The Controlled Materials Plan will go into effect on July 1st, as P/A had predicted, for steel, copper, and aluminum. It will operate as it did, successfully, during the last war: products that are controlled will either be "A" products, where the producer gets his orders and production authorization from his customer, or "B" products, where the authorization and the order comes directly from NPA (through the Industry Divisions). Manufacturers must file forms stating their detailed requirements for these metals, and NPA will allot specific amounts to them. By this restrictive production the government believes both defense and non-defense needs can be met. For three months CMP will be operated from Washington; after that it will be handled by NPA field offices.

Construction materials which will be affected by the plan include fabricated structural steel products, lighting fixtures, millwork, screens, flat-glass products, insulation, hardware, plumbing fixtures, metal doors and sash. Exempted items include residential heating and cooking equipment and household refrigerators.

Many building products also come under scope of Ceiling Price Regulation 22 of the Office of Price Stabilization. This sets ceiling prices at a pre-Korean base price plus actual increases in materials cost and factory payroll costs. Resulting in some immediate price rises in building materials, the Order should tend to stabilize prices during the rest of the year.

Among honors awarded at the A.I.A. Convention last month in Chicago, in addition to the Gold Medal to Maybeck, were 39 Fellowships; the Kemper Award to Marshall Shaffer, the Fine Arts Medal to Thomas Church, landscape architect; Honorary Memberships to Lewis Mumford and Burdell, and Englebert Reynolds; and a special citation for craftsmanship to Corning Glass Works.

A.I.A. and Producers' Council again have made awards for trade literature to building materials manufacturers. This year 15 Certificates of Merit were awarded, and 20 Honorable Mentions. Anemostat Corporation and Bettinger Enamel Corporation won Awards of Exceptional Merit.

Again in April construction records for the month were broken. Dept. of Commerce figures show $2,353 million volume, with an increase over March of 7% in residential building, 7% in industrial building, 6% in hospital construction, about the same volume for school work and churches, and a drop in stores, restaurants, and recreational structures.

G. E. announces a new laboratory at Nela Park, Cleveland, Ohio, to test modern lighting systems in relation to all sizes, proportions, and finishes of rooms. Regular spacing of simple filament units no longer answers the complex needs of contemporary buildings, and new requirements require new data, G.E. points out.

HHFA is about to embark on another research program which is long overdue, as a result of a recommendation by its Advisory Committee on Resource Conservation. The study will be of

(Continued on page 2)
"wood-frame dwelling structures...and the need for new methods brought about by the tendency to use larger window openings and omission or reduction in the number of interior partitions which heretofore served as structural bracing."

• Another useful bit of research is being started at Cornell, where the Housing Research Center and the School of Business and Public Administration will collaborate to study distribution problems in prefabricated housing, the area in which this new industry has most often stumbled.

• The new Corning Glass Center in Corning, New York, began its career with a high-level conference on "Living in Industrial Civilization," under the co-sponsorship of Corning Glass Works and the American Council of Learned Societies. The architect's part in this discussion was upheld by John Burchard of M.I.T. and Wells Bennett of U. of Michigan.

• Princeton, which early was interested in the Ames studies in visual perception, is constructing an Architectural Laboratory, where study of architectural details and architectonic forms constructed in various materials can be studied under varying conditions of light and varying effects of weather. Professor Jean Labatut will direct the work.

• Georgia Tech School of Architecture looks forward to expansion as a result of a recent grant of a quarter-million dollars from the Board of the Institute. This will make possible a strong graduate program, programs in city planning, and in industrial design, and research in building materials and construction methods. To make the students and faculty even happier, all this will take place in a handsome new building to be finished in 1952.

• Skidmore, Owings & Merrill, which now has permanent offices in New York, Chicago and San Francisco, has announced that a Portland, Oregon, office will be established in association with Pietro Belluschi, now Dean of M.I.T.'s School of Architecture and Planning. "This," says the firm, "represents an important advance in S.O. & M's program of assisting in the development of the West Coast by establishing offices in strategic locations."

• Konrad F. Wittmann, Professor of Design and Head of the Department of Interior Design at Pratt Institute, often a contributor to P/A, died recently at the age of 60. German born and educated, Wittmann had practiced abroad and for ten years had edited a German architectural magazine before he came to this country in 1938.

• The 8th International Congress for Modern Architecture (CIAM) will be held the week of July 7th at Hoddison, Hertfordshire, near London. Theme will be The Core — the physical community heart — of the city. Various CIAM groups have been preparing material to present at the Congress, for five "scale-levels," from the village to the metropolis.

• Walker Art Center, Minneapolis' successful regional museum and spreader of contemporary culture announces that its director, D. S. Defenbacher, is taking a leave of absence and that William M. Friedman, who has been Assistant Director, will act as its head.
Rolling Steel

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For railroad openings, truck openings, or any vehicle opening which is subject to frequent use, a good rolling steel door is the logical answer... they provide maximum protection against intrusion and fire... they occupy no usable space inside or outside the door opening... their quick opening, quick closing vertical action, with push-button control, saves time, and, their all-metal construction assures a life-time of continuous trouble-free service. Before you buy, check the specifications of Mahon Rolling Steel Doors... note the materials used, type of bearings, oven-baked protective coating applied to curtain slats prior to roll-forming, and other provisions for long life. You may find complete information on Mahon Rolling Steel Doors, including specifications, in Sweet's Files. If you do not have access to Sweet's, write for Catalog G-50.

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Manufacturers of Rolling Steel Doors, Grilles, and Automatic Closing Underwriters' Labeled Rolling Steel Doors and Fire Shutters; Insulated Metal Walls, Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms.

June 1951 3
WHEELING is "TOPS"

LIGHTER! Saves weight two ways: because of lightness of Tri-Rib Sheets themselves, and because smaller dead load allows use of lighter supporting members!

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20 ACRES of Tri-Rib Roof Deck cover the world's largest telephone plant!

In its new plant at Indianapolis, Western Electric Company can make in one year more telephone sets than are in use throughout all France! To "top" its nearly 20 acres of manufacturing space, roofing contractors used more than 1,400 tons of Wheeling Tri-Rib Steel Roof Deck!

Insulation was designed to give the entire roof a 4-hour time lag in solar heat transmission. Because of the lightness of Tri-Rib Sheets, the dead load of the finished roof was reduced. The resulting reserve capacity in the structural steel is important in carrying such suspended loads as conveyors, piping and ducts.

Tri-Rib Steel Roof Deck for fast, economical roofing is only one of the many building materials for which architects, engineers and builders rely on Wheeling. In the complete line of Wheeling Building Materials, they will find products that are low-cost solutions to many construction problems.

Made of Cop-R-Loy, the Copper Alloyed Steel, Wheeling Tri-Rib Steel Roof Deck is designed to specifications adopted by A.I.S.I. for light gauge structures.

The Wheeling Line of Building Materials includes:

Steelcrete Reinforcing Mesh, Expanded Metal, Metal Lath and Metal Lath Accessories, Tri-Rib Steel Roof Deck, ExM Angle Partitions and ExM Vault Reinforcing to meet #10 Insurance Classification. Write for descriptive literature and technical data.

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BUILDING MATERIAL DIVISION

NEW YORK PHILADELPHIA RICHMOND ST. LOUIS

June 1951
Over 3000 Cemesto* Buildings

Permanent homes, apartments, schools, other structures quickly, economically

Cemesto Insulating Structural Panels are a multi-function material combining great structural strength, high insulation value, interior and exterior finish—all in one handy unit that's quick and easy to apply!

Permit Important Savings
Their amazing versatility makes possible important economies in the design, erection and maintenance of permanent, insulated roof decks, curtain walls and partitions in buildings of every type and size. No wonder Cemesto Panels have been specified for thousands of residential, industrial, commercial, institutional and defense emergency structures...including over 3000 buildings in the famous A-Bomb City of Oak Ridge, Tennessee!

Strong and Permanent
Cemesto Panels consist of a core of Celotex cane fibre insulation, to which a non-combustible cement-asbestos facing is bonded on both sides by a vapor-resistant, moistureproof adhesive.

Many Unique Advantages
These rigid, pre-formed units are light and easy to handle. Yet they have remarkable structural strength! Their smooth hard, stone-gray surfaces have a light reflection value of 58%...provide attractive exterior and interior finish. Left unpainted, Cemesto Panels are maintenance-free. And their insulating core is protected by the exclusive (patented) Ferox® Process from fungus, dry rot, vermin and termites!

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Due to their high built-in insulation value, Cemesto Panels make any building cooler, more economical to air condition in summer...warmer, thriftier to heat in winter. They promote more comfortable, healthier working conditions that pay off in improved employee efficiency, reduced accidents, increased production!

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Almost 21 years of varied use in all climates, all over the world, have proved the stability and permanence of Cemesto Panels. Discover how this modern marvel of building materials can help you build better, faster, permanently...and at less cost...NOW! Mail coupon at right for complete information.
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hospitals, churches, theatres and
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Typical Oak Ridge Home
Most Oak Ridge families live in sturdy, attractive homes of Cemesto Panels. In a recent letter to The Celotex Corporation, Skidmore, Owings & Merrill, Architects-Engineers, wrote: "The Cemesto Houses were placed in the permanent category . . . ."

SKIDMORE, OWINGS & MERRILL
Architects-Engineers, planned and supervised construction of Oak Ridge, Tennessee. Approximately 5,000,000 ft.
of Cemesto Insulating Structural Panels were used.

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Don't Stop that Job!
...whether it's on the drawing board, or in
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June 1951
built to greet a million hands

Kwikset locks are precision manufactured, beautifully finished, designed to last.
ORIGINAL FEATURES

Dear Editor: P/A in its April issue presents an interesting survey of Chicago's Multistory Public Housing. Every architect who would keep abreast of housing progress should read it.

With urban redevelopment in New York City and elsewhere taking definite shape, the new approach of the Chicago planners should be carefully studied and appraised. With the broadly accepted conclusion that the only economic possibility of opening up the now densely crowded slum districts lies in the substitutions of high many-storied lowland-coverage structures for the crowd-ded-together, low, but high-coverage tenement houses characteristic of the city slums, the original features embodied in the Chicago multistoried buildings are of special interest.

Since the first intensive study of mass two-story housing, it has been recognized that outside light for all rooms is a necessity and that cross-ventilation is of the utmost desirability. Apartments but two rooms deep, with light and air at both front and rear, have long been the ideal. Apartments with but one exposure have long been discredited, and even the apartment with corner exposure has been recognized as second in desirability to those having complete cross-ventilation. To those of us who are familiar with the Chicago climate, the feasibility of the unenclosed open corridor, seems unbelievable; but if Chicago can get away with it, it certainly should not worry anyone else.

It is interesting to note that the skip-floor corridor schemes, akin to those of the East Gate apartments which have been built facing the Charles River in Cambridge for the N.E. Mutual Life Insurance Co. and M.I.T., were abandoned by the Chicago architects for outside corridors on each floor; and that when it was necessary to conform to the requirements of PHA, they had to abandon the outside corridor, though they found it possible to retain a communal play space at each story. Now that Chicago has had the courage to provide on each story an open corridor, though they found it possible to retain a communal play space at each story.

Dearborn Homes and Ogden Courts further destroyed basic design by giving the living room a full view of the kitchen equipment and complete exposure to kitchen odors and heat (and unwashed dishes when evening guests are around—the housewife is at least entitled to dirty dishes after dinner, until visitors have departed).

Dear Editor: The series of analyses by Julian Whittlesey in the April issue are of particular interest to me.

As director of development of the Chicago Housing Authority during the design stage of Loomis, Archer, and Prairie Courts I consider Mr. Whittlesey's discussion to be both clear and comprehensive.

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out noisy children are historically sen- sitive about those with noisy children."

This empirical statement is startling enough, without stressing that the ob-
servation is eternally true!

2. Are galleries and balconies justified at the expense of (cost and space)
dwelling unit areas? As for the mother
on the 6th-floor gallery eyeing her 3-
year-old being pushed from his bicycle
in the ground-level totlot—without
housewives who are former Olympic
100-yard dash stars, what practical
supervision or solace do the architects
expect?

3. Chicago shows a preponderance of
1- and 2-bedroom units. In a way, this
kind of distribution is more suited to
high-rise structures. However, I am
curious for it is my feeling that there
may be great unfulfilled needs among
families requiring 4- and 5-bedroom
units.

Seymour Stillman
Director of Planning
Buffalo 2, New York.

QUESTIONS AREAS

Dear Editor: The article, "New Dimen-
sions in Housing Design," by Julian
Whittlesey, in April 1951 P/A, is very
enlightening. Congratulations to the
Chicago Housing Authority! It should
encourage other cities to improve their
Public Housing Plans.

The average square-foot area per
room as noted in the apartment sched-
ules for the various housing projects
does not, however, show the true pic-
ture.

In the past, cost per room (square-
feet per room) was figured on a con-
struction room basis. If the rental
room is now used, instead, then the statistics
used for public housing seems doctored
up in order to reduce all figures which
make up the costs.

Private speculative builders in the
housing field use this method to calcu-
late their rentals. FHA permits an
extra one-half room count per apart-
ment if the living room area is in-
creased, but in no case is the living
room considered a 1½ room count.

If Dearborn Home areas were changed
from rental to construction rooms, the
average square foot area would change
from 217 sq. ft. to about 243 sq. ft. and
Ogden Courts from 220 sq. ft. to about
273 sq. ft.

My housing research has proven that
a change in the room count is not re-
quired to reduce the average square
foot area per room. If waste and un-
necessary space are eliminated, it is
possible to get more and larger rooms
in less area and cube than in a con-
ventional plan at a saving of 10% to
15% in construction and main-
tenance costs. This can be done without sac-
ificing conveniences in the dwelling unit.

Sound-proofed bedrooms without the use
of soundproofing materials (patented),
good privacy, light and ventilation,
ample storage space, etc., can be en-
joyed by each family without increasmg
costs.

Let us stick to the old-fashioned way,
if we can call it such, of counting
rooms and figuring cost on a con-
struction room basis, at the same time use
the latest ideas and materials to reduce
cost and plan better buildings.

Charles Henry Sacks
Brooklyn, N. Y.

DON'T TREAD ON ME

Dear Editor: In reference to the review of
Never Leave Well Enough Alone;
G.A.S. appears to suffer from a "schizo-
phrenic" condition, resulting from in-
roads on architecture made by the In-
dustrial Designer.
OPEN LETTER TO THE DISTRIBUTORS OF MICROROLD STAINLESS STEEL SHEETS

The current demand for Type 430 sheet is certainly a tribute to you distributors, and we want to take this opportunity to thank you for a job well done.

Because there is not sufficient nickel we asked our distributors, in July 1950, to explore the practicability of substituting Type 430 straight chrome stainless steel. While it is recognized that Type 430 is not a "cure-all", there are many applications where it does adequately provide the required corrosion resistance and other desirable characteristics.

We also wish to reassure you that we shall endeavor to allocate our production in an equitable manner.

Cordially yours,

T. S. Fitch
President

PS.—You are aware of the fact that the government regulations require us to supply 40% of our production for Defense Uses; this obviously means that we cannot provide as much tonnage for non-defense purposes as we used to provide, nor as much as we would like to provide, at this particular time.

T. S. F.
We doubt that you've worked on many clubhouses like this one lately.

We haven't helped heat any, either.

But we can help heating engineers and contractors provide the proper thermal environment for any client—anywhere—in any kind of structure.

We have a lot of literature on the automatic control of all phases of heating, ventilating and air conditioning. Information you should have in your files.

And we have a lot of very well-informed control engineers—in our 89 different offices—who have a lot more information right at their finger tips.

We sincerely believe we can help you on any project that poses problems of control of any kind—for control is Honeywell's business.

So, why not talk to Honeywell? Why not write to Honeywell for complete information on the equipment discussed across the page? And why not do it now?
Being slightly prejudiced, since studying, teaching Industrial Design, and working with the Los Angeles office of Raymond Loewy Associates, felt the review a tirade, lowering the profession to the "flotsam" that is appearing upon our landscapes.

At present, I am with a nationally known architectural firm, doing the same type of work I did at R.L.A., principally, Store Planning. The difference is as great as night and day. When the members of the architectural profession devote more time to top echelon, rather than A.I.A. reunion hashes, better associates and use of talent will prevail, resulting in a class of unparalleled design.

Regarding M.A.M.'s report on the 51 U.S. Industrial Design, this reviewer appears to carry the same views, regarding the Industrial Designer for "casing the intestines," which is indistinguishable from the architect and his structure. A vexation has clouded the architects' horizon, thus acrimonious invectiveness to the successful Industrial Designer.

J. Smith Bennett
Hollywood, Calif.

LETTERS TO THE SCHOOLMASTER

Dear Carl: I admire your candid and erudite criticism of the four statements on "Basic Design." (February 1951 P/A) Wasn't it St. Paul who said that "only the foolish measure themselves by themselves"? God knows how easy it is to appear foolish in seeking art in abstract form. On the other hand, what is more abstract than ideas about art expressed in word form?

I hope that you are wrong in your reference to a "lack of emphasis of human factors in design...in all four statements", though the rational side of the topic is the easier to express, I trust that we do not prejudice the presence or validity of the other.

It is good that you emphasized points such as the need for "experience-vocabulary" and "the study of man and nature," which means everything! Without curiosity and love (in the teacher as well as student, neither experience nor understanding will come easily, or with satisfaction.

The line one might draw between Charles Eames' chair and his love of design in the commonplace may not be straight, but it could hardly be more direct.

Eugene J. Mackey
St. Louis, Mo.

* a reminder that my statement in December issue does not use the word abstract - no clear image-value, in my opinion. - E.J.M.

...AND FOR HELP WITH THE TEMPERATURE CONTROL, WE'LL TALK TO HONEYWELL!

In apartment buildings, for example...

Question: Is there any way to control the temperature in an apartment building so that all tenants will be satisfied at the same time?

Answer: There certainly is—by installing Honeywell Personalized Heating Control. With PHC, each apartment has its own individual thermostat—each tenant can select the temperature most comfortable for him.

Question: But we've got to consider fuel bills. Won't they go up—with every tenant free to regulate his own heat?

Answer: On the contrary, they'll go down—as much as 20% annually! Surveys show owners often have to overheat a whole building to satisfy the 10% who like to live at 76°. Yet, most tenants want no more than 72°. Their PHC will regulate to that temperature—and save your client money.

Question: How about the added cost of PHC? Is individual control equipment more expensive to install than ordinary equipment?

Answer: Initially, Personalized Heating Control does cost more—although probably less than you think. But PHC is not just an added cost. It's an investment that pays definite, worth-while dividends. Experience has shown tenants will gladly pay a little extra for the greater comfort individual controls give. In just a few years, this extra will pay for the thermostats and valves. And from then on, the added income will benefit your client.

Gentlemen: Please send me detailed information about Personalized Heating Control for apartment buildings.

Name_________________________Firm Name_________________________
Address_________________________

Send this coupon today to: Dept. PA-6-82, Minneapolis 8, Minnesota

Honeywell
First in Controls

MINNEAPOLIS

June 1951 13
An Empty Roof Space Would Be The Best Insulation Against Summer Sun, Were It Not For Radiation

Convection is not a problem — there is no Convection downward. The only heat flow in summer through an empty roof space is Radiation, except for insignificant Conduction. Heat flow by conduction through roof spaces — through any building air space — is about 5%.

Ordinary insulation may retard heat for two or three hours, but builds up a large heat storage as compared to empty space. Fairly solid, it is a much better conductor of heat than empty air. Its surfaces absorb more than 90% heat rays. The heat passes through it by conduction, and is then radiated into the rooms at a 90% rate all through the day and into the night.

The solution is to use a material which has little substance and whose surfaces will not absorb nor emit appreciable radiation. Silver foil would be excellent but tough multiple accordion aluminum, which weighs but 1/5 oz. a sq. ft., is inexpensive and has practically the same heat-ray absorption and emissivity (2% more). It absorbs only 3% of the preponderant radiant heat flow through building air spaces inside walls, ceilings and roofs, and emits but 3%. It is non-condensation forming, impervious to vapor, and its multiple air spaces practically eliminate conduction. The commercial form is Infra Type 4 and 6.

The National Bureau of Standards Booklet BMS52, "Effect of Ceiling Insulation upon Summer Comfort," lists on page 10, the "insulations tested" in the order of decreasing effectiveness in protecting the ceiling against summer heat, as follows:

"1) Two layers aluminum foil (both sides of each layer reflecting).

"2) Full thick (3/8") rockwool."

