PROGRESSIVE ARCHITECTURE

newsletter

SEPTEMBER 1951

- Construction is now under a new set of regulations described in NPA Order M-4A. The effect is the stoppage of all building requiring more than 2 tons of steel, 200 pounds of copper, or any quantity of aluminum alloy steel or stainless steel. Any other work must be applied for under the provisions of Reg 6, on Form CMP-4C. Result is almost a green light to home builders, and a severe headache to architects and entrepreneurs of larger structures.

- Military construction received its huge appropriation during the month, and more architects must now turn to this phase of work for sustenance until regulations for private work are relaxed.

- Construction held up well during July, began to drop in August. Once more, final July figures showed record-breaking dollar volume. It will now soon be clear whether the expected slump after mid-year in categories such as private housing will really take place, to bring down the first half year totals to the figures that had been predicted for the year. During the first six months, every category went up over 1950 -- even total residential -- but some sub-categories were off a little (one-family, owner-occupied houses down a fraction of a percent).

- A new regulation is being discussed by OPS officials with the Construction Industry Advisory Committee, which would allow contractors to reflect increased labor and materials costs in future ceiling prices. Now contractors can reflect some materials costs but most absorb wage increases. These "ceilings" are kept as a matter of personal records, but need not be filed with OPS or reported.

- Real estate activity with an inflationary trend is foreseen by J. K. Lasser, tax consultant, as a result of the present excess profits tax. Sale and re-sale of buildings, just plain sales, which increase real estate values but bring tax profits to both buyer and seller, and other complicated devices all make Lasser say the "high taxes are not a burden; they might even be called a subsidy to many." But, he warns, the thinking and the maneuvering that results from them "can only produce higher prices for real estate."

- HHFA announces some interesting results of its recently completed Materials' Use Survey dealing with single-family detached houses, built in the first half of 1950. Nine-tenths of them were one-storied; two-thirds had no basements; heating was 5% coal, 60% gas, 30% oil. Average floor space was 980 sq. ft.

- A.I.A. is trying very hard, with several engineers' societies, to arrange some sensible relationship of architectural services to the armed services. There seems no good reasons why the Army or any other military branch should find it impossible to work with architect-engineer teams in the same professional way that any other hard-headed business client does. The business of shopping for prices and forcing unsatisfactory fee arrangements on the profession is as inexcusable as it would be in the case of a shyster builder.

(Continued on page 2)

newsletter

- Harwell Hamilton Harris, Los Angeles architect, has been named new director or the Universtiy of Texas School of Architecture.

- Brunner Scholarships awarded by the New York Chapter, A.I.A., have gone to Professor Esmond Shaw, Cooper Union, for a textbook on the history of domestic architecture in the U.S.; and to Professor Frederick J. Adams, M.I.T., for a study of the necessary qualifications and training of city planners. U. of Illinois announces Edward L. Ryerson travelling fellowships awards to Raymond C. Overseat in architecture, Charles W. Harris in landscape architecture.

- Rome Prize Fellowships are again offered, for 1952-1953, in architecture and landscape architecture among other subjects. Fellowships carry $1250 a year plus travel costs plus studio space and free residence at the American Academy in Rome. Applications go to the Academy's N.Y. office, 101 Park Avenue, before January 1st, 1952. They are awarded only to citizens, on evidence of ability and achievement.

- Building Research Advisory Board has a contract to advise Defense Production Administration on conservation of materials. Michael Reese Hospital in Chicago has a grant to study effects of air conditioning on the human body, from the Mitchell Air Conditioning Research Foundation. American Society of Refrigerating Engineers has authorized grants to a number of colleagues for research on refrigeration subjects.

- Aluminum Window Manufacturers Association states that aluminum windows are available for use right now "contrary to rumors and misunderstandings, due to changing government regulations." Residential aluminum windows are available in stock for immediate use, says the Institute, and cusom-built designs for hospitals, schools, apartments, etc., can meet "reasonable deliveries."

- Fulbright Industries, Arkansas manufacturer of furniture designed by Edward D. Stone, has named Showroom, Inc., of Miami, as southern distributors. Stone is now working on another line using metal legs.

- Junior Chamber of Commerce War Memorial Headquarters Building, for which competition was conducted by P/A in 1949 and won by a team headed by J. Edward Luders, has now been built and was dedicated on August 4th. This is one of the few instances in recent years of a competition for an actual building being carried through to a completed structure. Jedd Reisner, who was professional adviser to the jury, attended the ceremonies and will report on the success of the finished design in a later issue.

- Consumption of energy in the U.S. by the year 2000 will be equal to the current consumption of the entire world, G. W. Gleeson, dean of Engineering at Oregon State College, recently told a meeting of A.S.H.V.E. Such sources of energy as coal, gas, petroleum, will have to be supplemented soon with further development of continuous sources, such as water power, solar energy, wind power, earth heat.

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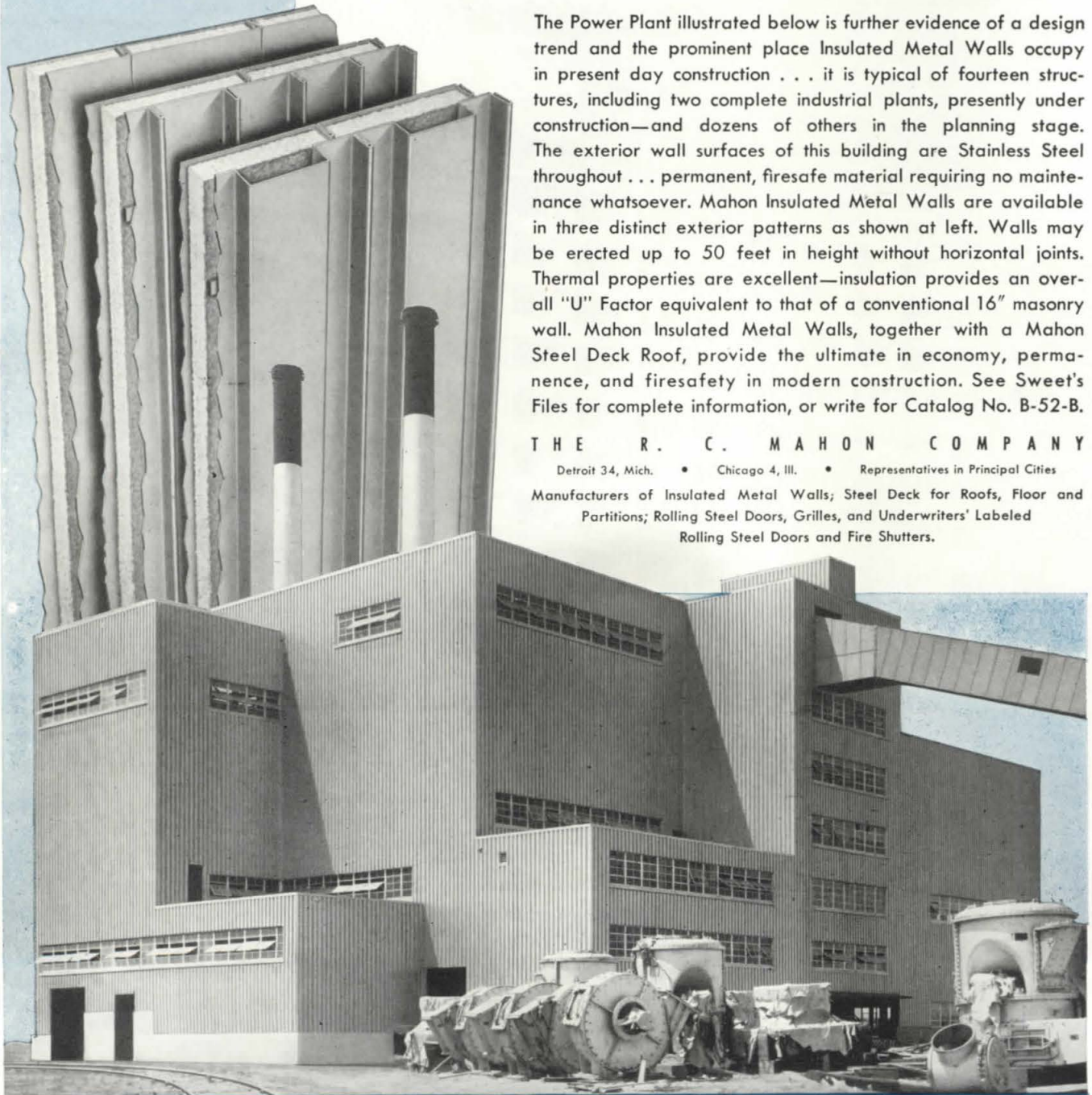

Mahon Insulated Metal Wall Panels employed in construction of new Power Plant for Central Power Electric Cooperative, Inc., Voltaire, N. D. Verne E. Alden Company, Chicago, Ill., Architects & Engineers, Rue Contracting Co., Fargo, N. D., Gen. Contr.

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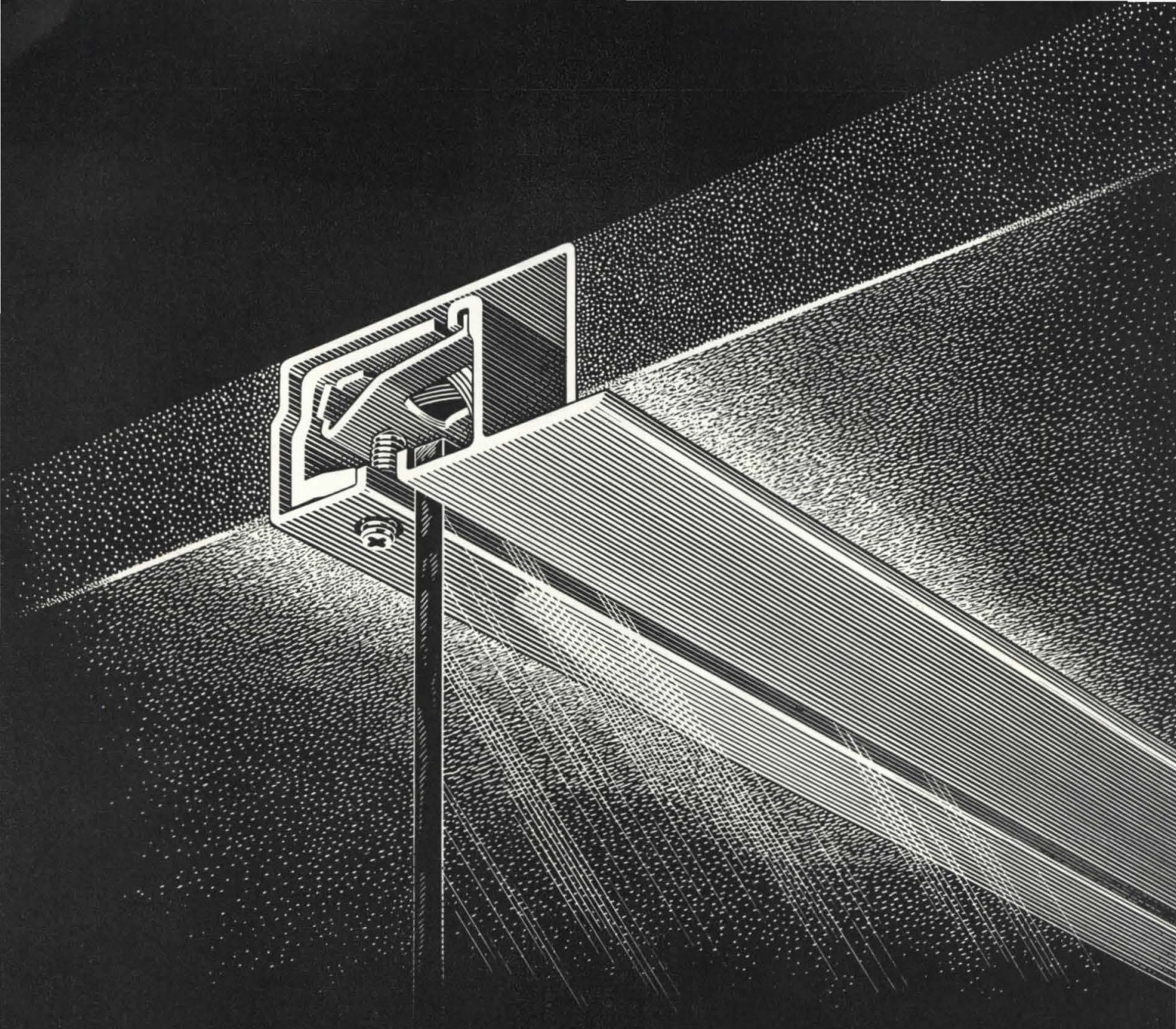

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p/a VIEWS

DESIGN CHALLENGE

Dear Editor: Thank you for the copy of "The Architect and the Health of America," July 1951 P/A. May I offer my appreciation for your subject for this issue and for the excellent presentations therein.

I endorse Mr. Rosenfield's editorial in particular, and certainly hope that he has sown a seed that will fall on fertile ground. Our substandard hospitals are not all due to the *age* of the buildings.

I returned in July from a very brief trip to England, France, Germany, and Sweden, where, in company of the Surgeon General, U. S. Air Force, military and civilian hospitals were seen. It was self-evident that when good architects gave proper attention to hospital construction, excellent institutions, well operated, were to be found.

With the emphasis at present being given to hospital construction throughout our country we should rise to the proper acceptance of the challenge on all levels and all aspects of health requirements.

LEE C. GAMMILL,
Consultant-Administrator:
Texas Children's Hospital, and
St. Luke's Episcopal Hospital
Consultant: Hospital Construction and Administration, S.G.O.,
U.S.A.F.

WIDE CIRCULATION

Dear Editor: Thank you for sending me copies of the July 1951 P/A, "The Architect and the Heatlh of America." It is a most interesting number and I think the article on the Massachusetts General Hospital is an excellent one. I shall see that it receives wide circulation here in the hospital.

DEAN A. CLARK, M.D.
General Director
Massachusetts General Hospital
Boston, Massachusetts

EXCELLENT JOB

Dear Editor: I have been wanting to get a note off to you telling you how pleased we all were with your recent hospital issue of PROGRESSIVE ARCHITECTURE. It is really an excellent job.

MARSHALL SHAFFER
Federal Security Agency
Public Health Service
Washington 25, D.C.

LIKE A MENU

Dear Editor: Your P.S. on the A.I.A. Convention which appeared in July 1951 P/A is excellent and fair. It is with a mixture of pride and alarm that we view the ever-increasing size of our conventions, which now have achieved the questionably enviable status of "big business." There are few hotels in the country which can still take care of us, and those we are committing three or four years in advance. No longer can we decide six months from the dates that it would be fun to have a convention in the Yosemite, or a boat trip to Bermuda, or any of those locales which would lend themselves delightfully to the spirit of the occasion. Instead, we find ourselves competing with major conventions for space and facilities. And too, in order to take care of the situation, we have to organize on a professional convention basis, in which endeavor we are getting to be quite expert.

Very few members of The Institute, except those who serve on committees in the host city, have any conception of the work involved in organizing, managing, and staging one of our conventions. The variety of tastes to be found in the profession is unlimited and, therefore, we arrange the program to meet as near as possible everyone's interest and pleasure. Consequently the program must be diversified. The program must also be timely and certainly this year there was no question confronting the profession and the construction industry, as far-reaching and as drastic as the impact of the current situation on the profession. This was brought to focus as could be best humanly accomplished, through the sessions on regulations and civil defense.

Had we not organized and put across these sessions, I feel that we would have been derelict in our duty to the profession. And in addition, to accommodate other interests in so far as facilities, money, and time permitted, we arranged concurrent sessions of a more technical and intimate nature. A big convention program might be likened to a restaurant menu. You cannot hope to order and eat everything that is offered, and you cannot prescribe a simple *table d'hote* for a large number of people of varying tastes.

On the whole, I think we did a good job at Chicago and we have had many compliments and congratulations; and few criticisms, almost all of which were of a trivial nature. We have already started to plan for the 1952 convention in your city and the affair threatens to be half again as large as the Chicago Convention. So probably you will have a chance to get a good look behind the scenes.

Again with much appreciation of your understanding editorial.

EDMUND R. PURVES
Executive Director
American Institute of Architects

FOR BETTER PROGRAMS

Dear Editor: You are so right in your criticism of the Chicago Convention in July 1951 P/A. I have become somewhat of a fan of Ralph Walker as a meeting handler, but whoever planned the program at Chicago needs to go to the foot of the class.

Some good advice on ticket selling, a conviction that a good party is people and time and drinks—not sitting, will solve most of what ails our conventions.

I feel seriously interested however in the problem of media. Finding the best media for the material to be presented. Some thought may have already been given to making talking movies of some "seminar" material. It could be of vast value to the chapters and to schools and would not need to take time at a national convention.

Another laudable effort is the "climatology" series in which professional publishers were in charge and the A.I.A. helped with the material. Our Mr. Taylor could get more to more of us, faster, with an extension of this idea to all architectural and related publications. Much could yet be done to bring the members to grips with their own problems and also bring to them some inspired material.

For seminar sessions at conventions those subjects should be selected which depend heavily on audience participation, those in which the response of the members adds materially to the knowledge on the subject.

The discussion of the Boards report, The Session on Chapter Affairs, the inspired talks by the principal speakers, and the private conversations are the "meat and potatoes" of conventions to me. The rest has to be good or I'm hereafter "agin" it.

(Continued on page 10)

P/A VIEWS

(Continued from page 9)

Don't forget it took our A.I.A. 94 years to find that "Humanity is our Client," so don't expect too much in a hurry.

FRANCIS R. WALTON
Daytona Beach, Florida

WHEN SPECIFYING TILE

Dear Editor: We were most interested in your specification on asphalt tile which I have circulated through the various departments of the Company who would be interested. We have the following comments and suggestions to make which we believe would improve this specification to a certain extent.

Materials for asphalt tile (b). Suggest you add Group E to the paragraph since Armstrong's "Decorator's Palette Colors" have been assigned to this group. This is a tile using monochrome, rather than polychrome marbleizing.

5. base (a) Suggest that you use rubber- or asphalt-tile base, since this is common practice, and note that premolded internal and external angles occur generally in rubber but rarely in the asphalt tile top set base.

7. cements (a) Please note that asphalt-tile floors are installed over felt; emulsion-type cement should be specified, but cut-back should never be used.

17. laying base (b) Suggest this be expanded to read "Cement base firmly to wall, using cement recommended by the manufacturer."

18. cleaning, waxing, polishing (b) Suggest this be amended to read "Apply two coats of water emulsion wax; . . ."

The writer hopes that these suggestions will be acceptable and in your opinion will increase the accuracy of the specification on this material.

JAMES TODD BALDWIN
Armstrong Cork Company
Research Laboratories
Architectural Section
Lancaster, Pennsylvania

LETTERS TO SCHOOLMASTER FEISS

Dear Sir: Would you care to express an opinion as to the value and future placement of a graduate architect with an advanced degree in school administration as a consultant in the field of public education? It has been suggested that a young architect, having had some experience with school plant design, would be more effective in this field were he to acquire specific training in administration, curriculum, and finance.

A Professor of Education at the State College here knows several experienced school administrators who have been retained as consultants by architectural organizations. He says that the solution to this demand is to supply architects trained in this field. In consequence, he feels that the trend toward integration in school plant design should encourage a young architect in my position to seek additional training in education.

Any expression of opinion that you might care to offer would be most gratefully received.

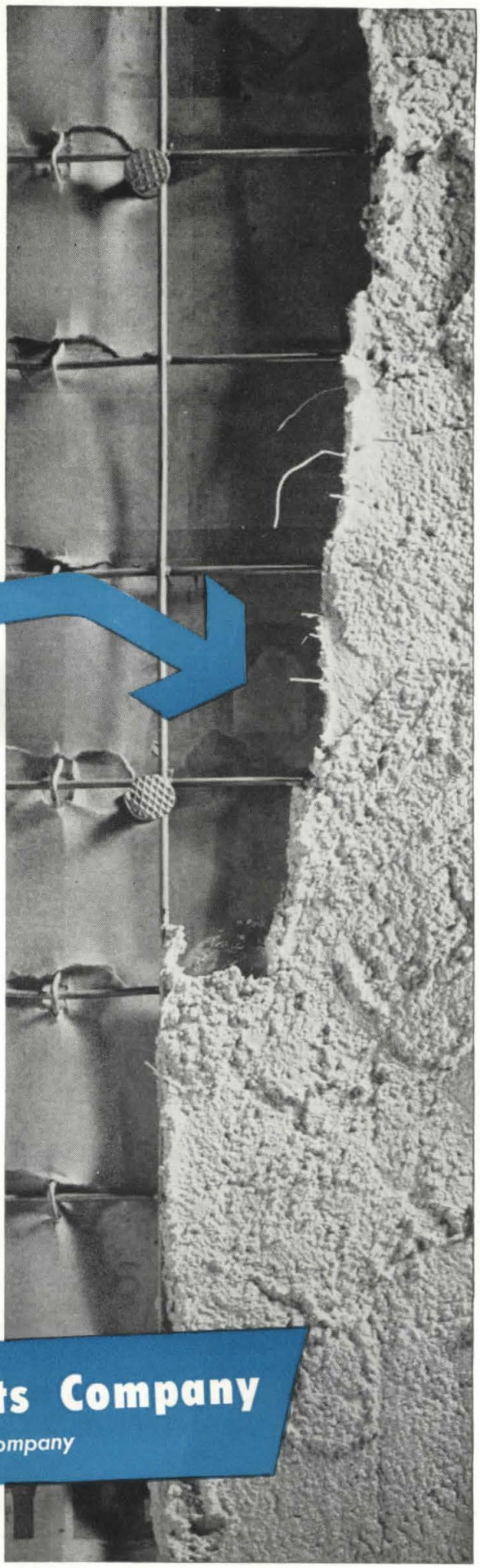
RAYMOND C. SCHNEIDER
Manhattan, Kas.

●

Dear Mr. Schneider: *Your interesting letter raises a question which is be-*

(Continued on page 12)

See how tough welded-wire **Pittsburgh Steeltex** bites deep into a stucco slab



Look closely at the actual-construction photograph. Notice that the Steeltex mesh is heavy, and the galvanized wires are welded together for greater rigidity. This provides positive protection against later distortion by actually strengthening the entire wall. Notice also the tough, double-ply waterproof backing. This not only protects the structure, it assists proper curing of the stucco slab. Steeltex backing and mesh are applied in one operation, thus saving money. For further good reasons for specifying Steeltex, see Sweet's or write for catalog D.S. 131, Dept. PA, Pittsburgh Steel Products Co., Grant Building, Pittsburgh 30, Pa.

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VIEWS

(Continued from page 10)

coming more and more pertinent as technological development in any particular science raises specific architectural issues requiring specialized solution. Not only is it a question in the field of education but also in medicine, hotel and restaurant management, aviation, religious institutions and many others. I have been aware of the fact that there are a number of well-known consultants in the field of education who are working with school boards and university development directors on the planning and design of educational structures. I see no reason why a young architect interested in pursuing the specialty of educational buildings should not take additional training in the field of education in order to better qualify himself for the idea of his special interest. In fact, I believe it would be a very wise thing for him to do.

While it may be that the well-known architectural specialists in educational buildings such as Ernest J. Kump, Perkins & Will, or Eero Saarinen, have not taken additional training in education to qualify them for architectural work in their field of special interest, I can readily see where a man who has had training in both fields could be of use not only to educational officials but also to the practicing architect as well.

One other item of importance in this matter is the fact that many educators are looking for architectural advice, although not necessarily for actual plans and working drawings at a specific time. Dean Herbert Hunsaker of Cleveland College was responsible for an important series of conference on the design of urban universities in which educators, university plant managers, and architects participated in discussions on the relationship between architecture and education at the urban university level. It was apparent to me at these meetings that the architect could contribute much to educationl development but that often he was significantly unaware of basic educational problems. You might find it interesting to correspond with Dean Hunsaker, who has taken a long and active interest in this problem.

CARL FEISS

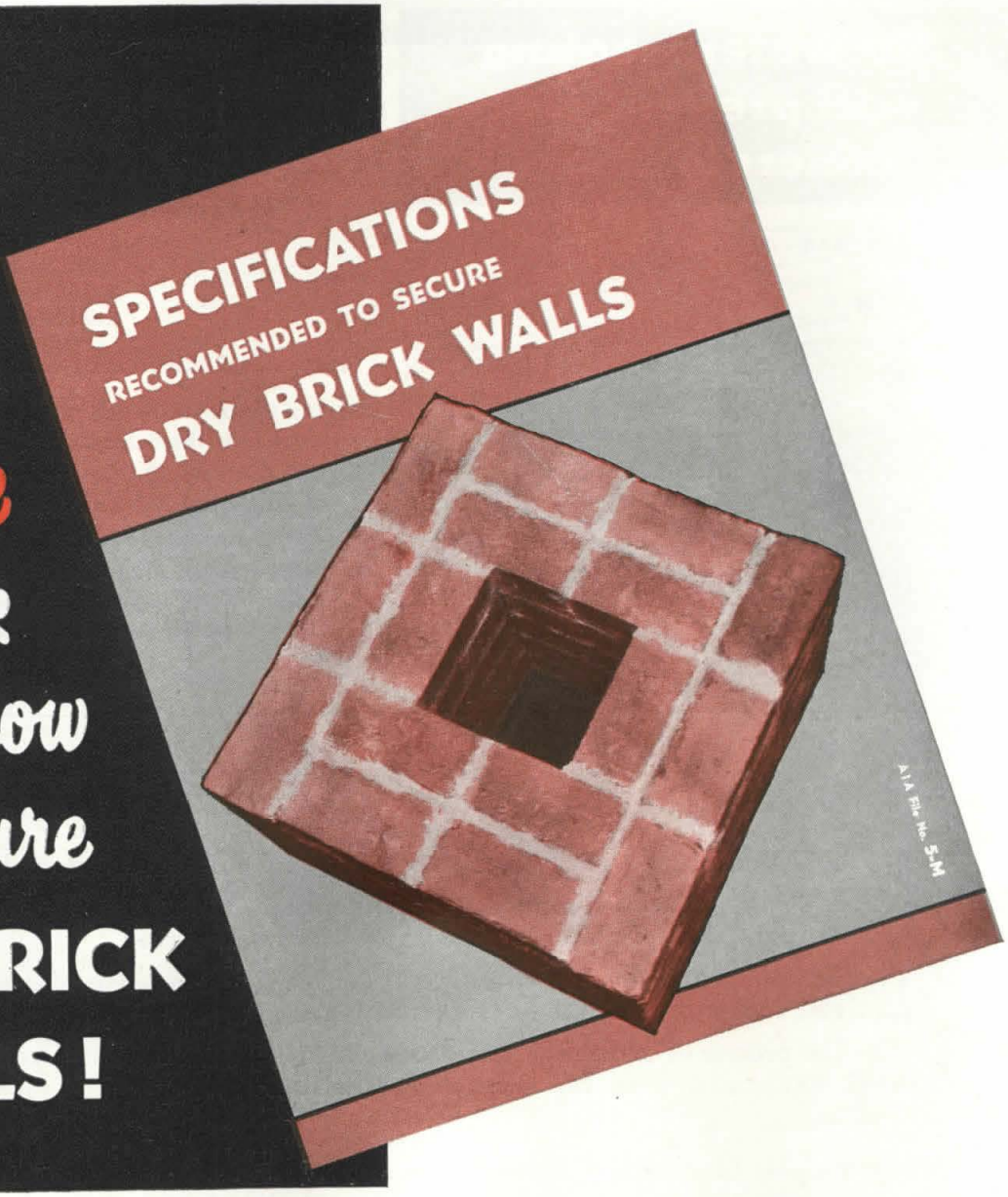
●

Dear Sir: We would like to have your criticism and comment on an item which seems very important to us. Perhaps you know of our research activities conducted here at Texas A & M College these past two years. This research program concerns correlated research in Environmental Engineering whereby the essential environmental factors are considered simultaneously. Through the investigation of the effects which various architectural shapes have upon man's physical environment, this research is directed towards obtaining data from which a scientific approach to total environmental control of buildings can be developed. In short, we are trying to find out something about environmental controls as related to architectural design, particularly natural lighting and natural ventilation.

One of the significant things that stem from this research is the fact that the techniques developed for comparing architectural forms can be used in the teaching of architecture. For that matter, we have already used it. Gordon McCutchan, who had charge of the fourth-year design class here at Texas A & M last spring, inserted into his regular program a problem that concerned the design of classrooms in respect to lighting and ventilation. The Texas Engineering Experiment Station put at his disposal all of the research staff and facilities. This experiment in

(Continued on page 19)

This Free book tells how to secure DRY BRICK WALLS!



Now the Louisville Cement Company has published another outstanding booklet, entitled *Specifications Recommended to Secure Dry Brick Walls*. This important pamphlet briefly interprets the exhaustive research carried on by many national authorities during the past twenty years. In 16 clearly-illustrated pages it describes the causes of leaky brick walls, explains how these causes may be avoided, and offers detailed specifications for the types of mortar, brick and workmanship required to secure dry brick walls.

This booklet is a sequel to *Type of Workmanship Recommended to Secure Dry Brick Walls*, a pamphlet which has been accepted by leading authorities as one of the most valuable works ever published on its subject. It is a 1951 Award Winner in the Class I competition sponsored jointly by the American Institute of Architects and the Producers' Council. It is used as a textbook in 232 colleges, high schools and trade schools.

Send for your free copy of this highly informative and interesting booklet, *today*. The coupon is for your convenience.

Louisville Cement Co., Inc.
Dept. 10
Second and Walnut Sts., Louisville 2, Kentucky

Gentlemen: Without cost or obligation, please send me a copy of *Specifications Recommended to Secure Dry Brick Walls.*

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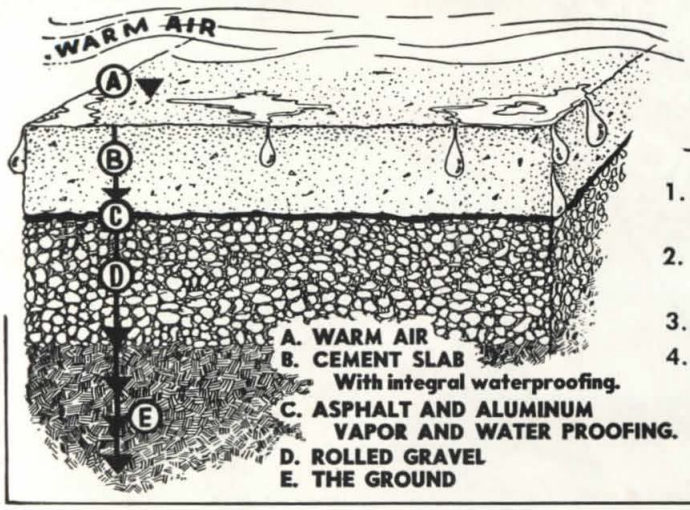
No waterproofing will prevent wet concrete floors

"Dampness on concrete floors is more often due to moisture from the air than from the ground. No amount of waterproofing beneath the slab will prevent this trouble."

From a "Progressive Architecture" Research Report, "Insulation for Concrete Floor Slabs on Grade."



1. The air (A) in immediate contact loses heat by conduction to the concrete (B).
2. The concrete (B) conducts heat through the layer of asphalt AND aluminum (C) to the gravel (D).
3. The gravel (D) conducts heat to the ground (E).
4. As the contacting air (A) loses heat, its capacity to retain water vapor is diminished. The excess condenses on the upper surface of the concrete floor.

THE EXPLANATION:

(1) Cold air can support little vapor. The excess falls out as water, or condensation, dew, etc.

(2) By direct conduction through and between solids, heat flows through the concrete floor into the earth, the flow in conduction being from warm to cold.

(3) Similarly, by conduction, heat flows out of the air in immediate contact with the colder concrete. That layer of air can no longer support all the vapor in it, so the excess condenses.

(4) The process of extracting heat out of the air at the upper surface of the concrete is continuous, and so is the formation of condensation.

Multiple sheets of accordion aluminum, *underneath* the floor, reflect back 97% of RADIATION. The air spaces permit only about 5% heat flow by CONDUCTION. There is of course no CONVECTION downward. Therefore with practically no heat loss, the concrete tends to follow air temperatures, and remains above the dew point. Ordinary insulations, being dense, are better conductors of heat. They are made more dense, still better conductors of heat, by the crushing weight of concrete, by inner condensation formation, and by ground dampness.

The commercial forms of multiple sheets of accordion aluminum are Infra Insulation Type 6, Type 4 and Type 4 Jr. (The built-in reflective air spaces are permanent.)

For new and inexpensive techniques in insulating floors and concrete slabs against heat flow loss, and condensation, as well as ceilings and walls, obtain FREE the revised 1951 edition of "Simplified Physics of Vapor and Thermal Insulation." Use coupon below.

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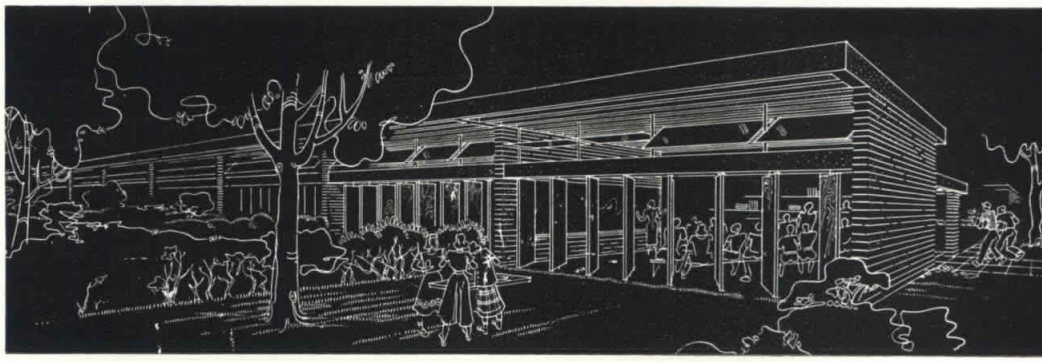
PROGRESS PREVIEW

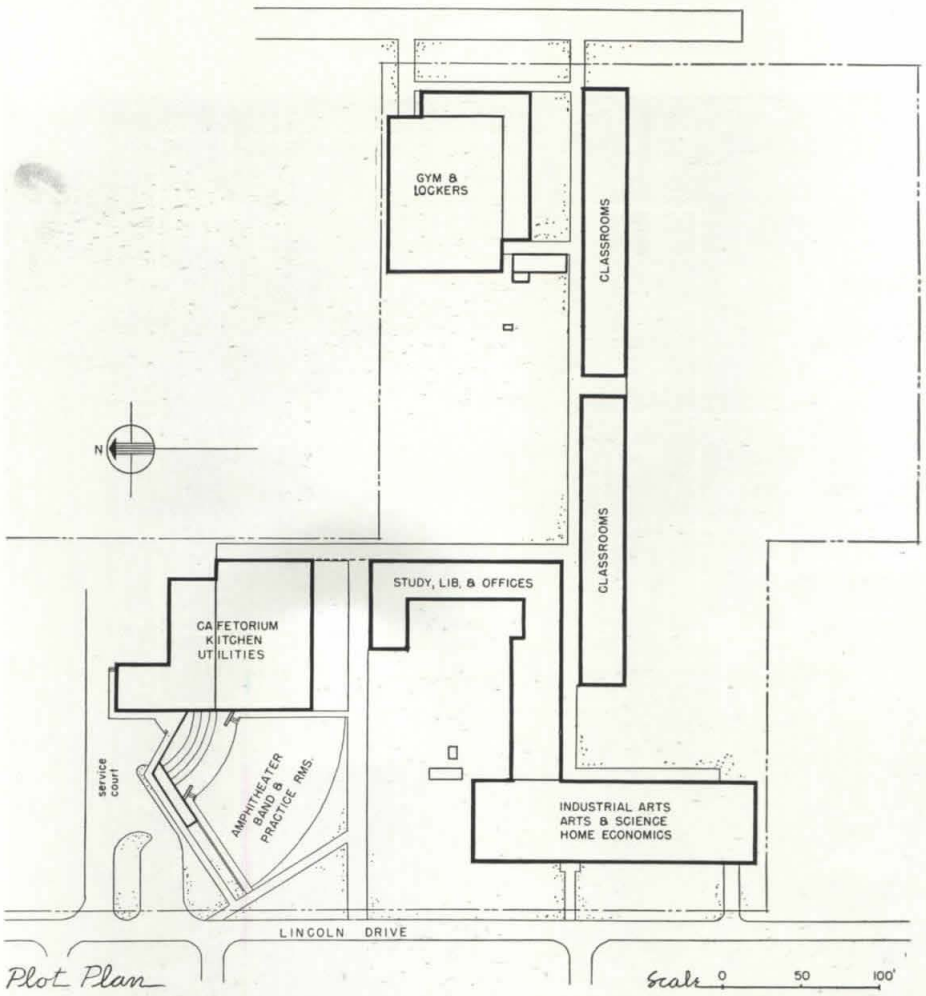


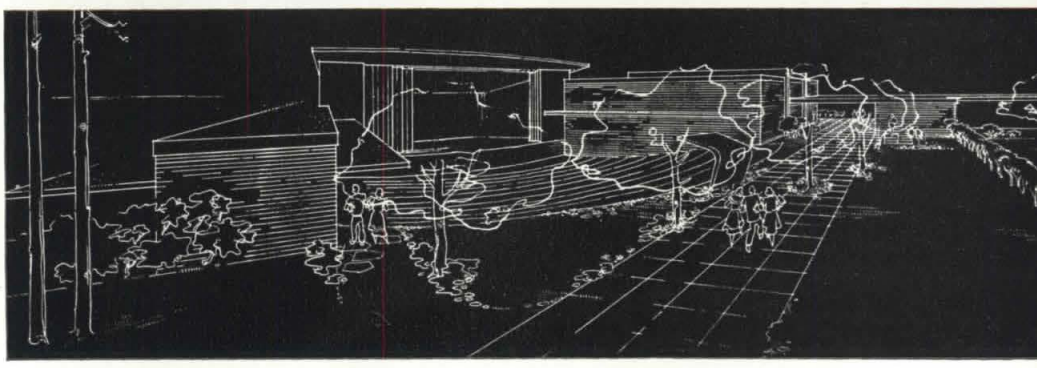
community school

When Alfred B. Parker, Miami architect, was awarded the commission for the new George Washington Carver School, which was urgently needed to accommodate steadily increasing elementary and high school student enrollment from Negro families of southwest Miami, there was no stated program. But after conferences with the principal, Mrs. Frances Tucker, and the entire teaching staff, the architect developed a program consistent with the progressive educational philosophy of the teachers and also possible within the budget.

It was realized last year that the usefulness of the school would be greatly increased by initiating well planned adult education classes, and otherwise aiding parents of the community. This broader concept of the school's role there is gaining acceptance and plans are being made to use the school's facilities "around the clock". Parker reports that "it may be justifiably stated that the community life of this area will center around this school."

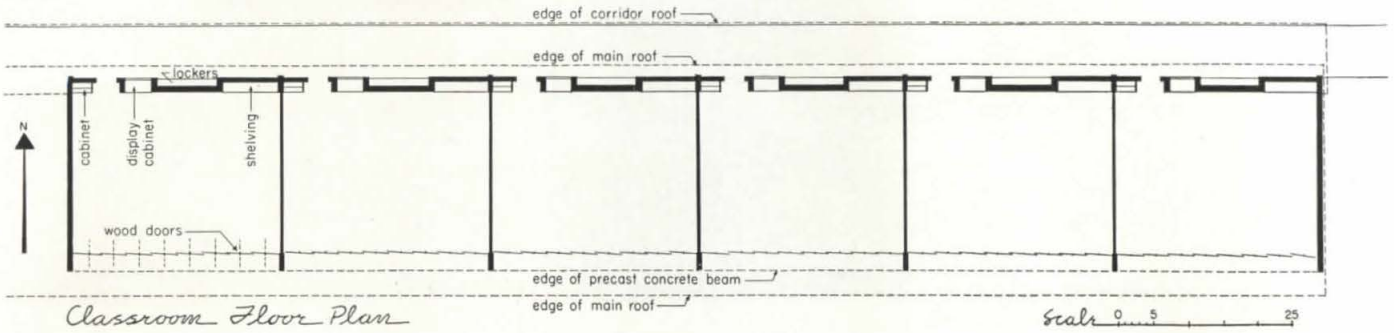
Planning and details of the school, particularly the series of floor-to-clerestory pivoted wood doors along the south walls of the classroom units (for sun and air control), have been discussed in *The Miami Herald* with the conclusion that Parker's design represents "another step forward,

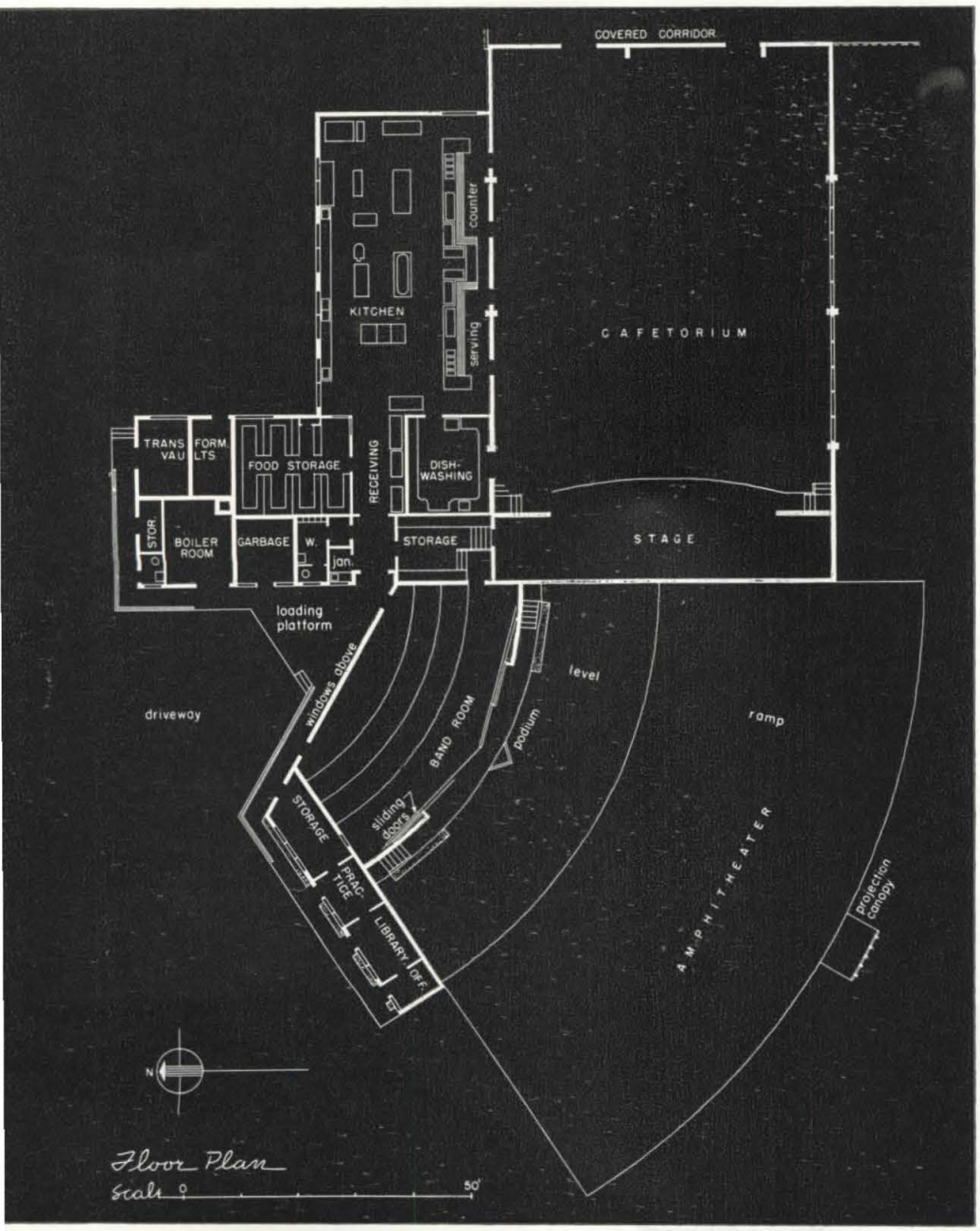




Plot plan and perspectives of George Washington Carver School, now under construction in the Negro area of the Coconut Grove section of Miami, indicate the freedom of the architectural design. Main approach is past the amphitheater (right) where community meetings and larger school assemblies will be held.

Simplicity of the plan for the classroom unit matches the directness of the glare-and-air control device for the south wall: wood doors pivoted and connected by hardware so that they can be readily operated (in unison) by hand.





into harmony with this area's climate and outdoor living." The new school is really a $605,000 addition to an existing (inadequate) building supplemented by a number of portable structures.

●

The architect's notes on the new school include the following pertinent comments:

"Classrooms will have clerestory windows on the north and south sides. Corridors will be to the north and the south wall will consist of vertical wood louvres, running from the floor to the clerestory windows. These will serve a number of purposes:

"(1) Air deflectors into the room.

"(2) Light reflectors and baffles (room-darkeners) for audio-visual work.

"(3) Access to the outer garden room.

"(4) Storm shutters for hurricane protection.

"The louvres are completely adjustable and the teacher will have to push only one louvre to the angle desired, and the entire set of louvres will move in unison. A special hardware was designed for these louvres but, due to war metal shortages, abandoned. The final hardware was made up from standard machine parts selected from a Boston gear catalog (shaft supports, thrust bearings, etc.).

●

"The structural system is largely precast concrete slabs, in which the roof slab and joist support are cast integrally. These are manufactured in a local factory, hauled to the building site and installed. The girders and cantilever beams are also made from precast members.

(Continued on page 19)

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What supoib taste! For help with the temperature control they consulted Honeywell!

We doubt that cartoonist Larry Reynolds' character, Butch, knows the difference between a stud and a joist.

But he certainly has one mighty sound idea.

Honeywell *can* help architects and their heating engineers provide the proper thermal environment for any client – anywhere – in any kind of structure. We have a lot of well informed control engineers – in our 91 different offices – who are experienced in doing just that. And we have a lot of literature that's yours for the asking – on the automatic control of heating, ventilating and air conditioning.

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For information on how to solve heating control problems in hospitals, see the column across the page.

MINNEAPOLIS
Honeywell
First in Controls

(Continued from 16)

"As the main approach to the school will be from Lincoln Avenue, by the Amphitheater and between the Cafetorium and Administrative Section, the west, solid wall of the Dean's office will serve as a background for a life-scale figure of the late George Washington Carver, distinguished Negro scientist.

"The Band Practice Room was designed to serve as a stage for the Amphitheater. The Amphitheater being formed with a bulldozer and inexpensively paved with asphaltic-cement, seemed an adequate solution to the problem of large school gatherings and also community meetings. The small shelter at the rear of the Amphitheater is for protection of moving picture and slide projectors, spotlights, etc.

"The Cafetorium will serve, as its name indicates, as a dining hall and enclosed auditorium. Seating and tables may be stored under the stage when the room is used for dancing."

VIEWS

(Continued from page 12)

teaching proved highly successful, at least in our opinion. Of course, there was a considerable number of objections, quite a few in fact, but generally the problem met with much enthusiasm from the students. One of the students said, "For the first time, we have been given something concrete."

We are rather excited about the possibility of introducing this new design medium into the architectural curriculum. Perhaps too excited. That is why we are writing you.

There are so many questions that must be answered. If this research program is brought into teaching, how best should it be integrated? Should it be included in the design or as a separate course? In what year should the work start?

These are questions which we would like to have answered by the men in the education field who are more qualified than we. We thought you could help.

WILLIAM W. CAUDILL, A.I.A.
Research Architect
Texas Engineering Experiment Station
College Station, Texas.

Dear Mr. Caudill: *I am in receipt of your letter of July 18 and the enclosure which I am transmitting to* PROGRESSIVE ARCHITECTURE *with the hope that it can be published, as the questions which*

(Continued on page 20)

p/a VIEWS

(Continued from page 19)

you raise are important. To the best of my knowledge, no university has resolved the problem of where specific research on building problems fits into the regular curriculum of the institution. The Research Reports prepared by the Texas Engineering Experiment Station, "The Feasibility of Using Models for Predetermining Natural Lighting" by E. E. Vezey, Research Physicist, and "The Measurement of Low Air Speeds by the Use of Titanium Tetrachloride" by Smith, Reed, and Hodges, are interesting demonstrations of the type of study which architectural educators should certainly study in the analysis of programs for technical training for architectural students.

As you know, in many universities there is developing a close contact between technical research organizations within a university, or affiliated with it, and schools of architecture. I know that in some instances lectures are given to undergraduates by research technicians, but I believe that it is only at the graduate level that students with special interests are permitted to move into detailed research experiments. The fact that Professor McCutchan, in charge of fourth-year design at Texas A & M, inserted the findings of these reports into the design training at the fourth-year level is interesting and I hope will elicit some comment from readers of your letter. I am not clear, from your letter, whether the students in fourth-year design participated in the preparation of these research reports as well. However, I am assuming from your letter that this is not the case but that the findings of these reports were used in the training program.

I believe that the major concern of educators at the undergraduate level, when considering research in a curriculum, is the time involved in the detailed solution of problems. We also have, in many instances, the problems of the necessary prerequisites in training; the courses in research methods, in mathematics, physics and chemistry, electronics or whatever the other basic material may have to be. Such material is not normally a part of an architectural or planning curriculum but is essential if a student is to be useful in the special-case, but that the findings of these research areas.

Since the normal five-year undergraduate curriculum of a school of architecture is already too heavily loaded, most educators relax and permit students to conduct special research only if they have had previous specialized training and interests and at the same time show sufficient aptitudes in the completion of their required architectural work to permit such extra curricular studies.

These are some of the limitations on a free use of technical research at the undergraduate level. In most graduate schools there seems to be more flexibility. In many instances there is no fixed graduate curriculum and there is much more freedom of option. The problems of prerequisites still remain unsolved, and we often face the difficulty in which a graduate student has to take undergraduate courses in a specialized subject in order that he may qualify to do graduate level research in a particular field. I, for one, have never been too much concerned about the question of graduate or undergraduate courses where a man wishes to fill out his education. Degrees are artificial and very seldom indicate true qualifications. However, they are part of the rote in almost all educational institutions and exert considerable control over freedom of action.

You are to be congratulated for the success of your interesting experiment, and I look forward to hearing more about it. CARL FEISS

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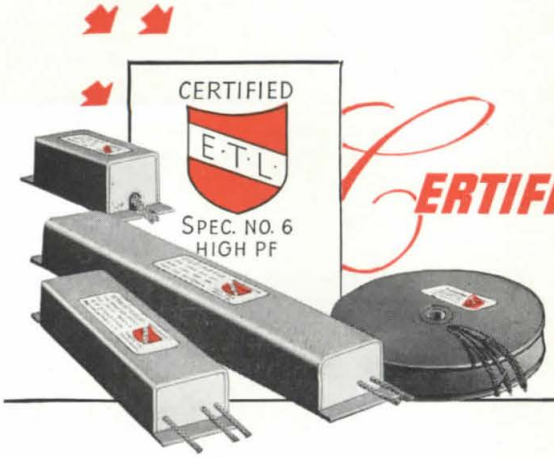

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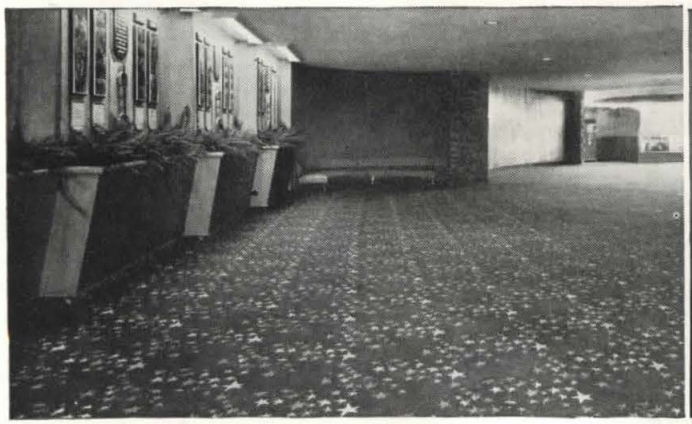

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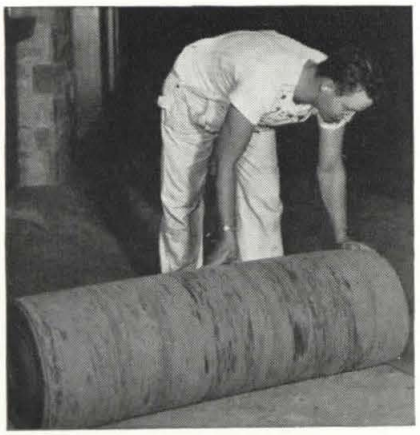

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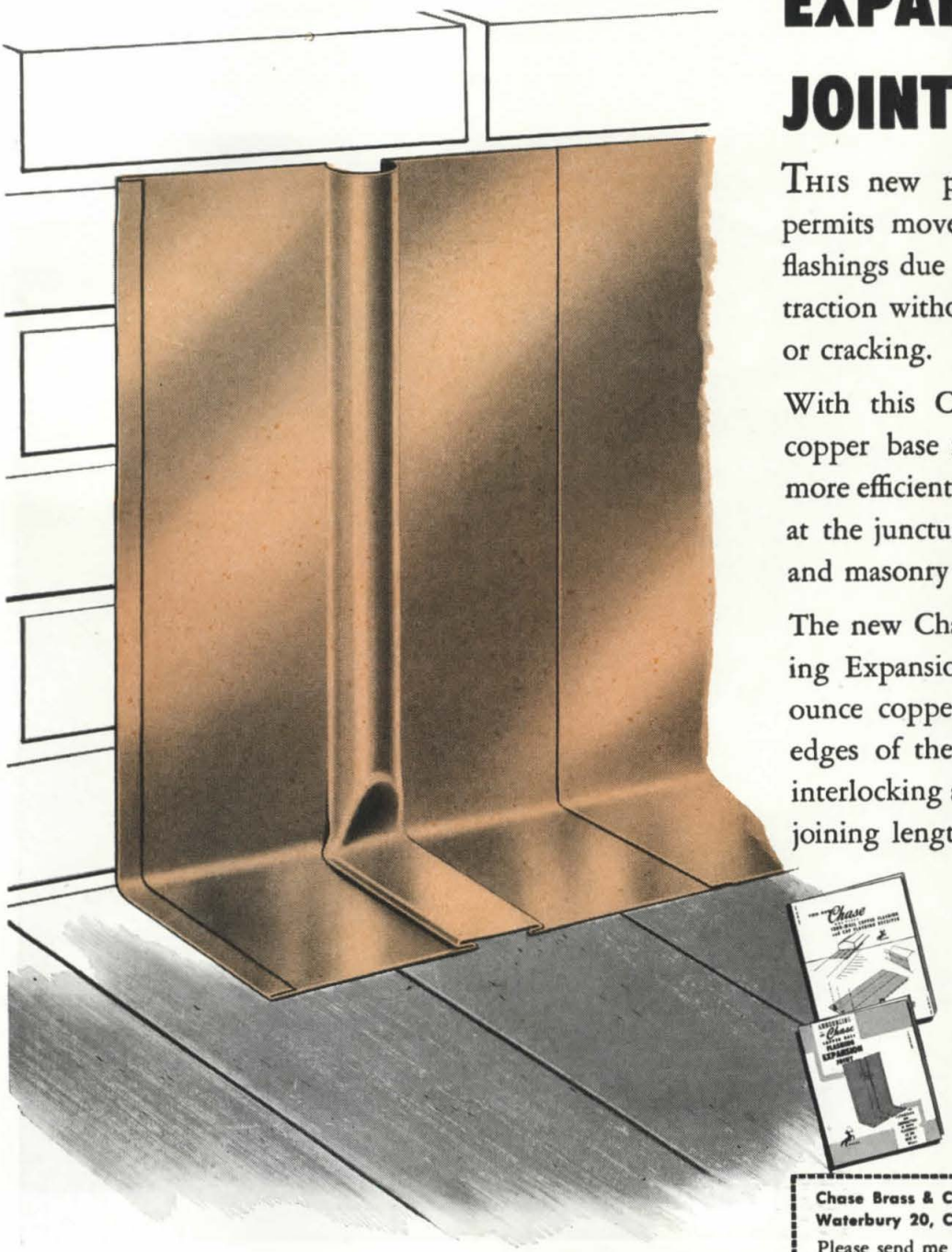

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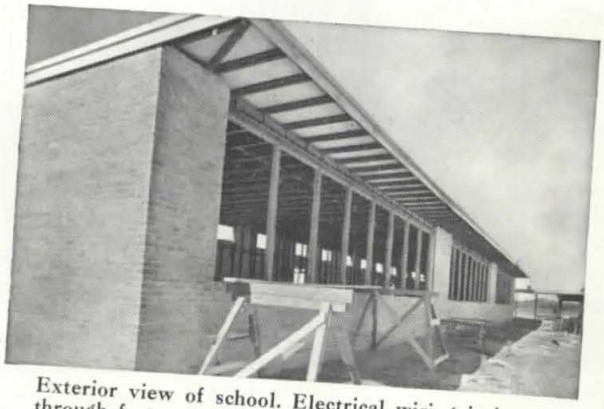

Exterior view of school. Electrical wiring is installed through factory-punched holes in frame members.

Here is what Benjamin Kenneth Wyatt, architect for the Robstown, Texas and other school buildings, says about Stran-Steel Framing:

"We have used Stran-Steel construction in several recent school buildings.

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"Being able to nail to Stran-Steel Framing gives the economy of wood framing for dry wall construction (Knox School) also eliminates furring for metal lath (Robstown Schools) in plaster construction. Fire-safety and long life is of paramount importance in school building construction, and incombustible Stran-Steel framework meets both of these requirements."

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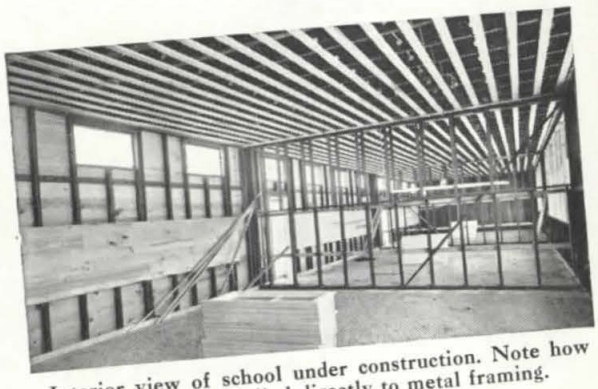

Interior view of school under construction. Note how wood collateral is nailed directly to metal framing.

Stran-Steel Framing for Robstown Elementary School.

Corridor detail of school showing Stran-Steel Framing.

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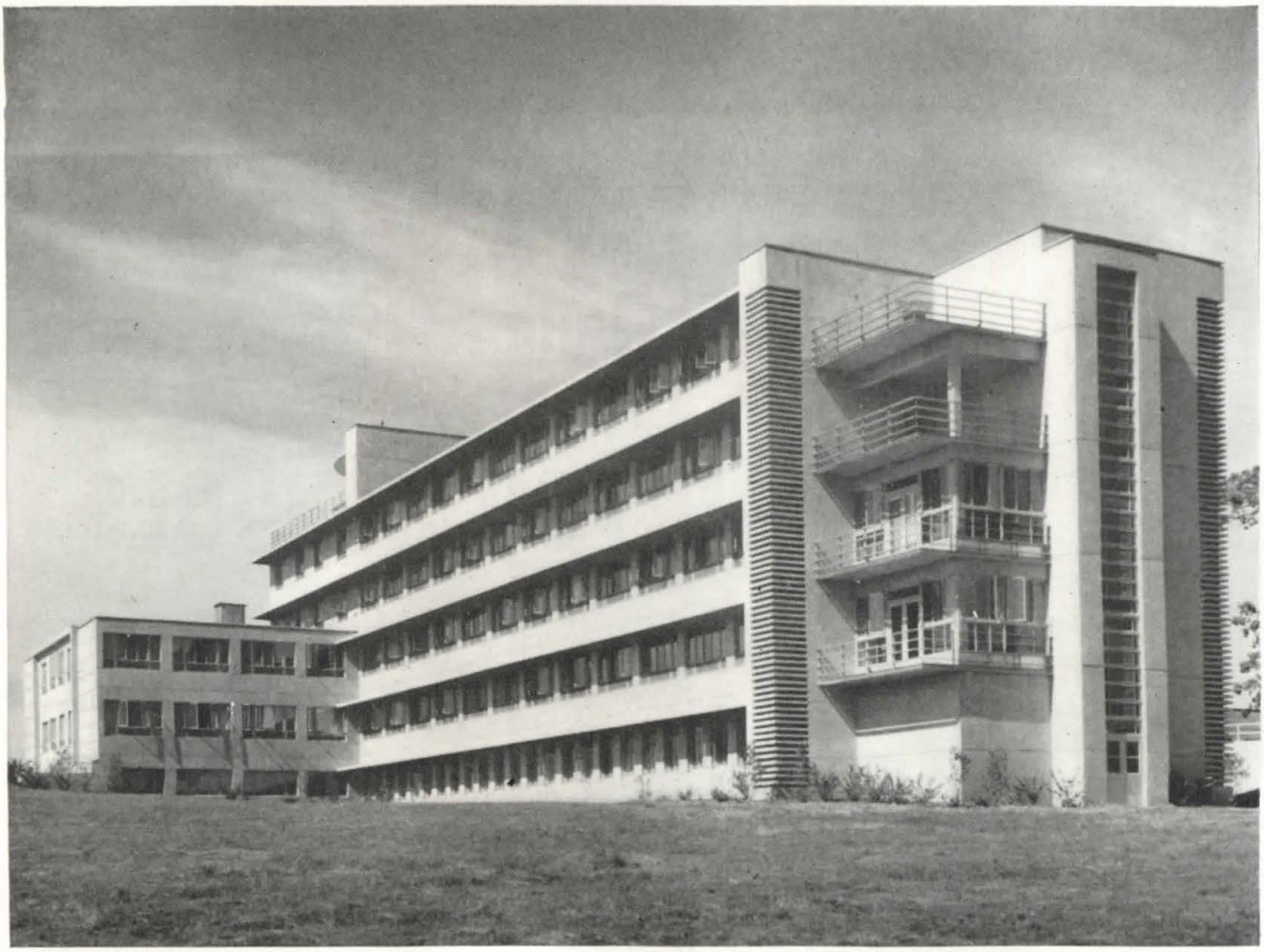

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For more information about designing attractive, economical buildings in architectural concrete send for free literature. Distributed only in U.S. and Canada.

The Jackson-Madison County Hospital in western Tennessee was designed in architectural concrete by Architect J. Frazer Smith, Inc., of Memphis. The structural engineer was A. R. Jessup of Nashville. The contractor was Harmon Construction Company of Oklahoma City.

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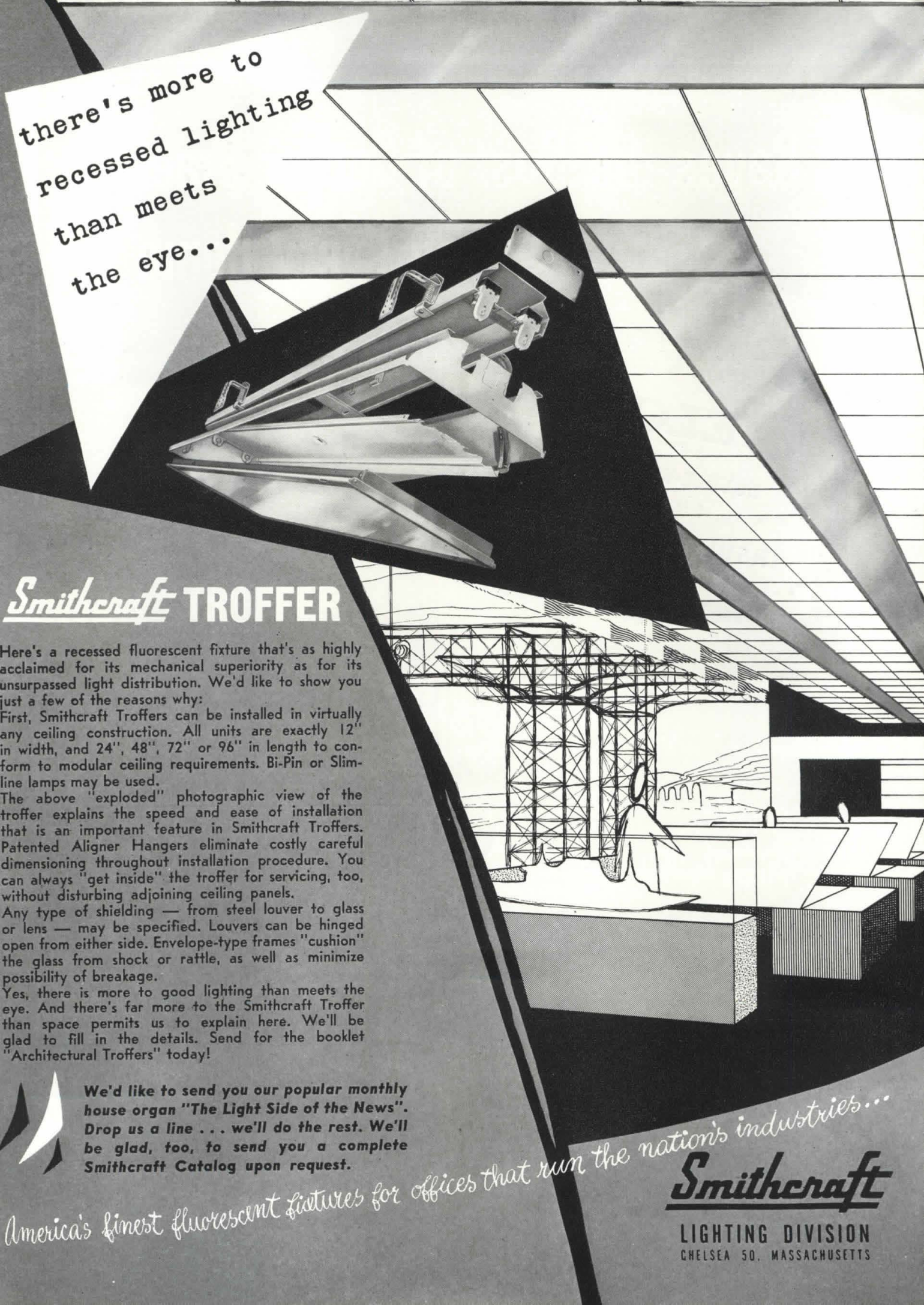
there's more to recessed lighting than meets the eye...



