is now marked in this way. The printing can withstand weathering for up to six months, but you can remove it easily when you are ready.

The American Brass Co., Waterbury 20, Conn.

This "hallmark" is your assurance of quality sheet copper—in the gage and temper you want for better sheet metal work use.

ANACONDA COPPER

December 1955
“Flexivent installation proved simple and time saving for school jobs”

says

Art Cummings,
Portland Contractor
700 Flexivent Window Units were specified for Elizabeth Hayhurst School in Portland, Oregon, by Dougan & Heims, architects. Builder Art Cummings reports, “We’re very much impressed by the ease of installation of Flexivents. It’s the most simple and time-saving of any installation we have made on a job of this type.”

Extreme versatility of Flexivents for school construction shows up in adaptability of grouping to style of building as well as in combination of fixed and ventilating sash to provide bright, airy classrooms with plenty of ventilation.

For information on the advantages of Andersen Flexivent Units for schools and commercial buildings you design, see Sweet’s Architectural Files or write Andersen for Detail Catalog or Tracing Detail File. WINDOWALLS are sold throughout the country including the Pacific Coast.

Flexible is the word for Flexivent.

Standard sash lock on bottom rail pulls sash securely shut, locks it firmly in place with no annoying rattle.

Roto Lock Operator (optional) works under screen with awning units. Dual arms pull both ends tight.

Special friction adjusters hold sash firmly in any open position, close tight against frame and weatherstrip.

Snap Lock is ideal for out-of-reach locations. Easily operated with any standard make window pole.

Exterior view shows 24-sash Flexivent groupings specified by Dougan & Heims for classrooms in Elizabeth Hayhurst School.
Under Toughest floor traffic and service conditions...

In this busy airline terminal, Johns-Manville Terraflex Tile retains its sparkling, look-like-new appearance in spite of day-in, day-out abuse... and meets stringent requirements for heavy-traffic service at the lowest possible cost.

Made of vinyl and asbestos, J-M Terraflex is exceptionally tough and resistant to wear... defies grease, oil, strong soaps and mild acids.

Terraflex can reduce maintenance costs one half. In actual use, tests showed Terraflex maintenance expense to be approximately 50% less than the next most economically maintained resilient flooring. Its nonporous surface requires no hard scrubbing... damp mopping usually keeps it clean and bright... frequent waxing is eliminated. Through years of economical service Terraflex pays for itself.

Available in a wide range of marbleized colors, J-M Terraflex vinyl-asbestos tile is ideal for restaurants, public areas, schools, hospitals... wherever reliable floor service, long-wearing beauty and long-time economy must be combined.

For complete information about Terraflex vinyl-asbestos floor tile, write Johns-Manville, Box 158, New York 16, N.Y.

See "Meet the Press" on NBC-TV, sponsored on alternate Sundays by Johns-Manville

More than a million people use the Miami Terminal of Eastern Air Lines each year. After several years of service, Terraflex has proved its durability... looks colorfully new... and has cut maintenance time and cost. Floor installed by Lotspeich Flooring Co.

provides beauty, color and wear with minimum care
SURE, it's beautiful to look at . . . in grain and figure, in warm, light, modern color. Glamorous rotary-cut Gold Coast Cherry is the new beauty star in flush doors.

More good news! Gold Coast Cherry cuts finishing costs: its beautiful color makes stain unnecessary — its smooth, close texture requires no filler.

Price? Actually lower than many domestic hardwoods!

That's Mengel rotary-cut Gold Coast Cherry — eye-appeal, buy-appeal — any way you look at it.

See for yourself: order an inspection lot from your distributor. Why not phone or write him . . . this very profitable minute?

Door Department, THE MENGEL CO., Louisville 1, Ky.
World's Largest Manufacturer of Hardwood Products
(Mengel Permanized Furniture, Doors, Kitchen Cabinets, Wall Closets)
Wisconsin School builds 5 modern

GILSULATE® for hot underground pipe insulation helps keep costs low

"The installation of this material is so simple that it is almost unbelievable."

E. F. Klingler & Associates, Eau Claire, Wis.

Recent surveys of schoolroom needs estimate construction costs at well over $30,000 per classroom, exclusive of land costs. Yet at Cadott School, Cadott, Wisconsin, E. F. Klingler & Associates successfully completed a modern 5-classroom addition for only a little over $54,000! Each classroom accommodates 30 pupils and measures 23' x 31' x 10'...

The outstanding design and construction features of this unique job are discussed in Weather Magic, a publication of The Trane Company, La Crosse, Wisconsin, (Vol. 18, No. 5, Jan. 1955). Here, from this article, is what E. F. Klingler & Associates say about the insulation used at Cadott School:

"The steam and return mains are standard black steel pipe, run about six inches outside the foundation lines of the building. These pipes are supported by laying them on short lengths of 11/4 inch pipe which were set into the foundation walls at right angles to the foundation, at elevations to get proper pitch to the lines. The insulation material used is a product of the American Gilsonite Company, and is an asphaltic ore marketed under the trade name of GILSULATE. The material resembles pulverized coal in appearance. The installation of this material is so simple that it is almost unbelievable. We merely backfilled the foundations with earth fill up to a point about four inches below the bottom surface of the steam-lines, poured in all the GILSULATE to a depth to afford four inches cover on all sides of the pipes, tamped it thoroughly, and covered it over with earth. At the highest point in the lines there are six inches of earth cover over the insulation and at the low point, about two feet. This material is completely impervious to water and is effective enough as an insulation so that at no time during the last winter was the heat loss great enough to melt the snow directly above the pipes, or for that matter, even thaw out the earth cover."

No other method for insulating and protecting hot underground pipes can match this performance—Triple-Zone GILSULATE shows the lowest installed cost providing efficiency and permanence.

Investigate the value of easily installed, low-cost GILSULATE. Use the coupon for complete information, or see your local GILSULATE distributor.
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1. Easy to use...just pour and tamp...pipe heat does the rest.
2. Forms 3 zones of protection against heat loss and all hazards commonly encountered by hot buried pipes.
3. Needs no housing or mechanical sheaths: no mixing, special handling or equipment.
4. Only needs normal pipe spacing: for multiple pipe or cramped conditions.
5. Three types available:
   Type A for 220°-310° F. temp. range
   Type B for 300°-385° F. temp. range
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ADDRESS
Modern Hospital Uses
JAMISON Stainless Clad Doors
for Sanitation Plus Beauty

Jamison Stainless Clad Doors maintain a tight seal on the deep freeze and on four separate rooms for meats, vegetables, dairy products, and garbage.

Architect: Charles H. McCauley, Birmingham, Alabama
Insulation Contractor: Armstrong Cork Company, Birmingham, Alabama

Druid City Hospital of Tuscaloosa, Alabama, combines sanitation and beauty by using five Jamison Stainless Clad Doors for refrigerated rooms in the Dietary Suite.

These doors are easy to clean... give lasting beauty... and withstand frequent washdowns. For additional information about Jamison Doors, consult your architect or write to JAMISON COLD STORAGE DOOR CO., HAGERSTOWN, MD.

More JAMISON Doors are used by more people than any other Cold Storage Door in the world.
New way to control Sun Glare—use daylight louver panels of PLEXIGLAS

Daylight Louver Panels, formed from PLEXIGLAS acrylic plastic, provide nearly optimum visual environment in daylighting systems. As shown in the cross-section drawing at the right, they combine opaque louver slats, light transmission and weather closure in one continuous surface. The design results in—

- Effective shielding from sun and sky glare.
- Improved distribution of daylight—an "indirect daylighting" system for evenly distributed diffused daylight.
- Reduction of solar heat gain inside buildings through reflection of a high proportion of direct sunlight striking the window area.

The daylight louver panel system is based on the formability, strength and weather-resistance of PLEXIGLAS, and was developed at the Daylighting Laboratory of Rohm & Haas Company. The names of suppliers of stock and custom-formed panels, and our new brochure—"Daylight Control with PLEXIGLAS"—containing data and recommendations on the use of daylight louver panels, are available on request.
Custom variety in pre-fab partitioning with "PERSPEC"

"PERSPEC", an entirely new idea in partitioning, consists of stock pre-fabricated steel frames, carrying electric wires and allowing complete freedom in the choice of colors, forms, textures and materials for panel inserts within the frames. Different heights, widths or a horizontal strip of brass positioned at the discretion of the user add to the possibilities. "PERSPEC" offers the architect or designer all the economy and efficiency of modern steel partitions, plus variety of effects.

Interior designed by Michael Saphier Associates, Inc. using "PERSPEC" with black recessed steel base at floor carrying electric wires; lower panels 3/16" steel with white factory finish; upper panels 3/16" milk translucent glass; horizontal brass strip.

Installation:
Conference room,
New York Convention and Visitors' Bureau,
42nd Street and
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A MODEL FOR EVERY TYPE OF DOOR IN ANY TYPE OF BUILDING

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Diagram shows how door is controlled as it opens. Accidental openings are eliminated... as are accidental hold-opens. The control also cushions the closing of door.

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POSITIVE CENTERING
BUILT-IN LEVELING DEVICE
NO ACCIDENTAL HOLD-OPEN
TWO SPEED CLOSING ACTION
PERMANENT HYDRAULIC OIL SEAL
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EASY INSTALLATION

Precision-built Dor-O-Matic door controls are at work in thousands of buildings from coast to coast... where they are providing more positive door closing action. There are twenty-five models in all. Each is designed for long service life under all conditions and complete adaptability to contemporary design and function. Only Dor-O-Matic provides all ten of the service advantages listed at left.

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Hidden Heat Blankets.

Room. American-Standard Baseboard Panels eliminate bulky radiators... don't steal valuable floor space. These compact heating panels hug the wall... project only a couple of inches into the room... and provide quality, even, clean heat. American Standard makes two types of baseboard panels: Heat (copper tubing with aluminum fins), and Radiantrim (a one-piece, cast iron finned unit).
NEW Merrilyn Counter Top Lavatory. This large 25" x 20" American-Standard lavatory is generous in size, easy to install and built to last. It's made of fine vitreous china for easy cleaning and lasting beauty... and it comes in all the popular American-Standard colors. Merrilyn is the latest addition to American-Standard's extensive line of counter top lavatories for use in homes, hotels, motels and institutions.

Compact Boilers with Large Output. American-Standard's new G-4 and G-6 Fired Boilers are of modern, compact design, with integral draft hoods and manifolds neatly enclosed in handsome, 20-gauge steel jackets. In spite of their compact construction, the boilers have high heating capacities. The G-4 is for large residences and small commercial buildings; the G-6 heats hotels, schools and apartment stores. Both boilers require no furnace headroom and are designed for low cost installation and operation.

Hang Your Heating On The Wall. Temtrim Finned Tube Radiation is low in cost, easy to install and allows great flexibility in layout. Temtrim is made of tough steel pressure tubing with steel fins. It can be hung on the wall at any level, from ceiling to floor, in single or multiple tiers. Temtrim is perfect for new buildings or in modernizing existing structures with two-pipe steam or hot water systems. Economical Temtrim heating, with fins exposed or with one of three attractive covers, can be installed in factories, gymnasiums and classrooms or office buildings.

These are just a few of the many plumbing, heating-cooling and kitchen products made by American-Standard Plumbing and Heating Division, American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Pennsylvania.
Modern design achieves beauty as well as utility with clean lines. The highly interesting patterns of today's wire glass, combined with positive strength and protection make it the ideal modern material. This rugged glass can be used in a variety of ways. On an inside stairway it creates a note of high drama as well as an arresting and effective safety barrier. Enclosing an outside fire stairwell, it guards against flame and accident. In building sidewall sash, it helps bottle up fire, aids in preventing costly conflagrations. Mississippi wire glass protects beautifully at minimum cost in vertical shafts, windows, doors and all other vulnerable locations where fire or breakage protection is desired.

Give your buildings beauty plus utility. Specify Mississippi Wire Glass, with either Misco or hexagonal wire netting. The original solid wire glass on which the Underwriters' Standard was based in 1899, it is the standard today by which all others are judged. Available in polished or obscure patterns through distributors of quality glass everywhere.

Write for free literature. Address Dept. 8.
The trend to clean, simple lines in modern school design points up the desirability of sound "skin" construction.

Fairmont High School was the first school in the Northwest to use this practical, economical construction method. Its aluminum curtain walls by Cupples employ vertical mullions, varied in size for design effect. Tubular weather-stripped windows are projected or fixed. Horizontal tubular sill finishes off the base. Composition panels, in slate gray or desert sand, make a durable inside wall for classrooms.

From skyscrapers to schools, Cupples is a pace-setter in "skin" development, fabrication and erection. Cupples, also, is one of the nation's largest manufacturers of commercial and residential aluminum windows, doors, Alumi-Coustic grid systems for suspended ceilings and special ornamental products. Our catalogs are filed in Sweet's.
By the makers of famous FOLDOOR—the one complete line of FABRIC-COVERED FOLDING DOORS

Specified by architects for finest homes, schools, churches, institutions
First door in the middle-price range to offer all 4 "plus features"
Choice of smart builders and home-makers in the lower-price field

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LUXTRROL brings to homes, for the very first time, light that is truly **controlled**. Light that glides from dark to bright, bright to dark, at the turn of a dial. Gone are old-fashioned "on-off" switches. Gone is "all-or-nothing" lighting.

In living room or TV room, bedroom or nursery, dining room, bar or den, LUXTRROL offers your prospects the perfect level of light for every occasion, every activity, every mood.

LUXTRROL is *not* a rheostat. Instead it is a soundly engineered autotransformer type unit. It has both fuse and thermal overload protection. It controls fluorescent and incandescent and cold-cathode lighting. It operates smoothly, silently, safely, is approved by Underwriters' Laboratories.

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New LUXTRROL Light Control requires no complex wiring, is as easy to install as an ordinary wallswitch!

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Emphasizing the enjoyment of The Fontainebleau's matchless splendor is a made-to-order indoor climate that's better than Nature's best! Ideal, perfectly regulated temperatures are constantly maintained throughout the entire building by a specially designed system of Johnson Automatic Temperature Control.

Highlights of this pace-setting control system include finger-tip selection of temperatures through Johnson Thermostats in each of The Fontainebleau's 565 guest rooms, all of which are equipped with Johnson-controlled air conditioning units.

The comfort requirements of the public areas are met with equal satisfaction by other Johnson thermostats, valves and related apparatus controlling 22 York “Recold” air conditioning units, ranging from 4.86 to 118.4 tons. These spaces vary in size from small shops to large dining rooms, cocktail lounges, the 17,000 sq. ft. Main Lobby and a Grand Ballroom accommodating 1,800 people.

With this Johnson-engineered Control System, The Fontainebleau enjoys not only the benefits of the finest in modern comfort control, but also is assured of the maximum return on every heating and cooling dollar spent.

The fact that The Fontainebleau—and the great majority of the nation's other better buildings—depend on Johnson Control is your assurance of its unmatched superiority. Johnson can provide the same high standards of comfort and economy for any building, small or large. An engineer from a nearby Johnson branch will gladly discuss your temperature control problems and give you his recommendations without obligation.

Johnson Service Company, 507-G East Michigan Street, Milwaukee 1, Wisconsin. Direct Branch Offices in Principal Cities.

Hotel Fontainebleau, Miami Beach. Morris Lapidus, architect, New York and Miami Beach; Sasnett & Bennett, mechanical engineers, Miami; B. A. Jacobi, air conditioning engineering advisor, New York; Taylor Construction Co., general contractor, Miami; Hill York Corp., air conditioning contractor, Miami.

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TEMPERATURE • AIR CONDITIONING
PLANNING • MANUFACTURING • INSTALLING • SINCE 1885
For America’s Finest Luxury Hotel . . .
Indoor Climate that’s Better than Nature’s Best!

Spacious size presents no comfort problem in The Fontainebleau’s impressive lobby or other public areas. Strategically located Johnson Thermostats insure refreshing, even temperatures regardless of the outdoor weather.

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the Fabulous Fontainebleau

Interesting Applications of JOHNSON CONTROL . . .

Room temperatures to suit the individual preference of guests are provided through Johnson T-432 Heating-Cooling Thermostats controlling Johnson Water Valves on room units. This sensitive, fast-acting thermostat permits occupants to enjoy ideal temperatures at all times—never feel a need for more or less heating and cooling. For complete description of operating features, write for Bulletin T-432.

Capacity control of the Fontainebleau’s seven refrigeration compressors is accomplished automatically by a Johnson Pneumatic Step Controller. The unit starts compressors in proper sequence to maintain the set chilled water temperature. A time delay assures the proper interval between successive switch operations on start-up or after current failure. Send for Bulletin G-180.

Air conditioning units in guest rooms are equipped with Johnson V-152 Water Valves to regulate the hot and chilled water supply. Designed especially for this type of application, this compact valve provides smooth, accurate response to the demands of the Room Thermostat. Features include V-ring self-sealing packing and molded rubber diaphragm. Write for Bulletin V-152.

Comfort control in some of the public areas is provided by the highly accurate Series T-800 Johnson Thermostats which sense the temperatures of the return air and maintain the temperature of the conditioned air at the proper level. Series T-800 Thermostats are available in a variety of models and are adaptable to many applications. Send for Bulletin T-800.
These buildings and hundreds like them cost less, less maintenance because they are constructed
were erected faster, occupied earlier, and require largely of Alcoa® Aluminum

Your Guide to Aluminum Value

Tune in "Alcoa Hour" NBC-TV Sunday evening — check your newspaper for time and channel

Details of these and other buildings where architects have exploited the outstanding advantages of aluminum are available on request. Write for your copy of Alcoa Architectural Achievements and see how aluminum has progressed from ornamentation and minor applications to its full stature as a primary structural material. Alcoa Company of America, 1890-M Alcoa Bldg., Pittsburgh 19, Pa.
ARCHITECT:
Frank Lloyd Wright,
Taliesin West, Arizona

CONTRACTORS:
Culwell Construction Company,
Oklahoma City, Okla.

STEEL FABRICATORS:
Flint Steel Corporation,
Tulsa, Okla.

OWNERS:
H. C. Price Company,
Bartlesville, Okla.

PHOTOS:
Joe D. Price,
Bartlesville, Okla.
For the new Price Tower in Bartlesville, Oklahoma

-IT'S WHEELING STEELCRETE!

Aside from its striking appearance, probably the most unconventional feature of the new Price Tower is the inclusion of one quadrant of apartment units along with its three quadrants of offices. And yet, because of its design and versatility of materials used, the entire 186-foot building is only one-seventh the weight of similarly sized buildings in New York City's Rockefeller Center.

Cantilever construction is achieved with floors and walls suspended from four vertical reinforced concrete supports...reinforced with over 395 tons of Wheeling Steelcrete Expanded Metal Reinforcing...solid steel mesh expanded from 5/8" carbon steel plate. Steelcrete is one of the many dependable Wheeling products specified and used with confidence by architects and builders.

The complete line of Wheeling Building Materials includes Steelcrete Reinforcing Mesh, Expanded Metal, ExM Gratings, Metal Lath and Accessories, Tri-Rib Steel Roof Deck, ExM Angle Frame Partitions, Steelcrete Bank Vault Reinforcing, and SofTite Cop-R-Loy Galvanized Sheets.

Floor plan showing reinforcing steel in place. The steelcrete reinforcements assure proper distribution of steel at low placing costs.

Heavy steelcrete reinforcing mesh in floor can be used as a working level until concrete is poured. No special catwalks or temporary "bridges" for concrete buggies are required.

Wall area using a combination of steelcrete and bars to obtain desired reinforcements. Produced in 3" x 6" diamond shape, steelcrete offers up to 1½ sq. in. of area to the foot of width.

WHEELING CORRUGATING COMPANY, WHEELING, WEST VIRGINIA
BUILDING MATERIALS DIVISION

ATLANTA BOSTON BUFFALO CHICAGO COLUMBUS DETROIT HOUSTON KANSAS CITY
LOUISVILLE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA RICHMOND ST. LOUIS

December 1955 47
Photograph taken during construction of Seaman's Bank for Savings showing installation of Tuttle & Bailey Type MPW Double Duct Mixing Plenum Wall Units.

Typical view of a general office area in Seaman's Bank for Savings showing how Tuttle & Bailey Type MPW Units blend with modern architectural design and decorative scheme.

Seaman's Bank for Savings...
First entire building in New York City to use double duct mixing plenum high pressure system features complete flexibility of heating/cooling zone control.

Architects: Halsey, McCormack & Helmer
Consulting Engineer: Edward E. Ashley
General Contractor: William L. Crow Construction Co.
Air Conditioning Contractor: Alward & Swift

ENGINEERED PRODUCTS FOR AIR CONDITIONING
& BAILEY

Pressure Units

give SEAMAN’S BANK for SAVINGS
indoor weather that satisfies everybody!

In this modern twelve-story addition to Manhattan’s financial district, Tuttle & Bailey High Pressure Units will provide efficient, economical year-around heating and cooling comfort. Type MPW Wall Units are located under all windows throughout the building, in banking areas and private offices. Type MPD Ceiling Units are installed in the dining areas.

Operating on an all-air system, these double duct units mix and discharge varying proportions of heated and cooled air to provide a constant volume at the exact temperature desired in individual areas. This flexibility means one area can be heated while another is cooled regardless of time of day or season.

Savings in overall building and installation costs were effected by the use of conduit risers and branches which reduced floor-to-floor dimensions. A single primary equipment room resulted in more useable space and the need for supplementary equipment required for the operation of other types of systems was eliminated. In addition, utilization of 100% outside air for cooling when temperature permits will save the cost of operating compressors, pumps, and cooling tower during such periods.

For complete information on the advantages of a high pressure air distribution system in new construction — or for remodeling — get in touch with your nearest Tuttle & Bailey Representative or write for Catalog No. 109 and Bulletin No. 110.
On the lake front of Chicago's near north side, the nation's tallest flat-slab reinforced concrete buildings are rapidly rising. They make up a $25,000,000 project of six 28 and 29-story apartment buildings—luxury "glass house" type—designed by the internationally renowned Ludwig Mies van der Rohe.

Mr. Frank J. Kornacker, structural engineer, said, "Reinforced concrete was chosen for economy reasons after a cost comparison with other structural methods. Another deciding factor was that materials were readily available."

Each year, an increasing number of buildings of all types are going to reinforced concrete construction. Reinforced concrete produces a rigid structure, highly resistant to wind, shock, and quake. Furthermore, materials and labor are readily available from local sources. On your next job, design for durability at low cost . . . design for reinforced concrete.

Compare...
YOU'LL SAVE WITH REINFORCED CONCRETE

38 South Dearborn Street • Chicago 3, Illinois
CONCRETE REINFORCING STEEL INSTITUTE
The combination of light-directing glass block and vision strip keep brightness at comfortable levels, provide vision and ventilation.

As a daylighting team the Toplite Panels and glass block provide sufficient daylight during normal days without need for artificial lighting.

Near the windows, or far from them, good daylight is everywhere.

Light-Selective Toplite Roof Panels transmit cool, desirable daylight; reject hot, glaring sun. No longer is it necessary to confine close detail work to the area nearest the windows. Toplite Roof panels permit daylighting of all building areas regardless of location or distance from exterior walls.

The prismatic glass units in O-I Toplite Panels “think” before they transmit the sun’s rays. Needed North light and the soft low rays from the South are readily accepted. But rays from the high summer sun are rejected. Glare and heat of old-fashioned skylights are eliminated.

Toplite Panels may be installed in continuous strip, pattern, or in individual panels. Use a Toplite Panel as you do a lighting fixture.

The complete story of this great new advance in efficient utilization of free daylight is available in a new booklet on Toplite Roof Panels. For your free copy, write today: Kimble Glass Company, subsidiary of Owens-Illinois, Dept. PA-12, Toledo 1, Ohio.
How to deliver high velocity air to schoolrooms

Shown here are two ways of using the Anemostat All-Air High Velocity system of draftless air distribution for heating and ventilating schools. Under-the-Window units (above) are the most practical for colder climates. Corridor distribution (below) is preferable in warmer climates.