Try this test: Tack or scotch-tape 3 sq. ft. of multiple accordion aluminum (we will send it free on request) to the underside of a hot roof or ceiling, whether uninsulated, or insulated with ordinary insulation. Step in and out of the protected area beneath. The difference will be so marked, you will need no thermometer.
PROGRESS PREVIEW

Eliel Saarinen's last sketches, made just before his death at Cranbrook last July 1, were of a campus chapel he was designing for Stephens College at Columbia, Missouri. Here and on page 16 are shown his own studies (larger illustrations) and also several elevations of the chapel drawn by Robert Snyder. Working drawings were subsequently prepared in the office of Eero Saarinen & Associates and bids were invited, but at present the project is in the category of "future construction." The bids exceeded the fund raised by sponsors of the chapel, who now are attempting to collect the increased amount.

The sensitivity to architectural proportion and the elegance of design expression that characterized Eliel Saarinen's drawing of the chapel plan (right) is one of his last sketches. The elevation (above) was drawn by Robert Snyder.
The sketches (above) are by Eliel Saarinen. The elevations (below) are by Robert Snyder.

The work of Eliel Saarinen are evident in these preliminary sketches from his drafting board. The unusual plan of the chapel with its syncopation of the spatial accents merits analysis. The adroit division of seating suggests a practicable and effective setting for the non-ritualistic services of a women's junior college under Baptist sponsorship. Thus the architect captured in his design the beauty of the circle, yet escaped the restrictions of such a finite parti.

Eliel Saarinen's sketches of the elevations of the chapel, further defined in the drawings by Snyder, reveal the subtleties of the major composition—slender bell tower accenting the rounded mass of the chapel. The fluting of the chapel wall, at a monumental scale, is perhaps the essence of the architectural expression.
HUNDREDS OF THOUSANDS OF SQUARE FEET LIGHT WEIGHT, PERMANENT, FIRE-SAFE, NO MAINTENANCE PRECAST CONCRETE ROOF SLABS ON THE ATOMIC PROJECTS AT OAK RIDGE, TENN. AND HANFORD, WASH.

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NOTICES

EXHIBITION

Well-designed, inexpensive household objects being made by hand in Japan today are being exhibited at the Museum of Modern Art, 11 W. 53 St., through June 17. Between 50 and 60 pieces of pottery, basketware, lacquer pieces, and matting designed for everyday use will be shown including bowls, casserole, pitchers, vases, tea cups, plates, jugs, flower holders, lacquered plates, and containers.

The material in the exhibition was collected in Japan by the architect ANTONIN RAYMOND and his wife, NOEMI RAYMOND, who lived and worked there for many years. The objects were not made for export but for everyday use in Japan.

ARCHITECT: William Lescaze, New York

Beauty and Economy
IN EXTERIOR FINISHES

Cabot's Stains are beautiful — they bring out all the loveliness of grain and texture — come in a wide range of colors from clear brilliant hues to weathering browns and grays, many available from no other source. Cabot's Stains are practical — 60-90% content of pure creosote oil, the best wood preservative known, preserves the wood and keeps termites out. Cabot's Stains are economical too — they cost less than 1/4 as much as good paint — go on quickly and easily — keep their fresh colors for years.

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Cabot's creosote stains

COMPETITION AWARDS

PHYLLIS McCARY, a student at the University of California, Los Angeles, won the first award given by the American Institute of Decorators in its annual competition for the best solutions of a specified problem, which was the redesign of the street floor of a city house. This award consists of the Rorimer Gold Medal, $200, and expenses to attend from Grand Rapids Convention of A.D. to receive the award.

The second award, consisting of a Rorimer Silver Medal and $50, went to MARSHALL C. PANN, a student at Pratt Institute, Brooklyn; while the third award, a Rorimer Silver Medal, was won by ERNEST W. GRILK, a student at the Chicago Academy of Fine Arts.

HARRY LAWENDA of San Francisco is winner of the furniture award in the 1950 Good Design Competition for Home Furnishings, staged annually by the American Institute of Decorators. The floor covering award goes to VIRGINIA HAMHILL, New York. PAAVO TYNELL of Finland won the lighting award, and KARL LAURELL of Poughquag, N. Y., designed and executed the winning material in the fabric category.

AWARD

The Committee on Scholarships of the Beaux-Arts Institute of Design announces the award of the 1951 Lloyd Warren Scholarship, representing the 38th Paris Prize in Architecture, carrying a stipend of $5000 for study of architecture abroad and in the U.S.A., to WILLIAM STOUTENBURG of the University of Illinois, Urbana, Ill. The alternate is KIRK R. CRAIG of Clemson Agricultural College, Clemson, S. C.

CONGRESS TO BE HELD

The second Congress of the INTERNATIONAL UNION OF ARCHITECTS will be held in Rabat (Morocco) from September 23 to 30, 1951. The theme will be "How the Architect acquits himself of his new tasks"; construction, reconstruction, remodelling, realizations, and prospects for the future.

The Congress will be presided over by ALEXANDRE COURTOIS, President of the Council of the "Ordre des Architectes" in Morocco. The general Commissioner will be E. J. DUHON.

The Congress will be followed by study tours left to the choice of the delegates.

For further information, those who desire to take part in the Congress may apply to the national branches of the U.I.A., to their national professional societies, or to the Secretary, Organizing Committee, 11, rue Berrery, Paris 8, France.

(Continued on page 20)
At Oak Ridge, for dependability, beauty and ease of installation the builders of America's most modern home site installed

*14,742 General Gibraltar Flush Doors

HERE'S ONE GREAT BUILDER'S REACTION...

At Oak Ridge, where precision is the watchword, as in many other famous building projects, Gibraltar flush doors were chosen to meet exacting requirements by builders of an exacting community. Here, in this ultra-modern American industrial center, architects, builders, and home owners alike demanded building accessories that would combine economy, beauty, cleanliness, and ease of installation — and the superior construction features of Gibraltar flush doors met all of these requirements more than adequately.

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PLASTER: Fireproofing - speedily applied over structural steel. Interior Walls - replaces sand plaster - at less than half the weight.

NOTICES

(Continued from page 18)

DESIGN STUDY ABROAD

The School of Art of Syracuse University will offer a design studies workshop course and study tour in Europe this summer under the direction of Professor and Mrs. Antonin Heythum. Students and teachers may earn six to nine units of academic credit, but anyone seriously interested in art, design, or architecture is eligible to register. Total cost of the trip, July 6 to August 26, is $987.

Participants will visit the Festival of Britain exhibitions in London and the "Triennale" international design exhibition in Monza, Italy. They will have interviews with prominent European designers, go to factories, studios, architecture centers, and attend various theatrical and musical performances in the six countries visited.

Contemporary design trends will be studied in Amsterdam, Rotterdam, and Frankfort; followed by an intensive 20-day workshop course in design analysis at the Ecole d'Humanité in Goldern, Switzerland, with excursions into the Alps, and to Lucerne, Zurich, Lausanne, and Geneva. Museums, galleries, and artists' studios will be visited in several Italian cities, with the last week of the study tour spent on the French Riviera and in Paris.

Illustrated folders may be obtained from the School of Art, Syracuse University, and from Study Abroad, Inc., 250 W 57 St., New York, N.Y.

New Practices, Partnerships

TULLY, HOBBS & HANSEN, Architects, Columbus, Ohio, announce the dissolution of their partnership.

RICHARD L. TULLY and FREDERICK H. HOBBS, Jr., announce the formation of a new partnership; address: 582 Oak St., Columbus 15, Ohio.

ARTHUR E. THOMAS, Architect, formerly of THOMAS & MCGUIRE ASSOCIATES, has opened an office at 28 Shetucket St., Norwich, Conn.

M. WARNER KLEY, formerly head of the Dept. of Store Planning and Design in the New York office of RAYMOND LOEWY ASSOCIATES, has announced the opening of architectural offices at 50 E. 86 St., New York, N.Y.

BIBERSTEIN & BOWLES, INC., Architects and Engineers, announce a change in the corporation's name to BIBERSTEIN, BOWLES & MEACHAM, INC., 1600 Elizabeth Ave., Charlotte, N. C.

LONG & THORSOY, Architects, 400 Metropolitan Life Bldg., Minneapolis, Minn., announce a change in the firm's name to THORSHOV & CERNY. NORMAN THORSOY is president and secretary; ROBERT G. CERNY, vice-president and treasurer.

CORRECTION

In the April P/A, page 60, the name of James Hammond was listed as Job Captain in connection with Ogden Courts, the Chicago multistory housing project designed by Skidmore, Owings & Merrill. This information came to us from what the newspapers usually describe as "informed sources." However, in this case the sources seem to have incorrectly informed us. For Mr. Hammond writes to tell us that, in the design of Ogden Courts, "Messrs. William E. Hartmann, Charles D. Wiley, and Paul B. Marren were the Project Manager, Chief Architect, and Job Captain, in that order." We are happy to report this and henceforth shall regard our "informed sources" with a more wary eye.
Russwin Fire Exit Bolts

Your recommendation on emergency door exit bolts probably gets more customer consideration than any other hardware item. In the Russwin line, you have a very special "talking" point... its extremely simple mechanism... only 3 moving parts. You can see how sturdy it's made from the illustration at the right... and each part is positively aligned. Such simplicity assures "touch and go" action at all times.

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Whatever your needs for emergency door equipment, there are Russwin products to fill them. Russwin fire exit bolts are classified into three divisions... heavy duty rim type, side latching; heavy duty, top and bottom and side latching; medium weight—competitive type—top and bottom latching and side latching. Specify Russwin Fire Exit Bolts with the utmost confidence. Russell & Erwin Division, The American Hardware Corp., New Britain, Conn.

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FOOL-PROOF DOGGING DEVICE
Positive, Tamper-Proof dogging device permits locking bar in depressed position, retracting latch bolt so that bar becomes a simple push and pull bar on door.
ANOTHER ADVANTAGE OF BUILDING WITH HOMASOTE...

MAXIMUM SIZE, STRENGTH and INSULATING VALUE combined with LIGHT WEIGHT

No matter what the emergency, Weatherproof Homasote always plays an important part in the construction picture. This famous insulating-building board—combining unusual strength with sizes up to 8' x 14'—meets all types of military and civilian construction, temporary or permanent ... barracks, warehouses, housing, field and ammunition shelters, field kitchens, camouflage, map mounting and road signs.

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* Patent Pending

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June 1951
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June 1951 25
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Comfort and salability. These primary considerations led
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June 1951
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(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.

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Call your Fenestra Representative (he's listed in the yellow pages of your phone book) or write to Detroit Steel Products Company, Dept. PA-6, 2253 East Grand Boulevard, Detroit 11, Michigan.

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*See Steel-Strong Windows made to STAY new

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HOT-DIP GALVANIZED STEEL WINDOWS

Intermediate Industrial Residence
Space-Saving Idea that Sells Homes

STANLEY SLIDING DOOR HARDWARE

A type of Stanley Hardware for all these installations — and more

- Single door mounted inside closet
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Investigate this modern, low-cost way to build SEL into today's smaller homes. Your hardware consultant, lumber or building material dealer will be glad to tell you more about Stanley Interior Sliding Door Hardware. The Stanley Works, New Britain, Connecticut.
Within the overall responsibility of the Architect and the Contractor is the design and erection of THE STEEL.

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June 1951 31
GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS

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WE SUGGEST THAT—
Brick taken from the scaffold should be tested for rate of absorption, as illustrated at top left. If the tested brick gains more than 1 ounce in weight, all brick should be thoroughly wet just before they are used.

A good initial bond between brick and mortar depends (1) upon the suction rate of the brick, and (2) the water-retaining capacity of the mortar.

If the absorption rate of the brick is too high at the time they are laid, they will suck the water out of the mortar too fast, even though the mortar has high water-retaining capacity. A thorough wetting of the brick just before they are laid is the only way to be sure they will have a low enough rate of absorption.

BRIXMENT

Brixment mortar has higher water-retaining capacity and stays soft and plastic longer when spread on porous brick. This helps secure a good, watertight bond.
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In the mammoth New York Housing Program, for instance, Briggs Beautyware has been installed in 5,123 apartments since 1948. It has been specified for a total of 11,753 apartments now in the construction or planning stage. This is just one of many important building projects where Briggs Beautyware has been used!

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how MOSAIC tile helped make

THE PACESETTER HOUSE OF 1951

a spectacular success

The editors of "House Beautiful" have pioneered some unusually practical uses for Mosaic Tile in their Pacesetter House for 1951.

Architect—Julius Gregory
Builder—Robert Chuckerow Construction Company
Tile Contractor—R. L. Leonardi, Inc.

The "House Beautiful" Pacesetter House of 1951, at Dobbs Ferry, New York.
IN THE OUTDOOR  living room the rich, earthy, red of the Mosaic Granitex Tile floor blends perfectly with its garden setting. Continuous traffic from the garden areas across this floor will never mar its surface or texture. Neither sun nor weather will change its permanent color. This floor may be hosed daily, for Mosaic Tile is impervious to moisture and stains.

Floor—Granitex Mosaic, Pattern No. 1779-A3.

BLUE FAIENCE TILE is an ever-beautiful finish on the sides of this combination serving bar and cooking peninsula. The hand-crafted appearance of Faience aids in blending the casual character of the living-dining area with the trim efficiency of this ultra-modern kitchen. Other types of Mosaic Tile are used on work counters, splash boards and walls for the utmost in easy cleaning and lasting beauty.

Peninsula—6" x 6" Faience color No. 2102.

MOSAIC TILE in this bathroom will turn in top performance for the life of the house because water and moisture will never affect the tile nor the manner in which it is set. The vanity top and the floor are unglazed ceramics, an especially hard and durable type of Mosaic Tile, with permanent color throughout its wear-proof body.

Harmonitone wall tile color—No. 161. Vanity top and floor color—No. 201 Velveticx.

From these pictures, you can visualize how Mosaic Tile, an extremely practical material—and used in every room in the Pacesetter House—may be used on both vertical and horizontal surfaces.

For example, Mosaic Faience Tile, which makes the fireplace wall so outstanding, offers opportunities of great interest if planned for elevator lobbies and for other large surfaces where everlasting beauty, utility and rock-bottom maintenance are required. For such uses, the cost of Mosaic Faience Tile will be no more than that of equally sturdy materials. In fact, it will probably be less.

There are other patterns you will want to see. Or, taking a clue from this job and from such other jobs as the ceramic Mosaic wall in Harvard University's recently completed graduate school, you may wish to develop your own design for the job you plan for Mosaic Tile.

In either case, Mosaic's Design Department is at your service. There is no obligation.

Center of attraction in Pacesetter House is this truly magnificent and really distinguished floor-to-ceiling fireplace wall, which serves also as a decorative partition between living and dining areas. Made of Mosaic Faience Tile, in a special design, its color are there to stay; can’t fade or bleach. Floor of living and dining area is Granitex Mosaic, which is also used on the floor of the outdoor living room.

—fireplace wall Mosaic Faience Tile, pattern No. 6056.
—floor Granitex Mosaic, pattern No. 1779-A3.

THE PACESETTER HOUSE is open to the public until July 1. We’d like you to see it if you are in the East. It’s at Dobbs Ferry, just up the Hudson River from New York.

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June 1951
THIS NIGHT view of the new Oak Ridge Senior High School building at the Oak Ridge project in Tennessee, is an interesting example of modern design in public building. Contributing to the impressive over-all effect is the wide use of Pittsburgh Polished Plate Glass and Pennvernon Window Glass—recognized as “window glass at its best!” Architects: Skidmore, Owings & Merrill, Chicago, Ill.

LARGE WINDOW wall areas, glazed with Pittsburgh Polished Plate Glass, are a prominent feature of the recently completed Harvey Ingham Hall of Science and Fitch Hall of Pharmacy buildings at Drake University, Des Moines, Iowa. The illustration here shows how the top floors of the new buildings are connected by an enclosed foot bridge, with huge window walls admitting floods of natural daylight. Architects: Saarinen, Swanson, and Saarinen, Bloomfield, Mich.; Associate Architects: Brooks-Borg, Des Moines, Iowa.
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IN PLANNING this unusual office building, Architects Lankton and Ziegela of Peoria, Illinois, made striking use of Twindow—Pittsburgh's window with built-in insulation—at the entrance and in the large tilted bay at right. Pittco De Luxe Store Front Metal and the Herculite Door add further appeal to this distinctive architectural creation.

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June 1951 51
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June 1951
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OAK RIDGE, U.S.A., WORLD'S 8th WONDER
IN TENNESSEE'S HILLS THE PATTERN OF DESTINY IS BEING SHAPED

Only a few years ago the quiet of the Tennessee hills was shattered by construction activities unprecedented in all history. The world's No. 1 atomic energy community was being created. With few exceptions living facilities were temporary, pending community development according to a Master Plan. Since war's end architectural and engineering progress has been transforming the pioneer Oak Ridge into a model which may well influence planning for other defense communities throughout the nation. Sloan is especially proud that its Flush Valves were selected for Oak Ridge—another example that explains why... 

Photos, HEDRICH-BLESSING, Chicago

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Sloan Flush Valves are specified for closets, urinals, service sinks, hospital sterilizers, etc., and once regulated to the requirements of the fixture, will deliver a uniform flush at all pressures between 10 and 100 pounds.
America's No. 1 Defense Community:
Oak Ridge, Tennessee

By George A. Sanderson

Oak Ridge, it seems safe to say, is the most unusual city of 40,000 to 50,000 population in the United States, perhaps in the entire world. The fact that it is a single-industry city—and that this one industry is nothing less than the distillation of that potent ingredient U-235—puts it in a class by itself as (1) a place for which one must have a healthy respect and (2) one of this country's most vital defense centers. The place was so nonexistent in 1940 that it didn't even appear in the census of that year. This seems hard to believe in light of the fact that Oak Ridge will soon be an established municipality with 50,000 permanent residents. Yet another “believe it or not” is that it will be a totally planned community, organized in a series of well-knit neighborhoods with street patterns and neighborhood facilities of the sort for which city-planning protagonists have long argued. From the professional point of view, the fact that the entire city was designed by just one architectural-engineering firm is perhaps the most incredible of all. Yet, so it is.

Back in 1942, when the firm of Skidmore, Owings & Merrill was commissioned by an unspecified but well accredited governmental agency to develop site and building plans for an essential secret town, the architects didn't have the slightest idea of its purpose or even where it was to be built. All they had to work from, initially, were aerial photographs, with little information about the lay of the land.

The original patterning of streets and communities was designed to accommodate 3000 families, the agency's estimated need at the time. The first Skidmore, Owings & Merrill staff to reach the Tennessee farmland that was to become Oak Ridge, in 1943, consisted of but six city planners, architects, and engineers. Albert Goers and Louis Scesa, who were among the original six and are still there on the job, report that up to the time the newspapers carried the awful news about the Hiroshima destruction, they and their associates did not know the reason for the community, other than that there were some secret plants over behind the hills and that these were, presumably, militarily connected.

Much of the earliest design work was handled by the New York office of S. O. & M., acting as architects-engineers. Using the Cemesto type of construction they had developed in conjunction with the John B. Pierce Foundation, they designed (among other things) the first important group of permanent single- and four-family dwelling units built at Oak Ridge. As the war and the demands of the town's secret enterprise became increasingly insistent, the design office grew to an eventual total (1944) of some 450 architects, engineers, city planners, designers, draftsmen, structural personnel, and related staffs. Even so, the arrival of new families raced ahead of any possibility of providing sufficient permanent buildings, and prefabricated houses designed by TVA architects were hauled in by the hundreds, adapted to existing conditions, and assembled along miles of curving streets and lanes in the new hillside neighborhoods. Trailer camps were huddled together wherever there was room, and temporary huts and whatever else could be commandeered to serve as human shelter crowded the landscape: until, at the community's most frenzied moment (1945) 75,000 persons were variously housed or encamped at Oak Ridge.

January 1, 1946, “The Manhattan Project” was officially transferred to the civilian Atomic Energy Commission. In taking stock of its war-born community, the AEC asked Skidmore, Owings & Merrill to
Above—looking south across Neighborhood 6 to the hillside Neighborhood 9 composed entirely of garden apartments.

Left—a group of the most recent Oak Ridge single-family dwelling units—50 three- and four-bedroom houses spotted throughout the city on available vacant sites.

Below—a typical group of the adapted TVA prefabs that are still in use in the earlier neighborhoods.

Acrosspage—some of the earliest permanent housing at Oak Ridge (3000 one- and four-family dwelling units).