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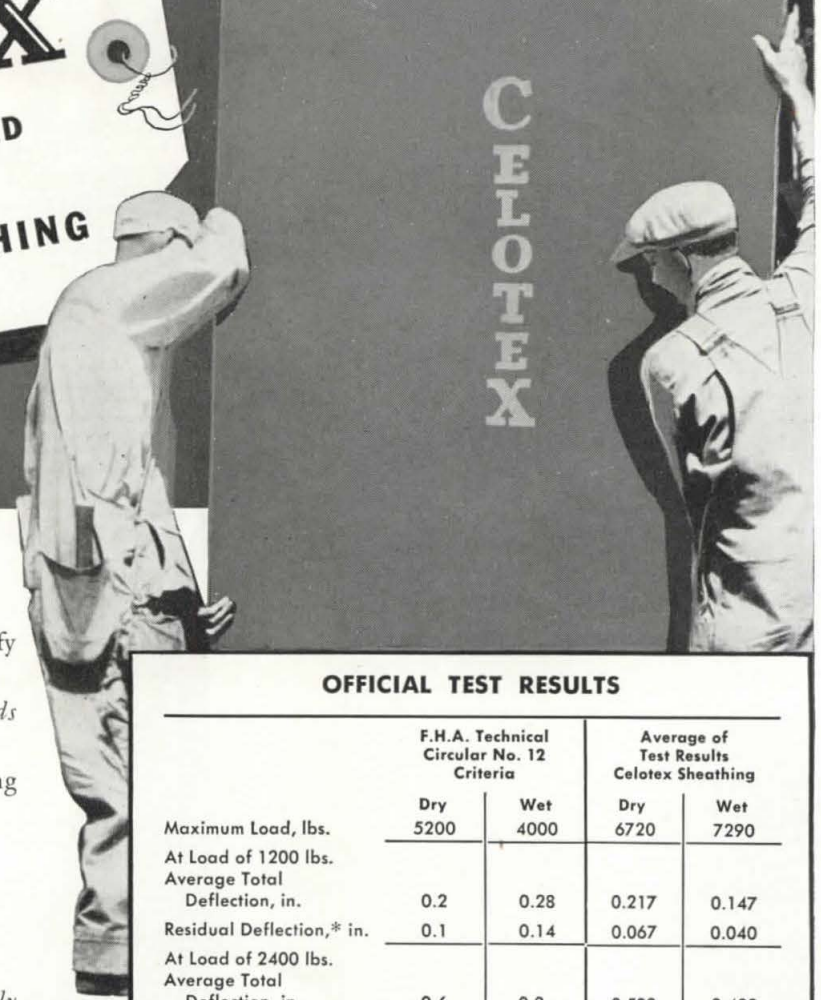

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Residual Deflection,* in.	0.1	0.14	0.067	0.040
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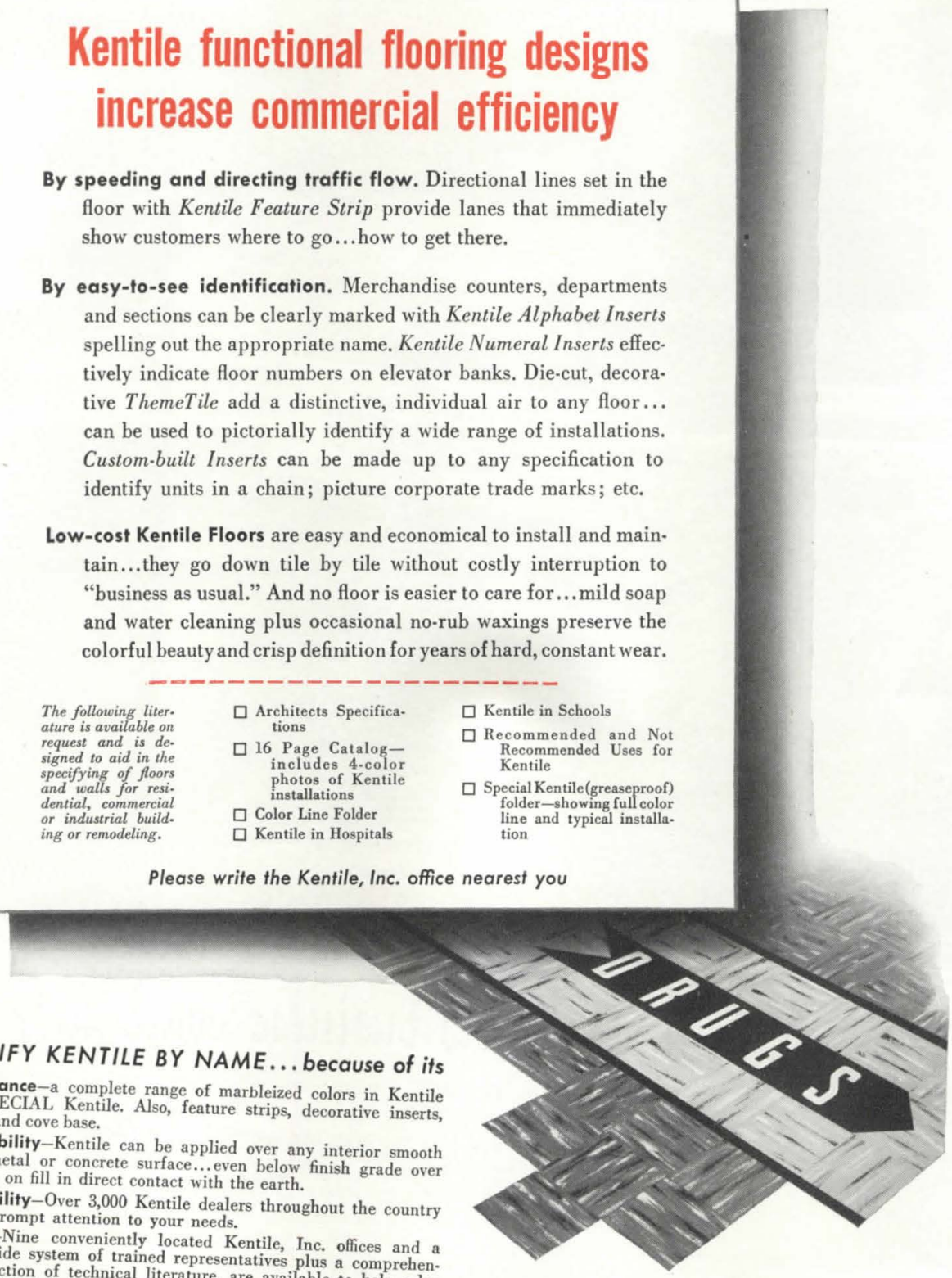

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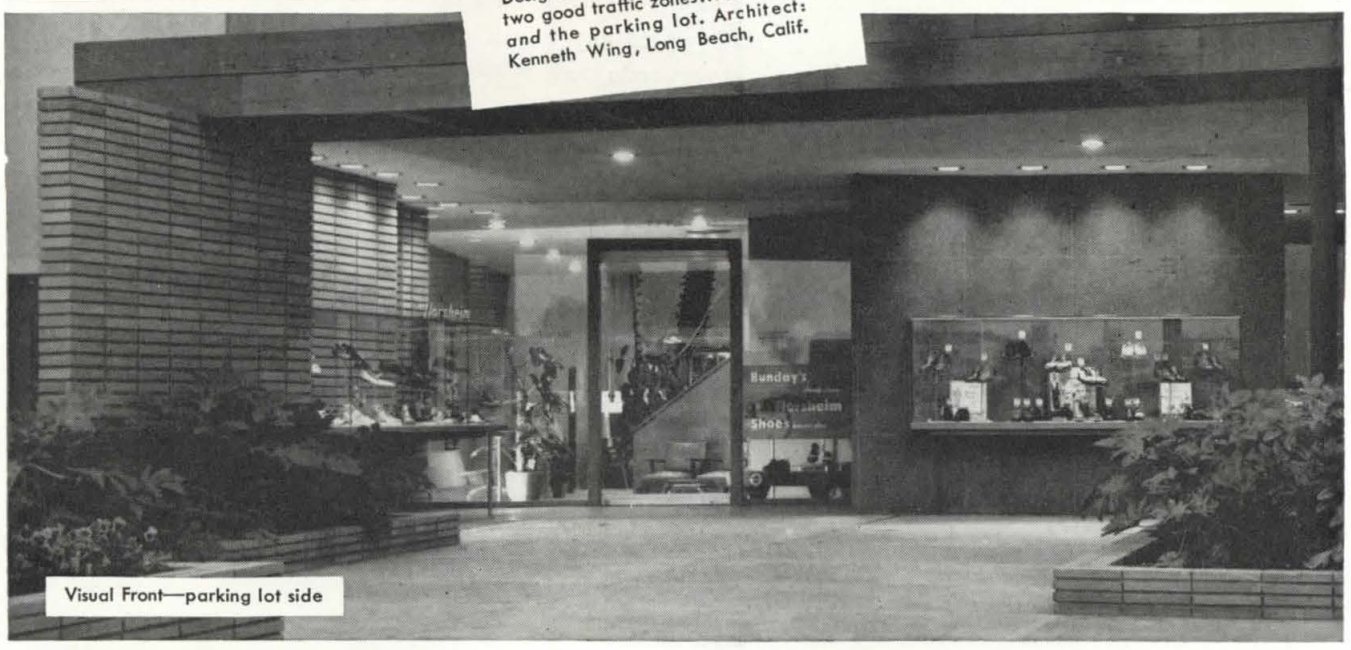
Visual Front—street side

Designed to attract business from two good traffic zones...the street and the parking lot. Architect: Kenneth Wing, Long Beach, Calif.



Visual Front—parking lot side

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The front door used to be *the* avenue through which business flowed into a store. Now traffic may come from two sides—or three—or four.

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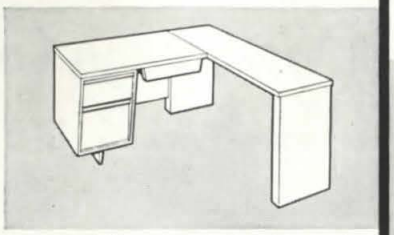
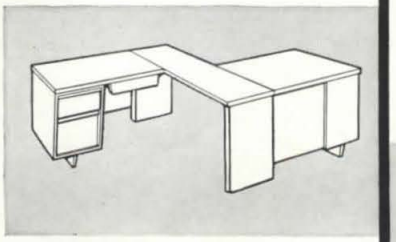


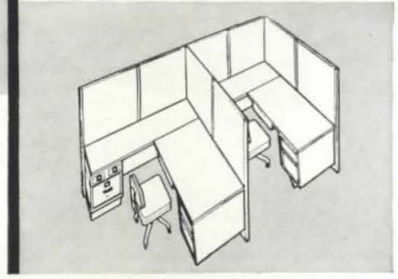
Basic "L" unit—desk with pedestal and center drawer—auxiliary top with end supports.



"L" Unit with horizontal section under auxiliary top. Various arrangements possible for letter files, map and drawing files and card index files.

Partitions for privacy—noise barriers—in full (66") or medium (48") height—in all-wood or combination wood and glass.

← Work station for two persons by the addition of desk unit gives economy of space and increased work efficiency.



Two Techniplan bays give semi-private work stations for two persons. Ideal for executive offices. Full height, all-wood partitions.

GLOBE-WERNICKE

Engineering Specialists in Office Equipment, Systems, and Visible Records

Cincinnati 12, Ohio

QUALITY AT ITS HIGHEST NATCO GLAZED VITRITILE

Showing use of Natco Ceramic Glazed Vitritile for interior walls and partitions in the Mental-Surgery Building of the Winnebago County Hospital, Winnebago, Wisconsin. Architects—Auler, Irion & Wertsch. Contractors—George A. Fuller Company.

In Winnebago County Hospital, Wisconsin, NATCO walls are sanitary, firesafe, lasting.

Everything in interior hospital walls and partitions is provided when faced with Natco Ceramic Glazed Color Engineered Vitritile — outstanding endurance against hard usage, utmost in sanitation, vermin and germ proof, easily cleaned and kept clean.

Natco Ceramic Glazed Color Engineered Vitritile is designed for use in either modular or conventional design.

A complete line of shapes and coordinated fittings are furnished to provide the most desirable and efficient layout with a minimum amount of cutting and fitting, especially when the building is modular designed.

Send for a copy of Catalog SA-50 for additional information on Natco Ceramic Glazed Color Engineered Vitritile and other Natco products.

NATCO CLAY PRODUCTS SINCE-1889

QUALITY FACING TILE FTI Member of FACING TILE INSTITUTE

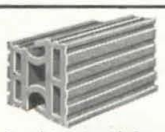
NATIONAL FIREPROOFING CORPORATION

GENERAL OFFICES: 327 FIFTH AVENUE • PITTSBURGH 22, PA.

Branches: New York • Syracuse • Detroit • North Birmingham, Alabama
Chicago • Philadelphia • Boston • Toronto 1, Canada

"The Quality Line Since 1889"

Raggle Blocks
Prevent Water Seepage
4" x 5½" x 12" Nom. Size



Speed-A-Backer Tile for
Backing Brick Faced Walls
12" long Varying Heights

Ceramic, Clear
Glazed Vitritile 5½" x 12"
Nom. Face Size

Ceramic Glazed Vitritile
8" x 16" Nom. Face Size

Non-Loadbearing Tile, Scored
and Unscored, 12" x 12" Face
In Standard Wall Thicknesses

Buff Unglazed, Manganese
Spot, Salt Glazed, Red
Textured Dri-Speedwall Tile,
5½" x 12" Nom. Face Size

Introducing

THE RUSSWIN HEAVY DUTY CYLINDRICAL LOCK

Now... a fully-rounded line of modern top quality locks

RUSSWIN *Unit Locks*

RUSSWIN *Mortise Locks*

RUSSWIN *Cylindrical Locks*

RUSSWIN *Tubular Locks*

Designed specifically for...

Schools, Hospitals, Apartment Houses, Commercial, Institutional and Industrial Buildings.

THE NEW RUSSWIN CYLINDRICAL LOCK

with ⅝" throw offers unmatched security, simplicity and durability.

Wrought or cast brass or bronze trim.

Extra large steel knob bearing in brass bushing for longest service life.

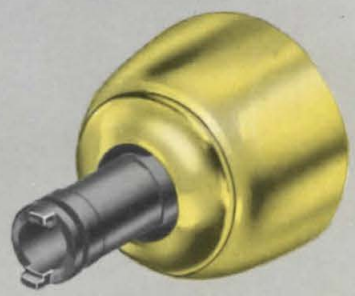
Completely reversible lock.

Extra large bearing area on latch retractor.

Exclusive Russwin ball bearing pin tumbler cylinder.

Full ⅝" throw adds extra security . . . handles extreme door shrinkage.

Simplified knob design assures quick, scar-proof door assembly. Knob action is strong, positive.



Seamless tubular knob shank for full torsional strength.

The addition of heavy-duty cylindrical locks to the Russwin Line of Builders' Hardware offers architects and consultants a new opportunity to recommend Russwin Quality Hardware *throughout.* This latest member of the Russwin Fam has been developed to mee the most exacting standards of the architectural profession and building industry. T benefits of its advanced design and construction can be demonstrated easily to every interested client. Wha more, the addition of heavy-duty cylindrical locks to the Russwin Line makes possible simpler, faster, more trouble-free specification writing. Every type of lock is now available from Russwin besides other essential builders' *hardware . . . for a wide variety of buildings.*

SINCE 1839

RUSSWIN®

DISTINCTIVE HARDWARE

PROVING THE ECONOMY OF QUALITY

MECHANICAL DESIGN FEATURES

EAVY-DUTY ONSTRUCTION

Seamless Tubular knob shank; full torsional strength of knob shank developed due to absence of longitudinal split. Double dog knob flange develops maximum strength between knob and knob shank. Phosphor bronze coil compression springs used throughout.

MPLIFIED ONSTRUCTION

Integrated design provides maximum number of lock functions with minimum number of different parts. Trouble-free operation assured through fewest possible number of parts in each lock.

RECISION MADE

Completely toleranced design insures uniform precision of parts.

EVERSIBLE ATCH

Minimum disassembly required to insure upright key. Reverse bevel condition easily met by simple operation of reversing knob.

ALL BEARING YLINDER

Famous Russwin 6 pin tumbler ball bearing principle utilized in all keyed functions. Only Russwins have the ball bearing cylinder.

EYS

Lifetime keys insured through use of 12% nickel alloy for all keys.

ASTER KEY

Locks can be furnished to any established Russwin master key system, regardless of complexity.

EVERSIBLE YLINDER

Cylinder may be reversed by removal of one screw. This operation easily performed in field — insures against installation of lock with upside down pin chamber. This allows adequate drainage of cylinder pin holes and tends to prevent dirt accumulations.

ONGER LATCH OLT THROW

Full ⅝" latch bolt throw insures maximum security under the worst conditions of door shrinkage.

TRIKE

Box strike insures full latch bolt engagement under all installation conditions, also armors against tampering with latch bolt when in position. 1¼" lip allows for maximum curve on lip of strike for easy latching.

TYLES

Available in *MODERN STYLE:* "Cosmic" design (wrought metal), "Flare" design (cast metal) . . . *CONVENTIONAL STYLE:* "Haddam" design (wrought metal), "Bristol" design (cast metal).

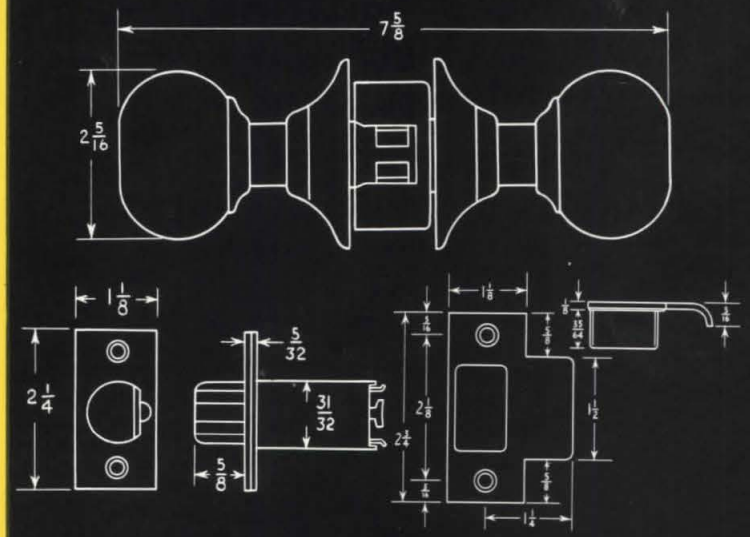
NISHES

Varied, extremely durable, typical Russwin Quality. See next page.

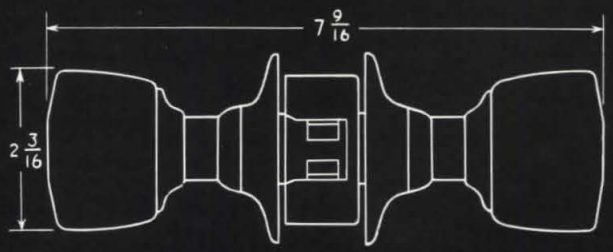
RUSSWIN®

HEAVY-DUTY CYLINDRICAL LOCKS

LOCK DIMENSIONS shown below are overall dimensions for Bristol and Haddam design. Latch and Box Strike dimensions shown are standard for all designs.



LOCK DIMENSIONS shown below are overall dimensions for the Cosmic and Flare designs.



FUNCTIONS

Russwin Heavy-Duty Locks are available in a wide variety of functions for many types of buildings. See following page.

INSTALLATION OF LOCK

Lock easily installed. Just drill 2 holes and mortise front in door. Rose screw adjusted to mark on shank for thickness of door. Inside knob twists into place; not necessary to line up with any component parts or use a tool which might scratch finish.

INTERCHANGEABLITY

Russwin heavy-duty cylindrical locks can be readily interchanged between doors or reversed to take care of changes in swing.

Handy Data on the new Russwin Heavy-Duty Cylindrical Lock Operations

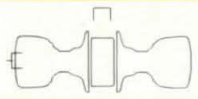
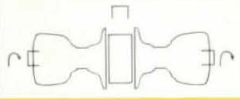
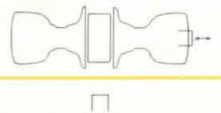
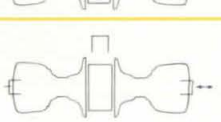
HARMONIZING DESIGNS AND FINISHES

"KEY-NOB" . . . Bristol or Haddam design . . . Finish, Dull Chromium

TURN BUTTON KNOB . . . Cosmic or Flare design . . . Finish, Polished Bronze

PLAIN KNOB . . . Bristol or Haddam design . . . Finish, Polished Chromium

PUSH BUTTON KNOB . . . Cosmic or Flare design . . . Finish, Polished Brass

RECOMMENDED FOR	LOCK NUMBER	LOCK OUTLINE	OPERATION
Residential Front and Rear Doors Office Doors	440		Latch bolt by knob each side. Inside always free. Turn button dead-locks knob. Cylinder retracts latch bolt whe side knob is locked. Dead locking latch
Bathrooms and Bedrooms	420		Latch bolt by knob each side. Inside always free. Push button dead locks knob. Push button released by turning knob or closing door . . . also releas emergency key through outside knob.
Classroom, Vestibule and Utility Room Doors	440⅝		Latch bolt by knob each side. Inside always free. Outside knob dead lock key in outside knob. Dead locking la
Apartment House Entrance, Office Building and Corridor Doors	446½		Latch bolt by knob each side. Inside always free. Outside knob dead lock key in inside knob. Key in outside kn tracts latch bolt when outside knob is Dead locking latch.
Utility room, Storeroom and Exit Doors	452		Latch bolt by inside knob only. Outsid fixed. Latch bolt may be retracted by c in outside knob. Dead locking latch.
Exit Doors	426		Latch bolt by knob either side. Turn locks or unlocks outside knob. Inside always free.
Passage Doors	410		Latch bolt by knob either side. Eac always free.
Exit Doors	414		Latch bolt by knob inside only. Inside always free. Outside knob fixed. Dea ing latch.
Communicating Hotel or Office Doors	428		Latch bolt by knob either side. Turn bu either knob locks or unlocks opposite Dead locking latch.
Cylinder Communicating Hotel or Office Doors	450½		Latch bolt by knob either side. Cylin each knob locks or unlocks opposite Dead locking latch.
Dormitory Bedrooms and Public Rest Room Doors	453		Latch bolt by knob either side. Inside always free. Push button dead locks knob. Turning inside knob or closing releases push button. Cylinder release button and dead locks outside knob. locking latch.
Residential Bedroom and Inner Office Doors	422		Latch bolt by knob either side. Push dead locks outer knob. Inside knob free. Turning inner knob or closing de leases push button. Dead locking latch
Office Doors	446		Latch bolt by knob each side. Push dead locks outside knob. Inside knob free. Turning inside knob releases push Cylinder retracts latch bolt and release button. Dead locking latch.

SYMBOLS  Rigid Knob — Cylinder and Key — Turn Button — Emergency — Push Button

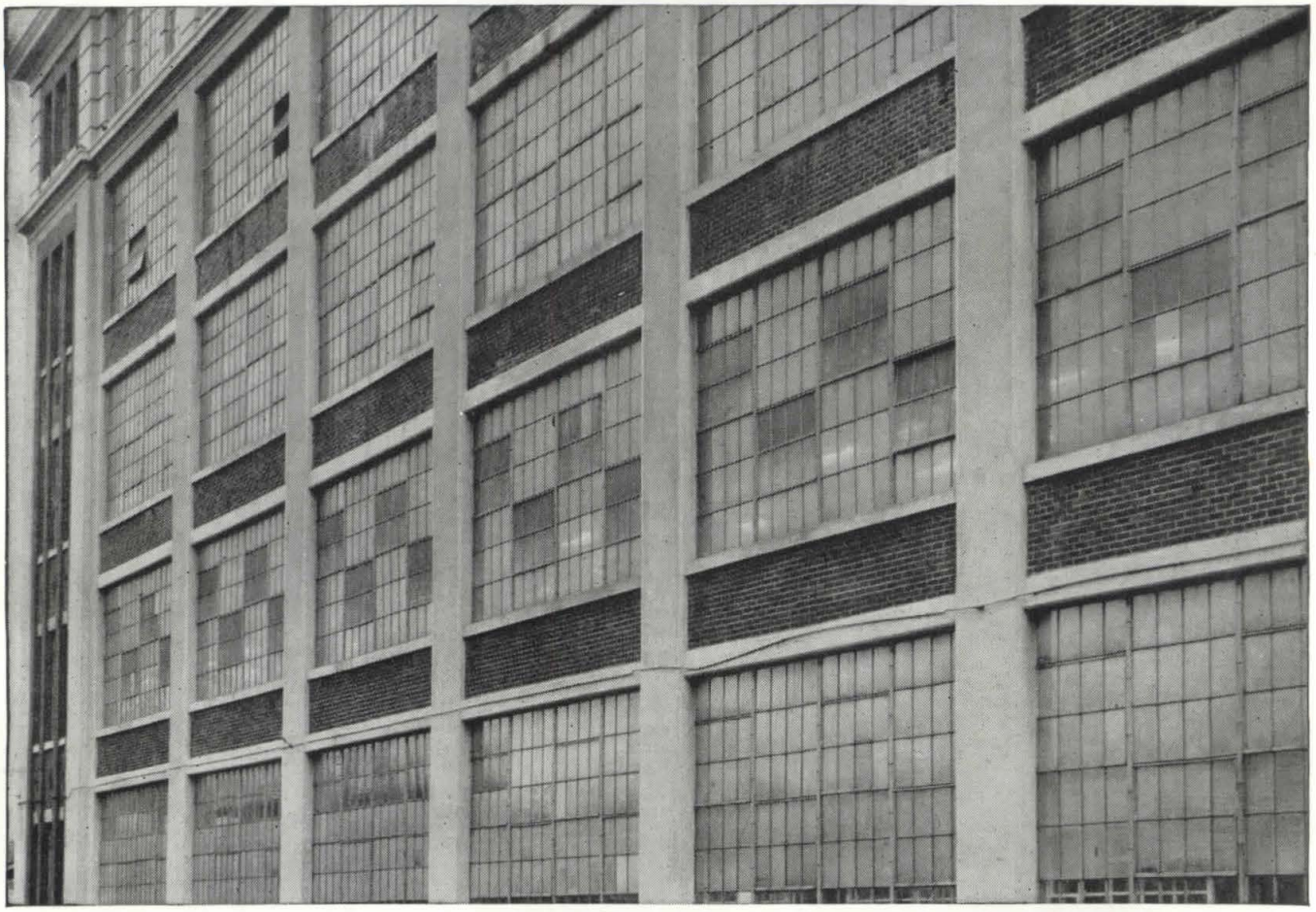
RUSSELL & ERWIN DIVISION

The American Hardware Corporation • New Britain, Conn.

Period Design Lock Trim
Unit Locks
Heavy Duty Cylindrical Locks
"Ten Strike" Mortise Locks
Tubular Locks

Colonial Hand Forged Iron Hardware
Entrance Door Sets
Cylinder and Bit Key Locks
Push Plates, Door Pulls, Push Bars
Fire Exit Bolts

Surface Door Closers
"400" Door Closers
Sash Hardware
Miscellaneous Hardware



30-year-old Fenestra Galvanized Steel Windows in American Woolen Company's Mill No. 2, Shawsheen, Mass. No sign of rust—yet they've never been painted.

No Rust—Even After 30 Years

(and these steel windows have never been painted!)

These are Fenestra* Galvanized Windows—"old style". They've served this building since Harding was President and although there are many signs of time in the picture above—there's not a sign of *rust.* There *is* no rust—even after 30 years.

And these windows were never painted.

But here's the really *big* news! *Now* Fenestra Engineers have developed a hot-dip galvanizing system that does *an even better* job—and they've built a special new plant around it, the only plant of its kind in the country. It has special tanks, special automatic controls—everything especially designed to give you the most *permanent* windows made.

Galvanizing is done *after* assembly of window frames and assembly of ventilators (and after cleaning, rinsing, fluxing and drying)—so that every bit of exposed metal gets a locked-on protective coating. To make sure the zinc coating is uniform, windows are hung from a unique conveyor that lowers to completely immerse them in molten zinc in one deep dip. Then withdraws them at controlled speed. Then they dip into the Bonderizing tank. Bonderizing gives them an attractive appearance and prepares the surface if you wish to paint them for decorative purposes.

Check on these windows today. *Steel-strong windows made to STAY new* put real meaning in the term "maintenance free"!

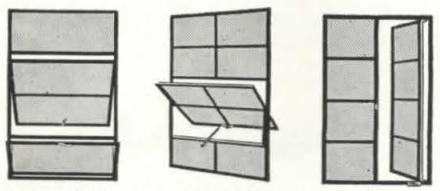
Call your Fenestra Representative (he's listed in the yellow pages of your phone book) or write to Detroit Steel Products Company, Dept. **PA-9,** 2253 East Grand Boulevard, Detroit 11, Michigan.

*®

Steel-Strong Windows made to STAY new

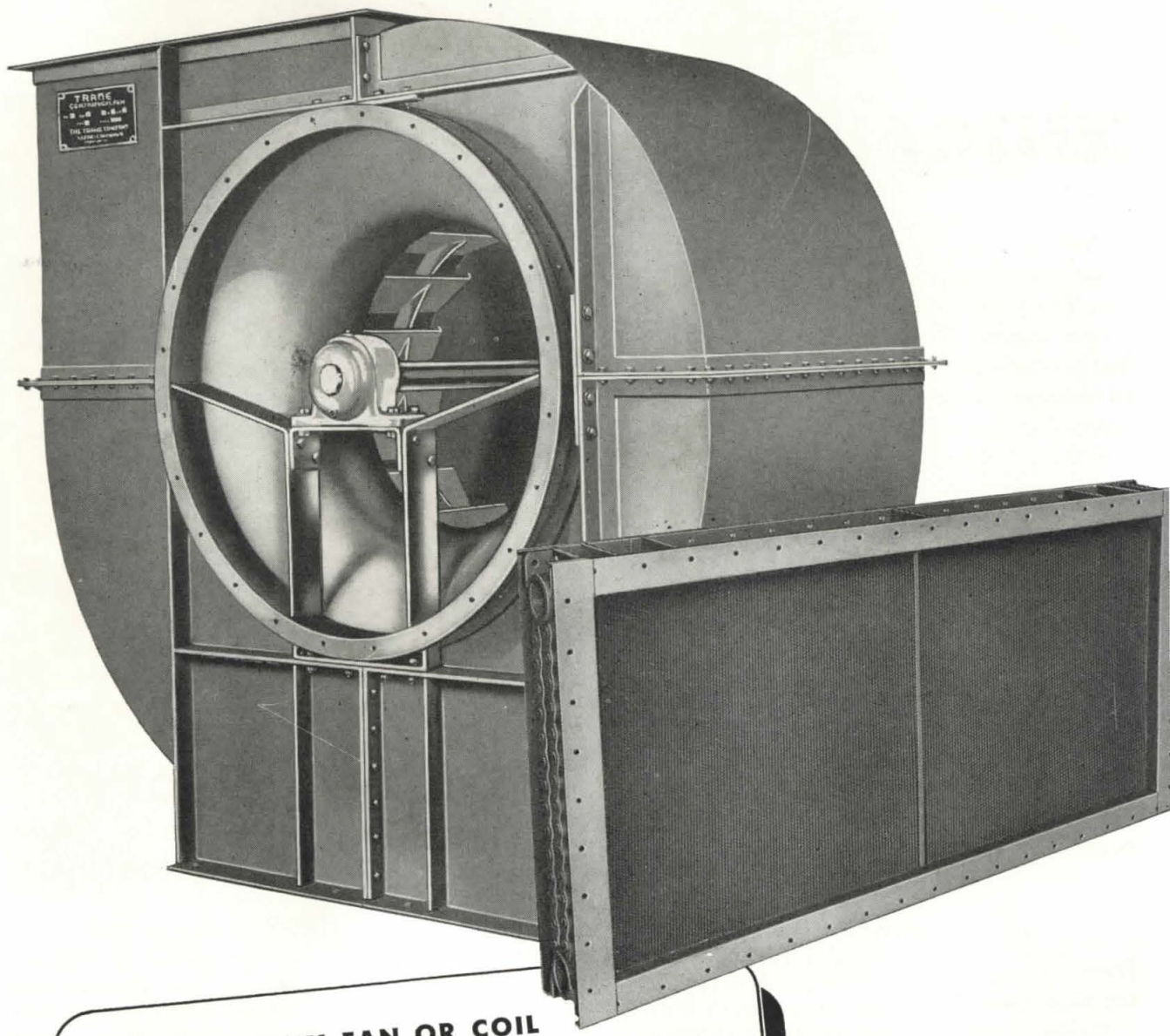
Fenestra

HOT-DIP GALVANIZED STEEL WINDOWS



Intermediate Industrial Residence

ESS HORSEPOWER AND



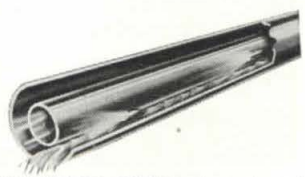
COMPARE ANY FAN OR COIL AGAINST THIS TRANE CHECK LIST

FANS

Feature	Trane	Fan A	Fan B
Chlorinated Rubber Enamel	X		
Formed Inlet Openings	X		
Uninterrupted Duct Collar	X		
Welded Construction (Large Fans)	X		
Lock Seam Construction (Small Fans)	X		
Full Capacity Fan Wheels	X		
Fan Blades as heavy as 7 gauge	X		

COILS

Feature	Trane	Coil A	Coil B
Kinetic Orifice	X		
Plate-Type Fin	X		
Dual-Fin Contact	X		
Mechanical Bond of Fin and Tube	X		
Bushed Tube to Header Joint	X		
Provision for Proper Tube Expansion	X		
Wide Coil Channels—2¼"	X		



THE KINETIC ORIFICE, the patented Trane feature, releases steam in the direction of condensate flow in steam distributing tube coils. Drainage of condensate is accelerated. Stratification and freezing is eliminated.

MANUFACTURING ENGINEERS

BETTER PERFORMANCE

WITH THIS TRANE CENTRAL SYSTEM COMBINATION

You get triple value when you combine Trane Centrifugal Fans and Trane Coils in a central system. You get outstanding products loaded with exclusive features. You get the rugged construction that has made Trane famous. And, you get the added advantages that come only when you combine matched products. *Together Trane Centrifugal Fans and Trane Coils create a central system that produces top performance with less horsepower than any similar combination.*

Here's why:

Thanks to modern design, the average horsepower requirements of Trane Fans is lowest in the industry. Trane Coils with their streamlined bond of tube and flat plate-like fin offer minimum resistance to air flow. Combine a low horsepower fan and a low air friction coil and power demands shrink accordingly. That means you get greater efficiency and lower operating costs.

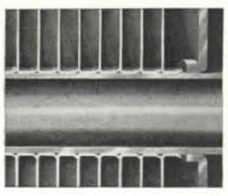
Rugged Construction for Consistent Performance—Then for long life and consistent performance, Trane gives you rugged construction in both products. Compare Trane Fan construction. Part for part, Trane uses metal that is as heavy or heavier than any other manufacturer.

Trane Coils use extra heavy tubing. Coil supports are equally strong. The Trane fin-and-tube construction with its solderless mechanical bond is designed to last a lifetime.

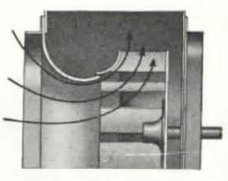
Lower Noise Level Fans – Besides low horsepower and heavier construction, other Trane Fan features include lower noise levels; more accurate fit and tolerance for consistent performance; chlorinated rubber base paint finish to prevent corrosion. Also featured is the uninterrupted collar for easy connection with duct work.

Coil Capacity Increased 15% – First in Trane Coil advantages is the kinetic orifice. This exclusive development in steam distributing tube coils increases capacity as much as 15%. Additional exclusive Trane features—six-step manufacture of fins to insure even heat flow—dual-fin contact that makes the fins an integral part of the tubes and speeds heat transfer – the guide flange assembly that permits expansion of the tubes for longer coil life.

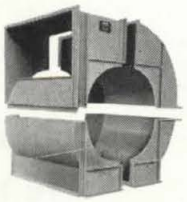
There's similar extra value when you combine other matched products from the complete Trane line of heating, cooling, ventilating and air conditioning equipment. Each product is studded with exclusive features, each offers more rugged construction. And when you combine them in complete systems you get added features such as the less horsepower better performance of Trane Fans and Coils.



DUAL-FIN CONTACT is illustrated in this cutaway section of a Trane Coil. Collar of one fin is extended to next fin to form uninterrupted surface for continuous flow of heat.



ACCURATELY STREAMLINED FAN INLET CONE makes possible even distribution of the air in the fan wheel without noisy turbulence—permits fan to operate at highest efficiency with lowest noise level.

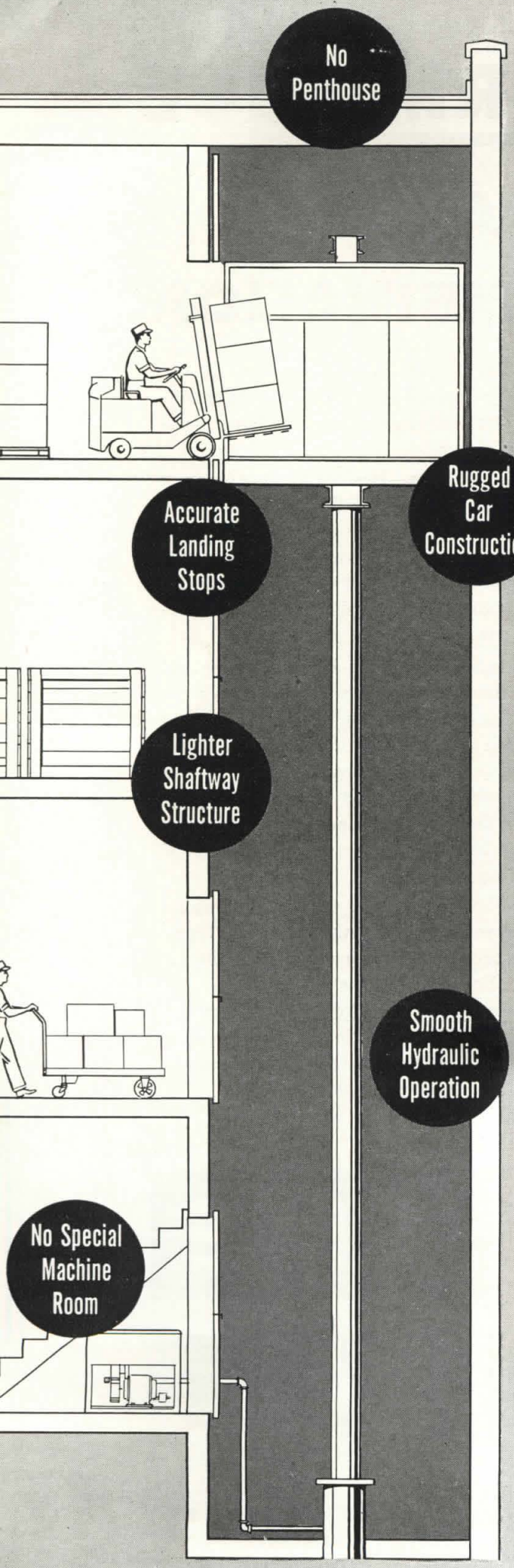


SPLIT FAN HOUSING permits easier installation. On large units, housings can be split on horizontal and vertical plane so fan parts can be moved through small openings and reassembled.

TRANE

THE TRANE COMPANY, LA CROSSE, WIS.
Eastern Mfg. Division, Scranton, Pennsylvania
Trane Company of Canada, Ltd. . . . Toronto
OFFICES IN 80 U.S. and 14 CANADIAN CITIES

OF HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT



Rotary Oildraulic Elevators

LOWEST COST INSTALLATION

■ The basic operating principle of Rotary Oildraulic Elevators (fluid under pressure) is ideal for heavy-duty freight service. Whether the load is little or great it is moved with the same efficiency. Power is applied directly to the load—there is no lost motion. The car will not move downward as heavy loads are rolled in . . . because the elevator is firmly supported on a solid column of oil. There is nothing to stretch or give.

From an architectural and construction standpoint (see diagram at left) the Rotary Oildraulic Elevator requires no costly, unsightly penthouse because it's pushed from below—not pulled from above. Nor is there any need for heavy sidewall supporting columns and footings. Rotary's Oildraulic jack supports the car and the load, and there are no counterweights or overhead machinery. Usually a special machine room is not used.

Oildraulic Elevators are built to handle power truck loading

Power truck loading is provided for on all Oildraulic freight elevators with a capacity of 5,000 lbs. or more. They are designed for use with power operated trucks and tractors even when such service is not planned at the time of purchase. This is done because the purchaser may start using power equipment later.

FOR 2, 3, OR 4-STORY BUILDINGS • HEAVY-DUTY SERVICE

Oildraulic automatic floor leveling accurately positions the car to each landing. This is a "must" for power vehicle handling. Exact floor stops minimize shock during loading; there are none of the jolts caused when the elevator car is above or below the landing.

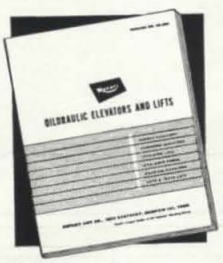
Rugged car construction is essential for freight service. Oildraulic freight elevator cars have deep-formed members, electrically welded. Bolsters, stiles and other parts are reinforced and braced to withstand stresses and strains. Every car is accurately engineered to do the job for which it is ordered, whether it be a small 1,000 lb. unit for packaged goods or a 50,000 lb. job to handle power vehicles with heavy loads. Manual or motorized car gates furnished as specified.

Rotary gives you the new Rota-Flow power system for smoother, quieter, lower-cost service

Rota-Flow, the revolutionary new hydraulic power transmission system, moves Rotary Oildraulic Elevators on a continuous, pulsation-free column of oil. Rota-Flow eliminates vibration and pumping noise, and operates with greater efficiency than any other hydraulic power unit.

Combined with the Rota-Flow power unit to give perfect operation is the Oildraulic Controller, an exclusive patented Rotary development. This remarkable device combines the functions of seven separate control valves and carries out the "instructions" of the electric control panel.

▪ Over 50,000 Rotary Oildraulic elevators and lifts are now serving major companies and building owners throughout the nation. Our coast-to-coast organization offers the most complete engineering and maintenance service in this field.



Write for A.I.A. File

See Section $\frac{33a}{Ro}$ in Sweet's Architectural File and write us for catalog and complete information on Rotary Oildraulic Elevators. Our Engineering Department will be glad to work with you on preliminary layouts and specifications. No obligation, of course.

ROTARY LIFT CO., *1018 Kentucky, Memphis 2, Tenn.*

Imagination and practical plannin

a striking coliseum

The University of Kentucky Memorial Coliseum,
Lexington, Kentucky.
Proctor-Ingels, electrical engineers.

Gillig

riwether

Ernst V. Johnson

Only architects with imagination could have conceived the bold, simple design of the University of Kentucky's Memorial Coliseum at Lexington. Only architects with foresight could have transformed this design into such a strikingly modern, completely functional field house and auditorium seating 13,000 people. Working together, three men from Lexington did the job—and left an architectural milestone.

But Mr. John Gillig, the senior architect, who supervised the entire project, Mr. Ernst Johnson, who did the architectural design work and Mr. Hugh Meriwether, who assisted the planning and wrote the specifications, know that the practical architect is also a practical businessman—whose job is to get full value from every dollar that goes into a building. And, being practical, they are great believers in quality . . . wherever quality means better performance and longer service life.

That's why it is interesting to note that these architects selected Day-Brite fixtures to light the main foyer and concourse, the ramps, offices, lounges and corridors of this well-lighted Coliseum. These architects realized that Day-Brite's initial cost would quickly be offset by lower installation, maintenance and operating costs. But, regardless of cost, they were determined to have this building illuminated properly—with the best lighting fixtures on the market.

The wide Day-Brite line contains fixtures that are designed for all kinds of building projects . . . and *every* Day-Brite fixture sold is guaranteed to offer top-quality performance at reasonable cost. Are *you* familiar with Day-Brite?

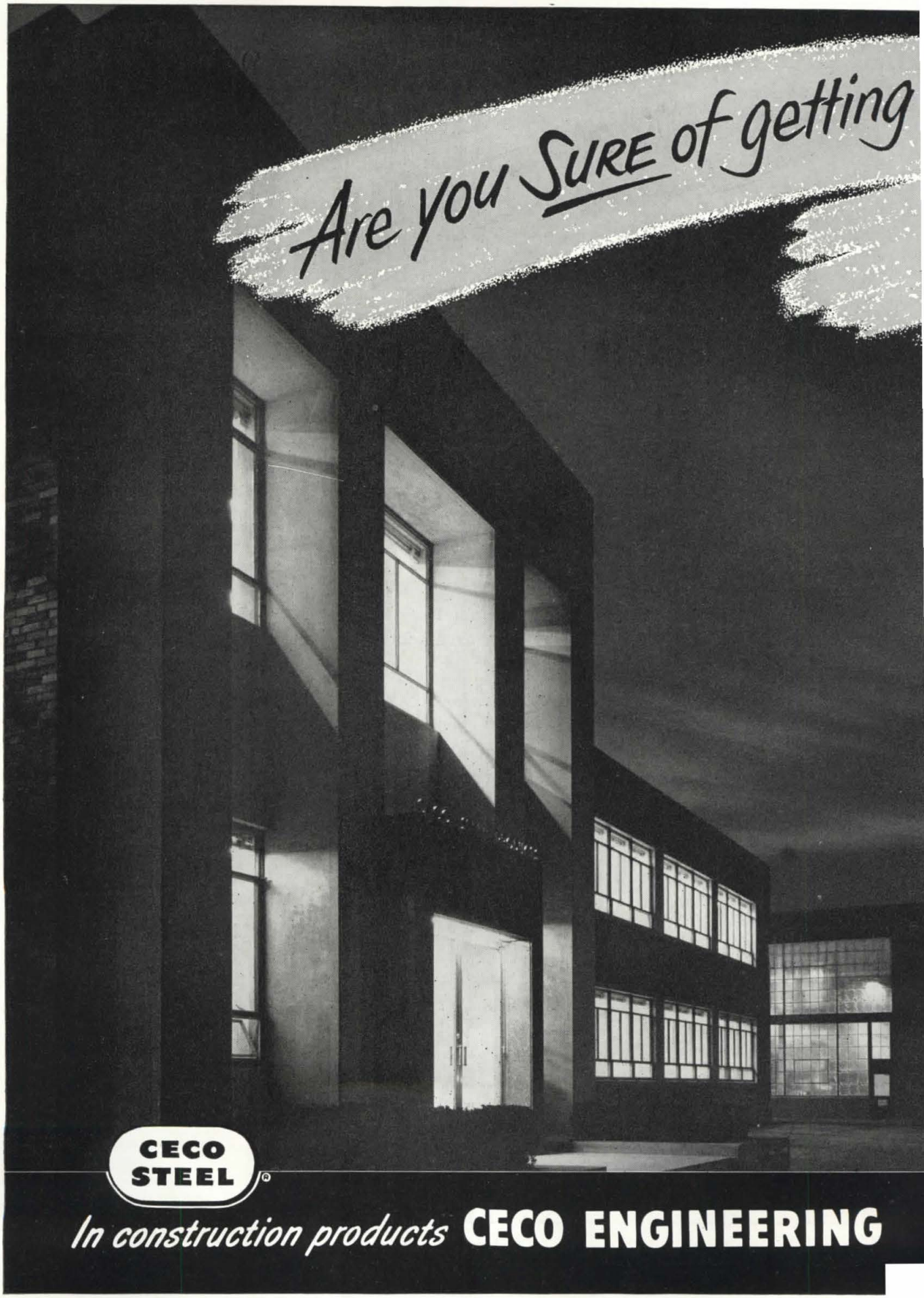
Day-Brite Lighting, Inc., 5405 Bulwer Ave., St. Louis 7, Missouri. In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario. Distributed nationally by leading electrical wholesalers.

121

vering expanse of the foyer is lighted
Day-Brite glass-enclosed troffers.

Day-Brite Boxco Troffers flood the main
concourse with glareless illumination.

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures


Are you SURE of getting
CECO STEEL
In construction products CECO ENGINEERING

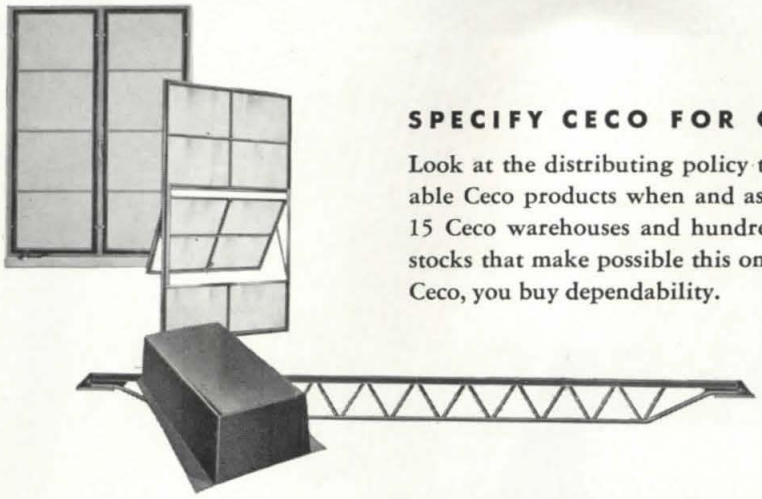
Critical-Material products?

You can depend on CECO Today...Tomorrow

Maybe you haven't worried about *where* you get steel windows, steel joists, steelforms and reinforcing steel, but in the uncertain times ahead, it's important that you take a critical look at the source of your supply. If you have used Ceco products, you know from both past and present experience that you have a supplier you can count on. If you have not used Ceco products, it will pay you . . . not only for today, but for tomorrow . . . to examine Ceco service.

First, look at the record: Ceco has a 39 year history of leadership and experience. Next, look at Ceco's production policy: In all Ceco products it's *engineering excellence* that makes the big difference. Creative imagination . . . painstaking research . . . careful, constant testing of results . . . all of these things work together to insure future deliveries of the same high quality as those being made today.

Chicago General Offices and Main Plant — one of many distributing points serving the nation.



SPECIFY CECO FOR ON-TIME DELIVERY

Look at the distributing policy that assures delivery of available Ceco products when and as you need them. Look at the 15 Ceco warehouses and hundreds of dealer and distributor stocks that make possible this on-time service. When you buy Ceco, you buy dependability.

CECO STEEL PRODUCTS CORPORATION

General Offices: 5601 West 26th Street, Chicago 50, Illinois

Offices, warehouses and fabricating plants in principal cities

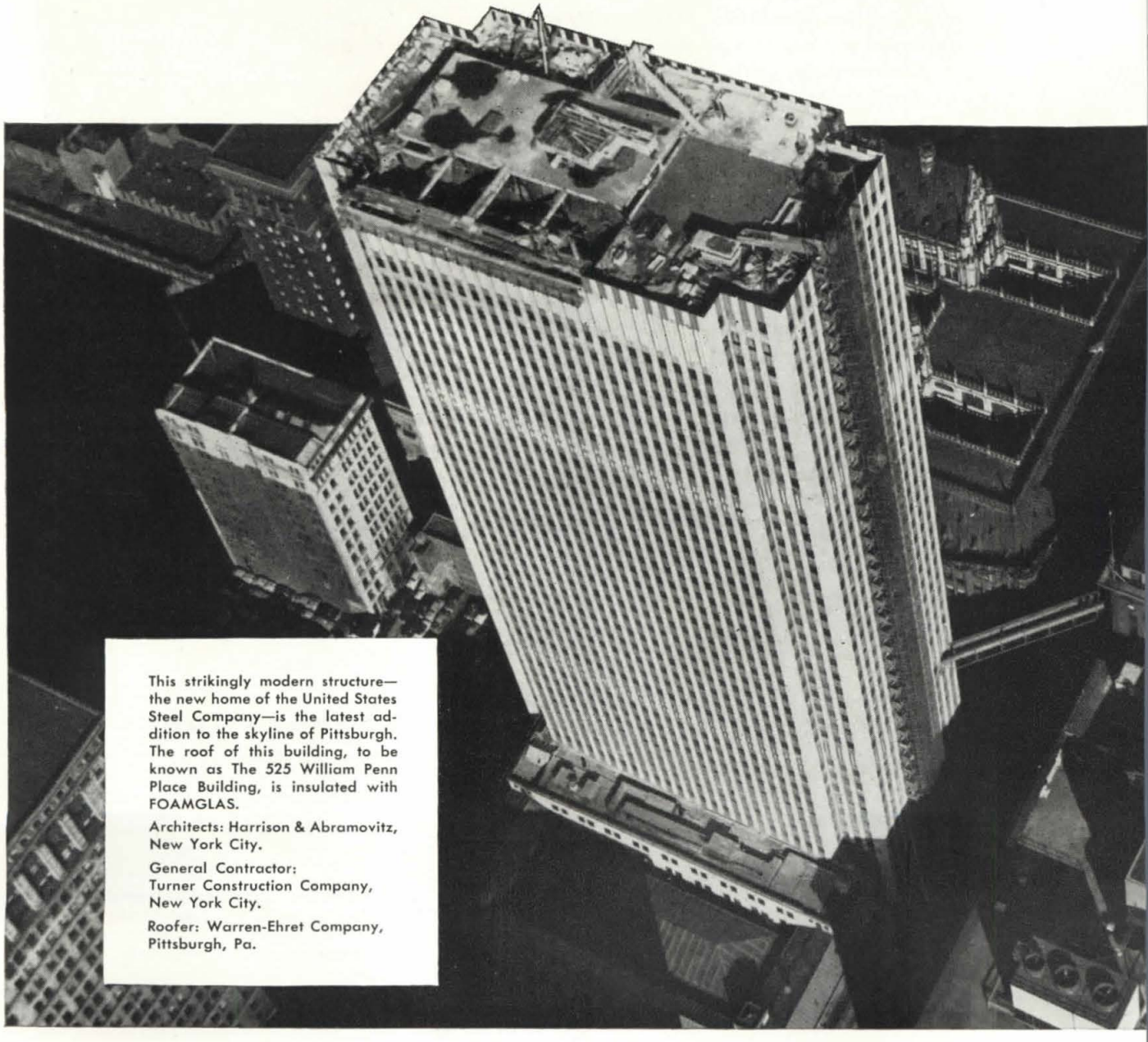
makes the big difference

Steel Windows and Doors • Steel Joists and Roof Deck
Steelforms • Reinforcing Steel • Metal Frame Screens
Aluminum Storm Windows • Combination Windows and Doors • Metal Lath • Roofing Products

"Tops" for new

FOAMGLAS

...the long life insulation



This strikingly modern structure—the new home of the United States Steel Company—is the latest addition to the skyline of Pittsburgh. The roof of this building, to be known as The 525 William Penn Place Building, is insulated with FOAMGLAS.

Architects: Harrison & Abramovitz, New York City.

General Contractor: Turner Construction Company, New York City.

Roofer: Warren-Ehret Company, Pittsburgh, Pa.

buildings

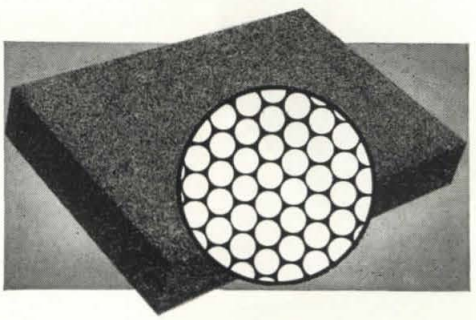
Here you see workmen installing FOAMGLAS on the towering roof of The William Penn Place Building, 42 stories above the street. The big, rigid blocks form a firm, level base for roofing felts, lay up quickly and are easy to handle.

As notable new landmarks accent the skylines of great cities, the preference for this proven insulating material reaches new heights.

▶ You can safely recommend FOAMGLAS to your most exacting clients for replacements as well as new construction with full confidence that you and they will find its performance completely satisfactory. Here's why:

Since FOAMGLAS consists entirely of still air sealed in minute glass cells, it offers more than just excellent insulation qualities—it is also unusually resistant to the many elements which cause ordinary insulation to deteriorate. Therefore, FOAMGLAS is long lasting and trouble free—an effective and economical insulating material, not only for roofs, but also for walls and ceilings, floors and sidewalks.

Before you specify an insulating material, be sure you have *complete* information on FOAMGLAS. Just send the coupon for a sample of the material and free copies of our fact-packed booklets.



The **best** glass insulation is cellular glass. The **only** cellular glass insulation is FOAMGLAS. This unique material is composed of still air, sealed in minute glass cells. It is light weight, incombustible, verminproof. It has unusually high resistance to moisture, chemicals and many other elements that cause insulation to deteriorate.

PITTSBURGH CORNING CORPORATION

PITTSBURGH 22, PA.

PITTSBURGH PC CORNING ®

FOAMGLAS®

the cellular glass insulation

WHEN YOU INSULATE WITH FOAMGLAS...THE INSULATION LASTS

Pittsburgh Corning Corporation
Dept. X-91, 307 Fourth Avenue
Pittsburgh 22, Pa.

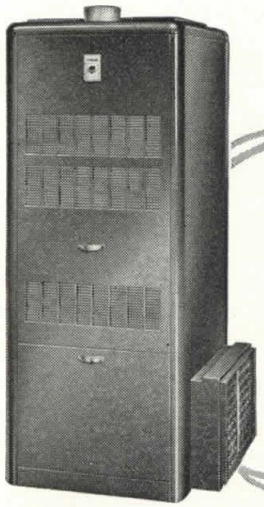
Please send me without obligation a sample of FOAMGLAS and your FREE booklets on the use of FOAMGLAS for: Homes ☐, Normal Temperature Commercial, Industrial and Public Buildings ☐, Refrigerated Structures ☐.

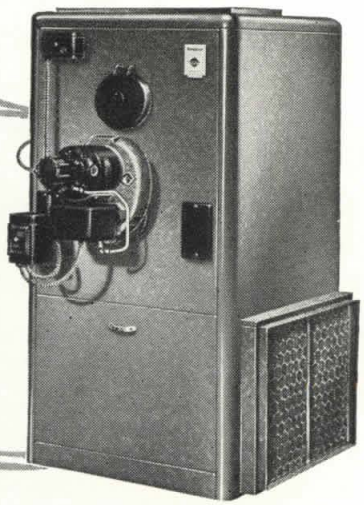
Name .....

Address .....

City ..... State.....

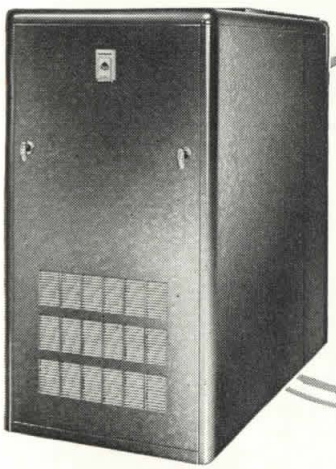
AMERICAN-Standard WARM AIR

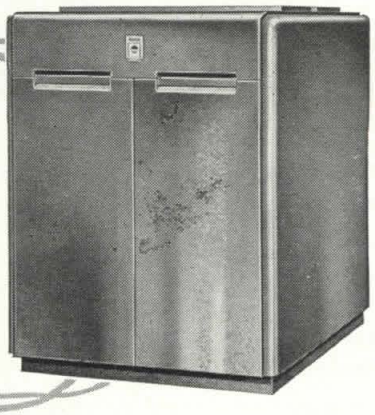




WYANDOTTE **WINTERGLO**

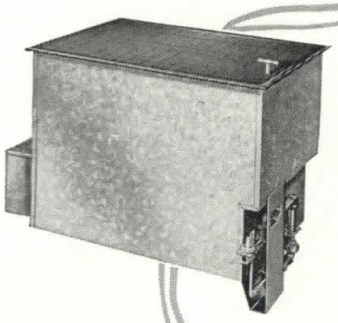
For utility rooms, closets, alcoves. These two steel "high boy" type winter air conditioners are typical of the American-Standard line of smartly-designed heating units for small homes and individual apartments. The Wyandotte is a gas fired unit, while the Winterglo is designed for oil firing.

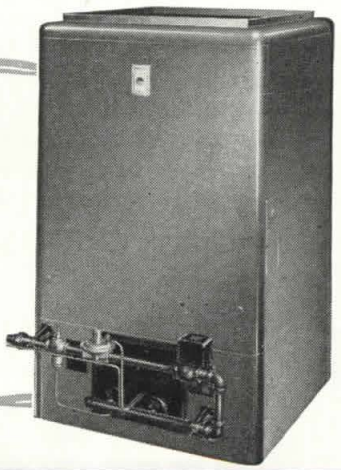




WINTERWAY **MOHAWK**

For basement installations. The steel, oil fired Winterway, popular for small to medium homes, is designed for unusual flexibility and ease of installation. The Mohawk, a de luxe cast iron winter air conditioner, provides automatic gas fired heating for virtually any size home. Both are typically compact in design.





NAVAHO **SHAWNEE**

For low-cost installations. The Navaho floor furnace is compact and shallow, can be installed easily in the floor of any small building, with or without basement, and does not require excavation. The Shawnee warm air furnace is ideal for installation in basements used as game rooms, laundries, or work shops. Both units burn all gases efficiently and economically.

AMERICAN-Standard

First in heating...first in plumbing

HEATING EQUIPMENT

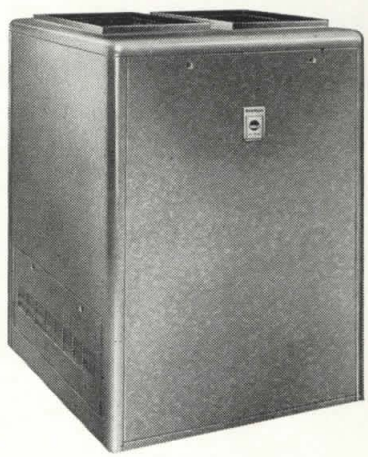
. . . for every type of installation

. . . for every type of fuel

■ Choose American-Standard warm air heating equipment for basement installations or for small-space installations such as utility rooms, closets and alcoves. You'll find units in the American-Standard line that will fill the bill exactly. For American-Standard warm air heating equipment includes a wide variety of types, sizes and models of warm air furnaces and winter air conditioners —designed to burn gas or oil or coal—plus the new Mayfair Summer Air Conditioner and the electronic Magne-filter Air Cleaner.

This completeness of line is one reason American-Standard warm air heating equipment is used on so many jobs. It allows the widest possible latitude in designing and planning. And, too, American-Standard products are recognized for their engineering and construction advantages . . . for long life and dependability in service.

You can depend on American-Standard warm air heating equipment to do the job *right*.



MAYFAIR

For summer cooling. The Mayfair summer air conditioner, latest addition to the American-Standard line, converts forced warm air heating system to year 'round conditioning. It uses same duct system . . . mechanically cools and dehumidifies the air.

MAGNE-FILTER

For clean air year 'round. The electronic Magne-filter air cleaner, installed in the return duct of *any* winter or summer air conditioning system, traps even the smallest dirt particles, removes pollen, air-borne bacteria, dust and smoke.

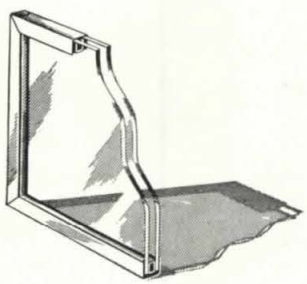
American Radiator & Standard Sanitary Corporation · P. O. Box 1226, Pittsburgh 30, Pa.

Serving home and industry

AMERICAN-STANDARD · AMERICAN BLOWER · CHURCH SEATS · DETROIT LUBRICATOR · KEWANEE BOILERS · ROSS HEATER · TONAWANDA IRON

Pittsburgh Glass
offers wide latitude in design

PITTSBURGH Polished Plate Glass and Twindow, Pittsburgh's window with built-in insulation, were effectively used in this new building of the United Engineering and Foundry Company, Pittsburgh, Pa. Twindow's insulating properties make it ideal for large expanses of glass. Cold spots and downdrafts are minimized. It reduces heating costs, decreases load on air-conditioning equipment, helps maintain desired temperature and humidity levels. Architects: Palmgreen, Patterson & Fleming, Pittsburgh, Pa.



TWINDOW consists of two or more panes of Pittsburgh Polished Plate Glass, separated by hermetically-sealed air spaces. The entire unit is enclosed in a long-lasting, protective frame of stainless steel. Forty-seven standard Twindow sizes are available.

COLORFUL CARRARA Structural Glass adds beauty and utility throughout the home. It is perfect for walls, wainscots and ceilings of kitchens and bathrooms as well as for fireplace surrounds, shelves and window sills. In this kitchen Carrara Glass was used for the walls and ceiling. There are ten beautiful colors to choose from.

SOLEX, a heat-absorbing Plate Glass, was selected for glazing the windows of the Library and Administration Building of Cameron State College at Lawton, Oklahoma. Solex admits ample light into rooms, but keeps out much of the heat and brightness of the sun. It is particularly desirable for windows on the southern and western exposure of hospitals, hotels, office buildings, airport control towers, and in laboratories and warehouses. Architect: Paul Harris, Chickasha, Oklahoma.

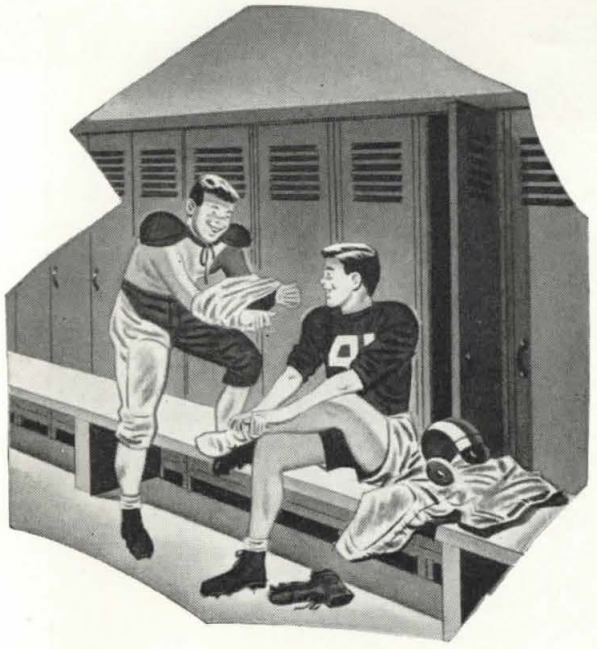
EL PANAMA HOTEL in Panama City, is a model of architectural charm. Contributing to its over-all attractiveness is the generous use of such Pittsburgh Products as Pennvernon Window Glass—recognized internationally as "window glass at its best"—Pittsburgh Polished Plate Glass and Pittsburgh Doorways. Architect: Edward D. Stone, New York, N. Y.; Associate Architects: Mendez & Sander, Panama City, Panama.

Design it better with **Pittsburgh Glass**

Your Sweet's Catalog File contains a complete listing and descriptions of Pittsburgh Plate Glass Company products.

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY



Part of the *Thrill* of making the team

To many a first-year school athlete, much of the thrill of "making the team" is his assignment to personal space in the team locker room. His private Berger Steel Locker is real evidence that he "belongs". It's part of his introduction to the comradeship and good-fellowship that typify American competitive sports.

Berger Steel Lockers are strong and rugged . . . built to stand up under the wear and tear of generations of exuberant athletes. By specifying this safe, convenient, well-ventilated storage, the school architect has helped make uniforms and equipment serve through several seasons . . . helped protect them against loss and unauthorized use.