Advantages:

• All-Air High Velocity units require smaller than conventional ducts, thus save space and money.
• All-Air HV units can be used for individual or zone control, in single or dual duct installation.
• Since air is supplied from the main equipment room, there is no need to break through the outside of the building for prime air make-up. This eliminates grilles, dampers, possibility of leaks.
• The Anemostat All-Air HV system can be simply installed by the sheet metal trades. No supply or return pipes are required. Units are quiet, need a minimum of maintenance from custodians.

For latest data on All-Air High Velocity units, write on your business letterhead for new Selection Manual 50 to Anemostat Corporation of America, 10 E. 39 Street, New York 16, N. Y.
After considerable testing and research, H. H. Robertson Company is pleased to announce the availability of a new product much needed in modern construction—a steel deck that will span great distances with the required load-carrying capacity. This new Long-Span Q-Deck, now in production, carries with it all the basic qualities and advantages of Robertson’s well known Standard Q-Deck. Tight side laps become standing seams and are caulked and mechanically fastened at regular intervals to act as a vapor barrier and for structural stability. Units are easy to handle and erect with a minimum crew. They install quickly and tightly because of precision manufacture. Long-Span Q-Deck fills a long felt need in schools, supermarkets and other buildings where longer single spans bring construction economies and design flexibility. Any standard insulation and built-up water-proofing can be used. Use the coupon to write for technical literature about this new Robertson product.
Spokane Coliseum proves efficiency of ReynoCouastic

Performers and spectators have attested the high acoustical efficiency of ReynoCouistic in the Spokane Coliseum. And this installation demonstrates other advantages of the system no less dramatically. The virtual elimination of maintenance is important in a ceiling difficult to reach. The brightness of aluminum makes lighting more effective, less expensive. And it is vital, in a public place, that this acoustical system is incombustible. Each shipment carries Underwriters' Laboratories label. Available in either natural aluminum or soft-white baked enamel finish.

A complete installation service is available. For name of nearest franchised acoustical applicator, call the Reynolds office listed under "Building Materials" in classified phone books of principal cities. For literature, write to Reynolds Metals Company, Building Products Division, 2014 South Ninth Street, Louisville 1, Kentucky.

Typical installation showing method of support for ceiling members and lighting fixtures. This system provides a noise reduction up to .90 uniformly high at all frequencies.

See "FRONTIER." Reynolds great dramatic series, Sundays, NBC-TV Network.
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and door hanging style... exterior and interior... from the heaviest lead-lined x-ray room door
to the lightest office rail gate

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Downers Grove, Ill... H. G. Neise, 5616 Aubrey Terrace
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THE OSCAR C. RIXSON COMPANY
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The new Oberlin Inn at Oberlin College in Ohio replaces the original college inn, built in 1867. The new inn has 48 bedrooms, public and private dining rooms, and lobby, and there is an adjacent shopping center. Most of the main building is two stories high, built on a framework of structural steel.

The large public dining room is one story high. To obtain maximum column-free space, Bethlehem Longspan Joists were used in the roof of this room, thereby making the best possible use of every square foot of floor space.

Over the other public rooms in the inn Bethlehem Shortspan Joists were used, both in the first floor ceiling and second floor roof. Here, as over the dining room, the joists were used in combination with a poured roof slab and plastered ceiling which, depending upon the type and thickness of the materials, provides a construction with up to four hours' fire-safety.

In addition, Bethlehem Joists helped to hold down building costs. They reached the job site fully marked, ready for immediate placing, without falsework. Installation of ductwork and wiring was simplified by running them right through the open webs.
meets every hospital flooring need
— with the rare “plus” of cheerful styling

Widely acclaimed, New York’s Upper Manhattan Medical Group Clinic integrates the highest standards of architecture, function and decor in an ideal union... in which MATICO Confetti tile is an essential specified element.

It’s easy to see why more and more architects are specifying MATICO Confetti Flooring for hospital projects. Basically, it’s because Confetti satisfies every need, every rigid requirement of the modern hospital. First, it is sanitary, durable and quietly resilient. But more than that, it is also fire-resistant and low cost for both installation and maintenance. And, in addition to all these utility values, Confetti’s gay dots-of-color styling lends new charm and cheer where past custom dictated hygienic coldness.

— Good reasons, all, why you can specify Confetti tile flooring not only with confidence, but with justifiable enthusiasm, in your next hospital project as well as other types of projects.

In these light and lifting circulation areas the Confetti floor of white with black mottle contributes to the air of buoyancy and lightness. Even under heavy traffic conditions Confetti’s bright colors last and last.

Consultation rooms for doctors and patients Confetti was specified also — this time in black and white mottle. (In addition, Confetti is also available in nine other color combinations).

Architects planned the pharmacy as a “display piece” near the Clinic’s entrance, where it can be seen through a wall of glass. Here, too, Confetti in white with black mottle was specified.

In this intimate waiting room, the decor is one of colorful furnishings, restful lighting and more of MATICO’S airy, bright Confetti flooring.
There's a lot for you in what they say

Gas unit heaters may look alike, but those built by Janitrol have a reputation for quality and performance you can stake your reputation on. They deliver the extra comfort and fuel economy that brings favorable comment to those responsible for specifying them. A complete line of Janitrol unit heaters fit every requirement—from small shop to mammoth industrial plant. There's good reason why you should specify Janitrol for your client's lasting satisfaction. See why in booklet below.
The amazing versatility of the new Gold Bond Holostud Wall System is dramatically demonstrated by the types of buildings in which it can be used efficiently. Whether you are designing a hospital, a modern skyscraper, an apartment building or school, you can use this newest of wall systems for strong, rigid, non-load bearing partitions.

In hospitals you can use Gold Bond Holostuds effectively to reduce sound transmission and simplify utility routing; in multi-story buildings these lightweight partitions will lower overall dead weight and save structural steel; apartment house utilities can be easily repaired or replaced at minimum cost; schools can cut initial building costs and add fireproofing safety.

Prefabricated Holostuds are adaptable to either metal or gypsum lath construction. Open strut-type design allows ducts, plumbing and electrical conduits to pass through partition studs easily, and at the same time adds exceptional strength and rigidity to the entire wall. Find out how the versatile Gold Bond Holostud Wall System can help to simplify your building designs. For full technical data, write Dept. PA-125.

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Cement paint... beauty aid for masonry faces

Smooth and bright, this attractive store front provides a paper-white background for Macy's signature. Its sparkling whiteness was achieved by coating brick masonry with prepared cement paint made with Atlas White Cement.

Easy to apply, white or tinted, economical cement paint smooths out dirt-catching rough spots in any masonry face... forms a durable, moisture-resistant surface, strongly bonded to the wall.

Why not see how cement paint can brighten up your next masonry project? For uniform color, be sure to specify cement paint made with Atlas White Cement. Available from leading cement-paint manufacturers.

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...for versatility, modern beauty, and enduring value

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HAVANA, CUBA Hotel Residencial, "Rosita" de Hornedo. Arquitectos: C. Martinez Marquez, Isidro Cordoves Jr.

Whatever your window needs be sure to get all the facts on this new window and the full Ware line... proven in thousands of installations throughout the hemisphere.

Dependable delivery assured through regional warehouses in HOUSTON, ATLANTA, CHICAGO, and NEWARK. Write Dept. PA-12.

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ALL WINDOWS CHEMICALLY CLEANED, ETCHED, AND LACQUERED PER FHA REQUIREMENTS
As of January first, 1956, ALL Securitee Systems parts will be imprinted with the company trade-mark.

By making this imprint a part of your specifications, you assure yourself, as well as your client, of a quality acoustical mechanical system—WITHOUT ADDITIONAL COST.

To our many friends and customers—ARCHITECTS, DESIGNERS, CONTRACTORS, APPLICATORS, all—may we take this opportunity to extend to you greetings of the season and our thanks for making this the most successful year in our brief history.

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W. J. HAERTEL & CO.
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*T. M. REG. U. S. PAT. OFF.
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Concrete Roof Systems Are
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PERMANENT! LOW IN COST!

And Adaptable To Any Roof Deck Design!

Nowhere in the construction industry is there to be found an equal to Zonolite systems of lightweight roof construction. They are simple in design, lightweight, firesafe, insulating, speedy in erection, strong, durable, have good appearance. Yet in spite of these added benefits, they are low in cost. The systems of construction shown here are only a small portion of the combinations now made possible by the use of Zonolite vermiculite concrete. To make your next roof deck job—or any job—outstanding, we suggest you send for Zonolite's manual on roof systems.

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Here is a book you'll refer to constantly... gives details of many roof deck systems... including design data, sectional drawings, etc. Mail coupon —no obligation.

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MITCHELL lighting modernizes 60 year old school

LIGHTING LEVEL UP 600%...

MITCHELL LIGHTS ANOTHER SCHOOL
Sixth Ward School
Washington, Pennsylvania

Electrical Contractor: Glenn Yoder, Hollsopple, Pa.

INSTALLATION:
Approximately 200 MITCHELL "Low Brightness" Luminaires (Model 3245), flush-mounted in continuous rows throughout. Foot-candles before relighting: 10.
Foot-candles after modernization with MITCHELL "Low Brightness" Luminaires: 60.
Increase in lighting level: 600%.

once-abandoned school restored to complete usefulness

A remarkable difference...the renovation program of this 60 year old school cost less with MITCHELL "Low Brightness" fluorescents which have increased the overall lighting level by 600%. More than any other factor, the new lighting imparts the effect of pleasing modernity.

MITCHELL Low Brightness Lighting makes the modernization complete: The exclusive MITCHELL Elliptical Reflector, utilizing Low Brightness lamps, delivers a maximum of glare-free light to all work surfaces. The resulting freedom from harsh contrasts and disturbing shadows creates ideal classroom lighting conditions. Finally, the MITCHELL Low Brightness Luminaire provides the advantages of beautiful appearance, practical design, high efficiency and simplicity of maintenance at a most reasonable cost.

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MITCHELL MANUFACTURING COMPANY
2525 N. Clybourn Ave., Chicago 14, Ill., Dept. S-M
In Canada: Mitchell Mfg. Co., Ltd., 19 Waterman Ave., Toronto
Are glass blocks "TOO EXPENSIVE"?

A panel of glass blocks does cost somewhat more than a corresponding area of single glazed wood or metal sash. And an installation costs even more when glass blocks are combined with other fenestration materials.

But let's look at these costs more closely. We came across a school* in which the old wood sash had been replaced with PC Glass Blocks, set above a vision strip. The installation cost about $10,000 more than ordinary sash would have cost. But look at the savings:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COST PER YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paint sash every 5 years @ $1000</td>
<td>$200</td>
</tr>
<tr>
<td>Wash windows 3 times per year @ $700 per year</td>
<td>$700</td>
</tr>
<tr>
<td>Replace 350 lights of glass per year @ $6 per light</td>
<td>$2,100</td>
</tr>
<tr>
<td>Replace window shades every 10 years @ $2,700</td>
<td>$270</td>
</tr>
<tr>
<td>Total window maintenance cost per year</td>
<td>$3,270</td>
</tr>
</tbody>
</table>

These costs have been practically eliminated since the PC Glass Blocks were installed. Annual return on the additional investment for glass blocks has been about 33%, or, the additional investment will be paid for in three years. On top of this, there has been an estimated 10 to 15% savings on the heating bill.

All this is in addition, of course, to the superlative daylighting made possible with the PC Glass Blocks. Next time you're thinking about fenestration costs, remember these figures. Check with your PC representative.

*Name and location of school available upon request.

Because of the many savings glass block panels provide, and because of their superior daylighting control, the slightly higher initial cost of glass blocks will be quickly paid for. Your client will continue to make these savings year after year.

PC Glass Blocks
Pittsburgh Corning Corporation, Pittsburgh 22, Pa. • In Canada: 57 Bloor St. W., Toronto, Ontario

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To meet today's trend in designing buildings of ALL classes —

**Bayley Curtain Wall Systems**

We invite you to take full advantage of our 30 years of experience in designing and building WINDOW CURTAIN WALLS

Think of it! Many Bayley engineers are lifetime specialists in curtain-wall window construction! For Bayley's 76 years of progress in metal fabricating and window making includes 30 years in the design and production of window curtain-walls. And Bayley protects your confidence with a record for quality production, thorough pre-engineering and follow-through services, integrity, and financial soundness (ask those who have dealt with Bayley). When you want to be sure, be sure it's Bayley.

The Bayley Intermediate Projected Window (steel or aluminum) is the basic element in Series 150 Curtain Wall Systems. It is also built into separate prefabricated panels composed of deep-sectioned framing members in the 450 Series. This permits wide flexibility in combining any of the newer wall-panel materials and design trends with both fixed and ventilating window areas, to meet any need for light, air, vision, and beauty.

*See Bayley in Sweet's. Complete catalogs on aluminum windows, 16a/Bay; steel windows, 16b/Ba.*

**1930**


**1954**

Libbey Owens Ford, Toledo, Ohio. Engineers & Builders — A. Bentley & Son, Toledo, Ohio

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WALTHAM, MASS., Nov. 4—One of the most exceptional provisions by an educational institution for the religious needs of its student body was dedicated here at Brandeis University this week—three chapels, one each for the Catholic, Jewish, and Protestant faiths. The buildings, designed by Harrison & Abramovitz, Architects, are disposed around a woodland pool on a hill apart from other buildings on the 200-acre campus. Traditional campus practice has either studiously ignored religious differences or provided one strictly sectarian house of worship. Nonsectarian Brandeis, though sponsored by the Jewish community, early determined that each faith should be granted free and full expression—and in such a manner as to eliminate the implication of minority status for any group.

Max Abramovitz, of the Architects' firm, comments: "Each Chapel was developed around its ritualistic requirements, and placed around the pool to develop a composition wherein the units would be subordinate to the idea of the group. To maintain a sense of the group, similar materials were used, and the mass of each Chapel, though different in plan, is approximately the same in volume."

Photos above show a general view and (left to right) the sanctuaries of the Protestant, Jewish, and Catholic Chapels.
SOLAR HEATING AND COOLING:

by Louise Cooper

PHOENIX, ARIZ., Nov. 12—Solar heating may soon be economically competitive with systems using conventional fuel, if it is combined in an installation also providing summertime cooling. Promising new methods of linking solar energy installations to cooling systems now on the market have been developed, and work on experimental models is underway. This new work may take solar heating and cooling out of the realm of research and make it a cost-saving reality in many parts of the United States—and a far-from-theoretic design problem for architects.

These are among the many new facts reported by researchers this week to some 900 scientists from 30 countries, here to attend a world symposium on solar energy. The conference was sponsored by the Association for Applied Solar Energy, the University of Arizona, and the Stanford Research Institute.

**New Solar Collector**

A partial solution to the architectural problems created by solar heating was presented to the conference by Dr. George O. G. Lof, Denver, one of the foremost authorities on solar heating and cooling. Dr. Lof has developed an overlapped flatplate solar collector, based on a scheme first proposed by K. W. Miller in the course of war-time government-sponsored research in which Dr. Lof also participated. The unit provides plate collectors with tilt built-in, thus making it unnecessary to plan for steeply tilted roofs to which flat-bed collectors can be attached. Except for the innovation of the series of ideally tilted collector strips, the unit follows the well-known principles of the solar-heat trap (drawing below).

Overlapped-plate solar collector, designed for factory production by Dr. George O. G. Lof. Black-coated glass strips are set at ideal tilt in overlapping series, mounted in airtight glass box.

**Research Houses**

Dr. Lof plans to use the collector unit in connection with a forced hot-air heating system in a $35,000 research house soon to be built in Denver, designed by Architect James M. Hunter, Boulder, Colo., who presented a model of the house to the conference.

In the research house (above) solar heating will take care of about 75 percent of heating requirements. Like most of those working in this field, Lof believes this is the most practical way to use solar heating. The Denver house system will use an auxiliary gas heater and will cost about $2100. A conventional heating system for this one-story, 2100 sq ft house would cost about $1300. Lof believes, however, that the solar installation will mean a fuel saving of about 60 percent. Mass production of the collector unit will produce further economies which may bring solar heating within striking distance of first-cost competition with conventional systems in many parts of the country. Some 21 companies are already commercially producing solar collectors of various types. Lof’s work is supported by the American Window Glass Co., Pittsburgh, Pa., which continued research support initiated by the Federal government during the last war.

The other essential part of a solar heating installation—heat storage to take care of the days when the sun doesn’t shine—is accomplished in the Denver house by 10 tons of gravel, stored in three 16-ft-high vertical tubes, 3 ft in diameter. This storage stack is placed in a stairwell leading to a basement utility area. Hot air from the solar collector is directed by dampers, through a floor piping system, to rooms of the house and back again to the collector for reheating. When thermostats in the collector and gravel storage tube indicate insufficient temperature at these points, dampers will shift and the auxiliary gas heater automatically comes into operation.

The Denver house heating system differs from the somewhat better-known system designed at MIT (where research in solar energy use has for many years been supported by the Cabot Foundation) in its use of air in the collector unit and of gravel storage. (See May 1955 P/A for a description of MIT system.)

**Solar collector heat pumps**

Bridgers & Paxton, Albuquerque, N.Mex., engineers responsible for the ingenious heat pump installation in the Simms Building at Albuquerque (September 1955 P/A) are backing complete solar heating. Members of the firm showed a model of an office building which the firm expects to build early next year, partly for its own occupancy (plan and
A REALITY?

photo below). This will be, so far as known, the first completely solar-heated nonresidential building in the world. It will cost about $60,000, of which some $16,000 represent mechanical work and equipment. These engineers believe that a heat-pump installation makes complete solar heating practical in many parts of the United States.

The heat-pump principle, they say, reduces the need for heat storage by a factor of 10. Their system uses a flat solar collector of 850 sq ft, with absorbed radiant heat transported by water and distributed through floor and ceiling radiant panels.

Further research in the use of a solar collector with a heat pump initiated by the American Gas and Electric Service Co., New York, some six years ago, was described to the conference. Among findings reported were that proper design can raise heat recovery from the solar trap to 100 percent; that the collector must be able to use outdoor air as well as direct sunlight as a heat source; that a solar collector can also be used as a heat sink for summer cooling; and that a solar-collector heat pump has considerably higher operating efficiency than heat-pump systems using only outdoor air as the heat source.

Solar Cooling

Space cooling by the use of solar energy has for a long time been an alluring prospect, because solar radiation is at a maximum in the months when cooling is needed. Dr. Lof reported experimental work on two systems, at least one of which promises, technically and economically, to make a combined solar heating-and-cooling system cheaper in some areas than an absorption cooling-and-heating system fired by gas. It is a solar-operated dehumidification and cooling installation, suitable for use with solar heating and which can supply most or all of the air conditioning required in an average house in many humid sections of the U.S.

Architectural Problems

A round table of architects, moderated by Lawrence B. Anderson, head of the Department of Architecture at MIT, faced many of the forbidding questions as to what solar collectors may do to the looks of houses. Winston A. Close, Minneapolis, predicting that the existing street pattern would outlast our fossil-fuel reserves, recommended inward-facing houses, built around garden courtyards, with solar collectors mounted in the garden, as a means of avoiding annoying east-west reflections from the collectors in typical subdivisions. Robert H. Dietz, Seattle, said that schools, frequently located on spacious ground and with their hours of use those when solar energy output is at a maximum, are good candidates for solar-heat installations. Solar collectors, he pointed out, could be designed to absorb enough of "yesterday's energy" to meet the critical morning warming-up requirement. Moderator Anderson proposed a possible design for solar collectors in flexible glass fibers, which might be produced as an all-in-one extruded panel, perhaps in five layers with a blackened film as the heat absorption surface at the center.

Thermal uses of solar energy presented at the conference and displayed at the accompanying exhibit ranged from ultra-high-temperature industrial furnaces to portable barbecue cookers (below). The Conference also considered the conversion of solar energy to electricity (the first solar battery was recently tested in Georgia) and various chemical, biochemical, and biological conversions. One of the most promising among the many discussed is the use of a sunbeam to shatter water to hydrogen and oxygen.
News Bulletins

- Construction expenditures in 1956 will climb to unprecedented peak of $44 billions—5% above $42-billion record estimated for 1955. Forecast—by U. S. Dep'ts. of Commerce and Labor—is based on moderate increases in overall economic activity.

- Reports on construction outlays in October '55 show 4% seasonal dip from September, but 11% gain over October '54. Cuts in residential construction accounted for most of decline to $3.9-billions total; however, private commercial and industrial building continued to advance and Air-Force expansion boosted military-construction outlays to postwar high of 1952.


- Frank Lloyd Wright's design for a glass-and-marble palace on the Grand Canal has been rejected in Venice by Artistic and Technical Commission. . . . Construction on Wright's Guggenheim Museum, on Manhattan's Fifth Ave., is expected to start in February 1956, according to Dr. Jacob Fold, Consulting Engineer for the project.

- Applications for 1956 Lloyd Warren Scholarship, $5,000 award for travel and study in U. S. or abroad, are due Jan. 2. Write: Lloyd Warren Scholarship, Beaux-Arts Institute of Design, 115 E. 40 St., New York 16, N. Y. . . .

- Architect William Lescaze's first skyscraper since Philadelphia Saving Fund Society building is nearing completion at 711 Third Ave., Manhattan, while the El is being demolished. The 20-story office building (left) of blue, white, and gray glazed brick will include a mosaic mural and stainless-steel sculptures in its lobby. . . . Cleveland's first new skyscraper (right) will be a 22-story aluminum- and glass-sheathed office building designed by Architects Carson & Lundin. Located on the Public Square, it will feature an open plaza with reflecting pool.

- Reopening of the AIA's historic Octagon House on November 10, after extensive repairs, was highlighted by the first American showing of an exhibition of FINNISH CONTEMPORARY ARCHITECTURE. Sponsored by the Finnish-American Society in Helsinki and assembled by a special committee from Association of Finnish Architects, the collection of models, plans, and photo enlargements presents a comprehensive survey of postwar Finnish architecture. The development of contemporary architecture in Finland is traced from the periods of Eliel Saarinen's Railway Station in Helsinki, 1914 (left), Alvar Aalto's Sanatorium for Tuberculosis, Paimio, 1933 (bottom, left to right), and Erik Bryggman's Burial Chapel, Turku, 1940, up to the recent works of several well-known architects and many younger men, including: High School, Rovaniemi, 1952, by Jorma Järvi; Primary School, Helsinki, 1953, by Rewell & Sipani; and The Little Theater, Helsinki, 1954, by K. & H Siren. . . . FINNISH CONTEMPORARY ARCHITECTURE is being circulated by the Smithsonian Traveling Exhibition Service.
SPRINGFIELD, MASS., Oct. 11—Another step toward the true “production-line house” was revealed here today by the Plastics Division of Monsanto Chemical Company. Molded modules—8’x16’ and bent to form ceiling, wall, and floor (left)—provide the basis for this new concept of house construction. The modules—cantilevered in pairs from a central utility core containing baths, kitchen, laundry, and heating facilities—will be occupied principally by living, dining, sleeping, and recreational areas. Combinations of these design components, including twin cores, allow a variety of floor plans. Changing space requirements of the growing or diminishing family can be easily accommodated by the flexible molded modules. As these units are cantilevered from the basic core, it was also pointed out that excavation requirements are radically reduced.

The designers do not wish this structure to be thought of as just a “plastics house.” New and traditional materials not only can but also should be used to equal advantage in houses of this kind.

Currently, the design is being refined at MIT by Architect Marvin Goody under direction of Richard W. Hamilton.

INDIAN RED STEEL SHEATHES HOSPITAL

POTTSTOWN, PA., Nov. 13—Dedication ceremonies were held here today for the new Pottstown Hospital. The work of Architect Vincent G. Kling, it is a most remarkable solution to the problems of an existing hospital plant, involving the retiring of obsolete facilities while providing in their place the most up-to-date techniques in patient care and hospital planning.