Photos: Torkel Korling; except for view of three houses at left by Bill Hedrich; Hedrich-Blessing
prepare an Evaluation Report on the existing town. Some portions of the city were of permanent construction and approved to remain; many buildings were semi-permanent; and a great deal of the sprawling development consisted of temporary or definitely sub-standard units that had to be replaced eventually (see map, top of page 66). So that this could proceed in orderly fashion and assure that the city would be sufficient and well planned, the Commission asked S. O. & M. to develop a Master Plan for the permanent city (see map, bottom of page 66). An early decision was that the eventual population should not exceed 50,000 to 55,000, both because of the physical limits of the narrow valley where the city is located and the estimated personnel requirements of the AEC plants and laboratories.

The first postwar housing construction actually to go forward was the group of garden apartments, two and three stories high, located in Neighborhood 9 (see pages 68-73). Following this came Willow Brook School (pages 82-84), an elementary school to serve the children of Neighborhood 6.

Third on the impressive agenda was a group of houses in Neighborhood 11, comprising 500 concrete-block single-family houses with two and three bedrooms (pages 74-75), and 343 single and duplex housing units, two-, three-, and four-bedroom type. Concurrent with this construction, and to serve this neighborhood, the Woodland Elementary School was erected.

The magnificent new Senior High School (pages 76-81) was the next undertaking which, with its adjunct auditorium and recreational areas, including an outdoor swimming pool, now will constitute an important part of the permanent city center.

Currently under construction are 450 multi-family dwelling units—composed of three-bedroom row houses and two- and three-story apartment houses (one-, two-, and three-bedroom units)—in Neighborhood 11. Also, 50 single-family dwelling units are being built on available sites in various older neighborhoods. Neighborhoods 12 and 13, and the buildings for the future administrative and cultural center, will proceed as the need arises.
This map shows the stage of growth when the (civilian) Atomic Energy Commission assumed jurisdiction early in 1947. Below is the Master Plan developed by David S. Geer and Fred W. Kraft of the Skidmore, Owings & Merrill staff—a plan that has been closely followed in all subsequent construction.

The city extends seven miles along a narrow, east-west valley between wooded ridges, the one on the north being Black Oak Ridge from which the community derives its name. Running the entire length of the town, down the center of the valley, is the major east-west artery, Oak Ridge Turnpike. Since the busiest approach is from the south (the road leading to Knoxville, 20 miles away), a new major north-south arterial highway will enter the long narrow city near the center of its southern boundary, continuing in a northwesterly direction, just west of Areas A and B in the Master Plan.

The new north-south highway cuts obliquely across the city, continuing (up between Neighborhoods 5 and 6) to join other highways to the north. East of the intersection of Oak Ridge Turnpike and this new north-south arterial highway is the huge area allocated to the cultural and recreational (A), administrative (B), and commercial (C) center of the city. The two letters S within the recreational area (A) indicate new high schools, the one near Neighborhood 4 being the huge new Senior High School shown on pages 76-81; the S at the western end of this area is reserved for a future Junior High School needed to serve the western half of the city. Thirteen residential neighborhoods, designed for about 3600 persons each, stretch out along the valley—eight north of Oak Ridge Turnpike; five to the south of it. Each of these neighborhoods has its central elementary school and recreational area (indicated in black), as well as a small, local shopping facility.
First housing to be built after the war—in fact, before the Master Plan was completed—were the “garden apartments” (453 dwelling units) that constitute Neighborhood 9. During the most hectic days of the city’s war activity, the site south of the Oak Ridge Turnpike (see Master Plan) had been occupied by temporary dormitories and a trailer camp. The wooded hills slope abruptly up to the south and encompass an eye-filling northern view of the Cumberland Mountains.

An early decision, therefore, was to orient most of the buildings toward the view rather than toward south light though, as will be seen, all apartments have at least two exposures. Three types of buildings make up the group—the three-story walk-up, shown on these pages and top of page 70; an open-stair-link type of building, two stories in height (pages 70-71), and a series of four-family units in which the upstairs apartments overhang the lower floor (pages 72-73).

To keep costs down, the apartment blocks are boldly set on the steep contours, resulting in a dramatic, step-down ordering of the buildings that also makes the most of the magnificent view. Since leading personnel, scientists, and others, would live here, there was a conscious effort to make the units as attractive as possible; hence the balconies, large window areas, and unusual openness. In all, there are 284 two-bedroom apartments in these three-story buildings.

Esthetically, one of the most satisfying things about the group is its colorfulness—a factor not so apparent in black-and-white pictures. The white-cement-washed concrete block walls against the background of dark hillsides form an arresting pattern; perhaps even more striking are the bright, porcelain-enamel balustrade panels that occur at the stairs, variously red, blue, yellow, and green.

The two- and three-story concrete buildings employ the same structural system (see listing, acrosspage). Merritt-Chapman & Scott were general contractors for the entire Neighborhood.

*Photos: Bill Hedrich; Hedrich-Blessing; except for view above by Torkel Koring*
MATERIALS AND METHODS

CONSTRUCTION


EQUIPMENT

The two-story open-stair-link type of apartment building provides 97 three-exposure dwelling units, each with a screened terrace opening off the ample living-dining room. Initially, the architects hoped to use this plan scheme—essentially flexible links between units—more generally, so that buildings could be placed across contours, if necessary, by increasing story heights. In practice, however, this proved to be more expensive than the solid, three-story units.

As in the case of the three-story buildings, the structure is a reinforced concrete frame (8” x 12” columns) left exposed, with exterior walls of concrete block finished with a white, cement wash.

It seems to the Editors that the planning of the individual apartments deserves careful notice. In these two-story units, for example, not only is there good and economical interior circulation and the private, screened porch, but even the kitchen has its own small service porch adjoining the access gallery.

Acrosspage—typical plan, a general view, and a stair detail of the two-story link buildings.
garden apartments: four-family units

The third of the garden-apartment building types—the four-family units, with the wood-sheathed overhanging second floors—are all located near the Turnpike boundary of the Neighborhood, because of their comparatively low height and apparent lightness. The architects felt that larger buildings near the road would be somewhat forbidding and block the entire project from view of passers-by.

Built in groups of three, the typical unit contains two identical two-bedroom apartments on the upper floor. Downstairs, in addition to the carports that are formed by the projecting second floor, are two additional rental units—mostly one-bedroom kitchenette units, but with two-bedroom apartments at the ends of each group (See plan acrosspage). In all, these so-called “over and under” buildings comprise 48 two-bedroom apartments and 24 one-bedroom units. Roofs of the extensions of the first-floor apartments become outdoor living terraces for the pairs of upstairs apartments.

In structure, these units depart from the system used for the other apartment buildings in the neighborhood. The first-floor element is of concrete-block construction, while the upper floor is of wood frame, surfaced with redwood siding. There is no mechanical ventilation, but all apartments have through natural ventilation and the ground-floor units have broad, screened porches, facing the mountain view.

Photo above: Torkel Korling; close-up acrosspage by Bill Hedrich: Hedrich-Blessing

MATERIALS AND METHODS

CONSTRUCTION


**EQUIPMENT**


**Plumbing and sanitation:** vitreous-china toilets and lavatory, cast-iron enameled bath and shower combination—Kohler Company; hot-water converter—Bell & Gossett Company; flush valves—Sloan Valve Company; accessories and metal medicine cabinets with fluorescent side-lights—G. M. Keitcham Manufacturing Corporation; pipe: galvanized wrought-iron—A. M. Byers Company; copper tubing—Reading Tube Company; black steel—National Tube Company. Heating: central heating plant with hot water as heating medium; fin-type convectors—Bell & Gossett Company; automatic temperature control—Hoffman Specialty Company; thermometers—Moeller Instrument Company.
neighborhood 11

Neighborhood 11 is an entirely new postwar community. The site, like so much of Oak Ridge, was hilly and wooded and, after placement of the elementary school and park in the approximate center, the residential streets, utilities, etc., were designed along the contours of the land.

Eventually, the neighborhood will house 1000 families. First units were the 500 concrete-block houses shown here, and the elementary school, which utilizes directional glass-block above clear-glass fenestration for classroom lighting. Currently, some 450 additional dwelling units are being built in both two-story row houses and three-story apartment buildings (40 two-bedroom units; 128 three-bedroom units; and 282 one-bedroom units, the latter making up the entire three-story group).

In the design of the concrete-block houses, the architects hoped to build them in groups of from three to six, with open areas between them; but, due to cost of utilities, the dimension of 35 feet between houses was established, and the units were organized along the road patterns and oriented for south and east light and view. All houses were built from variations on four, basic, plan types, all of which had to be designed (to meet competitive bidding requirements) so that they could be built by the Le Tourneau precast-concrete system, the “tilt-up” precast-concrete-slab system, Stransteel’s framing system with wood exterior siding, or conventional concrete-block bearing-wall construction.

The central partition reflects the design’s need to meet the most extreme case called for by the Le Tourneau method, though the successful bidder took the option of the concrete bearing-wall system. Roof framing is conventional wood. All houses have porches and are heated by a radiant system using copper tubing in the concrete floor slabs.
MATERIALS AND METHODS

CONSTRUCTION


EQUIPMENT


The 450 new dwelling units under construction in Neighborhood 11 consist of 4 two-story buildings with 40 two-bedroom units; 3 two-story buildings with 28 three-bedroom units; 8 three-story buildings with 282 one-bedroom units; and 18 two-story buildings with 100 three-bedroom units. The entire group is being built by T. C. Bateson Construction Company. Photos (row units): Bill Hedrich; Hedrich-Blessing; (detached unit): Thompson’s Commercial Photographer.

OAK RIDGE, TENNESSEE
Top of page — the entire school complex viewed from the south: (left to right) the gym-locker room unit; the long classroom-administration building; the connecting stepped-down corridor, and the auditorium mass. John A. Johnson & Sons, Inc., general contractors.

Above — detail of the covered entrance on the north front of the classroom building.

Right— the north front, with gym unit (and its separate public entrance) at right.

Acrosspage — end of the south face of the classroom building; glazed stairhall at right; one-story library element in background, left.

Photos: Bill Hedrich: Hedrich-Blessing
First permanent units of the city's new cultural center are the Senior High School, shown here, and its adjacent 1500-seat auditorium (page 81). Designed to provide for an ultimate enrollment of 1500 students, it will (when occupied next fall) take the place of the present Senior High School, in Neighborhood 3, which will then become one of the city's two Junior High Schools.

As a study of the Master Plan shows, this new cultural center, just north of Oak Ridge Turnpike, immediately adjoins the huge new administrative center and 100-acre shopping center that will be the main focus of the eventual community.

A hilly site, with a drop of more than 40 feet from the height on the north side down to the Turnpike, plus the desire to organize elements so that they could be used readily for extracurricular purposes as well as for school needs, dictated the basic scheme—with the 800-foot-long classroom-administration block on the higher land to the north, the gymnasium to the west adjoining the extensive playfields that are being built on this side, and a long, enclosed connecting passage leading down to the auditorium near the Turnpike, which has its own parking facilities. Because of curricular needs, workshops as well as art and music departments are included in the auditorium building, and also the big cafeteria (designed to seat 500) which, like the auditorium, will be used by various outside groups. The gymnasium, similarly, is to be used by adults and other groups, including professionals. Therefore, it includes a championship basketball court (running north and south) with folding bleachers along the east and west walls. By closing an electrically operated, folding partition, this huge room may be divided into two standard basketball courts, one for girls, the other for boys.
OAK RIDGE, TENNESSEE

The architects' presentation drawing on the facing page shows both the immediate site organization and the plan detail. A faint arrow in the plot drawing shows that "north" is to the right.

Left: (top)—detail of main (north) entrance lobby of classroom building with display case at left, library through doors beyond; floor is white terrazzo; (center)—a split classroom along the north wall of the second floor; (bottom)—one of the science classrooms.

All classrooms have projecting-type extruded-aluminum sash, acoustic ceilings, asphalt tile floors, stem-mounted fluorescent light fixtures, and wall-hung convectors.

Above: (top)—typical stairhall, with aluminum sash and handrails; (below)—the main corridor, lined with coat lockers; asphalt tile flooring; acoustical tile ceiling.

Photos: Bill Hedrich: Hedrich-Blessing

SENIOR HIGH SCHOOL
CONSTRUCTION


EQUIPMENT

Kitchen: ranges, deep-fat fryer, bake ovens, vegetable peeler, and dishwashing machine—Hotpoint, Incorporated.

Photos: Bill Hedrich; Hedrich-Blessing
In the postwar remodeling of Neighborhood 6, one of the prime needs was an elementary school to serve 600 children from kindergarten age through the sixth grade. Located north of the Oak Ridge Turnpike, and just west of a major north-south highway (see Master Plan), the school is built on an uneven, central plot.

Because of the sloping site—but wholly in accord with the wishes of the school authorities—the building is organized with classrooms on one level and administrative offices, service facilities, and kindergartens on a lower level. On the upper floor, in addition to classrooms, there is a gym-auditorium, equipped with an electrically operated folding partition 8 feet in front of the stage, so that rehearsals can proceed even when the gym is in use. Under the gym is the school cafeteria and kitchen. The standard classroom (either side of a central corridor in the south wing) is 30 feet wide and 40 feet long and receives crosslighting from a clerestory above corridor walls. A long, cabinet-display unit defines work spaces at the ends of the rooms and, in the case of the lower grades, this unit is extended to enclose individual toilets in the rear corner. Exterior doors lead out from all classrooms to allow for outdoor classes.

The building is a community center as well as an elementary school; hence, folding partitions are provided to close off school portions of the building when other areas are being used for adult, evening affairs.
Acrosspage—the east-west, two-story wing, with gym-cafeteria block at far end. John A. Johnson & Sons, Inc., were the general contractors.

Above — gym-auditorium with automatic folding wall partly closed.

Photos: Bill Hedrich: Hedrich-Blessing
Torkel Korling

**First Floor**

**Ground Floor**
CONSTRUCTION


EQUIPMENT


the future

In March, 1949, the fences and guard gates that had enclosed the city since its inception were removed, and the community was thrown open to the public. Security fences were relocated to protect only the restricted areas with their atomic energy plants.

Today's city displays most of the aspects of any normal community—religious groups, service clubs, and social organizations of all sorts; a 5-day-a-week newspaper, The Oak Ridger; a radio station; a city golf and country club, etc. Before too long, it is expected that Oak Ridge will become a self-governing municipality of the State of Tennessee. For the time being, however, it remains under AEC control as a Federal Area, but subject to the laws of the State and of Roane and Anderson Counties, within whose boundaries the site lies.

The only outright land sales that have been made—and these, with restricted deeds—have been to a few church organizations that are currently building. Sale of homes and business properties is contemplated, but not as yet initiated. The local government is vested in the Office of Community Affairs, whose officials are appointed by AEC. The Roane-Anderson Company, a private concern, continues, as it has from the start, to perform the operating functions for the city such as maintenance of buildings, utilities, etc., and the leasing of buildings.

The city is progressing boldly in line with its one firm tradition—constant change. Every month, every day the bivouac atmosphere of the place recedes, giving way to the orderly new city that is foretold in the Master Plan and its already completed components.
Cafeteria: Houston, Texas

MACKIE AND KAMRATH, ARCHITECTS
WALTER P. MOORE, STRUCTURAL ENGINEER
H. U. BIBLE, MECHANICAL ENGINEER

Left—a side entrance allows job applicants to reach the second floor office area without entering the main cafeteria; the covered walk leads customers back to a rear parking lot.

Below—the main cafeteria, showing (in the rear) the mezzanine dining space above the serving-counter space on the first floor. Photos: Paul Dorsey
The cantilevered second floor (across page) provides a sort of "elevated sidewalk cafe" with a view of the street; across the front, this becomes a balcony onto which private parties sometimes overflow.

A cafeteria to accommodate approximately 500, organized (for efficient service) for two serving lines; also with incoming and outgoing traffic separated. Private dining rooms for private parties.

L-shaped property, with 50-foot frontage on Main Street; parking lot adjoins rear of building, serving two bordering streets.

Along the south side of the building, a covered sidewalk provides sheltered passage back to parking lot. The main dining room occupies the fore-part of the building, with service and kitchens to the rear and in the basement. Upstairs are offices, a mezzanine dining space, and private dining space in both the rear extension and along the south balcony passage that commands a view of the street—a "sort of elevated sidewalk cafe," as the architects term it.

Patrons entering from Main Street choose one of the two serving lines that lead along side walls of the main dining room back to parallel U-shaped lanes along duplicate serving counters, terminating at cash desks just inside the entrance to the main dining room. Dishwashing is handled in the basement, by means of conveyors located centrally between dining and serving areas. Food storage (a delivery entrance and freight elevator are at rear center of the building) and mechanical equipment also are in the basement. The entire building is air-conditioned.


EQUIPMENT: Heating and air conditioning: gas-fired boiler; warm-air heating, galvanized-iron ducts, cork insulated; built-in conditioner, direct-expansion method; multi-shutter registers in walls, ceiling diffusers. Electrical: both incandescent and fluorescent fixtures.

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Left—the mezzanine “sidewalk cafe”; below—the rear mezzanine dining space, which may be closed off for private parties by an accordion partition.

Below—customers’ and workers’ views of one of the paired serving lines and (bottom) a kitchen detail.
Proposed High School
and
Community College: Keokuk, Iowa

PERKINS & WILL, ARCHITECTS-ENGINEERS
DEAN, ROSE & MUDRO, ASSOCIATE LANDSCAPE ARCHITECTS AND ENGINEERS
Senior High School and Community College with a flexible plan to anticipate changing needs in the curriculum; a balanced scheme to provide for full mental, emotional, and physical development of students. Irregular, 25-acre site, with contour variation upwards of 50 feet from the lowest point at the southern end to the highest point on the north. Arrangement within four distinct, but related and connected building elements: (1) the huge gym-field house unit at the relatively low, southwest end; (2) an L-shaped administration-cafeteria-office wing connecting the gym building with (3) a four-story academic—classroom wing, planned in a north-south-oriented rectangular block near the top of the site; and (4) the adjunct art department and workshops unit to the east. The community-junior college facilities that would share many of the school facilities are placed on the ground floor, across from the centrally placed library.

Most notable plan-and-design feature is the bilateral lighting of classrooms in the multistory academic block. Main classroom windows face north; interior walls of classrooms consist (on the corridor side) of banks of coat lockers, with plate-glass above them. The corridors themselves are cantilevered 12'-2" out from the centers of columns (along interior classroom walls); the entire enclosing wall on the south side of the corridors is a curtain wall of polished plate glass with aluminum sash. Thus, the corridors are sunny, enclosed loggias; southern light, but not direct sun, enters the rooms by means of the window strip above lockers, and all classrooms are bilaterally lighted.

Above—a few of the innumerable site-plan studies made by the architects before the final scheme was settled. Drawing at bottom corner of facing page is a typical early study of relationships between major functional elements.

At the minutes level beneath the unit that joins the administration-tower, wing and the gymnasium are the boys' locker and shower rooms. Further site studies and a preliminary design-sketch of the main entrance at the northwest corner of the group.
Bird's-eye view of model shows the gym wing at far left, cafeteria and administrative link, center; academic block (with library projecting toward the south at the minus-one level), and the art department-workshop building, in foreground. Note the plastic-bubble skylights in both the library and the workshop building.

Photos of model: Bill Hedrich, Hedrich-Blessing

**Classroom Floor Plan (PLUS TWO FLOOR LEVEL)**

**Library Floor Plan (MINUS ONE FLOOR LEVEL)**
The section through the academic building, with the projecting mass of the library, clearly shows the ingenious solution worked out for bilateral lighting in a multistory classroom building. The cantilevered southern corridors have continuous glazing on the exterior wall (note the fin-pipe radiation concealed behind the corridor handrail); inner walls consist of coat lockers with plate-glass panel above, and the larger windows of the classrooms face north, overlooking the Community College campus. The north-lighted classrooms for the college occur at the minus-one floor level, across the corridor from the library.

The classroom floor plan on the opposite page illustrates the flexibility that the scheme allows. A modular system, with 12-foot bays between vertical columns, plus the 28-foot standard depth of the rooms, permits room sizes that range from a 12' x 28' room, for departmental offices or small labs, up to a room 48' x 28' in area, that was needed (for instance) by the commercial department. The basic classroom size is 24' x 28'.

In both the library and in the arts-workshop unit, plastic skylight domes (see the detail, at left) bring light to interior areas.

A point in the school design that the sloping site helped the architects solve, is that the academic block, situated at the highest point of the site, dominates the scheme, even in competition with the huge mass of the gym unit which, through its placement at a lower grade, assumes its desired relationship—both visually and academically.
Standby Power Plants

By I. J. CROWLEY*

We have become so dependent upon electric power that an interruption of even short duration may result in loss of production, property, and even human life. As the demand for emergency power has steadily increased since the end of World War II, the installation of standby power equipment has become an important consideration in the planning of hospitals, department stores, hotels, office buildings, institutions, airports, pumping stations, and—most recently—bomb shelters.