Chances are that Berger may have helped the school architect work out the details. Berger offers architects and builders a thorough factory engineering and installation service based on many years experience in solving school equipment problems. See Sweet's Architectural File for more details, or write:

154 free-standing single tier Berger Steel Lockers are installed in the boys' locker and dressing rooms at Euclid Senior High School, Euclid, Ohio. Harry A Fulton, Architect.

Berger REPUBLIC STEEL

Manufacturing Division

REPUBLIC STEEL CORPORATION • CANTON 5, OHIO

A COMPLETE STEEL EQUIPMENT SERVICE FOR THE SCHOOLS OF AMERICA

steel

Lockers • Wardrobes • Storage Cabinets
Office Equipment and Furniture
Cabinets for Kitchens • Laboratories • Dispensaries
Shop Equipment • Shelving • Book Shelf Units

BERGER STEEL SCHOOL EQUIPMENT

functional beauty – lasting economy

ARCHITECTS: Naramore, Bain, Brady & Johanson
CONTRACTORS: Sound Construction & Engineering Co.

Ceramic Veneer

A Non-Critical Building Facing

The majestic new Veterans Administration Hospital in Seattle, Washington exemplifies the functional beauty of Ceramic Veneer. The entire elevation shown is faced with this adhesion type machine perfected terra-cotta, including the projecting canopies at each story as shown in the small inset photograph.

Versatile Ceramic Veneer was also applied throughout the entire entrance lobby. The variety of colors — modern character — light weight and low maintenance cost makes Ceramic Veneer the best choice for a permanent, economical building facing.

Ceramic Veneer IS A **GLADDING, McBEAN & CO.** PRODUCT

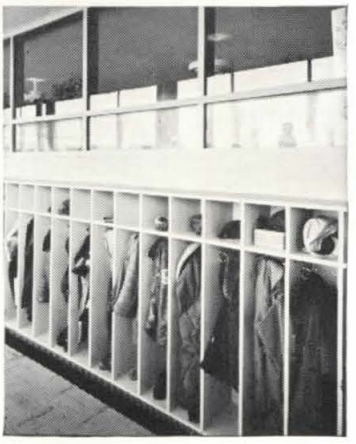
Other quality ceramic products include Glazed Structural Units, Hermosa Tru-Joint Tile, Face Brick, Roof Tile, Floor and Patio Tile, Refractories, Flue Linings, Vitrified Clay Pipe, Franciscan Ware and Franciscan Fine China

Since 1875

SAN FRANCISCO	LOS ANGELES	PORTLAND	SEATTLE	SPOKANE
1275 HARRISON ST.	2901 LOS FELIZ BLVD.	110 S. E. MAIN ST.	1500 FIRST AVE., S.	1102 N. MONROE ST.

ROCKY MOUNTAIN AFFILIATE: DENVER TERRA COTTA COMPANY • FIRST STREET AND UMATILLA, DENVER, COLORADO

Handsome, knock-resistant maple Weldwood Plywood storage cabinets, in natural finish, add much to this room's attractiveness, yet achieve completely the functional end desired.



Open clothes closets lining both halls are of birch Weldwood, painted gray. This beautiful hardwood plywood is often given natural finish.

All architectural millwork is by Sanford Woodworking.

Planning a new school?

...or modernizing an old one?

Check these practical ideas from the new Greenville School in Scarsdale, N. Y.

Why are school architects making more and more use of Weldwood Plywood?

This Scarsdale school, designed by Moore & Hutchins, tells part, yet not all, of the story.

These architects selected Weldwood hardwoods for closets and cabinets. In this way, they created furniture which is "tops" in carefree service and also extremely attractive in appearance.

Built-ins are but one of the ways in which this genuine wood paneling is being used in school construction and remodeling.

With Weldwood, you can have classrooms, auditorium and corridors panelled in beautiful hardwoods at surprisingly low cost. And, once installed, Weldwood walls require virtually no maintenance . . . no periodic redecorating. Weldwood Plywood is guaranteed for the life of the building in which it is installed.

In new construction, Weldwood Plywood can be applied directly to the studding. For redecorating, the large panels go up fast and easily right over existing walls . . . even over cracked, unsightly plaster.

So, whether your plans deal with brand new schools or time-honored old ones, make sure that they call for a liberal use of Weldwood Plywood . . . the quality standard of the industry.

WELDWOOD Plywood

Manufactured and distributed by

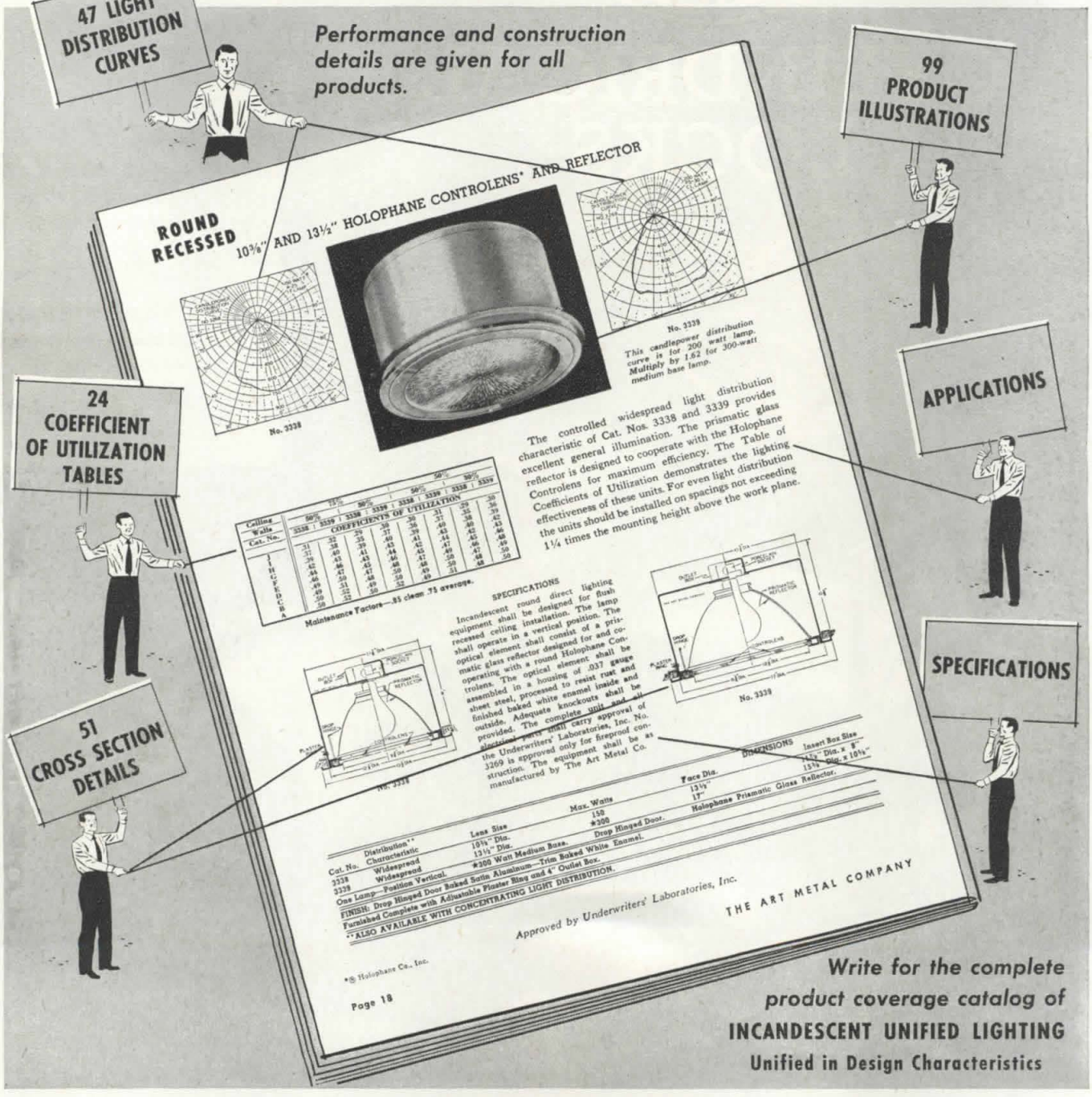
UNITED STATES PLYWOOD CORPORATION New York 18, N. Y.

and **U. S.-MENGEL PLYWOODS, INC., Louisville 1, Ky.**

Branches in Principal Cities • Distributing Units in Chief Trading Areas • Dealers Everywhere

ART METAL gives explicit data to speed specification writing and installation planning for all types of

INCANDESCENT LIGHTING



THE ART METAL COMPANY

CLEVELAND 3, OHIO

Manufacturers of Engineered Incandescent Lighting

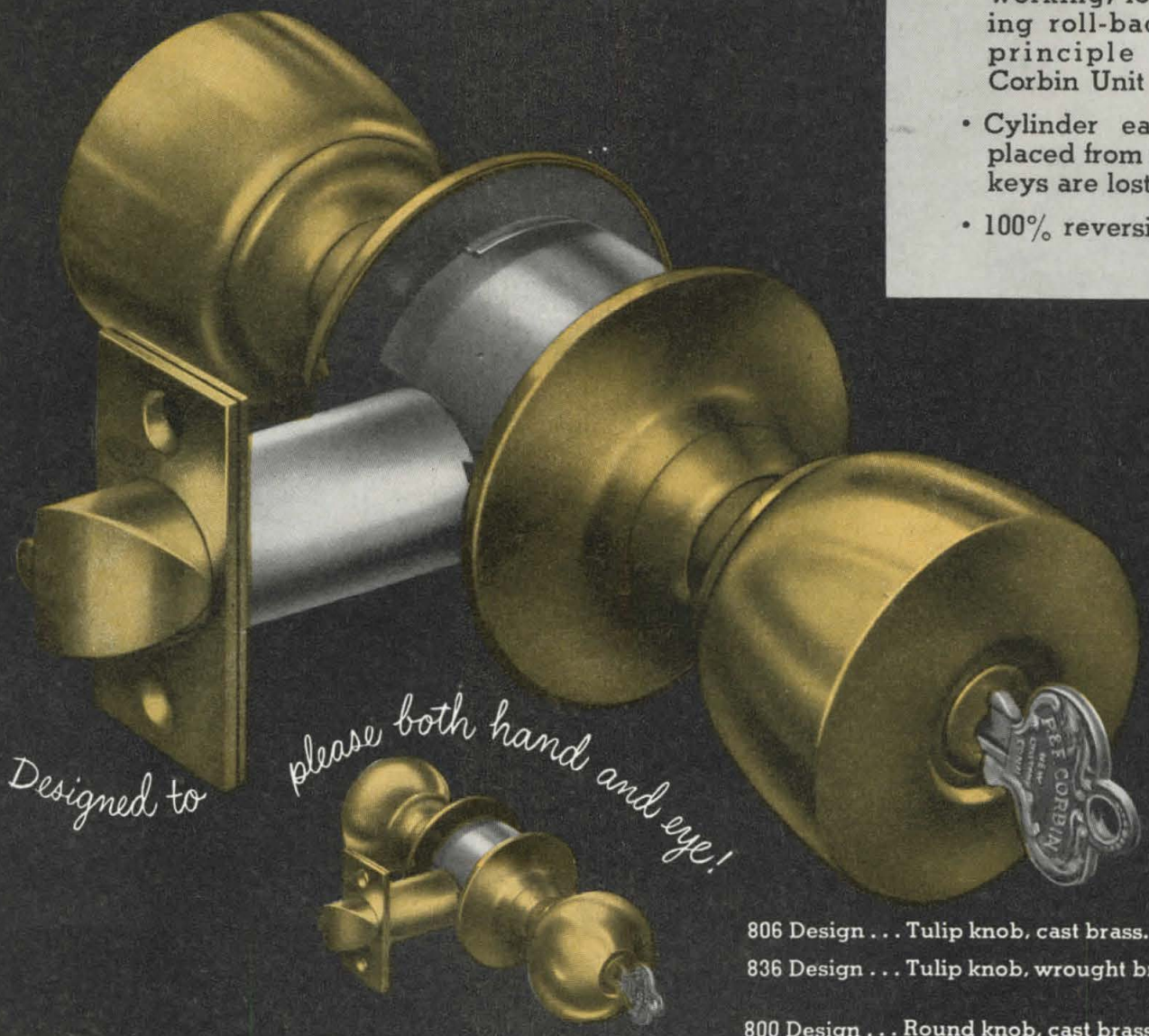
Now P. & F. Corbin offers you

CORBIN

CYLINDRICAL LOCKS

. . . with all these extra-quality features you've asked for . . . .

- 5/8 inch throw!
- The same smooth working, long-lasting roll-back latch principle as the Corbin Unit Lock!
- Cylinder easily replaced from inside if keys are lost!
- 100% reversible!



Designed to please both hand and eye!

806 Design . . . Tulip knob, cast brass.
836 Design . . . Tulip knob, wrought brass.

800 Design . . . Round knob, cast brass.
830 Design . . . Round knob, wrought brass.

Furnished in Polished Brass Finish.

Plus —

Compact heavy-duty construction throughout.

Master ring cylinder for greater protection and flexibility.

No screws in roses or knob shanks.

Adjustable for doors 1⅜ to 2 inches thick.

Extruded brass 5 pin tumbler standard; 6 pin tumbler for extended master key systems.

Seamless tubular knob shank with long bearing surface is specially designed for easy knob action and to prevent knobs from becoming wobbly.

Automatic deadlocks.

Fast 2-hole installation with same size holes for all functions.

CORBIN IS FIRST To offer you every major type of lock!

NOW, EVERY MAJOR TYPE of lock — unit locks, mortise locks, tubular locks and cylindrical locks — are available from one manufacturer: P. & F. Corbin. For the first time, you have complete freedom to select any of these different types of locks for the various parts of a building and yet have all locks master-keyed as needed and harmonious in design.

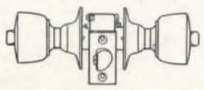
COMPLETE SPECIFICATIONS on the new Corbin Cylindrical Locks are now being mailed to architects, contractors and Corbin distributors in all parts of the United States. If you do not receive your copy soon, or if you would like additional copies, please let us know.

GOOD BUILDINGS DESERVE GOOD HARDWARE

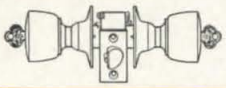
CORBIN

P. & F. CORBIN Division
The American Hardware Corporation
New Britain, Connecticut, U.S.A.

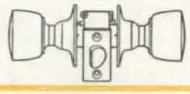
13 Most-used functions!



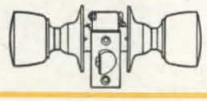
#400 — Communicating Door Lock — Either knob retracts latchbolt except when locked by turn-button in opposite knob.



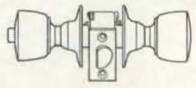
#402 — Communicating Door Lock — Either knob retracts latchbolt except when locked by key in opposite knob.



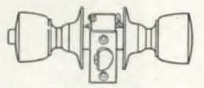
#410 — Passage Latch — Either knob retracts latchbolt at all times.



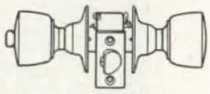
#415 — Exit Door Lock — Inside knob retracts latchbolt at all times. Outside knob is non-operative.



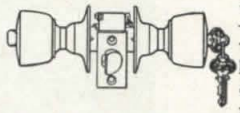
#420 — Bath or Bedroom Lock — Either knob retracts latchbolt except when outside knob is locked by push-button in inside knob. Turning inside knob, closing door or emergency key, nail, etc. in outside knob releases push-button.



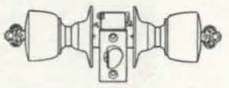
#441 — Inner Office or Bedroom Lock — Either knob retracts latchbolt except when outside knob is locked by push-button in inside knob. Turning inside knob or closing door releases push-button.



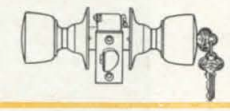
#444 — Exit Door Lock — Either knob retracts latchbolt except when outside knob is locked by turn-button in inside knob.



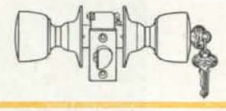
#451 — Exterior or Office Door Lock — Either knob retracts latchbolt except when outside knob is locked by turn-button in inside knob; then by key from outside until turn-button is manually released.



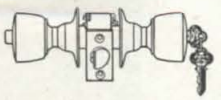
#454 — Apartment House Entrance or Office Building Lavatory Lock — Either knob retracts latchbolt except when outside knob is locked by key in inside knob; then by key from outside until unlocked by inside key.



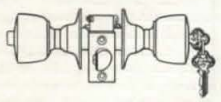
#455 — Classroom, Vestibule or Utility Room Lock — Either knob retracts latchbolt except when outside knob is locked by key in outside knob.



#457 — Storeroom, Utility Room or Exit Door Lock — Inside knob or key in outside knob retracts latchbolt at all times. Outside knob rigid.



#461 — Office Door Lock — Either knob retracts latchbolt except when outside knob is locked by push-button in inside knob; then by key from outside. Turning inside knob or outside key releases push-button; closing door does not release push-button.



#465 — Dormitory or Public Toilet Lock — Either knob retracts latchbolt except when outside knob is locked by push-button in inside knob or by key in outside knob. Push-button is automatically released by turning inside knob or outside key or by closing door; but when outside knob is locked by key, it remains locked until unlocked by key.

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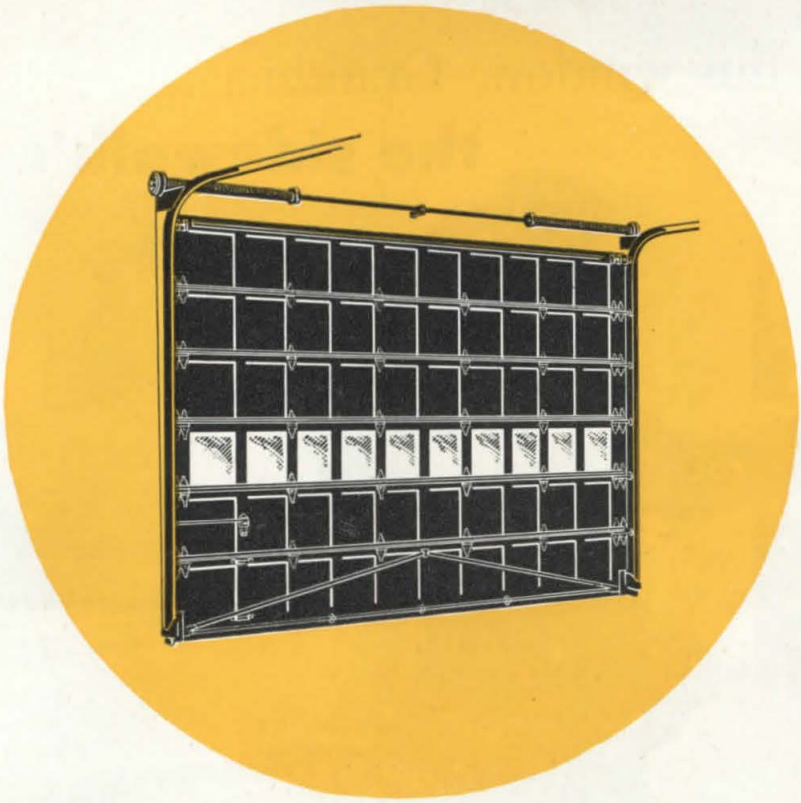

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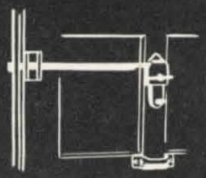

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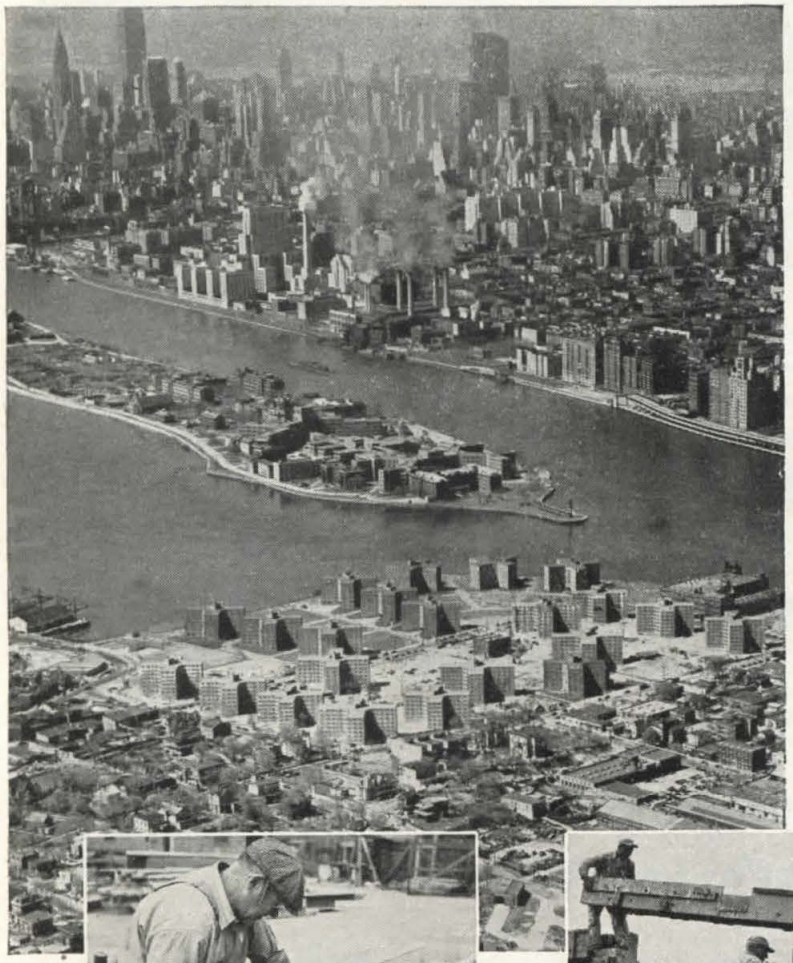

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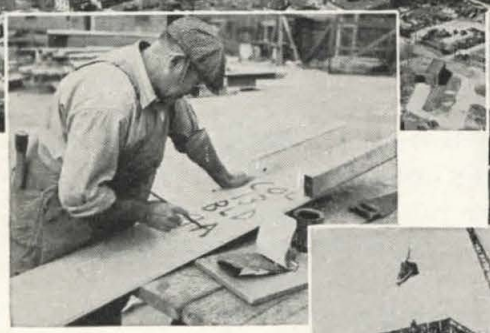

Forms for Astoria Houses, Section 2, designed and engineered in the office and built to closest tolerances, moved up at speed equal to or exceeding that of any other type of construction. Good job planning made fullest use of dependable 'Incor' high early strength. Result, 60 days' earlier completion—NET saving, $1.44 per cu. yd. concrete.

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the PROS and CONS of architecture for civil defense

It becomes almost dangerous these days to question any part of the civil defense proposals. Many architects are spending considerable time on the subject; several A.I.A. Chapters have been working on aspects of it; the A.I.A. Convention in Chicago made it a major seminar topic. Although almost nothing is being *done,* and although almost no money has been appropriated for what little is *proposed,* a body of literature on the matter is growing and certain basic assumptions seem to be taken for granted.

P/A believes that everyone—especially planners and architects—has the right and the duty to investigate carefully the various proposals that are being made, because a large part of the energy of the technical professions can be thrown into activities in this period which may later prove to have been useless or ill-advised. The patriotic appeal of moves for defense is so irresistible that objective scrutiny of the various proposals becomes doubly necessary.

What follows is, then, an analysis of various possible architectural "defense" activities, under the major headings of *Shelter* and *Dispersal.* First let us examine the pros and cons of the basic question: should architects at this time devote energy to planning for civil defense?

●

pro The architect must relate himself and his profession to changing times and to the problems, as well as the opportunities, with which society presents him. Assuming that at some time in the future we are likely to be subject to atomic bombing attacks, the architect has a responsibility to study ways to protect existing cities and to devise ways to make cities less vulnerable to attack. Part of his task will be to study, evaluate, and invent shelter possibilities and to design structures that will withstand blast; the other part will be to work toward the physical reorganization of our cities, with the aim of reducing their desirability as targets. In doing this, it should be possible to accomplish—in the name of strategic decentralization—those objectives of planned decentralization that have long been recognized as desirable.

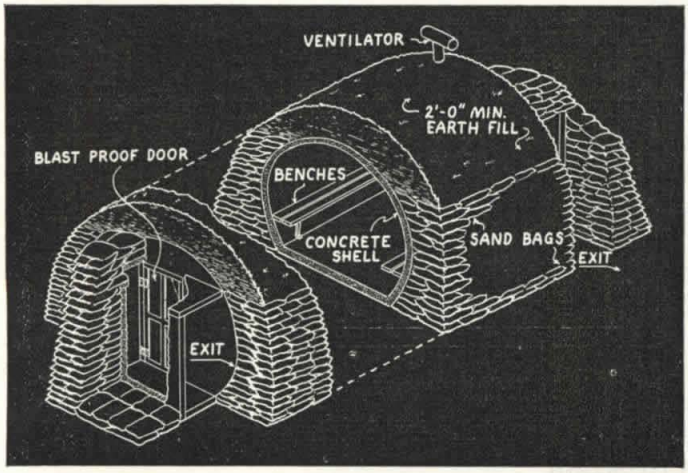
con The architect should act as leader, rather than as technician bending his will to that of the client of the moment. He should be concerned with long-range objectives, such as the improvement of the housing, health, and educational facilities of the nation; rather than economically wasteful activities, such as the protracted study of shelters for use in a hypothetical bombing. If he spends his extra time on moves toward international interchange of technical, cultural, and scientific information, toward the spread of U. S. design skill to more backward countries, and to improvement of the physical and intellectual level of our own country, he will be doing something more useful (and more profitable) for long-range defense, than measuring the stability of buildings against blast. As for strategic decentralization—urban dispersal cannot be forced through fear of a bomb; it must come as a result of planning for social objectives.

●

Who is right? Perhaps the readers of **P/A** can come to some reasonable conclusions by reading the pages that follow.

are individual shelters worth while?

yes . . . By Phillips P. Smith*



Today's world is divided into armed camps by two ideologies. Under these circumstances it seems just a matter of time until open hostilities are in full swing. Time and again, history has demonstrated that major powers cannot arm against one another without eventually coming to grips. If this is the case, and we have only one or two years of comparative peace, it behooves us to lay such plans as we now can to protect our people from the unprecedented horror and devastation that an atomic war will bring.

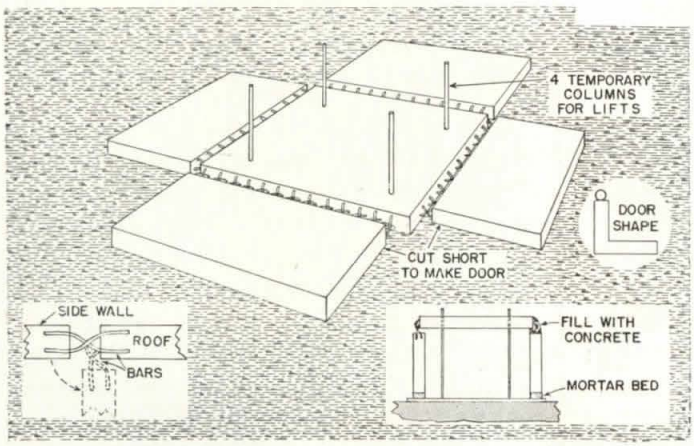
Our military leaders have repeatedly stated that a determined enemy can penetrate our defensive radar, antiaircraft, and fighter screen—both now and in the future. This means that our cities are vulnerable, for the first time in our history. In fact, it is apparent that industrial cities and ports, with their concentration of goods and populations, will be the prime targets for atomic warfare.

Fortunately for our study, at least, a large amount of information has been developed from examinations at Hiroshima-Nagasaki and from recent tests. We know now that there are three major destructive forces resulting from an atomic blast: a quickly passing wave of intense radiant heat; a violent shock wave, accompanied by high winds; a momentary wave, or beam, of lethal radiation.

Since almost any covering will protect humans and animals from radiant heat, we can disregard this item in any discussion of shelter requirements. The shock wave is perhaps the most destructive physical effect,

** Engineering Consultant; San Antonio, Texas, and Oakland, California.*

maybe . . . By J. J. Mallon*



Top illustration on this page is of a concrete shelter, to be erected on steel forms and covered with earth or sandbags, proposed by Concrete Forms Corporation, Irvington, N. Y.

Drawing directly above is a proposal by Fred N. Severud and Anthony Merrill: a concrete cubicle to be used for shelter or defense purposes, poured with separate roof and sides on the ground, lifted into place by the Youtz-Slick method of sliding the slab up the columns by hydraulic lifting equipment.

In England, preparations against air raids during the last war were made on the assumption that raids would be made in daylight and would be short. In fact, in the early years of the war, raids were protracted and at night. The guiding principle of defense was the avoidance of assembling large groups of shelterers.

For these reasons, the provided shelters were of limited capacity. They were of two types: (1) The Anderson Shelter for family use, made of metal and earthed by the householder in his garden; and (2) The Brick Shelter, built in the streets for persons who had no gardens.

The merits of both these shelters were:

(1) They vastly reduced the destructive power of a single bomb.

(2) They were adjacent to the occupant's residence and therefore required no provision of water or sanitation or heating.

(3) They secured the dispersal of the population and avoided risks of panic and contagion.

(4) The users reached them and returned to their houses without exertion, inconvenience, risk, or loss of time.

** Warden, Toynbee Hall, London, England.*

since it generates tremendous impacts of several hundred pounds per square foot, and winds in the 400- to 800-mile-an-hour range near the bursting bomb. No buildings we now have can withstand such shocks, and it appears unlikely that any practical, commercial structure can be designed to do so.

Radiation is also a serious menace, which is often glossed over, statistically. In designing shelters, we must bear in mind that radiation is extremely penetrating, and that strong blast-proof shelters are not enough. At least 40-inch concrete, or equivalent, is needed to stop the lethal rays from nearby atomic-bomb bursts. This figure alone is enough to discount proposals for hiding under tables, or for "light, portable shelters." The need is for stationary and substantial units.

Let us examine some of the other proposals which have been advanced. City planners and far-seeing architects have suggested replanning and redeveloping our existing cities to decentralize industry and scatter the target area; others propose greater decentralization into small towns and the creation of new cities. All of this is desirable in the long run, but it is patent that such long-term programs will not save many lives in 1953, if that should prove to be the year of decision.

Group shelters have been suggested, and many cities are making plans to provide such mass protection. Despite the cost of such projects they will prove helpful; but where the city is congested their use is limited, since they obviously cannot be built under structures that may collapse on them.

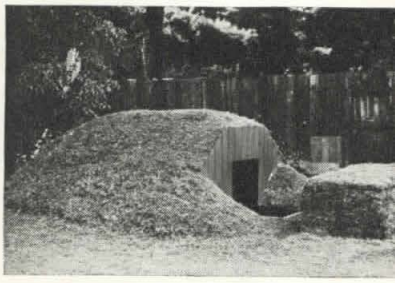
Most important is the fact that such mass shelters do *not* provide protection for the stay-at-home women and children, who deserve equal safety. Something not always remembered is that bombs dropped from 50,000 feet or warheads carried by long-range rockets may quite easily miss their primary targets by three or four miles—and hit far out in Suburbia. Even though a program of suburban group shelters is instituted and put into effect, block by block, they will be too far from many homes for all the people to reach them quickly in an emergency —particularly one at night.

Summing up these arguments—which show that cities and populations can't be relocated in the time available, and that group shelters alone are inadequate—points up the need for individual shelters readily available to each and every house. Such shelters can vary from very comfortable underground quarters, capable of sleeping an entire family all night during trying times (the writer has designed a luxury unit costing about $3000, and a wholly safe shelter for $450), to a simple slit trench, which each householder can dig for himself at no cost. Either type, located within 20 or 30 feet of each house, will provide safety for the whole family.

The job of building 10 or 15 million bomb shelters is too great for city, state, and federal governments. The problem assumes the vastness of tornado protection, and, like insurance, is a matter for each family to solve for itself—or face the possible consequences. It is in the design and construction of such family-type shelters that the responsible engineer and architect can play his most important role in the civilian defense program. He can offer guidance to city fathers in planning local programs, providing safe designs, and advising the individual client, on a basis consistent with his budget.

Right, two views of the Anderson Shelter, used in England during the last war. Protection is provided by earth cover, over corrugated galvanized-iron shell. Warden Mallon points out that these were more popular than mass shelters during early aspect of the bombing, but that during the final savage bombing, large numbers of persons who had originally used the shelters "ceased to do so and, notwithstanding air raid warnings . . . went to bed."

Photos: courtesy British Information Service (interior); and Combine Photos (exterior)



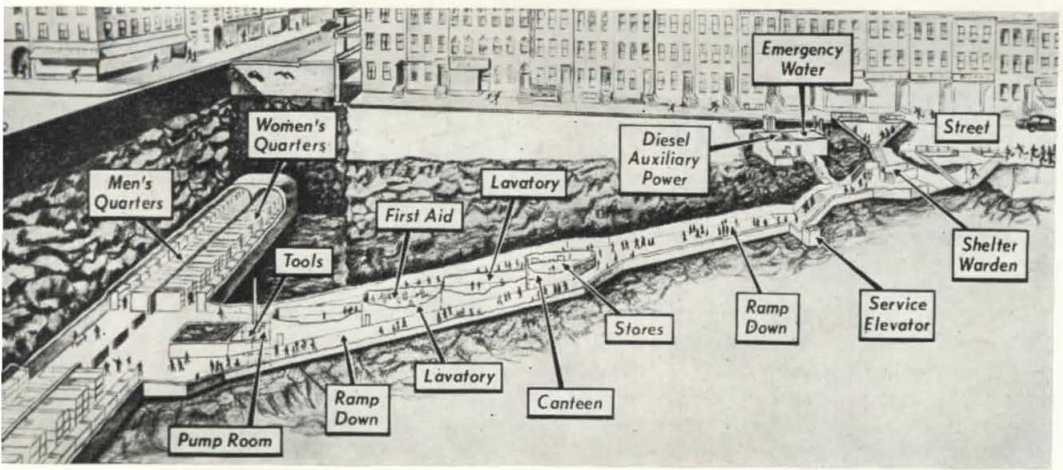
Whereas the Anderson Shelters were privately owned, the Brick Shelters in the streets had no owners and were not the responsibility of any individual or groups of individuals. Moreover, the Brick Shelters were of ugly appearance and, because they were superficial, they were deemed unsafe. The mass shelters, specially the deep-down shelters of the London Tube Railways, had warmth and company and greater apparent safety, and for these reasons were preferred to the Brick Shelters. The Anderson Shelters enjoyed and maintained a popularity which the Brick Shelters in the streets never achieved.

The writer, who was adviser to the Ministry of Food on canteens in air-raid shelters, has no first-hand knowledge or experience of the use of an Anderson Shelter. He is able, nevertheless, to assert that these shelters, when effectively earthed, fulfilled the hopes that had been formed of them: they vastly diminished risk; they were at hand; they offered privacy and admitted of some furnishing and the easy return of occupants to their house for food and for lavatory purposes. Were gardens universal, an improved type of Anderson Shelter would appear to offer the best possible defense of the citizen against raiders.

Anderson Shelters could be had larger or smaller. They were of tough steel. In position, they were completely covered with earth and were entered by descending steps. Any family groups could share Anderson protection because, if a group were numerous, it could obtain more shelters than one. A camp bed or easy chairs were generally part of the furnishing. The shelter was deemed safe, except in case of a direct hit.

Raids on Great Britain were in three phases: (1) bombing on conventional lines from planes in human control; (2) fly bombing; and (3) rocket bombing.

During the savage bombardment of 1940-1941, the raided populations so toughened that very large numbers of persons who at one time had used shelters (Anderson or other) ceased to do so and, notwithstanding air-raid warnings, or the actual air raid, went to bed. Nevertheless, it is true that the Anderson Shelter continued to be effectively in use until the termination of the first mentioned of these phases. Because both fly bombing and rocket bombing were fitful and the approach of the rocket bomb completely unannounced, shelters of every type lost much of their defensive efficacy against these types of bombing.



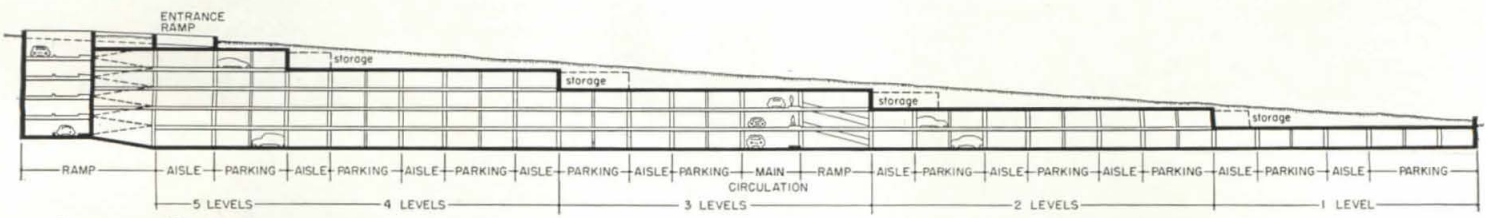
The "Bingham Plan" (above) for partial construction of future subways in New York, so that they might be used now as bomb shelters, envisages better sleeping accommodations than the British enjoyed during the last war in tube stations, such as the one at right, above.

Bingham Plan photo: World Wide: courtesy, New York Board of Transportation. Subway photo: courtesy British Information Services

can group shelters save lives?

Left—underground garage planned for Gross-Morton's "Windsor Park Apartments," Queens, New York, designed by Schulman & Soloway, architects, which meets air-raid-shelter specifications and, the promoters say, could be so used.

Below—Los Angeles' plan for a shelter-garage under the Civic Center, to accommodate 5600 automobiles or 90,000 persons. Like the Bingham Plan, this scheme would require Federal funds.



Section thru Garage

yes . . . . . if they are small and decentralized

The following is an excerpt from Report Number Three of the Advisory Committee on Civil Defense, New York Chapter, A.I.A.: Morris Ketchum, Jr., Chairman.

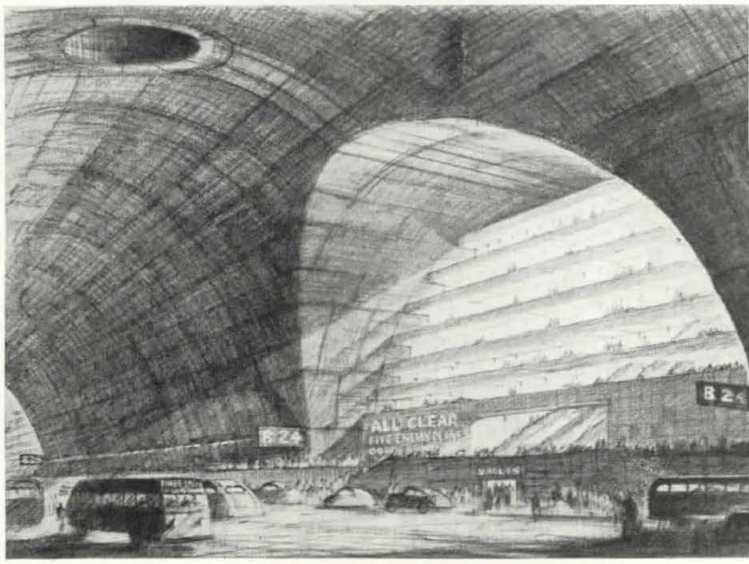
The "Bingham Plan" for providing various types of subterranean shelters, all in connection with proposed or existing subway lines, was announced by Sidney H. Bingham, Chairman of New York City's Board of Transportation, on December 29, 1950. These shelters would provide emergency sleeping accommodations for 101,500 persons and temporary shelter for 1 million others. All shelters would serve a dual purpose —*first*, as emergency bomb shelters, *second*, as future subway stations or tunnels.

Since most of New York's existing subways are not deeply buried below the streets, like those in London which served as shelters in World War II, only portions of the proposed Second Avenue subway line and only five existing stations in upper Manhattan could be utilized as bomb-proof shelters; although "splinter-proof" shelters offering partial protection can be made available at many existing stations. Subway tunnels are considered bomb-proof if they are covered by at least 50 feet of earth or 25 feet of solid rock.

This plan provides well dispersed shelters throughout the east side of Manhattan, for use only as shelters during the emergency period, later to be joined together as the Second Avenue Subway Trunk Line.

Expediting the construction of this proposed subway offers a practical plan for providing shelter protection in a structure of dual purpose, but not of dual use, while at the same time advancing the date for the completion of a transportation line necessary to the city, and returning through salvage most of the cost entailed in providing and equipping the shelters.

The "Bingham Plan" is the most practical, economical, and intelligent proposal yet produced for providing both emergency protective shelters and future permanent improvements to New York's public transportation system at minimum cost. It deserves the enthusiastic endorsement and support of the public and the architectural profession.



In 1942, the late George J. Atwell, New York builder, proposed a gigantic bomb shelter to be dug under the Palisades, and had Hugh Ferriss make drawings of the project. The one at the right shows the scope of this unrealized scheme.

Reproduced by courtesy of Mrs. George J. Atwell and Hugh Ferriss.

no . . . . . if they are large, mass shelters

The following is an excerpt from Report Number Two of the Advisory Committee on Civil Defense, New York Chapter, A.I.A.: Morris Ketchum, Jr., Chairman. While it deals primarily with garage-shelter proposals, many of its points are applicable to other forms of mass shelter.

City and state officials, throughout the country, have urged that the federal government assist in the construction of huge underground garages to serve the dual purposes of producing peacetime revenue as parking spaces and of being used for emergency bomb shelters in the event of enemy attack.

If such structures are to fulfill their dual purpose . . . current plans for their size and location must be realistically re-examined and redrawn. As now proposed, these garage-shelters would be too large and too remote from one another to answer either purpose...

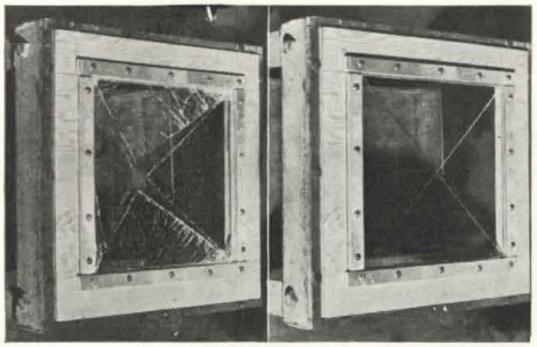
Based on 300 square feet of space required for each car in a garage and on a minimum area of four square feet per person, if people are packed in during an air raid, a 500-car garage could theoretically accommodate 37,500 persons, if used as a shelter. It would be manifestly impossible to fill such a garage-shelter within the maximum eight minutes allowing warning time. It becomes doubly impossible, if one considers that unless the garage-shelter were emptied of its cars well in advance of an air-raid warning, it could not be ready to be used as a shelter. Even if as many people could be accommodated within such garage-shelters with the cars still there, as when emptied of cars, the Advisory Board of Fire Protection strongly advises against allowing cars in any large underground garage which is to be used as a shelter. . .

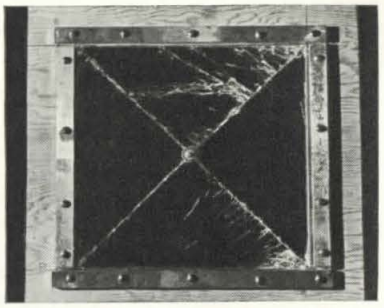
Huge garages, far remote from one another, are not the answer to the peacetime problem of providing off-street parking in the congested downtown areas of our cities. It has been proved that most people are reluctant to walk more than 1000 feet to their destination after parking their car. An off-street parking garage can therefore serve efficiently only an area within that walking distance. It is also obvious that overlarge parking garages, if suddenly emptied of their cars at the close of a business day, are liable to create an immediate traffic jam in the nearby streets.

If dual-purpose garage-shelters are to be useful both as emergency bomb shelters and as answers to the parking problem, each city, including our own, must first prepare an over-all plan for their strategic location and then limit their size to the proper capacity for each purpose. *This program, in turn, must be co-ordinated with a parallel program for the construction of adequate bomb shelters to serve individual buildings, located within each building. It is very improbable that the occupants of any building will have time enough after an air-raid warning to leave their building and then reach an underground shelter some distance away. However designed and located, dual-purpose garage-shelters would, in all probability, be capable only of accommodating the pedestrian population from nearby streets. If sidewalk pedestrians and also the occupants of all nearby buildings were required to reach some remote dual-purpose shelter, a dangerous panic would be inevitable.*

Within these limitations, the opportunity still exists to plan and construct garage-shelters that will help to answer both the emergency demands of civil defense and the long-range problems of traffic congestion.

can existing buildings and their occupants be protected?





The three photographs on this page illustrate a new window designed by Pittsburgh Plate Glass Company, to minimize the effects of explosive forces. The window uses a glass-plastic laminate, to be known as Flexseal Bomb Glass. When normal atmospheric pressures are exceeded by blast, the window opens automatically and "hinges" (right, above) since only the middle vinyl plastic lamination extends into the window frame. The four sections may break—but will not scatter—and for an emergency can be pushed back together (picture directly above).

yes . . .

The following data is excerpted from "Civil Defense: The Architect's Part," published by the American Institute of Architects, Washington 6, D. C.

FIREPROOF STRUCTURES: Steel-skeleton-frame fireproof structures with steel-supported concrete floors, and monolithic concrete buildings, are structurally the safest and best. No additional protection is necessary, for all practical purposes, beyond removal or protection of glass areas. *The use of the top three floors should be avoided for shelter areas.*

WALL-BEARING STRUCTURES: This type of building offers no dependable protection. Most bombed structures of this type may collapse completely under the effects of blast, up to about two miles, or need demolishing, or require bracing with shores and needles to prevent collapse. Structurally, therefore, not very much can be done beyond bracing and reinforcing to reduce bomb effects.

WOOD-FRAME STRUCTURES: While this type of building offers little protection against blast, moderate protection can be provided in some cases by selecting a refuge room having maximum lateral protection, and easy exits.

GLASS: Glass is one of the greatest sources of danger. It should be removed or replaced with non-shatterable material. Large show-windows are a particular danger due to their rigidity and blast resonance. Cross-bracing such glass areas is ineffective. Cellophane or paper coverings over any glass area is equally ineffectual.

By Verne O. McClurg*

For the purposes of this discussion, it is assumed that buildings will not be strengthened or protected to lessen damage to residential areas. The questions of protection of personnel in commercial buildings, in industrial plants or in downtown districts of large cities will not be covered.

In airborne attack, it will doubtless be the primary objective of an enemy to destroy elements considered by him most likely to hinder our ability to make war. There are many opinions as to how he may endeavor to do it; some holding that he may concentrate on transportation facilities, some that steel mills or other essential industries will be prime targets, still others believing that population bombing will be the main objective. Other considerations would be his potential for bombing: such as number of atomic bombs, number and expendibility of long-range bombers, and so on. It seems almost axiomatic that the Federal Government should make the most careful studies possible of all such pertinent factors and should furnish heads of Civil Defense organizations throughout the country with conclusions as to nature and likelihood of attack for each community. This has not been done.

In the absence of directives or other guidance from Federal authorities, of course each Civil Defense group must form its own opinion as to what to

*Chairman, Air Raid Shelter Committee, Chicago Civil Defense Corps.

no . . . By Lawrence B. Perkins*

By all means, let's have a survey. Let us, with great expenditure of time and effort prove to ourselves what five minutes of casual reflection would prove equally well—namely, that the cost of making tens of thousands of buildings safe would exceed the value of the buildings thus protected. And judging from some of the proposals offered in apparent seriousness, the buildings themselves would be made actively unpleasant and unlivable if they were made strong enough to withstand the stresses, let's say a mile from the point at which the bomb explodes. Such design would commit architecture and the people who live in buildings to generations of living less well than they know how to, as a concession to what we believe is a temporary, however awful, risk.

There are two things that you can protect against explosion: i.e., lives and property. The relative importance of these two hardly needs discussion. The land in which to cut broad and relatively shallow trenches is available in surprising quantities, even in supposedly crowded parts of cities. If it is true that saving lives can best be done in such trenches and that they present the least hazard from flying glass, burns, and the like; then the architectural problem quickly reduces itself to one of property damage versus property replacement.

Even if a building doesn't actually fall down, it can be damaged beyond the feasibility of repair. The buildings which apparently remained in place after the blast in Japan were still hardly worth salvaging. This suggests an attitude—the attitude of the early Chinese boatmen who assumed that some boats would be lost in the rapids of the Yangtze River. They divided their cargoes so that if five boats out of every hundred were lost, nobody stood to lose more than a twentieth of his investment in this disaster. Similarly, it seems by this well known principle, some times called insurance, that it would be far cheaper to prepare ourselves to rebuild the damage than to resist it. (Remember, we are assuming that the people will get out).

There is certainly no harm in visualizing situations where people can go, within a building, to points of less danger, if there is no time to get away from the building altogether. Certainly, a place where flying glass would do minimum damage and the harmful rays would be less apt to strike should be found—but not depended upon if we can avoid it.

In the specific case of school buildings, and I believe most other building

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protect the community against. Some will consider population bombing the major danger, while others may conclude it will be incidental or accidental. If we are not likely to be subjected to population bombing of residential areas as a primary objective, it would seem that homes in the vicinities of important industrial or transportation targets should be the main concern. If we are likely to suffer the killing of people as a primary objective, it probably would be confined to very densely populated districts in large cities, say those with at least 40,000 to 50,000 people per square mile.

So it may be that the provision of better shelter areas in existing residential buildings will be advisable only near concentrated industrial target areas and in or near areas of great population density in large cities. In buildings of fire-resistant construction, refuge areas would be selected, equipped, and treated about the same as those in similarly constructed office buildings and hotels. In buildings of ordinary construction (wood-framed floors and brick walls), refuge areas in basements could be made better by new construction or by shoring of first-floor construction, in accordance with the Shelter Manual of the Federal Civil Defense Administration or as suggested by local Civil Defense organizations.

It is unlikely that local Civil Defense organizations will have the manpower available to survey all buildings of whatever nature in target areas, but they fill furnish information necessary for the owner's guidance. However, it is felt that such betterment of shelter area will be voluntary and will be done by the owner or by joint action of tenants and owner.

By R. Evan Kennedy*

More than 40% of the population of the metropolitan city of Portland, Oregon, can be accommodated in sheltered areas in case of an air raid. This was brought out by a 1950 survey of the major buildings in the city, a structural study made by the architects and engineers of that area.

At the mayor's suggestion, a committee was set up, consisting of representatives of the Oregon Chapter, A.I.A., Oregon Section, A.S.C.E., Structural Engineers' Association of Oregon, Oregon Chapter, A.S.H.V.E., the City Building Department, and the City Civil Defense Department. Preliminary committee discussion and investigation soon established the fact that no part of any existing structure in the city would be deemed safe enough to be termed a bomb shelter, in the sense that great numbers of people should be directed to it for protection. It was pointed out, however, that many buildings do have areas within them that are more tenable in case of an attack than other areas would be, and that the casualty rate would be reduced if such areas were used for shelters.

The first thing to be done by the committee was to produce a means of evaluating the structures, to determine their weak points and strong points for the use intended. It was desired to develop a means that would produce more or less constant results when used by various individuals. The result was a check or evaluation sheet on which are listed the most important structural items to be considered, as well as other items a shelter should have (such as proper water facilities).

Volunteers (architects and engineers) were called and formed into groups of two or three. It was attempted to form each group from both architects and engineers, wherever possible. The groups then went to the specific buildings and returned their data when the survey was completed.

The groups looked for areas of buildings that were protected from flying debris, that would not become flooded or filled with gas, and that would be accessible. There was no minimum standard set to which all areas had to be graded. It was attempted to find which areas seemed to offer a degree of protection that was better than other parts of the buildings, and which could be defined as less likely to be destroyed than other parts of those same buildings. The buildings were restricted, however, to those that were of reinforced concrete or steel frame. Other types of structures were not deemed satisfactory for protection against any well-placed bomb.

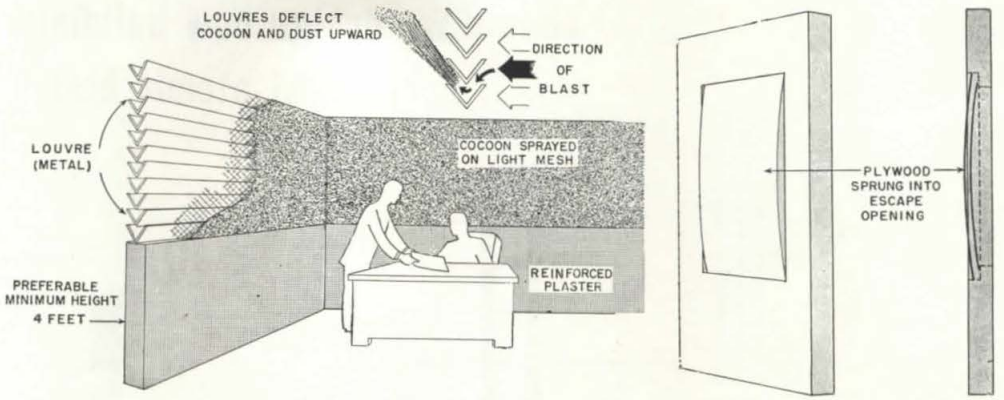
The study pointed up the fact that casualties can probably be greatly reduced by getting the population into less exposed areas of existing buildings.

Consulting Structural Engineer; president of Structural Engineers' Association of Oregon.

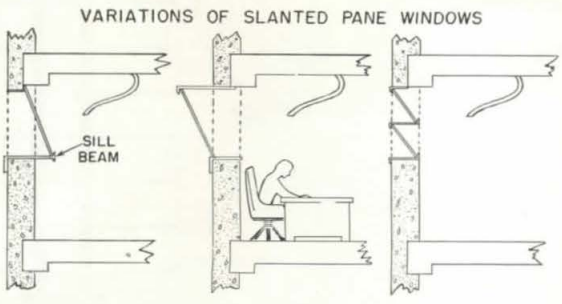
types as well, a conflict arises between architecture for good education and good service to children on one hand, and a good bomb shelter on the other—and they don't look much alike. Experience shows that buildings don't get torn down, and unless they should have the good fortune to be destroyed, very bad school buildings would remain for generations. I believe that arithmetic would support the assertion that it would not only be a better investment, but would actually cost less dollars, to build a hundred schools in the expectation of losing and rebuilding ten of them, than to build a hundred gloomy ones in the hope that all could survive an atomic jolt.

An additional obstacle: can you visualize the problem of visiting tens of thousands of buildings, studying their needs for reinforcement, writing volumes of recommendations, and then, above all, causing the owners to actually do something about it? The reader is respectfully referred to his own experience in matters such as the enforcement of zoning and occupancy standards in the normal process of city living.

It seems apparent that we could finish a war with more civilians alive and with better places for them to live and work, if we do not expend effort on protection of existing structures.

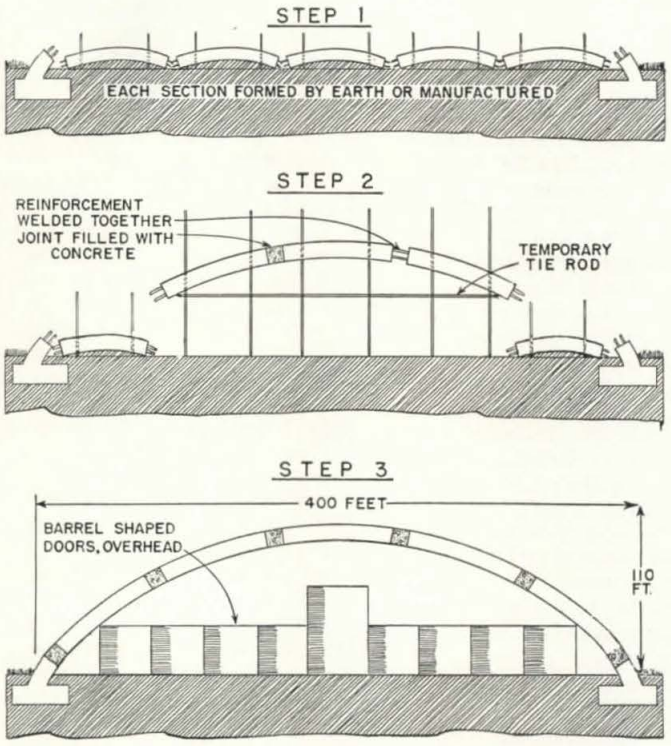


Above—suggested partition which will allow blast through, with insulating material being blown out. Scheme, proposed by Fred N. Severud and Anthony Merrill, would reduce pressures on structure of windowed building. Right—escape door (above) in shelter area, which would oppose blast but could be easily removed from inside after the blast; another Severud-Merrill proposal (right), for windows which would, under blast pressure, be driven up toward ceiling into a curved shield, thus reducing danger of flying fragments.



should we design new buildings to resist atomic blast?

The suggestion illustrated below is a method of roofing a fairly large area with a reinforced concrete arch, a form which resists blast pressures well, poured on the ground in sections and lifted into place by the Youtz-Slick method (see October 1950 P/A). At the bottom of the page are drawings of the use of "blast walls," plus floor plates, to provide the blast-resistant structure described by Severud and Merrill.



yes . . . . .

Excerpts from the forthcoming book by these authors: Designing for Atomic Blast, *to be published by Reinhold.*

The bombproofing needs of today are emergency ones, determined in the press of critical times and a complete uncertainty about the actual tests to which urban centers of America and the rest of the world are likely to be put. While the city of the atomic age is not going to rise today or tomorrow, it is not beyond the bounds of reason to expect a demand, in the not-too-distant future, for multi-storied bombproof buildings that will house the more normal functions of life.

In our contemplation of protective structures, many of us (laymen and technicians alike) tend to overshoot the mark at first and fall into the common error of seeking to make something *totally bombproof.* For economic reasons primarily, except for urban control structures and for larger enterprises of essential priority to the winning of a total war, structural *bombproofing* does not ordinarily enter into the considerations of protective design. What we are really after is *bomb resistance,* and that is a horse of a different color entirely. The economy factor is hard to obtain . . . the mathematical computations are such that it seems impossible to correlate the multiple strengths and weaknesses of a modern, windowed structure into any formula whereby one could say: X dollars spent for protection will buy such-and-such a percentage of maximum

**Severud is senior member of the firm of Severud-Elstad-Krueger, structural engineers, New York. Merrill is a Washington journalist, author of several published works on housing and construction techniques.*

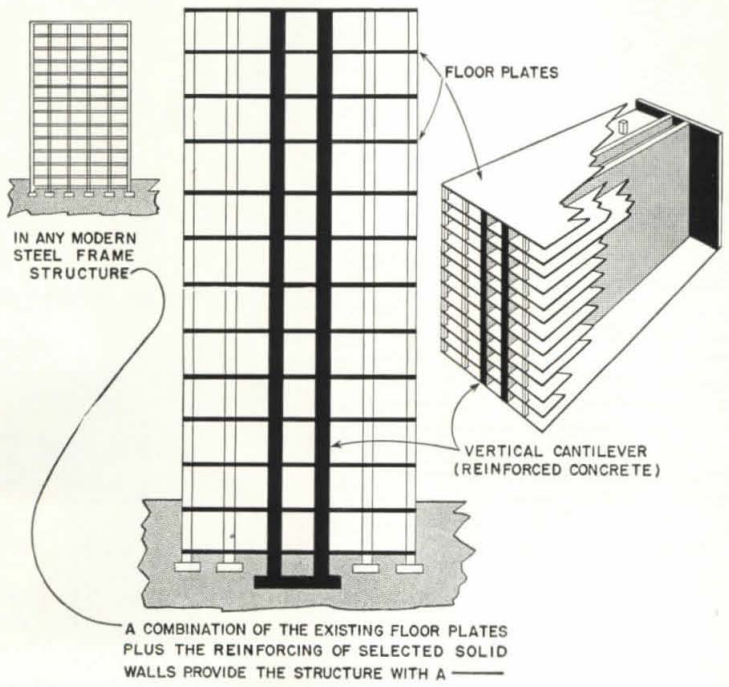
no . . . . . .

No one can deny that we are living in an age when the possibility of an atomic attack is ever present; nor can one deny that, should an attack come, many thousands of lives would be in jeopardy, buildings destroyed or damaged, and our entire economic life, in the immediate vicinity of the attack, completely disorganized, at least temporarily.

All of us in the design profession have the highest respect for Fred N. Severud as a structural engineer and any utterance or writing by him, dealing with a technical engineering subject, demands our attention, but his forthcoming book, in collaboration with Anthony F. Merrill (Reinhold), *is certain to cause the practicing architect to raise his eyebrows. Excerpts from their forthcoming book certainly make interesting and fascinating reading, but are their solutions or recommendations economically possible, practical, or even realistic?*

The authors concur in the generally accepted theory of experts and the civilian defense authorities that "in our

**Architect; past president, N.Y. Chapter, A.I.A.; chairman, A.I.A. Sub-committee on Civil Defense; member, American mission to United Kingdom to study protective construction; Chief Civilian Protection Adviser, U.S. Office Civilian Defense.*



By Fred N. Severud and Anthony F. Merrill*

bomb-proofness. It is our feeling, however, that certain sweeping assumptions are permissible.

One might say that for a 10% increase in cost the client could be guaranteed a 300% increase in strength—or whatever percentage seemed reasonable. That sort of generalization seems valid. . . . It seems to us that when cost presents itself, the designer can do no more than analyze his specific building and see that a maximum of rigidity and stability is gained within the functions of that building, without undue cost and without hampering the function.

Varying degrees of bomb resistance produce a scale of safety, at the top of which is total bombproofness. At the lower end of the scale is a degree of minimum safety in which the results of an atomic blast would be the survival of only the framework, the bare skeleton of beams and columns upon which the fabric of the original structure had hung, and upon which a new fabric might conceivably be hung. The survival degree scale has to begin at some zero point, and the framework is a very reasonable beginning point for that scale. Any new structure has advanced a long way toward completion, if foundations and steel are in place.

In designing for bomb resistance, it must be remembered that there is a radical difference in behavior between a structure that does not permit the blast to enter and the common type where the blast demolishes the windows and part of the walls and fights its way through the building. In the case of the windowless structure, the side that faces the blast receives the blow first and begins to stagger under it; fortunately as the blast runs around the sides of the building and spills over its top the one-sided blow is changed to a "hug" and the overturning tendency is arrested. Until the "hugging" occurs, the building goes through a series of contortions; the walls and framing members are deformed; partitions are subjected to great crushing forces as the framing elements yield; a great upward pull is exerted on the foundations.

It would be a rather hopeless task at the present time to undertake an accurate analysis of all these factors in an effort to arrive at a practical design approach. Some one must take the initiative, however. On the basis of a review of damage done during actual blasts, and some key computations, we offer an assumed lateral pressure varying from 500 to 1000 lbs per sq ft as a guide to creating a *windowless* structure that is stable against overturning. In the case of windowed structures, the tendency to topple is drastically reduced. We believe that a design based on 75 to 150 lbs per sq ft lateral forces should be sufficient to make most *windowed* buildings stable. Again we must emphasize the crudeness of these assumptions and the certainty that they will be modified as further tests are obtained and evaluated.

Providing the proper stiffness against one-sided lateral pressures, it is well to think of the problem as an earthquake in reverse. An earthquake shakes the building. A blast wave, on the other hand, takes hold of the earth by means of the building, and tries to shake the earth.

The commonest method of earthquake design is to base structural analysis upon the stiffness of the various joints between related beams and columns, and upon the rigidity of the members themselves. In other words an ordinary building with columns and beams is analyzed for what it is worth as a rigid structure, with a combination of all these rigid elements. Partitions and walls are assumed not to be there; they are generally disregarded as stiffening elements. Whenever partitions do occur in structures we believe that every attempt should be made to generate lateral stability through vertical walls rather than depending alone on columns and beams. Such a method has been used in many progressive earthquake designs.

It is recommended, then, that the designer look for walls or partitions of a permanent character, strategically placed, to carry the blast forces from floor to floor and eventually into the ground. Any modern steel or reinforced concrete building can be stiffened to a considerable degree by transforming such walls and partitions into "blast walls." It will be necessary to create these blast walls in two directions, at right angles to one another. The blast walls would normally be of reinforced concrete with so few openings that all horizontal forces can be readily absorbed. (*Illustration at the bottom of the facing page.*)

Under certain circumstances, it may be necessary to widen blast walls near the base (to be able to withstand the cantilever moments, which are larger near the foundations) to such an extent they extend outside the building. In, say, a twelve-story building, the walls may have to start flaring out

(Continued on following page)

By Harry M. Prince*

contemplation of protective structures, many of us (laymen and technicians alike) tend to overshoot the mark at first and fall into the common error of seeking to make something totally bombproof." *With that premise, this observer also agrees. Why then, we wonder, are not the authors realistic in their approach to the problem?*

Someone, it seems to us, is being very naive when it is suggested that an architect approach his client and say "while I appreciate the fact that the chances are very slight of your building being entirely damaged by a bomb burst, I suggest that your contemplated 10- or 12-story building, without a doubt should be designed as a silo-type building, with a diameter of something like 50 feet, and since I am not certain from which direction one may expect the bomb detonation will come, we will use blank walls or walls with few windows."

Except for the client who might possibly see in the proposal a promotion or sales angle, one can well imagine the client's reaction to these suggestions.

The construction industry in the United States is geared to a certain type of production, which is the result of generations of research and study, both technical and sociological. Shall we put the glass industry, for instance, out of business? Are we going to specify all-cardboard partitions, which will blow over when the blast comes, and ignore the advances that have been made in modular and removable metal partitioning? This would be a pretty drastic step; one which I think we are not likely to take, and one which I am sure the Civilian Defense authorities would not want us to contemplate.

Civil Defense will fail of its purpose if architects and planners have to forego all of the advances in the use of materials and in planning that they have learned to use in recent years. Civil Defense, in its broad meaning, will be a reasonable concept only when defensive measures are such that we do not have to live in holes, bastions, and silos. Certain measures to guard against panic, to care for emergencies, to disperse the population as much as possible, to teach the truth about the effects of the bomb—all these are necessary. But we are not, through some sort of hysterical reaction to the present emergency, likely to change the shape and the structure of our new buildings and increase the cost of already over-costly construction.

from the third-floor level, much as flying buttresses.

Fortunately the carrying of blast forces horizontally between the walls can be achieved at little or no cost. This is because the floor plates that are required for the function of the building represent girders of very large proportions. One point, however, that must be *looked into* very carefully is the connection between the floor plates acting as horizontal girders and the blast walls.

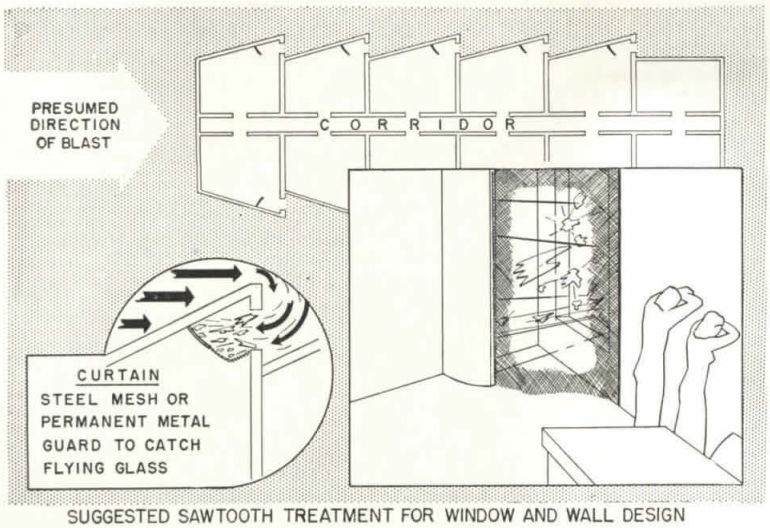
There is another design problem involved and that is the structure in which no vertical supports can be tolerated, like large factory floors. In designing for vertical supports one enters the field of shell construction, and there *are* forms which will stand up against atomic pressure: the arch type, and the domed or half-egg shape. The trouble with shell construction is that while it is very strong for an even load, it is vulnerable to a one-sided load. This may be compensated for in various ways, with cables, or with ribs, or with anything that would strengthen the shell against deformation.