As the pictures show, the new hospital was constructed directly through the center of the old plant—the only logical placement, both Architect and members of the Board of Trustees agreed. The old building, divided in half, continued to operate during the two construction years. When the new hospital was finished, the obsolete units were torn down and replaced with a landscape courtyard.

To minimize noise during this difficult construction feat, the structural steel frame was bolted instead of riveted. Also for this reason, as well as providing a clean building operation and a maintenance-free finished surface, wall panels are of heavy-gage steel with glass and Indian red pigment fused to the face. The sun-control grid protecting southeast-facing patients’ rooms is also of porcelain enamel panels, joined with cellular lightweight steel roof decking.

A hospital campus emerges from chaos. At right of the new five-story mass of the hospital (top) is the existing three-story nurses’ residence and a new, one-story wing for the school of nursing.
Washington Report
by Frederick Gutheim

Should Peter A. Strobel have sold his interest in the New York firm of Strobel & Salzman, consulting engineers, before he became Commissioner of Public Buildings? He now knows the answer to this question, but the situation that led Rep. Emanuel Celler (D., N. Y.), Chairman of a House Judiciary Subcommittee, to investigate Strobel's alleged conflict of interest is an enduring one—and will be around longer than was Strobel. The question that remains is: As between the Government Agency responsible for building and the Government Agency that gets what is built, who decides what is to be built?

In this case, the Central Intelligence Agency, which proposes a $36 millions headquarters for its 8000 employees on an outlying site near Washington, engaged Harrison & Abramowitz as architects, plus a battery of consultants that included Clarke & Rapuano. Earlier preliminary analyses of building need, as well as site studies, had been made for CIA by the Public Buildings Service. When CIA engaged Harrison & Abramowitz, PBS appears to have insisted that other architects be associated before they could consider the arrangement a satisfactory one. Strobel argued that, as contracting officer, PBS had the right and duty to impose such conditions, and cited CIA's lack of experience in construction to support its position. The ensuing hassle was not over an architectural fee (which Strobel estimated at between $1.5 and $2 millions) but for control of the choice of site and of the building itself, its character and its standards.

An analogous situation was faced by Congress in the rather smaller headquarters building of the Atomic Energy Commission (1400 employees) now being designed by Voorhees, Walker, Smith & Smith. That they decided in favor of letting AEC do its own building rather than obliging them to work through PBS was generally attributed to AEC's great construction experience, but qualitative factors of notable importance were also present. While CIA has a harder case to make for itself, there can be little doubt that the same motivations are at work here: they don't want the kind of building they know PBS would give them. And they know what they want!

While progress is being made with the PBS main building effort (the lease-purchase program), the continuing difficulties with program and design suggest that Congress would do well to reconsider the PBS role as a Central Building Agency. Government building is exposed to peculiar hazards and needs its own standards. All building needs cannot be satisfied at once, and programming is vital. The continuing nature of government building needs justifies higher quality construction to secure lower maintenance costs. Bureaucrats, no less than politicians, are monument builders, and safeguards against waste and whim are desirable. So is reasonable equity of treatment from one building to another. But if these conditions put public building in a strait jacket and frustrate the legitimate requirements they cannot be tolerated.

Under present circumstances, I cannot doubt that the cause of public building and its architecture will be served better if all dispersed Agencies and most other Government Agencies are allowed to select their own architects and are given control of their own building designs. The day of the "general purpose" office building, centrally located and adaptable to the needs of any Government Agency, on the model of the General Accounting Office building here, is passing. While there is a strong case for program co-ordination in Government building, and much to be said in favor of a perspective on public building longer than that of a single Agency, the PBS has shown on numerous occasions that it is unable to meet Agency requirements on sites, space standards, arrangement, and services; and that considerations of operations and maintenance are more significant than subtle adaptation of building design to occupant's requirements and needs. Probably this difficulty is less due to PBS policy than to the Budget Bureau, yet it remains to compromise whatever is designed. PBS wants to treat Government Agencies as a building owner or manager treats tenants; and Government Agencies want to operate as if they owned their own buildings. Only Congress can decide.

- The removal of the last of the temporary housing here and continued progress in the elimination of war-built structures that still clutter Washington parks, is satisfying evidence of a determination to maintain high architectural standards in the capital. Two of the most recent "temps" to go occupied especially important sites north of the Department of Commerce and the District Building, facing Pennsylvania Avenue. Such changes do more than remove recrescences and restore the status quo ante: they also open up important architectural opportunities.

- A glance at the redevelopment plans drawn for Webb & Knapp for the 500-acre district project south of the Mall, where Government office buildings and massive parking provisions have been planned, clearly shows the obsolescence of the older parts of Washington's central area. Last month, after extensive review, the National Capital Planning Commission approved these plans in principle. A staggering amount of clearance has already been done in this district where notorious photos could once be taken, showing the city's worst slums against the nearby Capitol dome. New construction here should commence in the coming year, now that redevelopment agency officials have given the green light to Roger Stevens and James H. Scheur.

- Further Government props to sustain the volume of homebuilding are expected from the Congress this year. Extension of veterans housing benefits (only 3 millions of the 16 millions of eligible veterans have used their loan privileges); soft-pedaling recent credit restrictions; and expanding public housing are the most likely developments to expect from the four Congressional Committees now looking into various aspects of housing.

72 Progressive Architecture
PARIS, FRANCE, Oct. 24—Western Europe, an area which includes many countries and demonstrates many trends in contemporary architecture, continues to be conservative in its major reconstruction projects, slow by U. S. standards in general application of new design techniques but stimulating and surprising to the visitor in scattered, individual architectural achievements.

Today I visited with Paul Nelson, U. S. Architect practicing in France, a house he is just finishing in a Paris suburb. It is, to some extent, a realization of the "suspended house" principle he evolved some years ago. The second-floor slab is suspended from the arched, concrete roof form, in a structure that has proved to be most economical, and which contains a surprising amount of space. The sparkle in the wall panels, apparent even in a black-and-white reproduction, comes from "polychromy" by the late Fernand Léger, artist and close friend of Nelson's.

In northern Italy, at Cortina d'Ampezzo, the ice-hockey stadium for the 1956 Winter Olympic Games is nearing completion. Against the dramatic setting of the Italian Alps, the warped-roof, three-sided structure, designed by Enrico Calcaterra, forms a disciplined but variform focus.

In Switzerland, Interlaken's first motel has recently opened. In the fine tradition of Swiss hostelries, its 21 "cabins," each with shower (a luxury not always found even in Europe's best hotels), provide drive-in convenience. Architects are Eduard Hefler and Franz Fueg.
### Financial News

**by William Hurd Hillyer**

Architecture and banking are celebrating what might be termed a golden jubilee. Today's conditions have wrought a change in bank designing concept which is bringing money into bank vaults and commissions into architects' offices, through the erection of new banking edifices and the remodeling of present quarters. As financial columnist of P/A, the writer attended the "Bank Town U.S.A." financial editors' conference at St. Louis, October 21-22, sponsored by Bank Building & Equipment Corporation of America, largest in its field. That city was chosen because it provides outstanding examples of modern new buildings and face-lifted older ones. It also exemplifies the increased bank income resulting from architectural ingenuity.

The Manchester Bank, as an illustration, has shown spectacular growth since the completion of its new premises with their 11 drive-up and 2 walk-up windows. These facilities serve the car-driving 85% of its customers and, with the bank's planned addition of 9 more walk-ups, will further accommodate the pedestrians. First National is "doing business as usual" while its quarters are undergoing a $61/2-millions transformation. At nearby Clayton, the American Investment Company needs neither walk-ups nor drive-ins, so its building incorporates an inverted-truss construction "to open up the corners." The essence of present-day and tomorrow's financial buildings is dually functional, in the sense of promoting the flow of business transactions, and at the same time meeting customers' needs, by drive-in and parking facilities.

Architecturally speaking, the emphasis for money-housing institution planning has shifted from a building wherein the financial firm uncomfortably ensonces itself, to one designed to fit that institution's employee and customer needs. With some 17,000 bank buildings, not to speak of several thousand more edifices for other financial businesses, and with all moneymen aware of the necessity for the new approach to proper bank housing, architectural possibilities are practically boundless.

- **On the monetary front**, two factors have conspired, since our last issue, to moderate the pace of general building activity. The first of these influences is a steadily rising cost, in interest rates, of funds. The Federal Reserve System continues to apply its "policy of restraint," adopted several weeks ago, and the resultant rate hike is now further boosted by a growing scarcity of short-time funds. "Free reserves" of commercial banks (excess reserves minus bank borrowings from the Fed) are below zero. The rate on such borrowings has been raised to 2 1/2%.

Banks have had to liquidate, during '55, some $6 billions of Government bonds to meet their customers' demands, and they may have to sell more, before Christmas, for year-end needs. The Government itself is compelled to pay more than twice as much interest on its Treasury bills (short-time loans) as it did this time last year.

Coincident with a tightening of VA and FHA mortgage terms, the lid has been clamped upon borrowings of savings and loan associations from the Federal Home Loan banks. Such mortgages are, in fact, being offered by brokers at a substantial discount.

The second slowdown factor in current construction is the rising cost of materials, which are up 8.4% since mid-'54, while the average of all prices has remained almost stationary. A "Wall Street Journal" roundup shows increases since 1950 ranging as high as 38% for Douglas fir and 33% for windowglass. During that period, the survey discloses, a 6-room frame dwelling in the St. Louis area which cost $13,800 five years ago to build (without land) is now cheap at $17,200.

These conditions, experts believe, will result in a 1956 decrease of nonfarm housing starts. The decline might go as deep as 10%, one eminent mortgage authority predicts, which would mean a reduction of 125,000 units. Total construction outlays went down $100 millions in October, to $3.9 billions from September's record top. At the first signs of a general slackening which might breed depression, the Federal restraints on lending will doubtless be loosened; if necessary, fresh credit will be injected into the economy. This contingency would heighten the inflationary peril previously warned against.

- **In such well-informed quarters as the Federal Reserve Banks of Chicago and Dallas, and the Guaranty Trust Company of New York**, livelier '56 hopes are drawn from tangible production and distribution totals than from any species of Government money creation or control. These authorities marshal, among other facts, the following:

  - Gross national product of goods and services, having passed the $392 billions record-breaking annual rate in the third '55 quarter, is projected above $400 billions for the full year;
  - Over-all activity is rising to the tune of $8 billions increase quarterly;
  - Federal cash budget surplus, perhaps $3 billions, will likely brighten the current fiscal year;
  - Consumers have more spending money—at a $256 billions annual rate, bettering last year's by some $17 billions—though a large part is installment-financed;
  - Corporation profits are up 35% to a near-record from this time '54, Wall Street announces, with every prospect that the upcurve will continue well in 1956;
  - Manufacturers' new orders and sales surpass mid-'54 by 30 and 20 points respectively on seasonably adjusted index of New York's First National City Bank. "Potential trouble spots in the economy," that institution declares, "are not running out of control."

Concluding tipoff as to 1956 by Federal Reserve Bank of Minneapolis: Deciding factors will be businessmen's decisions about inventory accumulations and raw plant investment. At the moment, "expansion appears to be the rule."
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the architects’ specifying this gypsum
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Architect Stickle tells why he used
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4. It makes for a clean job.

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   to apply.

Mr. Stickle concludes: "I believe that
this material will be used in greater
quantities as time goes on."

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The Adams & Westlake Company

ELKHART, INDIANA • Chicago • New York • Established 1857
library

location | Cincinnati, Ohio
architects | Woodie Gerber & Associates
associated architects | Samuel Hannaford & Sons
This main building for The Public Library of Cincinnati and Hamilton County is a happy exception to the stuffy architecture that cloaks so many public libraries. Not all interested parties were in favor of a contemporary design; in fact, a few would have preferred a Classic monument. It was mainly because of a limited budget, the architects believe, that a contemporary approach was made possible.

The director of the library, Carl P. Vitz, worked closely with the architects in developing the basic program—a "department store of knowledge" being his concept of a library's function. This is reflected in the departmentalization according to subject and in the wholly open plan, with infinite flexibility to meet changing needs. Vertical organization of the building, with two levels of stacks below the main floor and two more above the second floor, places books as close as possible to the pertinent departments, and a continuous vertical book lift serves the relatively light interdepartmental book-communication needs.

The ground floor houses history and literature departments, education, philosophy, and religion; a browsing room adjoining the main entrance (bottom, acrosspage); information desk, general catalog, lending department, and library garden (center, acrosspage). On the second floor—in addition to the science, industry, art, music, government, and business departments—there are a film and recording center and two meeting rooms; one to seat about 100 persons, the other, 35. Public rooms on the third floor are the children's room, and the memorial Rare Book Room near the southwest corner of the building which has the striking design feature of full-height operable, vertical stainless-steel louvers on the exterior. Remainder of the space at this level is devoted to processing departments, administrative and business offices, staff facilities, and rooftop terraces.

Except for occasional use of granite, exterior walls are of brick. Bright color accents occur in the surfacing of most prominent columns and the central service core of the building with Venetian-glass tile—yellow and gold for the core; and blue-green and gold on columns. All other columns (poured in round fiber forms) are painted blue-green. Continuous window stripping consists of double glazing, with heat-absorbing glass for the exterior panes, and inner panes of clear plate, sand-blasted on the sealed side, to control sky and sun glare.

The fully air-conditioned, sealed building cost $2,850,000, of which $885,000 went for mechanical equipment and elevators—or a unit cost of $14.90 per sq ft. Site, fees, stacks, furniture, and moving totaled $4670.
Immediately adjoining the main lobby (right) is the browsing room with its window walls (see SELECTED DETAILS). Terrazzo and cork are the floorings used in this area. Both perforated-metal pans and acoustical tile surface the ceilings.

The elevator lobby of the second floor (below left), used for exhibits, adjoins the reading room at this level (below). Column spacing of the reinforced-concrete structure is in 21'x22' bays to fit the 3' and 4'-6" standard library-stock module, for supports. Cantilevers around the building perimeter allow continuous exterior wall-hung shelving (painted Chinese red) and carry over the perimeter columns.
In the film and recording department on the second floor, one may listen to records at special tables equipped with earphones.
The Rare Book Room occupies a prominent corner of the third floor. The tall stainless-steel louvers are mechanically operated. Hardwood is used for the floor and polished red granite for walls. Columns are surfaced with colorful mosaic tiles from Venice. Interiors and many of the furnishings of the library were designed by Woodie Garber & Associates. Bodenstein & Schuster were Mechanical Engineers; W. W. Carlton & Associates, Structural Engineers; Frank J. Kornacker Associates, Special Structural Consultant; Frank Messer & Sons, General Contractor.
Adjoining the third-floor children's department (below) is the board room (foreground) and south-facing, stone-paved terrace (right) with planting boxes, reflecting pools, and sculpture by Harry Bertoia.

Materials & Methods

Construction


Equipment

office building

location | Oklahoma City, Oklahoma
architects-engineers | Coston-Frankfurt-Short
The first floor of this building contains offices, a library, meeting room, and a 200-seat auditorium for the Oklahoma Education Association. Rental space on the upper floor is presently occupied by Architects-Engineers Coston-Frankfurt-Short, who designed the building and supervised its construction. Located near the State Capitol, the structure is well sited on a corner plot, adjacent to residential areas, and close to the edge of the industrial district. The structural frame is of steel; walls are of brick or steel-framed panels. Floors of reinforced concrete are supported on steel joists. The roof framing employs steel joists and precast, insulated roof panels, topped with tar-and-gravel. Reddish-tan brick, blue steel spandrels, steel sash, with occasional use of blue-green heat-resistant plate glass, afford pleasant touches of color and texture on the exterior. Inside, major materials are gypsum tile and plaster, asphalt tile, and acoustical fiberboard ceiling tiles. A double-duct system has been installed for heating and air conditioning. Office areas are lighted by incandescent and fluorescent fixtures. General Contractor was Dunning Construction Company.

Entry to both offices as well as auditorium is from the central stair hall (left). Auditorium (left of photo above) is a windowless rectangle of brick, containing some kitchen facilities, coat storage, speaker's platform, and space to accommodate 200 persons. Offices (right of photo above) receive daylight from all four exposures. South windows are shielded by metal louvered extending 4 ft beyond building line. East and west windows have adjustable, exterior, metal blinds.

Photos: Julius Shulman
Door at ground floor (foreground of photo below) leads from marble-floored entrance hall into auditorium. Meeting room for Oklahoma Education Association may be partitioned into two sections.

Reception room for architects' offices (top right) is located on the second floor. Conference room (right), at west end of building, also serves as office space for partners.
house: Illinois

location | Barrington, Illinois
architect | Edward D. Dart
house: Illinois
Carport roof (below) is cantilevered, using 2" x 12" joists, 12" o.c. Main entrance (right) is located at end of path bordered by brick wall. For color accent, front door has been painted orange. Windows, doors, posts, mullions, and general trim are painted a flat black.

Photos: Hedrich-Blessing

It was the architect's intention not to alter the contours of this pleasantly undulating 13-acre site. The main floor level was therefore determined by the highest point of the site, and a drop in contours to the west was used to good advantage in providing a day-lighted study at the basement level. To achieve as much visual space as possible, all major rooms open into each other. Only the two bedrooms for the architect's own family of three, are secluded in the south wing. Generous overhangs and extensions of floor surfaces to the exterior, on porches and decks, help to enlarge the living areas visually as well as functionally. Standard wood framing has been employed throughout. Exterior materials are Illinois common brick, wood siding painted dark gray, and glass. Exposed natural brick, beveled siding for ceiling, gypsum form-board for walls, finished paneling, and teak wood for living room floor, summarize the major interior materials. A unique lighting fixture, made of 3' x 3' plastic panels, extends through the center of the house. Perimeter ducts embedded in slab carry forced hot air into all the rooms. Ricke Construction Co. was General Contractor.
house: Illinois

Well organized U-shaped kitchen (below) has pass-through into dining room (left). For a sense of spaciousness, interior partitions stop short of ceiling and wood ceiling extends over the entire living area.
Living room (top acrosspage) is one step above kitchen and dining room. Screened porch beyond serves as expansion to living quarters when doors are folded back during the summer months. Other outdoor extension is deck opening off living room (below) and study or occasional guest room (right). Deck cantilevers 10 feet beyond column line and is constructed of 4"x10" beams, 4' o.c.
Built on a 550-acre working ranch, this is the home of parents and two young sons. The family had previously lived in a city home that required several full-time servants. This house was specifically planned so that no more than occasional, part-time help would be needed.

The plan has remarkable provisions for the separate activities of the family. Heart of the scheme is the handsomely equipped kitchen that forms a buffer between formal, adult areas east of it and informal, family and children’s facilities to the west. From this core, meals may be served directly to (1) the formal dining room; (2) southern porch and terrace; or (3) multiuse family room, off which are bedrooms for the two boys. A deep porch west of the family room both governs afternoon sun and provides a play porch for the boys.

Note the large deep-freeze and walk-in larder—indication that the ranch produces and preserves much of its own food, as well as the fact that in-town purchases (requiring a trip of several miles) are made in quantity. The office in the angled unit bordering the service entrance is for conduct of ranch operations. The house is entirely of wood.
The private living side of the house is to the south (across page) where a deep-shaded living porch (below) adjoins the formal living room. Roof—and ceiling—construction consists of 2" x 6" T&G planking supported on 4"x8" rafter beams (spaced 7'-1" o.c.) which, in turn rest on a 4"x12" ridge beam. Exterior walls are of redwood siding.

On the entrance front, a sheltered walkway (right) leads to a drive-through carport at the side of a turning circle. Photo: Ernest Braun
The living room (above) is separated from the dining room (right of photo) by a high book-storage wall, topped with indirect lighting. Glass doors open both areas to the living porch.

Beyond the family-children's room at the west end of the house is a 16-ft-deep play porch (left).

Collaborating with the Architect were Engineers Buonacorsi, Murray & Lewis and General Contractor F. R. Fairweather.
Undoubtedly the most-used room in the house is the family room (below) with doors to outside on both south and west walls. A pass-through counter, in which are both barbecue grill and stove, opens from this room to the kitchen (right). Walls are of fir flooring, floors of vinyl cork. The house is heated by a hot-water system, served by an oil-fired boiler, and uses both unit convectors and baseboard convectors (the latter, under all fixed-glass areas).

Many mechanical conveniences are in or near the central kitchen (top)—built-in oven unit, dish washer, and garbage disposal unit in the kitchen, and washing machine, dryer, and ironer in the adjoining service space. The long pastry counter (right of photo) forms a pass-through island between kitchen and service areas.
One of the most interesting things about the Bienville Elementary School, built to accommodate a maximum of 595 children but with provision for expansion to an eventual student load of 770, is its site and siting. From the outset, it was known that the school was to share a large city square with a municipal playground, and the idea was that the 539'x 823' site would simply be split down the middle, with each project developed independently. However, the architects noted, because of the location of live oak trees on the property, this arbitrary division would mean that almost all trees would have to be removed. Several meetings with representatives of both school and park agencies convinced them of the advantage of dividing the property as shown on the plot plan. This scheme not only saved the trees but also made it possible to locate appropriate playground facilities adjacent to the areas for different age groups in the school buildings.

Four separate buildings, joined by covered walks, constitute the school plant—an administration-cafetorium building centrally placed on the north; a kindergarten building east of this; a classroom building for Grades 1 to 3 along the south side of the land; and a two-story building for Grades 4 to 6 at the western end.

To provide the amenity of bilateral lighting and ventilation, yet avoid the excessive length of buildings that would have been required had a single-story scheme been adopted throughout, “clusters” for the different class groups were employed. Large roof overhangs and use of vertical, exterior wing walls control sun glare in the one-story building. In the two-story block—also arranged in “clusters”—projecting window panels on the west side, “glazed” with asbestos cement, allow cross ventilation without direct sunlight.

The three-room-to-a-cluster scheme for the one-story building allows entrance to each of the three rooms from a neutral space; in the two-story building, clusters consist of two rooms, and open stairs (required for fire exits) separate the elements of the building. Perilliat-Rickey Construction Co., Inc., was General Contractor.
Construction, in the main, is of reinforced concrete. To reduce weight, the cafeteria element has light steel trusses resting on pipe columns; and the covered walks are also of steel. Because of unstable site conditions, all structures are supported on piling. Exterior walls are 10-in. hollow-core masonry, with brick or ceramic-tile exterior with structural facing tile within. Photos: Frank Lott Miller
elementary school

The tall, bay-windowed cafeteria-assembly room (or cafetorium) dominates the north side of the school quadrangle. Color is introduced both in glass panels and in ceramic-tile wall facing.
The main lobby of the administration building (above) leads directly to the cafetorium (at far end) or, to the right, across a landscaped court, to the school quadrangle. Color notes occur in the patterned asphalt-tile flooring and in wall insets.

From the quadrangle (left), one looks back across the courtyard to the main entrance.

Heating of the cafeterias, lobby, and kindergartens is by forced hot air from concealed units; all other spaces use baseboard-type convectors.
The one-story classroom building for Grades 1 to 3 is made up of three clusters of classrooms—one for each grade—that operate almost like separate schools. The typical classroom is bilaterally lighted, with deep roof overhang above low southern windows (right of photo) and two light strips on the facing wall—glass block for a glareless light source; operating sash for ventilation and light. Flooring throughout is asphalt tile, and acoustical tile is used on all ceilings.
The kindergarten unit was planned for maximum openness, with rooms opening fully to their eastern outdoor extensions. Clerestories supplement end wall elements for natural light and ventilation. Total contract cost of the school came to $494,000—or $10.50 per sq ft.
Passing of the stereotyped, cindery city "playground" with its rigid rows of iron-and-wood exercise equipment behind spiked fences is heralded in Philadelphia by adoption of a new kind of landscaped, informal area for family recreation as the standard for redevelopment of dozens of the municipal playgrounds. The components of the initial block-sized play center developed by Cornelia Hahn Oberlander for a congested neighborhood are noted on the plan (below). In Area A are climbing logs (2) and tables and stools for smaller children (5) enclosed by a low wall on which mothers may sit. Area B offers for larger children a play-sculpture (1) designed by Egon Moeller-Nielsen (Swedish sculptor who introduced this element in Stockholm playgrounds); as well as a concrete play-mountain (3), an amphitheater climber (4), swings, spray pool, etc. Area C provides a resting area with concrete benches (6) and games courts and tables for adults. All these areas are paved (except circles) and shaded. The remainder of the 3.5-acre block is a ball field (right of plan).