The principal factors which should be reviewed before specifying this type of equipment will be analyzed in the following paragraphs.

**Automatic vs. manually operated units.**

Where prompt restoration of power (within 15 seconds) is of paramount importance, only a fully automatic unit will satisfy this requirement. This type of plant is essential for hospitals that have not been provided with automatic emergency lights in the operating and delivery rooms. Fully automatic units also must be provided where operating personnel is not available at all times or where the personnel may be incapable of starting and operating generating equipment.

Where a power loss of short duration, say a matter of minutes, will not have serious consequences, a manually started unit will provide satisfactory protection—assuming, of course, that personnel familiar with the equipment is in constant attendance. The Greenwich Hospital, Greenwich, Connecticut, possesses a manually started 50-kw (625 kva) diesel-driven unit which has given efficient emergency service for more than four years. During this period, seven power failures of varying duration have occurred—one failure lasted 17 hours. The operating and delivery rooms are equipped with automatic, battery-operated lights; however, at no time has other locations within the hospital been without power longer than 33 seconds. This efficient record was possible because the hospital employs three eight-hour boiler-room shifts and because the standby unit was given a half-hour operating test each week. The engine-generator unit (see Figure 2) is installed in the boiler room of this hospital; the switchboard is located near the main distribution panel in a switchgear room adjoining the boiler room. When normal power fails, the operator starts the engine, then goes to the switchgear room and shifts a manually operated double-throw switch from the normal supply to the emergency unit. The foregoing not only describes what actions must be taken in the event of a power failure but also indicates that conditions should be ideal for the use of manually operated units in hospitals.

**Determining and planning the emergency load.**

The load to be carried by the emergency unit obviously establishes the size of the unit to be installed. The wiring layout of a building should be planned so that circuits carrying essential facilities can be segregated from those deemed nonessential. The pieces of equipment usually considered essential are: oil burners, elevators, fuel and water pumps, and lighting. The operation of all elevators need not be provided for if selector switches are installed which permit the operation of one elevator at a time on the emergency unit. This will permit the discharging of passengers from any elevator which may be stopped between floors. In the case of existing buildings, it may be less costly to provide an emergency unit of sufficient capacity to carry the entire load than to attempt to make the wiring changeover necessary to separate essential facilities.

**Types of generating equipment available.**

Emergency generators are commonly driven by diesel or gasoline engines, or by steam turbines. Engines burning natural gas, manufactured gas, butane or propane, are also available. The prime mover to be used will be determined by the prevailing conditions and the decision as to which type will give the better results. The majority of engineers now favor diesel-driven generator sets. Diesels start and come up to speed in not more than five seconds; carry their rated loads easily; and respond quickly to sudden shock loads because of their lugging ability. They are heavily constructed, simple in design, easy to maintain, and are not subject to the rigid regulations and codes which apply to the installation of gasoline engines.

Gasoline-driven sets are efficient and when properly maintained will give excellent service. High-test gasoline should not be used in a standby unit. Since the engine is not operated for days and, more frequently, weeks at a time, the gasoline evaporates from the carburetor, fuel pump, and fuel lines. Further, high-test gasoline leaves a gummy residue in the fuel pump and carburetor, which in time—2½ to 3 years from date of installation—will render these parts inoperative and make their replacement necessary. This difficulty can be overcome by using white gas in the unit. A gasoline engine cannot start as rapidly as a diesel because the evaporation previously referred to makes it necessary to lift fuel
from the supply tank to the pump and carburetor before the engine will fire. This lifting has to be done at cranking speed. Diesel oil, however, will not evaporate and the injection pump delivers fuel to the injection nozzles on the very first turn of the starter.

To provide quicker starting, a small gravity tank may be mounted on gasoline engines (see Figure 4). Fuel is pumped into this tank and then delivered to the carburetor. When the engine stops, this tank remains filled with fuel so that the engine will start promptly when next called upon. This small tank must be vented back to the main storage tank to avoid vapor lock; its capacity is limited to one quart by regulations of the National Board of Fire Underwriters.

Turbine-driven generators may be used where there is assurance of a continuing supply of high-pressure steam. They are quickly and automatically started by the use of a solenoid valve. Transferring the load back to the normal supply, however, must be done manually. No independent fuel supply or starting system is required.

Engines fueled with natural gas, manufactured gas, butane, or propane, assuming a nonfailing supply of fuel, will give satisfactory results.

Where a power failure can disrupt plant operations it is often advisable to have available a portable unit, mounted on a trailer. A 25-kw (31.25 kva) unit of this type is owned by the Kings County Lighting Company of Brooklyn, New York (see Figure 5). When a failure occurs, this unit is towed to the point of failure and a portable cable run from the generator to the service.

generator ratings. An alternating current generator of standard manufacture is rated in kw (kilowatts) and in kva (kilovolt-amperes). The former rating indicates real power, or the generator capacity which is available for work. The latter rating indicates apparent power only. Standard ac generator ratings are based on a power factor of 80 percent; for example, 62.5 kva or 50 kw. It is advisable to give both ratings, as well as the power factor, in specifying generator capacities. Standard generator ratings are indicated in the table below:

<table>
<thead>
<tr>
<th>kw</th>
<th>kva</th>
<th>kw</th>
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<tbody>
<tr>
<td>5</td>
<td>6.25</td>
<td>75</td>
</tr>
<tr>
<td>7.5</td>
<td>9.4</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>12.5</td>
<td>125</td>
</tr>
<tr>
<td>15</td>
<td>18.7</td>
<td>150</td>
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<td>20</td>
<td>25</td>
<td>175</td>
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<td>25</td>
<td>31.3</td>
<td>200</td>
</tr>
<tr>
<td>30</td>
<td>37.5</td>
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<td>50</td>
<td>300</td>
</tr>
<tr>
<td>50</td>
<td>62.5</td>
<td>350</td>
</tr>
<tr>
<td>60</td>
<td>75</td>
<td>400</td>
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Engine characteristics. The selection of an engine to drive a generator should be based upon obtaining, from the unit, a power supply of the same quality as that delivered by the public utility. A multicylinder engine should be provided—preferably one that does not have less than four cylinders. The speed at which the engine is to operate, of course, will have to be a synchronous speed—600, 720, 900, 1200, or 1800 rpm. Since standby units are used only occasionally, there should be no objection to operating at either 1200 or 1800 rpm. It should be noted that in some generator sizes the 1800 rpm generator is more expensive than the 1200 rpm generator, although the former is a four-pole machine and the latter a six-pole. This often results in a 1200 rpm unit costing less than an 1800 rpm unit due to the increase in the engine price being more than offset by the decrease in the generator price.

Engine accessories should include at least the following: air cleaner, fuel filter, lube oil filter, starting batteries with cables and electrolyte, trickle charger, safety alarms, flexible exhaust connection, and muffler.

Two methods of engine cooling are in general use. First is the conventional radiator and fan. Second, water from the normal supply is passed through the engine jackets, or through a heat exchanger, and off to waste. A heat exchanger should be used where raw water from the local supply might cause corrosion in the engine block.

Where water from the normal water supply is used for cooling, the rate of flow is regulated by a thermostatically controlled valve. This results in maintaining a given temperature regardless of load fluctuations or changes in ambient temperature. Where a heat exchanger is not used it is good practice to provide an expansion and mixing tank on the engine. Without such a tank, in the event of failure of the thermostatic valve, it is possible to seize the engine by a sudden inrush of cold water. (A 190 kw diesel unit equipped in this manner is shown (see Figure 6).

When considering the possibility of bombing attacks, which could disrupt water supply, closed cooling systems are preferred. Where engine-room temperatures are high enough to prohibit the use of a radiator and fan, the radiator may be installed in an outside wall and a motor-driven fan mounted behind it. Where this system is not feasible, a method often referred to as “high-temperature cooling” may be used. The radiator and fan are eliminated and the
engine is operated at temperatures as high as 240 F. A steam separator is utilized and the hot water is returned to the suction side of the jacket water pump. The steam may be discharged to atmosphere, or may be condensed and returned to the separator. Where the steam is condensed, very little make-up water is required; if the steam is discharged to atmosphere, a reasonable supply of make-up water must be provided.

The conventional engine starting system comprises an electric motor with worm-gear drive and batteries. Criticisms of this system are based upon the limited life of batteries. Lead batteries carry guarantees of from 18 to 24 months and should be replaced at least every two years. This becomes an expensive item. Glass-jar or nickel-cadmium batteries, although initially higher in cost, will result in a saving over a period of years because their life is many times that of lead batteries.

The electric starter may be replaced by supplying a starting winding in the generator which is energized by batteries. This system is practical only in small generating sets. In larger units, the physical size of the generator and the battery capacity required become excessive.

The one system of starting which requires no batteries is compressed-air starting. Large diesel engines are universally started by this method. A compressor and air-starting tanks, with pipe connections to a starting valve in each cylinder head, are used. Air is admitted to the starting valves from a storage tank. A valve gear opens and closes the valves at the proper time and in correct sequence to keep the engine rotating until the fuel ignites and the engine starts to run under its own power. At this point the starting air is shut off. The opening and closing of the air supply is done manually; however, some progress has been made in the use of air-starting with automatic units.

Comparatively small diesel and gasoline engines are sometimes used in standby units. These engines are not equipped with air-starting valves in the cylinders. To use compressed air for starting these engines, an air motor is used in place of an electric motor. As in large diesels, a supply of compressed air must be provided. The initial cost is about four times that of the starting motor and battery system; however, the expense of battery charging and servicing is eliminated. It is predicted that air-starting will be increasingly favored. To bring the system into general use, positive controls must be designed which will automatically supply starting-air to the motor and shut it off when the engine is operating under its own power. At least two companies are studying this problem at the present time.

Figure 6 (above)—this diesel-driven unit, cooled by a local supply of water, has an expansion and mixing tank mounted on the engine to prevent the engine from being seized by a sudden influx of cold water.

Figure 7-left—a free-standing switchboard and horizontal muffler above can be seen in this illustration.

Photos: courtesy of International Diesel Electric Co.

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**Photos: courtesy of International Diesel Electric Co.**

**MATERIALS AND METHODS**

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**Photos: courtesy of International Diesel Electric Co.**

engine and generator assembly. The engine and generator shafts may be connected by means of a flexible coupling; or a flanged half-coupling mounted on the generator shaft may be bolted into the engine flywheel. Before connecting the engine and generator shafts, a responsible manufacturer will determine whether or not the new mass, the two shafts, will produce a critical at the operating speed. Should a critical result at or about the operating speed of the unit, a torsional vibration is set up and there is a good possibility that the shaft will break. To eliminate this hazard, an extensive mathematical procedure known as a torsional analysis is followed.

A standby unit is usually guaranteed for only one year. During the guarantee period an existing critical may not become apparent, due to the infrequent use of the unit. It is therefore important that specifications provide that the manufacturer must submit copies of a torsional analysis. When assembled on the base, the engine, generator, and accessories should be readily accessible for servicing or repairing.

**Switchgear.** Switchboards may be free-standing, wall-mounted, or unit-mounted types. Because they are not affected by vibration and do not interfere with the circulation of air around the unit, the first two types are preferred. Instruments mounted on the
board include the following: voltmeter, ammeter, frequency meter, voltage regulator, exciter field rheostat, circuit breaker or fuse block, and trickle charger. A typical free-standing board is shown (see Figure 7 in right background).

**Shop tests and acceptance.** When the generating unit is complete, it should be given a full-load operating test at the plant of the manufacturer. This test should be witnessed by the principals or by the consulting engineers. Such tests not only demonstrate that the unit will carry its rated load but also insure that all accessories have been included. Should it not be convenient for the principals or engineers to be present at the test, an accredited testing or engineering firm may be delegated to perform this function.

**Installation.** The installation, with particular reference to gasoline-driven units, should be made in strict conformance with the regulations of the National Board of Fire Underwriters, and local ordinances.

Fuel-supply tanks are to be buried under at least two feet of earth. The top of the tank must be below the bottom of the carburetor. Where units are to be installed in basements, the latter rule is difficult to comply with. In these cases, the tank may be buried beneath the engine-room floor if it is covered by four inches of reinforced concrete.

The vent and fill lines must terminate outdoors. The fuel tank may be supplied with a remote-reading dial gage, if desired.

Exhaust lines preferably should be installed in a horizontal position. This is desirable because condensation in the line will collect in the muffler where it can be drained, or can be eliminated when the unit is operated. In cannot reach the interior of the engine, as happens when the muffler is installed in a vertical position. A horizontal exhaust line is shown (see Figure 7).

The exhaust tail-pipe should pass through an outside wall and be cut off at a 45-degree angle to prevent the entering of rainwater. Should the pipe pass through a combustible wall, local fire regulations will indicate the precautions to be taken. Exhaust lines may be discharged into existing stacks only with the approval of the authorities involved.

Batteries should not be installed on the unit. If so installed, they are subjected to the heat of the engine and the sealing compound may be dissolved. Also, acid may reach and damage the generator windings. It is best to provide a channel iron tray, or frame, which stands on the floor free of the unit. A battery charger mounted within the switchboard will simplify installation.

**Periodic tests.** Standby plants should be given a load test once a week and be permitted to operate at least until the water temperature reaches the specified operating rate. Lubrication, fuel, water, and batteries should be checked as a part of the weekly test.

**Sample specification.** Suggested specifications for a standby unit follow:

**Emergency generating unit**

- **General:** The generating unit shall consist of a ______ engine, direct connected to a ______ kw (______ kva), ______ phase, 60 cycle, ______ volt generator.

- **Engine:** The engine shall have at least ______ cylinders and develop not less than ______ hp at ______ rpm. The engine shall be equipped with the following:
  - Oil bath air cleaner
  - Fuel oil filter
  - Lube oil filter
  - Circulating water pump
  - Cooling system

- **Generator:** The generator shall be rated ______ kw (______ kva) at 80% power factor with exciter, meeting all A. I. E. E. and N. E. M. A. requirements.

- **Switchboard:** The switchboard shall be of the ______ dead-front type, containing the following instruments mounted and wired:
  - Ammeter and ammeter switch
  - Voltmeter, voltmeter switch
  - Voltage regulator
  - Exciter field rheostat
  - Circuit breaker
  - Frequency meter
  - Necessary current and potential transformers
  - Trickle charger

**Accessories**

- Batteries with electrolyte, cables and battery tray
- Muffler flexible exhaust hose
- Vibration isolation material
- Electrical or mechanical defects for a period of one year from date of shipment.

**Warranty**

- The manufacturer shall warrant the entire equipment free of electrical or mechanical defects for a period of one year from date of shipment.

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**Figure 8 (right)**—this 750-watt, 115-volt, ac, emergency unit has one cylinder and is air-cooled; gasoline operated, it starts and stops automatically.

**Figure 9 (below)**—a one-cylinder, air-cooled Armstrong-Siddley diesel engine which develops 8 hp at 1200 rpm.

*Photo: courtesy of Kohler Company*

*Photo: courtesy of Lister-Blackstone, Inc.*
Structural X-Ray Protection

By CARL B. BRAESTRUP

Introduction
Handbook 41, National Bureau of Standards, contains the latest X-ray protection code. With this publication, the hospital architect has available authoritative and detailed recommendations for structural shielding against radiation. The Handbook does not attempt to explain, however, the fundamental principles upon which the recommendations are based; nor does it illustrate their application with typical examples of protection design. Consequently, the architect without special training in radiologic physics may have difficulty in applying the data of the Handbook to his particular problems of X-ray shielding. It is the purpose of this article to provide this supplementary information.

radiation hazards
Damage caused by overexposure to X-rays includes permanent local and systemic injuries. Typical local effects are the production of skin ulcers, which may become malignant, and the temporary or permanent loss of hair. These results are usually caused by improper operating techniques rather than by inadequate structural shielding. Insufficient structural protection, however, is a common cause of systemic damage. The systemic injuries include progressive changes in the blood forming organs and genetic injuries; the former result in anemia and leukemia while the latter may cause temporary or permanent sterility and, possibly, mutations affecting future generations.

As a result of more than a half-century of extensive research and experience, it is now possible to use Roentgen rays with a high degree of safety. Yet, even at the present time, adequate radiation safeguards are not universally employed; one still finds X-ray departments with insufficient or no structural shielding. In many cases, this is due to a false sense of security caused by the lack of early and obvious physiological changes associated with overexposure to radiation.

permissible exposure
The principle purpose in providing shielding against X-rays is to reduce unwanted or stray radiation to such a minute value that it has no known harmful effects on the human body. As this level, called permissible exposure (tolerance dose), has been progressively reduced, the expense of structural protection has steadily risen; it has now reached a point where it is an important factor in the construction cost of the X-ray department.

According to the recommendations of the National Committee on Radiation Protection, the maximum permissible exposure to X- or gamma-radiation from external sources is 0.3 Roentgen (300 milliroentgens) per week. That is, it is considered safe to expose weekly the whole human body to this dose for an indefinite period.

It should be realized that it is impossible to eliminate exposure to ionizing radiations entirely; cosmic rays and the inherent presence of radioactive elements in the atmosphere, and in common building materials give a "background" exposure rate of about 0.01 mr/hr.

X-ray tube enclosures
The modern type of X-ray tube is enclosed in a protective housing, provided with a small aperture, practically limiting the rays to the useful beam. It should be emphasized, however, that although such equipment has been (erroneously) called "ray proof," it does not eliminate the need for structural shielding. Protective barriers must be provided against that part of the useful X-ray beam which is not absorbed by the patient and against secondary rays emitted by any material exposed to radiation.

protection barriers
The amount of structural protection required depends mainly upon the voltage used across the X-ray tube, the weekly milliampere-minutes (ma-min) of exposure, and the distance from the X-ray tube to the persons to be protected. The penetration of the X-ray beam increases considerably with the applied voltage, making the shielding requirements much greater for the higher potentials. As the quantity of X-rays is proportional to the milliampere-minutes, this consideration must be included in shielding calculations. Lastly, the intensity of the beam varies inversely as the square of the distance. This factor has a far greater significance than is generally realized; doubling the distance reduces the radiation to one quarter, tripling to one ninth, and so on.

Amortized protective barriers to the rays, lead is generally the most economical. Concrete and other heavy building materials may be used to advantage for voltages above 250 kv, where they are part of the structural configuration of the building. At voltages above 400 kv, concrete is used almost exclusively except where it is necessary to reduce the weight or space of the barrier. At 200 kv, a concrete barrier has to be about sixty times as thick as a lead barrier to give the same degree of protection; at one million volts, the ratio is only about six to one.

The thickness of a barrier also will depend upon the type of radiation to which it is exposed: the useful beam, leakage, or scattered (secondary) radiation. The barriers exposed to the useful beam are called primary protective barriers and their thickness may be determined directly from Table I. In fluoroscopy, the scattered radiation varies widely with field size and geometry; however, in fluoroscopy and radiography, it is safe to assume that at 90° it is less than one percent of the incident radiation measured at one meter (3.3 feet) from the scattering material. For 200-250 kv deep-therapy, this factor is less than 0.2 percent; and for one- to two-million volt therapy, less than 0.1 percent. Barriers exposed to leakage and scattered radiation only are called secondary protective barriers.

Consideration also should be given to the degree of occupancy of the space to be protected. Obviously, a stairway or lavatory requires less shielding than a permanently occupied office.

To summarize, the following factors must be known in order to determine accurately the protective requirements:

a. Kilovoltage: The maximum voltage rating of the proposed equipment.

b. Milliampere-minutes per week:

This factor depends both upon the milliampere rating of the equipment and the weekly work-factor. In fluoroscopy, the milliampere is low, 5 ma or less, and the exposure time relatively long, perhaps 5 to 15 minutes per examination. In radiography, the current is high, up to 500 ma, but the individual exposure is short, mostly fractions of a second. In therapy, the current varies...
from about 2 to 30 ma and the treatment may last from less than a minute up to an hour.

e. Distance: The shortest distance which is likely to be used between the X-ray tube and the occupied areas; the distances to neighboring buildings must also be known, if these are within the radiation field.

d. Occupancy: The degree of occupancy of surrounding regions.

e. Building construction: Frequently, the lead protection may be reduced or omitted by increasing the thickness of the building materials, especially in floors and ceilings.

construction of protection barriers

Handbook 41 gives the detailed construction requirements for protection barriers; it is necessary, therefore, to point out only the more common sources of error.