If the problem of designing one or more multi-storied structures against blast were presented to us today, we would turn without a doubt to the silo-type of construction for something like a 10- or 12-story building, with a diameter of something like 50 feet. The whole career of any structural member subjected to atomic-blast pressures depends on whether the pressure is applied from all sides or from just one side. The sooner the blast pressure wraps itself around any member and hugs it, the safer it will be. Similarly, faced with the necessity of producing a multi-story structure which is virtually bombproof, the designer will have to turn to more than just a *material* with strength to give him his protection. When he seeks *shape* he will come at last to the barrel or silo form, and when he does you may then look for the first of many buildings like those we illustrate here. (*Drawings below.*)

We would like to add a word about elements of the building, such as doors and windows *in a windowed structure*, which the blast can enter. While planning fenestration, the designer ought to pause, for a cursory glance at least, at the possibility of improving the window material by doing away with the glass, by providing a plastic membrane, or by arranging the glass in a less hazardous fashion than is customary in the ordinary window treatment. One technique might be to hinge the windows so that they would fly upward and inward under external pressure. The glass would smash, of course, but its tendency to scatter might be cut down if it lay parallel to the blast instead of at right angles while breaking up. We illustrate *(page 69)* two mechanical treatments for the windows and exterior walls which seem to offer some advantages. They are not ideal, of course, and in one of these treatments it will be seen that we are presenting considerable blank wall surface to the blast, in order to provide safety windows.

Like the ideal window, the ideal partition in this case should be one which is fragile enough to let go instantly under blast pressure, sufficiently low in mass to offer no hazard as a flying fragment, yet dense enough to function as a partition. The Japanese do it with a piece of paper, and that is obviously what we are seeking—a membrane of some sort. Our suggestion for a blast-parth partition *(drawing on page 69)* incorporates the membrane principle to a certain extent. Up to the height of perhaps four feet—the normal height of a seated figure—and higher or lower where desired, we would erect an ordinary partition wall. Above this, from wall top to ceiling, we would place a "breakout panel" of light plastic membrane, formed by spraying *"cocoon"* (the material used so effectively by the Navy in mothballing its ships) on wire netting. Two layers of this with an airspace between would provide considerable soundproofing.

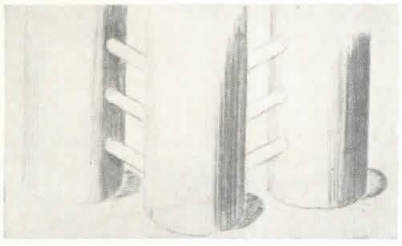
These few abbreviated illustrations indicate why we believe it is possible, at not too great expense, to design a reasonable degree of bomb resistance into new structures.

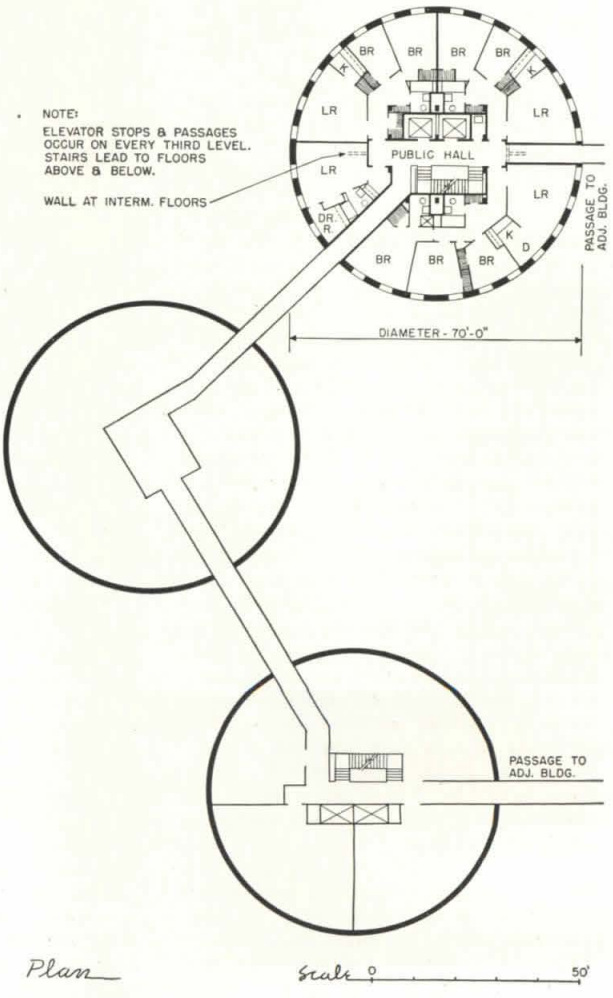


SUGGESTED SAWTOOTH TREATMENT FOR WINDOW AND WALL DESIGN

Above—an illustration for the Severud-Merrill book, suggesting a window treatment designed to let the glass fly back flat against the wall and be caught in a guard screen.

Below and right—a silo-shaped apartment house proposed by Severud, that would allow blast to "hug" rather than push *the building*. Elevators stop at every third floor; connecting corridors are staggered at every third floor. Windows would be designed to resist blast.





should urban redevelopment go forward now?

yes . . . By Eugene H. Klaber*

At present, there is a wave of enthusiasm sweeping the country for the construction of new towns. The destructiveness of atomic weapons has led even military authorities to believe that the only defense against atomic attack is space. The measure of dispersal that is necessary has not been specifically stated. Is it one family per acre and fifty workers per acre, or twenty families and two hundred workers? It seems to this writer that a community planned on the theory of atomic attack would be enormously expensive per person and entirely too sparsely settled to be economical for peacetime living. If this is true, it leads inevitably to the conclusion that there is no such thing as rational planning on the assumption of war.

In making a new scheme for Warsaw, Poland, the planners recognized this and have made a layout which they say is predicated on the maintenance of peace, realizing fully the likelihood that their city would be wiped out in an atomic conflict. One may well ask whether it is worth while to save 4% of the population from urban blight, solely that they may continue to live in a world that may be completely blighted. Can we, therefore, do any planning that has sense or human value based on the postulates that atomic war forces on us? Of course many planners are doubtless citing the defense angle as a political expedient, in order to get something done at a time when few will listen to any proposal that is not labeled "defense." The writer believes this is justifiable, but let us not delude ourselves that new towns are an adequate measure of defense. If they have an industrial base they are still bombing targets, even if small ones, especially since the new industries will mostly produce war materials.

As long as our efforts to create new communities are confined to nucleation of the decentralization which is taking place, anyway; we can ignore, for the moment, the problem of existing cities. As soon as we attempt to accelerate this movement, we must face the more complex and more important problem, the fate of the 38 millions who will still be living in our large urban agglomerations. Some will blandly say that our cities are outmoded mechanisms, that it is hopeless to attempt to make them livable, hence they should be allowed to rot until they are perforce abandoned. We cannot accept this crass logic, which is a weak excuse for running away the minute the going gets tough. We are not dealing merely with buildings, streets, and bus lines, but with the lives of human beings, with political and social institutions, preferences and prejudices, with many communities which have imperative reasons for being where they are.

Before discussing the normal problems of urban redevelopment, let us consider the question of defense. Since atomic war is a possibility, some measures of civil defense are in order, which may slightly mitigate the disaster if it comes. A few places can be found where people can hide and avoid the full impact of explosion, but what of the radioactive aftermath? Proposals to build deep shelters and live like moles are futile. Face the fact that if atomic bombs are dropped on large cities most of the population will die; there isn't room enough and there may not be time enough to find a spot of even temporary safety. This brings us to the conclusion that in urban redevelopment, as in new towns, rational planning must be predicated on the assumption that we can avoid atomic warfare. Let us plan our communities on the assumption that peace can be maintained. This does not lessen the task, it merely gives it a clear and achievable objective. If then war comes? If it does, it is questionable whether life will be worth living anywhere.

(Continued on page 152)

*F.A.I.A., A.I.P., redevelopment consultant to the City Planning Commission, Philadelphia, Pa.

no . . . By Donald Monson*

Slum clearance or redevelopment as visualized under Title I of the Housing Act of 1949 neither meets the criteria of defense nor fits into the now classic idea of a metropolitan complex. To rebuild a slum, even if at somewhat lower densities, does not break up the mass of the great city. When we speak of space alone being the only "before the fact" protection against atomic warfare, we mean something more than the few hundred feet between elevator apartments or an occasional public park. The fact that most of our plans for redevelopment—both public and private—bow to the speculative land values attached to slum areas by increasing rather than decreasing their density, only underlines the disservice rendered the national defense by such rebuilding.

We are fortunate in having an alternative pattern of city development at hand—a pattern which has emerged over the past 50 years and represents what we ought to do, even if there were no danger of atomic war. This recognizes that we cannot rebuild our great cities all at once, nor can we abandon them, each of us running off into the country and scattering our houses about without regard for transport or economy. The pattern begins with the direction of practically all new construction into widely spaced, optimum-sized new towns, properly sited on the existing metropolitan rail and highway transport grids. At the same time, these satellites are connected with the existing metropolis by wide new expressways cut through the present urban mass—expressways which will be the escape and access routes in an attack and which form the beginning of fire breaks. Next the fire breaks are widened, homes for the displaced people being made available in the new satellite cities. Finally, only after the population in the inner city has fallen to levels comparable to those of the new towns, with a consequent drop in the value of slum property, is the central core rebuilt. This places redevelopment in its proper sequence—at the end rather than the beginning of the city rebuilding process.

If we are to implement this new metropolitan pattern, we have a basic political decision to make. New towns in planned metropolitan areas require new ways of handling land development. At present our cities grow by accretion. A builder erects his houses near the existing roads and sewers, so that he will not have to carry the cost of the utilities for decades, or add the additional cost of long feeder lines to his sales price. If a private land developer tries to build a garden city, he freezes his capital for a long period and then can expect but a meagre return—or even a capital loss.

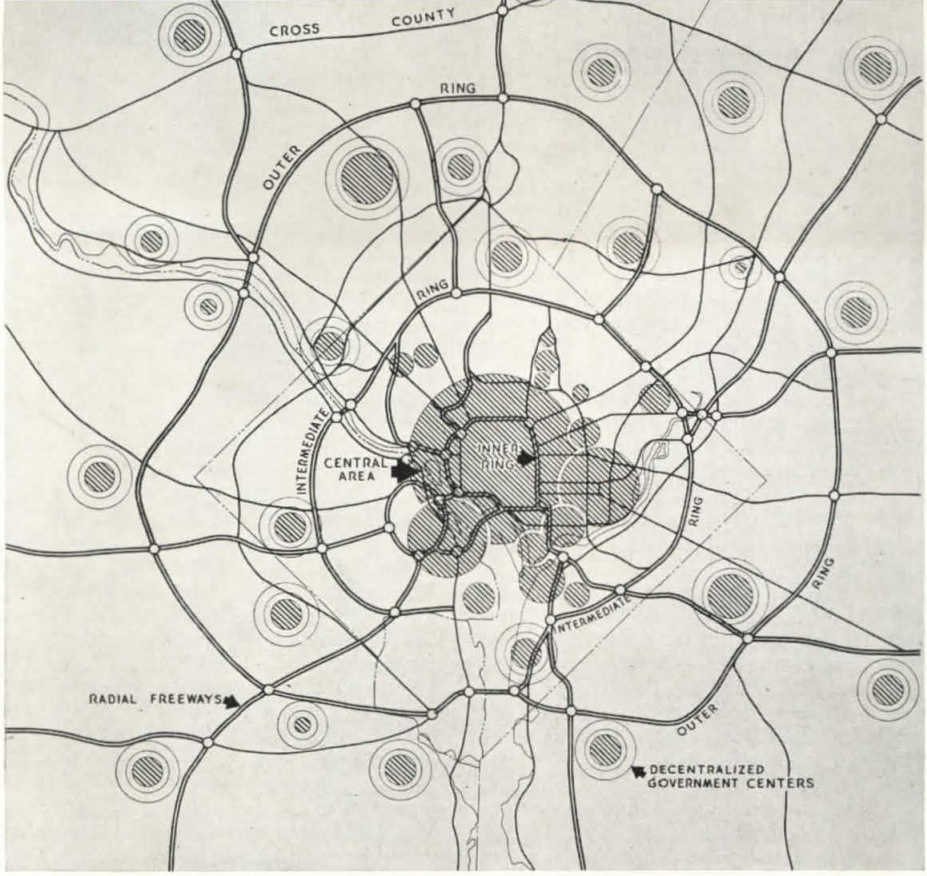
No single builder can change this system. It is true that a few successful satellite towns have been built, but their history goes to show that to build such towns successfully as an alternative to the increasing urban sprawl, there must be public control of all metropolitan building, not only to hold the necessary land reserves for future construction but also to maintain open country around the new towns, which is necessary for their safety and integrity.

This does not require public ownership of all urban land. It is only necessary to exercise public control when land changes use.

It has been argued that it is sufficient just to "zone" satellite towns into being and use existing FHA, PHA, and defense powers to direct all construction to the designated sites. This may be legally possible, but it would be grossly unfair. Without compensation to those who hold land having buildable value under our present system, and without requiring payment from those owning the favored sites, locating satellite towns through "zoning" will only make some rich at the expense of others.

While the problem of compensation is being worked out, construction could begin at once in connection with the awarding of defense contracts, FHA mortgage insurance approvals, RFC loans, public housing, and other existing forms of governmental control and direction of building. The basic problem, however, lies in our reluctance to face the fact that we cannot have decent metropolitan cities—to say nothing of safe metropolitan cities—without placing the siting of development in public hands. The question is not whether we shall have satellite towns or redevelopment—for we want both—but rather, whether or not speculative land profiteers shall be served, at the expense of the safety and well-being of us all.

*Housing Consultant, Labor Advisers, ECA; Office of the Special Representative, Paris, France.

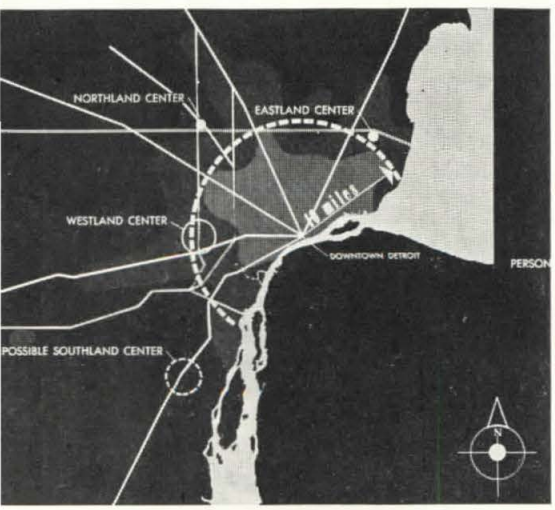


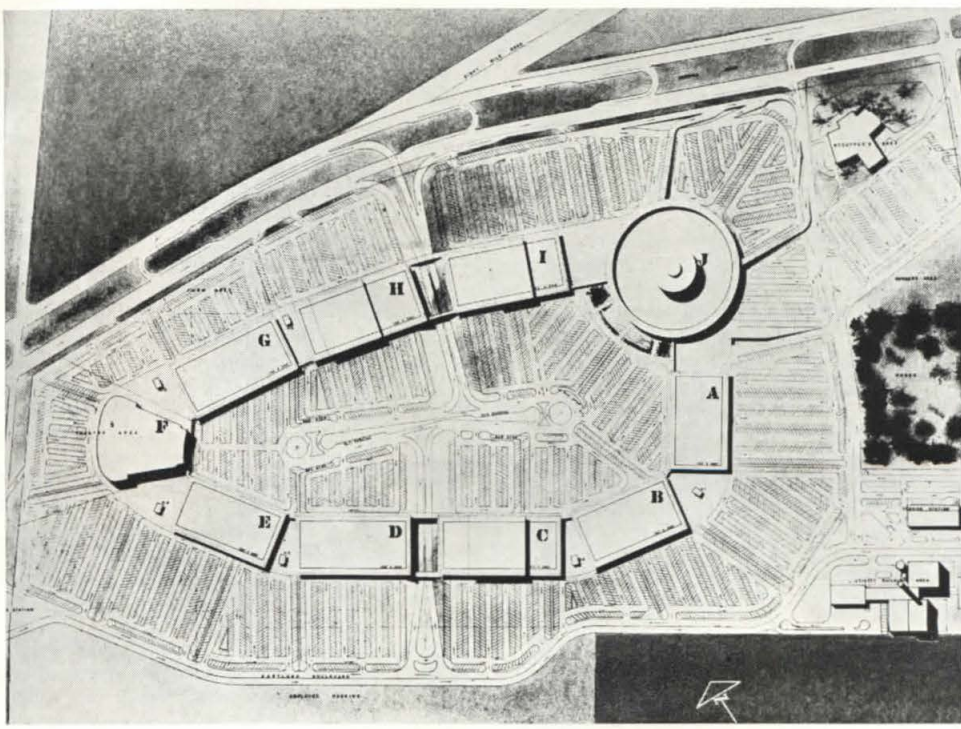
Left—pattern of proposed decentralized government employment centers, prepared by the National Capital Park and Planning Commission. It is proposed that the pattern would be based on a balanced distribution through the region, with centers placed to be accessible to a planned system of expressways. Certain of the centers would form the nuclei for satellite communities.

does safety lie in dispersal?

Victor Gruen, architect, has made studies for the J. L. Hudson Company of Detroit, showing how four huge regional shopping centers, ringing the central city, can be located away from the industrial targets to serve peacetime needs and, if necessary, act as emergency "defense welfare" centers, for rehabilitation, relocation, first-aid, etc.

Right—scheme for the Eastland Center, of fireproof construction, planned for the storage of food and emergency supplies, capable of housing and feeding large numbers of people.





yes . . . By Dr. Ralph E. Lapp*

IF THE DISPERSION IS SELECTIVE

Five years ago, I arrived at the conclusion that the only true defense against weapons of mass destruction was dispersion of our vital target cities. However, at that time, my experience was mostly that of an atomic scientist and I had only partial knowledge of the military and political implications of atomic weapons. Today, having devoted the past five years to an intensive study of these two important aspects of the problem of atomic defense, I am more convinced than ever that we must seek safety in space by dispersion.

My exposure to the non-scientific aspects of atomic defense has led me to re-examine the practical aspects of dispersion in terms of what it is possible to do within the span of the next two decades. Therefore, I have formed a new concept of dispersion—a concept which is practical, which is designed to be effective, and which, moreover, is politically possible. This concept I call *selective dispersion*. . . .

One of the things which has plagued those interested in dispersion has been the government's policy of withholding information about future developments, or for that matter, every current development in atomic weapons. If you are going to plan dispersion you must know what dispersal distance is safe. By dispersal distance, I mean the separation between community limits in the target system.

The question of the dispersal distance is now answered in the results of the planning announced for Washington, D.C. A minimum distance of 20 miles is specified as adequate. This distance takes into consideration future improvements in atomic weapons, including the H-bomb, probable bombing error, and non-weapon considerations. In the latter category I place such factors as communications, transportation, services.

You may be surprised to learn that the dispersal distance is only 20 miles. Perhaps you still recall the fact that the atomic bomb tests near Las Vegas earlier this year broke windows some 70 airline miles from the test site. This fact, which some have distorted to mean that an H-bomb was tested, should cause no alarm about the validity of the previously mentioned 20-mile distance. Window breakage is often a freak effect.

Personally, I have confidence in this *20-mile* dispersal distance. It has been carefully arrived at by conference between top officials in the Atomic Energy Commission, the National Security Resources Board, and other agencies.

If we consider the United States as a target for enemy A-bombs, what is it that the aggressor would want to hit? In view of our demonstrated ability in past wars, it should be obvious that the real objective would be the production front.

The production front can be knocked out in either of two ways. The enemy can bomb the industrial plants or can strike at the manufacturing labor force. Without going into exhaustive detail, my conclusion is that people are the real targets for the bomb. They are more concentrated, more vulnerable, and more difficult to replace.

Let me preface my statistics with this observation. Rather than look at our total metropolitan population (there are some 82,000,000 people in 150 metropolitan areas) I shall restrict the argument to the concentration of our production labor force. I have carefully selected 35 prime target centers and have assembled the following data. There are 7,126,000 production people working in 240,881 plants producing a product having a total dollar-value of $41,995,000,000. This is almost exactly half of our production labor force; it comprises 52% of our industrial plants, and is 56% of our industrial-dollar product. Much of this industrial plant is peripherally dispersed, but the people are not. An enemy striking at these

(Continued on following page)

Atomic scientist; associated with Manhattan Project until 1945; author of Radiological Safety, Nuclear Radiation Physics, *and* Must We Hide?

no . . . By Charles Abrams*

UNLESS WE RECOGNIZE THE RISKS AND THE SACRIFICES

Dr. Lapp's assumptions refute themselves. I shall therefore restate them in my own words with a few comments.

ASSUMPTION *1: We have 20 years within which to decentralize and make ourselves "safe" against atomic attack.*

COMMENT: *Judging by developments, we may expect a war within the next few years or shall have arrived at a* modus vivendi. *The selective dispersion theory is good for neither event. I don't mind a long-range plan for dispersion, but a 20-year plan which ultimately accomplishes no dispersion at all makes little sense.*

ASSUMPTION *2: After such decentralization, the enemy will attack the "unimportant" people of the cities and leave the production centers alone.*

COMMENT: *I wonder! Dr. Lapp himself admits that "people are the real targets for the bomb." He also concedes they are "more difficult to replace." If so, they are the ones who should be dispersed. But why not disperse both the people and the production front so as to remove both targets? The proposal is to leave most of the people behind as sitting ducks while the production centers and a number of "selected people tagged as essential to a war economy" are "saved." How the production centers could remain working without the support of the rest of the population, I don't know. I wonder also whether the workers will continue working away calmly while their women and children are taking a beating.*

ASSUMPTION *3: Within 20 years we should decentralize only the vital industries.*

COMMENT: *All or most industries, when properly converted, are "vital," though some may be more so than others. Banks are as important to the all-out war effort as the Fulton Fish Market in New York City, which supplies food for workers.*

ASSUMPTION *4: The destructive effect of an atom bomb 20 years hence will be the same as it is today. There will be no new weapons, there will be no high-power bombs, as were used in the last war to fire or blast the new production centers near the cities, there will be no bacterial warfare, and aviation will be no further developed than it is today.*

COMMENT: *No comment necessary.*

ASSUMPTION *5: The plan is "politically possible."*

COMMENT: *Here the proponents may be right. Anything is "politically possible" today. And because no one knows what future generals or statesmen may control their destinies—or those of the Soviet Republics after Stalin passes on to wherever he's going—it may be a good idea to arrive at some plan of dispersion. But not "selective!"*

Perhaps a plan of emergency dispersion might be evolved encompassing both human safety and continuity of production. But if we are computing defense over a 20-year period, it will require a fair statement to the American people of the risks and the sacrifices. It must be more realistic than the report of the National Securities Resources Board which, while warning of a "surprise attack" that might be "made suddenly," adds that "ours being a democratic nation dedicated to the principle of free enterprise, the government can neither dictate nor finance such a large-scale change in the industrial pattern." Also that the suggestions for dispersion are not intended to "encourage the relocation of manufacturing facilities for the purposes of adversely affecting wages, working conditions, and union contracts."

Dispersion is not only a financial affair, requiring the sacrifice of big business as well as of little people, but presents a vast social, political, and psychological problem entailing the resolution of the many complex factors in lives of human beings in danger—the will to live; the maintenance of family stability during, after, and in anticipation of attack; the willingness to pay the cost; the breaking of home, community, work, and family ties during the long process of dispersion; the maintenance of public morale, as well as of the democratic process; and all the other ramifications involved in the complex process of placing a democratic and individualist people under an enduring pattern of crisis.

Judging by the current "business as usual" attitude, we are a long way from any practical plan of dispersion, despite the 12 o'clock sirens and the official exhortations.

Lawyer, housing economist, author of The Future of Housing.

35 target centers could achieve overwhelming success with as few as one hundred A-bombs. Allow me to add one more statistic: in these same 35 target areas are some 54,695,000 people or over one-third of our total population.

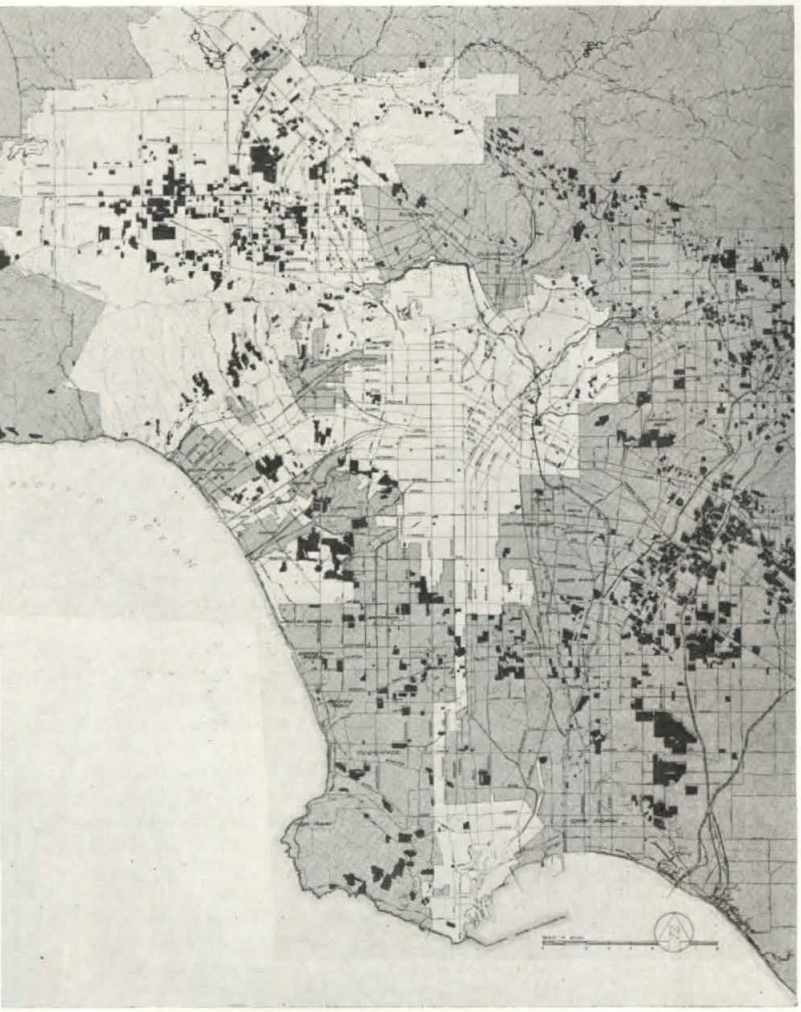
Attempting to disperse 50 million people is, of course, a hopeless task. But this is *not necessary*. Of the seven million manufacturing personnel in these cities, not all are essential to a war economy. I am talking now about the situation we confront when we have a real emergency and have to produce essential goods for the military. Furthermore, many of those in essential industries already live in relatively safe locations on the periphery of the city. So the number of selected people tagged as essential to a war economy and classed as vulnerable to attack is considerably smaller than seven million. These people and the industries in which they work are the nub of what I call selective dispersion.

My analysis may seem callous, but I prefer to think of it as a realistic approach to the problem of survival. It recognizes in advance of an atomic attack what will be important to our war effort after the attack. It recognizes the present vulnerability of our production front and indicates how it may be protected.

Any program for dispersion must of necessity be divided into two parts: one dealing with cities that are already in the target category and another aimed at those cities which are not yet targets. For those cities which are targets, the first rule must be that under no circumstances must any new essential industry be attracted within bomb range of the city. The second rule is that critical industries and people within bomb range must be relocated.

As for the cities which are not yet targets, there are two principles to bear in mind. One is the principle of size limitation, with emphasis not on total population but on the total manufacturing labor force. National security factors should dictate a maximum size for these cities. Depending on the location and criticality, a city may have an upper limit of 15,000 industrial personnel assigned to it. The second principle is defense in geometry. If, for economic reasons, the principle of size limitation does not apply then the city's growth should be channeled geometrically so that the over-all vulnerability of the target system is minimized.

Common to all these principles is the basic law that every weapon of mass destruction can be defeated with space. I advance the concept of selective dispersion and urge you to adopt it as a means of defeating the threat of atomic attack. It is the only true defense against the bomb. No qualified atomic scientist will tell you that there is any other defense.



Illustrations on this page reveal the attempt by Los Angeles City Planning Commission to control "natural" dispersal in the Los Angeles Valley.

Left—a map showing subdivision activity in San Fernando Valley (upper left) since the last war. Difficulty is in maintaining green areas between communities, to prevent overall sprawling growth. The whole region has been zoned for urban, suburban, limited agricultural, or unlimited agricultural use.

Right—one of the new towns in the San Fernando Valley section of Los Angeles—Panorama City. In 1948, the General Motors Assembly Plant is largely surrounded by farm land (upper photo); then, by 1950, a community of 4000 homes has grown, with shopping center, schools, parks and community structures (lower photo). The problem now will be to keep the town defined and self-contained. ***Photos: Kopec***

do new towns provide safety?

yes . . . By Clarence S. Stein*

Dispersal of industries and workers into limited-sized, low-density communities, surrounded by open country, is the only realistic protection against atomic attack.

Large massed industrial centers will be attacked if war comes. They cannot be fully protected. There will be no time, no place to escape.

Small communities' security is due to scarcity of atom bombs. Atom-bomb attacks must be concentrated on large, massed centers. Bombs are costly, their ingredients scarce; few will get through our defense. The enemy will find them strategically and economically unsuitable for any but major concentrations. They cannot be spared for numerous small targets.

Civil Defense, so called, offers no security against destruction of industries, transportation, homes, and most people in massed metropolitan areas. Few can reach bomb shelters. The interval between warning and bombing is too short. Vigilance, shelters, and post-attack evacuation are necessary (but partial) expedients. They must serve temporarily, while practical security is developed. As alternates to dispersal, they are mirages. Dispersal takes time. It admits no postponement. There is no alternate. First things come first means:

1. *All expansion outside important bomb areas* in dispersed communities.
2. *Communities small enough* to make

(Continued on following page)

Architect, town planner, author of many books, and designer of many projects leading toward better communities. His new book, Toward New Towns for America, *has just been published by Public Administration Service.*

no . . . By Jaqueline Tyrwhitt*

Even in an atomic war, the best method of defending the civilian population may be to take a positive line of action. The heavy bombing of London in the last war showed the enormous powers of self-reliance and resilience possessed by the human spirit, when acting freely within its own family group. It seems that the best pattern for living may also prove to be the best pattern for defense. Some people have leaped to the conclusion that one can provide this best pattern of living by building a great number of New Towns scattered all over the country—each housing something under 50,000 people. The arguments for this solution are:

That a target of 50,000 people is too small to be worthy of receiving an atom bomb. *This seems reasonable at first glance, but there are other types of bombs, and if the town were producing important war material it would be a valuable target whatever its population. Would Oak Ridge be spared? If the enemy's policy were one of terrorizing the civilian population, the small town would certainly be bombed. In both the Hit and Run Raids and the Baedeker Raids on Britain in 1942 even small villages were attacked. And finally, New Towns are likely to be used as secondary targets, upon which planes might unload their bombs if they have failed to find or have been driven away from their main targets.*

That present trends indicate a desire to move away from the city. *This is based on evidence that can be criticized. It is true that industries are moving out; they are in fact being forced out by traffic congestion and high land cost. For the same reasons, large stores are establishing branches outside the city, and social institutions such as hospitals and schools are moving out. It is also true that population statistics show that cities (or at least the centers of the cities) have a declining population, though in the metropolitan area as a whole the population has increased greatly. Other statistics show that the birth rate is lower within cities than in the country areas outside. False conclusions are often drawn from these statistics, but the truth of the matter is quite simple. The largest proportion of young married couples live on the city fringes, which are generally outside the administrative limits of the city. The city center is taken up by business of various kinds, at the expense of dwelling quarters. Thus the swelling residential suburban populations, which are of course an integral part of the city complex, are not within the* statistical *limits of the city itself.*

That a self-sufficient town of 50,000 people is an ideal environment for living. *It is beyond dispute that life in a New Town of this size would be infinitely pleasanter for the family of the young manager of a corner drug store who now lives somewhere in the wastes of Brooklyn. But it would not be possible for his elder brother, who is a steel worker, nor for his younger brother, who is attending classes at the University. We are quite literally not the same person today we were yesterday, and this changed personality with its altered needs requires a different environment. New Towns cannot provide an adequate environment during the adventurous period of youth, nor probably the most satisfying environment during the administrative period of middle age, and also the final reflective period of life.*

If an even distribution of independent self-contained New Towns can neither offer us immunity from air attack nor provide the most desirable environment for living—what do we really want? An answer that seems to offer some hope is contained in a new term—an addition to the dictionary of Planning Jargon—the Urban Constellation. *A book by Gyorgy Kepes of M.I.T. is shortly coming out, called* The New Landscape. *In it there are photographs of the heavenly constellations, of microscopic biological life, of animal tissues and inorganic crystals; air photographs of sand dunes, and water, and deserts. In almost all of these the same general phenomena can be observed. There is everywhere a freely disposed arrangement of differentiated but related elements, each to some extent complete in itself, but all oriented in an informal but organized manner toward a more important body of matter—the nucleus of the constellation. This order within disorder—or disorder within order—is entirely different from a rigid geometrical relationship of satellites to a central sphere. That the relationship of old-established towns and villages to their focal city falls into this universal pattern, is not a new discovery.*

For any constellation to be operative, it is clear that it must have an actively functioning nucleus—a heart. In the urban constellation this means that there must be a vital city center, to which all parts of the constellation have access. If new towns are not to be alien growths—tumors within a sick constellation—they must have a good and functioning relationship both to a lively central nucleus (the city) and to all other parts of the urban constellation.

No part of the most perfect urban constellation can provide the ideal environment for all men at any one time, nor for any one man at every stage of his life. Personal development and family groupings are exceedingly varied. Complete social and economic freedom of mobility can never be experienced by everyone. Only in a living space that contains within it sufficient diversity of opportunity, can the human spirit gain that confidence and resilience that enables it to develop its full potential—and even at times to "rise above itself." The only defense against death is life.

*Town Planning Consultant, London, England.

bombing wasteful and to make living neighborly and country like.

3. *Developed as a single operation,* including all essential housing, community facilities as well as industry.

4. *Planned spaciously* for living safely, in spite of peace-time auto hazards or war blitzing.

5. *Built soundly* for long pleasant use—come war or peace.

6. *Protected against sprawling overgrowth* by permanent, surrounding open country.

Meanwhile, within old metropolitan centers:

1. *No addition* to congestion—no building.

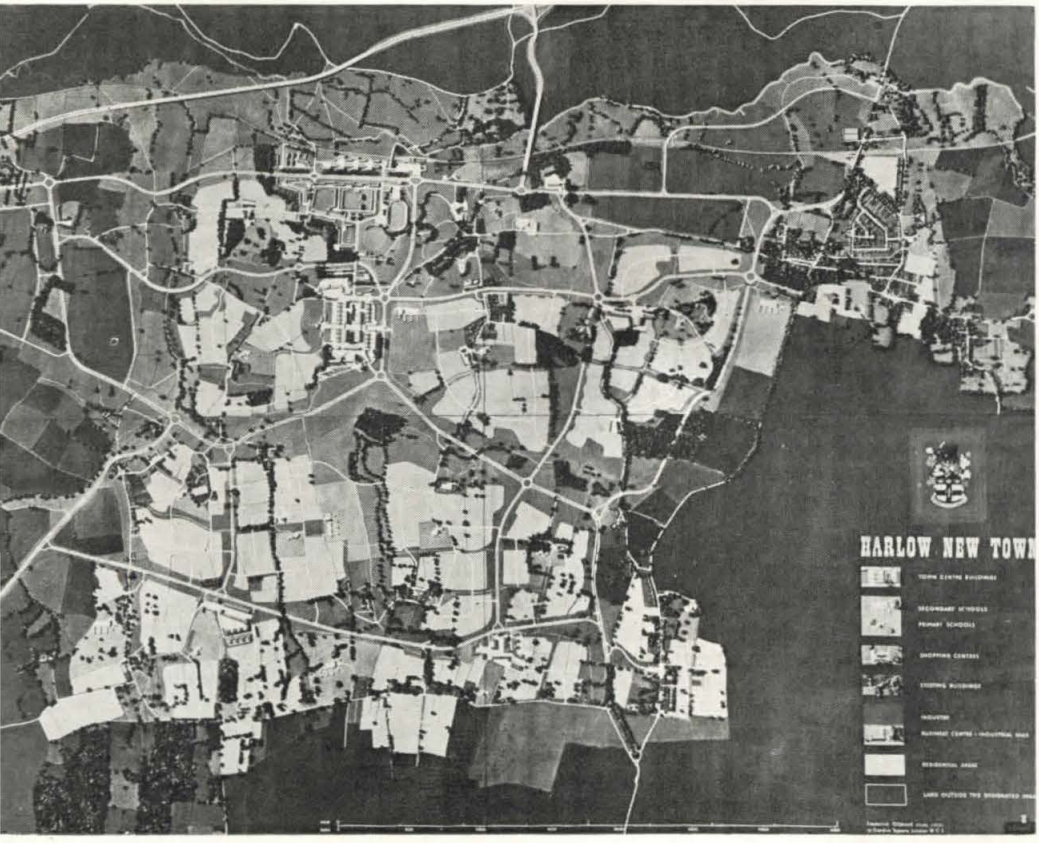
2. *Slum clearance* to provide for open spaces serving as fire stops and evacuation lanes.

3. *Redevelopment postponed,* while all obtainable materials, labor, ingenuity, creates New Towns.

New Towns will cost less, both to build and to operate, than redevelopment of old cities. Land is bought by acre and not by square foot; highways and utilities are less wasteful in modern superblocks than in obsolete gridiron patterns; planning and building can be based on experience and commonsense, rather than restrictive hand-me-downs.

Dispersal should start at once. Building a million houses annually (less than were constructed in U.S.A. last year) means two hundred complete New Towns in 10 years. Defense Communities should be located, planned, built, and administered for long-continued peace use, as well as for defense. Peacetime needs, for good living and efficient industrial production, demand similar dispersal, and the same kind of communities. The Metropolis, as we know it, is doomed. The monstrous cities, at the same time that they are expanding, are disintegrating. This is indicated by the continuous flight from the congested centers of all who can afford to escape—people, industries, and commerce.

Satellite Towns are an inadequate solution. New Towns we may call them; but they still depend on the old metropolis; they are tied to it; their working people daily feed in and out of it on overcrowded transportation lines and highways. The satellites, as well as the suburbs, remain subsidiaries of the old decaying center.

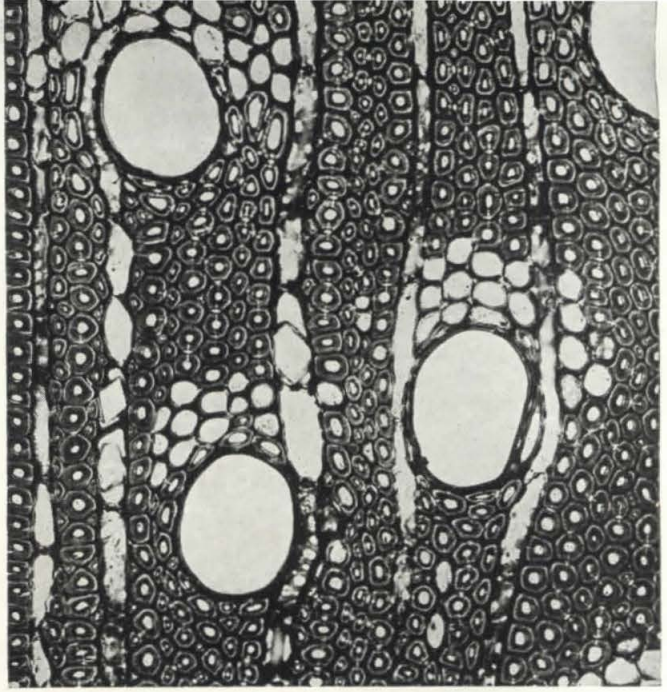


England's 1947 Town and Country Planning Act is referred to by several of the authors in this symposium. One result of that legislation has been Harlow New Town (plan above). Mark Hall North area, first residential section built, is shown in model (right). Aim of the master-planner, Frederick Gibberd, was to provide a planned framework for a community which would remain surrounded by an agricultural belt.

Photos: courtesy British Information Services

As a result the deadening concentration of the obsolete central areas is continuously augmented.

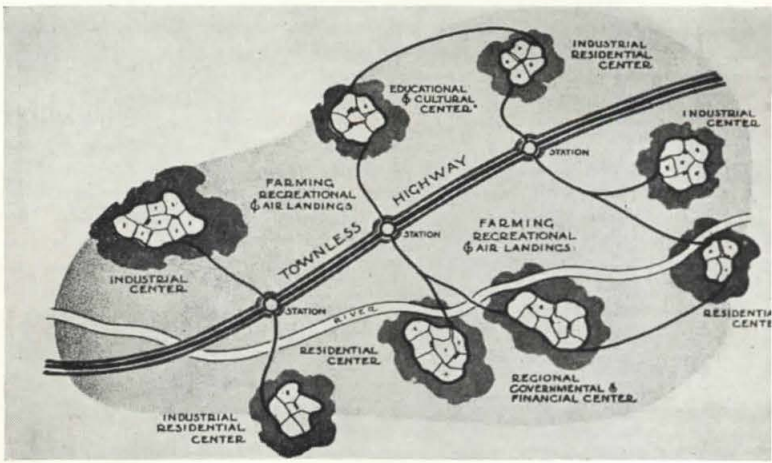
New Towns, yes! But as part of a broad, completely new pattern: the Regional City. The Regional City will be a constellation of small or moderate-sized towns or communities, separated by great areas of natural green, but bound closely together in time-distance by freeways. The Regional City has *no single center,* but many separate centers for different activities. Thus traffic load and movement are distributed and balanced. Such Regional Cities will combine all advantages of urban-rural town living, with the glamorous richness of the big metropolis. And, in time, the Metropolis itself will be developed as a Regional City.



Two patterns of urban decentralization are suggested in the papers discussing New Towns. Miss Tyrwhitt recommends the "urban constellation" which to her is similar to the general pattern of life—a freely disposed arrangement of differentiated but related elements all oriented toward a nucleus. (Both Stein and Mayer use the word *constellation* also, but in a somewhat different sense.)

Left and above—a Crab nebula in the heavens, photographed from Mt. Wilson Observatory, and a transverse section of wood, micro-photographed by Prof. I. W. Bailey of Harvard University Biological Laboratory. Both are illustrations from the forthcoming book, *The New Landscape*, by Prof. Gyorgy Kepes, of M. I. T.

Below—a pattern for the Regional City, as proposed by Stein in 1942, and which he would modify very little today. This is a group of communities, independent but related by highways and parkways, each containing in addition to its residential function some specialized function required for the group—commercial, cultural, educational, governmental, etc. This concept has no nucleus as such, no dominant center.



is there any defense from the bomb?

yes . . . By Albert Mayer*

We seem to be living in a sort of Never-Never Land. One of the clearest, least controvertible facts is that in any modern war, big cities will be unmercifully bombed, as they were in the last war. We need not strain our technical or emotional imaginations to try to gauge just how ghastly atomic bombing or bacteriological attack will be.

No one questions these horrors. Indeed, they have caused or contributed to what even in the circumstances are excessive jitters. Yet in different ways, an unbelievably large number of people shrink from the obvious and creative answers. There are many architects and planners who know these things, who also believe in the creative value of new towns, but who squeamishly talk against achieving them by the moral backdoor of saving lives.

There is a serious blind spot here. It may stem from a moral refusal to recognize the possibility of war and its consequences, or an arrogant isolationist feeling that we shall somehow be immune. But surely to recognize dangers inherent in the possibilities of mass lethal weapons in the hands of unregenerate nations and to embrace the only known remedy of multiple small concentrations spaced apart, is not morally cowardly or hysterical, but common sense and far-sightedness. In other fields we follow this course. We know the facts and dangers of tuberculosis, and we have followed the consequences by taking effective measures of various kinds, including decongestion.

In short, the possibility of bombing must be considered as a realistically serious technoligical development, and action taken. As citizens we must seek mightily to change our hearts and the hearts of nations—just as we hope in time to have no tuberculosis—but meantime provide corrective measures and solutions.

Not eveyone is waiting. The industrialists are decentralizing, have been decentralizing for 25 years. Under the impact of war dangers, the pace is accelerating. They, at least, have seen no contradiction between the permanent economic and productive advantages of decentralization, and the strategic advantages.

But there, too, there is a curious blind spot. Steel companies buy huge acreage—four or five thousand acres for production, but not one acre for living. Everyone knows what the results will be, and always have been, and were during the last war. Hours lost through long-range commuting; over-crowding in shacks and trailers; excessive rents in the houses that are built due to astronomic speculative land costs; absence of recreation facilities.

What are the negative factors that must be overcome, and how?

The industrialists hate the word "company town" like poison. And so they should, because the old company town, the mining town, was a shack town. But in a very simple way, they could achieve the advantage of the new town and avoid being bothered by the, to them, accompanying headaches. There are now architects and planners who know how to plan them. There are intelligent large-scale builders who know how to build and operate them—the Klutznicks, the Levitts, the Zeckendorfs.

General inertia and what is assumed to be vested interest constitute another formidable obstacle, even more difficult to grapple with because they are pervasive and not identifiable. Powerful arguments are available to us. City economies are worsened by indefinite growth. Traffic remedies have never yet caught up with the disease. There is no question of big city attrition, but of small city creation. The powerful magnet of big city facilities will continue its useful functions. But, above all, we are simply advocating in a creative way, what is now happening in a sloppy way.

Let us not be dismayed by the bitter-end arguments that big cities are indispensable and that not everyone wants to live in small towns. Big cities will stay but we want to arrest their elephantiasis. Decentralization can in some cases take the form of a central industrial-commercial-entertainment center, with new communities or with small existing communities close to it which will need to be carefully enlarged. This constellation would be only another illustration of the flexibility and adaptability of the whole concept.

The architect and the architectural profession, in this whole situation, will need to be catalyst and advocate, will need to work up convincing relationships and answers, will need to combine with other groups in exploring and advocating. If the architect wants to be granted, or to achieve, an important role in determining the kind of living he is later to create designs for, he and his profession have got to take a determined corporate interest, as well as, later, an individual professional one.

I believe that under a hard surface the situation and the crisis of the country are fluid, are conceivably in flux, and that the present elements could, with equal likelihood, produce creative crystallization or continue uncrystallized drift. I believe, too, that if we are not satisfied to drift along, and if we are capable of great effort and tenacity, we may play a considerable role in producing a creative basis for our future work.

*Architect, city planner, member of the firm of Mayer & Whittlesey

no . . . By Thomas H. Creighton

The Editors of P/A *began gathering material for this issue with completely open minds. We have read all of the literature that is available on Civil Defense, and we have solicited a number of experts on the subject to contribute their points of view, as you have seen. The Editors leave the discussion with several strong opinions established in their own minds (the readers' reactions may be very different). We feel:*

1. The architect and the planner cannot run away from the civil defense problem. Their advice is going to be asked and they are going to be faced with certain strong responsibilities.

2. The architect's role is not to rush out and design shelters or prop up buildings, but to give serious and sober thought to all aspects of the problem.

3. There is no true defense for people against the bomb, now or in the future, except to make damn sure that no bombs will be dropped. Structural frames designed by bomb-resistant principles may remain standing and shelters of one sort or another might save a few lives here and there, but by and large, protective measures are useless because of technical factors which can be readily proved (time, concentration, etc.), and because of psychological factors (we particularly noted Warden Mallon's comment, in the note he sent us with his piece: "personally, I was never out of bed for any whole night during the war").

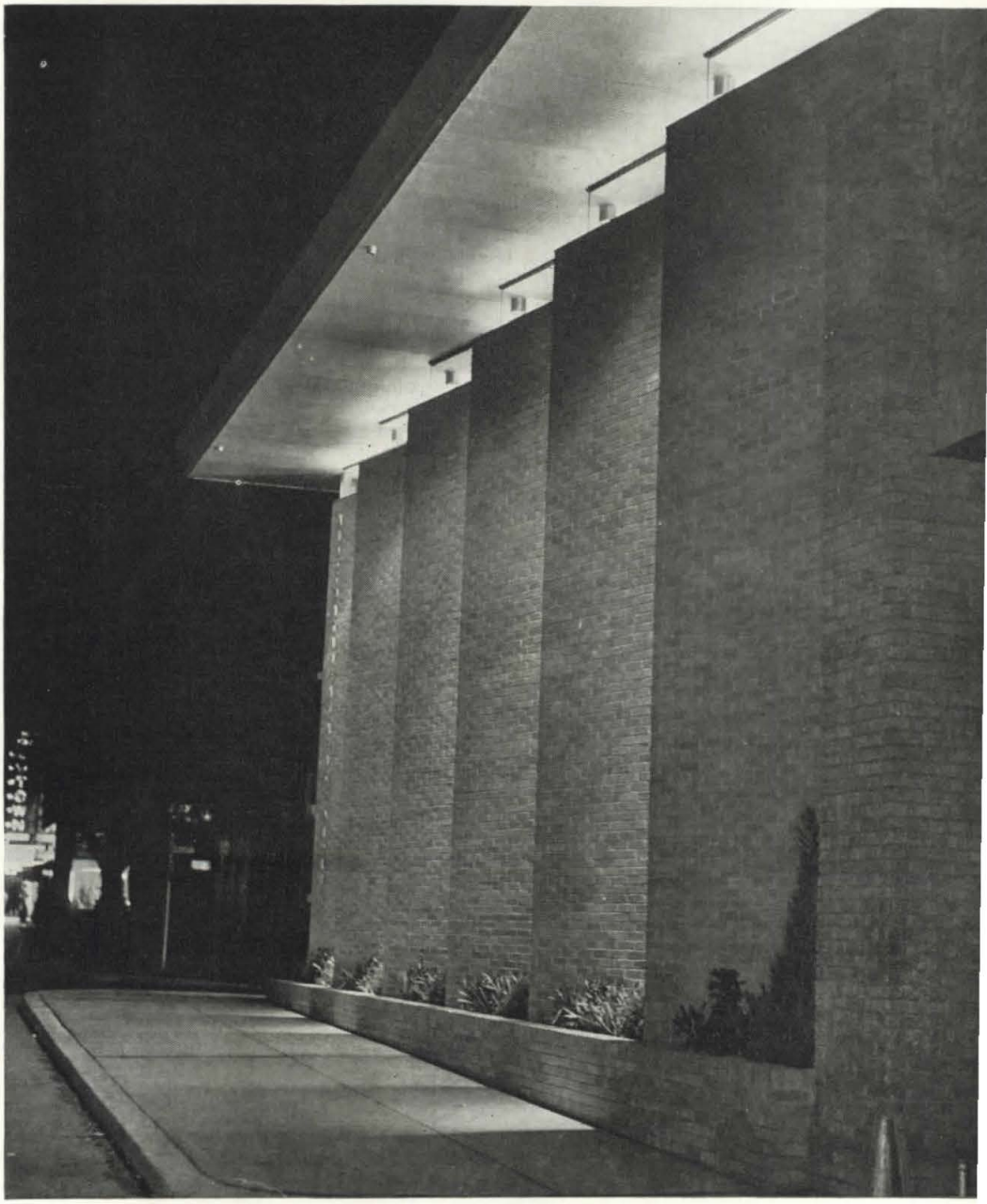
4. The attempts to use "defense" and the fear of the bomb as arguments for or against urban redevelopment or new towns leave us cold and rather shocked. As Klaber states, "rational planning must be predicated on the assumption that we can avoid atomic warfare." We feel that the advocates of dispersion and new towns begin to lose some of the strength of their arguments when, in the preceding pages, they tie them to Civil Defense. Under these circumstances, it is possible to question the concept, as Miss Tyrwhitt has done. We agree fully with Abrams that dispersion is a "vast social political, and psychological problem" which cannot be approached through the opportunistic use of fear of the bomb.

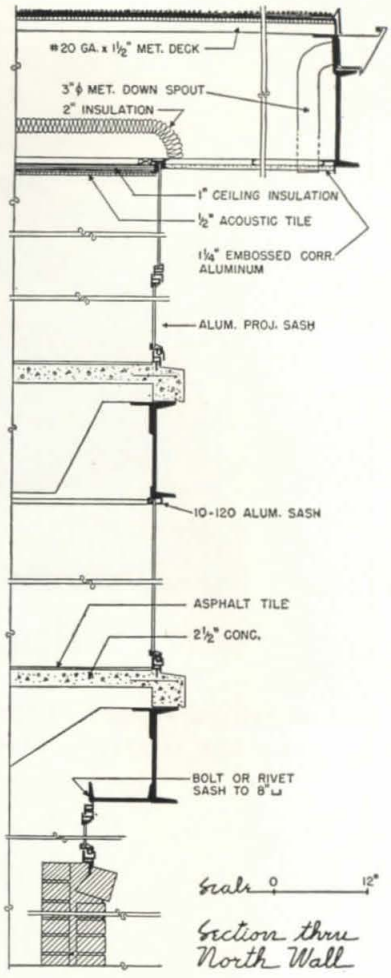
5. Mayer makes a strong point when he speaks of the shortsightedness of unplanned dispersal, and decentralized industry, with no thought of the community problems arising therefrom. The new Atomic Cities are frightful to contemplate. And yet again, let's not attack even this important problem as a Civil Defense measure. It may be, we dare believe, that the threat of war can be removed. What happens then to "selective dispersal" and "strategic decentralization?" Urban redevelopment along with a planned decentralization program, based on regional power development, social needs and transportation and distribution facilities is to us a much more defensible concept.

6. One final summary, so trite and obvious that it can be lost sight of in the argument: the best defense against war is peace.

Magazine Distribution Warehouse: Oklahoma City, Oklahoma

CONNER AND POJEZNY, ARCHITECTS
ERKINS, CONSULTING ELECTRICAL ENGINEER



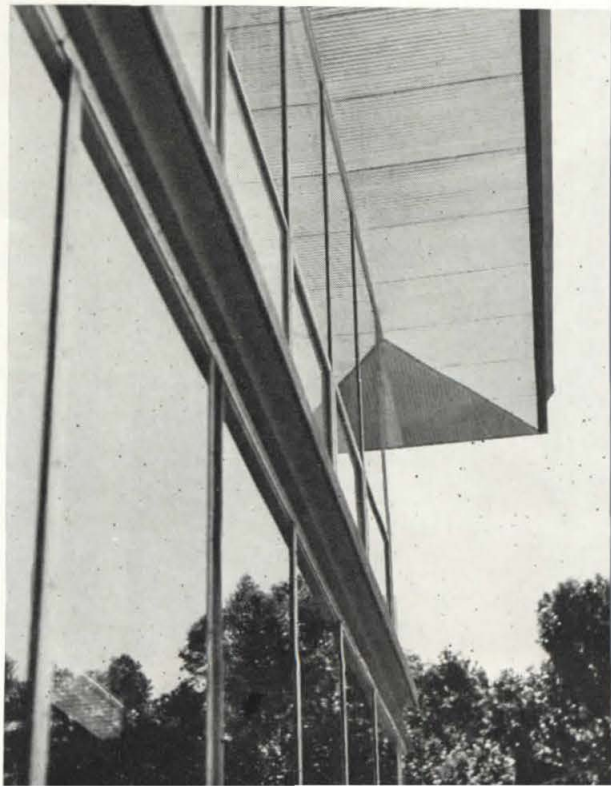


Left—the main entrance, showing mezzanine-level office space just above the narrow window band of the ground floor. Because of the site slope, the ground floor is at grade at the trucking end of the building.

Above—detail through north wall.

Below—the sawtooth west-wall panels (*left*) that exclude western sunlight (glass areas admit glareless northern daylight); and detail (*right*) at northwest corner.

Photos: Johnny Melton



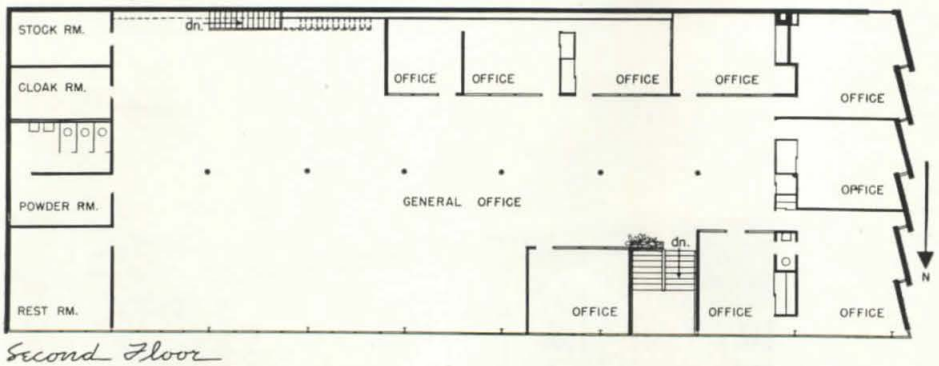
program Addition to an existing building for an agency that handles wholesale distribution of magazines, pocket books, etc., throughout Oklahoma, Texas, and three adjoining states. The old building, joined to and immediately south of the new unit shown here, is mainly a receiving dock and warehouse-type room where initial out-of-town sorting is handled. The new building consists (on the ground floor) of a large sales and distribution room where in-city magazines are sorted, and from which all magazines are shipped via a truck-loading space at the east end of the floor; and (on a mezzanine and the second floor) private and general offices. The west end of the ground floor is used for storage of shipments that are prepared in advance.

site Southeast corner site, with main, one-way thoroughfare on the west and a minor cross street on the north.

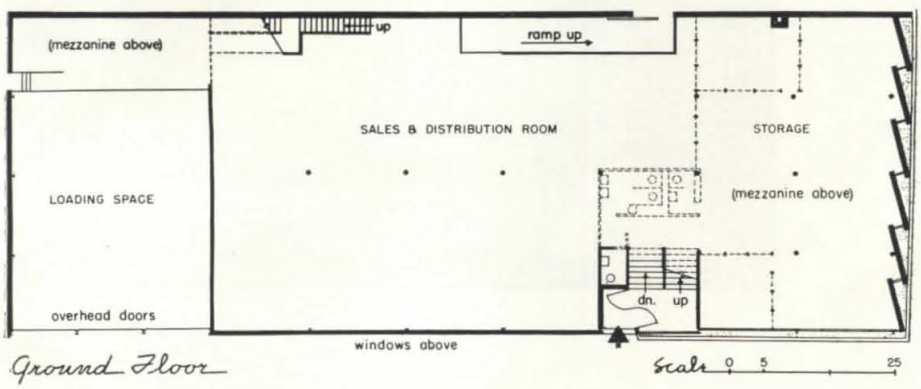
solution A long, rectangular unit, with the greater length along the side street. Because parking is not possible on the thoroughfare to the west, and since there is little public traffic into the building (no direct sales are made here) the entrance is placed on the north, and a cut-in curb strip along this side provides for temporary parking. For operational reasons, placement of offices worked out best at the west end of the building, but since the western summer sun and heat can be excessive in this locality, a saw-tooth plan scheme was developed for the west wall, so that light, but no direct sunlight, enters this area. To provide a pleasant atmosphere for work, the building is equipped with a music-playing system with individually controlled, ceiling-mounted speakers. The building is framed with fully welded structural steel, with horizontal and vertical continuity.

the architects *R. Duane Conner:* School of Architecture, Okla. A. and M., 1941. Five years with engineering companies as designer and design engineer on such projects as Manhattan Project at Oak Ridge, Tennessee; Douglas Aircraft plant at Oklahoma City; Camp Polk, Louisiana; Naval Aviation Training Center, Norman, Oklahoma, etc. Designer in the firm of Conner & Pojezny since 1946.

Fred Pojezny, Jr.: School of Architecture, Okla. A. and M., 1942. Architectural experience in various offices. Lieutenant in Navy in South Pacific and at Seattle Naval Base as Officer in Charge of Construction, 1942-1945. Since 1946, partner in the firm.



Second Floor



Ground Floor

Conner

Pojezny

Above—general view of the second-floor clerical area. At the left are stairs down to the mezzanine level.

Right—private office in the southwest corner of the second floor. The side wall consists of two sawtooth panels terminated by tall, narrow sheets of ¼"-plate glass.

CONSTRUCTION

Foundation: reinforced-concrete footings, grade beams. **Frame:** structural steel. **Walls:** brick cavity walls. **Floors:** concrete slabs. **Roof:** metal deck on steel joists. **Waterproofing and dampproofing:** static asphalt —Flintkote Company. **Insulation:** acoustical: cane-fiber tiles—Celotex Corporation; thermal: rock wool batts—United States Gypsum Company. **Floor surfacing:** asphalt tile—David E. Kennedy, Incorporated; rubber tile—B. F. Goodrich Company. **Ceiling surfacing:** upper floor: acoustical tile—Celotex Corporation; mezzanine: vermiculite plaster; vermiculite aggregate—Perlite Corporation. **Wall surfacing:** exterior and interior: face brick. **Roof surfacing:** built-up pitch, felt, gravel. **Roof drainage:** galvanized, sheet-steel gutters and downspouts—Wheeling Corrugated Company. **Partitions:** striated plywood panel interiors—United States Plywood Corporation, flush metal toilet partitions—Sanymetal Products Company, Incorporated. **Windows:** aluminum projected sash —Sunlight Metal Products Company; plate-glass store front, flashed opal, and aluminum settings—Pittsburgh Plate Glass Company. **Doors:** flush, solid birch; wood overhead—Overhead Door Company of Oklahoma; wood-slab entrance doors. **Hardware:** key-in-knob locksets, aluminum finished—Schlage Lock Company; overhead-door closers — Norton Door Closer Company; floor checks—Oscar Rixson Company; casement hardware—The Stanley Works. **Paint and stain:** exterior: oil-cement paint on steel—Tnemec Company; interior: stain wax on paneling — Samuel Cabot, Incorporated.

EQUIPMENT

Intercommunication: interphone system — Western Electric Company; low-level music projection—Muzak Corporation. **Lighting fixtures:** manufacturing and distributing areas: RLM incandescents; offices: fluorescent strip lighting — Litecontrol Corporation. **Electric distribution:** service entrance switch, circuit breakers, steel-tube and rigid-galvanized conduit—Westinghouse Electric Corporation; toggle switches and duplex outlets—Bryant Electric Company. **Plumbing and sanitation:** water closets with reverse traps, vitreous-china tubs and lavatories, toilet seats—Crane Company; flush valves—Sloan Valve Company; copper pipe and tubing for water-supply system—Anaconda Copper Mining Company; gas-fired automatic water heater. **Heating:** gas-fired, cast-iron, sectional hot-water boiler—Mueller Company; hot-water coils in sheet metal duct system. **Air Conditioning:** packaged unit, with piston-type compressor and evaporative condenser, using Freon—International Manufacturing Company; wall registers—Barber-Colman Company; winter-summer controls—Minneapolis-Honeywell Regulator Company; throw-away glass fiber filters; central centrifugal belt-driven blower; penthouse exhausters—United States Air Conditioning Corporation; copper fin-tube cooling coils—International Manufacturing Company.

Left—the president's office, in the northwest corner of the second floor. As in all the office areas, ceilings are surfaced with acoustical tile; artificial lighting derives from fluorescent-strip units, and there is a music-distribution speaker in the ceiling.

Above—parking space just east of the building. The center-hung shed (crossed, welded 3½" x 2½" angles, with ⅝" cables supporting the steel-framed, corrugated-aluminum-surfaced roof) provides maximum freedom for maneuvering cars. The architects tell us that "the roof flexes slightly in high winds, but it has withstood 80-mile gusts and sustained 50-mile breezes notwithstanding dire predictions to the contrary. It was erected by an ex oil-field worker and cost less than $1000."

Figuring Overtime Pay

By ROBLEY D. STEVENS*

Problems of wage administration are very important to management of architectural organizations, because in almost every such enterprise labor costs—whether for achitects, draftsmen, or clerical personnel—constitute a substantial part of the total cost of doing business. It is important, therefore, that such labor costs be controlled, or kept within reasonable limits. Accounting for overtime under the Fair Labor Standards Amendments 1949 is an important aspect of this problem for architectural firms.

Since the enactment of these Amendments, employes may not legally work more than 40 hours per week unless they are (a) paid time-and-one-half for all hours in excess of that 40-hour week; or (b) unless they are specifically exempted as Executive, Administrative, Professional, or Sales employes, pursuant to Section 13(a).

The proper handling of wage computation for overtime purposes is important to prove compliance and preclude costly penalties. It is important to pay attention to the official requirements, or at least to the inauguration of an overtime-pay development program, so that if and when an official investigation is conducted, it will be based on an accurate record and the remuneration paid individual workers will be in harmony with the basic-minimum legal requirements.

Briefly, Section 6 of these Amendments provides for a minimum-wage rate of 75 cents per hour for all employes affected by the Amendments. Section 7 provides for the 40-hour maximum; that is, an employer may not employ any such employe for a work-week longer than 40 hours "unless such employe receives compensation for his employment, in excess of the hours above specified, at a rate not less than one and one-half times the regular rate at which he is employed."

It should be clear that there is no absolute limitation in Section 7 of the F.L.S.A. 1949 Amended, on the number of hours that an employe may work in any work-week, if he is paid time-and-one-half his regular rate for the overtime hours. But for any work-week an employe is covered by the Act and is not exempt from its overtime pay requirements, the employer must total all the hours worked by the employe for him in that work-week (even though two or more unrelated job assignments may have been performed), and pay overtime compensation for each hour worked in excess of 40, in the week. This need not coincide with the calendar week but may begin on *any* day and at *any* hour of the day.

The Act takes a single work-week as its standard and does not permit averaging of hours over two or more weeks. There is, however, no requirement that overtime compensation be paid weekly. Overtime pay earned in a particular work-week must be paid on the regular payday for the period in which such work-week ends. If the employe's regular rate of pay is higher than the statutory minimum, his overtime compensation must be computed at a rate not less than time-and-one-half based on such higher rate.

The Act does not require employers to compensate employes on an hourly rate basis; their earnings may be determined on a piece-rate, salary, commission, or other basis. The regular hourly rate of pay of an employe is determined by dividing by his total remuneration for employment (except statutory exclusions) in any work-week for which such compensation was paid. The following examples of the proper official method of determining the regular rate of pay in particular instances may be helpful to management of architectural firms:

Hourly Rate Employe

If the employe is employed solely on the basis of a single hourly rate, the hourly rate is his regular rate. For his overtime work he must be paid, in addition to his straight-time hourly earnings, a sum determined by multiplying one-half the hourly rate by the number of hours worked in excess of 40 in the week. Thus, a $1 hourly rate will bring, for an employe who works 46 hours, a total weekly wage of $49 (46 hours @ $1 plus 6 hours @ 50 cents). In other words, the employe is entitled to be paid an amount equal to $1 an hour for 40 hours, and $1.50 an hour for the 6 hours of overtime, or a total of $49.