Recreation Commissioner Frederic R. Mann started the program, being continued under Commissioner R. W. Crawford, to provide city play centers that entire families can enjoy.
location | Philadelphia, Pennsylvania
client | Department of Recreation
landscape architect | Cornelia Hahn Oberlander
sculptor | Egon Moeller-Nielsen
contractor | Aversa Construction

Photos: Laurence S. Williams
Latest of the campus buildings to be completed at Orange Coast College is the Speech Arts Unit, heralded in July 1955 P/A, which featured campus structures completed up to that time. The Speech Arts Center is composed of a large auditorium with multipurpose stage, amphitheater, and a music building containing choral, band, and practice rooms. It is a remarkably versatile group of buildings, which not only serves the college in many different capacities, but also the community as a whole. As Richard J. Neutra pointed out in his recent book, *Survival Through Design*, “The all-purpose character of such a space which is to serve and activate a community is markedly different from that of the more specialized theater as it developed especially since the Renaissance into a place where spectators forming one world peep through a proscenium arch into another well rehearsed and staged world behind the barrier of footlights... Behind the student body of a college, for example, stands a wider and elastic community which may and should on occasion, converge on the campus.” One further change contributing to the evolution of
Today's campus theaters is the audience itself, which is now very often a participant rather than a group of mere spectators. "Participation," continues Neutra, "means being taken in, as much as feasible, making performance total, instead of 'half and half.' The stage extending around the 'audience,' or the audience surrounding the stage and players are two approaches to this totality, and at the same time, toward the desired intimacy between the two halves." To a degree this intimacy was achieved by the Elizabethan stage—the little theater-in-the-round—which has recently found favor again. On the other hand, suggests Neutra, there is a definite need on occasions for the opposite approach. "It is the one of surrounding the audience by action; simultaneous activity or action in sequence." This may be achieved by a widening and deepening of the stage, by special side stages, appropriate illumination, or an opening onto an outdoor terrace beyond the stage.

It would be difficult to find a more specific application or illustration of these theories than the recently completed Speech Arts Center, shown on these pages, and designed by Neutra and Robert E. Alexander. Among others who contributed to the success of these buildings were: Structural Engineers Parker, Zehnder & Associates; Mechanical Engineer Chester Walz; Electrical Engineer Earl Holmberg; J. C. Boespflug Construction Co., General Contractor; Rex Brandt, Color Consultant; Dr. Vern O. Knudsen, Acoustical Consultant.
The auditorium, together with stage and stage-craft facilities (above), covers an area of 24,492 sq ft and seats 1200 persons. Adjunct services include a projection booth, orchestra pit, organ loft, public-address system, storage space, and dressing rooms. The auditorium, of roughly egg-shaped plan, has reinforced-concrete floors and walls, steel roof trusses, and wood roof construction. Inside, the auditorium has screen walls of plaster or perforated hardboard, and ceiling baffles of plaster. A separate gas-fired air heating and ventilating system provides for audience comfort. Stage and auditorium lighting-control panels, including preset boards, are placed on a platform above the sliding doors of the side stages.

The stage, an area 45 ft deep and 104 ft wide, is perhaps the most versatile and ingenious part of the Speech Arts Center. Numerous arrangements (illustrated across page) are made feasible by movable doors, curtains, stage platforms, side stages, and revolving scenery platforms. Thus, use of the stage may range from a most intimate theater-in-the-round, seating up to 250 persons, to a focal center linking the indoor auditorium with the outdoor amphitheater, the whole seating a total of 3600 persons.
Preliminary "flexibility diagrams" (below) served as guides throughout the entire planning stages of the Speech Arts Center. From these, the manifold operations of the building are clearly apparent.

View of stage (left) from auditorium shows outdoor amphitheater in background. Automatically operated doors permit use of stage with either auditorium or outdoor amphitheater. Two revolving stage platforms allow for presetting of three or four scenes for quick changes. Tracks at ceiling carry teasers, wing drapes, and border lights. Rear main drape may also be used as front drop for amphitheater.

Photos: Julius Shulman
For economic reasons, the lobby was constructed as a shelter without walls but shielded from the prevailing west wind by a glass screen (below). Entrance into this lobby is from three directions—main vehicular approach from the east (above), pedestrian entrance from the north (left), and covered walk from the west (bottom). Approach from the west also links with shelter to music building.
Vertical marks on concrete walls of auditorium (left) are the result of slip-forms moved upward during construction. Rectangular structure in background encloses stage house, stage-craft facilities, heater and boiler rooms. Covered walk in foreground leads to music building.

Music building houses choral, band, and practice rooms, facilities for instrument repair, and uniform storage. Choral room (above) employs sound-absorbing blankets behind perforated-hardboard end walls. End walls, part of ceiling and wall above chalkboard in band room (left) are also acoustically absorbent. Instrument storage is at rear of room.
daylight measurements: six New England schools

More and more, primary and elementary schoolrooms are being built with provision for additional daylighting—that is, more than can be provided by windows along one wall. Wide classrooms with low ceilings are common in recent construction, offering a reason for bringing daylight into the side of the room away from the window wall. In some cases, where state codes require a minimum ratio between window area and floor area, such additional daylighting is mandatory for wide, low rooms.

Some of the methods being used to provide additional daylight are: skylights, clerestories on the inner wall, monitors,** and plastic domes. Technical papers1,2 have described some of these systems and discussions in the nontechnical press have sometimes implied that if substantial provision is made for additional daylighting, very little electric lighting need be installed in rooms which are not to be used for evening classes. On the other hand, some have argued that nothing more than a vision strip is justified in northern climates.3,4

This introduces the question of how much illumination is received by typical desks in such schoolrooms.5 Previous papers have dealt with daylighting intensities outdoors6 and with experimental data on particular systems;7,8,0 however, there is a need for factual data on actual schools in different latitudes.10

procedure

With this need in mind, a year's study was made of six schools in northeastern Massachusetts and southern New Hampshire, each having a different type of daylighting. In each school, a room was selected which seemed typical of those having the same orientation. A desk about midway from front to rear wall and located laterally in order to receive

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Manasseh Cutler School, Hamilton, Mass., Room No. 2

Exterior view through windows: Lawn, at level of schoolroom floor, slopes gently downward for about 200 ft, then rises. Pine and shade trees start 50 ft forward of forward window and slant away from room at 45° angle. Pine and shade trees about 1000 ft away, along skyline.

Clear glass in window wall/ Northwest exposure/ Clear glass in sloping monitor—monitor only in forward 20 ft of room/ No shades at windows/ Walls—stained wood/ Ceiling—acoustical tile/ Floor—slate-colored asphalt tile/ Number of similar rooms—12 (half with opposite exposure).

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Descriptive Measurements

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<td>0 to 5 footcandles 2%</td>
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† Percent of total readings measured hourly over one school year.

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Manasseh Cutler School, Hamilton, Mass., Room No. 2

Exterior view through windows: Lawn, at level of schoolroom floor, slopes gently downward for about 200 ft, then rises. Pine and shade trees start 50 ft forward of forward window and slant away from room at 45° angle. Pine and shade trees about 1000 ft away, along skyline.

Clear glass in window wall/ Northwest exposure/ Clear glass in sloping monitor—monitor only in forward 20 ft of room/ No shades at windows/ Walls—stained wood/ Ceiling—acoustical tile/ Floor—slate-colored asphalt tile/ Number of similar rooms—12 (half with opposite exposure).

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by Willard Allphin

the least daylight, was used for periodic footcandle readings.

Once every hour, a meter was placed on this desk (usually by the child occupying it), electric lights were turned off, and the meter was read. New Weston #703 meters, color- and cosine-corrected (and correct to ± 5%) were used. Results of these readings are tabulated. (Test locations shown on plans.)

room descriptions and measured results

Further measurements were taken by the author. In each of the selected classrooms, illumination measurements were made with a Weston #756 meter, and brightness measurements were made with a Spectra Spot meter. The latter eliminates human error by measuring brightness electronically.11 (Bright-day and dark-day measurements in foot-Lamberts are shown on each photo.)

Footcandle distributions in the test rooms were not measured at identical locations, because of the different room sizes and seating arrangements. The points were chosen in order to give a representative picture of the distributions, and are located approximately to scale on the floor plans.

Readings of footcandle distribution and brightness were taken at noon on clear days and on overcast days. The sky-brightness readings were taken by aiming the meter about half way between horizon and zenith in the direction faced by the main window walls.

Interior-brightness readings were made from a seated position in the center of the rear of the room, except where a monitor window could not be seen from this position. In such cases, the monitor reading only was taken from the right rear of the room, pointing the meter at a window midway between front and rear of room.

Exterior view through windows: Lawn at six in. above room floor level. Slopes up slightly for 50 ft, then changes to asphalt pavement. One-story red-brick building starts 60 ft forward of forward window and runs normal to window wall for 70 ft. Three-story red-brick building about 250 ft away, with corner opposite forward window. Pine and shade trees on skyline about 500 ft away.

54 in. of diffusing glass over 20-in. vision strip in window wall/ Roller shades at windows/ East exposure/ Two single-layer clear-plastic domes over wooden louvers/ Walls—brick, painted light buff/ Ceiling—acoustical tile/ Floor—green asphalt tile/ Number of similar rooms—two (one with opposite exposure).

Central School, Salem, N. H., Room No. 3

![Diagram of Central School, Salem, N. H., Room No. 3](image)

Illumination on Test Desk† | Reflectances
---|---
Over 100 footcandles | 27% | 39%
51 to 100 footcandles | 40% | 15 & 19%
31 to 50 footcandles | 16% | 65%
0 to 30 footcandles | 17% | Chalkboard 21%
0 to 20 footcandles | 100% | Tackboards 46%
0 to 10 footcandles | 9% | 1%
0 to 5 footcandles | 3% | 1%
† Percent of total readings measured hourly over one school year.

Descriptive Measurements

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<td>5 to 7 ft-c</td>
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December 1955 111
Central School Addition, West Acton, Mass., Room No. 2

Exterior view through windows: Level area six in. above room floor. Lawn for 10 ft, then asphalt for 25 ft more, then gravel. Grassy bank six ft high, running nearly parallel to windows, 50 to 60 ft away. Wall of adjoining wing 10 ft high, starts at rear of test room and runs normal to window wall for 22 ft. First six ft are red brick, next 16 ft are clear glass. Fairly tall pine trees about 300 ft away, forward of window.

Clear glass in window wall/ West exposure/ Double plastic-dome skylights, lower dome of diffusing plastic/ Venetian blinds at windows/ Roller shades under skylights/ Walls—cinder block, painted light buff/ Ceiling—perforated acoustical tile/ Floor—slate-colored asphalt tile/ Number of similar rooms—8 (half with opposite exposure).

Descriptive Measurements

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</table>

North School, Chelmsford, Mass., Room No. 6A

Exterior view through windows: Level area six in. above room floor. Asphalt pavement for 50 ft, then gravel. A few small pine trees forward of forward window and about 200 ft away. Pine trees on low ridge about 1000 ft away.

Clear glass in window wall/ West exposure/ Sill 12 in. above floor in forward half of wall; 33 in. above floor in rear half/ Four ft of diffusing glass in monitor/ Venetian blinds at window wall/ Front and rear walls—plaster, painted light bluish green/ Side wall—natural pine/ Dado—natural pine/ Ceiling—flat portion, perforated acoustical tile; sloping portion, plain acoustical tile/ Floor—light-green asphalt tile/ Number of similar rooms—10 (one half with opposite exposure).

Descriptive Measurements

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daylight measurements: six New England schools

Exterior view through windows: Gravel area about six in. below room floor. Dirt bank with some grass and brush curves from 50 ft forward of forward window to 100 ft away, normal to windows. Height of bank diminishes from about 30 ft, at forward end, to ground level opposite windows; 300-ft hills on skyline about 1500 ft away.

Clear glass in window wall/ West exposure/ Clear glass in clerestory opposite window wall/ Translucent-cloth draw drapes at window wall/ Walls — bluish-gray plaster/ Ceiling — perforated acoustical tile/ Floor — brown asphalt tile/ Number of similar rooms — 7.

West Parish School, Gloucester, Mass., Room No. 8

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<td>Average in seven rooms</td>
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<td>Spread of data in 7 rooms</td>
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Exterior view through windows: Level asphalt pavement six in. below room floor. Building 10 ft high; wall materials: red brick, clear glass, and glass block. A few shade trees are on a low ridge about 1500 ft away.

Four ft of glass blocks above three-ft clear-glass vision strip/ West exposure/ Glass blocks in clerestory facing west/ No shades at windows/ Walls — plaster, painted light peach/ Ceiling — acoustical tile/ Floor — slate-colored asphalt tile/ Number of similar rooms — 8 (one half with opposite exposure).

Fiske School, Lexington, Mass., Room No. 8

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</tr>
<tr>
<td>Spread of data in 8 rooms</td>
</tr>
</tbody>
</table>
results

Frequent checkups indicated that the young people did an accurate and conscientious job of reading the meters. Occasional readings were missed on days when school was in session, but these amounted to only 6% of the total of more than 5000 readings. Since they occurred at random times, their effects would tend to cancel out.

It cannot be emphasized too strongly that the data should not be used to compare one type of daylighting system with another, as to relative merits. Some of the factors which would make such comparisons unfair are:

- Exact geographic location (weather can differ in two places only a few miles apart).
- Orientation.
- Outdoor surround of room.
- Size and shape of room.
- Exact details of fenestration.
- Shades or other methods of daylight control.
- Adjustments of daylight controls by teacher.
- Reflectances in room.
- Considering the virtual impossibility of finding any two rooms which would have different methods of providing additional daylight, but would be identical in every other important particular, the author feels that a fair comparison could only be made under laboratory conditions with model rooms and an artificial sky.
- On the other hand, the combined readings should be of value because they show results actually obtained in schools which are being "lived in."

Here, therefore, are the totaled readings:

<table>
<thead>
<tr>
<th>Footcandles</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 100</td>
<td>11%</td>
</tr>
<tr>
<td>51 to 100</td>
<td>34%</td>
</tr>
<tr>
<td>31 to 50</td>
<td>24%</td>
</tr>
<tr>
<td>0 to 30</td>
<td>31%</td>
</tr>
<tr>
<td>0 to 20</td>
<td>18%</td>
</tr>
<tr>
<td>0 to 10</td>
<td>7%</td>
</tr>
<tr>
<td>0 to 5</td>
<td>2%</td>
</tr>
</tbody>
</table>

discuss the results

Note from the measurements (shown on plans) that on dark days the variations in footcandles across the room are much less than on bright days. Therefore, the low values are representative of more desks than are the high values.

The caution given earlier about attempting to compare the merits of the various daylighting systems also applies to the descriptive measurements of illumination and brightness. Because one "bright" day differs from another "bright" day and one "dark" day differs from another "dark" day, it would be entirely unwarranted to use the descriptive measurements to compare one school with another. The measurements are merely a general guide to how the daylight distributes itself in the rooms under some particular conditions.

Also, as was mentioned earlier, the descriptive measurements were taken at noon. This was done in order to reduce the differences due to orientation. However, it follows that the hourly footcandle readings on a test desk would include many values lower than that measured at noon on a particular dark day.

conclusions

With the acute shortage of schoolrooms and the need to hold construction costs down, there may be a temptation to put in less than enough electric lighting to provide a minimum of 30 footcandles, to feel that on a dark day children could be shifted from the poorest locations, or to consider that the program could be changed. Shifting the children would not accomplish much, because on dark days most desks are underlighted by daylight. Changing the program would seem undesirable in view of the small cost of meeting the ASA Standard, when spread over a period of years. The American Standard Practice for School Lighting calls for a minimum illumination of 30 footcandles on the desk. Too often designers overlook this point and provide an illumination that may maintain an average of 30 footcandles, but one that falls substantially below 30 in the weeks just before a cleaning.

Another point which should be mentioned is that potential savings in installation costs are not great if electric lighting is curtailed. Considering costs of wire, switches, panelboards, and labor, a 15-footcandle installation costs far more than half as much as a 30-footcandle installation.

There are things which can be said in favor of extra daylighting methods, apart from any economic considerations. For example, the author feels that too much consideration has been given to their effects on dark days and not enough to their effects on bright days. On the latter, there is a very cheerful feeling from the extra light in what used to be the darker side of the room. Furthermore, the higher illumination levels raise adaptation levels so that the sky brightness seen through the side windows is less glaring.

In short, both daylighting and electric-lighting systems have a place in school lighting, and neither should be considered to render the other unnecessary.

It is hoped that similar investigations will be made in more schools and in different climates and latitudes. However, on the basis of this investigation, it is evident that in climates equal to and darker than central New England, electric-lighting systems in schoolrooms should be designed for a minimum illumination of not less than that recommended by the American Standard Practice for School Lighting.

Sincere thanks are due to the superintendents, principals, teachers, and students who co-operated so cheerfully and efficiency in making this project possible.

references

lighting the audio-visual classroom

by Carl J. Allen*

One of the significant changes occurring in education is the increased use of audio-visual projected material. This greater use of audio-visual material is partly due to the outstanding success that the Armed Forces have had with this method of demonstration. The extent to which audio-visual material has increased is indicated by surveys which show that six times as many educational films are being used in schools today as were used in 1940. In the college field, it is estimated that 10 times as many educational films and audio-visual presentations are being used, as compared with 15 years ago.

Significant improvements have been made in the efficiency of lamps, the performance of projectors, and the reflectance characteristic of screens. This has led to the generally held belief that daylight projection is possible and that it is not necessary to darken classrooms. This, in turn, has led to most new schools being turned over to the teachers without any provisions for darkening the classrooms. A prevalent complaint from teachers is that it is difficult to show audio-visual presentations in these rooms because of the great amount of stray daylight which falls on the screen. It is possible, with considerable daylight in a room, to project satisfactorily black-and-white line drawings with high-output slide projectors using special directional screens—if one views the image from the projector position. However, if a colored slide is used in the same projector and viewed from one of the side seats, the results can be entirely unsatisfactory. The teacher viewing the same slide from beside the projector cannot understand this, as she is seeing a sharp, brilliant picture (Figure 1).

In order to understand fully the problem of audio-visual projection techniques, it is necessary to understand the limitations and capabilities of modern projection lamps, projectors, and screens—as well as the importance of proper room darkening and room lighting. The goal of room darkening is not to provide blackout, but dim-out conditions. The room should have subdued illumination, properly balanced, so that seeing is comfortable and concentration on the screen is enhanced.

It is generally conceded that audio-visual presentations should be conducted in the classroom and that the auditorium or special audio-visual room be used only for very long programs or for large groups. In many of the modern auditoriums there are no windows and the darkening problem does not exist, but in classrooms a dim-out daylight control is decidedly necessary.

projection lamps

A projection-lamp standardization program has reduced the number of commonly used projection lamps, such as used in school projectors, from over 100 types down to seven lamps. These seven will lamp at least 80 percent of the modern projectors used in schools. This standardization means, for one thing, that fewer lamps are necessary in the audio-visual center stock room. It also means better lamps, as manufacturing facilities can concentrate on less diversified production and thus improve lamp quality.

Only those lamps for which a projector is specifically designed should be used in that projector. Limitations of the optical and ventilation system of the projector limits the wattage of the lamp that can be used in a projector. Increasing the wattage of a lamp past a certain point may not significantly increase screen illumination. This same increase, however, might seriously overtax the ventilation system and cause trouble from excess heat.

Because projection lamps operate at high efficiencies, the temperature of the filaments, in most cases, is within a few hundred degrees of the melting point of tungsten. The typical projection lamp currently used has a 25-hr life. The 10-hr-lime lamp will deliver from 35 to 25 percent more light to the screen than the 25-hr-lime lamp. When comparing projectors, one should be careful that the lamps are of the same wattage, same life rating, and same rated voltage. Variation in rated voltage and difference in life rating can result in a difference of over 50 percent in light output from two projection lamps, both rated at the same wattage. Information regarding the lamp or lamps which should be used in a projector is available from the manufacturer.

projectors

The most commonly used projector is a 16-mm sound projector. The obvious reason for this is that more educational material is available on 16-mm sound film than on any other film medium. The next most commonly used projector is the 2"x2" projector, which also takes 35-mm slides and film strips. In addition to these two, there are four other types of projectors which are useful and very commonly used in schools. They are the 3½"x4" projector, the overhead projector, and the micro-projector.

While modern projectors are very effective in projecting clear and brilliant film images, they are not outstandingly efficient from the standpoint of utilization of the light available from the lamp. Using a 16-mm projector, for example, only 1½ to 2 percent of the light of the lamp actually reaches the screen. The 2"x2" and 3½"x4" projectors have approximately three times this efficiency, because they do not need shutters and because the aperture opening is not as restricted as that of the 16-mm. The opaque projector is the lowest in efficiency, since the light of the lamp must be reflected off a diffused reflecting surface such as the page of a book. In all the other projectors, the light from the filament of the lamp is directed by the lens system through a transparent medium of varying density or color.

The relative approximate potentials of various common types of projectors to produce illumination on the screen are compared (Table 1). The screen brightness in each of these cases was obtained by setting up each projector so that it would project about the same sized image, 3½"x4". The screen illumination was measured by a sensitive light meter located at the center of the screen. From this table it can be seen that a considerable amount of stray light might be permissible when using a large objective-lens, 3½"x4" projector, whereas prac-

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*School Lighting Specialist, General Electric Company, Nela Park, East Cleveland, Ohio.
tically no stray light is desirable when material is being projected by an opaque projector. The ratios of the screen brightness for these two projectors when the same wattage lamp is used in both is of the order of 36 to 1.

screens
There are three basic types of reflected-light screens that are in common use today. They are the beaded-glass screen, the processed metallic screen, and the white-mat screen. Each has its own use. If this use is not fully understood, the condition can easily arise where the teacher sees a very acceptable picture while the pupil sitting a few feet from her complains that he can hardly see the picture.

A close-up view of the three types of screens is shown (Figure 2A). A series of photos (Figures 2B, 2C, 2D) compares the brightness of the screen: from the position of the projector, zero-degree viewing; from a position slightly to one side, 22-degree viewing; and from a third position at a rather wide angle, 45-degree viewing. Obviously, there are certain seats in a classroom which do not give satisfactory viewing conditions with certain types of screens. The processed metallic screen is designed to reflect the light within a relatively small vertical angle, but to disperse the light in a rather wide horizontal angle. This is desirable when one considers that the students are generally seated in a cone-shaped pattern fanning out from the screen. The processed metallic screens, available in specially-processed silver and finely-ribbed aluminum, are available only in flat panels. The beaded screens have the advantage of being able to be rolled up and thus are more portable. For widest picture projector, the white-mat screen is best.

The beaded screen has the property of directing light back on the axis from which the light came originally. Thus the most brilliant image is seen from the projector position. Stray light from the window also is reflected back on itself and thus someone seated with his back to the windows will be disturbed the most by the reflections of the stray light from the windows.