Special precautions should be taken to prevent scattering under lead-lined doors and barriers of a therapy room where the floor is not lead-lined. This may be accomplished by providing an 18"-wide lead saddle under the doorframe and by extending the wall lead-barrier into the floor; another method is to install a continuous 18"-wide strip of lead under the walls and door-frames (see Figure 2). It may sometimes be necessary to provide shielding in the entire floor, even though there is no occupancy below, to prevent scattering under the lead-lined walls. Nearby buildings may possibly cause "back scatter" into occupied regions near the treatment room, necessitating shielding of the treatment-room windows.

Lead-glass windows should provide the same degree of protection as that required of the wall in which they are located. There should be adequate overlapping to prevent scattering around the glass.

A common error in structural protection is the lack of adequate support for the heavy lead-lined doors. Extra hinges and additional support for the doorframe should be provided.

special requirements: fluoroscopy

In fluoroscopy, protection is required against leakage and scattered radiation only, as the useful beam is almost completely absorbed by the lead-glass of the fluoroscopic screen. However, as fluoroscopic rooms are frequently used for radiography at a future time, it is advisable to provide the required additional protection initially.

radiography

In radiography, the useful beam is principally directed toward the floor or the wall area behind the patient when radiographed in an upright position. These areas, then, require primary protection barriers. To insure a higher factor of safety, permanently occupied regions, such as the control space and adjacent offices, should also have primary protection.

Special attention should be given to the protection of the operator; the most effective shielding will be achieved by locating the control of the X-ray equipment in an adjacent room provided with a lead-lined door. This is not always practical, however, as more than 100 radiographs may be taken daily in a busy X-ray room. Often, there is a tendency to leave the control door open during exposures. A lead-lined control booth without a door and within the radiographic room is satisfactory, if access is provided by means of a maze which effectively prevents scattering of radiation into the operator's position (see Figure 1).

Undeveloped X-ray films are extremely sensitive to radiation and may be damaged by exposures of less than a milliroentgen. It is essential, therefore, that the darkroom have ample protection. Additional structural shielding may be avoided by storing the un-

<table>
<thead>
<tr>
<th>Type of room</th>
<th>Kilovoltage</th>
<th>Maximum weekly ma-min</th>
<th>Target distance feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography</td>
<td>100</td>
<td>500</td>
<td>85</td>
</tr>
<tr>
<td>Radiography</td>
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<td>250</td>
<td>75</td>
</tr>
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<td>Therapy</td>
<td>100</td>
<td>2000</td>
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</tr>
<tr>
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<td>2000</td>
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<tr>
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<td>245</td>
</tr>
<tr>
<td>Therapy</td>
<td>250</td>
<td>20,000</td>
<td>385</td>
</tr>
</tbody>
</table>
developed films in a lead-lined box, and by not directing the useful beam toward the darkroom.

**therapy**

Roentgen rays produced at potentials from a few kilovolts to several million volts are employed therapeutically at the present time. In the not-too-distant future, generators operating at many million volts may be used. There is a wide variation in the protective requirements of different types of therapeutic installations. Nevertheless, the aim is the same: to limit the radiation in all accessible locations outside the treatment room to the maximum permissible value of 0.3 Roentgens per week.

**location of therapy rooms**

The cost of structural shielding may be reduced materially by locating the treatment rooms at some distance from habitually occupied regions, taking advantage of the "inverse square" law. As the useful beam is directed most frequently toward the floor, considerable saving may be gained by avoiding occupancy directly below the treatment room. This is particularly true for high voltage installations; further economy may be obtained by utilizing corner rooms where possible. Outside walls and especially windows may require radiation barriers, if they are close to occupied regions. This is apparent from a study of Table 2 wherein distances required to reduce dosage rates to permissible values are shown for various conditions.

The control of the X-ray generator should be located outside the treatment room if voltages above 100 kv are used; further, the doors to the treatment room should be provided with electrical interlocks, preventing exposure when open.

**shielding**

Unless the orientation of the useful beam is restricted, primary protection barriers should be provided in the entire floor and all the inside walls up to a height of seven feet. Where the location of the X-ray tube is fixed, it is possible to limit the primary shielding in the floor to the area actually exposed to the useful beam plus a border-strip one-foot wide. This saving is not recommended where there is a possibility of later changes in the location of the tube stand. Primary protection is usually not necessary in the ceiling, as the required secondary protective barriers are adequate to permit occasional therapy with the useful beam directed upwards. As previously mentioned, even outside walls and especially windows may require shielding. This is particularly true where treatment rooms face a narrow court. A solution for the protection barrier requirements of a 250 kv therapy installation is illustrated (Figure 3).

**scattered radiation**

The most frequent cause of inadequate protection is insufficient shielding against scattered rays emitted by the patient, floors, walls, or other irradiated objects. The intensity and quality of the scattered radiation vary with the size of the field, angle of scattering, and the nature of the scattering object. Furthermore, the intensity depends also upon the dosage rate of the incident beam and the distance from the scattering object.

**one- and two-million volt installations**

The safe and economical construction of installations in this voltage range requires considerable individual planning and expert advice; it is not possible here to give detailed information which is generally applicable. There are, however, certain general principles which should be mentioned, while additional data may be obtained from two recent papers.1

The cost of shielding such installations is determined largely by their location. Great savings may be gained by taking full advantage of the "inverse square law" in reducing the radiation. Wherever practical, a maze should be used as access to the treatment room, rather than a heavy motor-driven lead or steel door, the cost of which may exceed $10,000. If possible, the orientation of the X-ray tube should be so restricted that the maze entrance, or door, and the operator's position are not exposed to the useful beam.

Observation of the patient may be accomplished through a transparent tank filled with water and covered with lead-glass on the side facing the operator. The observation window should offer the same degree of protection as that required of the wall in which it

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1 "Radiology 51,840" (1948); C. B. Braestrup and H. O. Wyckoff, "Radiology 51,840" (1948); H. O. Wyckoff, R. J. Kennedy, and W. R. Bradford.
is mounted. The concrete, protective equivalent of such a window is approximately equal to one-third of the thickness of the water barrier plus twice the thickness of the lead-glass. The two sides, the top and bottom of the tank should be lined with at least ¼" lead overlapping the lead-glass window to prevent scattering around the window.

More recently, observation windows using laminated, ordinary glass have been used. However, the total thickness of the glass has to be sufficient to give the same lbs/sq. ft. as that required for concrete wall.

The actual protective equivalent of the window will also depend on the area of the window and quality of the lead glass.

As the density of glass is higher than that of concrete, the thickness of glass can be reduced in the ratio of the density of concrete to glass. For example, if a glass has a 10-percent higher density than concrete, the thickness of the glass window can be 10-percent less than the thickness required for a concrete wall, acting as a protection barrier.

calculation of barrier thickness

The National Bureau of Standards Handbook 41 has extensive tables and charts for the determination of the barrier thicknesses. They may be very much simplified by considering only those operating conditions which are commonly used.

In Table I are shown the required thicknesses of primary protective barriers for the usual range of milliampereminutes used per week. The minimum values are applicable for the smaller, less active hospital, while the maximum values should be used for any institution with a busy radiological service.

The determination of the thickness of a secondary protective barrier is more complicated, as it involves a larger number of factors. However, a usually safe approximation may be made by assuming that the secondary barrier requires one-half of the thickness of a primary protective barrier, again using

the values of Table I.

The thickness of both primary and secondary barriers may be reduced above seven feet, as the rays are re-scattered or passed through the ceiling of the adjoining room before striking any occupants. Both processes result in considerable attenuation of the radiation; and the barrier thickness above seven feet only needs to be one-third or one-quarter of the primary protective barrier thickness. For voltages not exceeding 125 kv, no lead shielding is required above seven feet, as the wall itself offers enough protection. X-ray protection measurements of numerous representative hospital installations have established that the above empirical rules provide adequate shielding. Greater economy may be obtained by a more complete analysis of all the factors involved, but the methods used for such determinations are usually too involved to be of value to the architect.

![Figure 2—250 Kv Therapy Installation](Image)

<table>
<thead>
<tr>
<th>Position</th>
<th>Ma-min per week</th>
<th>Type of barrier</th>
<th>Distance (feet)</th>
<th>Barrier Thickness (mm/In.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80,000</td>
<td>Secondary</td>
<td>6</td>
<td>5.2 ...</td>
<td>Oblique path = 11½&quot;</td>
</tr>
<tr>
<td>B</td>
<td>20,000</td>
<td>Primary</td>
<td>20</td>
<td>... 11¼</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>20,000</td>
<td>Primary</td>
<td>385</td>
<td>... ...</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>80,000</td>
<td>Primary</td>
<td>10</td>
<td>9.2 ...</td>
<td></td>
</tr>
<tr>
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<td>Primary</td>
<td>10</td>
<td>7.6 ...</td>
<td></td>
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<tr>
<td>F</td>
<td>80,000</td>
<td>Secondary</td>
<td>6</td>
<td>... 9½</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>80,000</td>
<td>Primary</td>
<td>10</td>
<td>4.0 plus 9½</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>80,000</td>
<td>Primary</td>
<td>12</td>
<td>3.0 plus 9½</td>
<td>Oblique path = 14½&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>... 9½</td>
<td></td>
</tr>
</tbody>
</table>
Streamlined Specifications: Asphalt Tile

By BEN JOHN SMALL®

1. general:
   (a) Applicable provisions of "General Conditions" govern work under this Section.
   (b) These specifications are of the abbreviated or "streamlined" type and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall," "shall," and others on the Drawings, "according to the plans," "shall," "as noted on," "as specified on," etc., are intentional. Omitted words and phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings. Words "shall be" or "shall" will be supplied by inference where colon (:) is used within sentences or phrases.
   (c) The Contractor shall provide all items, articles, materials, operations, or methods listed, mentioned, or scheduled on the Drawings and/or herein, including all labor, materials, equipment, and incidentals necessary and required for their completion.

2. work included:
   (a) Furnish labor and materials necessary to complete asphalt tile work indicated, as specified herein, or both, including:
      1. Felt over wood subfloors.
      2. Clean, wax, polish asphalt tile work.
      (b) Color: standard black.
      (c) Base: made of same material as asphalt tile floor.
      (d) Base color: standard black.
      (e) Of same material as asphalt tile floor: be — wide.
      (f) Asphalt primer: as recommended by tile manufacturer; spreading capacity: 100 sq. ft. per gallon. (Or)
      (g) Asphalt primer: FS SS-A-701. Where asphalt tile floors are to be installed on concrete subfloors on or below grade, on or concrete subfloors where moderate amount of moisture may be expected, cut-back-type primer should be specified. Where asphalt tile floors are to be installed over suspended concrete subfloors that have heated and ventilated spaces below them, cut-back-type or emulsion-type primers should be specified as optional. Suspended concrete subfloors that are hard, dry, free from dusting and not porous do not require primer. Primer is never required over felt or asphaltic underlayments.

3. work excluded from this section:
   (a) Extend asphalt tile only to kitchen and pantry dressers and not under some except into toe space.
   (b) Stop asphalt tile at front of radiator enclosures and do not carry into same.
   (d) Do not lay asphalt tile over replace hardwoods.
   (e) Metal dividing strips at joint where asphalt tile floors abut and finish flush with concrete, terrazzo, ceramic tile and — are specified under other sections. Where stair treads are to be covered with asphalt tile, specify and detail metal nosing strips.

4. asphalt tile:
   (a) Asphalt tile: FS SS-T-306a (as made by one of following manufacturers)

5. base:
   (a) Carry borders of 6" to 9" widths around fields.
      3/16" thick, "set on" cove type with pre-molded smooth rounded top and cove base; (or) 1/4" thick, straight base, with premolded internal and external angles (or) internal and external angles formed on job; be sufficiently flexible to allow for slight irregularities in walls and partitions.
   (b) Base: — high 1/4", 6", or state any special height required.
   (c) Base: made of same material as asphalt tile floor.
   (d) Base color: standard black.

6. strips:
   (a) Of same material as asphalt tile floor: be — wide.

7. cement:
   (a) Water-resistant asphalt cement: as recommended by tile manufacturer.
   (b) Water resisting asphalt cement: as recommended by tile manufacturer.

8. protective edgings:
   (a) Stainless steel or aluminum alloy of approved design to protect exposed tile edges.

9. primer:
   (a) Asphalt primer: as recommended by tile manufacturer; spreading capacity: 100 sq. ft. per gallon. (Or)
   (a) Asphalt primer: FS SS-A-701. Where asphalt tile floors are to be installed on concrete subfloors on or below grade, or on concrete subfloors where moderate amount of moisture may be expected, cut-back-type primer should be specified. Where asphalt tile floors are to be installed over suspended concrete subfloors that have heated and ventilated spaces below them, cut-back-type or emulsion-type primers should be specified as options. Suspended concrete subfloors that are hard, dry, free from dusting and not porous do not require primer. Primer is never required over felt or asphaltic underlayments.

10. lining felt (for use over wood floors):

11. samples:

12. delivery:
   (a) Deliver materials to job in manufacturer's original unopened containers with manufacturer's brand and name clearly marked thereon.

* Associate, Alfred Hopkins & Associates, Architects.
13. Subfloor:
(a) Lay asphalt tile on subfloor or wood. (State whether cement, concrete, wood, or undercoating. If wood, specify sanding of wood subfloors elsewhere.) (For separate Contracts)
(b) Inspect subfloor before starting work. Notify architect in writing of any defects in subfloor. Do not proceed until such defects have been corrected. Starting of work implies acceptance by this Contractor of underflooring. Where cement-filled metal pan stairs or top of landing is covered with asphalt tile, depress fill for thickness of tile.
(c) Use out of doors:
(d) Clean subfloor of grease or other dirt before proceeding. (For separate Contracts)
(e) Subfloor will be delivered to this Contractor broom clean; clean subfloor of grease or other dirt before proceeding.
(f) Wood subfloors: double construction, sufficient structural strength to carry intended loads without deflection. Surface flooring: well seasoned, kiln-dried flooring not over 3" face width, tasseled and tonguetailed. Surface flooring: sanded to uniform smooth surface; contain no cupped or spring boards. Nails: flush or set.
(g) Cement or concrete floors. Apply one primer coat to subfloor: when dry, travel on cement, evenly, thinly, using not over one gallon to 75 sq. ft. of floor.
(h) Old cement or concrete subfloors: made clean, free from floor coverings or other surface treatments. Remove points from floors in direct contact with ground. Fill expansion joints and score marks with spackle or approved joint filler.
(i) Do not begin work until work of other trades, including painting, has been completed.
(j) Maintain rooms and subfloors at 70°F minimum for at least 48 hours before, during, and 48 hours after tile applications. (For use over wood floors it is advisable first to lay undercoating on wire lath, but in case of very smooth and hard wood subfloors it is possible to lay asphalt tile over felt. Undercoating should also be used over rough concrete, gypsum, steel, or over old worn flooring of any type.)
(k) Cover wood subfloors with felt layer having butt jointed edges, staggered cross joints, cut carefully to fit around vertical surfaces, laid across joints of wood boards. Apply felt securely to subfloor with approved type linoleum paste. Ball felt into paste so as to remove air bubbles and ensure complete adhesion; use 150 lb. linoleum type roller. Ball edges and cross joints until firm adhesion is obtained; lay tile thereon.
(l) Floors which have been undercoated do not require any felt lining or further preparation.
(m) Use only experienced workmen. Lay tiles so as to ensure good contact with close, even joints and with finished surfaces in true plane, smooth. Lay tile squares with room axis, with border width varying slightly to maintain full size tiles in field. Lay tiles to pattern selected with grain reversed in alternate tiles.
(n) Borders to fit neatly, into breaks and recesses, against base, around pipes, under saddles and carpet strips. Cut, fit and scribe borders to walls after application of field tile.
(o) Install protective edgings, where tile edges are exposed, with flush screws spaced 12" apart; use expansion shields for screws in concrete.
(p) Do not apply base until plaster, or backing material, is thoroughly dried out.
(q) Do not apply base until plaster, or backing material, is thoroughly dried out.
(r) Cement base firmly to wall.
(s) Form in and out angles neatly; scribe base accurately to trim at doors.
(t) Base throughout: have top, bottom edges in firm contact with walls, floors.
(u) At completion, clean tile work and base; remove cement, dirt, or other foreign substances.
(v) Apply two coats of wax; polish each coat to produce well polished finish.
(w) Do not permit traffic on finished floors unless they are protected with heavy papers. (Asphalt tile when properly compounded has semi-rigid structure; any distortion from a level plane is best corrected by laying some and allowing to "set" naturally.)
(x) Inspect and make necessary adjustments within one month of time that heat is supplied continuously on finish areas.
(y) Tiles that have not "setted" in level plane with surrounding tiles: have heat applied locally, be quickly rolled to surrounding floor tile level. Repair tile, showing minor breaks and fractures, with heat and quick rolling.
(z) Tiles showing broken corners or fracture lines entirely across their surface: warmed, removed; substitute new tile of same color, thickness.

NOTES TO JOB CAPTAIN

1. Wood subfloors: Asphalt tile shall not be installed over wood subfloors which are subject to conditions that might cause buckling or warping of wood. This condition occurs generally on wood floors that are below grade, on grade, or above ground and without heat or adequate ventilation underneath floors.

2. Magnesite subfloors: Asphalt tile shall not be installed over magnesite subfloors that are in direct contact with the ground.

3. Use out of doors: All metal dams shall be removed from the legs of furniture and equipment. Suitable protective devices as recommended by the manufacturer furnishing the asphalt tile shall be used on furniture and equipment to protect against indentation. As a precautionary measure against indentation, lining felt as specified herein-before is recommended over wood floors.

4. Prevention of indentation: Where a single color is used in an overall pattern, the possible lack of uniformity should be given consideration. This is particularly true in plain colors.

5. Use of one solid color: Asphalt tile is available in:

- Standard (plain, marbled)
- Greaseproof
- Industrial
- Conductive

6. General: Means by which the cost of installation may be reduced, such as the use of conductive asphalt tile on floors not subject to conditions that might cause buckling or warping of wood, may be utilized, subject to the approval of this Contractor.
### 1. Installation Inspection:

<table>
<thead>
<tr>
<th>Type of subfloor</th>
<th>Inspect for</th>
<th>Floor should be</th>
</tr>
</thead>
<tbody>
<tr>
<td>New concrete</td>
<td>Proper curing and drying.</td>
<td>Free of expansion and travel marks, grease, dirt, or foreign matter. Free of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>imperfections. Hard, dry, and nonpowdery.</td>
</tr>
<tr>
<td>New wood</td>
<td>Compliance with flooring specifications of maker as to construction in single,</td>
<td>Smooth, dry, and free from grease, dirt, or other foreign matter.</td>
</tr>
<tr>
<td></td>
<td>double, tongue and groove, and hardboard underlayment.</td>
<td></td>
</tr>
<tr>
<td>Old concrete,</td>
<td>Soundness, dryness, and necessary repair.</td>
<td>Level, free from cracks, holes, paint, varnish, and other finish. Also free from</td>
</tr>
<tr>
<td>terrazzo,</td>
<td></td>
<td>dust and other foreign matter.</td>
</tr>
<tr>
<td>Ceramic tile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old wood</td>
<td>Renailing, replacement of worn or damaged boards, necessary filling of holes</td>
<td>Sanded smooth, free of paint, varnish, oil, or other foreign matter.</td>
</tr>
<tr>
<td></td>
<td>and cracks.</td>
<td></td>
</tr>
</tbody>
</table>

### ASPHALT TILE MAINTENANCE

1. **"don'ts"**:

   1. Don't use water or wax until the asphalt tile is thoroughly seated and until the adhesive has set up—about two weeks.
   2. Don't clean asphalt tile with gasoline, benzene, naphtha, turpentine, or organic solvents. Organic solvents will soften the material and cause discoloration.
   3. Don't expose asphalt tile to oils, greases, and solvent waxes such as paste wax.
   4. Don't use oily soaps or cleaners on asphalt tile floors.
   5. Don't use waxes containing turpentine, naphtha, or similar solvents.
   6. Don't use sweeping compounds which contain oils, sand, or chemicals.
   7. Don't apply wax over a dirty floor.
   8. Don't apply varnish, lacquer, or shellac. They contain ingredients which are injurious to asphalt tile and also eventually will cause unsightly traffic lanes.