If, in addition to the earnings at the $1 hourly rate, a production bonus, say, $4.60 is paid, the regular hourly rate of pay then is $1.10 an hour (46 hours @ $1 yields $46: the addition of the $4.60 bonus makes a total of $50.60. This total divided by 46 hours yields a rate of $1.10). The employe is then entitled to be paid a total wage of $53.90 for 46 hours (46 hours @ $1.10 *plus* 6 hours @ 55 cents —or 40 hours @ $1.10 plus 6 hours @ $1.65).

Day Rates and Job Rates

If the employe is paid a flat sum for a day's work

*LL.B., J.D., *Washington correspondent, former official representative U. S. Department of Labor; co-author of* Collective Bargaining; Regulatory Recordkeeping.

or for doing a particular job, without regard to the number of hours worked in the day or at the job, and if he receives no other form of compensation for services, his regular rate is determined by totaling all the sums received at such day rates or job rates in the work-week and dividing by the total hours actually worked. He is then entitled to extra half-time pay at this rate for all hours worked in excess of 40 in the work-week.

Salaried Employes—General

If the employe is employed solely on a weekly salary basis, his regular hourly rate of pay, on which time-and-one-half must be paid, is computed by dividing the salary by the number of hours which the salary is intended to compensate. If an employe is hired at a salary of $40 and if it is understood that this salary is compensation for the regular work-week of 35 hours, the employe's regular rate of pay is $40 divided by 35 hours or $1.14 an hour, and when he works overtime he is entitled to receive $1.14 for each of the first 40 hours and $1.71 (one and one-half times $1.14) for each hour thereafter. If an employe is hired at a salary of $40 for a 40-hour week, his regular rate is $1 an hour. Where the salary covers a period longer than a work-week, such as a month, it must be translated or reduced to its work-week equivalent. A monthly salary is subject to translation to its equivalent weekly wage by multiplying by 12 (number of months) and dividing by 52 (number of weeks). A semi-monthly salary is translated into its equivalent weekly wage by multiplying by 24 and dividing by 52. Once the weekly wage is arrived at, the regular hourly rate of pay will be calculated as indicated above.

Salaried Employes—Irregular Hours

If an employe earns $46 per week with the understanding that the salary is to cover *all* hours worked and if his hours of work fluctuate from week to week, his regular rate of pay will vary from week to week and will be the average hourly rate each week. Suppose that during the course of four weeks the employe works 40, 46, 50, and 41 hours. His regular hourly rate of pay in each of these weeks is approximately $1.15, $1.92, and $1.12, respectively. Since the employe has already received straight-time compensation on a salary basis for all hours worked, only additional half-time is due. For the first week the employe is entitled to be paid $46; for the second week $49 ($46 plus 6 hours @ 50 cents or 40 hours @ $1 plus 6 hours @ $1.50); for the third week $50.60 ($46 plus 10 hours @ 46 cents—or 40 hours @ 92 cents plus 10 hours @ $1.38); for the fourth week approximately $46.56 ($46 plus 1 hour @ 56 cents—or 40 hours @ $1.12 plus 1 hour @ $1.68).

Where an employe in a single work-week works at two or more different types of work for which different basic hourly rates (of not less than 75 cents an hour) have been established, his regular rate for that week is the weighted average of such rates. That is, his total earnings (except statutory exclusions) from all such rates are divided by the total number of hours worked at all jobs.

Section 7(d) provides that "the regular rate at which an employe is employed" shall *not* be deemed to include such things as gifts, reimbursable expenses, payments to a bona fide profit-sharing plan, contributions to a third person for the employe's benefit for insurance or retirement plans, and certain premium payments for extra or out-of-hours work.

Another aspect of the Amendments that might be pointed out is that subsistence allowances paid under Public Law 346 (commonly known as the G.I. Bill of Rights) to a veteran employed in an on-the-job training program may not be used to offset the wages to which he is entitled under the F.L.S.A. The subsistence allowances provided by Public Law 346 for payment to veterans are not paid as compensation for services rendered to an employer nor are they intended as subsidy payments for such employer. In order to qualify as wages under the F.L.S.A., sums paid to an employe must be paid by or on behalf of the employer. Since veterans' subsistence allowances are not so paid, they may not be used to make up the minimum-wage or overtime-pay requirements of the Act, nor are they included in the regular rate of pay under Section 7.

The foregoing information should assist the management of architectural firms in properly computing overtime pay of employes affected by the law. To avoid errors or omissions which may prove costly, it is necessary to check or periodically audit the payrolls. Among other benefits, this will provide the wage-hour inspector with the precise information he is seeking when checking the records.

House: Raleigh, North Carolina

program The architect's own home in Raleigh, where he is Dean of School of Design, North Carolina State College. Special things the Kamphoefners wished to achieve—living comfort, even in the sultry heat of summer; a compact working laboratory for a kitchen; a central location and good acoustical conditions for a record player and an extensive collection of recordings; space for informal entertaining of large gatherings.

site Rectangular lot 100′ x 188′ in area, in a pine woods and bordered, on the southeast, by a golf course.

solution Prevailing breezes derive from the southwest, which is also the source of the most torrid summer sun and heat. Secondary breezes are from the southeast, the direction also of the pleasant view across the golf course. All main rooms, therefore, are aligned to face the southeast. To gain the benefit of the southwest breeze, a large part of the end wall of the living room consists of an exterior louver, with hinged doors on the interior; louvers also occur in a southeast-facing clerestory that spans the length of the living room; in-opening panels at floor level, under the big southeast windows, also draw in cool ground air from this side. Thus, with doors and panels all opened, breezes are lured into the room and circulated to exit through the clerestory.

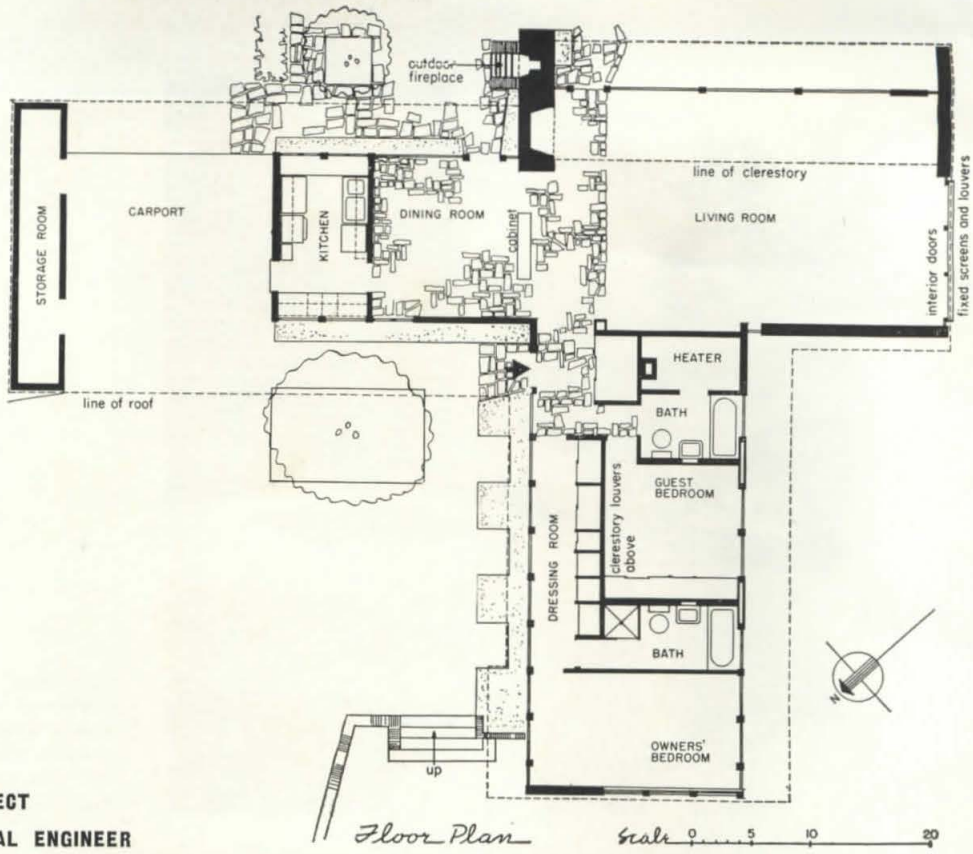
materials and methods CONSTRUCTION: *Foundation*: reinforced concrete. *Walls*: frame, with cypress boards or local brick veneer on the exterior; birch plywood inside. *Floors:* concrete slab, surfaced with carpet, linoleum, cork, or flagstone. *Ceilings:* beveled cypress siding on sloping ceilings; birch plywood on flat areas. *Roof:* flat areas—5-ply built up roofing; pitched roofs—standing seam copper. *Insulation:* batts in ceiling and walls. *Fenestration:* wood casements or special-milled top-hung sash; double, insulating glazing. EQUIPMENT: *Heating:* radiant system, with coils in concrete slab; oil-burning boiler; controls. *Lighting:* mostly incandescent units in light shelves. *Kitchen:* electric laundry, dishwasher, disposal unit; stove, refrigerator, exhaust fan.

Kamphoefner

In the bedroom wing, windows face southwest and are protected by a deep roof overhang. A louvered clerestory extends above the hall ceiling to draw the guest-room breezes across the room, up and out toward the northeast.

Facing page—entrance drive, with carport terminated by large storage room (*left*).

Below—the southeast living side of the house; an outside barbecue extends the dining area outdoors. *Photos: Andre Kertesz*



HENRY L. KAMPHOEFNER, ARCHITECT

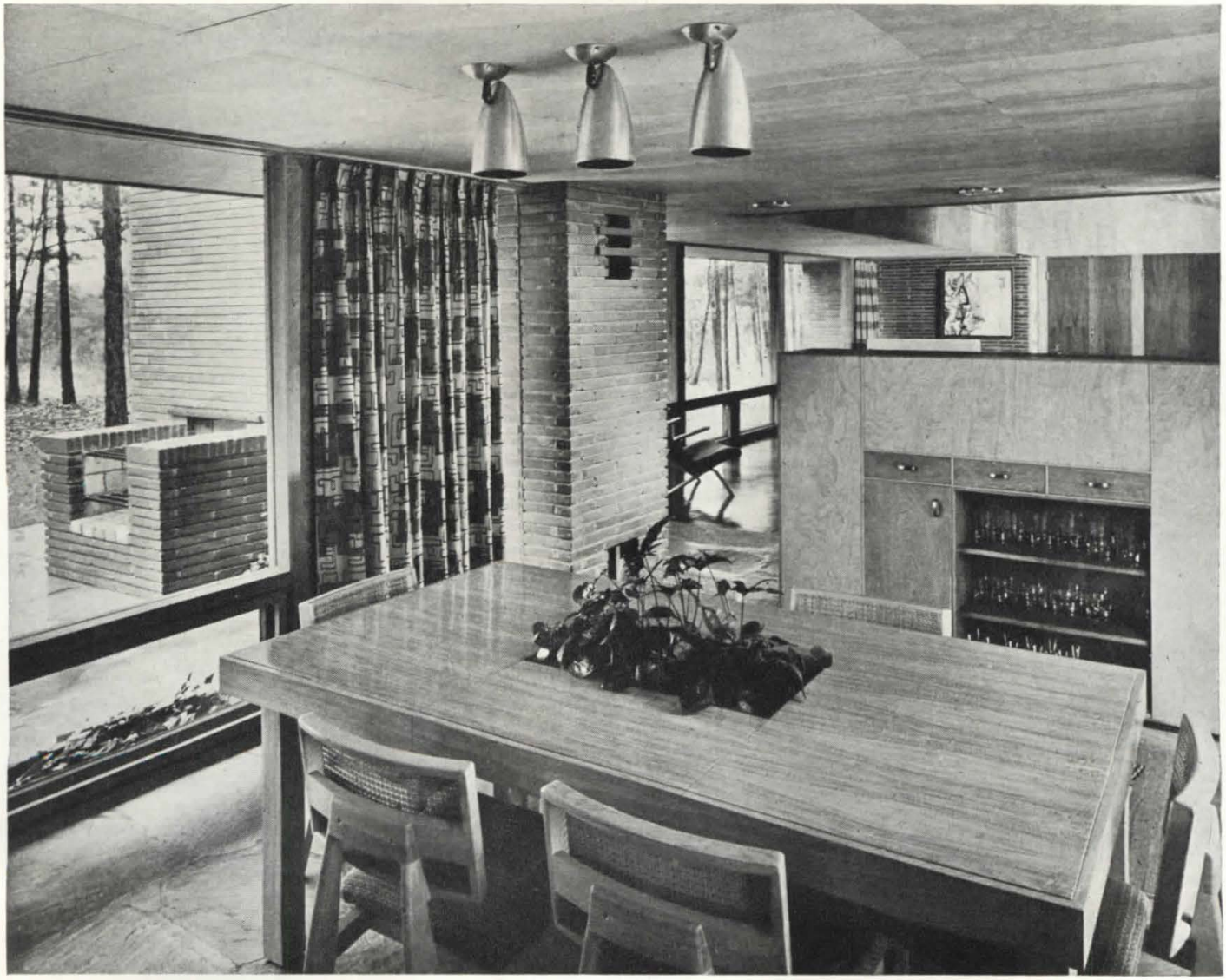
GEORGE MATSUMOTO, ASSOCIATE

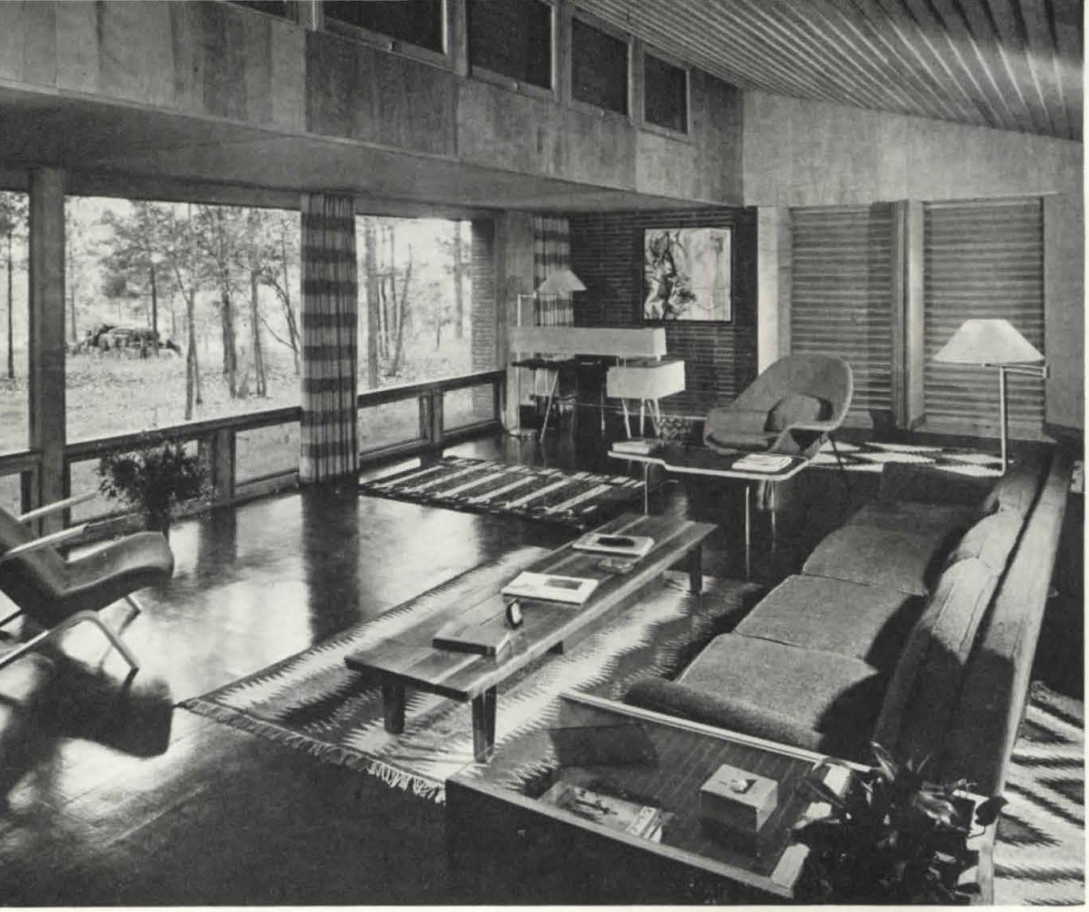
LAWRENCE A. ENERSEN, LANDSCAPE ARCHITECT

JOSEPH N. FARLOW, CONSULTING MECHANICAL ENGINEER

Left—detail of carport. Note the low, counter windows in kitchen which, with big windows on opposite wall produce a *venturi* effect in drawing air through the room.

Below—the dining area. A cabinet, with table storage on this side and spaces for the record collection and player on the living side, forms a partial division between the areas.

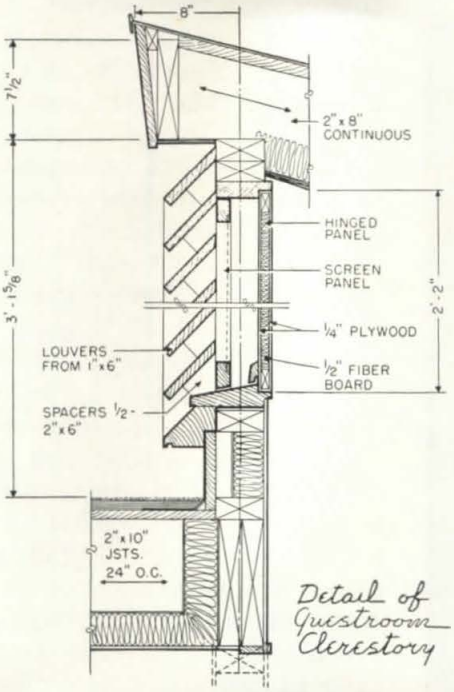




Above—living area, showing end-wall louvers, with interior doors opened; clerestory louver area with up-opening panels, and floor-level panels under the big southeast windows. With everything opened, a breeze can be created even on a quiet day.

At right—detail of the guest-room clerestory louver and view of end of living room with louver doors closed.

Bottom of page—southwest end of house, showing exterior louver wall; bedroom wing (*left*) has a deep roof overhang.



Detail of Guestroom Clerestory

stained glass

Series of twenty painted windows for the Church of SS. Peter and Paul in Pierre, South Dakota, for which Barry Byrne, Evanston, Illinois, was the architect, was the notable commission recently completed by Emil Frei, Incorporated, of St. Louis, Missouri. Two ten-window units on either side of the nave tell the stories of "The Good Samaritan" and "The Prodigal Son." The windows are of uniform size and are spaced at window width apart.

Apart from the contemporary symbolism used in stained glass by this progressive firm of designers, there is a variety in the visual planes that produces a three-dimensional effect, even an aspect of motion. To accomplish this, the entire design is highly keyed, and glass textures range from an exceedingly bubbly Blenko glass to panels of clear, smooth plate glass. Through the latter, as may be seen in the detail at the top of the facing page, outdoor objects are visible, colorful and mobile in themselves. These provided a succession of shifting effects to persons moving about within the church.

The typical organization of a panel unit is five vertical divisions, with the "picture" (at the left, one of the Prodigal Son series) in the second and third divisions up from the sill. The high-key color scheme consists of a simple field of lemon yellow, grayed yellows, and neutral grays, with small shots of intense reds, plus the clear-glass areas. The form, which carries through all panels and against which the figures are silhouetted, is made up of a variety of reds, ranging from pure color to rust and wine shades. The figures themselves are principally worked out in whites, both warm and cool, with occasional strong color accents in restricted areas.

Each job in the Frei firm is the work of an individual, assigned to do all the designing, full-size drawings, choosing of materials, painting on glass, and contacting architect and owner. In the case of the panels shown here, Robert Harmon was the designer for Emil Frei, Inc.

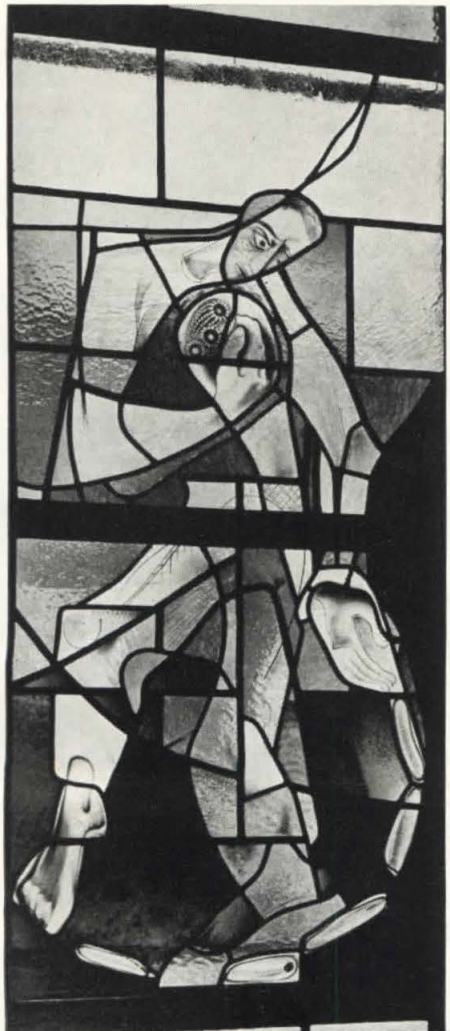
The photographs on these two pages show the various textures and aspects of the panel symbolizing "His Life of Dissipation and Gambling" in the Prodigal Son windows. One of the clear-glass areas that invite the eye beyond to moving objects outdoors, appears (right) just above the figure.

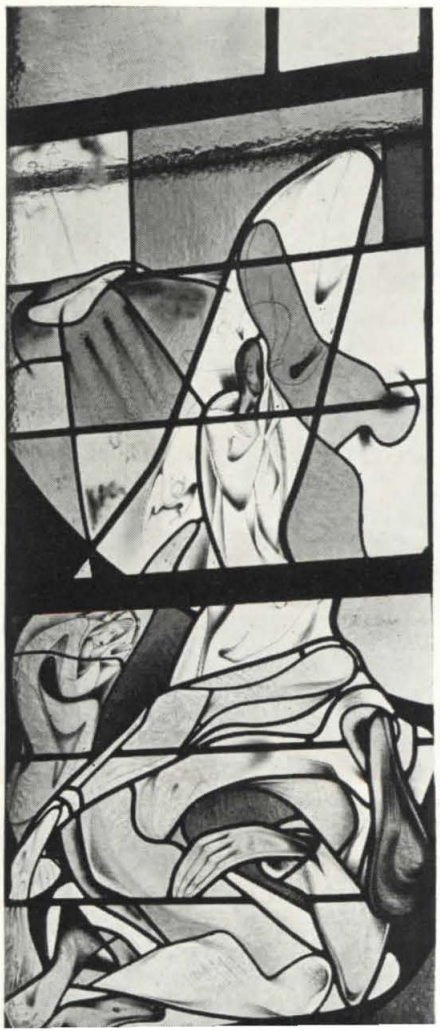
Photos: Savage Studio

Details of three panels from the story of the Prodigal Son. Right—"He Holds His Moneybag Tightly But Shows Concern as to Whether He Has Chosen the Right Course"; and

Below—"Reduced to Feeding the Swine" and (right) "He Receives His Legacy."

Details of two panels from the story of the Good Samaritan. Below—"The Levite Passes By" and (left) "The Good Samaritan Administers to the Pilgrim."





A New Editorial Feature

interior design data

to begin in January 1952 PROGRESSIVE ARCHITECTURE

Eight additional pages of the magazine will be devoted each month to a discussion of the Problems of the Design of Interiors and to the Selection of Products, Finishing Materials, and Furnishings that compose the interior — from the Architect's *point of view.*

WHY *Because the selection and specification of finishes, furniture, and equipment for interiors — the products that are chosen to complete the architectural treatment inside — represent a timely and important architectural problem. Because polls of our readers have indicated a strong desire for information and new data on interior design. Because no other magazine is now presenting such information and data from the* Architect's *point of view.*

WHAT *Each month there will be a discussion of one type of interior, photographs, and detailed reports on the finishes, products, equipment, and furnishings used. Selected examples of the room type for the month — school classrooms, hospital rooms, lobbies, offices, banking spaces, restaurants, churches, residential and many other interiors — will be analyzed to explain how the design results were achieved. The floor, wall, and ceiling surfaces, the furniture and fabrics, the heating, lighting, ventilating, and partitioning equipment will be described — and the reader advised on the selection and sources.* In addition, *there will be notes on NEW PRODUCTS for interiors, specific design data, and lists of sources.*

HOW *A Consulting Editor — chosen for experience in selection of interior finishes and equipment, and for marketing knowledge — will work with the P/A Editors to decide on the room types to be discussed, to gather specific information about the Products used, and to report Market News and Trends in Interior Design. This feature, it is to be noted, will* not *be based on interior* decoration.

WHERE *Another FIRST in P/A — of which there have been many — a new example of the way P/A discovers what its readers want and need, then provides it for them in a stimulating, practical form — and another reason why P/A continues to maintain the largest architectural circulation in the world.*

Warm-Air Heating and Structure

By WILLIAM J. McGUINNESS*

relative merits of heating systems

Proponents of various methods of heating have long proclaimed the advantages of their favorite systems. The choice of a method is frequently dictated by the occupancy or by the type of structure; conversely, the structure may have to be adapted to the kind of heating chosen. This is particularly true in the schemes under discussion. Steam, hot water, and warm air have all lived together long enough to have established the good qualities for which they are selected. A system may be ideal for the building it serves, but there is not likely to be an "ideal" system to replace all others. The improvement in controls, insulation, and distribution of heat have assured greater comfort in recent years. Good solutions have often been found in the combination of two or more systems; for example, the split system in winter air conditioning. In this system the radiators make up the heat loss at the outside walls while the humidity, cleanliness, motion of the air, and sometimes part of the heat load, are the responsibility of the ducted air.

the problem of heating a house

As progress was made in heating houses, it was found that gravity hot water offered some advantages over steam and that when forced hot water was developed it was a further improvement. Similarly, well distributed forced warm air is better than gravity warm air or a pipeless furnace. The better systems were usually a little more expensive and all had minor disadvantages which partly offset their excellence. Many of these problems were nearing a solution when we acquired a new kind of house and a new kind of heating system. The modern house and radiant heating arrived at about the same time. It is very easy to assume that they complement each other and that radiant heating is *the* solution to the heating problem of a modern house; indeed, this is largely true. A literal interpretation of this statement, however, will do little to improve further the heating of modern houses and the comfort of their occupants. Firstly, there are several kinds of radiant heating. The choice between floor and ceiling as a location for the heating panel involves a good deal of discussion of their relative advantages and disadvantages. Secondly, the use of forced warm air instead of forced hot water changes quite radically the nature of the heating panel. Generally, it makes possible a panel of smaller thermal capacity and consequently a faster response. The use of air permits the combination of partial air conditioning and radiant heating; this union, looked upon by many as a distinct advantage, is a characteristic of most of the systems described herein.

the case for warm-air radiant heating

In the short period during which radiant heating has enjoyed such an increase in popularity, forced hot water has been the medium chosen in a great majority of cases. Strangely enough, in the very beginning warm air was the favored method. The Romans and the ancient Koreans both used this system. Of course, the warm air consisted of the products of combustion, better known as flue gas or smoke, and a few disadvantages were apparent. Soot collecting in the passages and leaking through to the living space was hardly desirable. Slightly more serious was the appearance in the room of flame from the fire or the presence of poisonous carbon monoxide. The use of masonry in houses minimized some of these problems which would be much more serious in our wood residences. We have long since put our fire on the other side of a metal division and warmed air to be passed in back of ceilings or floors. One new system takes the added precaution of producing hot water first and then warm air by passing it over a convector. Recently, warm-air radiant heating has had a greatly increased use. It avoids the possible trouble of water leakage within the structure and possible freeze-ups if the house is cold and unoccupied. Unlike hot water pipes which must be imbedded in the radiating surface, warm air may pass on the other side of a thin surface. Heat is faster in arriving and there is less overshoot when heat is no longer needed—a most important factor in solar houses where the sun takes over quickly and calls for the heating system to be shut down completely and at once. Outdoor anticipating controls often needed in hot water radiant systems can generally be eliminated at considerable saving in expense. It might be assumed that some danger would attach to the method of passing warm air through house cavities, especially in wood structures which might catch fire at excessive air temperatures. The National Board of Fire Underwriters has already formulated regulations about this. When air comes directly from a warm-air furnace, an air-temperature limit control at the bonnet is mandatory to prevent air from circulating at a temperature exceeding 200 F. Also, the air passages in the structure must be wholly noncombustible or have a low flame-spread classification. When a converter is used to produce warm air from hot water or steam, the building passages may be built of nothing more combustible than 1-inch boards. The fire hazard of merely creating open spaces through the house is generally minimized by placing closeable dampers controlled by fusible links at the strategic control points. Federal Housing Administration has

*Professor of Architecture, Pratt Institute, Brooklyn, New York. Illustrated by Raniero Corbelletti.

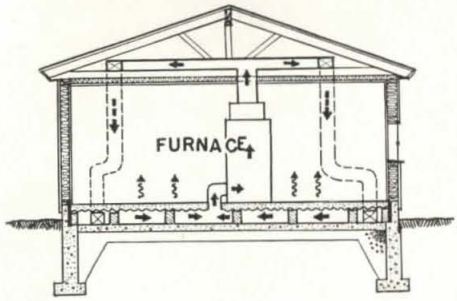
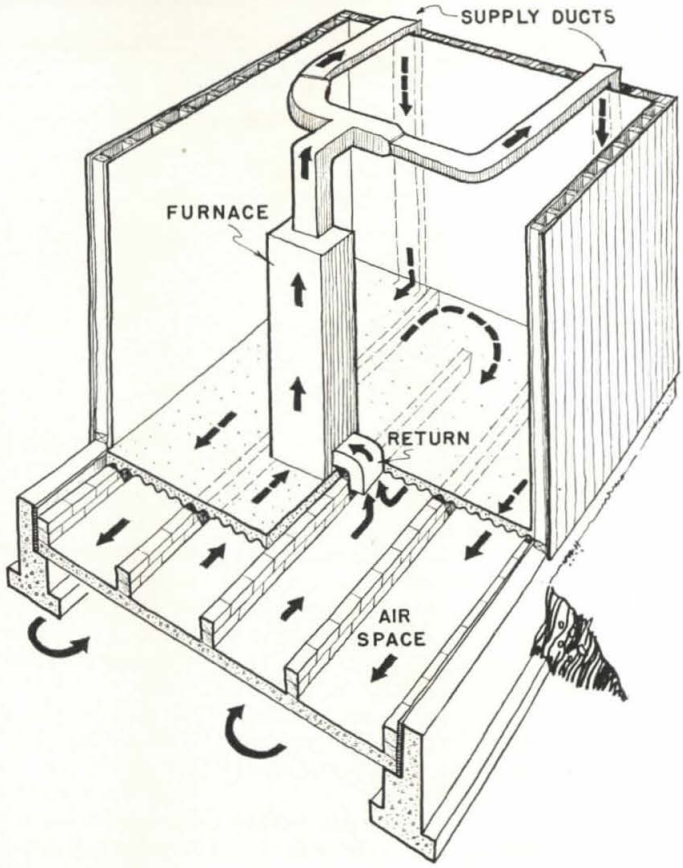


Figure 1a—an early warm-air floor panel system with no convection. Architects for a housing development using this heating method were Mellenbrook, Foley & Scott, Berea, Ohio.



been very watchful of this new system and has approved for mortgage guarantee only those installations that are safe as well as effective.

Probably the greatest advantage of all is the combination of the good qualities of radiant heat and winter air conditioning, facilitating humidification, filtration, and air-motion control. This undoubtedly can be extended to summer air conditioning. The cooling of room surfaces would produce radiant cooling to combine satisfactorily with a slightly reduced air temperature. The problem of condensation on the cooled walls can be solved by dehumidification provided that the house is kept closed.

radiant floor systems

An early method of warm-air radiant heating was described in February 1948, PROGRESSIVE ARCHITECTURE. Designers of this system which was installed at Berea, Ohio, were Architects Mellenbrook, Foley & Scott *(see Figure 1a)*. A warm-air furnace delivers air to a duct system in the attic space. These ducts down-feed through convenient stud partitions to seven or more starting points of the underfloor chambers. The air is first passed along the perimeter in these underfloor spaces which finally terminate at the furnace return duct; the slab is kept to a minimum of three inches above the air space. This would seem to be almost as slow in its response as a radiant hot water slab, but as the houses are of conventional design and without large glass areas, a slab of some thermal stability is satisfactory. The attic ducts need to be well wrapped to prevent excessive heat loss in that cold area. A floor of similar design but with an underground feed is shown *(see Figure 1b)*. This system uses hollow terra cotta block served by perforated terra cotta headers and square terra cotta ducts for supply and return. The ¾-inch tile web between air and room assures fast response and much of the heat loss from the feeder ducts is effective because of their position under the floor. The blocks make a finished tile-floor appearance and can be used without additional floor finish, which is an advantage because heavy carpeting will retard to some extent the effectiveness of a floor slab. In these and other floor systems using air, it is quite apparent that the floor will be dry and warm at all points.

floor systems that add convection

A scheme that includes baseboard grilles on exterior walls is shown *(see Figure 2)*. In this and other systems having air outlets near the exterior walls, the heat distribution is very good. Besides keeping the floor uniformly warm, additional heat in the form of warm air is introduced at the outside walls where it is most needed. The designers of conventional warm-air systems (not radiant) have taken a page from this book and are now tending toward the placing of outlet grilles on exterior walls instead of picking up the cold air at these points. The system illustrated in Figure 2 utilizes a new form well adapted to floor radiant heat. Twelve-inch square metal pans touch the concrete below on only 8 percent of their area which can be easily waterproofed with small discs. The thin metal (26 gage) and 1½ inches of concrete above provide fast heat conductance. Air distribution is by underground trenches of concrete which start the air at various points along the perimeter of the house.

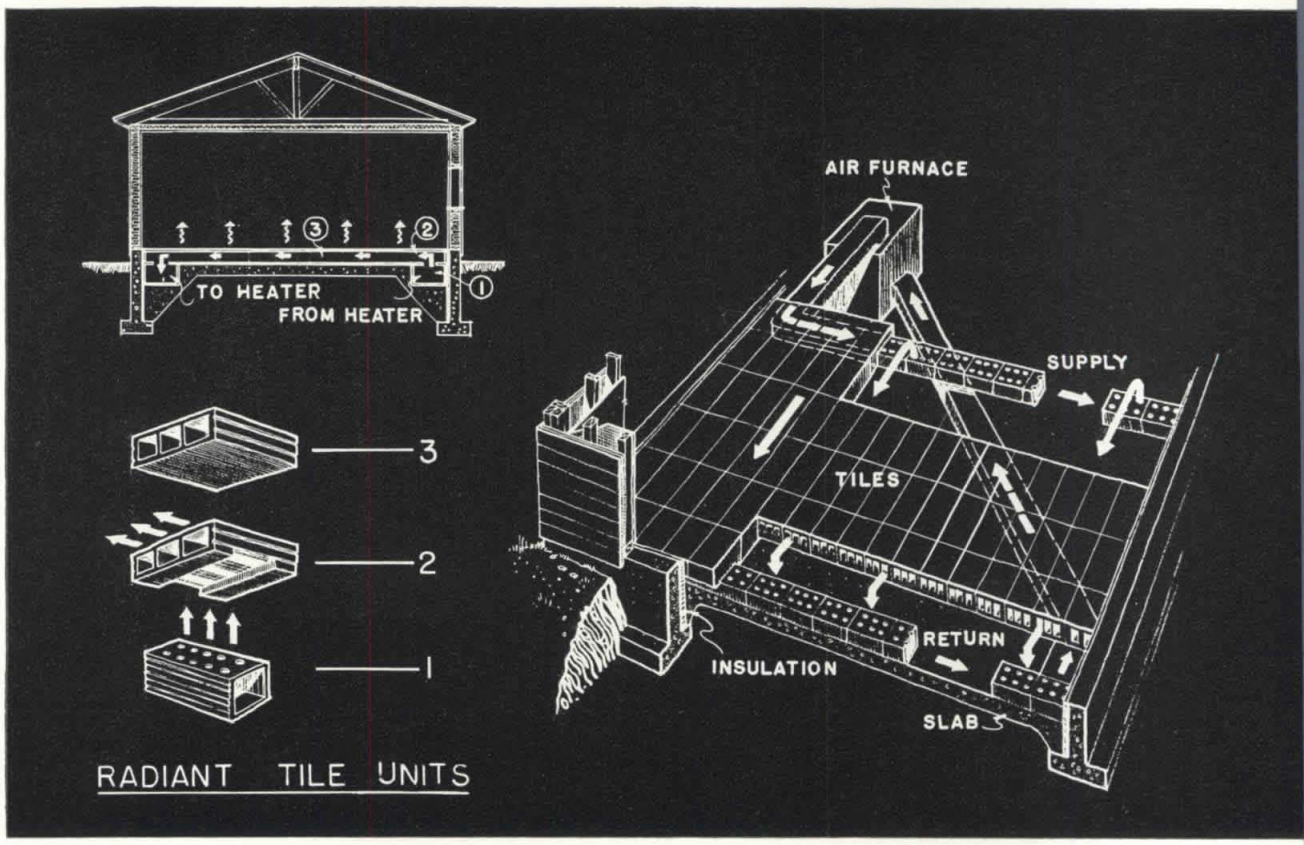


Figure 1b—a variation of the warm-air floor panel system without convection. Known as the RadianTile Heating System, this method was developed by Cannelton Sewer Pipe Company, Cannelton, Indiana.

Sheet metal baffles between the units create passages leading back to the furnace. Humidification and filtration are possible and the heating can be accelerated or retarded by opening or closing the grilles. Floor radiant systems have a disadvantage over ceiling installations because they are limited to temperatures of 85 F instead of 115 F, with correspondingly lower output. The addition of air grilles does a great deal to supplement the lower output and makes them comparable with ceiling radiant panels.

the popularity of perimeter heating

According to officials of the Federal Housing Administration, the use of perimeter heating has increased to almost equal that of conventional systems in some parts of the country. This system is ideally suited to the small house on a concrete slab. Research summarized in BMS 103 of the National Bureau of Standards states that the heat loss through the center of the concrete slab in a small house is negligible compared to the loss around the perimeter. It is obvious that if this loss is counteracted the floor temperatures around the outside walls will increase. If warm air can be discharged around the base it will aid in warming the exterior walls and produce a feeling of comfort *(this scheme is illustrated in Figure 3)*. The National Warm Air Heating and Air Conditioning Association, in its Bulletin No. 4, has summarized the details of installation and design for perimeter heating. The unheated middle of the floor slab on the ground must be very well insulated against loss to the ground which would reduce its temperature. It is also vital that the ground below this or any slab on the ground be kept perfectly dry; dampness greatly accelerates the heat loss to the ground and reduces the slab temperatures. An air furnace furnishes a down-feed supply to the radial ducts. Grilles supplied from the perimeter ducts discharge air directly into the room. There is a single return to the air furnace in a central location near the furnace room. A system of short return ducts exhausting from all the rooms will improve air distribution. The plan of delivering warm air directly into the floor slab and returning the air near the ceiling, or in short ducts in the attic space, is better for economy than delivering

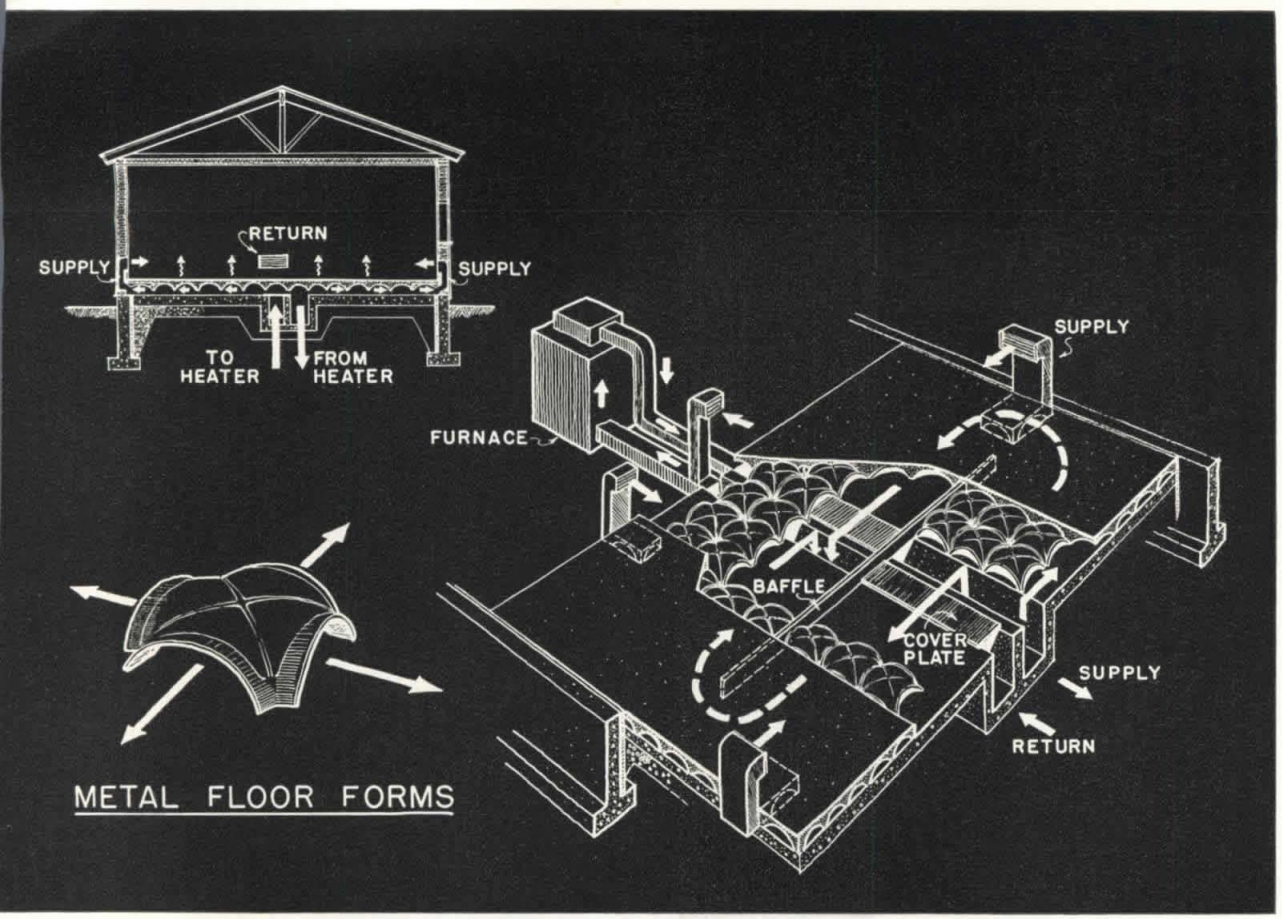


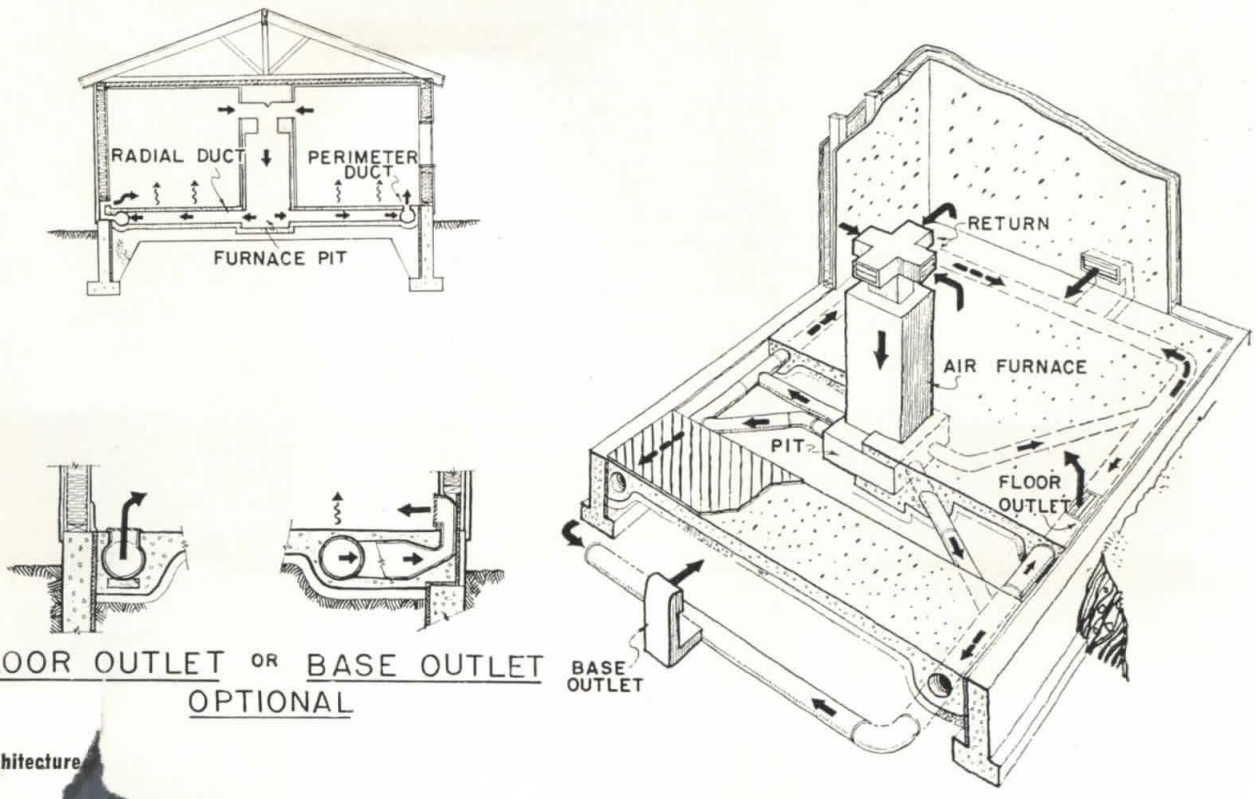
Figure 2—combination of radiant floor panels and warm air introduced into the room. The metal floor forms are manufactured by the Airfloor Company of California, Los Angeles.

warm air through attic ducts as in some other systems. There is a greater heat loss from the hotter supply air than there is from the cooler return air.

air baseboard replaces the grille

The general distribution of warm air in the perimeter system or in the system illustrated in Figure 2 can be further improved by the use of a new wall base air distributor. It is of small cross section, much smaller than the base used in hot water baseboard heating and, while no bigger than conventional wood base, it distributes warm air to heat all exterior walls. Screws along the length of the base adjust the opening at the top of the base, resulting in uniform air delivery along the wall. The top opening is partly closed in the vicinity of connecting ducts to divert the air to more remote spots. It reverses the usual downflow of cold air at exterior walls and is most useful under large glass areas or picture windows. It serves

Figure 3—perimeter heating combining warm-air convection and some radiant effect at the outside walls.



not only as an auxiliary in warm-air radiant floor systems but can be used in conventional forced warm-air designs to carry out the new idea of introducing warm air at the outside walls instead of interior walls. Because of the difficulty of passing air around the corner connections of the base, the ducts must connect at the middle of a length of base and each exterior wall length must be supplied by its own duct. This involves somewhat more duct work than is used in a normal forced warm-air system. *(Figure 4 illustrates the application of this new unit.)*

intermediate floors that heat two stories

The integration of structural, self-supporting floors of noncombustible material with heating units is shown *(see Figures 5a and 5b)*. In both of these cases, the structural slab heats the story above and the basement below, and in each one warm air is admitted through slots or baseboard elements along the outside walls. Figure 5a illustrates the use of steel cellular panels in the "Ideal Home" of the 1950 Detroit Builders' show. The warm air flows from the center of the house toward the outside walls, which is a reversal of the usual procedure; however, the effect of the cooling of the air as it approaches the outside wall is undoubtedly offset by the introduction into the room of air from the panels through slots at the wall. This air compensates for the slow response through the concrete covering the panels and also makes the first story about equal in effect to the basement which is only heated by downward radiation; there is no convection in the basement. The bottoms of these metal panels are left exposed and painted. Some individual rooms in this house are heated by small electric radiant panels; however, their cost of operation is somewhat excessive. On one or two other jobs recently, engineers have adapted the metal floor panels of several manufacturers for a similar purpose. This is a new use for this type of material and these are the first applications of the principle. Rapid developments can probably be expected.

The system shown in Figure 5b is much the same, but uses hollow structural concrete floor panels. Here again, the warm air is all discharged into the first story through adjustable baseboard grilles. Air may also be introduced into the basement through similar adjustable elements, thus balancing the heating to suit the heat losses of the two stories. The same material has also been used as a closed radiant system by circulating the air through the open passages and returning it to the furnace. The split system, however, which admits air to the rooms has proven to be much superior because

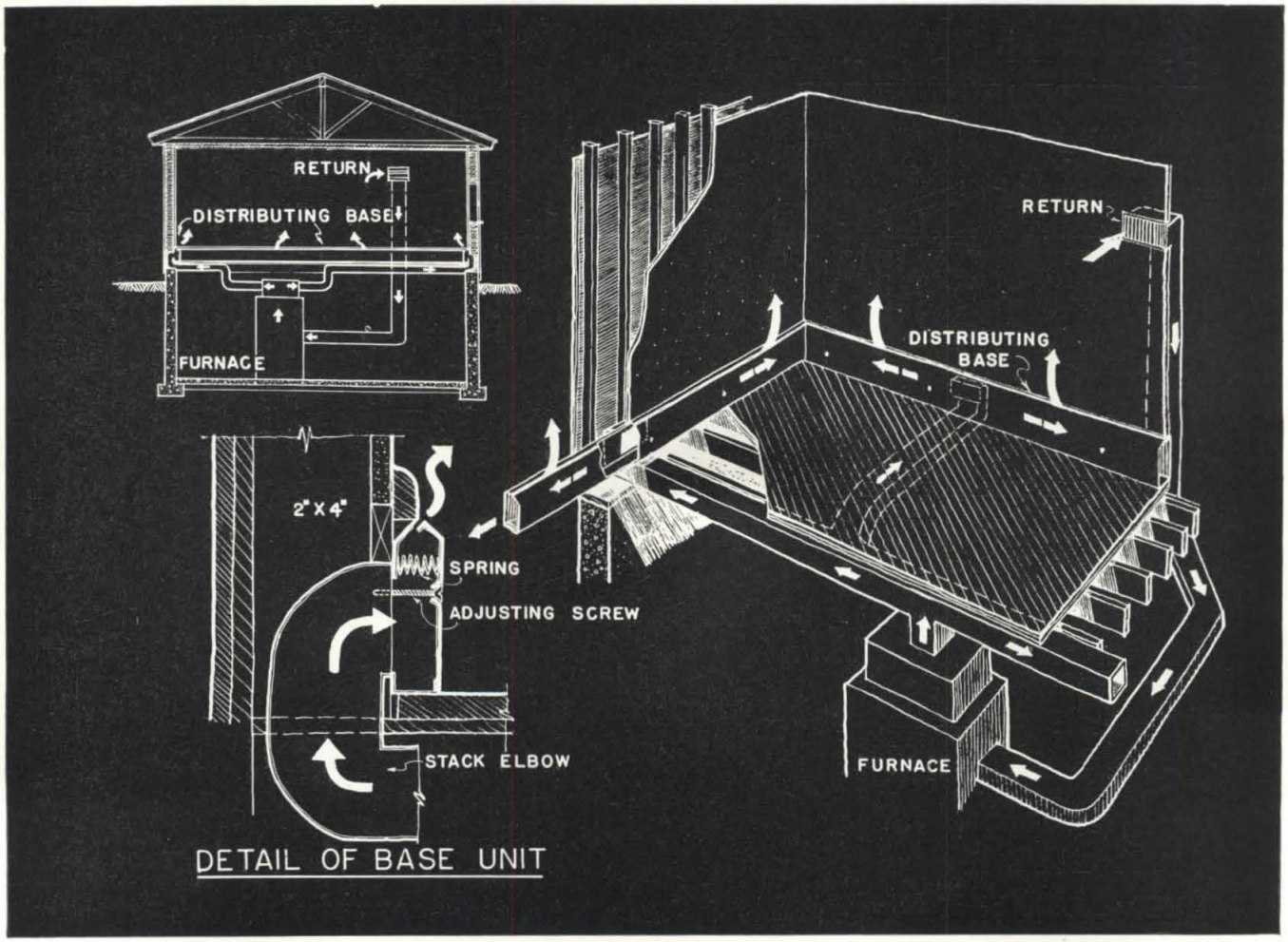
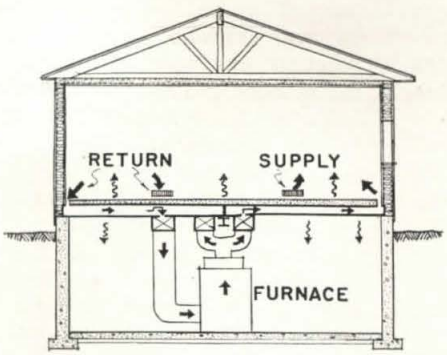
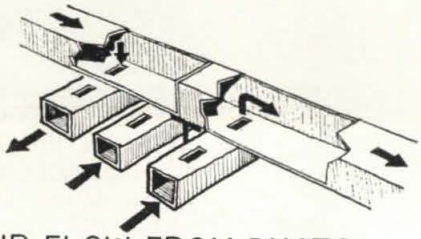
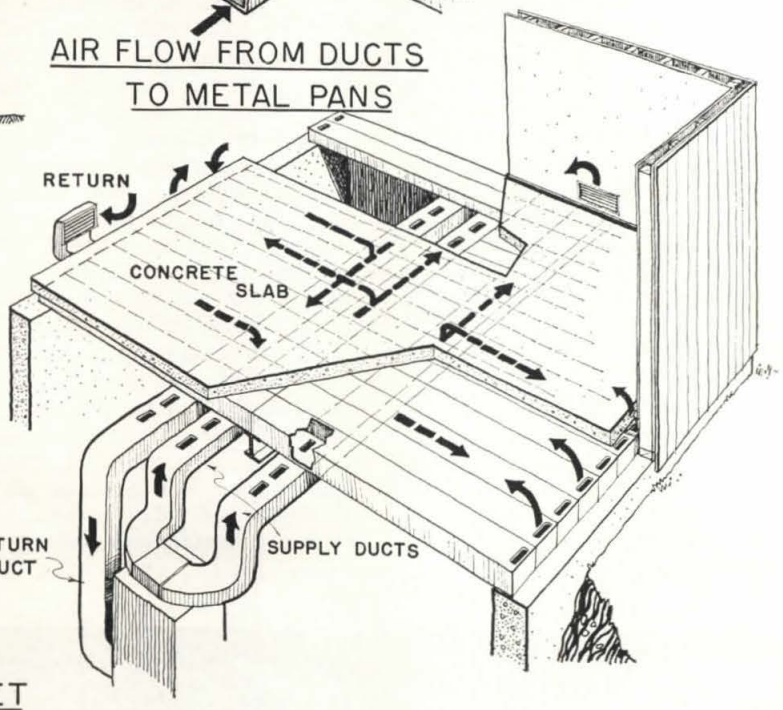


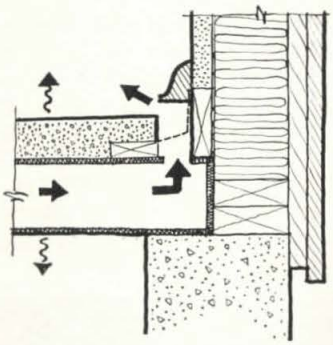
Figure 4—air distributing base for use with systems combining radiant heating and convection, perimeter heating, and conventional warm air systems. Brandes Company, Madison, Wisconsin, is the manufacturer of this base.



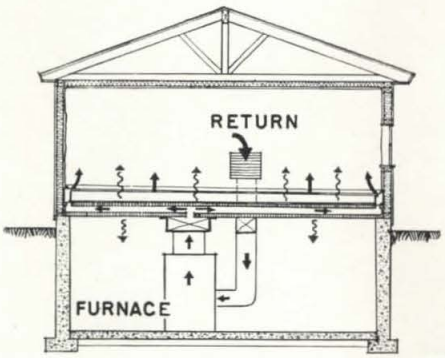


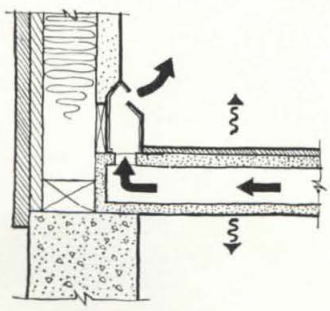
AIR FLOW FROM DUCTS
TO METAL PANS





DETAIL OF BASE OUTLET





DETAIL OF BASE SUPPLY

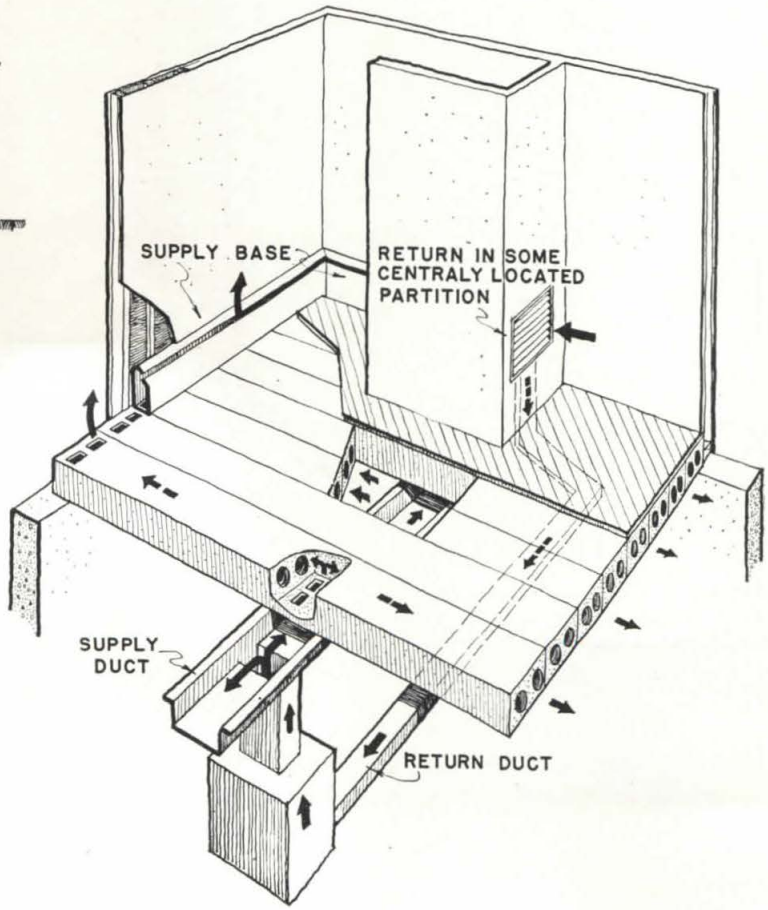


Figure 5a, acrosspage above—this system which combines a radiant slab and convective air serves stories both above and below the slab. The cellular steel panels in this illustration are a product of the Detroit Steel Products Company.

Figure 5b, acrosspage below—hollow, structural, concrete floor panels are integrated in this system which also combines a radiant slab and convective air to serve stories above and below slab. Panels are prefabricated by Flexicore, Incorporated, Dayton, Ohio.

of the possible adjustment. About 100 of these jobs have been installed. Further thinking on the base detail seems desirable.

hot water assures extra safety

A very simple and safe method which heats both stories of a two-story house radiantly and the basement by convection, uses a hot water boiler with very short connections to a convector-type converter to produce warm air *(see Figure 6)*. For this particular kind of installation serving a two-story and basement house, the warm air rises through an asbestos cement duct to the floor intermediate between the first and second stories; no fan is required. The joists of this floor are cross-furred on the ceiling below to permit flow in all directions. The returns consist of enclosed spaces in the outside walls located at intervals around the perimeter; other sections of wall are heavily insulated. When the walls are cold from low outside temperature or lack of sun the cold air in the return duct drops rapidly, pulling warm air across the ceiling in the direction of the receding cold air. When the return duct, so close to the outside temperature, senses the heat of the sun or a higher air temperature, the duct air does not drop so rapidly and warm air is not drawn across the ceiling. Thus, it is quite self-adjusting. The return air descends through the cellar, warms it, and ascends again through the supply duct. Fire-link controlled doors provide automatic fire-stopping in case of emergency and the structure should be permanently fire-stopped above the heating floor. In this system, air may pass over wood surfaces with the approval of the National Board of Fire Underwriters, because the hot water converter prevents the possibility of overheated air circulating through the house. This is one of the few air systems in which domestic hot water may be produced by coils at the source of heat which is the hot water boiler.

warm-air radiant ceiling panels

If warm air is to be used in a closed system to produce radiant panels, the ceiling is the best location unless convection air is also admitted to the room. The reason for this is that ceiling temperatures and outputs may be higher and that the ceiling is the more truly radiant surface. The National Warm Air Heating

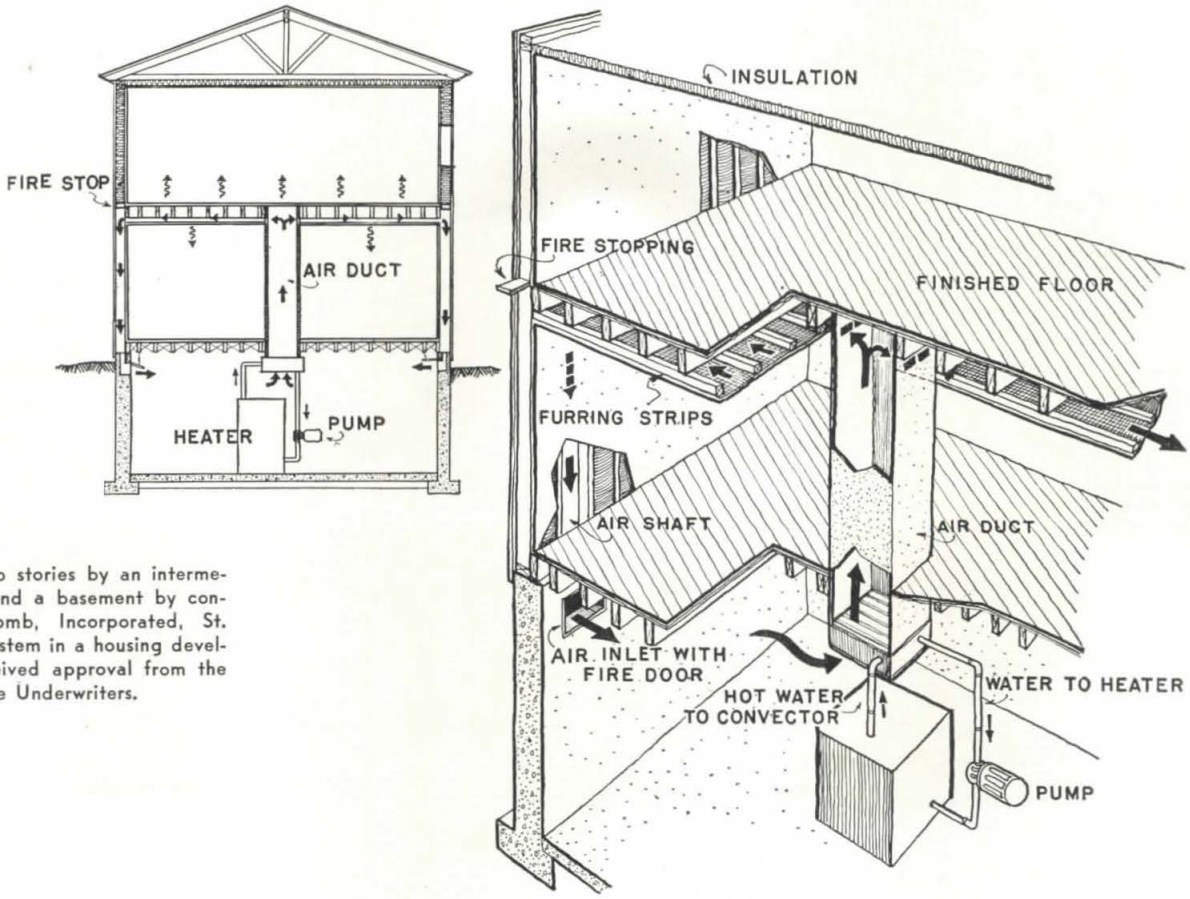


Figure 6—heating two stories by an intermediate radiant panel and a basement by convection. Scott-Newcomb, Incorporated, St. Louis, has used this system in a housing development and has received approval from the National Board of Fire Underwriters.

and Air Conditioning Association has established standards in the design of these systems in their Manual No. 7-A. One manufacturer's application of this principle is shown *(see Figure 7)*. Distribution ducts pass through the attic and should be well covered. The air passes between two ceilings in a chamber which must be noncombustible because of the use of an air furnace. These passages start at outside walls, are fed from above, and advance to the center of the house around baffles in the double ceiling. Down-flow returns collect the air and return it to the air furnace. The regular duct-type forced warm-air system has a temperature drop of about 100 degrees, but closed radiant systems have a drop of about 50 degrees with a corresponding need for the circulation of twice the quantity of air. Power cost for the fan may be expected to be a little higher.

Research to compare the effects and response of panel and convection systems was carried out by Professors S. Konzo and R. W. Roose* on a special research residence. The performance of the two systems was almost identical and an excerpt from their report states: "If any single conclusion may be drawn, it would be that the response and performance of the two systems were surprisingly similar. The differences in the results obtained were not as large as the proponents of the two systems have claimed."

*Professors of Mechanical Engineering, University of Illinois.

what's ahead?

If we are to credit the research of Konzo and Roose, there seems little reason for a struggle to break away completely from conventional warm-air methods in favor of radiant heat. The need for warmer surfaces within which to live is quite apparent, however, and radiant heating improves this condition greatly. Many people have felt that a combination of radiant heating and air conditioning might be a nearly perfect answer to the heating problems of many houses. Much of the data just reviewed points to the same conclusion. If we could select the best qualities in the systems described and put them together without too high a cost, we might dream up an ideal heating system. The ceiling and floors and, if possible, the walls, would be radiant panels of low output. Special elements would compensate for any excessive heat loss around the perimeter. Filtered and humidified air would make up the fluctuations above the steady low output of the radiant panels. The air would be introduced along exterior walls and particularly under large glass areas. Hot water boilers with converters would make it possible to use the structural passages without making them of fireproof materials and would also adapt well to the generation of domestic hot water. Where gravity permits the elimination of the fan, power could be saved and quietness achieved. Radiant surfaces would be of very low thermal capacity to facilitate fast pickup and shutdown. Finally, summer cooling might be accomplished by slightly cooling the room surfaces and cooling and dehumidifying the room air.