The size of the screen for classroom use is generally specified as one-sixth of the maximum probable viewing distance. Usually a square screen is suggested, in order that horizontally and vertically framed slides may be projected equally well. The ratio of one-sixth is based upon consideration of seeing small details on the screen. When there is no small detail, this maximum viewing distance can be somewhat increased. In some classrooms, 30-in. screens are used and the students are seated closer to the screen. One natural advantage of the small screen is that significantly higher brightnesses can be obtained. For example, the brightness of a 30-in. wide screen will be four times the brightness of a five-ft wide screen when the same amount of light is projected upon

![Figure 1—student seated at one side of the projector does not see as brilliant a picture on a beaded screen as does the teacher standing beside the projector.](image)

### Table 1—Screen Illumination with Various Typical Projectors

<table>
<thead>
<tr>
<th>Projector image: 3'-4&quot; x 4'-.6&quot;</th>
<th>Lens</th>
<th>Lamp</th>
<th>Screen illumination (ft-c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3½&quot; x 4&quot;</td>
<td>4½&quot; diam, 18° E.F.</td>
<td>750 w</td>
<td>28</td>
</tr>
<tr>
<td>2½&quot; x 4&quot;</td>
<td>3½&quot; diam, 16° E.F.</td>
<td>750 w</td>
<td>24</td>
</tr>
<tr>
<td>2&quot; x 2&quot;</td>
<td>3, 7½° E.F.</td>
<td>750 w</td>
<td>60</td>
</tr>
<tr>
<td>1½ mm</td>
<td>3½&quot; diam, 16° E.F.</td>
<td>750 w</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1½&quot; diam, 16° E.F.</td>
<td>500 w</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1½&quot; diam, 16° E.F.</td>
<td>750 w</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1½&quot; diam, 16° E.F.</td>
<td>500 w</td>
<td>6</td>
</tr>
</tbody>
</table>

*With 80-percent reflectance white card in opaque projector.

### Table 2—Permissible Stray Light on Beaded Screen from Window Area

<table>
<thead>
<tr>
<th>Lamp size [w]</th>
<th>Screen illumination at ft-c</th>
<th>Screen brightness at ft-L</th>
<th>Maximum permissible stray illumination on screen*</th>
</tr>
</thead>
<tbody>
<tr>
<td>750</td>
<td>24</td>
<td>90</td>
<td>25</td>
</tr>
<tr>
<td>500</td>
<td>18</td>
<td>70</td>
<td>18</td>
</tr>
<tr>
<td>300</td>
<td>9</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>4</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>500'</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

*Hand-colored slide of light-colored interior scene in projector. Opaque projector with white card in projector for screen-brightness values and a photograph in projector for stray-light evaluation.
lighting the audio-visual classroom

both. This increase is inversely proportional to areas of the projected image. There is a very common practice, although not necessarily condoned, that TV screens are being observed at much greater distances than six times the screen width. It is important to note that a TV screen may be 10 to 15 times the brightness of a typically projected 16-mm motion picture. This partly accounts for the greater amount of room illumination that can be permitted with television as compared to motion-picture projection. Another reason is that many of the TV tubes are made of black glass and the reflected light is partly absorbed and not reflected to dilute the TV image.

One projection scheme which has met with fair success has been the use of rear projection. The size of the enclosing box is generally limited by the clearance width of typical classroom doors through which it must pass. Like the TV screen, much of the stray light which is incident on the translucent screen is transmitted through the screen and absorbed in the black interior. Older types of translucent screens were rather narrow in their viewing angle; translucent screens with specially-processed surfaces are now available, however, which perform similarly to the processed metallic screens.

**room darkening**

The trend today is not to blackout the classroom for audio-visual presentations, but merely to dim-out the daylight which might be striking the screen and washing out the projected image. Even with all the improvements in projectors, screens, and lamps, it does not take much stray light to dilute typical projected images to the point where they lose significant detail and offer an unsatisfactory visual impression. The results of one investigation to determine the maximum amount of stray light coming from the windows, which would tend to make a typical projected picture unsatisfactory, are shown (Table II). The criterion used by the observers was that the picture was unsatisfactory if significant details, which were clearly present under darkened conditions, were lost when the stray light was excessive. The exact maximum amount of stray light naturally will vary widely with various types of projected material. A four-part slide (Figure 3) was used in another test. One section was an Ektachrome slide (upper left), one a hand-colored slide (upper right), one a black-and-white photographic slide (lower left), and the last a black-and-white line drawing (lower right). The three photographic slides showed no significant difference in the amount of stray light. With a good projector, the black-and-white line drawing slide was still reasonably acceptable with 100 ft-c of stray light on the screen.

One of the principal problems in specifying the amount of darkening necessary for satisfactory projection is the great variation normally encountered in daylight. For example, on a sunlit day the outdoor illumination might be as high as 10,000 ft-c. On a dark, rainy day, the illumination might drop to only 100 or so ft-c. Daylight projection can be very satisfactory if a black-and-white line drawing is being projected while the observer is near the projector axis, and, if the day is not specifically brilliant and if there is no direct sunlight on the windows. When the sun is on the windows, even when typical roller shades are drawn, if a fairly dark-colored scene is being observed from a position somewhat off the projector axis, the conditions can be entirely unsatisfactory. Under these conditions it is desirable to block out nearly all of the stray light which may fall on the screen.

The simplest solution where individual windows are concerned is the use of roller shades of opaque material which overlap the windows by at least six in.
While these shades are usually black, they need not be, as long as they are essentially opaque. They may be any light color which harmonizes with the room interior.

The room-darkening device which seems to have met with the most favor is the drapery which can be drawn on curtain tracks over the entire face of the windows. There are plastic draperies available which are fire resistant and which have excellent wear- and tear-resistant properties. Draperies work especially well with unit window ventilators located beneath the windows. One basic reason why the draperies are popular is that they can be brought into use as fast as one can walk the length of the classroom to pull the draperies over the face of the windows. Draperies have also been used on curtain tracks which are located about 18 in. from the windows with 12 in. or 18 in. clearance from the floor, so that the windows may be left open for ventilation.

In addition to the use of draperies, glass-block lighted rooms may be darkened by double-hung roller shades which are mounted at the division between the glass-block area and the vision strip. One set of roller shades may be pulled up over the glass blocks and the other set may be pulled down over the vision strip.

Where complete darkening is desired, roller shades should be confined in light-tight side and bottom channels. In lecture rooms where darkening is required a good part of the time, roller shades are frequently operated by electric motors controlled with limit switches. Skylights may be darkened by roller shades which are held close to the opening by tight wires over which the roller shade slides. If the stray light is coming into the screen from the side or overhead, its washing out effect may be minimized by means of baffles around the screen.

Recent developments in Venetian blinds have produced a blind which closes tightly with very little light leakage. When used in conjunction with light-tight side and bottom channels, these full-closure Venetian blinds are a very effective means of room darkening. They also serve very well for the purpose of normal daylight brightness control.

**Room lighting**

It may seem paradoxical that after the room has been darkened the next consideration is to provide light in the room; however, it is generally agreed that a completely dark surrounding is not comfortable for viewing projected audio-visual material. The contrast between the screen and its surround is too great. On the other hand, too much surrounding light detracts from the projected images and if it falls on the screen it dilutes the sharpness of the projected image.

Most existing rooms will have no provision for dimming the existing lighting system. In this case, an indirect light which is part of the projector cart may be utilized. The indirect reflector lamp is controlled by a small variable autotransformer so that the illumination in the room may be varied from about one ft-c to complete darkness. About one ft-c seems about as much as is normally desired. The exact amount will vary with each type of projection and the position of the observer in relation to the screen. The double-pole double-throw switch was incorporated into this design in order to overcome the awkward situation when there is no light in the room between the time the room lighting is switched off and the time the teacher turns on the projector. When the double-throw switch is in one position, the indirect light is on at its full value and the projector is off. When the double-throw switch is turned to its other position, the projector is on.
and the indirect light is on at a subdued level, depending upon the setting of the autotransformer. With this arrangement, the lighting in the room may be varied to meet the requirements of the specific type of projection being done.

In new construction where incandescent lamps are to be used for general lighting, a double-pole double-throw switch can also be used to provide dim-out lighting by placing two of the rear lamps in series (Figure 4). Series operation of incandescent lamps is equivalent to operating the lamps at 50 percent of rated voltage, which results in a light output of about 10 percent of normal light output. Thus, if 30 ft-c are provided in the room when all six lamps are operated in series, about 6 ft-c can be provided when the four front lamps are turned off and the two rear lamps operated in series. The double-pole double-throw switch should be conveniently located in the rear wall of the room, near the probable projector location.

One audio-visual lighting scheme which has worked out very satisfactorily is a downlighting system in which the light is confined just over the seating area (Figure 5). In this case, 75-w R30 reflector lamps operated at full voltage will provide about 5 to 10 ft-c. This is too disturbing light for viewing typical projected pictures. The white page of a notebook becomes too bright in contrast to the brightness of a typical picture on the screen; further, the full brightness of the lamps, even when fairly well shielded, produces a sense of overhead glare under darkened-room conditions. When these same lamps are reduced in output by an autotransformer so that about one ft-c is provided on the desk, then the lighting arrangement is very comfortable from the standpoint of glare and also from the standpoint of brightness balance of notebook and screen. With this arrangement, there is no wash-out effect of stray light on the screen as the light is confined principally to the seating area.

In many lecture rooms there are no windows. The two rooms shown (Figures 6 and 7) illustrate common methods of lighting such rooms. One installation uses incandescent downlights; the light output is controlled by motor-driven autotransformer dimmers. The motor-driven dimmers may be remotely controlled and operated by push buttons either at the speaker's position or at the projection location at the rear of the room. The lecture room shown (Figure 6) is lighted by rapid-start fluorescent lamps which can be dimmed by recently developed circuits. The fluorescent lamps in the low-brightness etched-aluminum troffers in this room are also controlled by motor operated dimmers.

There are occasions when the instructor may wish to write in the dark at the time material is being projected on the screen. This is possible by using a "black-light" chalkboard. The reflector above the chalkboard utilizes a commercially available fluorescent chalkboard lighting reflector. Instead of the regular fluorescent lamp, it is lamped with a 40-w black-light fluorescent lamp equipped with a black-light filter. Using fluorescent chalks in the various available brilliant colors, writing in the dark can be very effective and dramatic.

**preparation of audio-visual material**

One additional consideration in the audio-visual picture is the preparation of slide material for good visibility.

Too often when one wishes to illustrate a talk, illustrations in articles or books are copied directly for slide use. This frequently results in too much and too small detail.

When one considers the preparation of material for a slide, one is concerned with the size of letter that should be used and with the thickness of lines if graphs or curves are involved. The information shown (below) is designed to give guidance in this respect. Letter sizes and line widths are given in terms of height of the illustration. Thus, if the available letter sizes are known, the height of the drawing may be determined. If the size of the drawing is known, then the ratio of letter height to drawing height gives the minimum-size letters which should be employed.

Based upon a minimum projected-letter-height of one in, for each 30 ft of viewing distance. The typical AMA eye chart with 20-20 vision being just able to see letters of one-in, height at 50 ft. Thus, the 1/50 H ratio considers the fact that everyone does not have 20-20 vision and for some the size of letters needs to be larger. The assumption is made that a screen width equal to 1/6 the maximum viewing distance will be used during the projection of the material. A convenient way of checking the relative visibility of letter sizes and line widths is to view the drawing or chart at a distance eight times the height of the chart. This is essentially the same formula as viewing the chart at six times the chart's width, as typical slide proportions, width to height, are about 1.25-1.33 to one.

There are many convenient means of lettering charts. Charts may be hand lettered or may be mechanically lettered by devices such as the Wrico or Leroy lettering guides. For dramatic three-dimensional lettering, molded letters of various styles are available. Precut gummed paper letters, available in a wide range of sizes, offer a convenient means of providing quite legible lettering for charts. Under certain conditions, the typewriter can be used. The electric typewriter is naturally best, because of its controlled pressure, and when used with carbon-paper ribbon gives excellent results. The regular pica typewriter with good black ribbon and clean type makes acceptable letters. The pica-size type typed on a 3"x4" card will produce letters of minimum acceptable size. If the same type is typed on a 3"x9" card, the size of the resulting letters projected on the screen will give good visibility for viewing distance of the order of six times the width of the screen.

Today, suitable equipment is available for making audio-visual teaching an efficient means of education. The various components—projectors, screens, darkening devices, and lighting—still need to be co-ordinated so that a teacher can use audio-visual projection with a minimum of classroom interruption. It might be well to reflect that the teacher-blackboard combination is a very old but still very effective audio-visual team. If audio-visual projection is to be as long lived and as successful, it too must be easy and effective to use.
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spec small talk

reefer modular

It was 2 a.m. I had just gotten through reading "Modular Grid Lines" in the May-June 1955 issue of the Bulletin of the AIA. I tried to sleep, but could not. C. E. Silling's burning slogan, "Organize, Systematize, Modularize," kept gnawing at me relentlessly. I searched for comforting distraction in other literature: alas, without avail! The fates were working into the other side of the street. I fell to reading "Facts and Features Exclusive with Sta-Kold, Vinco and Sno-Queen Refrigerators and Freezers," only to discover that their interiors were frighteningly modularized. Yes, sir, the gizzards of these boxes are interchangeable—interiors can be changed in minutes—no tools needed. Each and every interior is adjustable to take all or any combination of refrigerated drawers, stationary or pull-out meat rails, stationary or pull-out shelves, and baker's pan slides. Friends, this is possible only through the use of patented, exclusive accessories. You know, at 2 a.m. this can cause an everlasting trauma. Victory Metal Manufacturing Corporation, Germantown Pike, Plymouth Meeting, Pennsylvania, Conshohocken 6-5000, the manufacturers, when defrosted will tell you that they fathered the first and only refrigerators in the world to win the Institutional Feeding and Housing product-of-the-month award. Undoubtedly, users will be delighted with the reefer quick change-overs to provide dough retarders (note to myself—when I arise in the morn I must not forget to send a bill for that job finished four months ago or else my dough will be retarded permanently), a salad or dessert, or a meat storage refrigerator. Storage requirements at the beginning of the week can be varied to salad or dessert, or a meat storage refrigerator. Each refrigerator has a full-length coil, automatic defrosting, slideout compressors for easy servicing and automatic interior lights. All-metal construction, coved edges, and ball corners are standard. Interiors, exterior sides, door and bottom grill are all stainless steel. The Sta-Kold model has stainless steel on the fascia exterior of the door kick plate and the balance is of corrosion resistant aluminum. The Sno-Queen baby has stainless steel on the fascia and kick plate, white deluxe on the exterior of the door and sides, balance aluminum. Porcelain exterior and interior are available for more dough. Top, back, and bottom are aluminum. Bottom kick plates are heavy stainless steel. Compressor and motor units are hermetically sealed for trouble-free performance. And 15 to 90 cu ft models are available in self-contained, remote and pass-through units. Gosh, I'm hungry. Will I ever fall asleep? Good nite. Zz-zz-zz.

By this time I guess you must know of my fine print compulsion reading. Went to see the play "Bad Seed" and found myself reading in the playbill the following:


It was then that I got a sneaky idea for ethical advertising by architects. In such a list of credits one could include with propriety simply: "Architecture by Post, Pendentive, and Piloti."

price vice

All right, so I'm price conscious. When I ride along the highway and note (where the road is torn asunder) those road torches that look like hot-footed hilliard balls, I wonder how much they each cost. How about those heavy-duty water-proofed tarpaulins? And then that lime-slaking boxes? And those concrete chutes, collapsible horse heads, roof crabs, post-hole diggers, common trestles, midget louver, and reversible safety shoes. There, I'll bet you thought I acquired my first ulcer by merely contemplating my navel.

1. $5
2. 10c per sq ft
3. $40
4. $2.20 per ft
5. From $1.20 to $3.50, depending upon the horse's weight.
6. $5
7. $3.75
8. $2.65 per ft
9. 25c and up
10. $3.25 per pair

chucking lug

The other day I was watching a stripper in action doing a pickle roll and an occasional side thrust when during a bump up a breakdown developed in the cast. The impact of an off center kiss by this model played bob with the flow lines of the cast which naturally sent the boss on a bender. Lest I give the impression that I am eccentric or off center in any way, may I hasten to explain that the italicized words form part of a very interesting glossary of terms commonly used in connection with brass forgings as issued by Copper & Brass Research Association.

Have I been a bore? Sorry!

December 1955 121
new colors... new designs

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Again—Elastic U. S. Naugahyde sets the pace in vinyl upholstery design. Striking new patterns... rich new textures...
a completely new spectrum of colors. For samples and information
write U. S. Rubber, Coated Fabrics Department, Mishawaka, Indiana.

*Patent applied for

United States Rubber
In presenting examples of an interior design element that adds unique life and beauty to any area, we have chosen to show interior planting that is actually gardening, not merely a grouping of potted plants placed as afterthought accents. Such use of integral planting is part of architectural planning, a component of the room's original design. Our examples include five different uses of planting in houses, one in an office building lobby, one in a church.

In the residential category, Architect Neutra extends both pond and planting into the living room to bring the outdoors in; the Hunters, in their own home, utilize an entire hall as a "growing room," selecting materials and equipment that permit indoor gardening; Wilson, Morris & Crain extend a hearth to include a planting area, locate the planting under plastic dome skylights for best growing conditions; the Kecks use planting and a view window for an extraordinary effect in an entrance hall; and Architect Charles Gilman Davis and Landscape Architect Elizabeth Ames Davis provide a horticultural-hobbyist client with a planting area oriented to natural sunlight. In an office building, Neutra landscapes the lobby by bringing an outside planting strip into the interior. Architects Thorshov & Cerny use planting as a partial screen for the baptistry tank in a church, particularly apt setting for living growth.

Landscape Architect James C. Rose makes these suggestions: 1. Locate interior planting areas where they may receive best natural light, or, if this is not feasible, locate artificial lighting for both growing help and for decorative effect. 2. Allow adequate space for plant composition, so that plants will not be too crowded to grow. It is most advisable to consult with a plantsman at the time of planning the planting area, to make sure just how much space the plants actually need for growing room. 3. Provide for adequate drainage. 4. In designing planted areas, accomplish a spatial feeling through height variations, hanging plants as mobiles, sculptural compositions of plants related in scale to the entire room area.
Design Theory: Hall from main house to bedroom utilized as indoor gardening area to compensate for long winters and short gardening season. Plant area has no bottom, but has specially prepared soil down to natural grade, to reduce need for frequent watering. Slate floor and stone walls permit watering by hose. Radiant heat in floor for quick drying and desirable humidity. Large window faces south.

Color Plan: Natural tones of grey slate and stone, gray-stained fir, natural birch, as background for greens of plants.

doors and windows
Doors: solid-core 1 1/4" plywood/United States Plywood Co., 55 W. 44 St., New York 36, N. Y.

lighting
Recessed Ceiling Lights: General Lighting Co., 248 McKibbin St., Brooklyn, N. Y.
Surface Swivel Fixtures: Kurt Versen Co., 4 Slocum Ave., Englewood, N. J.

walls, flooring, ceiling
Floors: 12" x 12" slate tiles installed on concrete slab/ sealed with Hornglaze wax/O'Brien Co., Granville, N. Y.
Stairs: Honduras mahogany.
Ceiling: 3'x6' panels of white birch plywood/ Bradford Veneer and Panel Co., Bradford, W.
example house
location Houston, Texas
architects Wilson, Morris & Crain

data

Design Theory: Planting located under plastic-dome skylights for best growing conditions—and esthetic effect. Room somewhat "woodsy" in character, with continuous glass doors on east looking into heavy tree shade outside.

Color Plan: Floor, joists, and walls warm dark brown. Ceiling, stone and fabrics in pink-beige tones.

cabinetwork
Concealed Cabinets: in wall paneling.

doors and walls
All: V-joint redwood, 1'x6'.

windows
All: Arcadia Metal Products Co., 324 N. Second Ave., Arcadia, Calif.

furniture

flooring and ceiling
Floors: concrete/ painted.
Ceiling: Tectum Div., Alliance Mfg. Co., 105 S. Sixth St., Newark, Ohio.
data

Design Theory: Entrance hall, leading to living room at left, bedrooms at right, as seen from front door. Natural materials, window placement, interior planting relate interior to outdoors.

Color Plan: Monochromatic grays of natural materials.

window

Plate Glass: "Thermopane" sealed, double glazing/ Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo, Ohio.

walls, ceiling, flooring

Walls: Joliet stone, gray.
Ceiling: acoustical plaster.
Floors: Vermont slate flagstone.

example | house
--- | ---
location | Hinsdale, Illinois
architects | George Fred Keck & William Keck
example house
location Portland, Oregon
architect Charles Gilman Davis
landscape architect Elizabeth Ames Davis

data

Design Theory: Designed around client's interest in specimen house plants. Free-flowing open plan, an expression of continuity of space.

Color Plan: Wood walls stained medium gray; living area, deep blue with coral trim at planting box; ceiling, light gray; fireplace, red brick, with copper hood.

windows

walls, ceiling, flooring
Ceiling: lightweight plaster/ painted.
Floors: polished concrete/ waxed.
example: office building  
location: Los Angeles, California  
architect: Richard J. Neutra

data
Design Theory: To introduce some feeling of outdoors in an insurance office, lobby was landscaped. Outside planting strip continues into lobby (through glass partition).

Color Plan: light-colored terrazzo; glass, both clear and acid-treated corrugated; walnut; stainless steel.

doors and partitions
Glass Partition: acid-treated, corrugated/ Mississipi Glass Co., 88 Angelica St., St. Louis 7, Mo.
Stainless-Steel Column: Wagner-Woodruff Co., Los Angeles, Calif.

furniture and fabrics
Furniture: patented metal spring supported chair/ birch table/ designed by Richard J. Neutra/ executed by Fred Epping, Los Angeles, Calif.

flooring
Entrance: terrazzo.
data

Design Theory: Denomination practices baptism by immersion and planting is used here as partial screen for baptismy tank. When not in use, tank is covered with mahogany Formica top. Access to tank is through door leading from choir room.

Color Plan: Blend of "naturals" (terrazzo, travertine, redwood, brick, oak, mahogany), with contrasting painted walls.

doors and windows
Doors: "Roddiscraft"/solid-core flush doors/Philippine mahogany veneer/Roddis Plywood Corp., Marshfield, Wis.
Windows: aluminum sash/single glazing/Formica Corp., Wausau, Wis.

lighting
Fixtures: brass and glass/Lightolier Co., 346 Claremont St., Jersey City, N. J.

furniture and fabrics
Chancel Furniture, Lectern, Pulpit: redwood and aluminum/architect-designed.
Plant Box: Winona travertine/mahogany top/Formica Co., 4620 Spring Grove Ave., Cincinnati 32, Ohio.

walls, ceiling, flooring
Walls: Chicago common brick; Plaster, painted/The Martin-Senour Co., 2520 S. quarry St., Chicago 8, Ill.
Ceiling: firred, acoustical plaster/off-white/Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.; nave/Redwood T&G boards/clear stain.
Flooring: aisles, chancel/Minnesota travertine stone; under pews/terrazzo.

example
location
Minneapolis, Minnesota
architects
Thorshov & Cerny, Inc.
A decorative arts exhibition at the Bertha Schaefer Gallery, 32 E. 57 St., New York, represents important artist-craftsmen whose creative work lends itself aptly to interior architectural use. The weavings of (Miss) Franklin Colvin are applicable as tapestries, space dividers, draperies. Hugh Wiley's mosaics may be used as table tops, as wall pieces, as murals. Boris Chatman's ceramic medallions set in a composition are usable both as table tops and as framed wall pieces.

**Useful Arts:** (right) Mosaic wall panel by Hugh Wiley/ retail: $300; sheer fabric for drapery or wall panel handwoven by Franklin Colvin/ retail: $200; hand-sculptured stool, applewood seat, hickory legs, 25" high/ by Wharton Esherick/ retail: $50; pivot-top table, natural finish walnut/ designed by Bertha Schaefer for M. Singer & Sons/ retail: $150; (below) handwoven panels, 50"x18", combining yarns, textures, piles in vivid colors/ by Franklin Colvin/ retail: $75 apiece.

**Table-Tops:** (left) ceramic medallions/ diversified designs and colors/ set in composition, plywood-mounted/ by Boris Chatman/ retail: $320; (above) pebbles/ Italian mosaics of black glass and marble/ set in Swedish putty/ plywood-mounted, brass-strip framed/ by Hugh Wiley/ retail: $270.
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Parkland Memorial Hospital, Dallas. Roscoe DeWitt, Architect
Albert H. Scheidt, FACHA, Consultant, Dallas
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Three designs for business offices, introduced by the Executive Furniture Guild of America, in settings created by George W. Reinoehl, with furniture by Stow & Davis Furniture Company, 80 Front Ave., S.W., Grand Rapids, Michigan.