2. **cleaning**:

   (a) New floors should not be washed or waxed until all the tiles are tightly adhered to the subfloor. This may require several days. If cleaning is necessary in this time, wipe up with a damp cloth or mop—not wet.
   (b) When ready, clean the floors thoroughly, and apply a good grade of water emulsion wax. Several successive light coats are recommended.
   (c) An occasional washing with a diluted warm souds solution of a good neutral soap or cleaner will keep floors clean and attractive. After washing, rinse thoroughly with clear water and when all traces of soap and dirt have been removed, dry with a clean mop.
   (d) If ordinary washing fails to remove any stains, the surface of the tile should be rubbed lightly with 200 Steel Wool using a concentrated solution of neutral soap or cleaner and warm water.
   (e) The use of a good grade water emulsion wax applied in accordance with the manufacturer's directions is recommended.
   (f) If a high lustrous sheen is desired, apply several successive light coats, buffing each coat after it has been allowed to dry thoroughly.
   (g) DO NOT use waxes containing such solvents as turpentine and benzene, as they soften the tile and cause the colors to bleed.
   (h) Grease and oils allowed to remain in contact with asphalt tile will permanently stain the floor. In case of spillage, wipe off immediately.
   (i) DO NOT use varnishes, lacquers, shellac or other plastic finishes. These materials usually contain solvents that will permanently injure asphalt tile.
   (j) For side chairs, light cabinets, etc., that are moved more or less frequently, glides having a smooth, flat base, with rounded edges and a flexible pin to maintain flat contact with the floor are recommended. The size should depend upon the weight to be carried. Such glides can be obtained in sizes from about 1" to 2 1/2", diameter. Small metal domes should be removed from the bottoms of all chair and furniture legs, and replaced with flat glides.

3. **waxing**:

   (a) Easy swiveling ball bearing wide wheel casters, or flat guides, should be used on furniture that is moved frequently, such as desk chairs, etc. Casters should have large diameter wheels (2" or more) with wide flat soft rubber composition tread. Small diameter, narrow, hard wheel castors, particularly with a crowned tread and without ball swivels will unnecessarily and unduly mark all types of resilient flooring. For heavier furniture, such as pianos, trucks, hospital beds, etc., consult flooring contractor.
   (b) Furniture cups are made of a composition material in a pleasing neutral color, designed to prevent the legs of furniture from cutting the floor. They are manufactured with openings 1 1/2", 1 3/4", 2" and 2 1/2" square, and also with round openings 1 1/8" and 1 1/2" in diameter. They are designed for use on heavier furniture that is moved infrequently.

The author acknowledges gratefully the assistance of the Asphalt Tile Institute in the preparation of these specifications.
CONSTRUCTION: METHODS

structural
Reinforced Concrete Haunched Girders Reduce Waste Cubage. Aug. '49.
Prestressed Concrete Bridge, Philadelphia, Pa. May '50.
Prestressed Concrete Garage. Henry H. Werner, Apr. '51.
Design for Welded Continuous Steel Framing. J. B. McCormick, Sept. '50.

Two Roof Construction Methods. Aug. '49.

insulation
Weather Conditioning of Roofs for Residences. Groff Conklin, Parts 1, 2, Nov., Dec. '49.
Air-Conditioning Sound Control. F. Honerkamp, Nov. '50.
Structural X-Ray Protection. Carl B. Braestrup, June '51.

others
Prefab Bathroom Units. June '50.
Column Chase Encloses Steam Risers and Returns. Mar. '50.

CONSTRUCTION: MATERIALS

aluminum

wood
Wood Preservatives and Preservative Treatment. George M. Hunt, May '51.

plastics

others
Permalite, Plaster Aggregate, Weighs Only 8 1/2 Pounds Per Cubic Foot. Aug. '49.
Streamlined Specifications: Copper Roofing and Sheet Metal Work. Ben John Small, Parts 1, 2, June, Dec. '50.

ENVIRONMENTAL CONTROL: METHODS

lighting
Lighting as a Factor in Office Economy. R. L. Oetting, Feb. '50.
Editors: Visit Daylighting Laboratory. May '51.

heating, cooling
Radiant Low Voltage Electric Heat. A. H. Abernethy and David R. Shearer, July '50.
Control of Radiant Panel Heating. Edwin F. Snyder, Aug. '50.

Design Factors in Panel and Air-Cooling Systems. Charles S. Leopold, Parts 1, 2, Mar., Apr. '51.

sanitation
Sewage Treatment for Institutions in Rural Areas. Robert C. Gloppen, Parts 1, 2, Dec. '49, July '50.
Water Filtration Plant, Mar. '50.

ENVIRONMENTAL CONTROL: EQUIPMENT

Television Antenna Systems for Multiple Dwellings. Ira Kamen, Aug. '50.
Elevator Requirements for the 200-Bed General Hospital. G. M. Hepple, Feb. '51.
Standby Power Plants. I. J. Crowley, June '51.

SPECIAL REPORTS

Design for Sight Saving. Lessing Williams, Aug. '49.
Sun Control Methods. Groff Conklin, Parts 1, 2, May, June '50.
A. I. A. Sponsors Product Exhibit at Convention

As an adjunct to the activities of last month’s 83rd Annual Convention of the American Institute of Architects, in Chicago, a Building Products Exhibit was staged to supplement the opportunities for architects, particularly those from smaller communities, to view some of the more recently developed building products and materials. Due to limited floor space, it was necessary to eliminate familiar and well known items of general promotional publicity. To meet this limitation, the theme “New Values” was selected by the Committee on Convention Exhibits, headed by Paul Gerhardt, Jr., of the Chicago Chapter. Forty-eight exhibition booths were occupied, and in all but a few instances, the booth designs had not been used at any previous public showing. On this page, I/AP reports some of the products which were shown.

new floor system simplifies concrete construction

Although high-strength steels have been used for almost a century in suspension bridge cables, these steels have found little application in building construction. Recently, however, the Granco Steel Products Company has pioneered an unusual but extremely logical floor construction system using this material. Their product, known as Cofar floors, replaces all temporary wood forming and conventional reinforcement for concrete construction with tough-tempered, galvanized, deep-corrugated steel and transverse temperature wires welded perpendicularly to the steel corrugations. The normal reinforcing bars placed in bottoms of slabs are eliminated; only those bars required to prevent cracks due to negative moment must be placed in tops of slabs over supporting beams. Construction is greatly simplified and accelerated; there are but two steps of ordinary concrete pouring procedure that remain: (1) placing the Cofar and its supports; and (2) pouring the concrete.

A 4" slab of Cofar does the work of a 12"-deep floor of conventional wood construction and can carry five times the load required of floors under ordinary service. Pipes for radiant heating and conduit for electrical services can be placed in the floor without difficulty. From the underside, the corrugated sheet is visible; it may be painted, or if desired, any type of hung ceiling can be installed.

With this system the advantages of concrete floors are brought within the budget of the home owner. Cofar construction has been widely accepted by modern building codes; St. Louis has approved its use and two 26-story Chicago apartment buildings using this system are now nearing completion. Granco Steel Products Company, Granite City, III.

lightweight, enameled curtain wall

This enameled curtain wall, an assembly of metal studding and sheet-metal panels completely filled with loose insulation, has been designed to withstand a 30-lb. wind load and a 2-hour fire test. Suspended at each floor from spandrel beams, it is but 5" thick and weighs only 5 1/2 lbs. per sq. ft. It can support its own weight and can be erected without scaffolding by one trade.

To insure that no corrosion will occur, all surfaces, inside and out, are of porcelain enamel. Both interior and exterior finishes can be made any reasonable color and the metal panels can be fabricated to meet any design shape. The Erie Enameling Company, Erie, Pa.

"Flattest wood panel ever developed"

Among the newest materials that were exhibited in Chicago was United States Plywood Corporation’s Novaply. This product is a 3-ply wood paneling composed of two 1/16" surfaces of small wood veneer flakes, separated by a core of medium size chips—both flakes and chips are resin-coated and impregnated. They are fused together under heat and pressure to produce a variegated, textured, surface which can be painted, stained, or left in its natural finish.

The manufacturer claims that Novaply is the flattest wood panel ever developed and that it is practically warp-free. Easily fabricated by ordinary woodworking tools, it has excellent nail and screw holding properties. Novaply is relatively light weight, is highly resistant to abrasion, and possesses good acoustic and thermal insulation properties. This material should be considered for interior applications only; its principle uses will be for furniture, wall paneling, core stock for mounting veneers or plastic laminates, and for cabinet and sliding doors. United States Plywood Corporation, 55 West 44 Street, New York 18, N. Y.
luminous-acoustical ceiling

There was a great deal of interest in Wakefield's luminous-acoustical ceiling. In addition to the data included in the accompanying paper, the following information will help to describe the system further. Perforated acoustical baffles, wedge-shaped and filled with sound-absorbing material, are spaced 36" on center. Tests have shown that in a hard surfaced room with linoleum floors, wood furniture, and without a luminous ceiling and acoustical baffles, there was a sound absorption rate of 5 seconds. After installation of this ceiling and baffles, low frequency sound was absorbed in .58 seconds, high frequency sound in .78 seconds, and average sound in .65 seconds.

This ceiling offers lighting intensities ranging from 50 footcandles to substantially higher levels. The acrylic plastic sheets, considered most suitable by this manufacturer, have furnished an apparently similar transmission of 87 percent in a test room. Completely diffused lighting qualities provide uniformity of brightness throughout the ceiling. As the plastic sheets slide over another, the plenum space between the luminous ceiling and room ceiling is easily accessible from the floor for installation and maintenance. F. W. Wakefield Brass Company, Vermilion, Ohio.

among other exhibitors

Minneapolis-Honeywell demonstrated its electronic air-conditioning control system which enables the selection of a control sequence to provide maximum effectiveness of air-conditioning equipment. Baseboard radiant panels for use with forced-hot-water or two-pipe heating systems in residential, commercial, and institutional installations were exhibited by American-Standard. Their panels are shipped assembled in 6' lengths and can be assembled on the job in increments of 1' up to 30'; with a 3' minimum length.

The Structural Clay Products Institute booth demonstrated the use and application of adhesion type ceramic veneer. A structural, long-span sheet metal panel with integral acoustical treat- ment; combining the function of roof deck, joist, and metal pan acoustical ceiling was shown at the Detroit Steel Products Company booth.

air and temperature control

Temperature Regulator: self-contained temperature controller, with clearly marked, calibrated, adjusting dial; no test or null adjustment necessary before or after installation, except for setting of dial which gives exact setting in degrees Fahrenheit. Two-wire connection to any 115v or 230v a-c circuit. Barber-Colman Co., 150 Loomis, Rockford, III.

Humidity: portable, 1/3 hp dehumidifier, designed for wide range of localities, from home basements to storage lofts; weighs only 60 lb., fitted with casters and handholds to move wherever needed. Said to have higher dehumidification capacity per hp than any other similar apparatus. Enclosed in baked-enamel, flat-topped cabinet. Carrier Corp., Syracuse 1, N. Y.

Filter: unique air filter developed to keep radio-active particulate and particulate particulate out of air in such a way that all particles become entangled in fiber. Single unit can filter 1000 cu. ft. of air per min. at pressures within capacities of central station air-conditioning system. Cambridge Corp., 350 S. Geddes St., Syracuse, N. Y.

Model CMZ Multi-Zone Air Conditioners: complete summer-winter operation with only one air-condi tioning unit, for installation wherever one unit must serve two or more zones; individual controls for each zone make it possible to heat one zone while cooling another. Thermastatically controlled dampers modulate flow of warm or cool air. Eight different model sizes, with total air volume range of from 1000 to 17,000 cfm which can be divided into 2 to 6 zones. Marlo Coll Co., 6135 Manchester Ave., St. Louis 10, Mo.

Gas-Fired Wet/Hot Air Conditioners: five new high input sizes ranging from 300,000 to 675,000 Btu, all approved by A.G.A. for use with natural, mixed, and manufactured gas. Especially developed for heating larger residences, apartments, schools, churches, and commercial buildings. Easy to assemble, clean, and maintain. L. J. Mueller Furnace Co., 2005 W. Oklahoma Ave., Milwaukee 15, Wis.

Sonaarduct: new fire-resistant fiber-dust when embedded in concrete floor slab, serves as supply or return line in radial and perimeter hot-air heating with oil or gas furnaces. Will not delamin atve when placed under water or exposed to excessive moisture; said to improve with age because it cures with heat. Excellent substitute for metal, glazed tile, or concrete block. Available in lengths up to 25', in inside diameter from 2' up to and including 24'. Ceiling can be done with hand or power saw. Sonaco Products Co., Hartsville, S. C.

doors and windows

Daylight Diffuser: scientifically designed daylight control screens, made of glass cloth, for installation along interior side of window bank in class rooms; screen traps direct light most upward and into room, yet provide for both some horizontal, direct light and some downward, diffuse light, to give glareless and uniform daylight. Screens may be laundered or dusted; no ironing necessary. American Seating Co., Ninth & Broadway, Grand Rapids 2, Mich.

this month's products

electrical equipment, lighting

Holoflux: surface-mounted luminaires; extreme shallowness (6½") simulates recessed lighting without expense of roughing-in. Low brightness, high output, brightness control across and along axis of lamps. Claimed to have complete absence of glare, in longest continuous runs. Suitable for commercial and institutional buildings. Holo phone Co., Inc., 342 Madison Ave., New York, N. Y.


insulation (thermal, acoustic)

Perforated Temlock Tile: low-cost fiberboard acoustical material, finished in warm white. Quick, easy, and inexpensive installation made possible by means of special Lok-Bevel joint, which has wide flap for concealed stapling and nailing. Tiles available in 16" x 16" x 1/2" size, with sound absorbing perforations arranged in 12" pattern. Armstrong Cork Co., Lancaster, Pa.

Birpac: preformed insulation to fit around ears, fees, and 45° pipe connections; low thermal conduction, neat appearance. Simple application: merely place each half of fitting on each side of pipe section, then staple, wire, or tape both halves together. Available for all standard sizes of pipe from 1½" to 8" in standard thicknesses. BMP Products Corp., 2645 Main St., Buffalo 14, N. Y.

sanitation, plumbing, drainage

ABCo Incinerator: commercial, air-cooled, automatic, gas-fired incinerator completely consumes wet or dry garbage and waste material in minutes. Steel construction; three-fold insulation keeps heat within unit; lining sealed tight with refractory cement to withstand extreme temperatures. Clock may be set for predetermined time, automatically controls burner and stops flame when time has expired. Units available in either 7 or 15 bushel capacities. ABCO Incinerator Corp., NBC Bldg., Cleveland, Ohio.

G-141 Vogue Lavatory: vitreous-china counter-top lavatory for any vanity or dressing table installation. Concealed front overflow, recessed soap dishes, wide splash rims, deep, full-size bowl punched for either centered or combination supply fittings. Available in 5 colors. Richmond Radi ator Co., 19 E. 47 St., New York 17, N. Y.

specialized equipment

Fire-Alarm Box: said to be smallest code station ever made, with maximum projection of less than 2" from wall. Single-action: one pull assures operation, sends coded alarm through control panel to audible signals in building. Transparent, dust-tight cover, on which are etched complete testing instructions, allows for visual testing of mechanism. Available in lustrous red enamel with highly polished metal trim, or any other desired color or finish. Edwards Co., Norwalk, Conn.
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


1-102. National Heating Products (586), 20-p. catalog containing heating products, such as steel or cast-iron boilers, convectors and enclosures, cast-iron radiation, baseboard heating units, domestic water heaters, and horizontal and down-flow unit heaters, for homes, stores, institutions, and industries. Ratings, capacities, inputs and outputs, roughing-in dimensions, contents table. National Radiator Co., 221 Central Ave., Johnstown, Pa.

1-103. Typhoon, 8-p. bulletin gives specifications and special features of line of packaged air-conditioning models from 1 1/2 to 20 tons, as well as data on 3- to 20-ton evaporative condensers. Diagrams illustrate outside dimensions and general arrangement of components. Typhoon Air Conditioning Co., Inc., 794 Union St., Brooklyn 15, N. Y.

1-104. Zephairs Fans, AIA 30-D-1 (5145), 12-p. catalog on belt-driven and other types of fans for homes and industry. Basic design data, grille and shutter sizes, dimensions, capacities, other tables. Hunter Fan & Ventilating Co., 400 S. Front St., Memphis, Tenn.

Two booklets on suspended unit heaters, giving capacity data, conversion factors, dimensions, general specifications. Other booklet on baseboard radiation; properties, advantages, architects' specifications, capacities, typical layout for hot water system, roughing-in dimensions. Fedders-Quigan Corp., Buffalo 7, N. Y.

1-105. Unit Heaters

1-106. Downblow Unit Heaters, AIA 30 DII (16C-1)

1-107. Baseboard Radiation CONSTRUCTION

3-84. How to Give Students and Budgets a Break (SX-651), 4-p. folder on contemporary prefab steel school structures which can be extended at any time with standard parts. Properties, advantages, typical photos. Armeo Drainage & Metal Products, Inc., Middletown, Ohio.

Two 4-p. folders, one on copper base flashing expansion joint for application at base of building walls, the other on one-piece through-wall copper flashing and cap flashing receiver. Methods of application, features, specifications. Chase Brass & Copper Co., Inc., Waterbury, Conn.: 3-85. Copper Base Flashing Expansion Joint, AIA 12-H

3-86. Thru-Wall Copper Flashing, AIA 12-H

3-87. Long Span Flexicore Slabs, AIA 4-k (1951 Issue), 6-p. brochure describing precast, prestressed concrete building unit for floors and roofs. Properties, load chart, table of sizes, typical drawings indicating methods of wiring, plumbing, and radiant panel heating with long span slab construction. Flexicore Co., Inc., P. O. Box 825, Dayton 1, Ohio.

3-88. Marble for the Modern Bank, AIA 22-A, 10-p. folder illustrating use of marble in bank interiors. Photos of most recent counter, stair, lobby, and elevator wall installations; also membership list of Marble Institute of America. Marble Institute of America, Inc., 108 Forster Ave., Mt. Vernon, N. Y.

3-89. Movable Metal Walls (51), 48-p. booklet illustrating advantages of movable steel partitions, the speed and economy with which they may be erected, dismantled, and relocated to fit changes in space layout. Construction features, detail drawings, partition types and accessories, wiring facilities, photos. Mills Co., 965 Way­side Rd., Cleveland, Ohio.:


3-91. Zonatile (ZT-1), 4-p. folder on new reinforced, lightweight, vermiculite roof slab for installation over bar, joists and bulb tees; combines insulation and structural strength, can be installed during any season. Physical properties, design data for sub-purlins and rafter sections, specifications. Zonolite Co., 1235 S. La Salle St., Chicago 8, Ill.

Two booklets, one giving specifications and data on caulking and pointing of masonry construction, the other discussing roof problems and their treatment. Tremco Mfg. Co., 8701 Kinsman Rd., Cleveland, Ohio.: 3-92. Mastic Caulking and Pointing, AIA 7-D (164B)

3-93. Solving Roof Problems

DOORS AND WINDOWS


4-100. Specify Levolor, 4-p. folder describing Venetian blinds made with plastic-coated aluminum slats, and incorporating tilting mechanism that ensures accurate slat alignment. Construction, specifications. Levolor Lorraine, Inc., 391 W. Broadway, New York 12, N. Y.


4-103. Seal-O-Sash, 4-p. folder on fabric strip, impregnated with non-drying asphalts, to protect imbedded and inaccessible members of metal window frames from moisture and other corrosive agents producing rust; strip also permits expansion and settlement. Application directions, specifications. Seal-O-Sash Co., 1020 E. 48 St., Brooklyn, N. Y.
ELECTRICAL EQUIPMENT, LIGHTING


5-68. Mercury by Smithcraft (540A), 4-p. data folder. Description of popular, economical, all-steel, louvered fixture, general-diffuse in light distribution; designed for offices, schools, stores, etc. Suggested mounting arrangements, coefficients of utilization, specifications. Smithcraft Lighting Division, Chelsea 50, Mass.

FINISHERS AND PROTECTORS

6-34. American Colors, 4-p. folder illustrating samples of streak-free, flat wall paints, oil-based, in colors ranging from deep tones to light pastels. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.


INSULATION (THERMAL, ACOUSTIC)
9-48. Serviced Products, 12-p. bulletin describing cork composition vapor seal and floor insulation which helps prevent heat loss through concrete floor slabs and structures on grade; other products described include asphalt-plank flooring, rubber waterstops, joint fillers, and other related materials. Recommended uses, general information. Serviced Products Corp., 6051 W. 65 St., Chicago 38, Ill.