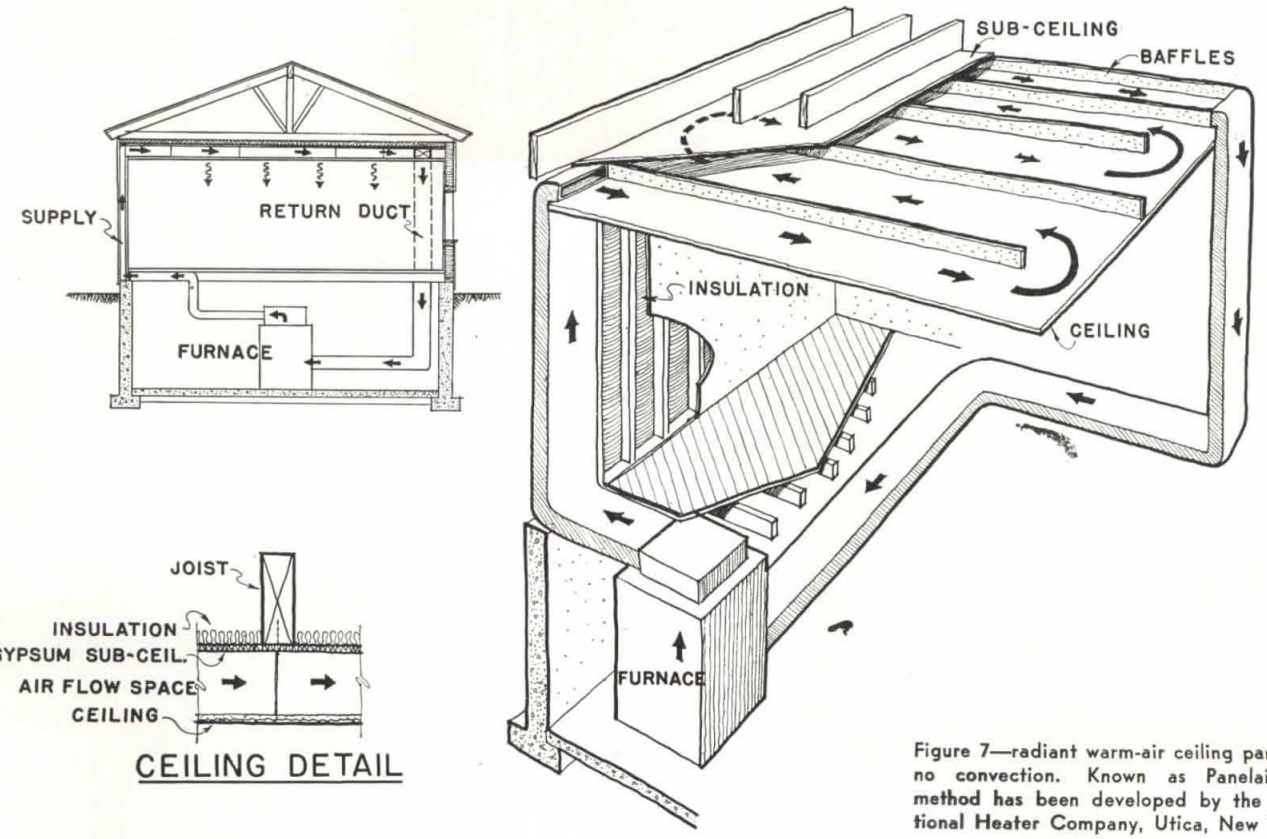


Figure 7—radiant warm-air ceiling panels with no convection. Known as Panelaire, this method has been developed by the International Heater Company, Utica, New York.

TABLE 1: CRITERIA FOR THE OPTIMUM:

LUMINOUS ENVIRONMENT	THERMAL ENVIRONMENT
Luminous pharos (lumen)	**Radiant pharos** (watt) Net dissipation from body = 120 watt $\frac{\text{Air temperature} + \text{mean radiant temperature}}{2} = 70F$
Luminous pharosage (lumen m^{-2}) The more light the better (if quality is properly controlled). Use all the light you can afford.	**Radiant pharosage** (watt m^{-2}) Should be uniform over the surface of the body.
Luminous helios (blondel) 3:1 adaptation helios criterion	**Radiant helios** (herschel) .....

Luminous Ceilings and Radiant Heating

By DOMINA EBERLE SPENCER*

Some of the technical vocabulary used in this article will be unfamiliar to many readers of **P/A.** *Although a brief glossary follows, a more complete discussion of this nomenclature will be found in Moon and Spencer,* Lighting Design, *(Addison-Wesley Press, Cambridge, Mass., 1948). The introduction to this book states that the mks (meter-kilogram-second) system is employed throughout, in accordance with modern electrical-engineering practice.*

***Helios** = generalized brightness; the mks unit of* **luminous helios** *is the* **blondel.** *(1 blondel = π lumens m^{-2} received per unit solid angle.) A perfectly diffusing surface reflecting one lumen per square meter has a helios of one blondel. The mks unit of* **radiant helios** *is the* **herschel.** *(1 herschel = π watt m^{-2} received per unit solid angle.)*

***Pharos** = flux, basic concept of geometrical photometrics.* **Luminous pharos** *= luminous flux; the mks unit is the lumen.* **Radiant pharos** *= radiant flux; the mks unit is the watt.*

***Pharosage** = pharos per unit area.* **Luminous pharosage** *= illumination; the mks unit is the lumen m^{-2}.* **Radiant pharosage** *= radiant flux density; the mks unit is the watt m^{-2}.*

●

The modern idea of functional design dominates architectural thought and planning: as a result, many buildings are designed today not as imitations of the past but as conveniences for human living. Functional design applies equally well to the engineering of an optimum system for lighting and heating where the aim is to provide the best possible luminous and thermal environment. We want to be able to work or play in an environment that enables us to see clearly and to feel fresh and comfortable; and yet, we wish to be unaware of the lighting and heating systems themselves.

To produce this ideal environment, the designer must know something about the behavior of the human eye, as well as temperature and humidity requirements for comfort. The application of these basic scientific criteria allows us to produce an ideal environment indoors. In place of the glaring contemporary imitations of candles and oil lamps, we can now have lighting that is quiet, unobtrusive, and functional. In place of the uncomfortable and antiquated heating systems of the past, we have the modern systems of radiant heating.

One of the most recent lighting developments is the complete luminous ceiling which fills an entire room with a completely diffused and glareless light, by means of a light source above a plastic hung ceiling. It seems reasonable to try to combine this contemporary method of ceiling lighting with radiant heating. In the following paragraphs, the possibilities of this newest development in the creation of a pleasing environment will be analyzed.

the luminous environment

It is only recently that illuminating engineers have begun to think in terms of the luminous environment; the old idea was to consider only the quantity of light. In 1906, the Illuminating Engineering Society stated that one foot-candle was the right amount of light for reading. This fallacy is not entirely dead, for, as the years have passed, other dictatorial but ever-changing statements have been made on the correct quantity of light for various uses. As recently as 1950, 30 lumen ft^{-2} was recommended as the right value for classrooms.

Actually, modern research[1] indicates that there is no basis for specifying the right quantity of light for a given task. With a uniform surround, we can see better and better with larger and larger quantities of light, right up to daylight values. Non-uniformities in the surround are much more important visually than the exact quantity of light. Therefore, our decision on how much light to use cannot be based on visual or scientific facts. It is based only on our pocketbook. We use as much light as we think we can afford. If the price of lamps and electricity continues to decrease and our standard of living continues to rise, we will probably use increasing amounts of light.

The *quality* of the lighting system is much more important than the *quantity* of light; in fact, great difficulties are encountered if quality is ignored. As the quantity of lighting is improved, the eye becomes more and more sensitive to non-uniformities in the visual field. Candlelight is fairly comfortable, but a similar distribution of light at 50 times the quantity is very glaring. Thus, it is necessary to consider quality first and to develop methods of specifying the entire luminous environment.

The simplest and most significant criterion for quality is the 3:1 adaptation helios criterion[2]: If the eye looks at a uniform surround until it becomes adapted to it, the adaptation helios of the eye is equal to the helios (brightness) of the background. The criterion states that the adaptation helios for any line of sight should be no more than three times the adaptation helios of the work, while the minimum adaptation helios should be at least one third of the adaptation helios of the work. Thus, if the helios of the work is 600 blondel, then the helios of a luminaire should be no more than 1800 blondel; and the helios of the floor or of a desk top should be at least 200 blondel.

The criterion is just as simple as that. Yet it limits the variation of the

*University of Connecticut, Storrs, Conn.

[1, 2] *Moon and Spencer,* Lighting Design *(Addison-Wesley Press, Cambridge, Mass., 1948).*

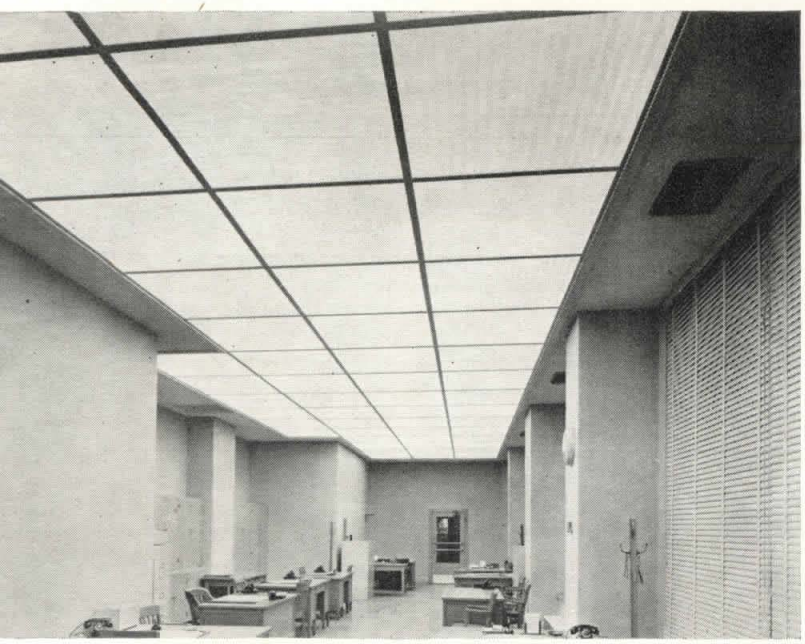


Figure 1 *Photo: courtesy of Rohm & Haas*

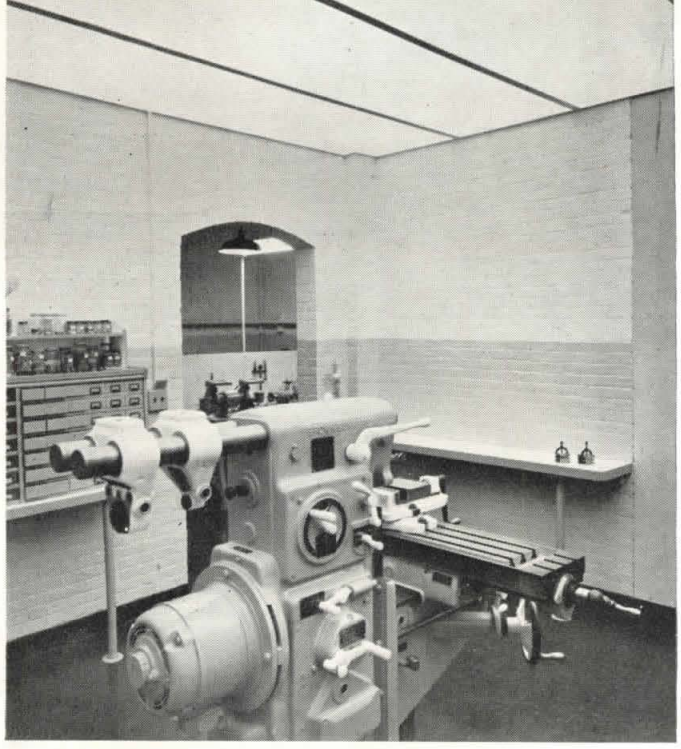


Figure 2

helios in the field of view. If the simple 3:1 criterion is satisfied, the ideal luminous environment results. Direct and reflected glare are eliminated. Head and hand shadows are imperceptible and modeling shadows are just sufficient to be flattering to the human face. The general effect of such a luminous environment is soft and comfortable; large quantities of light can be used without producing glare.

the thermal environment

The physical concepts required to specify the thermal environment are not the same as those used to describe the luminous environment *(see Table 1)*. In lighting, one can never find a satisfactory criterion to tell him exactly how much light to use; in specifying the thermal environment[3], however, the first and most important criterion is completely dependent upon *quantity*. The total radiant pharos (watt) received by the human body should be just sufficient so that the net dissipation of thermal energy from the body is 120 watt.

This criterion is satisfied if the air temperature is 70F. It is also satisfied if the mean value of the air temperature and the mean radiant temperature of the enclosure is 70F. Thus, with radiant heating, we may use an air temperature of 68F, if the mean radiant temperature of the room surfaces is 72F. The use of a lower air temperature in winter permits a saving of fuel, since thermal losses through windows and walls are reduced. The low air temperature provides comfort conditions for sedentary workers, with a feeling of freshness and less tendency to drowsiness. The lower temperature also tends to increase the relative humidity, in a season when the air is ordinarily too dry. In the summer, a different combination of temperatures can be used with radiant-cooling systems. A suitable combination is an air temperature of 78F and a mean radiant temperature of room surfaces of 62F. Again energy requirements are reduced. In summer, there is less shock on entering a cooled room if the difference between air temperature outdoors and indoors is minimized. A high air temperature also tends to produce a lower relative humidity on oppressive, humid summer days.

The second criterion that should be satisfied deals with the distribution of radiant pharosage. If the source of radiant heat is concentrated, some parts of the body will freeze while others are uncomfortably warm. While we toast our hands at a campfire our backs may be very cold. If we are to be comfortable, yet unconscious of the source of radiant heat, the radiant pharosage must be reasonably uniform over the surface of the body. Since the skin does not have the directional sensitivity of the eye, radiant helios is of no physiological importance.

luminous ceiling lighting

By the interflection theory[4], it is possible to predict the helios distribution for any type of luminaire. Such calculations show that the foregoing criteria for the optimum luminous environment are satisfied, if one uses:

(1) *Luminous ceiling lighting* in which the entire ceiling is a diffusing source of uniform helios.

(2) *High reflectances* on all room surfaces.

The appearance of rooms lighted by luminous ceilings is shown *(see Figures 1 and 2)*. This type of lighting has been used with success in offices, classrooms, stores, drafting rooms, and machine shops.

To construct a luminous ceiling, fluorescent or incandescent lamps are placed directly beneath a white ceiling which has a reflectance of at least 0.80. A diffusing material is hung below the lamps, at a sufficient distance so that the ceiling appears perfectly uniform when viewed from below. A good criterion for lamp spacing is illustrated *(see Figure 3)*. The distance between rows of lamps should be no more than one and one-half times the distance from lamp centers to the diffusing material. If a depth of 12 inches is available below the lamp centers, the lamp spacing should be no more than 18 inches.

The reflectance of walls, floor, and furniture are very important. With low reflectances, a luminous ceiling appears bright and glaring as the helios ratios greatly exceed 3:1. On the other hand, if high reflectances are used, the ceiling never appears uncomfortably bright, no matter how large the quantity of light. By the interflection theory, it is found that the 3:1 adaptation helios ratio is satisfied for most room shapes if the reflectance of the walls is at least 0.50 and the reflectance of floor and furniture is at least 0.30.

[3] *T. Napier Adlam*, Radiant Heating, Radiant Cooling, and Snow Melting, *The Industrial Press, New York, 1947*; Chase Radiant Heating Manual, *Chase Brass and Copper Co., Waterbury, Conn., 1945*; *B. F. Raber and F. W. Hutchinson*, Panel Heating and Cooling Analysis, *John Wiley & Sons, New York, 1947*; *R. W. Shoemaker*, Radiant Heating, *McGraw-Hill, New York, 1948*.

[4] *A theoretical method of predicting the exact distribution of light in a room. This method, based on integral equations and developed by Moon and Spencer, enables one to predict the quantity of light or coefficient of utilization and the entire helios distribution for any type of lighting, room shape, or room reflectance. The method includes both light coming directly from light sources and the interflected component which bounces around between various room surfaces many times before it is finally absorbed.*

A number of diffusing materials have been found satisfactory for use in luminous ceilings. Examination of materials shows that sufficient diffusion is not obtained if the transmittance is much in excess of 0.50. Ordinary tracing paper has ideal optical properties. Various types of diffusing glass can be used, but they generally require heavy supports. Lighter construction is possible with corrugated plastic sheets. Rigid sheets of acrylic plastic in sections about 3′ x 4′ have been used with some success; corrugated vinyl plastic in very thin, long, flexible sheets of 3′ widths has also been used by several manufacturers.

The reflectances of all room surfaces are high in the visible region of the spectrum (0.4 to 0.7μ) and interflections play an important role. In a large room the coefficient of utilization for a luminous ceiling would be only 25% without interflections. Yet it is nearly 90% in the same room, if recommended reflectances are used. Thus, modern interflection theory must be employed when designing luminous ceiling lighting.

radiant heating

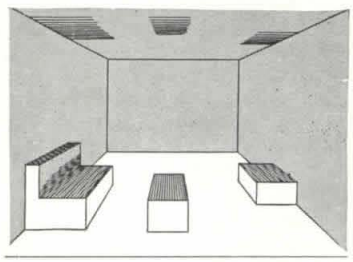
The architect who has some familiarity with illumination calculations can carry over much of his knowledge of lighting to the study of radiant heating. There are, however, several important differences which must be kept in mind.

(1) *The region of the spectrum.* In all of our work on lighting calculations, we deal with sources of light designed to give as much radiation as possible in the visible region of the spectrum (0.4 to 0.7μ). In radiant heating, we are interested primarily in the infrared region of the spectrum. Radiant-heat sources may be metal pipes containing hot water, incandescent lamps operated at low voltage, infrared heating lamps, or electrical resistance wire. The lower the operating temperature, the longer the wave length at which the maximum radiation occurs. According to Wien's displacement law, the wave length at which maximum blackbody radiation occurs is given by

$$\lambda_{max} = 2883/T$$

where λ_{max} is expressed in micron (μ) and the temperature T is given in degrees Kelvin (K). A 250-watt drying lamp operates at a color temperature of 2530K and has maximum output at $\lambda_{max} = 1.14\mu$ in the near infrared. A hot-water pipe operating at 130F or 327K will have its maximum at $\lambda_{max} = 8.83\mu$ in the far infrared.

(2) *Reflectances in the infrared.* The reflecting properties of familiar surfaces behave differently in the infrared and in the visible regions. In the infrared, all nonmetallic surfaces become excellent absorbers, excellent radiators, and poor reflectors. Whether they appear white or black to the human eye, all painted surfaces, wood, plaster, and plastic become almost perfect blackbodies in the infrared. Thus, the walls of a room are "black" to infrared radiation. Interflections are negligible and the methods of calculation applicable are those used for calculating direct



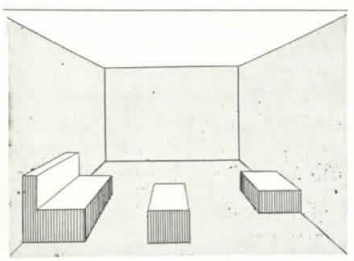


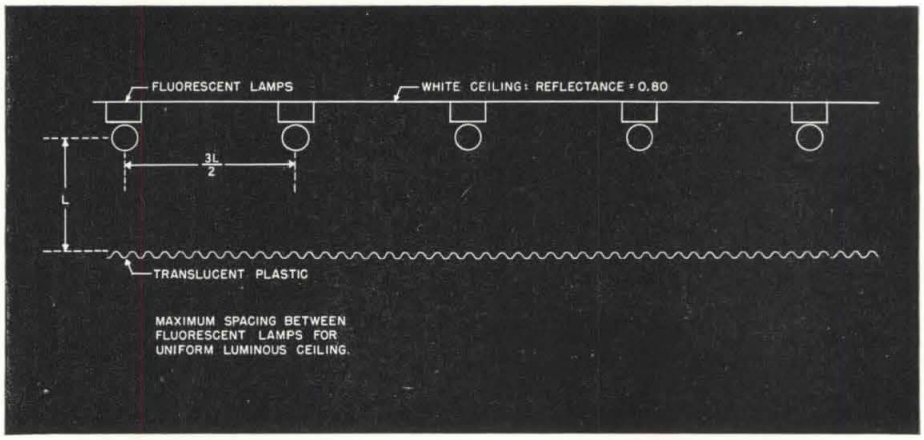
Figure 4—distribution of radiation *(top, above)* from a radiant-floor panel. People seated on chairs or working at desks have warm feet, but shiver in the shadow of their furniture.

Figure 5—radiant pharosage distribution *(bottom, above)* from a ceiling heating panel. Radiant pharosage on occupants is comfortably uniform.

Figure 6—luminous ceiling designed by the author *(right)*. Beams which support plastic sheets also serve as acoustical treatment.

Photo: Ezra Stoller © Pictor

Figure 3—lamp spacing *(below)* for a uniform luminous ceiling. Fluorescent lamps are usually installed parallel to the plastic corrugations.



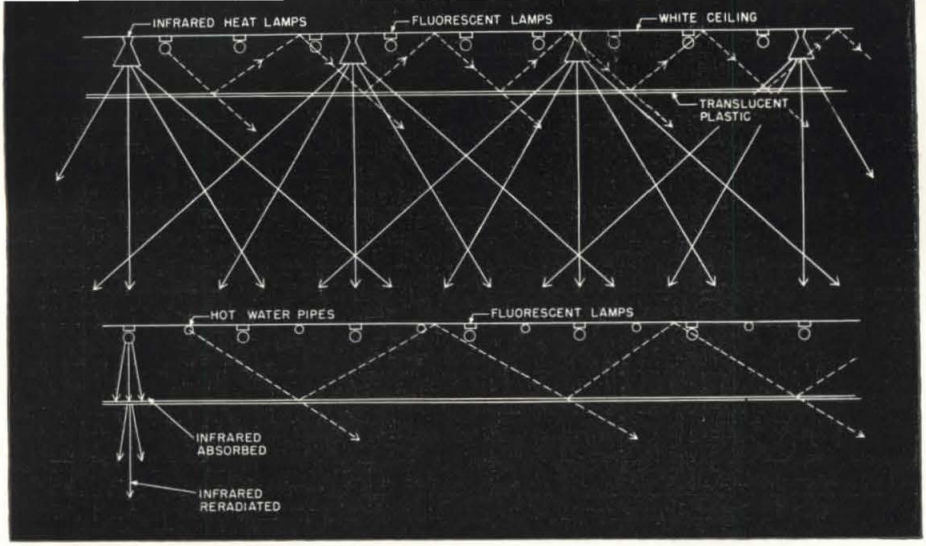


Figure 7—combination of luminous ceiling and near-infrared sources *(left)*.

Figure 8—combination of luminous ceiling and far-infrared sources *(left)*.

TABLE 2: CHARACTERISTICS OF RADIANT HEATING PANELS

	Maximum temperature	Maximum output (watt ft $^{-2}$)	Convection	Radiant heating
Floor panels	85F	9.20	50%	50%
Ceiling panels	120F	20.6	30%	70%
Wall panels	120F	24.9	43%	57%

Air temperature 70F

radiation from a large-area light source.

Radiant heating panels can be built into the wall, ceiling, or floor *(see Table 2)*. The highest temperature at which it is practical to operate a floor panel is about 85F, giving an output of about 9.20 watt ft^{-2}. Ceiling panels can be operated at much higher temperatures. A typical panel operating at 120F has an output of 20.6 watt ft^{-2}, or over twice as much as a floor panel.

Radiant panels never operate completely as radiators. Heat is transferred partly by radiation and partly by convection. The ceiling panel operates most nearly as a radiant-heat source transmitting about 70% of its thermal output by radiation and 30% by conduction. Floor panels transmit only about 50% of their output by radiation. Thus, the most effective way of obtaining radiant heating is by using a ceiling panel. If cold water is circulated in radiant-heating pipes in the summer, the situation is reversed; a floor system acts more nearly on the radiant-heating principle.

To picture the distribution of radiant pharosage in a room, imagine that a luminous panel replaces the radiant panel and that room surfaces are black. Figure 4 indicates the distribution from a radiant-heating system which covers the entire floor. The furniture of this room casts shadows and the radiant pharosage is not sufficiently uniform. There will be many positions in which a person may feel uncomfortably cold. This difficulty is not encountered if the radiant-heating system is placed in the ceiling *(see Figure 5)*. The distribution of radiant energy is the same as that from a luminous-ceiling lighted room with dark walls. The radiant pharosage is uniform and there are no shadows on the occupants of the room.

Thus, we can conclude that a radiant heating panel in the ceiling is frequently preferable to one placed in wall or floor, because it has a larger thermal output per unit area, behaves more nearly as a radiant-heat source, and gives a more uniform distribution of heat.

the combination

The question that must now be answered is: How can one most effectively combine radiant heating with luminous ceilings? If the radiant-heating panels are placed in the walls, floor, or unlighted parts of the ceiling, the method of design can be the traditional one. Such a combination has been used in the Fitchburg Youth Library *(see Figure 6)*. Here a radiant floor is used supplemented by radiant ceiling panels in the opaque part of the sawtooth structure.

In many cases, however, one may conclude that the use of a complete ceiling is desirable both from a lighting and a radiant heating standpoint. An advantage of combining the luminous ceiling and radiant heating is that the sources of radiant heat can be left exposed and need not be concealed in the structure of the building. With plastic luminous ceilings, two systems are possible:

(1) If the heat source, say an infrared-heat lamp, operates at a temperature of about 2500K with its maximum near 1μ, the plastic is found to be essentially transparent. The plastic transmits radiation without becoming heated itself. Ordinary methods of lighting design are applicable. Infrared-heat lamps are spaced above the plastic so that the incident radiant pharosage on the occupants is uniform *(see Figure 7)*. Calculations can be made by the point-by-point method, using the procedures ordinarily applied to factory lighting.

There are two disadvantages to this method. Some of the radiation from the infrared-heat lamps is in the visible region and may show up as spots on the luminous ceiling. Also, electricity is too expensive in most localities to be an economical heat source.

(2) The second method is to use long-wave-length infrared radiation from low-temperature radiators such as hot-water pipes or resistance wire. If the temperature of the radiator is between 100 and 200F, the maximum radiation will occur at 8 or 9μ. In the far infrared, the properties of suitable plastics are entirely different from those in the near infrared. Instead of being highly transparent, the plastics act as a very nearly perfect blackbody. Ninety-four percent of the energy incident on the plastic is absorbed and then reradiated. The system can be designed in such a way that the plastic itself operates at a temperature of 120 to 130F. A practical procedure is to place copper tubing carrying hot water parallel to the fluorescent lamps *(see Figure 8)*. The copper tubing itself should be painted white. Its surface will then be highly reflectant in the visible spectrum, but will act as an excellent blackbody radiator in the far infrared. The ceiling must be designed to be highly reflectant in the visible spectrum and also in the far infrared. Most of the thermal power from the heat sources is eventually absorbed by the plastic and reradiated into the room. About 20.6 watt ft^{-2} will be radiated from the ceiling, if it is operated at 120F. This value is numerically equal to the radiant helios of the ceiling. The distribution of radiant pharosage in the room is then easily calculated by applying the formulas ordinarily used for calculating the light coming directly from a rectangular source.

The second method has several practical advantages over the traditional way of installing radiant heating in ceilings. The mass of plastic to be heated is very small, so the time lag will be very short. The heating pipes are readily accessible and can be repaired easily.

Thus, there are practical methods of combining these two new methods of heating and lighting. The architect can now pioneer by designing buildings in which both luminous ceilings and radiant heating are used.

p/a products

Portable Office: space-saving, basic unit includes two 60"-high, sound-deadened partitions with translucent plastic top panels, roomy bookcase, and Formica-topped, L-shaped desk. Offices of any size and arrangement are possible. Grand Rapids Products, Inc., Federal Square Bldg., Grand Rapids, Mich.

air and temperature control

Duplex Thermostat: for two-position control of motor-operated heating system components. Control is changed from one thermostatic element to the other by automatic time clock or manual switch; settings easily varied from 45F to 75F for night, and 55F to 85F for day operation. Thermostat enclosed in champagne gold-finished metal case. Barber-Colman Co., Rockford, Ill.

Power Roof Exhauster: fully assembled unit, complete with motor, housing, safety switch; for roof ventilating application where noise must be held to minimum, as in churches, hospitals, schools, etc. Special suspension mountings and insulating pads "float" the driving assembly, eliminating all hum and vibration. Housing can be furnished in aluminum, copper, galvanized iron, or other metals. Chicago Blower Corp., 4558 W. Congress St., Chicago 24, Ill.

Gravity Warm Air Furnace: gas-fired, fully automatic; durable, heavy-gage steel body and radiator with all seams continuously welded to assure long life and eliminate possibility of gas leaks. Box-type draft diverter prevents chimney downdrafts from extinguishing pilot or affecting efficiency of furnace. Available in three models with ratings from 75,000 to 136,000 Btu. Thatcher Furnace Co., Garwood, N. J.

Volume Ventilator: three models—for wall, ceiling, floor installations—introduce, filter, heat, and distribute outside air up to 13,500 cfm; steam heating coils guard against freeze-up and provide even heating and rapid elimination of condensation. Especially suited for school auditoriums and gyms. Trane Co., La Crosse, Wis.

Gas-Fired Unit Heaters: two lines of fan, blower and duct-type models, with sheet steel or cast-iron exchangers. Four-point suspension permits rigid mounting without strain on gas lines or piping. In sizes with capacities from 55,000 to 200,000 Btu. United States Air Conditioning Corp., 3300 Como Ave., S.E., Minneapolis 14, Minn.

construction

Alfane: synthetic resin cement provides corrosion-resistant adhesion for jointing brick or tile in floors and tanks. Sets hard in contact with concrete or metals; outstanding adhesive properties for a wide variety of other materials, including glass. Atlas Mineral Products Co., Mertztown, Pa.

Vermiculite-Sand Concrete: new type of structural concrete weighs half as much as ordinary concrete with four times more insulation value; designed for floor construction where bar joists or junior I-beams carry slab. Compressive and indentation strengths adequate for use as base for tile, terrazzo, linoleum, or carpeting without addition of sand concrete topping. Vermiculite Institute, 208 S. La Salle St., Chicago, Ill.

doors and windows

Interior Glass Door: constructed of single slab of ⅜" thick, heat-tempered glass patterned on both sides, gives transmission of soft light between two rooms while maintaining privacy. Ready to hang, furnished with bronze-finished hardware, including Sargent lock and Stanley ball-bearing hinges providing fingertip operation. Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio.

Thermo-glaze: steel sliding doors and windows, dual-glazed on the job to provide all advantages of factory sealed double glazing by avoiding breakage and leakage risks involved in shipping. Dry air space between panes is sealed at time of glazing by rocker type glazing bead which exerts metal-to-rubber-to-glass pressure; dehydration of air space maintained by patented dehydrator. Twelve different models. Steelbilt, Inc., 4801 E. Washington Blvd., Los Angeles, Calif.

electrical equipment, lighting

Challengers: lighting units, 8' in length, constructed of baked-enamel finished steel, utilizing four 40w, T-12, 48" fluorescent lamps, for industrial locations. Wired for 110-125v a-c circuits, with choice of instant start or starter type ballasts. Curtis Lighting, Inc., 6135 W. 65 St., Chicago 38, Ill.

Automatic Illumination Control: weatherproof, plug-in type provides completely automatic "on-off" control of lighting at predetermined light levels. Unit merely plugged into standard watt-hour meter receptacle; requires no standby power, draws no current between on and off operations. Recommended for street, sign, and industrial lighting, also for controlling lights on obstruction markers, airway beacons, and air strips. Weston Electrical Instrument Corp., 641 Frelinghuysen Ave., Newark 5, N. J.

finishers and protectors

Concrete Floor Hardener and Etcher: liquid especially formulated to provide etching control in preparation of concrete and terrazzo flooring before sealing; claimed to govern penetration of finish coat, thus extending its coverage and saving money on final floor dressing application. Effective also as protective coating against heavy traffic; impervious to alkalis, oils, acids. Multi-Clean Products, Inc., 2277 Ford Parkway, St. Paul, Minn.

PCA-100 Anti-Rust Paint: prevents rust on new metal, or may be applied on already rusted metal to prevent further rust action. Suitable for either brush or spray application. Furnished in black only; due to penetrating characteristics, should be used solely as "finish" coat. Paint Corp. of America, Fidelity Bldg., Cleveland 14, Ohio.

sanitation, water supply, drainage

Kewanee Cottage Boiler: direct-fired hot water heater provides abundant hot water economically; recommended for apartments, schools, motels, hotels, etc. Height 56¾", length and width 23"; can be installed in minimum of space. Kewanee Boiler Corp., Kewanee, Ill.

specialized equipment

Model 20 Copyflex: low-cost copying machine for medium volume production of prints from tracings, engineering drawings, and other large-sized technical originals; 46" printing width with exposure speeds up to 95" per minute; lower priced than other machines in same volume range. Operation requires no special training; operator merely feeds sensitized medium into machine with translucent original; copies are processed by machine and stacked ready for use. Charles Bruning Co., Inc., 100 Reade St., New York, N. Y.

Golden Jubilee Gas and Electric Ranges: both ranges identically designed, with four burners and divided top; equipped with glass-bottom broiler that obtains best broiling results, completely automatic ovens, (said to be roomiest ovens in industry), glass control panel through which fluorescent light illuminates working surface of range, other new features. Over-all size: 30" wide x 25½" deep x 36" high. Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.

Custom-Standard Antenaplex: four systems designed to meet master television antenna needs of multiple unit structures. Two models intended for use where moderate number of TV receivers (up to about 64) are to be operated from single array of antennas; another model intended for installations requiring up to seven channels; a smaller model for installation requiring no more than four channels. Except for number of channels accommodated, all types are similar, with amplifiers, power supply, and combining network mounted on single chassis. Radio Corp. of America, Camden, N. J.

surfacing materials

Grip-Strut Grating: one-piece material made of sheet steel or aluminum formed with perforated diamond patterned surfacing for prevention of skidding, recommended for such uses as cat walks, work platforms, steps, and wherever non-skid grating surface is required. Globe Co., 4000 S. Princeton Ave., Chicago, Ill.

Korweld: new panel construction for movable partitions, incorporating extremely durable, non-metallic composition board panels welded to honeycomb of impregnated paper; steel posts, base, cornice, lay-in wiring facilities, and accessories furnished with panels; baked enamel finish has slightly textured surface which gives warm appearance to office, laboratory, classroom and similar interiors. E. F. Hauserman Co., 68 Grant Ave., Cleveland, Ohio.

Aerofan Ceiling Ventilator: low-cost, exceptionally easy-to-install unit for new or remodeled residential construction. Housing framed by two 2 x 4's between ceiling joists; reversible flange can be fastened above or below plaster; quiet in operation, no special wiring—just an ordinary light circuit. Pryne & Co., Inc., 140 N. Towne Ave., Pomona, Calif.

Chart-Photometer: compact set of color scales, in kit form, for measuring reflectance quickly and accurately for three standard illuminants—incandescent light, average daylight, and light from blue sky. Developed especially for illuminating engineers, decorators, and architects, scale reflectances are obtained from measurements made by National Bureau of Standards on manufacturer's standard color papers; these calculations, which may vary widely under different illuminants, can determine kind and placement of fixtures and finishes, textures and surfaces for effective distribution of light. Priced at $15. Munsell Color Co., Inc., 10 E. Franklin St., Baltimore 2, Md.

MANUFACTURERS' LITERATURE

★ *Editor's Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.*

air and temperature control

1-118. A Few Facts About Dehumidification for Industry, 4-p. bulletin. New, revised data relating to problems resulting from over-humidity in industrial and chemical plants. Tables of recommended humidities in various industries, descriptions of two dehumidifying units. Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica, N. Y.

1-119. Boiler-Burner Units (L-550-1), 4-p. illus. folder describing series of oil- or gas-fired, vertical fire tube boiler-burners, available in five models—for steam heating, hot-water heating, and hot-water supply—in all sizes ranging from 118,000 to 808,000 Btu ratings. Construction features, dimensions, controls and other accessories, specifications. Aldrich Co., Wyoming, Ill.

1-120. Easy Estimator, combination handbook and work sheet giving simplified method for estimating approximate heat losses, radiation requirements, and materials costs for manufacturer's baseboard heating system. Installation data, forms for computing individual room requirements, price lists. Radiant Baseboard Panels, Inc., 900 W. Main St., New Britain, Conn.

1-121. Modern Heating (262), 12-p. illus. booklet on cabinet convector radiators employing fin-and-tube heating element, designed for free-standing or semi-recessed installation with two-pipe steam or hot-water systems. Construction, capacities, descriptions of special purpose convectors for unusual exposures such as very long windows and for bathrooms and other small enclosures with low heat loss. John J. Nesbitt, Inc., State Rd. & Rhawn St., Philadelphia 36, Pa.

1-122. How Increasing Your Steam Costs Can Save Money (2171), 8-p. booklet consisting of questions and answers regarding efficient use of steam in industrial buildings. Illustrations of steam traps, strainers, inlet valve, and temperature control. Sarco Co., Inc., 350 Fifth Ave., New York 1, N. Y.

★ **1-123. Custom-Air** (DS-369), 36-p. illus. bulletin containing full technical data for laying out year-round air conditioning for offices, hotels, hospitals, and other multi-room structures, with temperature control for individual rooms. Criteria for design of ventilation air system, room unit selection and performance data, roughing-in dimensions, mechanical specifications, system controls, typical arrangement. Trane Co., La Crosse, Wis.

1-124. Air Conditioning Equipment (SA-6692), 16-p. condensed catalog listing and illustrating equipment for cooling, heating, dehumidifying purposes; includes compressors, condensers, water coolers, heating and cooling coils, heating and ventilating units, central-plant type self-contained air conditioners, industrial heaters, etc. Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Pk., Boston 36, Mass.

construction

Bulletin containing full color reproductions of domestic and foreign granites, includes practical data on sizes, tolerances, thicknesses, finishes. Other bulletin describes colors and textures of granite veneers; uses, dimensions, section specifications. H. E. Fletcher Co., West Chelmsford 2, Mass.:

3-104. Fletcher Granite (8)

3-105. Fletcher Granite Veneer, AIA 8-B-3

3-106. Construction Details for Drafting Room Use, AIA 17-A, set of five loose sheets containing detail drawings of insulated metal walls and steel deck roofs. R. C. Mahon Co., 8650 Mt. Elliott Ave., Detroit 1, Mich.

★ **3-107. Terrazzo and Mosaic,** 136-p. loose-leaf catalog. See also, Reviews, page 126. National Terrazzo and Mosaic Assn., Inc., 711 Fourteenth St., N.W., Washington 6, D. C.

doors and windows

4-112. Window Ideas, 32-p. booklet. Illustrations of window wall arrangements in actual homes, all using combinations of stock-size, wood window units. Features, advantages, details. Andersen Corp., Bayport, Minn.

4-113. Glass for Construction, AIA 26-A (SA-51), 12-p. illus. catalog describing various types of polished plate glass, window glass, safety glass, double glazing, glass doors, decorative and structural glass. Properties, thicknesses, standard sizes, suggested specifications. Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo, Ohio.

4-114. Auto-Lok, 12-p. illus. catalog on aluminum awning windows in wide range of modular sizes, with vent arrangements to fit every requirement; especially designed vinyl weatherstripping and automatic locking device said to make unit tightest closing window ever made. Sizes; section, mullion, and glazing details; installation data. Ludman Corp., P.O. 4541, Miami 28, Fla.

★ **4-115. How to Give Your Store the Look That Sells** (GO1906), 32-p. booklet showing photographic illustrations of modernized store fronts, covering practically every field of retail merchandising. Descriptions of various glass and metal store front products. Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

4-116. Raynor Door, AIA 16-D, 8-p. brochure on wood, sectional overhead doors for residential, commercial, industrial, and rural structures. Construction data, types, specifications, drawings, index. Raynor Mfg. Co., Dixon, Ill.

4-117. The Friendliest Doors in the World (M-12), 6-p. illus. folder. Description of door operators that open doors automatically upon approach, by means of photoelectric control or by stepping on carpet containing contact switches that actuate door operator; suitable for all entrance doors and for service doors to restaurants, cocktail lounges, etc. Advantages, method of operation, typical installation photos. The Stanley Works, New Britain, Conn.

4-118. VMP Standard Metal, AIA 16-A, 8-p. booklet. Welded, one-piece metal frames for use with metal or wood doors in all types of wall construction in multiple housing; also, several types of metal doors, including fire door and frame units. Typical construction, applications, frame and door details, hardware. Virginia Metal Products Corp., Orange, Va.

electrical equipment, lighting

5-75. Temprex Lighting Fixtures, 8-p. catalog. Line of incandescent, glass-bowl ceiling fixtures constructed with telescoping rod in center for connection to ceiling. Rod makes fixture self-aligning and permits glass bowl to be lowered for easy cleaning and relamping. Types of bowls, mounting diagram, dimensions. Appleman Art Glass Works, Bergenfield, N. J.

Folder describing louvered steel paneling for regulating light distribution from ceiling-mounted fluorescent and hot or cold cathode light sources. Installation requirements, method of installation, specifications, advantages. Second folder provides general information and installation data on paneling. Federal Enterprises, Inc., 8700 S. State St., Chicago, Ill.:

5-76. Cell-Ceil

5-77. Cell-Ceil Information and Installation Data

5-78. Litecraft, AIA 31-F-2, loose-leaf catalog presenting wide range of commercial, industrial, and theatrical spotlights, downlights and other types of fixtures; also includes wide range of

reflectors, lenses, and filters. Illustrations, brief descriptions, technical data. Litecraft Mfg. Corp., 790 Wythe Ave., Brooklyn 11, N. Y.

5-79. Getting the Most from Your Home's Electric System (EG-2), 24-p. booklet discussing requirements of electric wiring systems for new and existing houses. Checklists of recommended layouts and outlets for lighting fixtures and appliances throughout house, diagrams, specifications. National Adequate Wiring Bureau, 155 E. 44 St., New York 17, N. Y. (15 cents per copy; payable with stamps, coins, money order, or check made out to National Adequate Wiring Bureau.)

5-80. Electrunite E.M.T. (DEK-1), circular describing galvanized electrical metallic tubing covered with polyethylene, furnishing corrosion resistant raceway with fume-free protection from outlet to outlet and reducing replacement costs. Properties, engineering data, advantages. Republic Steel Corp., Steel & Tubes Div., 244 E. 131 St., Cleveland 8, Ohio.

★ **5-81. Wakefield Ceiling,** AIA 31-F, 39-B, (51), 34-p. loose-leaf booklet analyzing advantages of acoustically insulated luminous ceiling providing low-brightness, glare-free illumination with effective sound control; system consists of fluorescent lamps mounted above suspended ceiling of corrugated acrylic plastic; sound control is integrated with light source by means of perforated baffles filled with Fiberglas wool which are suspended below plastic diffuser. Applicability, illumination and acoustics data, diagrams. F. W. Wakefield Brass Co., Vermilion, Ohio.

★ **5-82. Bus Duct Manual** (B-42-72A), 68-p. illus. manual describing types of bus duct and accessories available. Application and test data, cost information on typical bus duct installation, advantages of bus duct for secondary power of distribution system, specifications, other technical data. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

finishers and protectors

6-41. Corrosion Control Coatings, 10-p. bulletin on types of synthetic rubber-based coatings formulated for maximum resistance to corrosion on masonry or metallic surfaces. Characteristics, properties, uses, methods of application. Casey & Case Coating Co., P.O. Box 151, Maywood, Calif.

6-42. Over the Rough Spots, 32-p. illus. booklet. Description of products for repair, protection, maintenance of wood and concrete floors. Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa.

insulation (thermal, acoustic)

9-55. Permalite, 8-p. brochure illustrating advantages of lightweight, insulating concrete roof fill. Mix design data table, typical specifications. Great Lakes Carbon Corp., 18 E. 48 St., New York, N. Y.

9-56. Insulrock, 8-p. illus. booklet on strong, durable, incombustible slabs composed of chemically treated wood fiber coated with water and fire-resisting Portland cement bonded under pressure; high thermal insulation, sound absorption, and structural strength, suitable for use as roof decking, roof insulation, non-bearing partitions, etc. Characteristics, uses, table of loads and spans, construction details, specifications. Insulrock Corp., E. Linden Ave., Linden, N. J.

sanitation, water supply, drainage

19-169. Cascade, AIA 35-H-6 (510), 4-p. illus. folder illustrating bath enclosures made of rigid, sliding panels of acrylic plastic in transparent colors, for installation, with metal tracks, on standard five-foot recessed tubs. Colors, method of installation. Fiat Metal Mfg. Co., 9301 W. Belmont Ave., Franklin Pk., Ill.

19-170. Sperzel Company, 4-p. illus. folder offering various models of toilet seats molded of solid, one-piece polystyrene plastic that will not chip, peel, craze or wear. Advantages, hinge bolt construction drawings. Sperzel Co., 123 14 Ave. S., Minneapolis 4, Minn.

specialized equipment

19-171. Modern Commercial Cooking Equipment, 6-p. folder. Descriptions and illustrations of heavy-duty broiler and grill units of steel construction, for use with any type of gas; each furnished with heavy, polished, cast iron griddles; units can be quickly dismantled for easy cleaning, no smoke or odor when properly operated. Advantages. MagiKitch'n Equipment Corp., Quakertown, Pa.

surfacing materials

19-172. Mastic Flooring Underlayments (1-F-12), 4-p. illus. folder on two types of underlayments made with mastic binders—asphalt and rubber—that provide level, resilient, sound-deadening surface for floor covering installations. Methods of application, photos. Flintkote Co.

19-173. Laminated Panels, AIA 23 (788-25P-H.P.-209), 12-p. illus. brochure presents several types of laminated wood panels in different ply thicknesses, for ceiling and wall covering in homes. Characteristics, uses, application on new and old construction, types of moldings, typical installation photos. Upson Co., Lockport, N. Y.

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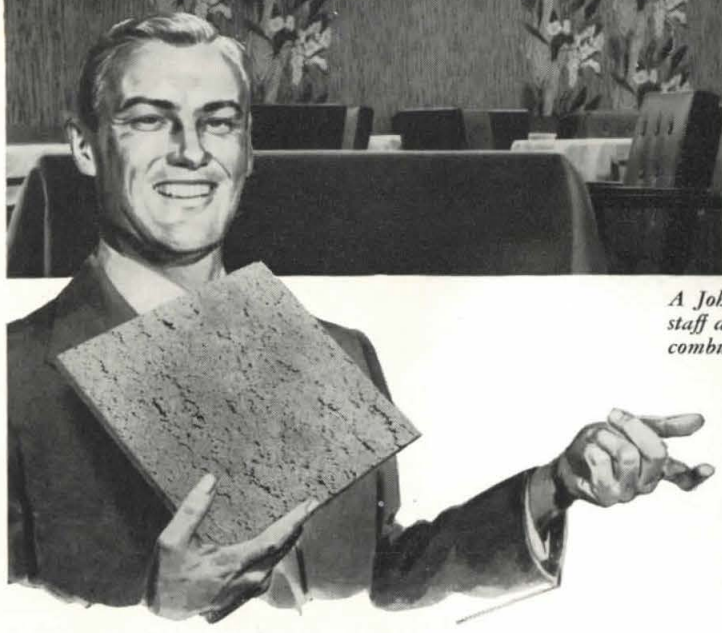

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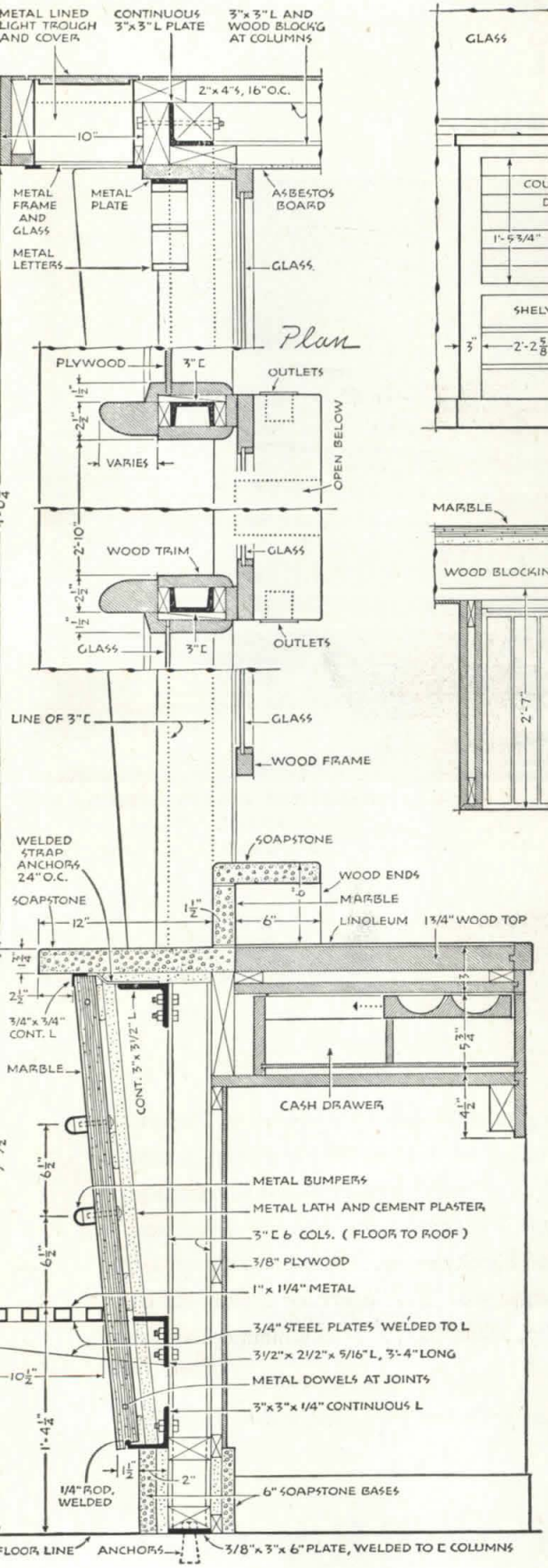
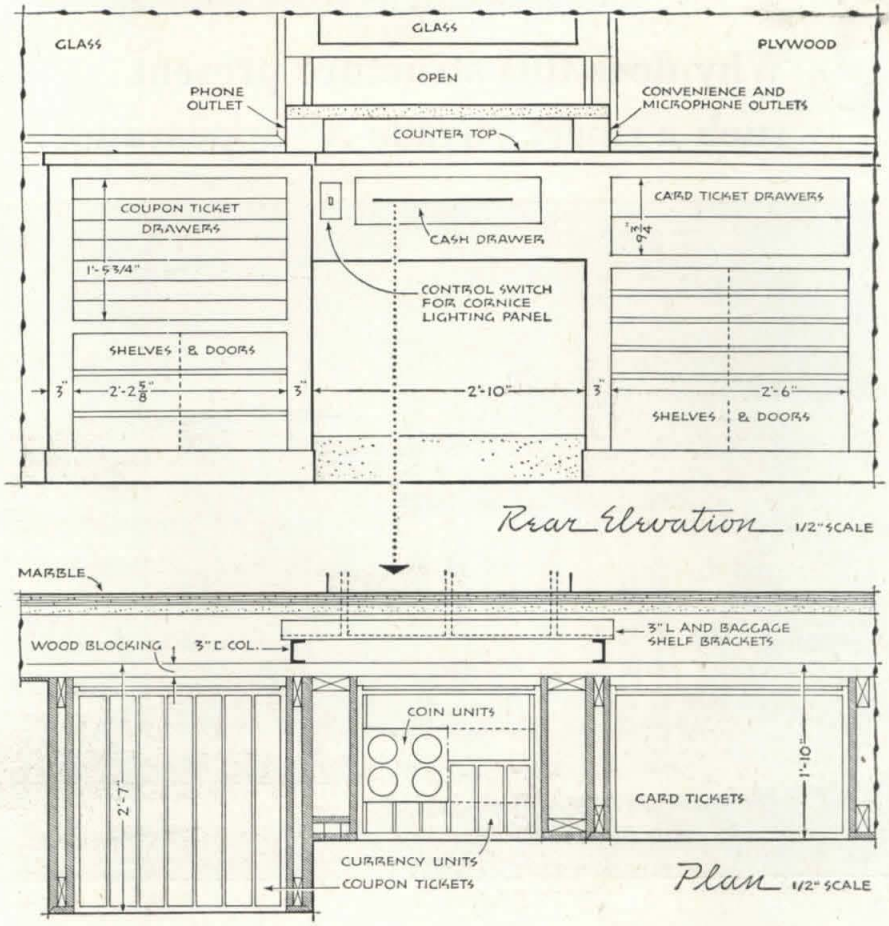


Wall Section at Window 1" SCALE



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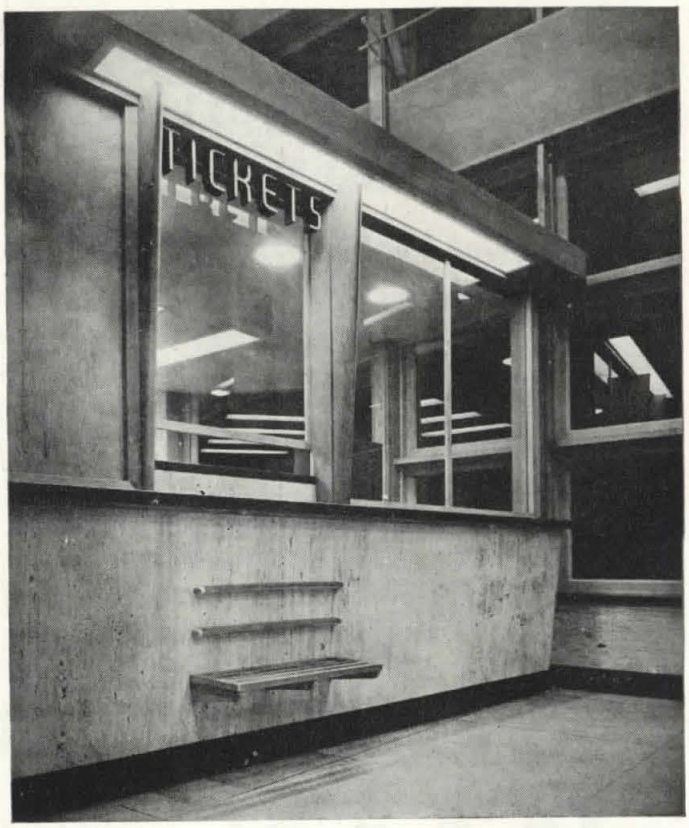

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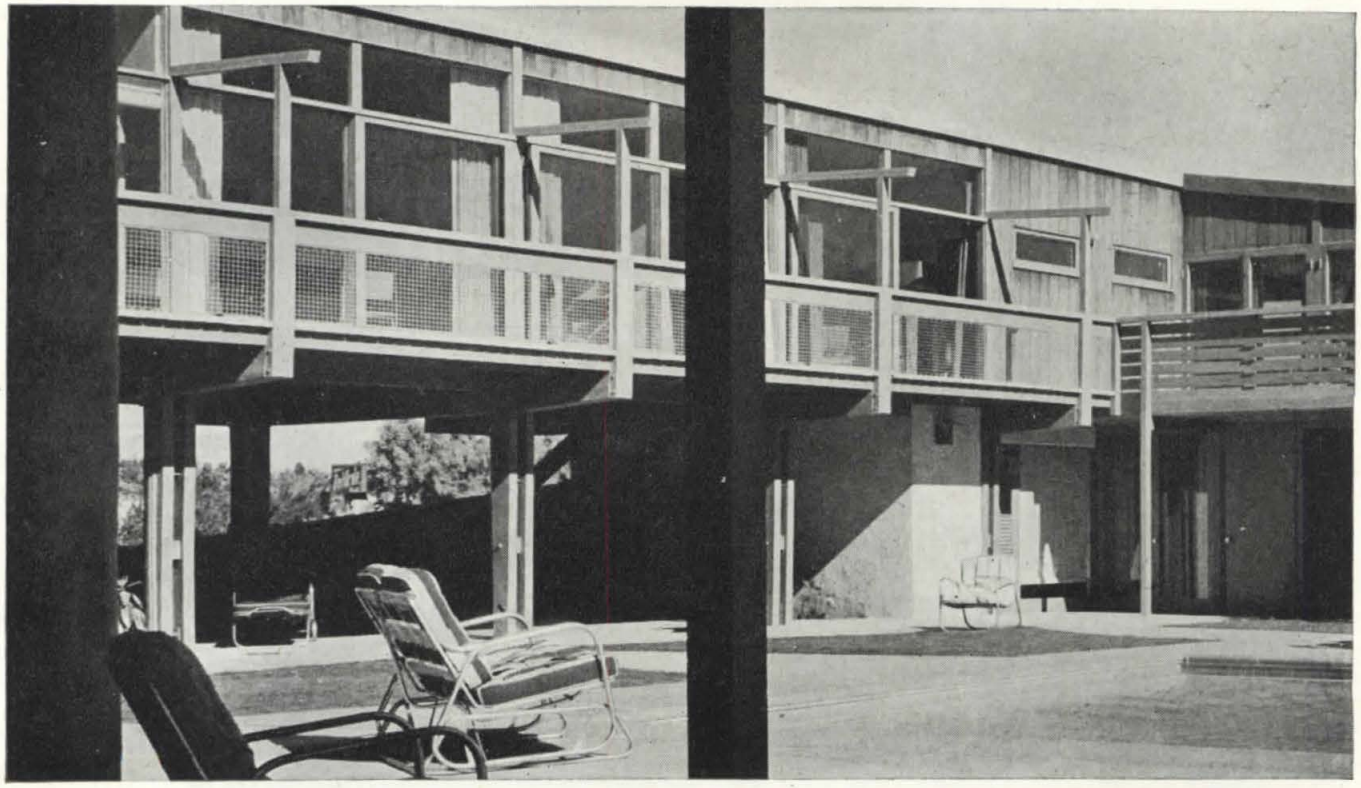
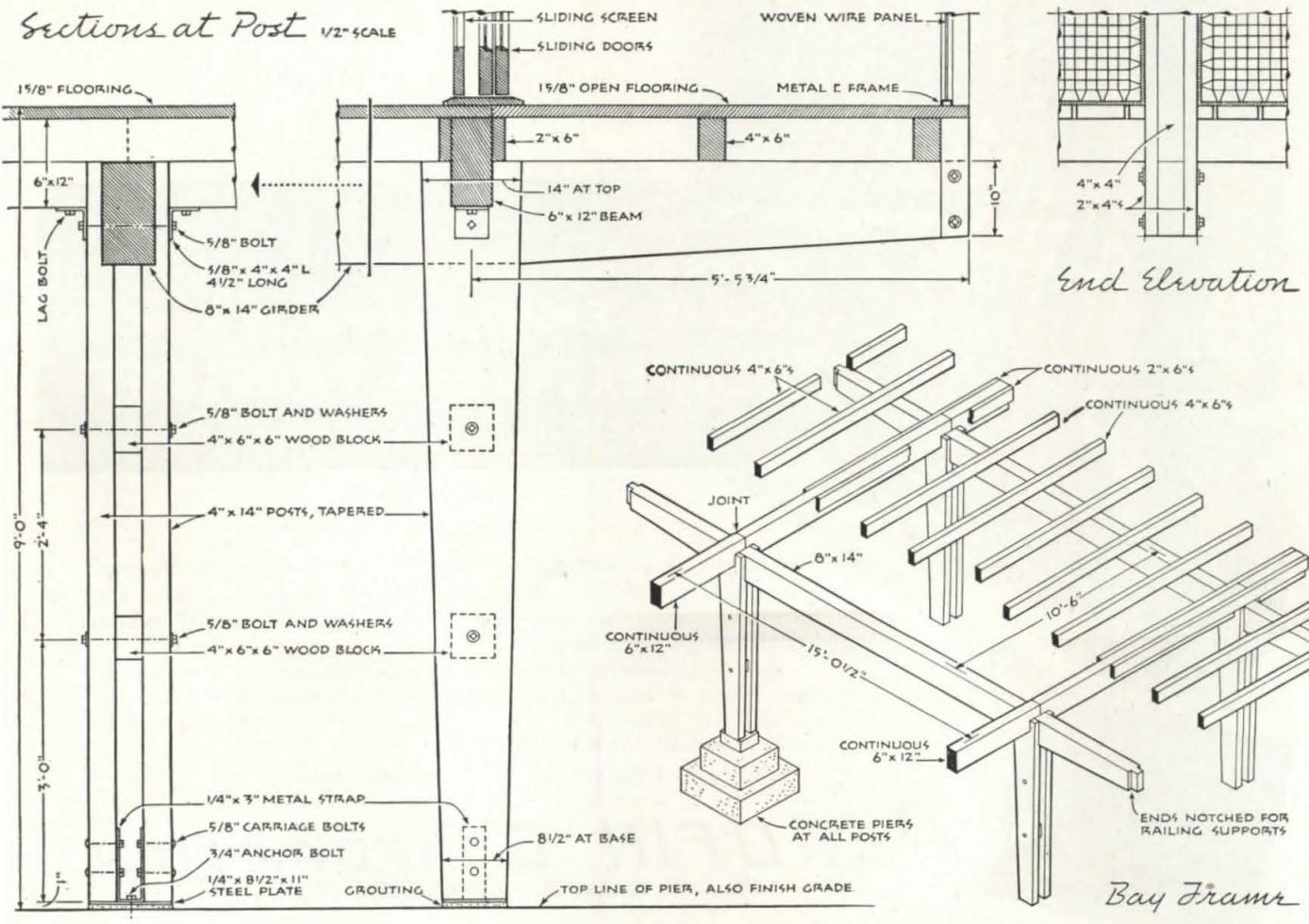
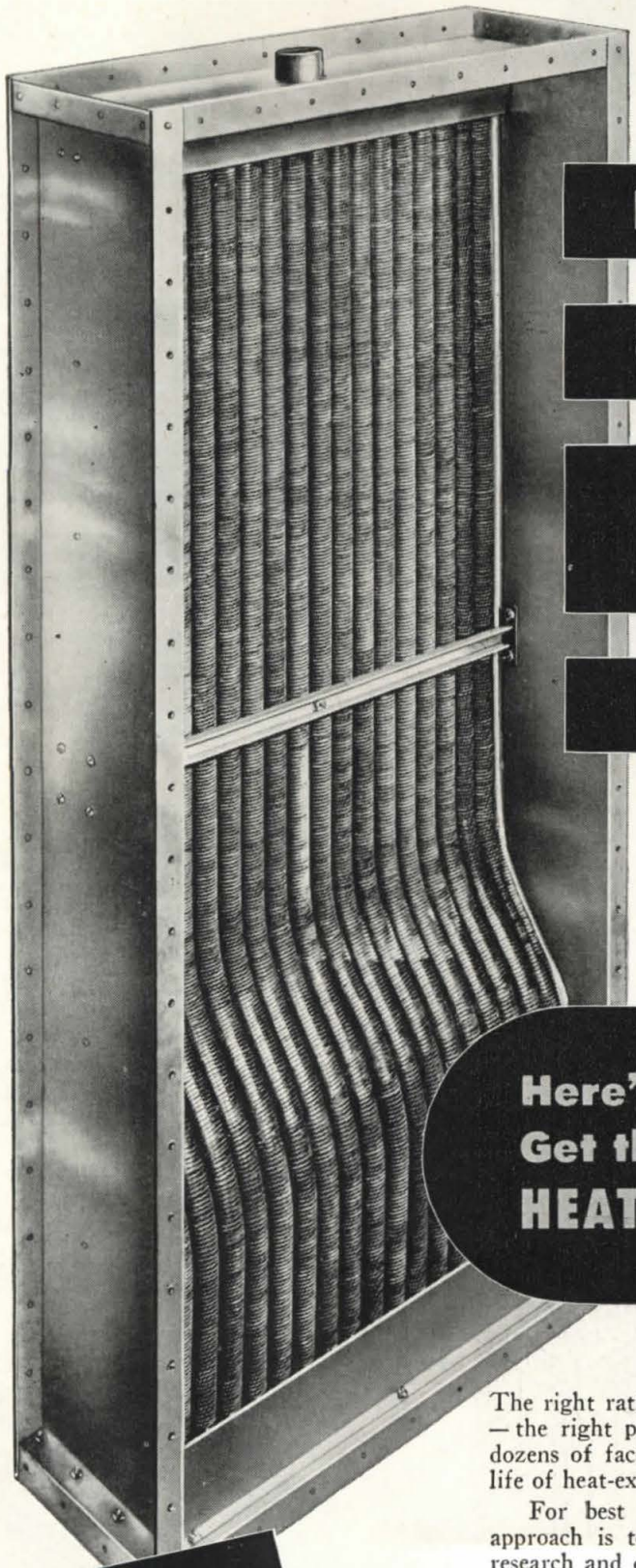


JULIUS SHULMAN



DEL MARCUS MOTEL, Palm Springs, Calif.

WILLIAM F. CODY, ARCHITECT



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Sections at 1 2 3
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Plan at Lip

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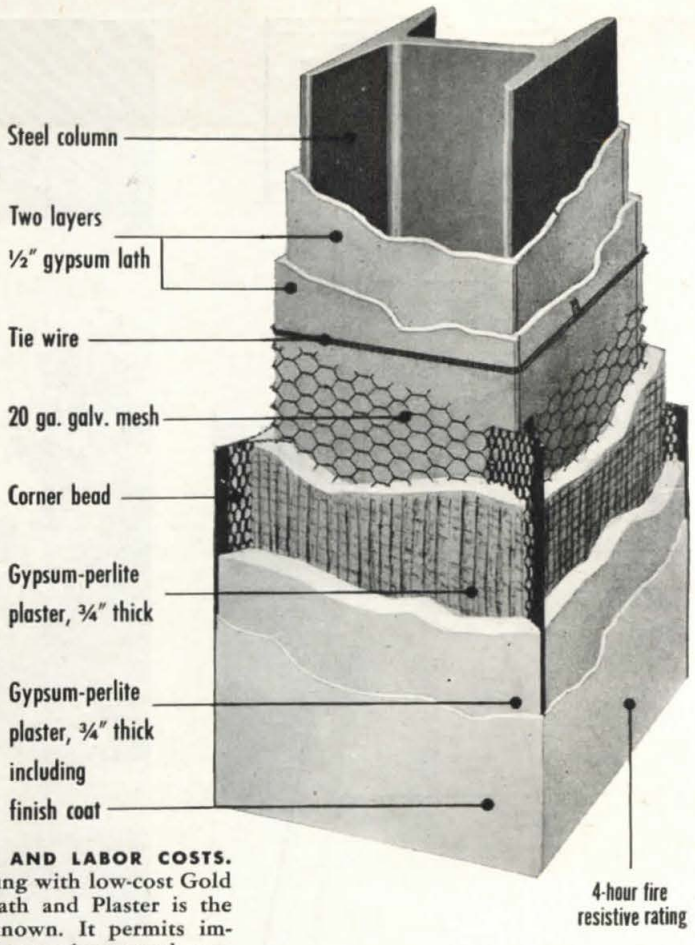

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1½ HOURS. Specifications are same as for one hour rating, but set grounds for ⅜" of plaster.