1. Natural walnut furniture, with muted green leather upholstery, the color matched in the Spinning Wheel Rugs wool carpet, the Martin-Senour Co. wall paint. Natural cowhide tiles by Eagle-Ottawa Leather Co. finish one wall and floor corner. Curved lighting panel with brushed brass down lights custom-designed, executed by Stamford, Inc.

2. Office for a woman executive, with emphasis on blue, repeated in varying tones in the leather upholstery on bleached walnut chairs, the tambour front of the storage cabinet, the carpet, the draperies. Pewter accessories repeat the pewter feet and ferrules of the furniture.

3 and 4. Views of the “Life Extension Office.” Its key feature is a remote-control system with control panels both in the desk and in the conference areas. This “Sigmacon” remote control unit, developed under the direction of George W. Reinoehl and executed by Michigan Bell Telephone Co., provides a telephone system equipped with transmitter-receiver amplifier as well as conventional hand set; dimmer controls for all lighting; an inter-com system with both conventional and amplifier combinations; mechanical control of doors, curtains, temperature; a panel unit which includes tape recorder, TV and hi-fi equipment, as well as a kitchen. Vivid green leather upholstery on the ebony-finished furniture is matched in the handwoven upholstery by Rancho Fabrics. Carpet is gold. Silk shantung draperies by Isabel Scott Fabrics Corp. and woven straw wall covering by Murals, Inc., are white.
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Scandinavian Fixtures: (left) #16523/ cone-shaped metal shade, mat finish, in white, red, or blue, 10” high, base diameter 13½”, designed by Poul Henningsen of Denmark; retail: $19.50; (below) #148/181-1/ tepee-shaped translucent plastic, in red, cocoa, white, 16½” high, base diameter 7”, designed by Hans Bergstrom of Sweden; retail: $35/ Georg Jensen, 667 Fifth Ave., New York 22, N. Y.

Library Furniture: designed for Cincinnati Public Library (see page 77)/ steel rod "A-frames," black semigloss baked enamel finish, lend themselves to many variations; units are flexible, inexpensive, hold maximum capacity, occupy minimum space, do not interrupt visual supervision; all work surfaces of Formica/ shelves of birch or maple/ standard shelf length is 4½ ft; (right) "A-frame" with detachable shelves; (below) "A-frame" with periodical rack; (bottom) "A-frame" with sit-down reference shelf/ chairs by Brunswick-Balke-Collender/ units designed by John R. Burquist of Woodie Gerber & Associates/ Backus Bros., Inc., 214 E. Third St., Cincinnati, Ohio.
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| Diagram of Kennatrack Series 600 sliding door hardware | Kennatrack Series 600 sliding door hardware is designed for quality wardrobe installations of 1 3/4' to 2' in doors/ door weight is evenly distributed over 8 self-aligning nylon wheels for finger-tip operation/ extruded aluminum double track automatically assures correct spacing between doors/ heavy gauge steel hangers have threaded vertical adjust for exact alignment of door to jamb. New nylon Kennaguides which screw to floor can be used without saw kerf in bottom of door/ center spacer goes between doors/ side guide goes at outside of each door and are slotted for easy adjustment.

The Kennatrack "Architectural Portfolio" gives you full information for detailing this complete line of sliding door hardware/ its scaled detail drawings save you valuable time/ write manufacturer for free copy/ Kennatrack Corporation, Elkhart, Indiana.
Two pamphlets containing engineering data on heating and cooling units designed especially for schools. Both present information on proper selection and application of units; both give sample problems, cross-section drawings of units, and layout drawings of temperature-control system. First brochure describes cooling, heating, and ventilating unit for classrooms in mild climates where outdoor air can usually be used for natural cooling; second brochure explains operation of ventilator unit for auditoriums, gyms, or swimming pools. Herman Nelson Div., American Air Filter Co., Inc., Louisville 8, Ky.


114. Electronic Controls for Heating, Ventilating, and Air Conditioning (SA-2418), 46-p. reference guide on electronic equipment prepared especially for architects and engineers. Contains data on component parts of control systems; gives diagrams of 17 typical electronic systems. Also provides data sheets explaining control panels; specifications. Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.


116. Broan Fans, ALA 39-D-1 (55), 8-p. catalog giving information on ventilating fans for bathrooms and kitchens. Features fan with motorized exterior door to prevent heat losses when unit is not operating; also shows wall and ceiling fans for horizontal or vertical discharge. Drawings, dimensions, details of installation in frame and masonry construction. Broan Mfg. Co., Inc., 1669 N. Water St., Milwaukee 2, Wis.


118. Architectural Woodwork: Cabinet Construction Data, AIA 19-D (5), most recent booklet in series on architectural woodwork. Features outstanding group of details of custom-designed cabinets and casework chosen from P/A Selected Details; shows classroom storage units, office furniture, residential storage walls, and kitchen cabinets. Architectural Woodwork Inst., 332 S. Michigan Ave., Chicago 4, Ill.

121. Vertical Furring, AIA 20-B-1 (14), 4-p. technical bulletin giving information on both braced and freestanding vertical furring. Specifications provide complete data on installation of furring; tables list maximum allowable heights for furring as well as maximum stud spacing; details show construction of furred recess suitable for metal lockers or built-in cabinets. Metal Lath Manufacturers Assn., Engineers Bldg., Cleveland 14, Ohio.
216. Principles of Warm-Air Floor-Panel Heating, AIA 39-A (CM-108), 24-p. manual discussing basic concepts of warm-air panel heating as applied to floors constructed of hollow-concrete ma­sonry units. Outlines general heating fac­tors affecting comfort; explains principles of panel heating. Descriptions and iso­metric drawings show several methods of circulating warm air; notes give pertinent data on design and installation of system. National Concrete Masonry Assn., 38 S. Dearborn St., Chicago 3, Ill.

217. Lightsteel Technical Manual, AIA 13-C (SS8), 16-p. booklet present­ing data on lightweight-steel framing system. Large-scale isometric details show steel sections in wall, floor, roof, and ceiling assemblies; drawings also cover typical window and door details. Provides information on installation of vapor bar­riers and thermal insulation; gives data on connection of lightweight members to steel or concrete structure. Penn Metal Co., Inc., 265 E. 42 St., New York 17, N. Y.

218. Duraface Foundglas, AIA 37-B, 4-p. folder illustrating ceramic-faced insulating block; gives information on design and installation of system. Large-scale isometric details show data on design and installation of system.

219. Reynolds Architectural Aluminum, AIA 15, portfolio enclosing 102 pages of data sheets on aluminum sections. Provides section drawings, details, and dimen­sions for all standard thresholds, sills, handrails, and copings; presents data on structural sections as well as embossed sheet aluminum. Also includes information on nonwarehouse items. Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

220. Unistrut Metal Framing, AIA 14-C (700), 78-p. catalog describing metal framing system. Outlines procedure for design of beams and columns; illustrates stand­ard channel sections and special connec­tors. Drawings show use of framing for pipe supports, lighting-fixture hangers, or shelving; tables give electrical and piping symbols as well as pipe sizes. Unistrut Products Co., 1013 Washington Blvd., Chicago 7, Ill.

221. LaBelle Cut Nails, 12-p. booklet ex­plaining properties and advantages of cut­steel nails. Gives dimensions and draw­ings of specially hardened cut nails for finishing, work, flooring, or furring; also describes cut nails for masonry or build­ing-block construction. Photos; compar­i­tion of value of cut nails vs. wire nails. Wheeling Corrugating Co., Wheeling, W. Va.

doors and windows


310. Columbia Tension Screens, 8-p. brochure containing information on alumi­num tension screens. Lists advantages of screens held tightly against opening by tension; describes installation in ordinary double-hung windows as well as in case­ment units. Includes data on narrow­frame and tubular-aluminum-frame screens. Photos; specifications. The Columbia Mills, Inc., 120 W. Onondaga St., Syracuse 2, N. Y.

311. Paul Heineley's Movable Shutters, 8-p. booklet illustrating movable wood shutters. Photos show installation in resi­dential and commercial interiors; drawings explain sizing of shutters to fit unusually shaped openings. Installation details; di­mensions; specifications. Paul Heineley's Movable Shutters, P. O. Box 190-A, Santa Monica, Calif.


313. Overline Entrances, AIA 16-A (701), 8-p. pamphlet illustrating steel-framed en­trances. describes satin-finish stainless­steel frames in addition to baked-enamel finish available in 11 colors. Sections show basic designs in narrow-framed glass en­trances; tables give standard dimensions. Installation details; data on hardware. Overly Mfg. Co., Greensburg, Pa.


315. Steel Doors and Frames, AIA 16-A, 8-p. publication containing information on steel doors. Presents advantages of steel for interior doors and sliding closet doors; provides typical details for doors installed in plaster or drywall construction. Photos; recommended specifications for doors and frames. The Steel Door Inst., 2130 Keith Bldg., Cleveland 15, Ohio.

electric equipment, lighting

406. Panel-Glo Systems (43), 32-p. engi­neering report on modular luminous ceil­ing system. Discusses special construction of vinyl ceiling panel which also diffuses conditioned air; gives complete descrip­tion of light-transmission factors and acous­tical properties. Presents recommendations for design of suspension system and air conditioning where luminous ceiling is used; contains comprehensive data on in­stallation of lighting fixtures. Benjamin Electric Mfg. Co., Des Plaines, Ill.

407. C-lestor System, 4-p. pamphlet on system of remote-control presetting of lighting arrangements—suitable for TV studios, theaters, and exhibitions. Ex­plains operation of system designed to hold almost unlimited number of lighting set-ups; describes functions of master con­troller, console, and relay and breaker cabinets. Drawings. Century Lighting Inc., 521 W. 43 St., New York 36, N. Y.


409. Smithcraft Architectural Troffers (493C), 36-p. booklet featuring improved troffer-type lighting fixtures. Details show installation of troffer fixtures in several familiar types of ceiling construction; drawings and charts contain data on fix­tures in one-ft or two-ft widths. Also (Continued on page 147)
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410. School Building (B-6521), 32-p. brochure prepared to serve as guide in initial planning of lighting and electric facilities for modern schools. Discusses requirements of electrical system in terms of flexibility, performance, safety, space, and economy; describes types of systems suitable for school use. Also provides data on lighting fixtures. Drawings; photos. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.


607. Simplex Radiant-Acoustical Ceiling, AIA 39-B, 4-p. folder on suspended-ceiling system integrating radiant and forced-air heating or cooling with acoustical treatment and lighting. Explains principle of heating or cooling by both tempered air and radiation; describes acoustical qualities of perforated metal ceiling with additional insulation above panels; shows installation of lighting fixtures in suspended ceiling. Drawings; specifications. Simplex Ceiling Corp., 552 W. 52 St., New York 19, N. Y.

sanitation, water supply, plumbing

704. Scotch-Brand Products, 16-p. publication on polyvinyl-chloride-backed tape to protect pipelines from corrosion. Charts outline physical properties of tape, including insulation values; photos show application of tape at job site. Also contains data on electrical tape for protection of splices and connections. Dept. E5-299,

Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.

specialized equipment

804. Allenco Fire-Protection Equipment, AIA 29-E2 (150), 44-p. bulletin on fire-equipment cabinets, hose connections, and extinguishers. Features new equipment cabinets with removable glass-retaining strip to facilitate replacement of broken glass; describes several types of water- or chemical-filled extinguishers; illustrates many kinds of hydrants. Details; dimensions; specifications. W. E. Allen Mfg. Co., 566 W. Lake St., Chicago 6, Ill.

Jensen Guide to High-Fidelity Loud Speakers in Homes and Institutions (A-1060), 36-p. manual on design and construction of high-fidelity loudspeaker systems for music areas. Describes eight matched-
component speaker kits planned for economical, built-in installations; gives simplified details and data for design of acoustically correct speaker enclosures. Available only on direct application to Jensen Mfg. Co., 6601 S. Laramie Ave., Chicago 38, Ill. 50c.

surfacing materials
904. Slate Chalkboards, AIA 35-B-I, 16-p pamphlet outlining advantages of slate chalkboards for school installations. Emphasizes contrast between black slate and white chalk for easing vision; gives data on cost comparison of slate and other chalkboard materials. Pennsylvania Slate Producers Guild, Pen Argyl, Pa.


906. Finishing of Philippine Mahogany, AIA 19-E, 8-p. circular explaining several methods of finishing mahogany. Color photos show how finishes appear on both light-red and dark-red mahogany; instructions tell how to achieve illustrated effects. Also contains recommendations for obtaining successful results in finishing woods. Philippine Mahogany Assn., Inc. 111 W. Seventh St., Los Angeles 14, Calif.


908. Vikon Porcelain-on-Aluminum ™ Tile, 8-p. catalog containing actual samples of porcelain-enamel aluminum wall tiles. Includes small-size tiles in all 12 colors as well as larger tiles to show actual size and bevel; outlines fireproof, lightweight, and chip-resistant features of aluminum tiles. Recommendations for installation; dimensions; specifications. Vikon Tile Corp., Washington, N. J.

interior furnishings
34. Contemporary Home Designed * Around the Kitchen (1), first in series of portfolios enclosing photos of homes especially designed by well-known architects to emphasize importance of the kitchen. Plans and exterior view present medium-priced home designed by Architect Robert A. Little; cut-away view shows completely equipped kitchen-laundry area in relationship to rest of house. Frigidaire Div., General Motors Corp., Dayton 1, Ohio.

Risom Contemporary Furniture, 34-p. book presenting furniture designs by Jens Risom. Photos show designs for chairs, sofas, tables, desks, cabinets, and headboard available in light birch or walnut finish; description gives data on fabrics and dimensions of each piece of furniture. Also contains elevation drawings. Available only on direct application to Jens Risom Design, Inc., 49 E. 53 St., New York 22, N. Y.

35. Colorama Styling by Steelcase, 14-p. 36. Convertibles by Steelcase, 28-p. First of two pamphlets on steel office * furniture includes color plates of scenes from Arizona desert which inspired color styling of office units; color photos show furniture in desert sage, mist green, metallic gray, and blond tan. Second pamphlet covers each unit in more detail; drawings and photos show how desks, cabinets, bookcases, and files can be combined to suit variety of office functions. Gives data on clamps which interlock units to form efficient work center; provides dimensions of desk units and chairs. Steelcase Inc., Grand Rapids, Mich.
pride of the community!

Gentle Community Building, Houlton, Maine. Alonzo J. Harriman, Inc., Auburn, Maine, Architects and Engineers

foot-friendly NORTHERN HARD MAPLE

The air of hospitality that beckons the townspeople of Houlton into their new Community House is repeated with cordial emphasis within. The warm, "foot-friendly" comfort of resilient, Northern Hard Maple Flooring extends its own invitation. Activities room, dance lounge and gymnasium-auditorium—all are maple-floored, for enduring, low-cost "housekeeping" and maintenance. We believe you'll agree, the building's low $7.75 unit cost ($123,750 for its 10,000 square feet) bespeaks to some degree the economy of "the finest floor that grows." Write for latest literature, or consult Sweet's (Arch. 12K-MA).

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Listed by Underwriters' Laboratories, Inc.

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3 Plants • 10 Warehouses • 36 Sales Offices
Chromalox, electric room heater of unbreakable, all-metal construction (left), gives positive protection against moisture and rough usage. Heating element bonded to back of radiant-heating plate consists of nickel-chromium resistor wire packed in high-density insulating refractory. Width, 26"; height, 23”; extends 3” from wall. Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.

Fiberglas-reinforced, built-up roofs reduce roofing failures and help cut down costly repairs by decreasing cracking or “alligatoring.” Such a built-up roof (below) with gravel finish requires one less layer of bitumin and felts than a conventional bonded roof. Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

Self-contained Weathermaker for universal application (left) has matching plenum and specifically designed five-way-air-return base accessory. Employs water-cooled refrigeration and is available in sizes of 2-, 3-, and 5-hp. Return air is brought through bottom of unit making it possible to move desks and other furniture directly against solid front panel. Twenty-two-carat gold-plated control cluster is located at center of panel. Carrier Corp., Syracuse 1, N.Y.

Kaylo-20 (right), a new heat insulation product used primarily as covering for pipes and vessels, withstands temperatures of 1800 F. Made of hydrous calcium silicate, this product has the advantage of expanding slightly up to 1100 F. Completely immersed in a test furnace at 1800 F, shrinkage is limited to about 1½ percent. Pipe insulation is produced in thicknesses and diameters from ½” to 39”. Owens-Illinois, Toledo, Ohio.

Powers Type H Hydroguard shower control (above) has only one dial to turn and requires only one hole in tile wall. Combined with safety, comfort, and water conservation features, this thermostatic shower control is ideal for practically all types of occupancy. Also available for exposed wiring installations. The Powers Regulator Co., 3400 Oakton St., Skokie, Ill.

Unitrol 400, gold and silver thermostatic control for gas water heaters (left), combines a snap-action thermostat, a thermomagnetic automatic pilot, and large-capacity gas cock. Fits snugly against water-heater shell, but can be easily removed without removing immersion unit. Grayson Controls Division, Robertshaw-Fulton Controls Co., Long Beach, Calif.
Only 18 Days From Start to Finish! Averaging 3000 sq. ft. per day, workmen spraying 3 coats of acoustical plastic on Cofar completed each floor in only 3 days—the entire job in 18 days!

Handles easily, places fast—Cofar units arrived at the job site conveniently bundled and identified for immediate placing. In 8 days, 5 workmen had placed and welded Cofar into position—ready for concrete pours several days ahead of ordinary forms.

Wood forms eliminated—Because Cofar eliminates bulky, expensive wood forms, limited storage space on the job site was used to maximum advantage. Once installed, Cofar forms a solid, safe, sheltered working deck for all trades.

1 floor every 4 days—Fast Cofar construction helped to make up 60% of an 8-week delay. Concrete pours were made in 4 days per floor, more than 50% faster than with ordinary forms. Tight laps between Cofar units kept wet concrete from leaking.
Addition to Yorktowne Hotel, York, Pa.
Architect: Roy Stiff, St. Louis, Mo.
Hotel Consultant: J. G. Jackson & Associates, St. Louis, Mo.

Hotel Consultant—J. G. Jackson says: "Cofar, sprayed with acoustical plastic, cut our ceiling-floor construction cost 42¢ per sq. ft.—an amazing saving! Also, this new kind of ceiling eliminates the possibility of future damage from plumbing leakage."

Job Superintendent—Norman Babner reports: "Our limited working area was not cluttered up because Cofar eliminates wood forms. Clean-up operations were cut because concrete does not leak through tight Cofar units."

Architect—Roy Stiff says: "Thanks to Cofar, we've made a definite saving in time, money and high labor costs. The Cofar and acoustical plastic ceilings offer distinctive beauty and secure the best fire insurance rating obtainable."

Cofar® sprayed with acoustical plastic cuts ceiling-floor construction costs 42¢ per square foot!

Five men install 8 floors of Cofar in 8 days in new York, Pa., hotel addition

YORK, PA.—In the 8-story addition to the Yorktowne Hotel, a new kind of ceiling made of Cofar (combined form and reinforcement) sprayed with acoustical plastic has saved almost $9500 in building costs.

Roy Stiff, architect, reports: "Cofar's attractive corrugated pattern contributes a distinctive architectural effect. By eliminating expensive suspended or conventional plastered ceilings, Cofar, sprayed with acoustical plastic, saves 12" to 18" in wasted ceiling height... saves structural materials by reducing the over-all height of the building."

Says Norman Babner, job superintendent for R. S. Noonan, Inc., York, Pa., contractors: "Cofar cost only 7¢ per sq. ft. to install because the easy-to-handle units are quickly placed and welded. Once installed, Cofar forms an immediate, sheltered work platform for electricians and plumbers. Cofar placement and concrete pours averaged 4 working days per floor. With conventional forms, the same area would take 2 weeks. And, because Cofar requires minimum support, our shoring costs were only 1½¢ per sq. ft."

Cofar deep-corrugated steel units save weeks of construction time, provide earlier occupancy, help make your client's building dollars go further. For information, estimates or costs on your building project, contact home or district office, attention Dept. P-6.

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air and temperature control

Spotaire LRC Conditioner: air-conditioning unit, designed expressly for multistory structures, allows individual-room temperature control with centralized supply system. Unit, installed at ceiling, is regulated by three-speed wall switch; piping from centralized supply delivers chilled or hot water for cooling, ventilating, filtering, or heating. Rubber-mounted motor with special 1/2" shaft insures quiet vibration-less operation. Conditioning equipment is also available without enclosure for built-in installations. Drayer-Hanson Inc., 3301 Medford St., Los Angeles 63, Calif.

Webster Heating-Cooling Conditioner: air-conditioning unit, for use with centralized supply system, features year-round, individual-room temperature control. Unit consists of coil, filter, three-speed fan, and drip connection; chiller and boiler, connected in parallel, supply hot or cold water. Enclosure, sized to fit in standard stud spacing, is equipped with directional louver to spread conditioned air throughout room; quiet operation is achieved by rubber-mounted motor and fan. Warren Webster & Co., Camden 5, N. J.

Flexi-Cool Conditioner: new cooling unit, for small commercial buildings and homes, is adaptable to wide variety of installation requirements. Cooling-cycle section alone can be added to existing furnace; where space is limited, blower and cooling coil can be installed as unit with condenser located in remote area; entire unit can be placed in remote location and connected via conditioned area by ductwork. Cooling unit, for use with air- and water-cooled condenser, may be located in crawl space, closet, basement, or garage; unit is suitable for floor or ceiling installation, in vertical or horizontal position. Worthington Corp., Harrison, N. J.

Perspec Partitions: new steel partitions achieve custom-designed appearance through flexibility of arrangement, size, and surfacing materials. Designed on expansible module, sections will accommodate glass, 3/8" or 2" steel panels, and 3" flush steel panels; 2"x2" frame section also carries concealed wiring. In addition, wide variety of surface treatments—such as cork, wood, wallpaper, and textured foil—may be specified by architect. Aetna Steel Products Corp., 730 Fifth Ave., New York 19 N. Y.

Blok-Joint: rubber control joint for masonry construction provides protection from leakage through mortar joints. Control joint, with cross-shaped section, fits in vertical masonry joints and compensates for wall movement due to contraction or stresses on building; in addition, control joint relieves strain on wall section in which it is installed. Rubber joint is supplied in lengths up to 50'. The Carter-Waters Corp., 2440 Pennway, Kansas City 8, Mo.

Foil-Lined Fiber Ducts: aluminum-foil lining in fiber ducts improves performance of warm-air perimeter heater. Rigid-fiber tubes, embedded in concrete slabs on grade, distribute warm air to perimeter registers; foil duct lining, chosen for great reflectivity and low emissivity, increases efficiency of heat flow. Lightweight ducts, which will support 200 lb per lineal ft, are manufactured in diameters from 4" to 8"; sections are joined by standard galvanized joints and fittings. International Oil Burner Co., 3809 Park Ave., St. Louis 16, Mo.

K System: two-oz iron clip, used with lightweight steel beams, results in savings of time, materials, and money. Small clips, three in. long, fit over top flanges of beams; plywood forms for concrete floor rest on clips. After concrete is poured and hardened, exposed section of clip is knocked away, allowing plywood form to drop free. Structure is given added rigidity, since clips permit concrete floor to extend below top flange of beams. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
GRATELITE is to form what verse is to prose: A more harmonious, inspiring vehicle of thought... which creates a mood, an atmosphere of warmth and richness.

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doors and windows

Dual-Glazing Adaptor: new device for sliding-glass doors permits use of double glazing in climates where glass doors were previously considered impractical. Adaptor, which fits on standard door frame, holds double-glass panes; snap-on vinyl beading prevents air infiltration at frame. Adaptor is engineered to keep weight of heavier glass panes centered over track for smooth operation. Ador Sales, Inc., 2345 W. Commonwealth Ave., Fullerton, Calif.