INTERIOR FURNISHINGS

SPECIALIZED EQUIPMENT
19-133. Playground Equipment (K), 59-p. catalog reviewing wide range of playground equipment—swings, parallel bars, chutes, varieties of poles, ladders, seesaws, tennis equipment, etc. General data, shipping weight, accessories, rail freight rates. J. E. Burke Co., Fond du Lac, Wis.

19-134. Metalab Educational Labora
tory, 4-p. folder. Illustrations of laboratory equipment, such as chemistry desks, chemistry and science tables, storage and other types of cabinets. Dimensions, construction. Metalab Equipment Corp., Hicksville, N. Y.

SURFACING MATERIALS


(To obtain literature coupon must be used by 8/1/51)

PROGRESSIVE ARCHITECTURE, 330 West 42nd Street, New York 18, N. Y.
I should like a copy of each piece of Manufacturers’ Literature circled below. We request students to send their inquiries directly to the manufacturers.

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3-85 3-86 3-87 3-88 3-89 3-90 3-91 3-92
3-93 4-99 4-100 4-101 4-102 4-103 5-66 5-67
5-68 6-33 6-34 6-35 9-48 9-49 19-135 19-136
19-137 19-138 19-139 19-140

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June 1951
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& FACES OF EACH BOX
MADE OF 1/4" WOOD STOCK

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MADE OF 1/4" PLYWOOD OVER 2" x 4" FRAME

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The entrance doors of this building are equipped with Corbin Automatic Exit Fixtures, providing maximum safety in emergencies. For high security, many of the interior doors are fitted with Corbin “900” Series unit locks. Other interior doors have Corbin cylinder office door locks, dead locks or rim dead locks, master-keyed to their special requirements.

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SHAFER RESIDENCE, New York, N. Y.

KATZ, WAISMAN, BLUMENKRANZ, WEBER & STEIN, ARCHITECTS

June 1951 113
selected details

CHURCH: furniture

DESERT EPISCOPAL CHURCH, Palm Springs, Calif.

CLARK & FREY, ARCHITECTS
selected details

5 LECTURN

6 PULPIT

7 PEWS

DESERT EPISCOPAL CHURCH, Palm Springs, Calif.

CLARK & FREY, ARCHITECTS

June 1951
From the port-cochere, the interior presents a quiet, capable appearance.

The simple dignity of the entrance hall is lighted by glareless Day-Brite glass enclosed.
When three distinguished Knoxville architects like Albert Baumann, Jr., Will Griffin and Shi Goodwyne tackle a project, the results are going to be a dramatic example of designing skill. The new 200-bed East Tennessee Tuberculosis Hospital at Knoxville paves an architectural milestone for simple, modern beauty and solid patient comfort.

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- PC Foamglas is used to insulate this roof of the new, modern synagogue for Adas Israel Congregation, Washington, D.C. Architects & Engineers: Frank Grad & Sons—General Contractors: M. Cladny Construction Co., Inc.—Roofer: Warren-Ehret Company—all of Washington, D.C.

- PC Foamglas is widely used for freestanding walls and partitions and in corewall construction between inner and outer masonry as shown here at the new meat processing plant of Stadler Packing Company, Inc., Columbus, Ind. Foamglas acts as a long-lasting barrier to vapor and heat transfer ... helps maintain required operating temperatures. Architects: Johnson and McKenney, Columbus, Ind.
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It consists of still air sealed in minute glass cells, assuring constant insulation value.

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- Its high compressive strength enables PC Foamglas to withstand normal floor loads when installed under wearing surfaces. Here, workmen are applying Foamglas on the floor of a film storage room at the new Eastman Kodak Company branch, Dallas, Texas. Foamglas also lines the walls and ceiling of this room. Architects: Thomas, Jameson and Merrill, Dallas, Tex.

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There's need for speed in building today—an urgency that has to be met. For the nation's industrial plants must expand so enough of the things vital to defense can be made in quantity—quickly. And to help you complete more plants "on time", open-web steel joist construction truly meets the need. Here is the fastest way ever to build, with a saving in labor, too. No temporary framework is necessary—there's nothing to take down. So since speed is the need on "rush order" plants, specify Ceco open-web steel joists. They are fabricated to exact sizes in the factory, come to the job tagged, ready to install. Ceco assures you fast service from five strategically located plants: Birmingham, Chicago, Houston, and the New York and Pittsburgh areas. When speed's your need—call Ceco.

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Modern industrial buildings must be prepared to meet a host of entirely new conditions. Nuclear fission, reinforced construction, underground shelters, and massive machinery present a different set of problems.

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THOSE IMPURE GREEKS


The last 25 years have been amazingly productive in archaeology so that the revised edition of Dinsmoor’s Architecture of Ancient Greece is almost a totally new book. Not only does it bring the record of discoveries up to date, but also, because of the new material that has been found, it makes possible completely new syntheses. The history of ancient Greek architecture is today a far different story from what it was in 1927, when the preceding edition was issued, and Professor Dinsmoor’s impeccable scholarship and his vast knowledge of the field have enabled him to present this new history with authority.

The differences between the old and the new concepts are striking. The earlier set categories of the orders have lost much of their hard-and-fast definition. The Greeks, we now realize, experimented with all sorts of forms outside the rules: they used Doric-type entablatures with Ionic or even Corinthian columns; they combined half-columns with piers, and they developed (at least once) an extraordinary capital Doric on one side with a sweeping up-curving modillion scroll on the other; they tried many different types of temple plan, and extensive variations in the interior effects of the temples were present. And in secular architecture we find an almost complete lack of crystallized types; there was a continual flux from the beginnings on down. Many of these variations were known earlier (but the early historians and archaeologists tended to overlook them or play them down), so it required the constant intensive work of the last quarter-century to see them in their proper proportion and to realize they were not mere accidents but, rather, integral parts of the Greek quest for form.

Another fact emerges from this new history: the extraordinary number of buildings—even famous buildings—that were never finished! The Athenian Propylaea and the Erechtheum are examples, but the list goes on indefinitely. Buildings were remodeled, often, almost continuously up through Roman times. Grandiose beginnings were made and the structures left half-built. Quarrying and setting bosses in many buildings were never smoothed off; apparently the ebullient Greeks were more eager to get on with the new than to complete the old.

Recent excavations and new studies of old sites have combined, too, to destroy the old picture of the early primitive stage, the culminating (in the Periclean period), and the later theoretical decay of Greek architecture. We can now realize that this older conception represents the choice, largely arbitrary, of but one of many attitudes toward Greek architecture. In planning, for instance, the period of supposed culmination was still definitely primitive, almost formless. The entire concept of architecture—and of city planning as well—that sees architecture as the ordered integration of many differing elements into a unity greater than the sum of its parts only developed in post-

(Continued on page 131)
A Waylite masonry structural wall with the interior surface left exposed provides a 3-fold advantage for many types of structures. The soft lights and shadows of the textured grey surface are attractive. Waylite masonry has a noise coefficient of up to 50% and provides adequate acoustical treatment. It is a very economical architectural treatment because plaster or other finishes are eliminated.

Waylite gives you a completed finished and acoustically treated interior at NO EXTRA COST!

A Waylite interior Zion Evangelical Lutheran Church, Chicago
Architect: Herbert Brand  •  Contractor: Couch-Walker

For further information address Waylite Company, 105 W. Madison Street, Chicago 2, or Box 30, Bethlehem, Pennsylvania.

REVIEWS

(Continued from page 131)

Alexandrian times. The late agora of Priene, Miletus, or Ephesus, for instance, were a far cry from the formless open space spotted with unconnected structures of the Athenian agora of the fifth century.

Now these are all important new perceptions. If there is to some a loss in the destruction of the old ideal of an architectural Golden Age under Pericles, there is a much greater gain; for, in the light of this new history, we can see the Greek architects as men much like ourselves, working in the context of their own times, seeking, experimenting, in the enduring architectural task of trying to find an expressive, a beautiful, and an efficient environment for human beings.

This is the lesson of Professor Dinsmoor’s book. Its new presentation of the pre-Greek architecture of the area in the light of the most recent ethnic knowledge is particularly valuable, as is its clear exposition of the varying gifts to the common Greek tradition made by the peoples of European Greece and of Asia Minor and the Islands of the Aegean. Its examples are definite and clearly described; the bibliography is copious and authoritative.

This reviewer has but three small criticisms; all are possibly the result of the fact that this book, as a revision of a revision, still harks back in arrangement to its early original. The first criticism is the fact that major developments and important trends are sometimes buried under the number of examples that are named and described; the chronological framework sometimes conceals, more than it reveals those basic problems of planning and fitness that make architecture what it is. The second is the lack of a clear and thorough description of Greek construction, of the way the Greeks used materials or bridged over spaces. And the third is the fact that, except in the section on Aegean work, there is little attempt to relate these temples and tombs, these agoras and houses and sacred sites, to the throning life that went on around them and in them—the life they were erected to serve. For it is not true that building form can only be truly understood in the light of that human context?

Yet even these three factors can largely be picked up by a diligent reader, implied, if not specifically stated in many passages in the book. Professor Dinsmoor has written a work of surpassing value to all students in the fascinating field of Greek building, and no one who pretends to a knowledge of it can do without this monumental achievement.

TAIDOY HAMLIN

LANDSCAPE DECORATION


Lordly pursuit of the European great and wealthy during the 18th century was reordering what Nature had wrought in the surroundings of their country houses. Notable among their enthusiasms was a mode of landscape decoration fondly believed to be a faithful recreation of the far-off gardens of China. Dr. Siren, whose appreciation and meticulous knowledge of the genuine Cathay landscaping has made his earlier Gardens of China the outstanding contemporary reference on the subject, lovingly collected here rare photographs, drawings, and copious data on the extraordinary translation of this Oriental idiom. The examples are primarily English, French, and Swedish (Germany and Austria being forbidden territory during the years of this book’s preparation).

The fashion that swept Europe’s privileged class is considered in all its major characteristics—the changes in gardening, architectural innovations, the aristocratic interest, discussion, and controversy that resulted. The publisher has contributed fine printing in a format.
PICTURE WALL captures a beautiful view with a single wide Andersen Gliding Window Unit. It’s a WINDOWALL. It provides the crowning touch to a kitchen which shows interesting use of materials throughout.

This WINDOWALL floods light and air into the room that needs lots of both. It adds comfort and beauty to a kitchen work area which too often is needlessly drab. And because it is a WINDOWALL, it is efficient both as window and as wall.

See Detail Catalog in Sweet’s Architectural and Builders’ Files, or write us for further information. The complete WINDOWALLS Tracing Detail File will be sent on request to architects and designers at no charge. Andersen WINDOWALLS are sold by lumber and millwork dealers. *TRADEMARK OF ANDERSEN CORPORATION
Dr. Sirén declares, than such idle copy­
ing as led contemporary decorators to fill rooms with Chinoiseries and fan­tasies. There was intense interest in luxuries that could be imported from the Far East. The British East India Company was exploiting its rich mo­nopolies and in France the fad was de­creed by that top arbiter of spending, Madame de Pompadour (who was in­terested financially in the Compagnie des Indes). But in the open air, there were more serious implications. Dr. Sirén comments:

"It would be too rash to assume that the China enthusiasts and garden amateurs of eighteenth century Europe were sufficiently informed about the cultural traditions of the Far East to be able to appreciate the poetic sym­bolism and philosophical allusions char­acteristic of the Chinese gardens, but through the descriptions and illustra­tions which had reached the West they had nevertheless felt, as it were, a breath from that ideal world which supposedly was to be realized in the gardens of China. To what extent those notions were correct or incorrect, may be left an open question. It was of no fundamental importance, for here, as in so many corresponding cases, it was the creative thought rather than its material prototype or origin that was the essential thing. In a word, the scanty, and in part somewhat fantastic, information concerning the gardens of China that reached Europe was suffi­cient to act as a stimulating impetus, or a signpost to the distant landscapes of the world of dreams.

"They aroused the imagination and were translated in living creations in a manner that was as arbitrary as it was successful, for they corresponded to a spiritual demand, a cultural need that had then come to full consciousness. How this was realized in certain European countries is described ... These remarks are intended only to motivate the title under which this volume appears. The motivation may seem necessary today, but it certainly would not have been so in the 1770's and 80's, when people were convinced that the gardens of China had really been transferred to Europe." C.M.

SCHOOL PLANNING

Schools for the Very Young. Heinrich and Elisabeth Waechter. Architectural Record, 119 W. 40th St., New York 18, N. Y., Jan. 1951. 197 pp., illus. $6.50

All will agree that this book is con­cerned with a very important building type and one about which there is insuffi­cient knowledge. Mr. and Mrs. Waechter are suited to write such a book. He is an architect; she is a child educator. The book is largely the product of research done under the A.A.R.L.-Edward Langley Scholarship. Between them, the authors have valiantly at­tempted to cover the whole, wide field of pre-school development and the shel­ter in which it must occur. They give a brief historical survey of the pre-school educational movement from Oberlin & Pestalozzi, through Froebel & Maria Montessori to the present day, with its somewhat more pragmatic ideas. They go on to describe the actual life and work as it occurs in pre-schools and proceed to discuss the problems of de­sign, location, equipment, and certain technological aspects. They give a num­ber of plans and illustrations of various such buildings and include an extremely useful bibliography.

I say they have attempted to cover the field: in all sincerity, I cannot feel they have succeeded in doing so. If this book is intended for architects, it might well have given a more detailed analy­
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NO LIMIT TO THE USES OF
ALUMINUM

From thinnest foil to jet-plane armor, aluminum is the most versatile of metals. It has become the architect's most modern material. No other metal within economic reach can be rolled so fine, extruded so easily in endless shapes, drawn, forged, cast. No other metal offers at low cost aluminum's freedom from rust and resistance to corrosion. No other metal combines light weight with a strength which can be made equal to mild steel. And no other low-cost metal can equal aluminum's radiant heat reflectivity.

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Reynolds Aluminum Windows (residential casement, double-hung, fixed, picture) are outstanding in finish and design. Military needs affect production but aluminum capacity is expanding. Check your supplier.

Reynolds Lifetime Aluminum Gutters prove aluminum's economy... half the cost of other rustproof materials. Ogee and Half-Round, smooth or stippled. Military needs for aluminum may affect supply.

Reynolds Aluminum Reflective Insulation—foil on one side (Type C) or both sides (Type B) of kraft paper. A preferred insulation and vapor barrier. 25", 33" and 36" widths, in boxed rolls of 250 square feet.


Aluminum is required for planes and other military needs. Expansion is under way. Keep checking your sources for products shown... also for Aluminum Nails, Flashing.

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June 1951
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REVIEWS

(Continued from page 134)

sis of pre-school development, not only briefly describing the Froebel and Montessori systems but also indicating the difference in the products. The educationalist will know this of course and will not need it; but on the other hand he might well be interested in the buildings in considerable detail, buildings with which the architect is familiar and can therefore study from other sources. The information about construction, lighting, and mechanical equipment is far too general to be of much use to architects, and without explanatory notes and illustrations can be of little value to the educationalist. Much of it is not concerned with the particular problem of the pre-school but with all schools—indeed, all buildings. Prefabrication, durability, cost, etc., are dealt with, in other books, much more comprehensively.

In his excellent foreword, Richard Neutra says, "It has long been my deep conviction that the planning of buildings—especially buildings for the very young—should be approached through applied physiology." Now there are deep physiological and psychological differences between the very young and the adolescent. The child's is a little world but it is a world which is expanding at a formidable rate. This comprehension should be very much at the back of any research on the problem. First, we must state that the child is the client, not the teacher or the educational authority. What does he need? After, we can decide whether he can get it or not. Scale is obviously of first importance; even teachers are often chosen smaller for this reason. But what should this scale be? Does the child need a little house for little people, something which may be even more in scale with him than his home? Or does he need something which will be a transition from his home to the primary school?

What we want to know are the pros and cons. Since the child sits and plays on the floor, it is obviously essential that this floor should be suited for such activities, i.e.: it should be heated, clean, soft, etc. But should it not also be used to develop those senses, so formative at this time, tactile and visual? Why, for instance should not color be used, even patterns on the floor?

It is not what is said in this book that is at fault; it is what has not been said. It is not that the buildings which have been illustrated are poor (though some of them are not pre-school buildings) but that others and important ones have not been shown at all. One might also suggest that photos or per-
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This quality asphalt tile sticks permanently to concrete floors, even on or below grade.

It adds resilience, warmth, beauty... at low, low cost.

A floor of Tile-Tex® Asphalt Tile dresses up any part of the house. And, it can be a big help in transforming a dreary basement into a playtime palace for the whole family... at surprisingly little cost.

Jitterbug jubilee or quiet game of chess... this tough, resilient floor matches the mood of the party.

A warm design or a gay pattern... Tile-Tex has it.

You have a wide range of sizes, a rainbow of colors (28 of them).

Versatility of laying tile-at-a-time makes decoration almost a question of "name it, and you can have it."

You can even have special inserts, custom-cut to your own specifications and set into the floor.

Another Tile-Tex advantage is the ease of keeping it clean. A brush with the broom removes loose dirt. Washing is only an occasional necessity. And, if you want a high shine, it's easy to wax.

Add really exceptional durability to all the other qualities, and you can't help deciding on Tile-Tex.

A Tile-Tex floor will give the average family a lifetime of trouble-free service, and with reasonable care, show no signs of wear.

So, if you plan to re-do the basement, finish the attic, or build from the ground up, consider Tile-Tex Asphalt Tile for floors. Chances are you will place it in your plans.

Look up your local Tile-Tex contractor in the classified telephone book. If he is not listed, write for data: THE TILE-TEX DIVISION, The Flintkote Company, Dept. R, 1234 McKinley St., Chicago Heights, Ill.

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Now you can do something about the weather

This is how you can help your client obtain complete comfort indoors, day and night, through all the seasons.

Specify Bryant All-Weather Conditioning for refreshing summer cooling ... automatic gas heating in winter ... stimulating air circulation all the year ... and independent, automatic control of humidity that eliminates that cold, "clammy" feeling.

The Bryant All-Weather Conditioner is designed for ease of installation and maintenance. All basic equipment and controls are concealed within a single, compact steel jacket. Cooling system, using safe, odorless Freon F-12, meets all code requirements. Heavigage Heat Exchanger and built-in draft diverter of heating component are porcelain-enamed for extra long life. Five different safety devices throughout the unit provide complete protection.

Add value and livability to your designs with Bryant All-Weather Conditioning. For application data and specifications, contact the Bryant Distributor in your locality or write direct.

Bryant Heater Division, Affiliated Gas Equipment, Inc., Dept. 123, 17825 St. Clair Ave., Cleveland 10, Ohio.

Bryant Model 576 All-Weather Conditioner. Made in 15, 3 and 5-ton cooling capacities. Gas heating inputs from 100,000 to 200,000 Btu per hour, for use with all gases.
ONLY SELECTOMATIC TAKES YOU FROM FLOOR TO FLOOR SO FAST ... SO SMOOTHLY!

Maybe you think scared rabbits have fast “get-away” . . . that feather-landings are tops for softness. And birds make more accurate landings than anybody. But, you haven’t seen anything until you ride a new Selectomatic elevator equipped with Synchro-Glide—the fabulous Westinghouse automatic landing control!

Selectomatic “masterminds” the over-all control of the elevator system. Its ingenious “electrical brain” reduces waiting time to a minimum. And Synchro-Glide cuts floor-to-floor travel time $1\frac{1}{2}$ seconds per stop per car. These are the facts!

But—to get a clear picture of how much these facts mean to you, you must see Selectomatic in action . . . enjoy its smooth, fast ride yourself.

So, if you are in any way responsible for planning elevator investments, test ride Selectomatic before you decide! Write today for the names of nearby Selectomatic installations you can “test ride.”

Westinghouse Electric Corp., Elevator Division, Dept. E-1, Jersey City, N. J.

For years, Westinghouse engineering developments have stimulated the vertical transportation industry to strive for ever higher standards of quality and efficiency. In every phase of vertical transportation—equipment, maintenance, and service—Westinghouse has been the vanguard for progress. So, whatever your traffic problems may be—there’s a Westinghouse Integrated Vertical Transportation System to solve them completely. Look ahead with the leader . . .
SPECIMENS OF PRE-SCHOOLS SHOULD BE TAKEN FROM INFANT'S EYE-LEVEL AND NOT PHOTOGRAPHER'S OR BIRD'S EYE-LEVEL. AS IT IS, ONE HAS TO WADE THROUGH A GREAT DEAL OF IRRELEVANT MATTER TO DISCOVER WHAT COULD BE PUT IN A NUTSHELL; A PRETTY GOOD NUTSHELL, TO BE SURE, BUT NOT A VERY BIG ONE, CERTAINLY NOT A BIG ENOUGH ONE TO SPREAD ITS CONTENTS OVER 200 PAGES.