2 HOURS. Place Gold Bond ⅜" x 16" x 48" Perforated Gypsum Lath vertically against column flanges and bridging web spaces. Cut as required to box the column. Wrap and tie lath with double strands of 18 gauge tie wire 2" from ends of lath and at intermediate points not exceeding 15" c.c. At each corner, wire tie Gold Bond No. 1 Expanded Corner Bead to the wire ties encircling lath to form grounds for 1" of plaster. Mix Gold Bond Gypsum Plaster 100 lbs. to 2½ cu. ft. of perlite aggregate. Apply in a doubleback operation to within 1/16" of ground and leave rough for finish.

3 HOURS. Box column with two layers of Gold Bond ½" Long Length Gypsum Lath placed vertically against the column flanges and bridging the web spaces. Wrap column and lath with 1" hexagonal 20 gauge galvanized wire mesh tying cut ends to give continuity around the column. At each corner wire tie Gold Bond No. 1 Expanded Corner Bead to form grounds for 1" of plaster. Mix Gold Bond Gypsum Plaster 100 lbs. to 2½ cu. ft. of perlite aggregate. Apply in a doubleback operation to within 1/16" of ground and leave rough for finish.

4 HOURS. At each corner, wire tie Gold Bond No. 1 Expanded Corner Bead to the wire ties encircling lath to form grounds for 1½" of plaster. Mix Gold Bond Gypsum Plaster 100 lbs. to 2 cu. ft. of perlite aggregate for the scratch coat and 100 lbs. to 3 cu. ft. of perlite for the brown coat. Plaster in two separate coats, allowing the scratch coat to set hard before application of the brown. Brown coat to be applied in a doubleback operation to within 1/16" of ground and leave rough for finish.

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REVIEWS

PLANNER'S PROGRESS

Toward New Towns for America. *Clarence S. Stein. The University Press of Liverpool, Public Administration Service, Publications Div., 1313 E. 60 St., Chicago, Ill., 1951. 245 pp., illus. $5*

Very seldom does a publication on city planning evoke immediately an emotional reaction; but even the greatest skeptic must admit that something like human progress exists in the world, as he studies Clarence Stein's *Toward New Towns for America.* Here is a history of projects once considered radical and revolutionary attempts to reform the pattern of living. Yet today all their basic ideas have become matters of course.

Stein writes a kind of impersonalized autobiography, in terms of work rather than of personal experience. The analyses of "Sunnyside," "Radburn," and "Phipps Garden Apartments," created by Stein in co-operation with Henry Wright, prove the value and success of their concepts, as do "Greenbelt," "Greenbrook," "Greendale," "Baldwin Hills Village," and other settlements developed under the influence of their ideas.

These ideas are the concepts of planning on a large scale, based on the sociological needs of specific economic classes and on the assumption of public condemnation of land for housing purposes. The combination and integration of the usual small lots in order to create the possibility of green commons within larger blocks and super-blocks, the grouping of buildings of different heights and bulk, the standardization of units though varying in appearance, the specialization of roads ("built for one use instead of for all uses"—in other words, separation of pedestrian and general traffic roads), and the culde-sac leading into the individual blocks —these are the intrinsic elements for modern planning.

In his wise and lucid introduction, Lewis Mumford, who was closely connected with Stein for many years, traces the gradual evolution of these ideas back to Ebenezer Howard and Raymond Unwin, to the Swiss and German projects of the early 20's, and even, referring to the problem of road specialization, to Olmsted. Stein and Wright, however, developed these ideas away from the latent Romanticism which somewhat had influenced those pioneering projects; they adapted them to the specific sociological conditions at the end of the 20's and the early 30's in the U.S.A.

(Continued on page 120)

BOOKS RECEIVED

How To Build Fences and Gates. Lane Publishing Co., 576 Sacramento St., San Francisco, Calif., 1951. 96 pp., illus. paper bound. $1.50

Simplified Mechanics and Strength of Materials. Harry Parker, M.S. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y., 1951. 275 pp. $4

Cleveland Today—Tomorrow. The General Plan of Cleveland. City Planning Commission, December 1950. 47 pp., illus., map of city

Accomplishments 1950. City Planning Commission, Los Angeles, Calif. 48 pp. illus. pamphlet

Facts About Chicago's Low-Rent Public Housing. Chicago Housing Authority, 608 S. Dearborn St., Chicago, Ill., June 1951. 33 pp. pamphlet, illus., for limited distribution only

p/a REVIEWS

(Continued from page 119)

The thoroughness of their social and economic research is proven in the charts accompanying the text; from the surveys of the future inhabitants' incomes to the costs of local government and community activities, and to the analysis of construction costs for individual dwelling units. The relative costs of various schemes for the grouping of houses—always including the expenditures for streets, sewerage, public and house services and landscaping—are analyzed and compared, as are the costs of house and garage construction.

Let us not forget that the various commissions and committees for housing and regional planning, especially the Regional Planning Association of America, go back to the original Stein, Wright, and Mumford group and their discussions and informal meetings, which started in 1923. Thus, any criticism today as to details of their projects is relatively impertinent. What they did has become history.

"The educated man is he who can best make use of the wisdom of the past," to quote a line from Mumford's introduction. Stein himself is definitely critical of some of the earlier work. The city planner of today will, in all modesty, primarily criticize the esthetic appearance of the individual buildings. He will not share Stein's belief that only the strict rectangular form of the individual unit guarantees the lowest cost of construction. He will recognize a certain formalism, even where the whole layout is seemingly adapted to the topographical situation.

But these esthetic reservations are unimportant, considering that the most essential motifs of modern planning were evident there: the feeling for open space and the tendency to integrate the housing unit with the open space. Although Stein, Wright, and their group started primarily from social and economic considerations, they shared the feeling for the integration of volume and space, so characteristic of the planning generation of today.

PAUL ZUCKER

THE GOOD OLD (CLASSIC) DAYS

Nineteenth Century Architecture in Britain. *Reginald Turnor. B. T. Batsford, Ltd., 122 E. 55th St., New York 22, N. Y. 1951., 111 pp., illus. $4.75*

Herein is charted the course of an extraordinary century of British architecture—a revolutionary and determinedly self-conscious declination that had its parallels in our own country. Dealing principally with the period usually

(Continued on page 122)

Playroom-Gymnasium in new Blythe Park School, Riverside, Ill., floored with block-patterned Northern Hard Maple. Perkins & Will, Chicago, Architects-Engineers.

Stage detail of the dual-use auditorium showing flexible-unit platforms, maple-surfaced, adaptable to any needs of choral activity or pageantry. The colorful red-and-black curtain was specially designed by Angelo Testa.

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p/a REVIEWS

(Continued from page 120)

remembered as the Gothic Revival, the author analyzes the sources of this unlikely come-uppance and finds them to be chiefly moral and ethical, heavily prodded by the Victorian guilty conscience and/or complacency.

Turnor sees the decorous, formal orderliness of the Classical approach that was the esthetic choice at the opening of the century, as an established tradition, from which a sensible British architecture might have developed in an evolutionary manner. Instead, however, there ensued the revolutionary Battle of the Styles and the Gothic Revival—at first a romantic literary and fashionable whim; later, an ardent, religion-based, holier-than-thou cause supported in different ways by such vigorous advocates as Pugin and Ruskin; and finally, a respectable, stodgy, and official habit. All of which, in the author's view, constitutes a grim history of the decline and fall of good taste.

Finding his almost perfect examples of architectural dullness in the works of Sir Gilbert Scott ("that Victorian colossus of industrious dreariness") and Alfred Waterhouse ("It is part of my argument that good taste was dead, and it would be absurd to blame Waterhouse for so magnificently celebrating its demise"), he is yet at pains to discover the virtues—here and there, real genius—that found expression in the period, in spite of all. And the plates and illustrations show a surprising quantity of decent design accomplished. Nonetheless, the burden of the report is one of constant deterioration of taste until "The Twilight of the Goths" and the lively influence of William Morris (who, unlike Pugin and Ruskin, did not confuse esthetics with ethics) brought signs of convalescence from a dark age.

Two leitmotifs to the major theme strike this reviewer with special impact. One is the author's extreme admiration for the Classic tradition—the Greek, Roman, Renaissance-inspired design approach. In it, he feels was a sound and living school whose teachings (at the opening of the Nineteenth Century at any rate) could be appropriately applied to the design of almost any type of building then known. Futhermore, he contends, "this school was unbedevilled by religious or ethical considerations," and out of it, he suggests, architecture could have evolved (through individual talents such as Soane's) had not the romantic-religious-respectable upsurge occurred.

The other is his quite evident distaste for the tenets of today's progressive architecture. In several places, he

(Continued on page 124)

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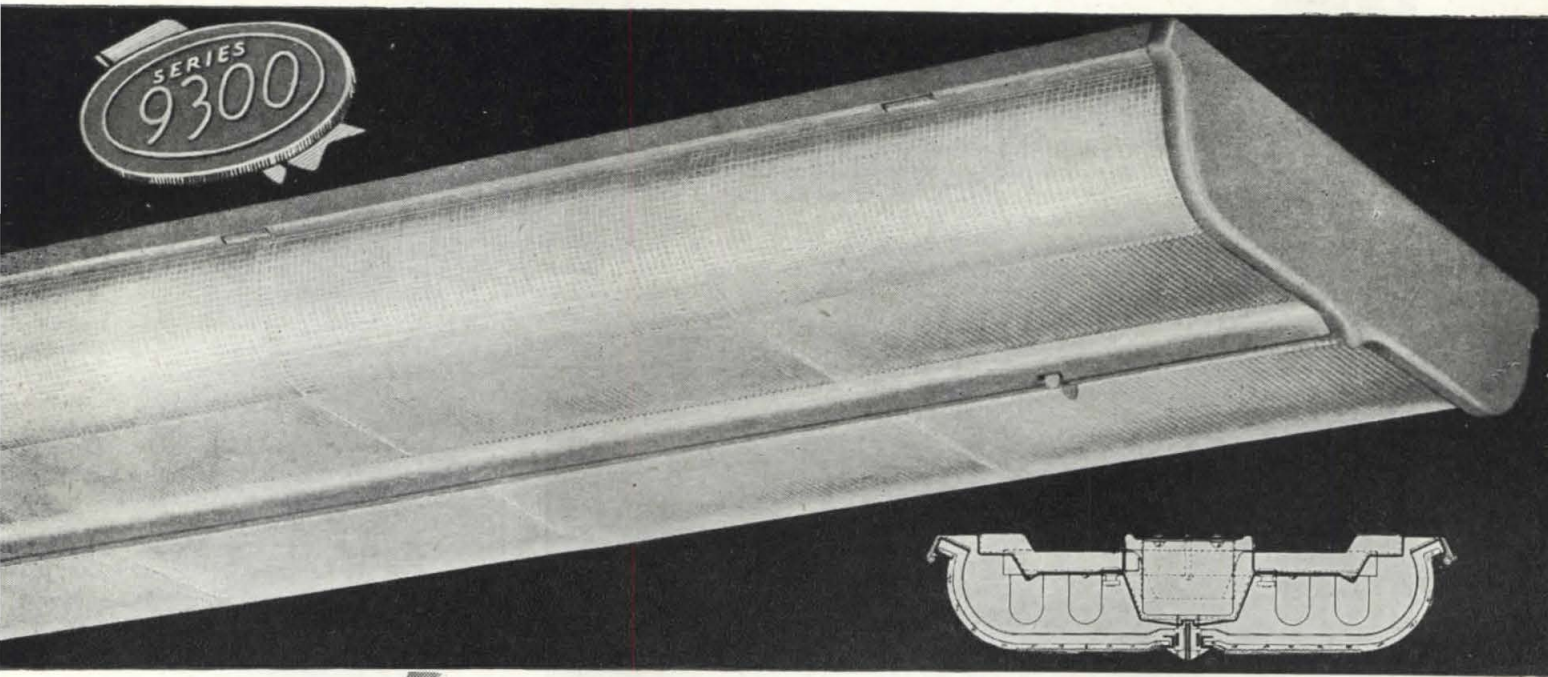

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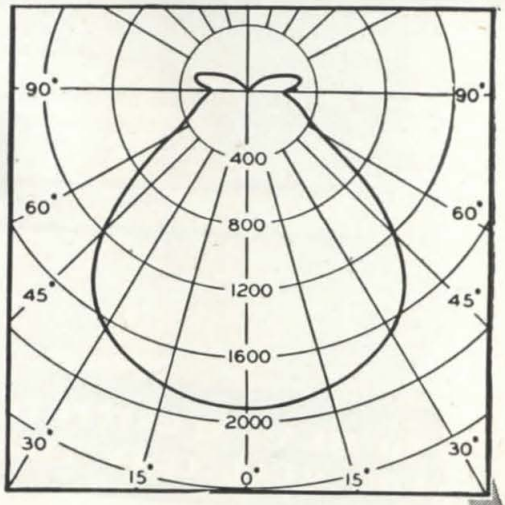

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(Continued from page 122)

draws parallels between the Gothic viewpoint and the architectural-engineering concepts which attract so many today—"the Gothic and the modern architecture of steel, reinforced concrete, and glass share, in their restlessness and dynamism, a fundamental antipathy to the Classic spirit," although he concedes that today's "revolution" is mainly one of materials that have come from engineering discoveries, while the Victorians' was much more moralistic. Still, he insists, both are based on principles involving sentimentalism—"The undue moral reverence for structure preached by Victorians and modernists is a sentimentalism, in spite of its too conscious worship of common sense." His conclusion, therefore, is a rather despairing one.

In the Victorian era, he observes, "engineers were interested in being architects. Now, architects aspire to be engineers." Hence, *he concludes*, "I think that we must submit to the engineers and the moralists of steel and concrete . . . no use to sigh over lost graces, or attempt a Ruskinian imposition of one traditional style. For better or worse, the modernists have the field. It may be we can have no buildings of which a later generation may be proud —at least until out of the structural theories and the mechanical moralisings there comes a return of the old-fashioned belief that architecture is an art."

In the main, this is an exceptionally well documented record of a most checquered century of architectural performance; and the student of architectural influences—whether rational and scholarly, or sentimental and romantic —will read it with profit. G.A.S.

PASSING MONUMENTS

Museum Buildings—Volume I, A Planning Study *by Lawrence Vail Coleman. The American Association of Museums, Washington. 298 pp., 8½ x 11½, illus., $10.00*

Several years ago the late Colonel Lemuel Q. Stoopnagle invented an animal called the "V-tagging blippard" which spent its time (quite logically) tagging v's in MVSEVM BVILDINGS and elsewhere. According to Lawrence Vail Coleman, author of *Museum Buildings* this busy little animal may soon be out of a job, as only four neo-classical museums have been built in the last decade. Judging from the changes that have come over museum practice, education, and architecture, these may be the last. Strange as it seems, this optimistic attitude may not be so far wrong.

Museum people are quite aware of the serious limitations imposed by the bulky monumental building of the past. Coleman briefly traces the history of museum design in the United States and picks 1933 as the turning point; after this the modern movement got underway. A discussion of the museum organism explains the types of museums and the activities carried on by them. The twenty chapters in the book cover every phase of museum planning: siting, design, lighting, space requirements, library and other special areas, service areas and mechanical equipment, materials. There is also a brief chapter on remodeling.

The book is well illustrated and the author has made his selections carefully from the available material. There are a number of very fine examples of modern buildings, including the Museum of Modern Art, Des Moines Art Center, Cranbrook Institute of Science, Portland Museum of Art, the Guggenheim Museum of Non-Objective Art, etc.

(Continued on page 126)

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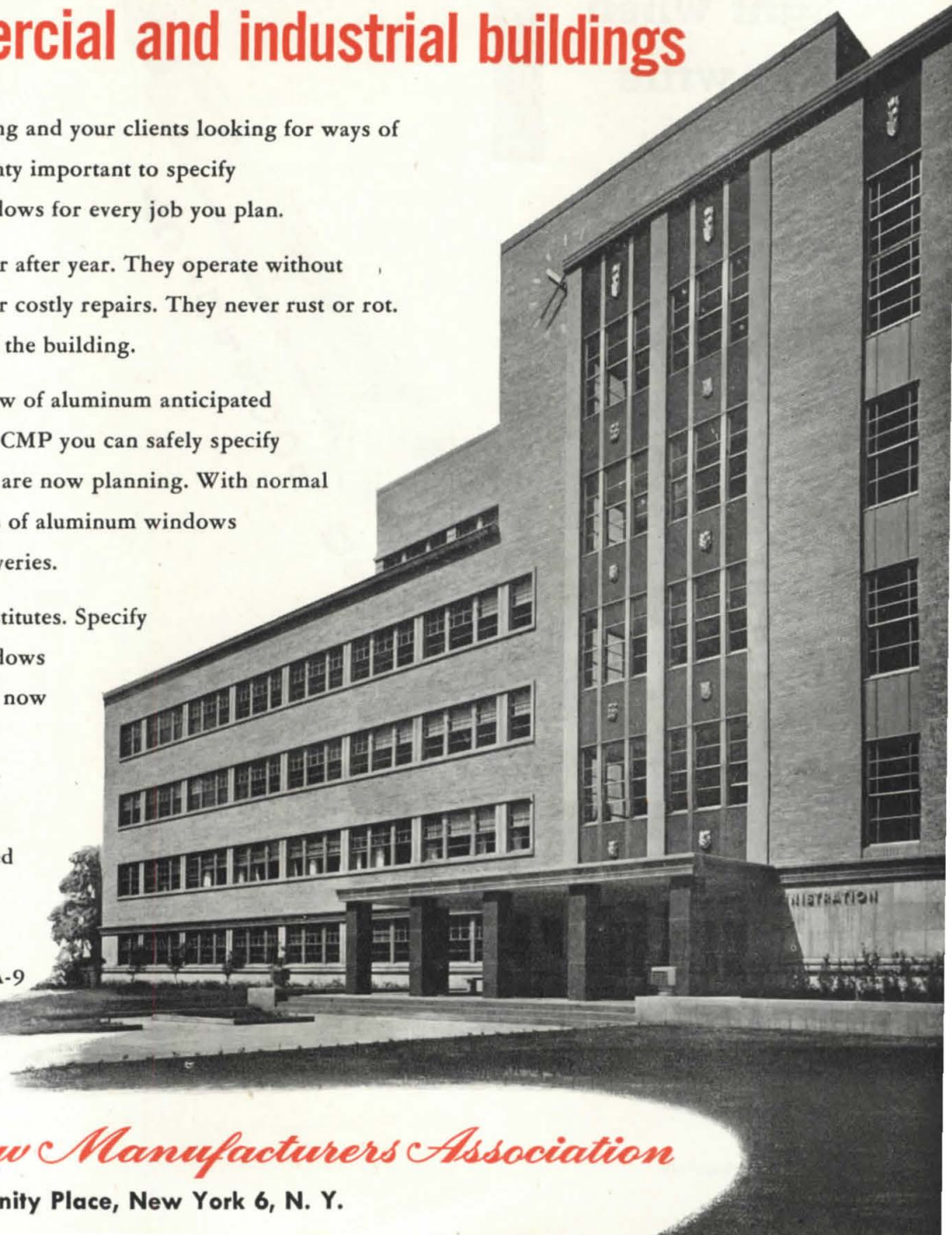


General Service Building
Univ. of Michigan, Ann Arbor, Mich.
Architects: Harley, Ellington & Day

Aluminum Window Manufacturers Association

74 Trinity Place, New York 6, N. Y.

(Continued from page 124)

This book will be invaluable to architects, consultants, museum professionals and trustees, and others who are concerned with museum design. It is *Volume I*, incidentally, of a series. The other parts of the completed work will be two volumes of architectural drawings and photographs of recently completed buildings. W.W.A.

NEW CONCRETE CODE

Building Code Requirements for Reinforced Concrete (ACI 318-51). April, 1951. *American Concrete Institute, 18263 W. McNichols Rd., Detroit 19, Mich. 63 pp. 50 cents*

A new building code adopted as a standard of the A.C.I. at its 47th annual convention last February, allows for improved properties of new-style deformed reinforcing bars. The standard decreases the allowable bond stresses in plain bars and increases the allowable bond stresses for the new type of bar. Top bars—those having more than 12 inches of concrete under them—are assigned lower bond stresses than bars in other positions.

According to the new provisions, all plain bars must be hooked. The new deformed reinforcing bars develop sufficient anchorage by bond alone to correspond to special anchorage with the old type bars and, therefore, hooks are unnecessary in many cases.

The code, written so that it may be used verbatim or adopted by reference in a general building code, also covers the proper design and construction of reinforced concrete buildings. E. T.

SELECTING TERRAZZO

Terrazzo and Mosaic. *National Terrazzo and Mosaic Assn., Inc., 711 Fourteenth St., N.W., Washington 5, D.C. 136 pp., illus. $10*

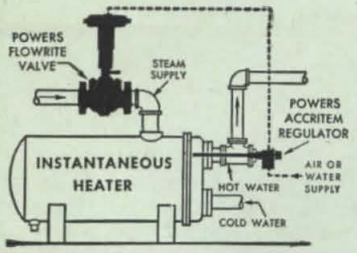
Of interest and service to architects, building contractors, and the building industry in general, this loose-leaf catalog presents a complete story of Portland cement terrazzo. In addition to installation specifications, there are 100 full-color plates of marble mosaic and glass mosaic samples which are easily removable from the binder to facilitate comparison and selection of color and pattern combinations. Structural detail drawings illustrate the application of terrazzo to stairways, wall base, partitions, wainscots, and conductive operating-room floors. Among other informative matter, the book offers data on resiliency tests, the use of terrazzo flooring with radiant heating, a general outline for outdoor installations, and a final page on the maintenance of terrazzo. E. T.

MODULAR ECONOMIES

The Modular Method in Dwelling Design. *Housing and Home Finance Agency, Division of Housing Research, Washington 25, D. C. May 1951. 54 pp. 30 cents*

The first publication on Modular Coordination, put out by the HHFA a few years ago, presented this subject in nontechnical terms for the layman. Their second, and newest effort is aimed at assisting the architect in home building and deals primarily with the application of modular control in drafting practice. Based upon principles developed by the American Standards Association, the brochure was prepared in the interest of lower-cost housing, with the hope that economies in building construction will be achieved by co-operative effort of material and equipment manufacturers, architects, and builders. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

E. T.



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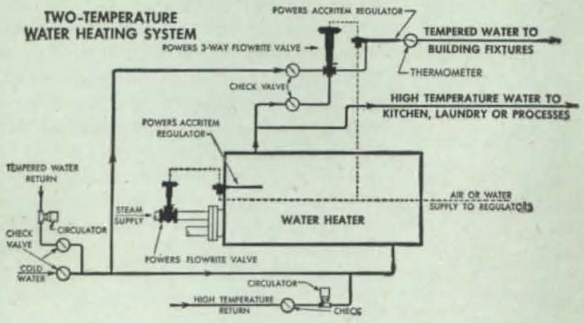

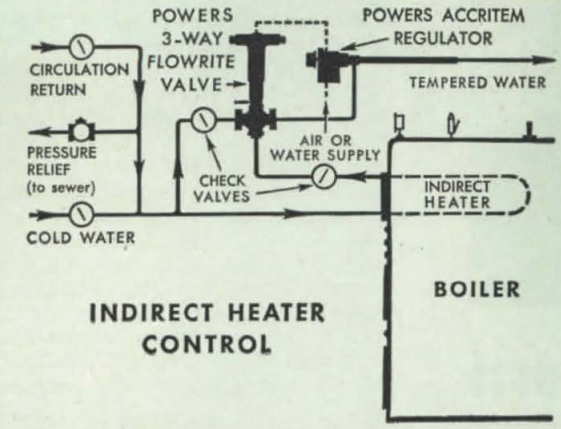

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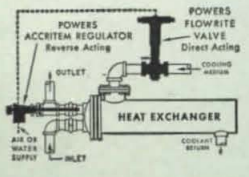
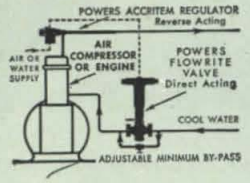
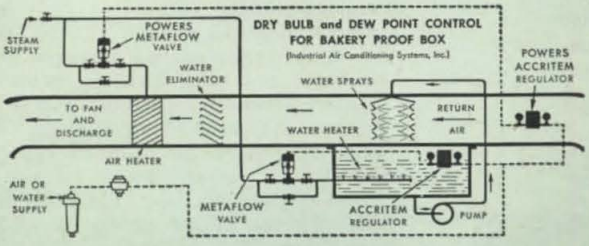
Use Accritem Regulators to control diaphragm operated valves or dampers. They save labor, stop losses caused by over-heating and have the following—

IMPORTANT ADVANTAGES

- ***Adjustable Sensitivity*** and over-heat protection.
- ***Calibrated Dial*** temperature adjustment.
- ***Simple, Rugged Construction*** withstands vibration and insures many years of reliable service.
- ***Temperature Ranges*** 50 to 250° F. and 150 to 350° F.
- ***Easy to Install*** Requires 15 lb. supply of compressed air or water for its operation.
- ***Small Size***—regulator head is only 2⅞" x 3⅝", sensitive bulb is 12" long with ½" I.P.S. connection.







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ACCRITEM HEAT REGULATOR
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(AMH)

60 Years of Temperature and Humidity Control

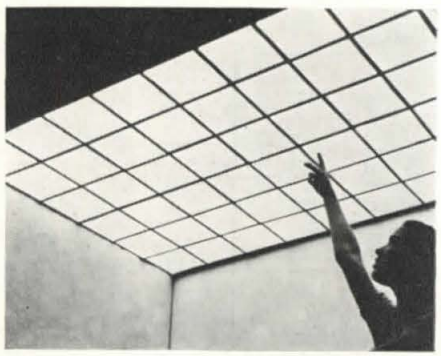
New Area Light Source Eliminates Bulbs and Tubes

Institute of Vision to Assist Architects and Engineers

By Burton H. Holmes

For many architectural lighting requirements, where concentration of energy is of importance or where maximum effectiveness requires redirection and diffusion of the light source, incandescent point sources of illumination have been satisfactory for many years. In 1938, fluorescent line sources of light invaded the illumination field and have been used since that time with remarkable success and fabulous volume for both industrial and commercial buildings. Concurrently, luminous ceilings of one type or another have been desirable for some types of occupancy. Although these have given the illusion of being true area source lighting, their efficiency has been dependent upon the diffusion and radiation of either incandescent or fluorescent sources by such mediums as glass and plastics. (See "How to Design Your Luminous Ceilings" by Parry Moon and Domina Eberle Spencer, June 1951 *Illuminating Engineering;* "Luminous Ceilings and Radiant Heating" by Domina Eberle Spencer, September 1951 PROGRESSIVE ARCHITECTURE.) Recently, however, a genuine area lighting source, involving neither incandescence nor gaseous discharge phenomena, has emerged from the laboratories of Sylvania Electric Products, Inc.

When certain materials are placed in a fluctuating electric field under proper conditions, they are excited to luminescence and continue to emit light as long as the exciting field is maintained. Based upon the foregoing principle, Sylvania's new lamp, called Panelite, consists of a special sheet of conductive glass, on which is placed a "phosphor-dielectric" coating, and a layer of vaporized aluminum. These two coatings add less than 1/100" to the glass itself; there is no limit, other than the practical ones of production equipment and handling facilities, to the area of glass that may be treated. (Experimentation has shown that plastics can also be used.) Wires connected to the edges of the sheet pick up current directly from a regular 120-volt, 60-cycle circuit. Although now in its infancy, this electro-luminescent lamp, a sandwich of light, should someday take its place as a major light source.



These lamps may perform in the following capacities: luminous panels for ceilings, walls, and other structural elements; dials and faces for clocks, instruments, and meters; viewing plates for X-rays, photograph transparancies, tracings, and industrial inspection; indicator devices for elevator panels, exit signs, etc. Panelite lamps, which follow dimming control in a manner similar to that of incandescent lamps, are virtually the complete fixture and as they become better known it is predicted that they will be used as structural materials in their own right.

(Continued on page 130)

SPECIFY

Smoothedge

TACKLESS METHOD FOR PERFECT CARPET INSTALLATION

REPLACEMENT OR REFUND OF MONEY ★ Guaranteed by Good Housekeeping IF NOT AS ADVERTISED THEREIN

WHAT SMOOTHEDGE DOES ★ *Smoothedge* gripper holds the carpet firmly and invisibly from underneath. As a result, ugly tack marks, bulges, and dust-catching indentations are eliminated. The carpet is also easier to take up for cleaning. No special provisions are required for either wood or concrete floors. To specify, merely state, "Carpet to be installed with *Smoothedge* carpet gripper."

EASY TO SPECIFY—AVAILABLE NATIONALLY ★ Handled by over 4,000 carpet retailers and by 68 carpet distributors. Recommended by leading mills for wall-to-wall carpet installations.

SEND FOR A.I.A. FILE AND NAMES OF INSTALLATION CONTRACTORS NEAREST YOU

THE ROBERTS CO., Dept. PS-9
1536 N. Indiana Street, Los Angeles 63, Calif.

☐ Please send me Smoothedge A.I.A. file.
☐ Installation Manual.
☐ Names of nearest contractors.

Name_____

Address_____

City_____

DESIGNED BY RODNEY WALKER ★ DECORATING BY CARROLL SAGAR, AID ★ JULIUS SHULMAN PHOTO

(Continued from page 128)

Commercial availability of the electro-luminescent lamp is limited at the present time to: (1) a green luminosity at 0.1 footlambert when the lamp is connected to a standard 120-volt, 60-cycle circuit; (2) a green luminosity not over 2.0 footlamberts when a 500-volt step-up transformer is made part of the circuit. Sylvania claims that this colored light at two footlambert brightness would be quite noticeable in any interior lighted up to 5 or 8 footcandles. This level would include most rooms in the home, amusement places, lobbies of certain buildings, and similar areas where lighting for critical vision is either not required or provided only for localized areas. The lamp is the coolest of all sources, as it has no cathode or filament concentration. For present applications, the operational temperature is unnoticeable to the human hand. Its life should be indefinite; the end will coincide with the period when lamp brightness has decreased to a level which is inadequate—rather than the usual type of abrupt termination due to filament or cathode failure. Operational costs are moderate; even with the use of a transformer, which builds up brightness and therefore requires more power, a 4′ x 6′ panel consumes less energy than a 25-watt light bulb.

Besides green, golden yellow, soft blue, and daylight lamp colors have been developed and will *soon* be commercially available. Although the architectural applications of this new light source are in the early stages of development, it is anticipated that Panelite lamps will be improved to a point where they can be used successfully as primary lighting sources for offices, commercial buildings, and other occupancies requiring higher illumination levels.

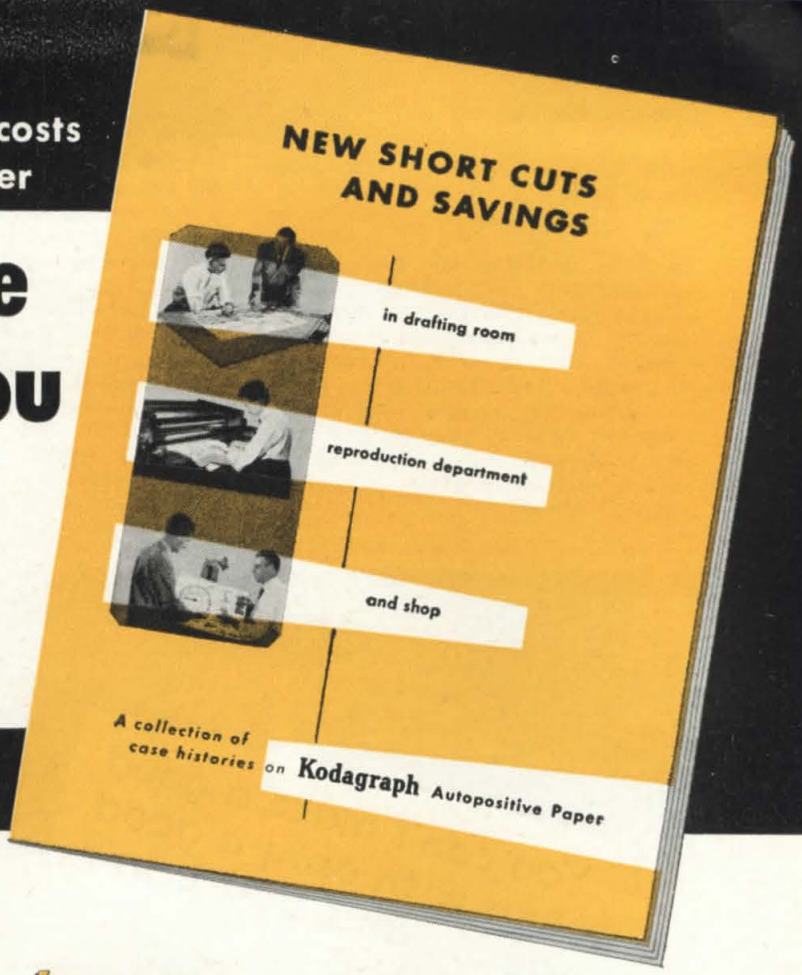
●

From the countless pieces of literature that cross one's desk during a month's time, it is refreshing to come across one that has more distinction than the others. Some are unusual because of the excellence of the technical data presented (see starred reviews in P/A MANUFACTURERS' LITERATURE); in some, the rugged efficiency of engineering equipment is subtly complimented by the more delicate contours of the human form (see Creighton's August 1950 and September 1951 P.S.); and, once in a while, an unintended bit of humor creeps into the copy of a serious-minded public relations manager. Recently, we received a letter describing the activities of a well known perforating company in the architectural and building field. Their enthusiastic note stated: "The 68-year-old firm, largest and oldest in the field, does a 2½ to 3 million-dollar business a year supplying industry with nothing more than holes in various materials." It would seem that this effort approaches the business

(Continued on page 132)

Thousands of companies are cutting costs with Kodagraph Autopositive Paper

...this new, free booklet shows you how



Here you'll find a selection of case histories illustrating the many different ways industry is using Kodagraph Autopositive Paper—the low-cost photographic intermediate material...which gives you positive copies *directly;* which can be handled in room light...and printed with existing equipment.

Interesting and Profitable Reading

how the American Brake Shoe Company (Kellogg Div.) . . . broke the bottleneck in reproducing blueprints.

how the Cleveland Crane and Engineering Company . . . saves creative drafting time.

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how the Crompton & Knowles Looms Works . . . simplified its engineering drawing files.

how the Ford Motor Company . . . saves $75,000 per year in retracing costs.

how the Heald Machine Company . . . produces photographic intermediate prints at a new low cost.

how the Ingersoll-Rand Company (Compressor Div.) . . . salvages old drawings . . . employs ingenious short cuts in drafting.

how the M. W. Kellogg Company . . . assures photo-lasting intermediates for its overseas branches.

how the State of Virginia, Dept. of Highways . . . saved thousands of man-hours in its drafting room.

how Palmquist & Wright . . ."insures" its drawings at low cost.

Valuable information for every architect, engineer, and draftsman

On every page of this concisely written, well-illustrated booklet, you'll find factual information which can be converted readily into savings in your company.

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Kodak TRADE-MARK

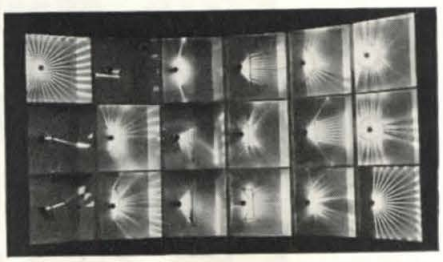
(Continued from page 130)

man's dream of achieving a 100% margin of profit.

●

To assist architects and engineers in the solutions of their lighting problems, a Light and Vision Institute has been recently incorporated into the newly enlarged offices of the Holophane Company in New York. The Institute, which also forms an integral part of the company's research program, is a demonstration area for newly developed lighting methods and the systems of prismatic control.

Within this display and lecture room, the Holophane engineers have installed a new conception of vertical surface lighting produced by a controlled lens of concave cross-section. Built into the ceiling is a type of surgery lighting which develops 3000 footcandles to facilitate the televising of surgical operations. On one wall, an impressive control board, divided into a series of compartments, demonstrates selected examples of light redirection through prismatic control. Backlighted photomurals illustrate significant installations covering a wide range of illumination projects. In all instances, quality lighting is provided for industrial, commercial, and institutional needs without extensive use of critical materials.



This institute of vision will also be of interest and service for public utilities, industrial safety groups, architectural and engineering students, optical societies, and electrical distributors.

NOTICES

Fellowship

THE ALBERT FARWELL BEMIS FOUNDATION has announced the awarding of its Fellowship in Housing for 1951-1952 to JAMES W. HANSON, graduate in economics of the University of Nebraska, who worked in the Graduate School at M.I.T., and in the Department of Economics there.

New Addresses

WILLIAM G. LYLES, BISSETT, CARLISLE & WOLFF, Architects-Engineers, Addison Apt. Bldg., 831 E. Morehead St., Charlotte, N.C.

MARCELLUS WRIGHT & SON, Architects, Crozet House, 100 E. Main St., Richmond, Va.

New Practices, Partnerships

GEVES GEORGE KENNY and BURT V. STEVENS announce the formation of a partnership under the firm name of KENNY & STEVENS, Architects, 311 Kenilworth Drive, Akron 3, Ohio.

JAMES D. CARTER, Architect, announces the opening of his office at 3244 De Saix Blvd., New Orleans 19, La.

Awards

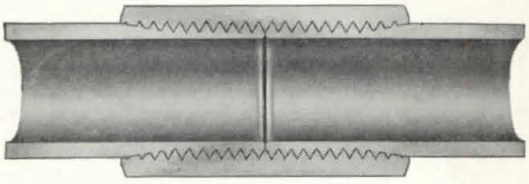
The Architectural League of New York has announced the award of the prize and Honorable Mentions in the BIRCH BURDETTE LONG COMPETITION for architectural renderings.

First prize went to ROBERT SCHWARTZ for his pencil and wash drawing of The Swifton Shopping Center, Ketchum, Gina & Sharp, Architects. Honorable Mention went to EDWARD P. CHRYSTIE for his water color of the American Cemetery Memorial in Luxembourg, Voorhees, Walker, Foley & Smith, Architects. A second Honorable Mention went to GEORGE COOPER RUDOLPH for his water color of the Good Housekeeping Model House, Cliff May, Architect.

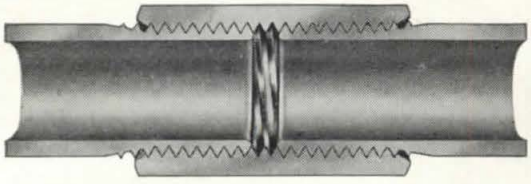
IT'S FORTIFIED FOR LIFE-TIME PROTECTION

SPECIFY NATIONAL ELECTRIC SHERARDUCT

To Keep Wiring Safe, PERMANENTLY



SHERARDUCT COUPLING—All surfaces and threads are Sherardized. Accurately undercut threads permit completely closed joints—no raw threads exposed—no gaps to interfere with the easy fishing of wires.



ORDINARY COUPLING—Raw threads meet raw threads—accelerates rust—weakens joint. Threads exposed in gaps trap wire ends and make the fishing of wires difficult.

FULL WEIGHT . . .

THREADED . . .

RIGID STEEL CONDUIT

When the job calls for a conduit that must withstand the test of time—there's only one *Sherarduct!* Sherarduct is a rigid steel conduit that is permanently rust-proof. The zinc protective coating alloyed to the steel by the special Sherardizing process will not crack or peel. Sherarduct is heavy-walled, threaded, smooth inside to assure easy fishing.

NATIONAL ELECTRIC PRODUCTS — WIRING SYSTEMS 6 — WIRES AND CABLES

National Electric
PRODUCTS CORPORATION

1328 CHAMBER OF COMMERCE BLDG., PITTSBURGH 19, PA.

out of school

By CARL FEISS

This is the second anniversary of this column; the twenty-fifth in a row. What a lot of words! C. F.

I was in Puerto Rico and the Virgin Islands the other day. You have all seen pictures of the Caribé-Hilton Hotel. Even if it dates me, I'll say it's very, very good. I also saw the Virgin Isle Hotel at Charlotte Amalie. Travel is broadening.

One of the fun things about traveling is that one encounters so many interesting architectural endeavors in unexpected places. Henry Klumb of San Juan is too little known on the mainland. His industrial-vocational schools at Arecibo, Ponce, and Mayaguez are exciting, and among other fine works I singled out his new Science Building at the University of Puerto Rico in the suburbs of San Juan and his own home nearby. This latter, which is quite unphotographable, is a house without exterior walls. It can be best described as a high-spirited veranda, decorated with space and tropical foliage and further embellished by charming people. You can't beat that kind of architecture.

●

The main issue before us today is the following letter about a proposed national magazine run by and for architectural students. Here is the letter in full from Editor-in-Chief Julian Sacks, a student in the Department of Architecture, Catholic University, Washington, D. C.:

Dear Mr. Feiss: At the recent Convention of the American Institute of Architects a student representative body of 21 schools formed a national student architectural publication called *Line Magazine, Inc.*

There has long been a need for a medium of communication and exchange of ideas among the students of various schools of architecture and planning. It is not the purpose of the professional periodicals to do this. Occasionally, these technical journals have published student work; however the body of this material has been scant and certainly insufficient to unite more closely the students in this country, and to provide for what we would like to call a friendly interchange of ideas and a healthy competitive spirit.

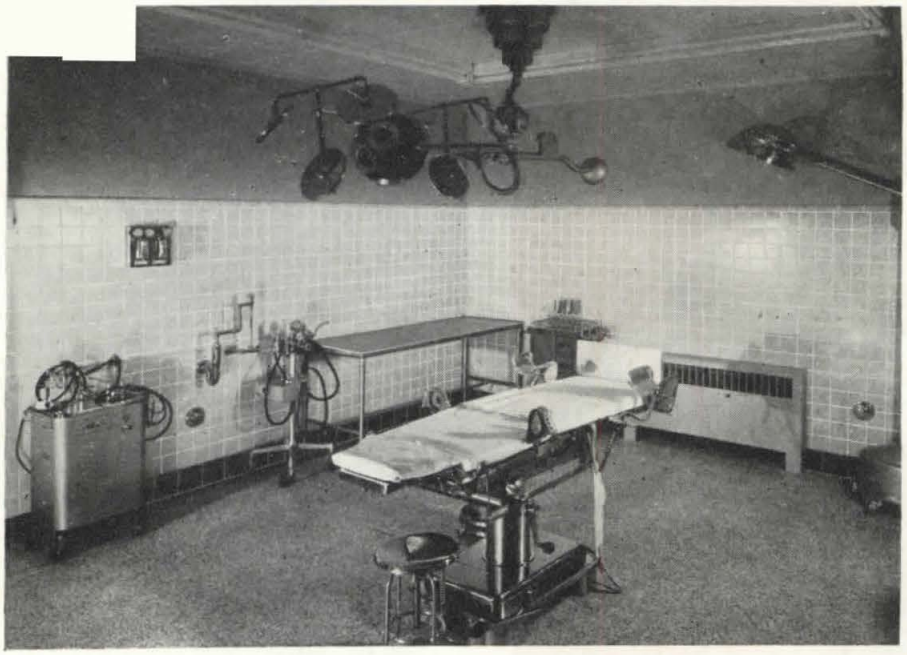
As a magazine of, by, and for the students, it is not aimed at the practicing professional; but we certainly would welcome articles and letters aimed at the student from prominent men in the field. However, it is desired that the bulk of the material come from the pens, boards, and minds of students. It is our aim to broaden the scope of the student's interest beyond the drafting room, as well as in the drafting room. We hope that through this publication the students of the United States and foreign countries will find a medium of self-expression, and that problems of interpretation of curricula could be examined freely and with tolerance, and ideas on design, construction, use of environment, and social concepts could be given illustrations and commentary.

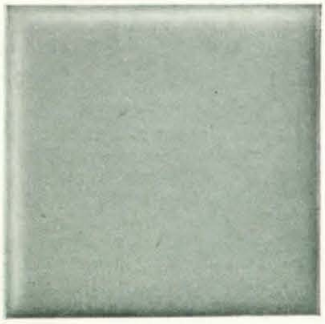
The idea of a student publication of this sort is not a new one; many times and in many schools it was brought

(Continued on page 136)

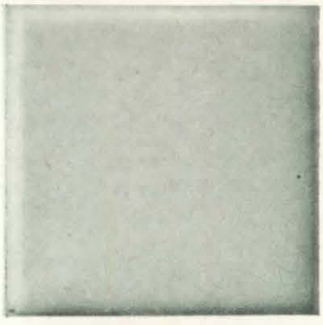
softly-shaded and functionally correct . . .

the new, beautiful Suntile colors increase the efficiency of any HOSPITAL INTERIOR!





Sea Green 511



Light Sea Green 513

Suntile SEA GREEN, LIGHT SEA GREEN

Recommended for hospital surgery

Shown above are two tones of Suntile Sea Green—an original and modern color designed by Suntile with the aid of Faber Birren, nationally known color authority. The soft tone Sea Green is recommended for surgeries and operating rooms; the bright tone Light Sea Green for other service areas. Both of these are carefully balanced green tints with a special satin finish. The tint is complementary to the color of human tissue and complexion—and will aid vision and reduce ocular fatigue for the surgeon. Both of these Suntile backgrounds present a dignified appearance, are visually restful and physically durable. These are only two of a complete Suntile line of 12 functional colors, adaptable to all parts of a hospital.

you get the right color plus the permanence of real clay TILE!

Can color help hospital interiors fulfill their functions *better?*

Color authorities say "yes."

There's a *right* color—a most suitable, most beneficial color—for surgeries, wardrooms, corridors, and cafeterias . . .

The *right* color can relieve eye strain of doctors—impart visual and emotional benefits—provide a restful and cheerful environment for both patients and staff.

Suntile's beautiful new line of softly shaded colors has been scientifically developed to *fit the function of interiors*—not only in hospitals but in schools, institutions, commercial and industrial buildings.

This "color-fitted-to-the-function feature" gives you another reason for selecting color-balanced Suntile for walls and floors. Other well-known reasons for choosing this *real* clay tile are: permanence, ability to withstand heavy use, sanitation, ease of cleaning, low maintenance!

Write Dept. PA-9 for our new color booklet "Suntile Functional Color Recommendations." See your local Authorized Suntile Dealer. The Cambridge Tile Mfg. Co., P.O. Box 71, Cincinnati 15, Ohio.

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SUNTILE OFFERS YOU BOTH • BETTER TILE • BETTER INSTALLATION

out of school

(Continued from page 134)

forth, and only too often the idea has turned into failure. The one great cause for the failure was the lack of continuity.

At the convention in May, the necessary machinery was set up to overcome this obstacle. The organization of *Line* will be governed by a board of directors made up of students from all parts of the country.

We have divided the country into 11 regions. Those schools that wish to take an active part in this magazine will each form a Magazine Group, and representatives of these groups will make up the Regional Board which will elect one student as the Regional Editor. The combined group of 11 Regional Editors form the board of directors, headed by the editor-in-chief. The Board will meet annually, perhaps taking advantage of the A.I.A. Conventions, to decide the theme of the issues for the following year. The Board's report will be sent out to all the Magazine Groups, and it will be their job to assimilate the material from their school and forward it to the Regional Editor. The Regional Editor will choose the best examples of student work to represent his area, and will forward it to the editor-in-chief for final assembly.

This magazine is to be a nonprofit corporation and the subscription rate is to be as low as possible. We have asked the schools to underwrite us for subscriptions amounting to not less than 25% of their architectural enrollment.

At our first general meeting 21 schools were present and they all expressed their desire to support our magazine. From this group the board of directors was set up and further discussed the mechanics of this publication. There will be a permanent business office; however, the editorship will rotate from school to school each year. The proposed magazine will be a "quarterly" publication, but with three issues distributed each year. Due to the approaching summer vacation it would be impossible to produce the first issue before February 1952.

I am sending you photographs showing how we have divided the country into its respective regions, and the table of organization I have previously outlined.

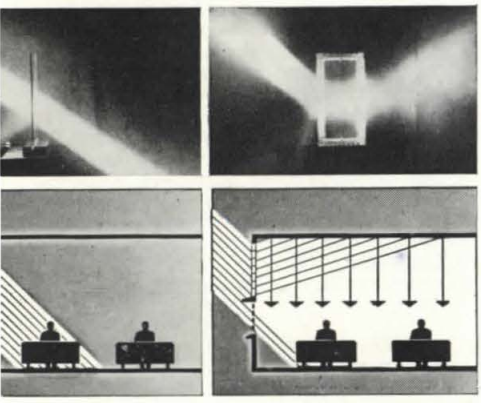
As Julian Sacks states, this is anything but a new idea, but it is worthy of every supporting effort possible. Such a publication has been discussed by American architectural students since I was one myself! While a number of student publications have been born and have died young, they have most commonly been localized efforts within an individual school. In some instances, subscriptions from the outside were solicited but even so there was failure. I am not an authority on the subject so I can only guess at some of the reasons for dissolution. I would hazard that:

First: The student editors grew up, graduated, had to earn a living and

(Continued on page 138)

Technicians studying daylight illumination in the Test Room section of the Daylight Laboratory. Special light meters on desk tops read and automatically record illumination twenty-four hours a day throughout the year.

ONLY "DAYLIGHT" GOES TO SCHOOL HERE FOR Daylight Engineering STUDY



Direct sun causes uncomfortable brightness near windows, extreme contrast in other parts of room. Insulux Fenestration directs and spreads daylight to ceiling, keeps brightness at comfortable levels.

IN THIS SPECIAL one-room "schoolhouse," built by the Daylighting Laboratory of the Engineering Research Institute, University of Michigan, daylight is studied, tested, optical principles researched to learn how to get the highest *quality* light from daylight . . . to make it do a better lighting job.

To permit study of daylight in rooms of varying sizes and shapes, both ceiling and wall sections are movable. Ceiling sections may be lowered or tilted . . . wall sections are movable to permit variations in room size. Special light meters automatically record illumination.

One significant better-daylighting result is the development of Insulux Light Directing Glass Block No. 363. This new block controls light so efficiently that a building virtually "turns with the sun." Entire glass areas transmit free daylight from early morning to late afternoon.

A Daylight Engineer will be glad to show you the benefits the new Insulux Glass Block® can bring to your structures. Just write: Daylight Engineering Laboratory, Dept PA 9, Box 1035, Toledo 1, Ohio . . . Insulux Division, American Structural Products Company, Subsidiary of Owens-Illinois Glass Co.

INSULUX GLASS BLOCK

INSULUX FENESTRATION SYSTEMS

— by the leaders of Daylight Engineering

out of school

(Continued from page 136)

neglected to establish a line of succession.

Second: The publications aped the commercial architectural magazines but could not swing the business management end; costs of editing, photography, printing, office management, mailing, *et al*, being what they are.

Third: That ideas wore thin, that the sponsors were hopeful designers and not journalists.

Fourth: That these were not national in scope or intent.

I sincerely hope that *Line* will succeed (despite its dull name). Whether or not the suggested organization pattern is unwieldy, remains to be seen. The main thing to hope for is that the infant about to be born will have blood coursing through its veins, will emerge with not only a few lusty yowls but will continue to grow, feeding greedily on the never-ending ideas and problems which all architectural and planning students wish to discuss among themselves. The main problem, it seems to me, is going to be to winnow the nourishing wheat kernels from the preponderance of chaff which as widespread a source of supply could dump into a central bin. To do this will require a sieve of fine mesh, woven with skill and purpose.

What is the program for *Line?* (Isn't architecture more than line?) What are some of the issues and principles it hopes to develop? Without a burning work program there will be no incitement to violence. Without a basic cause other than a *kaffee klatsch* the magazine will die like all the rest.

●

In England and Austrialia, there are going national student organizations serving the architectural schools. They are apparently working to programs of their own. The name of the journal of the Architectural Student's Association of Great Britain is *Plan.* I cannot judge the strength of the organizations but let me quote here from *Aspect*, March 1951. This is the "news sheet" of the Australian architectural students.

"This news sheet is published by a national organization of architecture students. There are about 1000 of these students in Australia; there are 10 Architectural Schools. Co-operating in this national organization are the following bodies: The Architectural Student Association of West Australia, South Australia, Tasmania, and Queensland; the Victorian Architectural Students' Society; the A. S. Clubs in Melbourne University, Melbourne Technical College, and Sydney University Architectural Society.

"The name of this high-falutin' octopoid? It is the Architectural Students Bureau of the National Union of Australian University Students. But, you exclaim, half the Architectural students in Australia go to Technical Colleges. And so, in order to get everything properly fixed up, 22 architectural students from five states agreed unanimously to the following motion, when it was put at the recent student congress in Adelaide: 'That this meeting of individual architectural students, and representatives of various architectural student clubs, Associations, and societies, recommends that steps be taken by the A.S.B. of N.U.A.U.S., towards the formation of an Architectural Students Association of Australia as soon as practicable.' So this is really the first aim of the Bureau. The date set for its accomplishment is March, 1952. The main permanent aims of this organization are as follows:

(1) To improve the standards of architectural education. Students can do this (a) by research, in committees or groups; (b) by surveys of student opinion; (c) by direct discussions at summer congresses, lunch-hour meetings, and week-end conferences; and (d) by presentation of the results of research, surveys, and discussions to the

(Continued on page 140)

out of school

(Continued from page 138)

heads of the schools, and to the Institute's Board of Education, and to other particular bodies that have influence over our training.

(2) To promote inter-specialist, inter-school, and international student understanding; to improve staff-student relations. This can be done by exchanges of publications and exhibitions; by facilitating interstate and international travel and employment; combined with summer congresses and week-end camps, etc.

(3) To campaign for improvements in architectural student scholarships, rates of pay, etc.

(4) To represent the interests and opinions of Australian architectural students before bodies which make decisions affecting our education; e.g. the R.A.I.A., the N.U.A.U.S., the F.A.T.C.S; and the Commonwealth Universities Commission.

(5) To act on any other matters raised by students through their local representatives.

"The function of this publication is to act in accordance with the aims set out above, and to serve as a forum for Australian architectural students' opinions.

"Here then are some proposals for the reform of architectural education, to start discussion. They have been adapted from the educational reform policy of the Architectural Students' Association of Great Britain.

(1) Design programs with sites and clients to which the student has access.

(2) Group-working on design subjects.

(3) Students working as laborers on building sites, as part of their course.

(4) Staff-student participation in public criticism of building and planning proposals.

(5) Workshops in the schools, for the experimental study of materials and techniques.

(6) Students working in factories and studying machine techniques and processes on the spot.

(7) Joint programs with students of other faculties, such as medicine, economics, social science, engineering, psychology, and the natural sciences.

(8) Collaboration with students of painting, sculpture, and the other arts from the start of design programs.

(9) Joint work between students of different years in the five-year course.

(10) Substitution of formal lectures by free discussion wherever possible.

(11) Control of the school curriculum by joint student-staff committees.

(12) The study of architectural history as a fuller view of the present, rather than as an academic catalog of forms, e.g. a measured drawing should be produced not as a purely visual record of a building, but as a complete analysis of the form, function, structure of the building in its social context."

These aims and proposals are interesting indeed. I would not presume to

(Continued on page 142)

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out of school

(Continued from page 140)

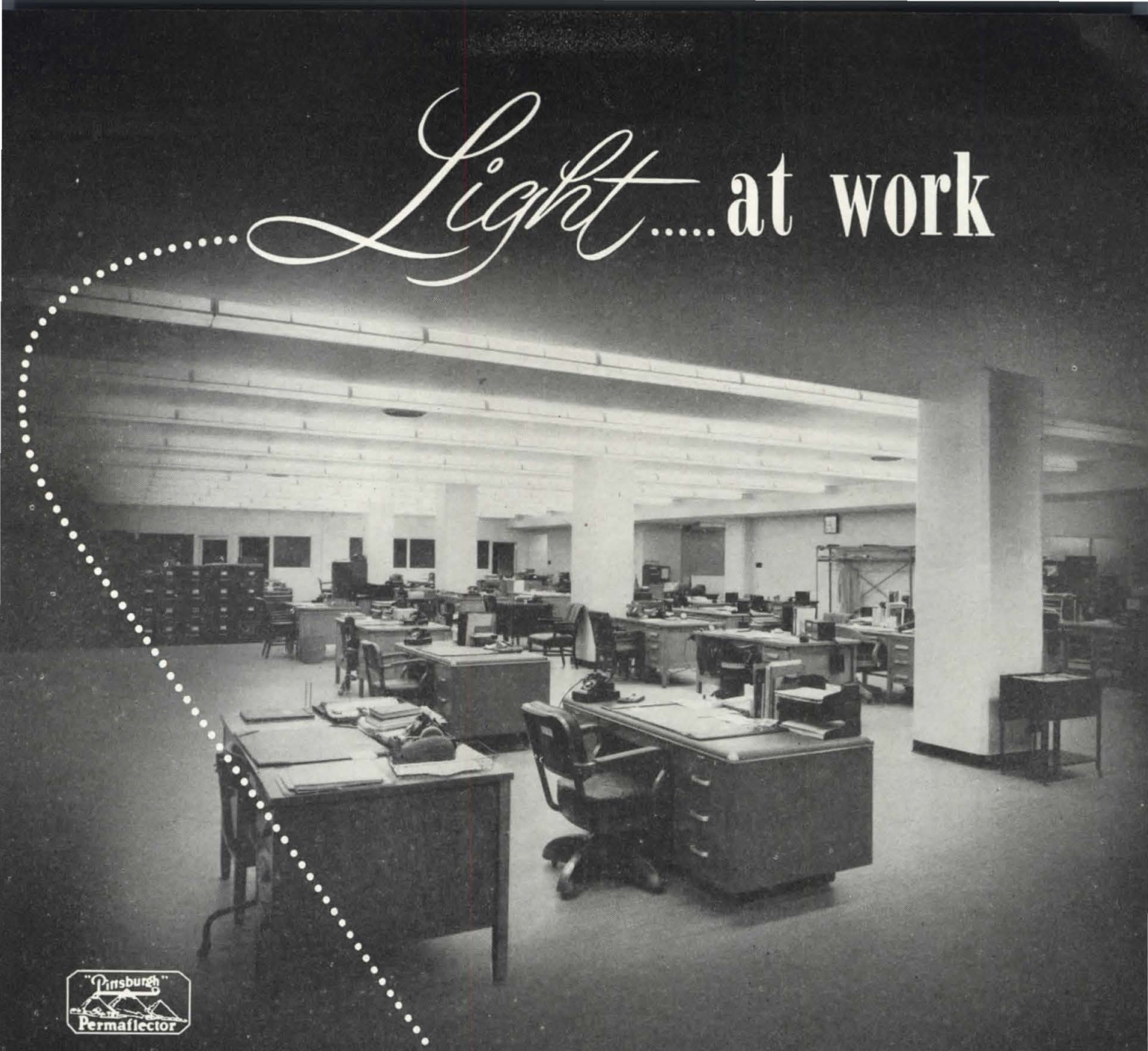
criticize them, or give them approval either, since I am unfamiliar with Australian problems. Theirs would be a simpler one than our, however, despite comparable size of country, because of only 10 schools as against our 70 plus. While in Great Britain there are nearly as many schools as ours, the area of the U.S. being nearly 40 times greater again militates against comparability. Our widely dispersed schools growing out of evry kind of stimulus, differing in size, budget, status, and (above all) in teaching skills and degrees of liberalism or conservatism (depending on which way you look at them), present very widely diversified situations. Students hoping to find willing and sympathetic ears of other students on which to air their troubles, may find their audience either disinterested or unsympathetic. That is *another* reason why an agenda is important for *Line* if its editorial policy is to be more than just a "line."

I am going to hazard a suggestion here for those students interested in *Line* and in the continuity of a student paper. Sooner or later you are all going to want to join the A.I.A. Many have already joined student chapters of the A.I.A. Yours is a different organizational pattern than the Australian and British. The student chapter of the A.I.A. is, in my opinion, the key to a possible continuity of the magazine and of a sound method of developing policy within each school. I know that most students rebel at the thought of being "controlled" from the Octagon. I don't blame them. On the other hand, I have seen little evidence that the Octagon is controlling student chapters—or for that matter, could. If the chairman of the student chapter could and would also serve as the chairman of the magazine group for each school (or schools, where there are more than one to a chapter), an immediate relationship of value would develop between student chapters and student magazine. As the student chapters gain in strength and usefulness, *Line* (or by any other name) would grow in strength and purpose. There is at present no organ of intercommunication between student chapters other than the A.I.A. secretariat. This does not afford a vehicle satisfying the purpose of *Line* as I understand it.

This is purely gratuitous advice. But I am also interested in the outlook for the young architect's future professional organization, the A.I.A. New blood, new ideas, and experience in nationwide thinking can prove invaluable in the development of future A.I.A. leaders. And local A.I.A. chapters—the full, professional chapters — will gain by strong, purposeful student chapters. The thing works both ways. Students

(Continued on page 144)

Light.....at work



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out of school

(Continued from page 142)

must gain their experience working with practiced architects and planners, most of whom are members of the A.I.A. or A.I.P., whose advice and experience in practice must be sought by both *Line* and the student chapters of the A.I.A. With luck and good management on everybody's part, perhaps a formula could be achieved wherein the Regional Divisions suggested in the *Line* organization could coincide with the student chapter locations. I think they do in part, anyway. Then, still looking into the future, the day might arrive when the Octagon could become a central secretariat and permanent home for *Line*. I am not thinking of the Octagon as an editorial office but as a mailing center, subscription, and management headquarters. In the long run, this would be the sensible thing to have happen. For, don't forget, no periodical anywhere has an annual turn-over of both editors, business managers, and business address. There are funds to be handled, bookkeeping, accounts, and records of real value. These cannot float from school to school through the years.

The A.I.A. will also have to be sold on some of these ideas. It has a busy home office and it would be willing to assume such responsibilities, I am guessing, only when the case has been made that students *want* to intercommunicate and have the get-up and gumption to *try*. Come on students, get a program together and help Julian Sacks put this thing over! There will be plenty of us old-timers who wish you well, if you really mean business.

Good luck for the new school year!

NOTICES

Fulbright Awards

The Conference Board of Associated Research Councils, the Committee on International Exchange of Persons, has issued a booklet announcing the FULBRIGHT AWARDS for 1952-53 in Europe and the Near East. Those interested may obtain copies of this booklet, together with a newly-issued booklet, *The Fulbright Program*, which contains general information about the awards and should be read in connection with the program announcement, by writing to the above Board at 2101 Constitution Ave., N.W., Washington 25, D. C.

New Addresses

LEVY & SCHEINGARTEN, Architects, 699 Newark Ave., Elizabeth 3, N. J.

ROBERT E. BUCHNER, Architect, 1341 S. Boston, Tulsa, Okla.

CRONHEIM & WEGER, Architects, N.W. Corner 20th and Walnut Sts., Philadelphia 3, Pa.

New Practices, Partnerships

ROBERT E. ROBERTSON, JR., announces the conclusion of his partnership in the former firm of WILLIAR & ROBERTSON and the continuation of his practice as ROBERTSON & ASSOCIATES, Consulting Engineers, 339 St. Paul Pl., Baltimore 2, Md.

BRUEGGEMAN, SWAIN & ALLEN, Architects announce the dissolution of this partnership. EDWARD F. BRUEGGEMAN will continue to practice at 808 Pyramid Bldg., Little Rock, Ark. GUY W. SWAIN and WILLIAM S. ALLEN will continue to practice under the firm name of SWAIN & ALLEN, Suite 331, Gazette Bldg., Little Rock, Ark.

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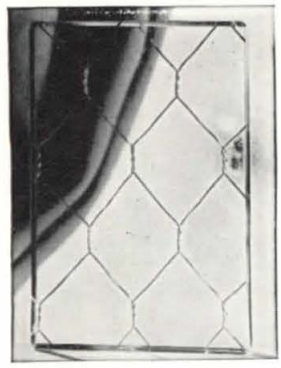

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Ad No. BRD-113—This advertisement appears in:
Interiors—Aug., 1951
Progressive Architecture—Sept., 1951

it's le law

By BERNARD TOMSON

The United States Court of Claims recently decided a case in which were described the trials and tribulations of one architect's dealings with the United States Government, that should serve as an object lesson and as a danger signal to all others similarly situated.

Perhaps a question and answer period, using quotations from the case, is in order:

Question: Does the following constitute duress?

"Upon arrival at Memphis, Mr. H. *(the architect)* went to the office of Colonel G. W. Miller, Executive Assistant to the District Engineer. After waiting in the outer office for two days Mr. H. was allowed to see the Colonel who met him with severely critical language and threatened to throw him off the job. Mr. H. was then handed a contract purporting to cover the fixed fee for the new work and was told by the Colonel, 'You can take it or leave it. That is it.' He took it voluntarily, as we have found, but was doubtless motivated in so doing by the prospect of loss of work, impairment of credit, and the unnecessarily overbearing conduct of the Colonel."

Answer: No.

(By the Court) "We do not find that this amounted to duress upon the plaintiff."

●

Question: ". . . the contract reads in its parts pertinent here, as follows: . . . All disputes arising under this contract shall be decided by the Contracting Officer whose decision shall be in writing subject to written appeal by the Architect-Engineer within thirty (30) days to the Secretary of War or his duly authorized representative, whose decision shall be final and conclusive upon the parties hereto . . .".

The architect waits thirty-four (34) days before appealing. What rights does the architect have to recover his just fees where the Court finds that "many of the facts are in plaintiff's (architect's) favor?"

Answer: None.

(By the Court) "As we see it, there is no necessity to go into any of these questions except one because the tragedy of the plantiff's situation is that it has failed to exhaust its administrative remedy before coming to this Court . . . It follows that when a contractor *(or architect)* chooses without due cause to ignore the provisions of Article 15 he destroys his right to sue for damages in the Court of Claims. That court is then obliged to outlaw his claims, whatever may be their equity. To do otherwise is to rewrite the contract."

●

The full story revealed in the opinion has all the fascination of a horrible example.

The architect, in 1942, accepted a letter contract offered by a United States District Engineer and thereafter entered into a cost-plus-fixed-fee archi-

(Continued on page 150)

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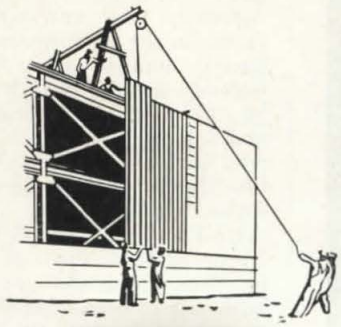

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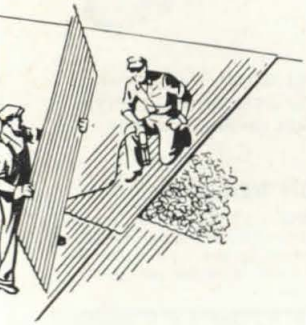

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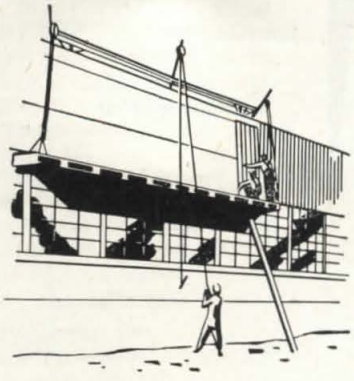

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it's the law

(Continued from page 148)

tect-engineer contract in connection with the construction of a bombardment station in Tennessee to cost $2,466,750. For the designing, Mr. H. agreed to a fee of $10,650, and to a fee of $7,100 for supervision. (As I figure, this is less than 1%).