LSA KoolShade Sunscreen: metal insect screen also provides protection against glare. Screen is made up of louvers 1/20" wide, spaced 23 to vertical in.; louvers are tilted at 24° angle—said to be ideal angle for maintaining proper illumination levels while eliminating solar heat. Screens, which require no adjustment, are claimed to give greater protection to window six ft high than structural overhang 15 ft deep. KoolShade, Reflectal Corp., 310 S. Michigan Ave., Chicago 4, Ill.

sanitation, plumbing, water supply

Precise Cleaning System: centralized vacuum-cleaning system is designed for low-cost residential installations. Vacuum unit is installed in basement or utility room; baseboard outlets and switches are located at convenient points throughout house; expandable hose, fitted with cleaning attachments, connects to outlets. System, which eliminates noise and dust, can be installed in new or existing homes. Precise Mfg. Co., Inc., 2561 S. 67th St., Philadelphia 42, Pa.

specialized equipment

Best Coffee Maker: completely automatic, electronically controlled coffee maker reduces brewing costs and saves labor time. When machine is turned on, correct volume of water, at proper temperature for brewing coffee, flows through extractor and seeps through grounds; water supply in tank is automatically replenished and heated. Compact design permits easy servicing and cleaning; built-in safety device prevents excessive steam pressure. Best Products Co., 2618 W. Addison, Chicago 18, Ill.

surfacing materials

Cork-Tex Underlay: cork cushion for resilient-hardwood or flexible-tile flooring laid on concrete eliminates need for subfloor. Composition material, made from high-grade milling cork, is available in 3/8" and 1/2" thicknesses; cork mat is also claimed to reduce sound reflection and lessen noise transmission through floors. Bond Crown and Cork Div., Continental Can Co., 100 E. 42 St., New York 17, N. Y.

Wood-Block Flooring: flexible-strip, end-grain wood flooring is made specifically for gymnasiums, shops, laboratories, and locations subject to rough wear. Flooring is assembled from 1 1/2" or 2" kiln-dried pine blocks, wire trussed together in strips; lengths of flooring are then interlocked with patented steel-wire splines. Special finishing compounds are added to give extra wear resistance and bring out pattern on end-grain blocks. Jennison Wright Corp., 2460-66 Broadway, Toledo 9, Ohio.

Creo-Dipt Shakes: two new factory-primed, red-cedar shakes offer greater variety in exterior appearance for development homes. Sanded-face shake features smooth surface; 18" hand-split shake is genuine cedar shingle at economical price. Both types of shingles as well as earlier scored-surface shake are available in 20 different colors at no extra cost. Creo-Dipt Co., Inc., N. Tonawanda, N. Y.
MODERN DOOR CONTROL BY LCN - CLOSERS CONCEALED IN HEAD FRAME

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Construction Details on Opposite Page
A CONSTRUCTION WALL is no stronger than its weakest segment. Ruined foundations commence their deterioration when dampness, moisture or water penetrate weakened areas. Once breached, a poorly waterproofed wall soon becomes a serious and expensive problem. Contractor reputations are injured when water damage occurs.

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**p/a reviews**

**valuable essay**

Italy's Architecture Today. Carlo Pagani. Ulrico Hoepli, Corso Matteotti 12, Milan, Italy, 1955. 293 pp., illus., L.5.500

Pagani has a cosmopolitan and comparative view of his own country and he also knows all of Europe and America from coast to coast. With his office in Milan he has the forward-looking metropolitan attitude of the North Italian industrial civilization and shares its doubts about the political influences which, in the past, made of the architects around the courts of Vittore Emanuele and of Mussolini, cautious diplomats or bombastic eclectics.

About 1900, "Art Nouveau" began in Milan. Rationalism took up the antihistorical ideas of the great futurist architectural essayist and graphic artist Sant Elia, who might have been an architect of European significance but for his early death in World War I. Pagano, Terragni, and the writer Persico were the leading figures of the so-called rationalist movement between 1930 and 1940.

The war, with its catastrophic devastations, tested once again the resilience of Italian humanity. Over and over again through history foreigners have destroyed the beautiful countryside of Italy, outraged her cultural monuments of the past, toppled her economy.

During reconstruction, men like Ernesto Rogers warned against deficient, substandard rehousing. Industry recovered speedily and engaged on its own part in rehousing, although rarely with an excellence equal to the Olivetti achievement, which was guided by a superb spirit of social consciousness and desire for an over-all view of the problems of planning. The government itself has shown far less of this spirit.

The APAO, the movement for organic architecture, owes much of its humanly forward-looking spirit to (Continued on page 162)
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TO ARCHITECTS, ENGINEERS

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Bruno Zevi, who had been in America and had become an admiring friend of Frank Lloyd Wright. Rome again revived its role as the center from which a mental and architectural climate began once more to spread all over Italy, despite the veering and turning of a Capital's politics.

At this time of a high tide in quality production, it would be impossible to name the many fine architects who honor not only their own great country by their work, but also many foreign nations into which these Italian designers have extended their influence.

The neatness of workmanship in Italian building surpasses that in almost all other countries of the world. Italy leads most other lands also in the number and average quality of its many architectural students, who are taught by excellent professors and served by a number of well-edited periodicals of varying approaches.

Pagani's book may perhaps be considered too impartial by many of his countrymen who have, more often than American architects, very militant and vital convictions. For the foreign reader, however, the lack of bias must seem an advantage, and he can endeavor to form his opinion from the wealth of splendid illustrative material. Richard J. Neutra

**Studies in the Functions and Design of Hospitals.** Oxford University Press, 114 Fifth Ave., New York 11, N. Y., 1955. 185 pp., illus., $15

Just as I finished reading this book, I received a letter from a friend, a member of the Institute of Architects of Brazil, telling me of his trip to Europe this summer. In Sweden and England, my friend "became acquainted with their fine institutes on hospital research." In this country, we are still in the talking stage,
except for a mild beginning by the American Psychiatric Association.*

The Report under review is that of a team sponsored by the Nuffield Provincial Hospital Trust and the University of Bristol, England. The title of the report implies that the design of a hospital must follow its functions. This may be news to those in our profession who resent the discipline of function and who would reverse the logic by making function fall in line with "design." (Nevertheless, I hope, in my lifetime, to see F.L.W. design a hospital after "firing all the experts," because I cannot suppress the desire to see whether the magic of an esthetic approach would make a good hospital.)

This volume is just the beginning. Research is infinite and involves experimentation. It is rather difficult to experiment with the existing structures of the English hospitals, because most of them have been built in accordance with the standards of Florence Nightingale in Queen Victoria's reign. These involve a series of closely spaced long pavilions, connected by a corridor. In the usual 30-bed ward, the beds are ranged 15 to a side with heads against the outside walls, high narrow windows occupying the intervals between the beds. (Your reviewer had a hand in trying to break down this precedent when, in a 1932 competition, he and an English architect submitted premiated designs which, contrary to a specific program requirement that the design must follow Florence Nightingale, were based on the Rigs system.)

In consequence of the above condition, the investigating team concerned itself largely with reviewing hospital planning literature in the U.S., Switzerland, France, and Sweden. The team also did much observ-

(Continued on page 166)

*At the last session of Congress, $1,200,000 was authorized for hospital research, and the American Architectural Foundation, Inc., is currently soliciting funds to conduct research in hospital planning and in other fields.

*The Scarborough Hospital, Scarborough, England.
The vast musical literature of the world is limited to a maximum of 13 tones in any one octave . . . similarly there is a very wide range of harmonious effects to be obtained with Waylite Masonry walls of any thickness . . . a few of the different handlings are shown here . . . they are achieved very simply. . . . Waylite masonry has adequate structural strength—superior thermal insulative qualities—and exposed Waylite interior walls need no acoustical treatment.

Waylite Co., 20 N. Wacker Drive, Chicago, or Box 30, Bethlehem, Pa.
**Perimaheat**

**Baseboard Convectors**

SUPPORT BRACKET for front cover and element hanger is specially designed to support and facilitate the installation of a bypass or return tube entirely within the cabinet.

DAMPER or SPLITTER (optional) can be installed at any time—now or later. Dampers are held in place by retainers snapped into top groove and can be set in any position from fully open to fully closed. Splitters attach to support brackets.

ONE-PIECE BACK AND TOP facilitates easy installation—eliminates air leakage and streaking. Cabinet is suitable for surface mounting or partially recessed installation.

FRONT COVER has smooth, easy-to-clean surface—snaps firmly into place without screws yet is easily removable for access.

HANGERS support and cushion strip allows heating element to move noiselessly with expansion and contraction.

HIGH CAPACITY HEATING ELEMENT consisting of aluminum fins mechanically bonded to a 7/8" O.D. copper tube. Fin collars and tube form a double-walled continuous metal transfer surface that assures maximum heating efficiency.

The Young Radiator Company is a member of the Convectors Manufacturers Association and subscribes to the engineering standards of that association.

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For new or remodeling jobs. Can also be installed semi-recessed.

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Unit provides maximum floor space. Front panel projects but 1/2 inch from wall.

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Slanting top designed for institutions where frequent floor cleaning makes wall hung units desirable.

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Just 12" high for placing beneath picture windows. Free-standing or semi-recessed.

Quick warm-up, high capacity sleek, easy-to-clean cabinets

Lightweight, non-ferrous Perimaheat element responds quickly to thermostatic control. There's no lag in heating-up, no overrun. Maximum output is obtained with a minimum of length. Streamlined Perimaheat enclosure is designed to be inconspicuous, and is finished in neutral gray for easy painting to match any decorative theme. For further Perimaheat details, see the yellow pages of your telephone directory for nearest Young Representative or write, YOUNG RADIATOR COMPANY, Dept. M-245, Racine, Wisconsin.

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Details on a 
**BEETTER PENCIL**

(MARS TECHNICO with Mars Lumograph lead)

- Mars Technico clutch mechanism; made of brass for longer life. Noiseless, smooth working, almost frictionless. Serrated to lock lead in place. Grips 0.3" of lead.

- Brass tip; 6 bands of serrations prevent slipping.

- Mars-Lumograph lead; ribbed to hold securely. Does not flake or smudge; so opaque, inking-in is unnecessary.

- Mars Technico tubular brass insert, houses the lead. Threaded at base for positive locking of clutch mechanism in place.

- Housing; kiln-dried cedar for light-but-sturdy construction.

- Total weight only .47 oz.

- Spring; 2" long, made of fine steel for proper tension control of clutch mechanism.

- Mars Technico push button; for instantaneous release or adjustment of lead; with brass lead-sharpener, recessed in push button; easily removable. Keeps lead sharpened without spreading graphite dust in work area.

(Continued from page 163)

**reviews**

In terms of what is being currently planned in the U.S., the proposed nursing units strongly resemble the plans in the U.K., the hospital is concerned, the team concentrated its studies on the nursing unit, referred to in England as the ward, and on the design of hospital additions to be used for later experimentation. These additions, now being built, are also primarily nursing units.

In terms of English precedent, what is being proposed is veritably revolutionary as compared even with up-to-the-minute Florence Nightingale, at least in respect to the abolition of the 80-bed room and the placing of beds parallel to the outside wall instead of perpendicular to it. In terms of what is being currently planned in the U.S., the proposed nursing units strongly resemble the

(Continued on page 170)
for the home of **TOMORROW**

**SPLIT-BUS**
circuit breaker type
**SERVICE EQUIPMENT**

© Split-Bus Service Equipment has been specifically designed to solve the ever-increasing problem of expanding residential power demands.

Approved by the Underwriters' Laboratories, Inc., for label service, these units provide capacity for electric ranges, water heaters, driers, air-conditioning, etc., and sub-feeder to additional outlets of distribution.

The units are of the panel base assembly type. They have 100 or 200 amp., feeder capacity for single phase solid neutral service.

The 100 amp. unit is of two types — one having space for four double pole and 10 single pole branches and the other for six double pole and 10 single pole branches. The 200 amp. unit also makes provision for six double pole and 10 single pole branches.

The new units plus a stock of individually-packaged © T-M and QP thermal magnetic quick-make and quick-break plug-in type circuit breakers, meet almost any requirement.

Include these new units in all residential type of construction. Your nearest © representative, listed in Sweet's will be glad to tell you about them. Or see your © distributor for this Service Equipment.

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**SPECIFIC DATA ON SPLIT-BUS SERVICE EQUIPMENT**

<table>
<thead>
<tr>
<th>CATALOG NO.</th>
<th>AMP. MAIN CAPACITY</th>
<th>MAXIMUM NO. BRANCHES</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>© SE4DPL100-8SPL50</td>
<td>100</td>
<td>4</td>
<td>9&quot;x18&quot;x3½&quot;</td>
</tr>
<tr>
<td>© SE4DPL100-10SPL50</td>
<td>100</td>
<td>6</td>
<td>9&quot;x24&quot;x3½&quot;</td>
</tr>
<tr>
<td>© SE6DPL100-10SPL50</td>
<td>100</td>
<td>10</td>
<td>9&quot;x24&quot;x3½&quot;</td>
</tr>
<tr>
<td>© SE6DPL200-10SPL50</td>
<td>200</td>
<td>6</td>
<td>9&quot;x24&quot;x3½&quot;</td>
</tr>
</tbody>
</table>

Circuit Breakers are © T-M and QP, thermal magnetic, quick-make and quick-break. Capacities are 10 to 50 amps. Two pole common trip plug-in type circuit breakers also available in new units. Adjoining single pole branches can be fitted with handle extension for double pole, individual trip operation.

---

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service equipment • safety switches
load centers • Quikheter

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December 1955 167
CONCRETE
Shell Roof Provides
Distinctive, Economical Pool
in Seattle

Economical construction and unobstructed inside space were main reasons for choosing a concrete shell roof for the Seattle park department’s swimming pool at Green Lake. The 64’ x 110’ roof is supported only at the end walls. It forms a curve with a 54’ radius and arches to 25’ above the normal pool water level. The concrete in the roof tapers from 6” thick at the end walls to 3¾” in a distance of 4’.

Concrete shell roofs can span up to 300’ and more without supporting columns. That’s an important consideration in auditoriums, garages, warehouses, hangars, gymnasiums, exhibition buildings and train sheds and repair shops.

Concrete shell roofs are low-annual-cost investments. They are economical to build, need little or no maintenance, have long life and low insurance rates. Write for free literature. It is distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION Dept. A12-25, 33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work
Safe, glare-free illumination
for world's largest underground garage

No more circling weary blocks looking for a place to park in Chicago's busy Grant Park area.

Now you swing your car off the street down a ramp to the new Grant Park Underground Garage. There's space there for 2359 cars in 787,000 square feet of floor space.

Lighting in this garage, wherein 90% of the cars are self-parkers, must provide for quick adjustment from natural to artificial illumination. "Avenues" must be bright—but free of accident-causing glare and shadows. Walkways must be safe for pedestrians on their way to and from their cars.

High efficiency Corning Alba-Lite lightingware was selected because it meets all of the requirements for safe lighting established by the Chicago Park District. Alba-Lite is a translucent opal glass. It transmits 60-65% of the light and diffusely reflects 25-30% for an efficiency of greater than 90%. And Alba-Lite transmits the true color of the light source.

In this area where discoloration of lightingware by exhaust fumes could be an expensive maintenance item, easy-to-clean Alba-Lite again proves a wise choice. Nor will time ever dim Alba-Lite's sparkling appearance.

For additional information about Alba-Lite and other Corning-engineered lightingware—louvering, diffusing, and prismatic—use the form below.
Cuts Cost of "In-And-Out Handling"*

with Kinnear Steel Rolling Doors

*"In-and-out handling" is involved wherever merchandise or materials must be moved through doorways—in shipping, receiving, warehousing, processing, or production scheduling. It takes a continuous bite out of profits if door equipment isn't of highest efficiency.

That's why, along with such time-savers as loading platforms that adjust quickly to any level, this newest John Wanamaker store features Kinnear Steel Rolling Doors.

You see one of these doors in action above. Note that it opens and closes straight up and down. Merchandise stacked door-high or higher, only an inch or two inside or outside the door, won't hamper its operation. The door coils compactly above the opening, out of the way and safe from damage. Wind can't slam it shut or bang it back and forth.

When closed, Kinnear Rolling Doors give all-steel protection against wind, fire, weather, theft, and vandalism.

Heavy galvanizing (1.25 ounces of pure zinc per square foot, ASTM standards) gives the rugged steel curtain extra resistance to corrosion.

In addition, a special Kinnear Paint Bond makes field-applied finishes cover better and adhere longer.

In industrial and commercial applications alike Kinnear Rolling Doors offer "more, for less, for longer".

Built any size, for old or new construction, with motor, manual, or mechanical operation. Write for information on any door need.

The KINNEAR Manufacturing Company

FACTORIES:
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1742 Yosemite Ave., San Francisco 24, Calif.

Offices and Agents in All Principal Cities
Attractive, modern Miami, Florida, guest house, designed by Robert Fitch Smith, AIA, features glowing beauty of translucent reinforced plastic panels on 40% of outside walls.

Reinforced plastic panels spark fresh, functional design ideas!

Include functional beauty in your home designs with versatile fibrous glass reinforced plastic panels—a truly modern building material. Architects have already discovered many exciting new applications for these beautiful, durable, low-cost panels. For example:

Patio roofing, fencing, skylights, partitions, awnings made of reinforced plastic panels offer smart, lasting beauty. Your clients will appreciate them in all these installations because they require minimum maintenance, won't shatter, dent or fade.

These richly colored lightweight panels are rustproof, rotproof, weather-resistant, with a high strength-to-weight ratio and excellent dimensional stability.

Monsanto's contribution to the quality of these panels is a dependable supply of their basic raw materials: phthalic, maleic and succinic anhydrides, adipic and fumaric acids plus styrene monomer.

For help in finding dependable suppliers for polyester resins and custom molders of reinforced plastics, call your nearest Monsanto office, or write Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Box 478-U-8, St. Louis 1, Missouri.
$100 SAVINGS PER DOOR!

Four big reasons why these Fenestra Hollow Metal Door units can give you this tremendous saving on every single door opening in your next building!

1. Fenestra* Hollow Metal Doors cost you less at the very start, because you get production-line economy—not custom job costs. They are mass produced on special jigs that avoid expensive time and labor.

2. You save time—these doors come to your job complete with pre-fitted door, frame and hardware specifically made for each other. There’s no expensive lost time in planning, ordering and assembling special elements.

3. You save on installation costs because these complete units need no cutting, no fitting, no mortising or tapping. One carpenter with one screwdriver can install the door in minutes!

4. You save year after year on maintenance because Fenestra Hollow Metal Doors can’t warp, swell, stick or splinter. They always open easily, smoothly. They close quietly because inside surfaces are covered with sound-deadening material.

There’s a door for every purpose in the Fenestra line: Entrance Doors, Flush or Regular Interior Doors with glass or metal panels, Doors with the Underwriters’ B Label. For photos and details, write the Detroit Steel Products Company, Dept. PA-12, 5409 Griffin Street, Detroit 11, Michigan.

Your Fenestra representative will be glad to demonstrate this "packaged door"—show you specifically how it can save you big sums of money. Ideal for schools, hospitals, offices and commercial buildings of all types.

Fenestra | HOLLOW METAL DOOR • FRAME • HARDWARE UNITS

Architectural, Residential and Industrial Windows • Metal Building Panels • Electrifloor* • Roof Deck • Hollow Metal Swing and Slide Doors
In airports, where height is a hazard, buildings hug the ground. They grow OUT instead of UP. And because steam must travel great distances, there can be a marked loss of heat in long piping runs. Here space is valuable too, so areas to house boilers must be kept compact. Such was the problem at the San Francisco International Airport. Solution called for space-saving boilers large enough to supply steam to the remote corners of the sprawling airport buildings, and with sufficient reserve to compensate for transmission heat loss. Kewanee reserve plus rated boilers were selected because they offered a compact installation with enough power to guard against heat loss, yet maintain required temperatures. Kewanee Boilers assure savings in fuel and maintenance since they operate at "cruising speed" with 50% more power built-in to provide for piping, pickup and additional capacity requirements. So be safe—be sure—select Kewanee.
everyone talks about the weather...

...But Arcadia solved the weather problem with Twin-Seal Wool Pile Weatherstripping — another important point of difference between Arcadia and other sliding glass doors.

On Arcadia’s new custom aluminum door, shown below in a section at the latching jamb, a positive weather-seal is made by a double row of opposing wool pile weatherstrips. Wind, rain, cold and dirt are locked out tightly. Identical strips at head and interlocker, and a spring-loaded wool pile sill strip complete the four-side weatherseal. Twin-Seal Weatherstripping, fully silicoated for moisture and abrasion resistance, is easily replaced without dismantling the sliding panel.

Twin-Seal Weatherstripping is just one Arcadia point of difference you should know about. For complete details on Arcadia steel and aluminum doors, see the Yellow Pages under “DOORS, Sliding.”

reviews

(Continued from page 170)

and the larger the unit the more economical it is in terms of personnel. The other point is that, after careful evaluation, the team report gives its blessing to the 6-bed room. (Accordingly, while the first experimental unit is based on the 4-bed alcove, the second is based on the 6-bed unit.) I have advocated the first solution on many occasions, and have frequently been considered kin to savage for defending the second.

I cannot refrain from criticising the manner in which stairs are used in the first experimental building (I presume in obedience to a pseudo-aesthetic consideration), blocking the ends of the nursing unit and depriving it of view, light, air, and possible future expansion. In the second building, the above defect is corrected.

The team also studied the operating suite (theater). And one of the experimental buildings will have a suite of two operating rooms built on the new plan, which is also a radical departure from English precedent. It resembles the U.S. prototype, but actually lies between the elaborate European precedent, where adherence to techniques is enforced by physical arrangement, and the U.S. plan, which leaves aseptic techniques largely to the discipline of the operating-suite personnel.

The study of the outpatient service is the best we have seen and those of us who do not wish to design by guess or by taking someone’s word for it will find this chapter most valuable.

The chapters on the physical environment within the hospital are generally interesting, but would be considered rather primitive as compared with our best practices in the design for control of sound and in the mechanical specialties such as heating and ventilating, fire protection, etc. Daylighting, in this chapter, has most to offer, as some very interesting ideas are presented.

The chapter titled “Some General Considerations Affecting Design” is (Continued on page 176)
5 ideas for distinctive, trouble-free gable ends...

1. Masonite Panelgroove—Newest member of the Presdwood family, Panelgroove presents clean-cut vertical grooves every 4" giving an attractive plank effect. Ship-lapped edges.

2. Panel and Batten—Sturdy panels of Tempered Presdwood with wood batten strips create this popular and appealing design. Use as many batten strips as desired on 4' wide panels.

3. Masonite Shadowvent—The famous Presdwood lap siding that makes other methods obsolete! No visible nails. Patented aluminum shadow strip is vented to minimize moisture problems.

4. Masonite Ridgewood—Combed textured surface of this new Presdwood affords a rich-looking, distinctive design that harmonizes with any other siding treatment. In panels, lap sidings or shingles.

5. Masonite Tempered Presdwood Panels—Economical to buy and apply. Won’t twist or swell out of shape when simple instructions are followed. Takes and holds paint without checking or crazing.

Weather-defying Masonite Presdwood® products offer a refreshing variety of interesting treatments for gable ends, short runs, accent areas and other exterior applications. Strong, firm and grainless, they resist moisture and temperature changes permanently!

These are just a few of the hundreds of ways that versatile Masonite Presdwood products can help you put more user-satisfaction in your houses. Offered in 44 types, textures and thicknesses, Masonite Presdwood is available through lumber dealers everywhere. For detailed architectural specifications, write Masonite® Corporation, Dept. PA-12, Box 777, Chicago 90, Ill. In Canada: Gatineau, Quebec.

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MANUFACTURER OF PRESDWOOD PANEL PRODUCTS
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INSIST on DFPA grademarked fir plywood! EXT-DFPA and PLYSHIELD for outdoor use... PLYPANEL for paneling, built-ins... PLYSCORD for sheathing... PLYBASE for underlayment... PLYFORM for concrete form work. Other grades for other uses.

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reviews

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perhaps the weakest. It is understandable only as an effort to include at least something on such important topics as orientation, external noise, architectural character, etc., but I am confident that subsequent "investigations" will really come to grips with those topics.

Curiously, the chapter on "Planning to Meet the Demand," or, as we would say, "Measuring the Need," comes at the end of the book rather than at the beginning, as would be normally expected. This, of course, is really a clear indication of the intent of the whole book. It is not meant to be a pompous pronouncement to settle all hospital problems once and for all, but an intelligent and, to me, an inspiring beginning.

ISADORE ROSENFIELD

the secluded retreat


Almost everyone has a desire to own a camp or cabin on a wooded lake in the mountains, along a quiet river, or on a sandy dune or rocky shore along the ocean. But not everyone has the urge and know-how to build his own. This book is aimed at the man who, chiefly for reasons of economy or because he feels it will be a challenge to his ability as well as sound occupational therapy, wants to build his own summer retreat.

This is much more than just another simple "how-to-do-it" book. Livingston is an architect, builder, and technical adviser, and has thorough acquaintance with the type of building and construction he discusses. His approach to the subject, while inspirational to some extent, is highly practical, clearly presented, and readily understandable. Under his expert guidance here one can find all the details for constructing a summer cabin set forth step by
step—from the laying of the foundation to the interior furnishings. Rather than offering too many confusing ideas and suggestions, Livingston starts off with the plans and specifications for ten units, ranging from a simple yet appealing cabin that can be built for less than $1,000 to more elaborate camps and cottages.

Some of the 10 cottages are planned around simple core or starter units—that is, a one-room arrangement that is sufficiently flexible so that other rooms can be added later on. An analysis of the plans for these cabins reveals how relatively simple and inexpensive the construction is, yet nothing is sacrificed to make them attractive in appearance. They are designed for easy informal living and all provide the one essential requirement for buildings of this nature—maximum light and air.

To supplement his own ideas for a variety of summer cabins, the author has included a small portfolio showing plans and photographs of summer homes that have already been built. These are the work of recognized architects of this country and Canada. Each has been selected to show particularly practical and attractive plans and exterior details that anyone can readily incorporate in his own cottage.

FRANK A. WRENSCH

first regional study
Architects for the South. Southern Regional Education Board, 830 W. Peachtree St., Atlanta, Ga., 1955, 40 pp.

Architects for the South comprises the final report of the Commission on Architectural Education in the South which, in 1953 under the egis of the Southern Regional Education Board, undertook an appraisal of the profession and its schools in the 14 states of the region. The Commission included educators, practitioners, and (Continued on page 178)
The COMPANY TREASURER knows

... that safety against slipping on plant floors is an unseen factor in the balance sheet.

... that every plant equipped with ALGRIP Abrasive Rolled Steel Floor Plate reduces its accident rate ... its lost man-hours of production ... its compensation payments ... and its insurance rate ... Because ALGRIP ... the world's only abrasive rolled steel floor plate ... has a surface that makes slipping practically impossible ... on level floor or incline ... wet, oily or greasy ...

And because ALGRIP's controlled-depth of abrasive penetration in the plate assures a constant, enduring anti-slip floor surface.

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**1953 injury rates**

| FREQUENCY RATE | 0.0000 to 0.0060 | 0.0061 to 0.0120 | 0.0121 to 0.0180 | 0.0181 to 0.0240 | 0.0241 to 0.0300 | 0.0301 to 0.0360 | 0.0361 to 0.0420 | 0.0421 to 0.0480 | 0.0481 to 0.0540 | 0.0541 to 0.0600 | 0.0601 to 0.0660 | 0.0661 to 0.0720 | 0.0721 to 0.0780 | 0.0781 to 0.0840 | 0.0841 to 0.0900 | 0.0901 to 0.0960 | 0.0961 to 1.0000 |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| TRAMINATING   | 0.22            | 0.20            | 0.18            | 0.16            | 0.14            | 0.12            | 0.10            | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| ELECTRIC      | 0.18            | 0.16            | 0.14            | 0.12            | 0.10            | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| AUTOMOBILE    | 0.16            | 0.14            | 0.12            | 0.10            | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| A-UNIT TRANSPORT | 0.14          | 0.12            | 0.10            | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| ISOL.         | 0.10            | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| JUNKED         | 0.08            | 0.06            | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| TREASURER      | 0.04            | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| SULFUR         | 0.02            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |
| UNITS         | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            | 0.00            |


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A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

ALGRIP—Approved for Safety by Underwriters' Laboratories.

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Other products: A.W. SUPER-DIAMOND Rolled Steel Floor Plate—Plates—Sheets—Strip—(Alloy and Special Grades)

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reviews

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other interested persons. Prof. Paul M. Heffernan served as Consultant.

The need for the study arose in the question as to whether the region's existing schools of architecture will be able to meet the profession's future demands for trained personnel. The answer required estimates of the number of architects needed by the region in 1960 and 1975, the enrolments needed to support this corps, and the school capacity required to take care of the resulting educational load.

In arriving at these estimates, the Commission adopted methods of projection first introduced by the AIA Commission for the Survey of Architectural Education and Registration in its report *The Architect at Mid-Century: Evolution and Achievement*. Additional data was obtained by special tabulations of the responses to the AIA 1950 Survey of the Architectural Profession. In the one new analysis introduced in the southern study, a ratio of the number of census-enumerated architects to the value of New Construction is attempted. Unfortunately, the validity of this ratio is highly questionable because data on New Construction derived from Department of Commerce reports includes much more than New Building Construction. For example, the AIA Commission estimated that New Building Construction represented 60.8 percent of New Construction in 1940 and 73.5 percent in 1950. Happily, however, the use of this misleading ratio does not vitiate the principal arguments of the present study.

The report finds that "projected enrollments in Southern schools of architecture, based on expected overall increases in college enrollment, will be more than sufficient to produce enough architects during the next 20 years to allow for the range of growth estimated for the profession." The chief conclusion of the report—that the inevitable expansion

(Continued on page 182)
At new Parkside School, Hartford City, Indiana . . .

FOAMGLAS roof and wall insulation makes electric heating system practical

The new Parkside School at Hartford City, Indiana was designed to take full advantage of the low installation cost and the operating economies possible with electric heating. According to architect T. A. McConnaughey, stay-dry FOAMGLAS roof and wall insulation was a major factor in making that type of heating system practical at Parkside. He says:

"Constantly effective building insulation is a 'must' for maximum operating efficiency of an electric heating system. We picked FOAMGLAS because it can't absorb the moisture that destroys the effectiveness of ordinary insulations. We can depend on it to retain its original insulating value continuously. Once installed, we can forget it."

Mr. McConnaughey concludes, "FOAMGLAS also gave us these construction bonuses: Its strength and rigidity prevent it from sagging or buckling after installation. Its fireproofness means added building safety. The ease with which it can be fabricated made it possible for us to imbed electric conduits in the under surface of the roof insulation . . . without impairing performance."

Parkside School is one of hundreds across the country where FOAMGLAS furnishes dependable, long-lasting insulating protection . . . not only for roofs and walls, but for ceilings, floors, piping and equipment as well. Why not find out today how you can best use this unique cellular glass insulation in your designs for schools and other insulated buildings. Write us for a sample and detailed literature.

Pittsburgh Corning Corporation
Dept. AB-125, One Gateway Center
Pittsburgh 22, Pennsylvania

In Canada: 57 Bloor St. W., Toronto, Ontario

Workman is shown grooving the under surface of FOAMGLAS block to accommodate electric conduit. Cutting into the block's surface does not affect its moisture resistance.
reviews

(Continued from page 178)

of educational facilities needed to accommodate these enrolments should be centered in existing schools—parallels exactly the recommendation of the AIA Commission.

Beyond its specific utility for the South, the report also has national significance in that it is the first regional study to follow the directions and methods established by the AIA Survey. Thus, it lends additional emphasis to the opportunity provided by co-operative analysis and planning which should encourage other states and regions to investigate their own future needs and resources in professional education. For this reason, Architects for the South should be studied by all forward-looking architects and educators.

TURPIN BANNISTER

Mumford re-visited


Remarkably few architectural critics have found the means to discuss the subject in such a way that it interests the layman as well as the professional. Even fewer have had the wit to view architectural expression in relation to time and space and the social milieu in which it appears, rather than as a museum-like series of isolated buildings. In both respects, Lewis Mumford is a notable exception. And it is a revealing experience to re-read these two early Mumford volumes—Sticks and Stones, that appeared originally in 1924, and its companion volume, The Brown Decades, that appeared in

(Continued on page 194)
The SECOND NATIONAL BANK BUILDING, now being completed at Houston, Texas is another of America's outstanding buildings with aluminum curtain walls and aluminum windows by General Bronze. This new, 24-story building will not only be Houston's largest and most modern building but will also be its first all-aluminum building.

As the pioneer in aluminum curtain wall construction and the foremost fabricator of fine aluminum windows, General Bronze has a world of practical experience to offer architects. This experience, gained from such well-known jobs as the Alcoa Building in Pittsburgh, the U.N. Building, Lever House, 99 and 460 Park Avenue Buildings in New York City, The Equitable Life Assurance Society Building in Milwaukee, the Texaco Building in New Orleans and others is at your service. Why not call in the General Bronze representative as you plan new buildings. He can be of real assistance to you. Our catalogs are filed in Sweet's.
**Novafold**

**SOLID CORE PLASTIC DOORS**

— space- and money-saving doors and room dividers

By saving the space a swinging door wastes, you increase the usable area of any room! The Novafold Solid Core Plastic Door provides this attractive sales feature—at a price 25 to 50% less than comparable Vinyl-covered doors.

Novafold folds to 16% of its expanded width in a flush-with-the-wall 4½" stack. 4" leaves, in individual, full-length pockets in the Vinyl Plastic cover, give you a solid core door—room-to-room privacy—true accordion folding.

Smooth, silent operation is assured by self-lubricating Nylon slides. An exclusive Novafold feature is the linkage chain that gives even pleating when the unit is drawn.

Novafold is available in six colors—a wide range of sizes—affording unlimited application possibilities.

In Novafold, you have a top-quality product that is guaranteed for one year by the manufacturer against defects. This unit folds into the smallest space possible, thus increasing the usable floor and wall space.

Novafold affords the latest design features—in a wide range of size and color combinations—at a price 25 to 50% less than for doors of comparable quality.

Novafold is installed in 4 to 7 minutes. In new construction—no furring, trim or roughing is needed. There are no floor guides. With special track, Novafold is available for curved openings.

Colors: Beige, Dark Green, Chartreuse, Eggshell, Gray and Red.

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FRANKLIN L. WHITE, appointed Manager, Air Conditioning Division, PHILCO CORPORATION, Philadelphia, Pa.

DON MCAINALLY, named Sales Promotion manager, L.O.F. GLASS FIBERS COMPANY, Toledo, Ohio.

WESLEY D. HAMILTON, FRANK W. SCHROEDER, and ARTHUR M. SIMPSON, promoted (respectively) by INTERNATIONAL STEEL COMPANY, Evansville, Ind., to Executive Vice-President in charge of Operations; Vice-President, Steel Division; and Vice-President and General Manager, Revolving Door Division.

DARWYN L. BROWN, who recently joined WASHINGTON STEEL CORPORATION, Pittsburgh, Pa., as Assistant to President.

FRANK PAVLICK, elected President, and W. L. DAUGHERTY, new Secretary-Treasurer, SANYMETAL PRODUCTS CO., INC., Cleveland, Ohio.

REEVE K. BIGGERS, appointed national account executive, OWENS-CORNING FIBERGLAS CORPORATION, New York, N.Y.

JOHN W. HALL, named Director of Advertising and Sales Promotion for NATIONAL-U.S. RAadiator CORPORATION, Johnstown, Pa.

RICHARD M. GERBER, new Manager of building products department, KAISER ALUMINUM & CHEMICAL SALES, INC., Chicago, Ill.

JOHN VEICKLY, appointed Assistant Director of Administration in Advertising Division, UNITED STATES STEEL CORPORATION, New York, N.Y.

**Luria expands**

LURIA STEEL & TRADING CORPORATION, New York, N.Y., has purchased HUNTER ALUMINUM PRIME WINDOW DIVISION of F. C. RUSSELL COMPANY, Cleveland, Ohio. Newly organized LURIA BUILDING PRODUCTS, INC., New York, N. Y., will handle the business.
KLIEGL Wall Washers will do it! Beautiful wall lighting—without scallops—now possible. Unique reflector design projects light through a small ceiling opening illuminating the wall smoothly from ceiling to floor. Straight down lighting also obtainable by simply removing interior baffle.

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**Architectural Lighting Division**

**KLIEGL BROS Lighting**

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**POCKET DOOR T-FRAME**

For Single or Double Sliding Pocket Doors

Here is the only universal, warp-proof Pocket Door T-Frame for all standard interior door requirements. It is designed for single or bi-parting doors 1-3/8" thick, 6'-6" or 6'-8" high. Any type of wall material may be used . . . lath and plaster, dry wall or plasterboard, wood paneling or tile. Available for 2'-0", 2'-4", 2'-6", 2'-8" and 3'-0" doors.

**PACKAGE INCLUDES:**
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- Bumper • Screws • Instructions

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Double pocket doors give a center opening twice the width of by-passing doors and make a convenient opening for walk-in closets. They create extra living space if used between rooms. The doors disappear into wall pockets when opened and meet in the center of the doorway when closed. Easy to install. Ask for Series 1200B for Bi-Parting Pocket Doors which includes two T-Frames and coupling.

See our Catalog in Sweet's Architectural or Light Construction Files, or write

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December 1955 185
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THEN — you discover some of the plus-values that benefit both the designer and builder:

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NAILABLE STEEL JOISTS • LONGSPANS • BOWSTRING ROOF TRUSSES • METAL DECK • V-LOK STEEL FRAMING STRUCTURAL
Steady Sales Increase Sighted By Advance Executive

In an exclusive interview with J. C. Hamilton, Sales Executive of Advance Transformer Company, it was revealed that sales of Advance ballasts have shown a steady increase in the last three years. These ballasts have become recognized quality products in the industry, he said, and more architects are specifying Advance products exclusively.

The new BRQ 2-S-110 ballast for 96-T-12 lamp at 800 ma. in a Rapid Start design, is entirely new. It is a complete system, it is a radical new design that will change the industry. Mr. Lou Duman, President of Advance Transformer Company, announced the perfection of this new and advanced ballast which was immediately produced.

"Ever conscious of the need for consistent with price," he said, "our engineers design to assure the maximum service." Increased efficiency is effected with the new 2-S-110 Rapid Start Ballast. This is accomplished by a radically new design which has been added to the perfection of this new Advance Ballast which will maintain the high standards of the Certified Ballast manufacturers.

Mr. Max Orr, Vice President in charge of sales, stated, "This new ballast will offer the lighting designer, and to the general lighting industry.

Lighting engineers and architects are finding in the use of sound materials and modern efficient methods, the most efficient and best results. This new ballast will offer the lighting designer, architect, lighting engineer and general lighting manufacturer the assurance of meeting the highest requirements for efficiency and service."

More Efficiency In New BRQ 2-S-110 Advance Ballast

MoreEfficiency In New BRQ 2-S-110 Advance Ballast

Catalog BRQ 2-S-110

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• Smaller
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Approx.

30% Reduction
28% Reduction
30% Increase

800 ma.

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Photograph shows a section of the Langley-Bath Clearwater High School, located at Bath, Aiken County, S. C. It received design awards in the AASA-AIA School Building exhibition and the South Atlantic AIA Regional Honor Awards Program and from the School Executive magazine.

Lyles, Bissetti, Carlisle & Wolff, architects.
E. M. Spung Construction Co., general contractor.
W. O. Blackstonc & Company, plumbing and heating contractor.
All of Columbia, South Carolina.

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188 Progressive Architecture
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Reports Mr. Louis J. Koch, Senior Master Mechanic

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(Continued on page 198)
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see catalog 31a in Sweet's File

reviews

(Continued from page 183)

1931—to discover how consistent this dean of our architectural critics has been through the years; how contemporary and pertinent (for the most part) are the analyses and discussions, though developed 25 to 30 years back.

The Brown Decades, you will recall, heralds the "buried renaissance" that was churning up through the welter of the post-Civil War era—a movement that Mumford himself admits he had largely overlooked, through unfamiliarity, in the earlier volume. Here he discusses and interrelates the creative writing of Emily Dickinson and Walt Whitman; the genius of the Roeblings, father and son, in accomplishing the Brooklyn Bridge; the new horizons and humane approach that Frederick Law Olmsted and others brought to the treatment of the urban landscape; and the unintimidated contributions to architecture made by H. H. Richardson, Root, Sullivan, Wright, and the rest.

Sticks and Stones, with its painstaking analysis of why our architecture is as it is and what must happen if it is to become any better, remains much as it was, with only a few paragraphs added to certain chapters, and a fresh and discursive preface that views the book in retrospect, commenting on the elements the author feels are most contributory and admitting frankly its youthful errors of omission.

The new editions of both books, now issued at popular prices, are enhanced with illustrations. And this reviewer feels that those who "knew them when," as well as the student who has yet to discover them, will find the texts rewarding, instructive, and almost uncannily up-to-date in their viewpoints.

books received

World's Contemporary Houses. Volume 1. Edited by Shinji Koike, Ryuichi Hamaguchi, Kimimasa Abe. Shokokusha Publishing Co., Tokyo, Japan, 1954. 100 pp., illus., $6.50

prefab handbook

This handbook is intended by the authors for manufacturers and dealers in the prefabricated house industry. It will be of interest and importance principally within that industry since discussion is limited to principles, policies, and problems of the prefabricated house industry.

LAWRENCE E. MAWN

hospital criteria
A Guide to Hospital Building in Ontario. Prepared by the Committee on Designing, Constructing, and Equipping of Public Hospitals in Ontario. University of Toronto Press, Toronto 5, Ontario, Canada, 1954. 307 pp., illus., $10

Although this volume was prepared with the requirements of a specific locality in mind, the result is a guide to hospital planning so broad in application that it should be of interest to architects, hospital administrators, and planning boards outside the limited boundaries of Ontario. As a guide, the primary purpose is to suggest the procedure for designing an efficient, economical working unit, from the initial planning stages through to the finished building. Essential factors relating to each phase of planning are presented in outline form; however, the book does not attempt to specify particular requirements and sizes, materials and methods, nor does it show "typical plans." This approach not only tends to stimulate original thinking on the part of the architect, but also insures that the material will not quickly become obsolete with new developments in structure and technology.

L.G.
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This is the very first Weathermaker Home—and it started architects everywhere to designing homes around Carrier air conditioning.

This house grew from a very simple idea: that if a house were designed around air conditioning it could be a better house.

It need not depend on natural ventilation. Ells and wings wouldn’t be necessary. Only a few windows need have movable sash. The bathrooms needn’t require a window. Windows, doors and even the rooms themselves could be placed to suit the convenience of the owner, not to catch a breeze. Windows could be grouped; some walls could be solid, to allow space for storage and convenient furniture arrangement.

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JOBS AND MEN

(CONTINUED FROM PAGE 192)

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Back at the editorial desk after a trip to Europe, I find it difficult to get down to the monthly business of meeting deadlines. Even this P.S. escape valve, which has always been fun when the month’s hard work is over, seems a chore. I sit and look out of the window across Avenue to a space which is open—at the moment—only because some buildings have been torn down to make room for a new Kahn & Jacobs skyscraper; and I think of looking across from our hotel window in Milan to a great open space before the Cathedral, which had been planned to be open, centuries ago. One of my associates comes in to ask me a question, and I suddenly realize I haven’t heard a word he’s said; I’m still driving across the St. Gotthard Pass in that little Volkswagen.

This is the place and the time of course, to report on all the good contemporary things I saw abroad. I’m embarrassed; I saw so little built since the 16th Century that seems worth reporting. I suppose it sounds just like a typical, provincial, flag-waving touring American to say so, but I came back feeling strongly that in contemporary development—with all the mistakes we have made, all the admitted failures and inadequacies—we are far ahead of Western Europe. Ugly as our cities are, isolated as our really fine pieces of new architecture may be, my observation is that in the design of schools, hospitals, churches, apartments, housing projects, or what have you, there is little abroad to compare with what we can show.

Like all generalities, that one is inaccurate, and I’m sure that I’ll hear from many of you who were in Europe this year and brought home pictures of that little church you saw outside Zug (it’s coming along nicely; I got some good pictures, I think) or found half a dozen nice shop interiors in Milan, or paid a reverent visit to Ronchamp. Personally, I was very disappointed in the Milan renaissance of the 19th Century that seems worth reporting. Italy, France, of the unexpected, relaxing, vista-broadening open space; the narrow street that suddenly becomes a Piazza or a Place or a Plaza or a Square; with a market and a church and a cafe, and then narrows down again to streets of everyday living and commerce until the next open area comes.

This is, of course, a lesson we have been taught over and over; it has become fashionable to remark on it, and I am now in the fashion. Yet we continue to ignore it. We impose our gridiron, and line them curb to curb, mile after mile, and wonder why we can’t relax from the straight and narrow tensions that result.

Park Avenue goes on endlessly past my window, with the only break in the building line the space that Lever Brothers allowed SOM to leave under their handsome building. At the moment, there is an open block opposite me, and even though it is a hole in the ground, a few trees escaped the bulldozer, and I can see sky and a vista. Next month it will cease to be Piazza 55th Street, and will become again another 200 ft module in the continuous wall.

**Every trip away from home and office** has its high spots and its pleasant memories. This one included my first visit to Stuttgart, a city that made a most favorable impression (and where I saw one of those two good schools); an unexpected realization of the thin line that divides two of the cultures that form our background, as we drove from the neat, clean, busy, efficient German-speaking part of Switzerland down into the easy-going, slower-moving, more romantic, less orderly Italian-speaking portion; a visit (in a cloudburst) to the Grimoldi Museum at Antibes, where Picasso tapestries and Roman antiquities live happily together; Portofino, the fishing village which is not yet spoiled by tourism but which if anyone visiting the North of Italy misses he should have his head examined; a day with Paul Nelson, Madeleine, and the two boys who will grow up to speak French, English, and Italian with equal facility, and a visit to see a new house Paul has designed, with polychromatic by Le Corbusier just before his death; a day in Hampstead Garden Suburb, the charming, relaxing, Parker-Unwin-Lutyns “garden city” outside London, spent with Hermann and Kate Field (which I shall report in greater detail later; for now let me tell Hermann’s friends that he is healthy and well, in every sense).

**Every U.S. tourist** who considers himself a cut above the “typical” U.S. tourist comes back with at least one story illustrating the confusion of that worthy individual who is the backbone of the top industry in many areas of Europe. Mine, I think, is rather pathetic. My hero flew back from Paris on the same plane we did. He was ahead of me in line at the Aerogare des Invalides (the in-town air terminal) and he was obviously tired, anxious to get back to the good old U.S.A., and more than a little confused by foreign ways and foreign languages. His first embarrassment was that he had misplaced his passport—a crime no one allows himself to commit away from home. His second was that in reaching for his luggage to search for the missing document he stepped on a baggage platform which was a series of pipe rollers, and delivered himself right back on the back of his neck. The passport, however, was in one of his suitcases, and when we passed through the gate to the limousine he was again ahead of me in line. All of us efficient tourists were clutching our little green cards, which are bus ticket, aircraft boarding pass, and general identification tag.

The girl at the gate asked him in perfect English (so many of them speak perfect English), “May I see your boarding pass?” More tired and homesick than ever, and by now frightfully embarrassed, he frowned, thought a moment, and shook his head in perplexity. She repeated the request, and again he puzzled over these strange foreign words. Finally he shrugged in resignation and said, “Sorry, miss, I don’t speak French.” That’s done. Now to settle back, look out the window and remember, for instance...Ferrara...we got lost hunting for Ariosto’s house, and when we found it it wasn’t very pretty, but the squares we wandered through...
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