Shortly after completion of the design the United States Government decided to change the type of installation being built. The cost of the new project was now estimated at $5,647,950. Upon the issuance of the new directive effectuating this change, the architect was instructed to perform the necessary redesigning which he did. Unknown to Mr. H., the District Engineer's office at Memphis obtained approval for its own rough layout for the new project, and let contracts on the basis of this inadequate plan—all while H. was laboring on the new drawings. This made his new drawings as useless as his old ones.

As might be expected, because of the inadequacy of the District Engineer's drawings upon which the contracts had been let, serious difficulties arose in the execution of the plans and the performance of the work. It became necessary for Mr. H. to redesign much of the work. These circumstances caused an investigation by Washington and the result of the investigation reflected no credit upon the Memphis office or its co-operation with Mr. H.

Mr. H. claimed additional compensation because of the added designing necessary, the unwarranted interferences in the performance of his work putting him to great extra cost and expense beyond what would ordinarily be encountered in contracts of this sort, and for extra work done for which he was not requested in writing to do. He also claimed that he signed the changed contract under duress.

On February 14, 1945, the contracting officer made findings of fact in which he determined that he was without authority to decide the matter of duress in connection with the signing of the changed order and in findings on the other matters—and disallowed the architect's claims.

On March 20, 1945 (thirty-four days after the contracting officer's decision), Mr. H. appealed to the Secretary of War. The War Department Board of Contract Appeals dismissed the appeal because it had not been taken within the prescribed time stated in the contract. Upon this disallowance the architect brought an action in the Court of Claims which, as stated, denied him any recovery.

To Summarize:

(1) Do not permit yourself to be stampeded into anything just because you are dealing with a public officer.

(2) When you execute a public works contract, know its terms and *follow the letter of its provisions.*

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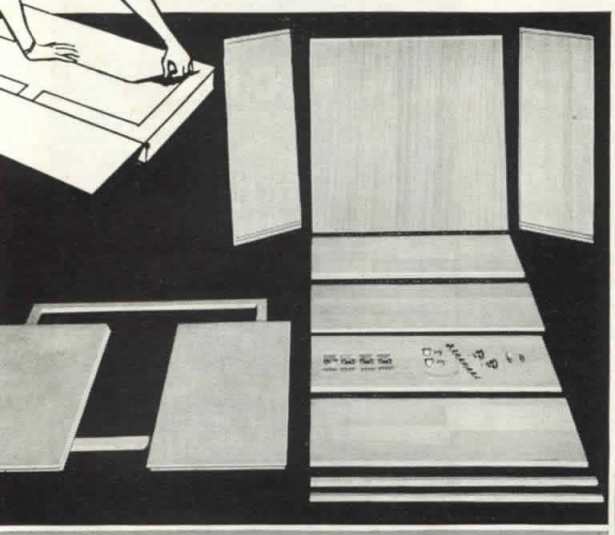

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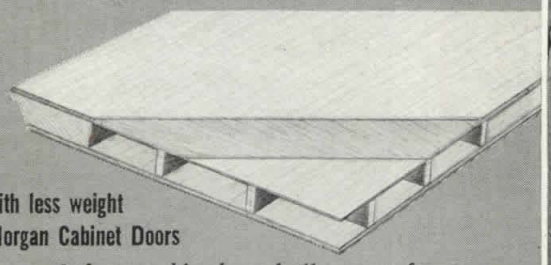

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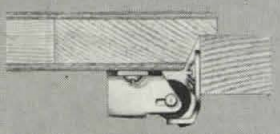

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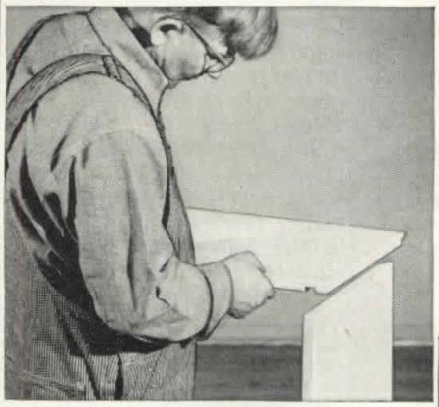

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Photos courtesy of Popular Home Magazine

urban redevelopment

(Continued from page 73)

Planning for urban redevelopment begins in the street, not on the drafting board. A careful appraisal of what exists in a city is not simply an amassing of social and physical statistics, valuable as these tools are. It involves hard grinding work of tramping the streets and using eyes, ears, nose, and mind to understand the meaning of what is observed and the ethos of the people; are they there by choice or by force of circumstances, are their roots deep or shallow? These things can be grasped without questionnaires. When it comes to physical planning of redevelopment, the problem must be attacked from both ends simultaneously, the over-all pattern of the entire city, and the detailed study of minor areas. In the latter case, what must be saved, what should go, what will people accept as a program for action? We know that little redevelopment is accomplished without popular support and hence initial presentations to the public must be in terms of what the average person can grasp. For the time being, the bigger aspects of planning may remain in the background, but the big plan must be made. The ultimate result will not be perfect, but there will be a result.

In this process, planners run the serious risk of losing themselves in details, hence they must constantly check to see that the totality of what they propose is tending toward the creation of the broader plan which they have been formulating at the other end of the line; there, planning must be far in advance of programs of immediate action.

At this point, someone is going to get up and yell that this approach to planning is unimaginative and that no big plans will result; but consider the fate of most big redevelopment plans from which nothing at all *has* resulted, because they were based on *a priori* assumptions of what urban planning and living should be. On the contrary, this approach demands a much higher degree of imagination—imagination based not on deductive thinking from assumed premises but on inductive processes rooted in fact. The big end must be approached with patience and with the collaboration of existing city agencies and of the people themselves.

The physical planning of redeveloped cities is much more exacting than that of new towns. The same is true of almost every other phase of the planning process. Let us examine briefly just a few of the problems involved.

(1) LIMITED PLANNING JURISDICTION. Our large cities are not protected by greenbelts, hence the inlying suburban areas are an integral part of the total urban development—a part over which most cities have absolutely no planning control. What is done there may be good but usually isn't. All too often, the suburbs are a chaotic sprawl whose development has been motivated by an

(Continued on page 154)

urban redevelopment

(Continued from page 152)

attempt to derive benefits from the central city but at the same time to avoid its taxation and is regulations for safety and amenity. The obvious answer is that control of planning should extend over entire regions, but knowing the answer and achieving the fact are worlds apart. The city has no mandatory power beyond its limits and every little borough is jealous of its own power as well as fearful of the big town. Outlying communities must be brought to realize their interest in regional planning and the measure in which they are dependent on the health of the central city. Again we face the problem that requires time and patience for its solution.

(2) FINANCIAL ASPECTS OF DECENTRALIZATION. Although a large city creates increased land values far beyond its borders, its tax base stops at its geographical limits. With declining population and flight of business and industry, the large city is less and less able to raise the revenues it needs, for ultimately the sources of taxation are the profit of business and industry and the incomes of people. Any considerable reduction in population or in the number of businesses and industries will inevitably place an added burden on those that remain. Granted that some municipal services will be less costly with fewer to serve, the funded debt can be reduced only gradually, indeed it may at times be increased by the changes involved in decentralization.

Some financial aid may be expected from the Federal Government to pay for replanning and to write down land cost to land value under rational use, but operating costs and debt payments will still remain. In any event, substantial decentralization will reduce land values. If this were merely a matter of loss to individuals who have taken a business risk in land ownership or speculation it would not be too serious a deterrent, but since the principal source of municipal taxation is real estate, a serious decline in the presumptive value of real estate, would mean either a higher tax rate or a resort to other forms of taxation. But what other forms? Added consumption or occupancy taxes would leave the citizen just where he would be with higher real estate taxes. Certain consumption taxes might produce a contribution from nonresidents who use the city's facilities (e.g. a tax on hotel rooms) but it is questionable how substantial this would be. Jo Bingham has suggested (*footnote: "The Tax Review" for January 1948*) that if addmission taxes were waived by the Federal and State Governments and preempted by the cities they would have an important added income.

Income taxes as a source of municipal revenue are of doubtful value. With Federal and frequently State income taxes, a third income tax would probably accelerate the flight from the city

(Continued on page 158)

Photographs taken at *Sky Line Inn, Manchester, Vt.*, show "Kalistron" wall coverings and upholstery materials with colors fused to undersides for permanence and "depth." By United States Plywood Corp., 55 W. 44th St., New York 18, N. Y.

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Rich decorative effects in colorful "Kalistron" wall coverings that are made of VINYLITE Plastics are enhanced by appropriate, multicolor printed designs, in passenger cars of Great Northern Railway Co. Easily cleaned. Scuff-resistant. Do not crack, chip, or peel.

LOOKING FOR wall coverings and furniture upholstery with the maximum of colorful beauty and texture—plus durability that knocks maintenance costs practically out of the picture?

You'll find these qualities teamed up in exquisitely colored, scuff- and stain-resistant materials made of VINYLITE Brand Plastics!

Small wonder that they're chosen today for so many hotels, restaurants, hospitals, schools, public buildings, private homes! Study these combined advantages . . . consider what they mean in reduced maintenance costs *over the years:*

- **Washable, resisting strong alkalies and most strong acids**
- **Resistant to water, oils, greases, alcohol**
- **Unlimited range of fast colors and embossed designs**
- **Easily applied; never in need of refinishing**
- **Resistant to aging; resilient and strong**

Ask us for technical data and a list of representative suppliers of wall covering and upholstery materials made of VINYLITE Brand Plastics. Write Dept. HV-58.

Vinylite BRAND **PLASTICS**

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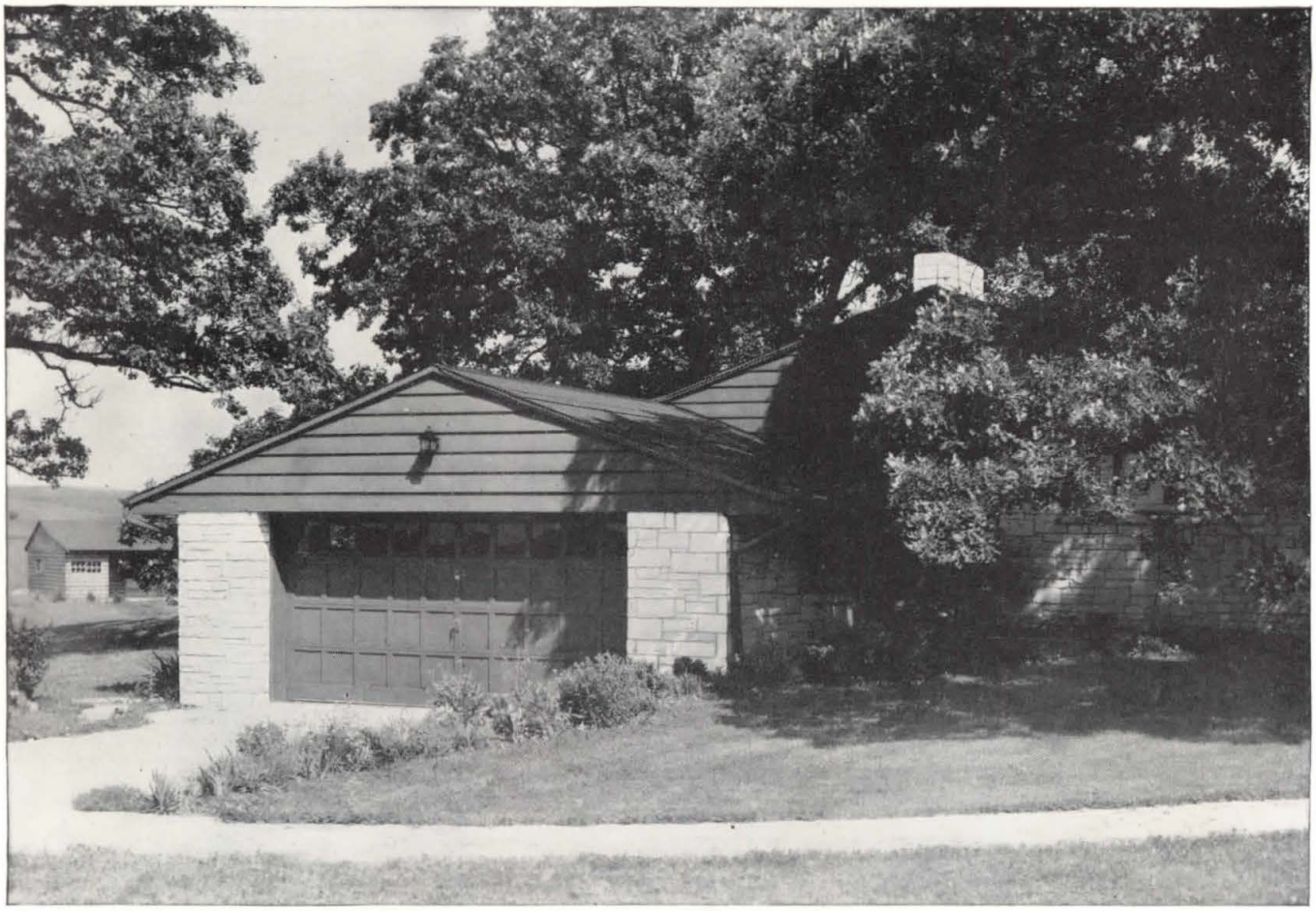
BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N.Y.



STANDARD

Barcol OVERdoors

HARMONIZE BEAUTIFULLY IN MODERN COUNTRY HOMES

It is sometimes a question whether to use special design sections on the overhead door for a new residence garage, or to employ the standard paneled sections. After much experiment, the panel design was adopted as standard because of its inherent strength and resistance to warping, ease of construction, high strength/weight ratio, comparatively low cost, adaptability for glass panels as desired, ease of installation, and ability to fit all size openings. Take a glance at the picture above — here is at least one type of residence where the standard panel design can be, and is, as harmonious as you might wish. Barcol OVERdoor paneled sections are designed and built for maximum durability — an important factor in any installation, and an important *feature* of the Barcol OVERdoor.

BARCOL

FACTORY-TRAINED SALES AND SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

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Thermopane

REGISTERED U.S. PAT. OFFICE

The acceptance of *Thermopane* insulating glass—Libbey·Owens·Ford's transparent insulating unit—has been tremendous. It is timely to emphasize the following:

1. *Thermopane** is a registered trade-mark of the Libbey·Owens·Ford Glass Company;

2. Only Libbey·Owens·Ford makes *Thermopane* insulating glass;

3. Only Libbey·Owens·Ford can call a transparent insulating unit *Thermopane*;

4. Only *Thermopane* has the *Bondermetic Seal** which bonds the panes of glass into one unit to prevent dirt and moisture from entering the dry air space;

5. The name "*Thermopane*" can and should be used when referring to the L·O·F product only;

6. The word "*Thermopane*" should never be used when referring to any other brand of multiple-glazing construction.

We make these statements because the function of a trade-mark is to identify unequivocally the manufacturer of a product . . . and to eliminate the possibility of confusion in the mind of the public concerning the producer of a specified product . . . and to assure that the customer gets what he orders.

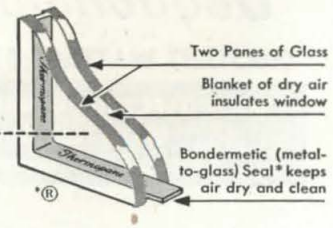
We are sure that architects, contractors and others who are familiar with the superiority and advantages of *Thermopane* will welcome these statements . . . will refrain from using our trade-mark in referring to any construction or product not made by the Libbey·Owens·Ford Glass Company.

We believe that our readers will understand L·O·F's pride in *Thermopane* and our sincere desire to have *Thermopane* continue to enjoy its individuality.

LIBBEY·OWENS·FORD GLASS COMPANY
TOLEDO 3, OHIO

L·O·F GLASS *Thermopane* LOOK FOR THE NAME ON THE SEAL BETWEEN THE PANES

FOR BETTER VISION SPECIFY THERMOPANE MADE WITH POLISHED PLATE GLASS



urban redevelopment

(Continued from page 154)

of those best able to pay. Nor will ungraded wage taxes as levied in a few cities work out equitably. The theory is that outsiders earning wages in the city will contribute. Aside from the fact that an ungraded tax works a hardship on the lowest income families, it has the further objection that it invites retaliatory taxation by communities in the tributary area.

(3) OTHER MUNICIPAL PROBLEMS. If a city of, say, 1,500,000 inhabitants is reduced to a population of 1,000,000 every branch of its government will be seriously affected. The problems involved are not insuperable, but their solution must be a part of the planning process. How will police and fire protection be afforded to the entire urban area with a smaller population? What will be done with schools designed to serve a dense population, when half of the clasrooms may be empty? How can oversize utility systems be handled economically?

Other problems of urban redevelopment might be cited, but enough has been said to show the great complexity of what we face. But it must be faced. As we have said, this is the big job. There is no doubt that we have the technical capacity to do it; add persistency and courage and we will yet have cities worthy of the term "civilized."

Warmth...Texture ...Beauty

and never have cost comparisons been so favorable to this permanently beautiful wall material

Time works with you in long term low cost when the walls are Roddiscraft Hardwood Plywood. Once installed, it yields the most years of useful service and requires the least in present day costly man-hours of work to keep it always attractive.

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YOUNG ARCHITECT—registered New York. Opportunity as associate with professional engineer. Well-established, good location, small organization, kept busy. Must be fast and neat on pencil perspective rendering. Full particulars with first letter and photo. Box 391, PROGRESSIVE ARCHITECTURE.

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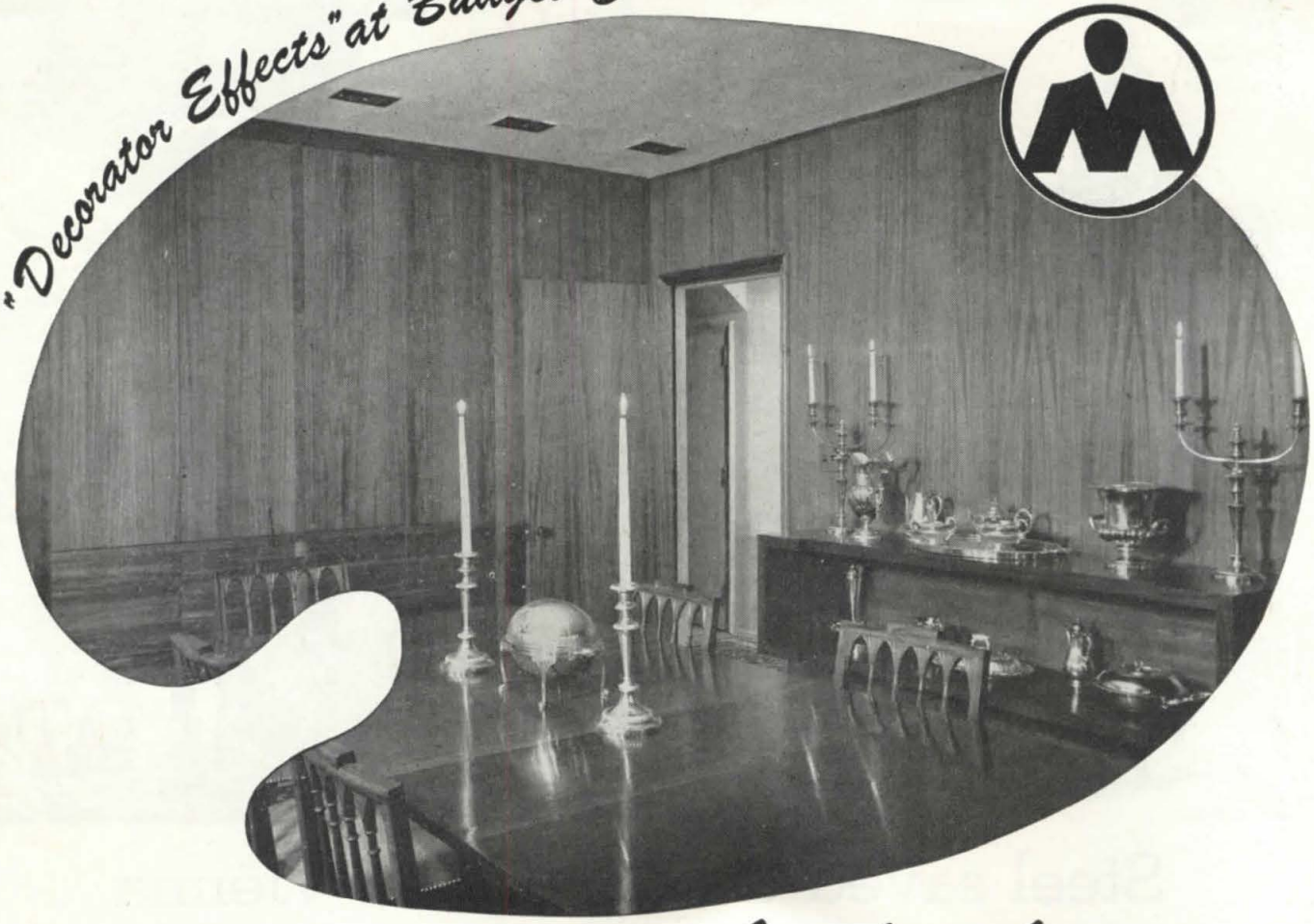

Look what you can do with Mengelux FANCY FACE PLYWOOD!

Using Mengelux — *hardwood* plywood, with one face of lovely, genuine Mahogany, Walnut, Oak and Birch — you can get "decorator interiors" at a cost only slightly higher than plaster and wallpaper. The installation is completed in hours instead of days or weeks, and you give your client that "something extra" which makes all the difference between conventional and *extraordinary* jobs.

Mengelux is available in large, 48″ x 96″ panels, and in other standard stock sizes. It is available through leading distributors and building materials dealers, almost everywhere. Write us direct for local names and addresses.

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THE UTILITY HARDWOOD PLYWOOD

Mengelbord

Where fancy faces are not required, Mengelbord is the answer to the builder's prayer! It is 1/4″ *hardwood* plywood, with one-piece face, free from joints and oval patches. No grain-raising. Works and cuts cleanly. Most panels are all-white or nearly all-white. Can be painted, stained or finished natural. And Mengelbord is available through same distributors who handle Mengelux; names and addresses on request.

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The Mengel Company . . . growers and processors of timber • manufacturers of fine furniture • plywood • flush doors • veneers corrugated containers • kitchen cabinets and wall closets

Steel saved civilization at Vienna

MODERN history begins with the record of conflict between Christians and Moslems--six centuries of wars that opened with the Crusades and saw the Turks capture Constantinople in 1453.

More than 100,000 Turkish janizaries and cavalry besieged Vienna in 1683. For two months, to quote the diary of an eye witness, "The enemy continued playing their cannon and granadoes. But the city walls were strong, Christian cannon were bigger and more numerous and ammunition more plentiful." Finally came a day when the officer's journal reported, "The enemy did not play their cannon so fast. It was confirmed that they had no great provision of bullets, inasmuch as they shot back not only our bullets, but also pummels of swords and all sorts of iron and stones."

At last a great Christian relief army was assembled. "They made an attack in the best order that ever army did. The enemy, forced always to give back, were put all into confusion. They betook themselves to flight, leaving all their provisions, ammunition, cannons and tents --the greatest part rendered unfit for farther use by our great guns."

Never again did the Turks seriously menace Christendom. Western civilization had been saved once more by its supremacy in the use of iron and steel. To aid our survival America's free private industry is producing steel at the highest rate ever known--and still expanding. The question remains--Will America use enough of this tremendous steel production to guarantee the continued supremacy of Western, Christian civilization?---We believe the answer is yes!

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The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

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You see a finished structure, translated from your imagination and skill into a building with beauty and usefulness . . . and of course you're proud. This pride is shared by your Distributor of Acousti-Celotex Products because he helped you achieve effective sound conditioning . . . *just as you planned it*, without tampering or compromise.

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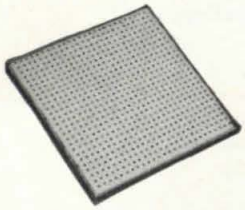
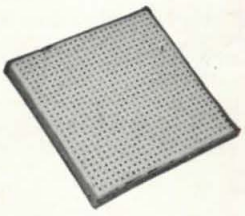


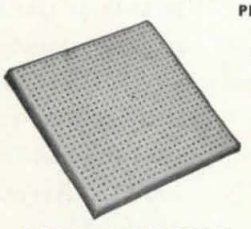
ACOUSTI-CELOTEX* CANE FIBRE TILE

A lightweight, rigid unit, combining acoustical efficiency with a durable, smooth surface. Perforations (to within 1/8" of the back) assure repeated paintability, easy maintenance. Available in a variety of sound-absorbent ratings. Dry rot proofed by exclusive Ferox* process.



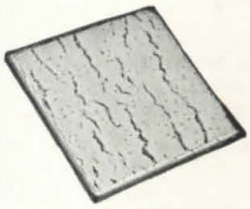
ACOUSTI-CELOTEX* MINERAL TILE

Made of mineral fibre, felted with a binder to form a rigid tile with a universal rating of incombustibility. Perforated with small holes extending almost to the back, this tile provides high acoustical absorption plus unrestricted paintability by either brush or spray method.



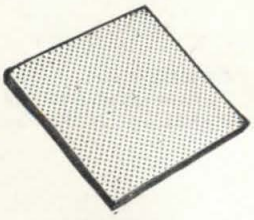
ACOUSTI-CELOTEX* FLAME-RESISTANT SURFACED TILE

A cane fibre tile with a flame-resistant surface. This tile meets *Slow Burning* rating contained in Federal Specifications SS-A-118a. It may be washed with any commonly used solution, satisfactory for good quality oil-base paint finishes, without impairing its flame-resistant surface characteristics and without loss of sound-absorbing capacity. Repainting with Duo-Tex flame-retarding paint will maintain peak efficiency. Supplied in all sizes and thicknesses of regular cane tile.



ACOUSTI-CELOTEX FISSURETONE*

A totally new mineral fibre acoustical tile. Attractively styled to simulate travertine. It beautifies any interior and effectively controls sound reverberation. Lightweight, rigid and incombustible, it is factory-finished in a soft, flat white of high light-reflection rating.



ACOUSTEEL*

Combines a face of perforated steel with a rigid pad of sound-absorbing Rock Wool to provide excellent sound-absorption, together with attractive appearance, durability and incombustibility. The exposed surface of perforated steel is finished in baked-on enamel. Acousteel is paintable, washable, cleanable.

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You need less mixing water for a given slump when you use Atlas Duraplastic air-entraining portland cement. You'll find the mix is more plastic, more cohesive, more uniform. And that means easy placement . . . and improved surface appearance on large or small structural jobs.

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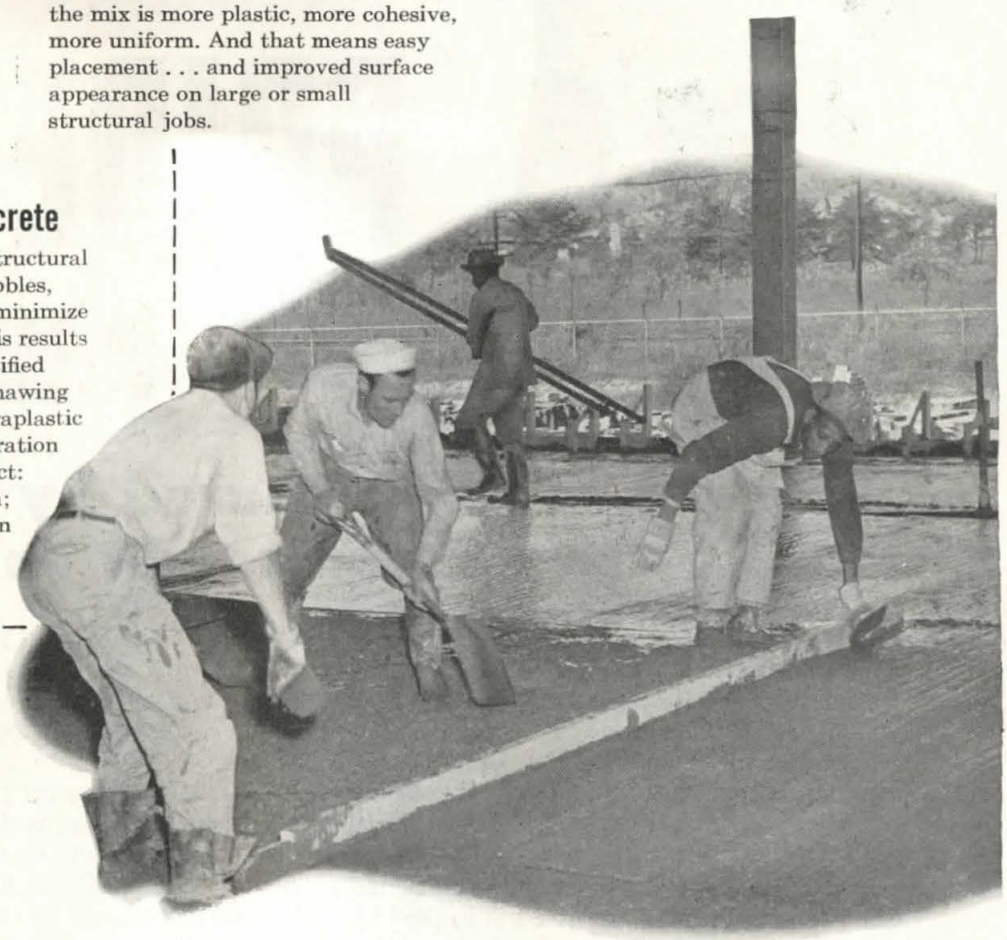

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It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

*"*Duraplastic*" *is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

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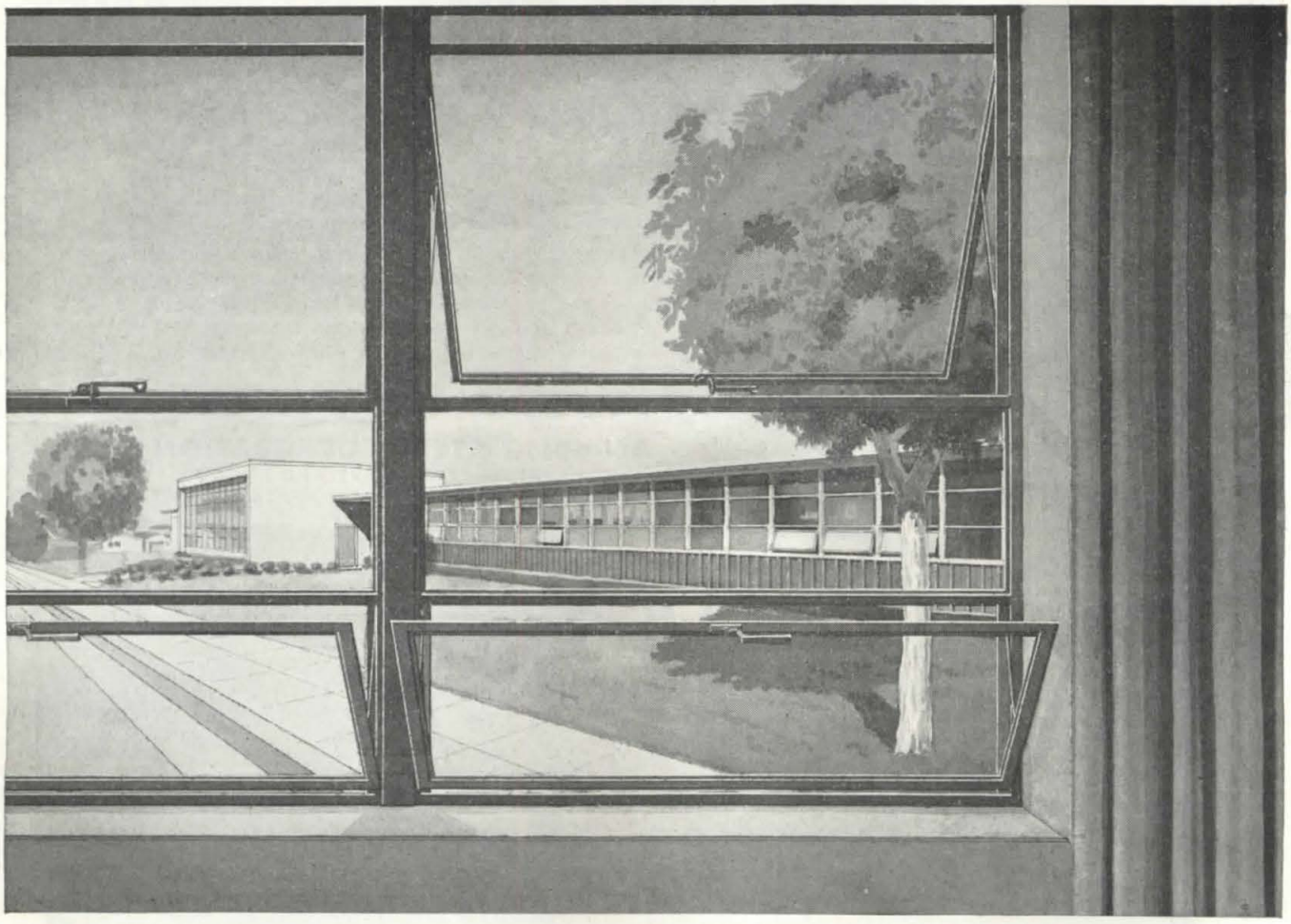

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Teachers like the uniform, all-weather ventilation control — simply designed easy to operate hardware.

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TONCAN is an *alloy* iron. Its basic ingredient is highly-refined open hearth iron. Copper is added —*twice as much* as in ordinary copper-bearing steels or irons. Then the correct amount of Molybdenum is alloyed to bring out the full effectiveness of this double dose of copper.

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—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods and other sheet metal applications requiring rust-resistance—and for corrugated metal drainage products.

HOMASOTE presents

the NOVA Roller Door

—the silent, fingertip flush door for passage ways and closets

—developed through two years of constant research and field testing

Highest in quality . . . simple and inexpensive to install . . . silently responding to fingertip control . . . here is the roller door as you knew it would one day be perfected.

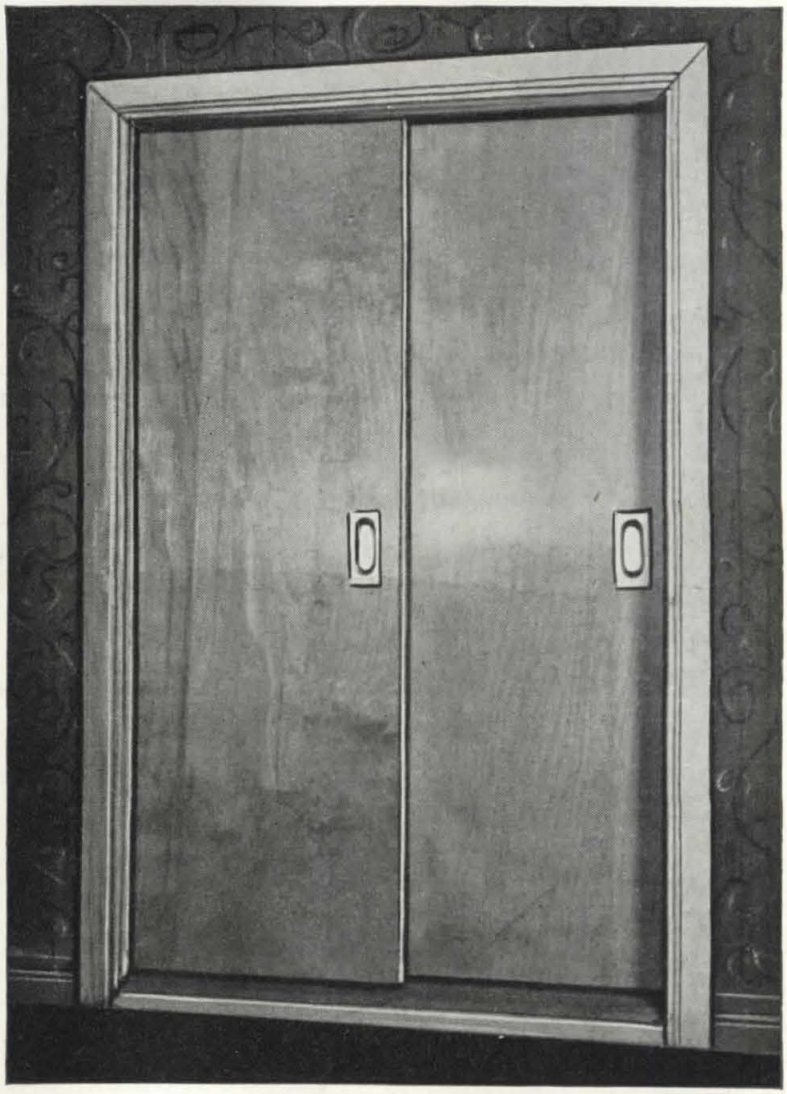
This is a hollow core, flush door—regularly sold in unselected gum, paint grade—which can be painted or stained for many beautiful effects—Black Walnut, African Mahogany, Birch, Red or White Oak.

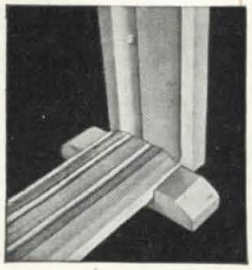
Nova Roller Doors are light, strong and warp-resistant. They are ideal for closets, basement storage, garage storage, storage walls and removable partitions.

The closet may be one of the standard sizes—or extend the width of the room. Two or more doors enclose it entirely. Instead of opening only part of the closet, as with a swinging door, you have full access. And—you don't waste the valuable floor space needed to accommodate a swinging door.

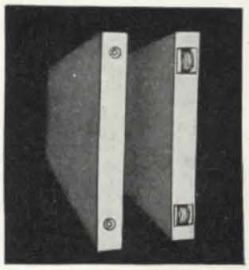
The Nova Roller Door comes cartoned with special side jambs, head and floor tracks and all hardware installed. In less than one hour's time, one man makes the complete installation. *Nine standard opening sizes:* 32″, 36″, 40″, 48″ 56″, 60″, 72″, 84″, and 96″. *Three standard heights:* 6′0″, 6′6″ and 6′8″.

We urge you to write today for the full details. *Kindly include the name of your lumber dealer.*

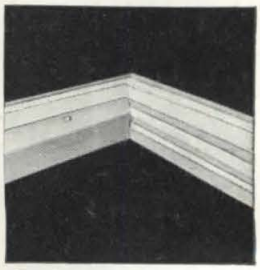




The oak floor track, laid on the finished floor, sets the proper distance between jambs at the bottom. Note rubber bumper on jamb.



Revolving roller guides operate in head track; vulcanized rubber rollers in floor track — assuring silent, fingertip control.



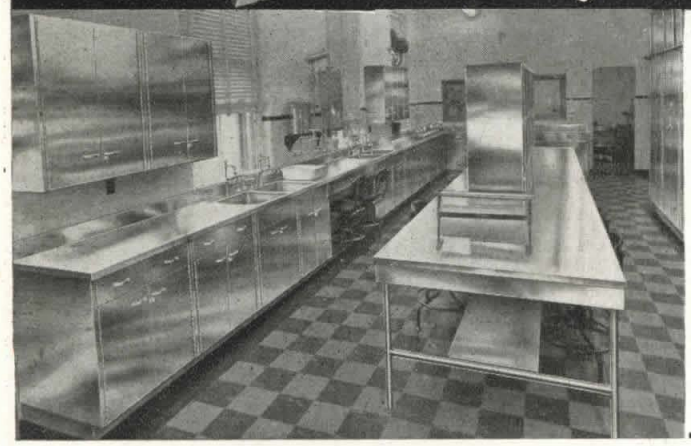
Side jamb (left) is routed to receive the door; head track (right) is accurately machined for perfect operation of revolving roller guides.

NOVA SALES Co. TRENTON 3, N. J.

A Novasco Product

A wholly owned subsidiary of the Homasote Company, manufacturers of the oldest and strongest insulating-building board, Wood-textured and Striated panels.

Now is the Time to Modernize with Just Line Stainless Steel Equipment



When modernizing your present building, be sure to specify JUST LINE Stainless Steel equipment. Because it assures the utmost in sanitation and a lifetime of service, JUST LINE Stainless Steel equipment is first choice of leading Architects, Builders and Institution Administrators.

Write for Literature R-851 *or send us your specifications. Our Engineers will gladly cooperate with you in developing your plans.*

Just Manufacturing Co.
4610-20 W. 21st Street, Chicago 50, Illinois

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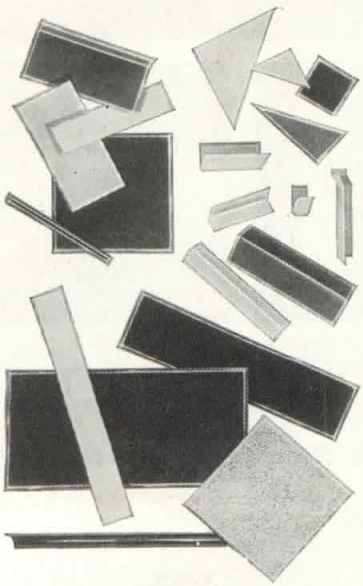

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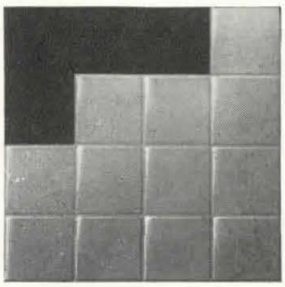

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As compared to the cost of conventional barracks construction, estimated at $2,300 per man, the cost of the nonconventional barracks illustrated above is only an estimated $1,485 per man (just $1.11 per cubic foot)!

And this barracks at Offutt Air Force Base, Omaha, Nebraska, is something special. Flyers of the Strategic Air Command fly "around the clock." As some sleep, others are "taking off." So army engineers are giving them 2-man rooms for peaceful quiet and privacy, better and more convenient bath facilities, a pleasanter place in every way—all at $1.11 per cubic foot . . . a saving of one-third. How?

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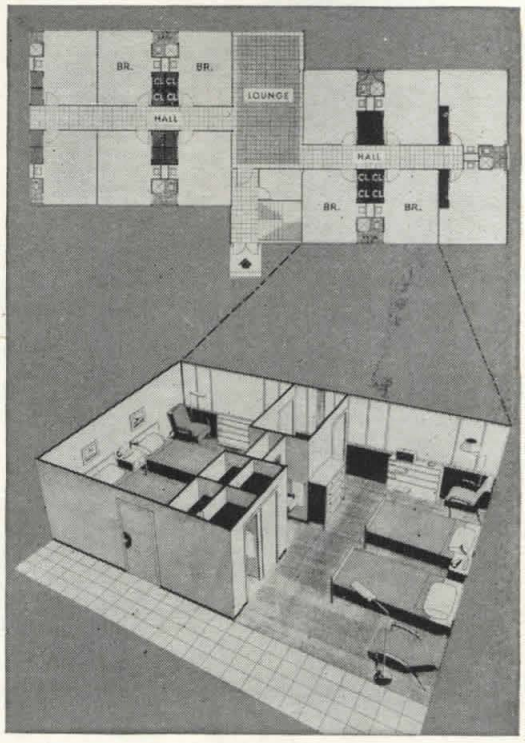
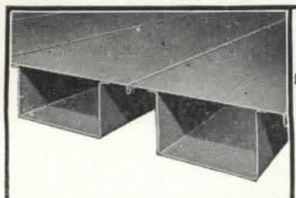
Only $1.11 Per Cubic Foot for this 37 x 282-ft., 3-story Offutt Air Force Base barracks housing 216 men. Total cost about 321 thousand dollars—approximately 30% less than conventionally built barracks . . . and the whole building is firesafe! Contractor: Korshoj Construction Company, Blair, Nebraska.

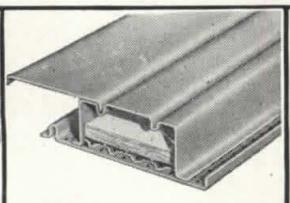


Fenestra PANELS • DOORS • WINDOWS

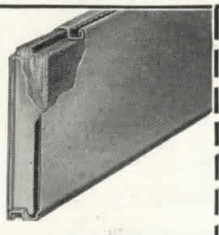
engineered to cut the waste out of building



"D" Panels for floors, roofs, ceilings. Standard width 16". Depth 1½" to 7½".



Acoustical "AD" Panels for ceiling-silencer-roof. Width 16". Depth up to 7½".



"C" Insulated Wall Panels. Standard width 16". The depth is 3".

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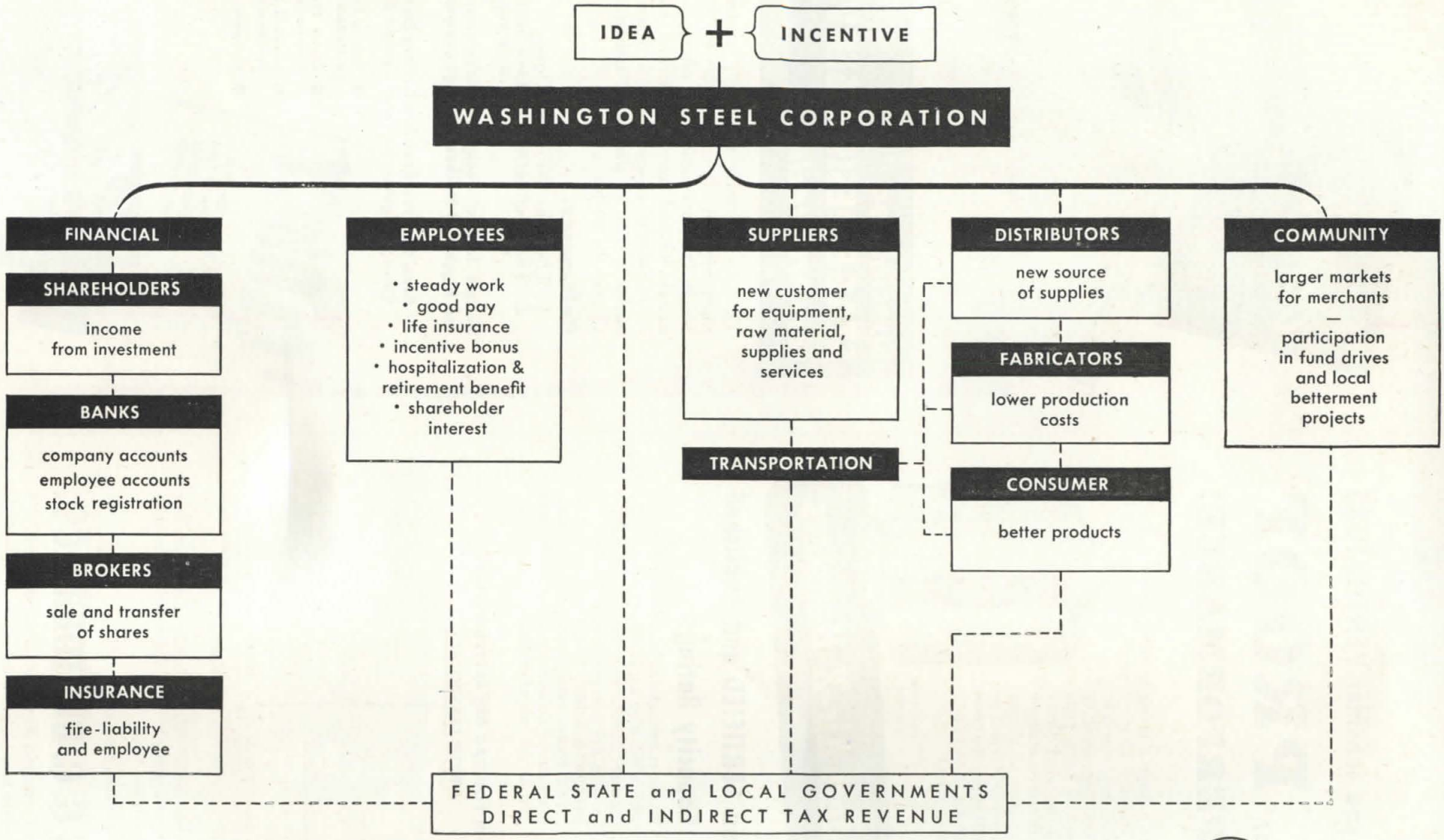

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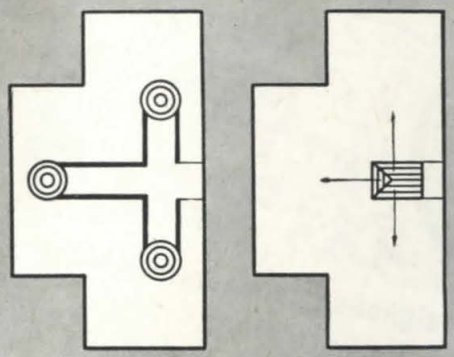

Substantial savings in metal and labor are yours due to the shorter duct runs with Agitair tailor-made diffusers.

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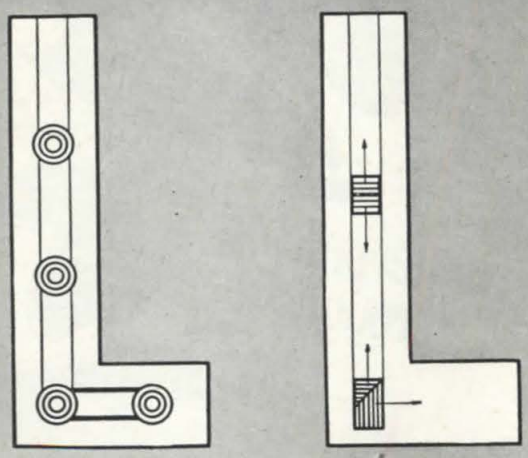

One diffuser does the work of two with no sacrifice in air distribution. Note the savings.

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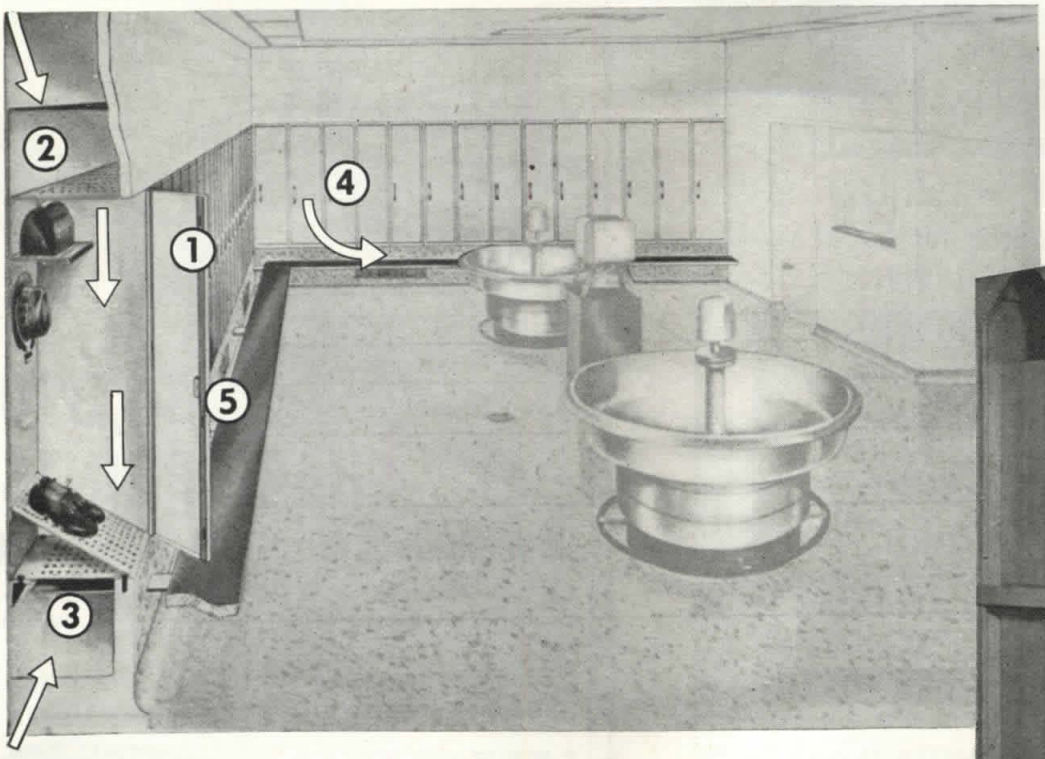

Check the features of these Scott-designed "AIRFLOW" lockers:

1. Solid doors allow no odors to enter or escape.
2. Top plenum through which fresh air enters.
3. Base plenum through which stale air is exhausted.
4. Exhaust vent in locker island base carries off humid stale air.
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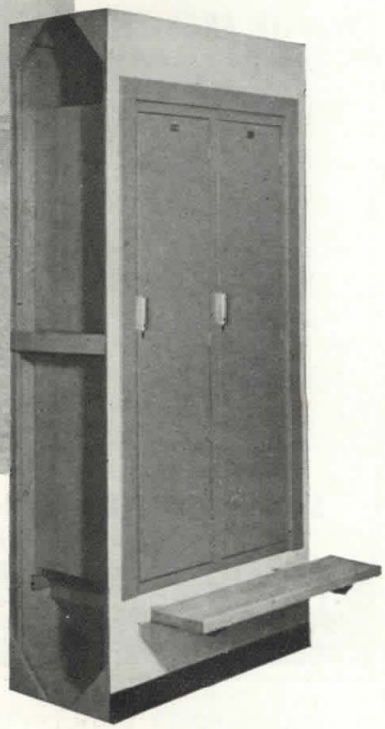

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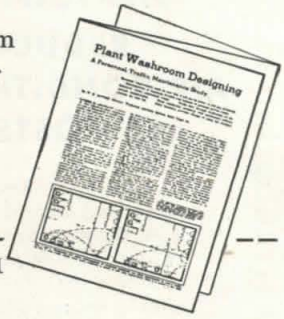
This is another example of the aid Scott Washroom Advisory Service Consultants offer to you who plan personal service rooms. This know-how gained from servicing more than half a million washrooms, is yours for the asking.

Contact Scott Washroom Advisory Service, Scott Paper Company, Chester, Penna.



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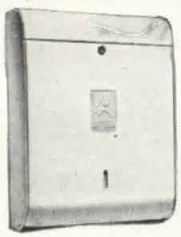

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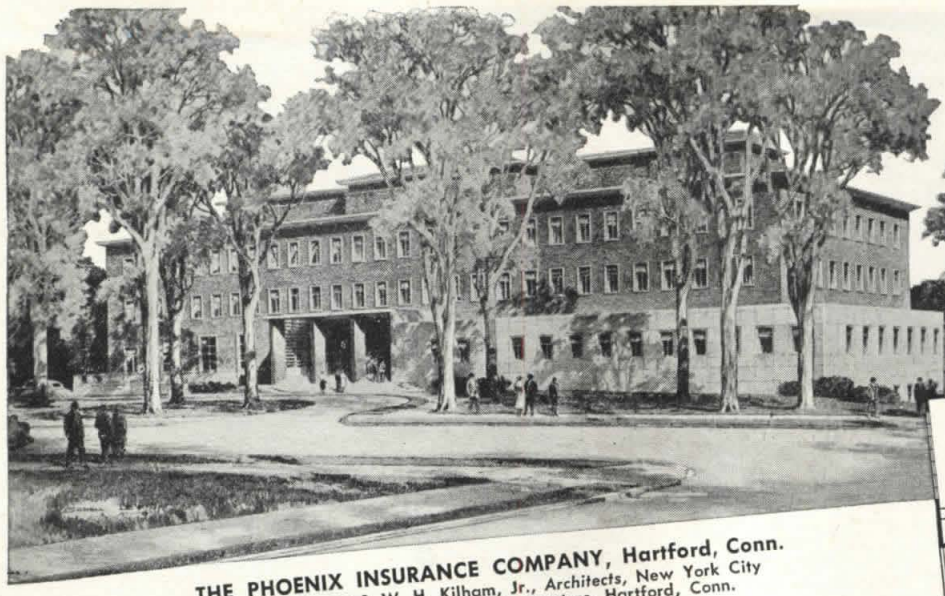

THE PHOENIX INSURANCE COMPANY, Hartford, Conn.
R. B. O'Connor & W. H. Kilham, Jr., Architects, New York City
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1 ELECTRIC DUMBWAITER

1 FREIGHT ELEVATOR

1 EXECUTIVE ELEVATOR

3 PASSENGER ELEVATORS

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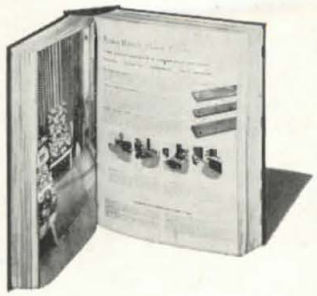

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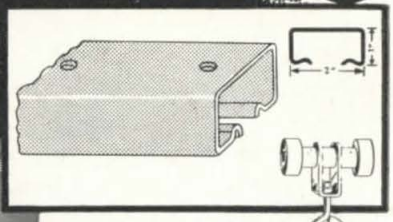

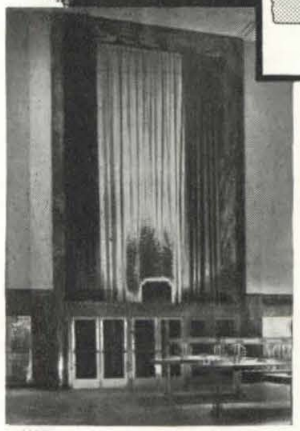

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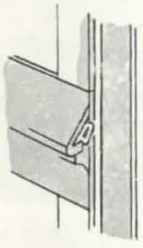

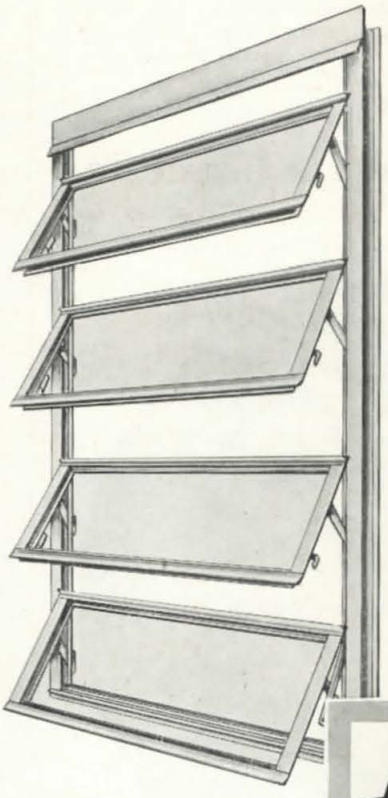

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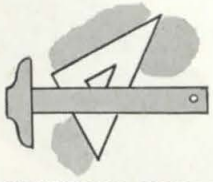

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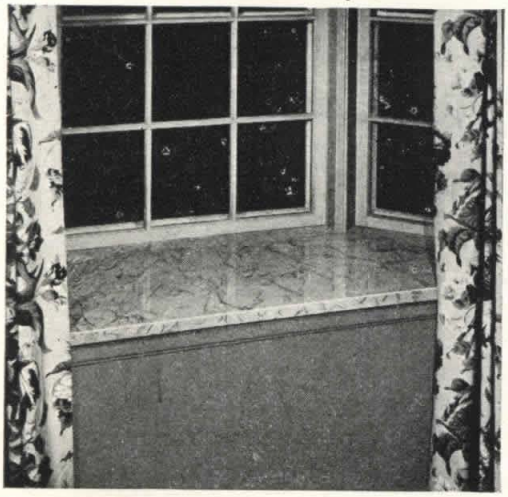

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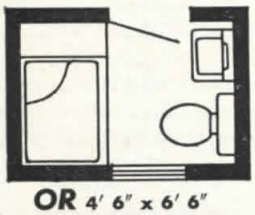
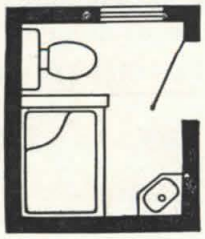


OR 4' 6" x 6' 6"



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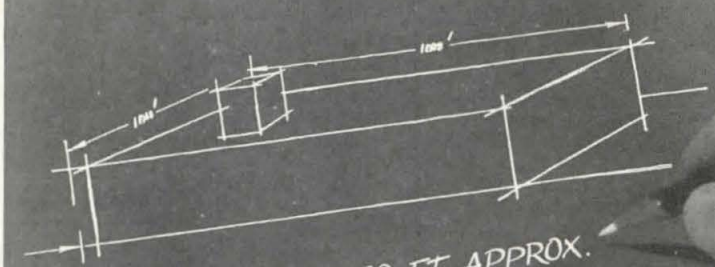

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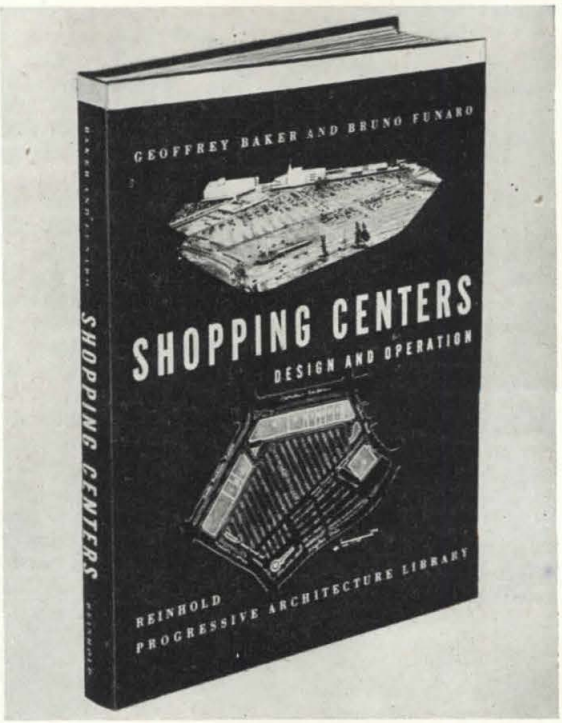

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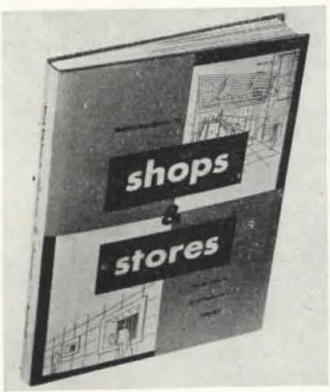

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P.S.

CIVIL DEFENSE POSTSCRIPT: Someone has handed me a newspaper clipping which says, "Atom Bomb Kit in Every Home is Urged by U. S." Yet in Washington I met a salesman who was very much annoyed with Civil Defense authorities; he'd been trying to promote a vestpocket Geiger counter, which would ring a bell when you'd had too much, and found the authorities disinterested. (Since then, I understand, such a gadget *has* been recommended.) *The New Yorker*, in a Civil Defense Note, documents the fact that not only human beings are influenced by the fear of the times. "A pair of yellow warblers, now resident with their offspring in Van Cortlandt Park," that magazine reports, "are occupying a nest built entirely out of fire-proof home-insulating materials."

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AS I HAVE INDICATED in these columns before, I believe that the work which has been done and is being done by Adelbert Ames, Jr., at Hanover, N.H., in the Institute for Associated Research, holds important implications for architecture. Ames' studies have to do with the relationship between what we see and what we do (individually, and as a social unit). I wrote a brief and inadequate piece on the subject for P/A back in December, 1947, which Ames was good enough to say nice things about (after all, it was the first attempt to tie his studies into architectural application). And from time to time I have seen indications of the effect on other fields, of his research in visual reactions and visual sensations.

Recently there has been an important turn toward humanism in architecture, a new realization—of the sort that seeps into the world of cultural development every so often—that writing and painting and sculpture and architecture are for *people*. For people to see and enjoy and enrich their lives from and—in the sense that Ames speaks of use-value in relation to the esthetic experience—to make use of. The battle is not, as so many would have us believe, between mechanization and humanism, but rather between obscurantism and communication. We want to make use of mechanical processes, but in a way that is understandable and produces a response, rather than a repulsion, in the user.

All this leads up to the fact that Ames, apparently more sure of his findings than he was when he prefaced every observation with "our studies seem to indicate," has now even ventured into the field of art criticism. Analyzing the work of the late Alexander James (son of William James, the philosopher) from the point of view of the psychologist and physiologist, Ames writes me that he feels that some of his general conclusions "may be important." I think they are. Excerpts follow:

"(Other artists) were also sincerely seeking for values denied by the mechanistic age, but they believed that true esthetic values could be experienced and expressed only in abstracted forms and designs, or in the extraordinary or the bizarre, or in subjective experiences not directly related to what was perceived. Perhaps the reason for this was that they never freed themselves from the mechanistic belief that bifurcated reality into the subjective and objective, and mistakenly believed that the world they perceived about them was a determined, mechanical structure existing in its own right apart from man. Believing this, they rightly could see no possibility of esthetic values existing in nature as they perceived it, so they sought for them elsewhere.

"Their mistake would seem to be that they failed to recognize that the world they perceived about them, far from having an existence apart from themselves, only exists because of its significance to them as human beings. They failed to realize that what they perceive about them is determined by what they themselves bring to the occasion."

●

HOW VERY SLOWLY good contemporary architecture has its effect on the appearance of the established city. Perhaps the strongest *architectural* argument for the New Town is that only in places like Oak Ridge, in the United States, can one begin to feel the full impact, visually and in a use-sense, of the new design criteria. These pessimistic observations are prompted by a trip to Boston, where one can drive along the Charles and see the new Aalto dormitory snaking its way along the river bank, and near it the light and airy Eastgate apartments by Koch, et al; go out to Wellesley or Chelsea and visit good new housing projects by Stubbins; see plenty of pleasant houses in the suburbs—and still find Copley Square and the Common just as they have been for many, many generations. And what is probably more apparent, find that the great changes are in the dominance of the skyline by the John Hancock Building and the destruction of the Esplanade by a not-too-welcome motor speedway.

Another general observation, not so pessimistic: it is interesting to find some of the most staid, conservative communities of the East accepting in their residential areas enough "modern" houses so that the community character does begin to change. Along one road in Greenwich, Connecticut, for instance, one comes across in a few miles the house that Bill Armbruster is building for himself, the house that Henry Hill has done as his first invasion of the east, and a house by Yamasaki. In Lincoln, Massachusetts, dotted still with Revolutionary landmarks and some wonderful old houses, the original invasion by Gropius and Breuer is being supplemented by an impressive number of new good houses—one by Stubbins and several by Lawrence Anderson, that I liked particularly. And in this connection I should probably mention the move into the Hamptons on Long Island, with the most recent striking contrast an uncompromising addition by Philip Johnson to a wonderful old Victorian house owned by the Henry Ford II's. These aren't New Towns—they are among the Oldest Towns. And yet they are going to be changed, apparently rather quickly.

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I HAVE BEEN GOING THROUGH my cheesecake file, to see if I couldn't find some good warm-weather material. Last year's column which studied the subject of pulchritude in manufacturers' releases must have frightened the advertising agencies, because I find the picking rather slim this year. The unidentified young ladies themselves are not slim, however, as witness the one in shorts who is demonstrating that a sheet of Wheeling Expanded Metal will not bend, whereas a continuous sheet of metal will. The other is garbed, presumably, for the cool air that comes out of Palmer Manufacturing Corporation's Sno-Breeze B-3500 Blower Cooler.

Thomas H. Creighton