FELLO ATKINSON

This is the only comprehensive survey of all aspects of prefabricated housing that exists today. In the annotated bibliographies given in this book are listed a good many articles, pamphlets, and some books—but none of these begins to compare in comprehensiveness with the work of Burnham Kelly and his staff.

THE PREFABRICATION OF HOUSES. Burnham Kelly. The Technology Press of Massachusetts Institute of Technology and John Wiley & Sons, Inc., 440 Fourth Ave., New York, N.Y. 1951, 466 pp., illus. $7.50

The introduction to the second part, from which I quote, clearly indicates the type of thinking which one encounters in this book and indicates that the information obtained from various companies is not presented as a series of discontinuous facts, but has been integrated into the over-all picture of the industry. We might quote here the first four paragraphs of the introduction on page 177.

"Prefabricators of houses in the United States during the period of study by no means pursued the same goals. Their diversity of interests is reflected in their approach to design. To some, this term means structural engineering; to others, it means production engineering; to a few, it means architecture; and to many, it means sales appeal. The term properly includes all these aspects, and many others, for a decision made in any part of the long operational channel which leads from raw materials to completed houses may have an important effect on the design.

"Considering the term as broadly as this, one might with some justification say that this entire book is a discussion of factors which should influence design. As used in this chapter, however, the word means something narrower and more concrete. Described here in some detail are the different products which were made by the companies studied, with some reference to the techniques by which they were made. This, then, is design, in the terms of plans and specifications, and as defined by production systems.

"That the subject does not lend itself to simple treatment can be illustrated on the one hand by the millions of dollars spent by Lustron before even starting production, and on the other hand by the small company which, in answer to our request for information, reported that it had been so busy getting into production that it had no time to make plans and specifications."

In large part, differences in design stemmed from differences in basic approach to prefabrication. The type of market sought, the house planned for that market, the scheme for the production of that house—all these things varied tremendously, and it would be a fascinating study to analyze the reasons of background, experience, intuition, and prejudice which could lead to such differences among producers in the same general field."

A great deal of the value of this book lies in the fact that it deals not only with design but with management,

(Continued on page 141)
**Kitchen Ideas**

**TO HELP YOU WHEN YOU SPECIFY H & H WIRING DEVICES**

**FLUSH RANGE OUTLETS**
Adequate range outlets and circuits for apartments and homes add to convenience and utility. Simplify cleaning, decorating, etc. 50A, 250V, 3 wire. Also available in surface types.

**CLOCK OUTLETS**
Clock hangs picture-fashion on the wall. No wires exposed. Recess for plug cap provides completely flush job. 15A, 125V; 10A, 250V.

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Will accept all appliances. Takes standard 2 wire cap as well as 3 wire grounding cap. Positive 3rd wire ground. Back or side wired. 15A, 125V.

**PILOT LIGHTS**
Kitchen switch control with pilot light to show when garage, cellar, or outdoor lights are lit.

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**MAKE THEM COMPLETE WITH H & H WIRING DEVICES**

Those plans on your board mean someone is building for the future. Your skill and knowledge can contribute much to making that future complete, by making it more livable electrically. There's where the H & H line of wiring devices can do a job. You'll find just the device to meet every specification for adequate wiring. A quick review of the line stocked by electrical distributors may spark a good idea, or solve a special problem for you. Plan to investigate these smart, modern, dependable devices today.

For more information, write today to: 2306 Laurel Street, Hartford 6, Connecticut. Good Housekeeping Building Forum booklet “Electrical Planning in the Home” sent on request.

**QUALITY-MINDED ARCHITECTS SPECIFY**

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**THE ARROW-HART & HEGEMAN ELECTRIC COMPANY HARTFORD, CONNECTICUT**

increased 215%, while production for the housing industry as a whole had increased in the neighborhood of 50%. It is estimated that 28,000 houses had been shipped by prefabricators during this period as compared with 35,000 for the entire year of 1949. (Note: The 28,000 was for the first half of 1950.)

This increase is attributed to several factors—one being the introduction of a shift house selling without land for $5000—$6000 erected. Another important reason given by one of the operators purchasing prefabricated houses was: "One of the reasons we got into prefab building was the only way we could control our costs. When we start a job now we know exactly what our costs are and—more important—we are sure they won't jump up on us midway through the job." Coupled with this question of costs, of course, is the question of availability of materials.

The third part of the book, which is composed of appendix and index, will be of value to those wishing to check some particular item in the book or carry their investigation further.

This is undoubtedly the authoritative book on the subject and will probably remain so for some years to come. It is a book that most all those in the prefabricated industry will not only wish to read for the purpose of learning what is said about their particular efforts but a book from which even experts in the field can gain valuable information. To the architect, builder, real estate operator, or home owner, it will be found to have much information of value and be readable.

Robert L. Davison

LOVE OF THE LAND


Thomas Sharp, in English Panorama, has produced an exciting book of a kind entirely absent in this country. It is a brief, vivid, and enthralling account of the changes in the face of England, urban and rural both, since mankind has been at work there. The English are connoisseurs in landscape as no American is. To the American observer, his landscape is confused with "views" or bits of "untouched nature"; to the American entrepreneur, landscape is merely another opportunity for exploitation either agriculturally, mineralogically, or by the devious ways of land speculation. To the Englishman, on the other hand, landscape is an expression always of the interplay of human history and natural condition. The earth is man's home and, like his house, it is expressive of his ideals and his achievements and his failures; also, like his house, it is something to be savored and cherished. Seen thus, landscapes become not only highly instructive but also deep sources of emotional satisfaction.

It is an almost total lack here of this sense of intimate relationship between man and land that has permitted the riotous destruction of natural human values, that has gone on recently across the Potomac from Washington and across the rivers from New York in New Jersey and Long Island—an unnecessary and thoughtless destruction of agriculture, of natural beauty, to replace them with a universal ugliness of basically squalid dormitories, focusless, spaceless, and dull with a terrifying and all-embracing dullness. It is for this reason that I believe English Panorama is a most valuable work for Americans: if we can learn its lessons, we may be saved much future disaster. I only wish that a whole series of regional analogues to it could be published here!

Talbot Hamlin

(Continued on page 144)
FACTORIES, hotels, hospitals and other structures and buildings erected now will require much less maintenance in years to come — if effective rust control with RUST-OLEUM is written into the original specifications.

Protection against costly rust is particularly important in structural beams and columns, metal deck ceilings, crawl spaces, metal sash, etc., where manufacturing processes, industrial fumes, and condensation due to ventilation difficulties increases serious rust damage that threatens the structural strength of the metal.

RUST-OLEUM effectively retards rust because its tough, pliable, moisture-resisting film combats the causes of rust — even under many of the most difficult conditions. 25 years of superior service to industry is proof that RUST-OLEUM gives excellent results in protection of rustable metal. RUST-OLEUM is highly resistant to water, dampness, brine, heat, industrial fumes, general weathering, and many other rust producing conditions.

In drawing up specifications that involve the use of rustable metal, consider the extra protection that RUST-OLEUM provides. Specify RUST-OLEUM as the shop coat on all new steel. Remember, the first primer coats are the foundation on which your plan for future protection must stand. It's a profitable, worthwhile investment for your client!

When you deal with rust problems, we'll gladly help you with specific recommendations. See the complete RUST-OLEUM catalog in Sweets Architectural File, or write for a copy. RUST-OLEUM can be obtained promptly from Industrial Distributors' stocks in principal cities of the United States and Canada.

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"Rigid Economy Man!"
A portent of hope for New Yorkers sweating out increasing taxes and stifling in the malodorous traffic stoppage, so offensive to residents and visitors and so ruinous to Manhattan business, is the recent appearance of a long-awaited report on a Plan for Rezoning the City of New York. An opportunity to study the report is given this summer to property owners, land speculators, merchants, civic groups, and others painfully aware of the urgent need for an overhauling of the famed New York Zoning Resolution of 1916 (and its more than 1400 Amendments). In the fall, City Planning Commission intends to hold a series of public hearings to give all interested individuals and organizations full opportunity to comment. Then the Commission will act on the proposals and submit recommendations to the Board of Estimate.

Presumably the prospect of relief is expected to hearten residents in the intervening months, to restrain angry manufacturers from moving industries out of the city, to affect the planning of any new parks, schools, or other civic amenities, and generally to modify the psychological crisis. Ultimately the Plan for Rezoning is expected to stabilize property values, protect the established neighborhoods, and afford a sound basis for long-range planning. A number of planning experts, analysts, and statisticians collaborated in preparation of this report—and first reactions have been favorable on the part of civic groups, real estate interests, banks, and architects.

Pointing out that “zoning regulations in the long run determine the future city,” the authors of the report begin with the definitive statement: “The proper function of zoning, although often misunderstood, is simple and clean-cut. Zoning regulations constitute an exercise of the police power, generally delegated by the state to a local government, to control two things—first, the use of land and buildings, and second, the size and shape of buildings and their location in relation to each other and to lot lines.”


In order to promote public comprehension and discussion of the report, the New York Chapter, A.I.A., drew on the Arnold W. Brunner Fund to finance preparation of a simplified analysis, which now has been made available. This analysis was prepared by Bruno Funaro, in association with Geoffrey Baker, under direction of a Chapter committee headed by Geoffrey M. Matt.

Excerpts from this Review of the Plan for Rezoning suggest its succinct interpretation of the detailed study: “Zoning is the act of dividing land into a number of zones, each allotted a specific use, such as single-family houses, apartment houses, office buildings, or factories. This zoning is enforced by a legal ordinance. The legal justification for imposing such restrictions upon private property has always been ‘the promotion and protection of public health, safety, morals, and welfare’. These words can be made to justify almost any regulation. Actually, zoning controls are designed for a certain existing set of local conditions, with some intelligent attempt at forecasting conditions in the years ahead. The 1916 Ordinance, still in force today, could scarcely be expected to foresee and regulate the enormous growth of automobile use.”

The Case of the Wandering Shelves

PARDON our peaked hat and British accent. They’re just props anyway, to introduce a “case” we solved successfully. It started with our assignment to do the Brevitt Shoe Salon at B. Altman & Co. Brevitt is a top-notch English shoe concern.

And here’s where Bergen’s woodwizardry came to the rescue. The designer’s plans called for display shelves that could “wander” all over the columns and background panels of the Salon. Shelves that could be easily positioned to reflect changing display ideas. It was elementary, Watson. Bergen aged-in-the-wood craftsmanship always solves these puzzling cases with an elan and dispatch that leaves bystanders shaking their heads in wonderment. But why wonder about Bergen’s unique position in the field? Call us...write...or telegraph. We will see you with case histories that make fascinating reading material. And that’s because, to Bergenize is also to be budget-wise. Write to Dept. P for our Portfolio of “Jobs Well Done.” It’s worth seeing.
Only a good Thermostatic Water Mixer can prevent accidents like these.

**TYPICAL SHOWER & TUB COMBINATIONS**

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- Unsurpassed for SIMPLICITY
- CONVENIENCE
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- SAFETY

Contact your nearest POWERS office for specification data.

Only ONE shower or tub accident may cost many times more than a

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**THERMOSTATIC WATER MIXER**

Safety tests prove it will outperform all other thermostatic or pressure actuated mixers.

*How it works*—Hot and cold water are piped to mixer where they are blended and thermostatically controlled at any temperature desired between 60° to 115°F. (Note safety limit).

For shower or tub bath, Powers mixer handle is turned to right until water flowing into tub reaches temperature desired. Then bather enters tub. For a shower, diverter spout knob is pulled up diverting water to shower head. When shower is completed, handle of mixer is turned to OFF. Diverter spout flapper valve returns to "tub" position automatically.

**Safety Features that give better control:**

1. Powers mixers prevent delivery to shower or tub above 115°F.
2. Temperature remains constant wherever set regardless of pressure or temperature changes in water supply lines.
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Powers thermostatic water mixers are completely automatic, convenient, dependable and the safest temperature regulator made for tub and shower combinations.

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June 1951 145
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- Minwax Wood Finish Masking Colors are noted for their fidelity to Nature's wood tones. Under their "magic touch", even plywood takes on a luxury look. Variations in color blend together to form quiet, harmonious backgrounds for furnishings and drapes.

Actual Colonial paneling in the Metropolitan Museum of Art in New York City inspired the development of Cape Cod Maple, Ipswich Pine and other Minwax colors. The same touch of authenticity is found in Straw and Spruce Grey, the newest of the Minwax wood tones.

Fine reproductions of all Minwax colors are in Sweet's. Samples on actual wood panels are available on request. Just write to Minwax Co., Inc., 11 West 42nd St., New York 18, N. Y. Please address Dept'PA-6.

PLASTIMENT CONCRETE SATISFIES ALL FOUR BECAUSE

- MIXES BETTER
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PLASTIMENT is the chemically Retarding Densifier especially developed for concrete work which requires your guarantee. Retards set, densifies mix to provide controlled properties far superior to reference concrete. Designed for use with all types of aggregates and all methods of mixing and placing. PLASTIMENT-Concrete's ease of handling and superior results find ready on-the-job acceptance in every phase of construction. For full details, write or call.

When you see this insignia

You can be sure that the perlite conforms to the rigid specifications of this institute.

So, for your protection, insist on perlite bearing the insignia of the Perlite Institute, 35 West 53rd Street, New York 19, N. Y.
PROVED IN IMPORTANT PROJECTS
THE COUNTRY OVER!

Now MATICO delivers outstanding performance in famous Oak Ridge

Finest quality . . . long-lasting wear . . . greater economy . . . resilience underfoot . . . easier, faster installation . . . enduring beauty . . . these are the outstanding advantages that make MATICO Asphalt Tile ideal for every type of installation. And in important projects throughout the country MATICO is proving its superior quality by on-the-job performance. Included in this list of projects are such well-known names as Bond Clothing Co., Philco Radio Corp., General Electric Co., Metropolitan Life Insurance Co., and Fort Hamilton Veterans Administration Hospital (where MATICO was used throughout).

There is no stronger proof of MATICO quality than the selection of MATICO Asphalt Tile—time after time—for use in America's foremost industrial plants, institutions, government buildings, apartment developments and housing projects.

Be sure to specify MATICO when next you order asphalt tile flooring . . . it's the most economical, serviceable type of luxury flooring you can choose.

GET TO KNOW MATICO
Consult our insert in Sweet's file Architectural Section 13g. For free samples write on your business stationery.
Open upward smoothly, easily
Save floor and wall space
Coil completely out of way
Rugged all-metal construction
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You get better door service at lower cost in Kinnear’s combination of efficient coiling upward action and protective, all-metal, interlocking-slat construction. Kinnear Rolling Doors give you maximum use of space around doorways. They open and close with smooth, time-saving ease, year after year. They defy wind, weather, or intrusion. Electric push-button operation available, with remote controls if desired. Kinnear Rolling Doors are built in any size, for new or old construction. Write for complete details today.

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Offices and Agents in Principal Cities

REVIEWS
(Continued from page 146)

Turning to discussion of Angle of Light Obstruction (basis for limiting heights of buildings to insure ample light and air for streets and yards), Funaro and Baker note that the measurement is from street centerline to the lotline at rear—and that limitations are similar to existing New York regulations affecting heights and setbacks, though expressed in angles rather than vertical and horizontal dimensions. To free designers somewhat, heights may be averaged by a formula: $Y = \frac{Aa + Bb}{a + b}$

To avoid overlong stretches of a uniform street frontage, such averaging is limited to 1½ times the width of a residential street and twice the street width in other districts.

Other topics of the Plan for Rezoning discussed by the reviewers include Area for Light Access (offering a convenient graphic device for the designer); Setbacks for the Non-Residential Buildings in Residential Districts (schools, firehouses, etc.); Off-Street Parking and Loading Berths;

(Continued on page 150)
The best laid plans... will be based on copper tubes

Check these advantages of copper tubes for small house construction:

- Ideal for prefabrication of lightweight assemblies and repetitive construction.
- Economical—solder-type fittings, long lengths and light weight cut installation costs.
- More permanent—copper piping can't rust; smooth bore reduces danger of clogging.
- Permit simplified design and construction—copper tubes and compact fittings can be installed in standard width partitions and in restricted spaces.
- Added value—copper piping indicates quality construction; makes owners proud; adds to sale value.

For information on ANACONDA Copper Tubes for water lines and radiant panel heating, and on Type M Tubes for soil, waste and vent lines, write to The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

Nothing serves like ANACONDA COPPER TUBES
Expansion Completed
Fast! Three Quonsets, 40 by 200 feet each, and one 24 by 48-foot Quonset create a big new plant for Fastener Corporation at Franklin Park, Illinois.

IDEAL FOR Factories, WAREHOUSES, MACHINE SHOPS, STORAGE OR SERVICE BUILDINGS

For additions to your present plant—or for new plants—Quonsets mean fast completion, economy of materials, adaptability to any use. Also, should plants need more expansion later, you can add Quonset to Quonset, according to the need.

Made of N-A-X HIGH-TENSILE steel, Quonsets provide non-combustible construction and permanence far surpassing less modern buildings. They require little upkeep—are easily maintained. Let Quonsets serve you now. Write us today.

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Expands Floor Area by 20,000 Sq. Ft. Bill Jack Scientific Instrument Co., San Diego, Calif., began with two Quonsets and added 20,000 sq. ft. of floor space in just 50 days.

usable open space may be
on the ground

on the roof

or on balconies

Sketches: Baker and Funaro
THE SUBJECT of cold is well known to students seated next to windows where there are chilling down-drafts. Larger window areas used in modern school construction make this section of the room a "coat zone". Chilled students with health endangered can't be expected to concentrate on study. But why put up with drafts? There is an easy answer. DRAFT STOP introduces fresh air, warms it properly and traps drafts before they start.

New DRAFT STOP, a development offered exclusively by Herman Nelson, is a system that captures drafts at the source. Fresh air and automatically controlled temperatures enable pupils to concentrate on learning. Uniform temperatures throughout the room result in equal opportunity for good study habits. No device nor design can take the place of the new DRAFT STOP System... it gets the honors.

In your plans for new schools or new additions be certain DRAFT STOP is specified. It's the modern method for adequate ventilation without drafts. Send for our illustrated booklet available upon request to Dept. PA-6, address below.
"Think how much work would have been saved, if this world had been created by an engineer."
— Rotter and Theoren: September Affair

As usual, I am writing in flight, this time several thousand feet over the Carolinas, facing towards Florida. The redbud is in the woods and the freshly plowed fields are tan rectangles in the dark patches of pine. Watching spring unfurl herself, as the plane swings southward, is an unrolling of a great panorama of the season. The dogwood is appearing now and there is a soft green fur over the land. I am always astonished to see how much of the Atlantic seaboard is forest and wilderness. There is so much room in this big country and people are so silly, jamming themselves together in cities. Excuse me a minute, we are just passing over a winding brown river and a white plantation under great trees on a bluff. There is a handsome formal box garden and a paddock. Wonder where we are? I'll bet they smoke their own ham down there. Grits and corn pudding and collards. Must be time for lunch. Stewardess, when do we eat?

This is my second "commencement" column addressed to young men and women just coming out of school. The world is no better and not much worse than it appeared to be last June. You are facing either military training or a return to familiar ranks. As I write this, the situation is most obscure. We are feeling our way along a tortured and dim corridor in the vast structure of time. At any moment our groping hands may open a door into the bright and tranquil gardens of peace, or we may fall into the frightful abyss of total war. How long we continue to feel our way in this limbo of fear and uncertainty, no one knows. There is some comfort in the fact that the corridor is crowded with others hoping to find the right door. We are in good company.

To dispel this atmosphere of brooding fear, the world needs men and women with strong conviction and virile, positive objectives. You have been trained as builders. You would not want to be architects and planners if you did not want to build for peace. Otherwise you would have concentrated on mining engineering and the building of an underground world for a hobgoblin race more grim than any conceived by the late George MacDonald in his most blood-curdling story for little children.

Do not look for logic in a world that uses science to destroy on one hand and science to save lives and build on the other. The great anomaly of war is that we attack our enemy to kill and maim but the moment he lies bleeding on the ground our whole attention is directed towards the merciful comforting and healing of his wounds. After destroying and possessing an enemy city, having killed its inhabitants, wrecked its buildings, and broken its life, we immediately work to rebuild and restore. It is the fact that we can turn the spigot of our emotions on and off so easily, that gives me hope, though this is with one reservation. Do you remember the orator (Continued on page 154)
YOU SPECIFY WITH CONFIDENCE
when your choice is American-Olean Tile

Nothing takes the place of real clay tile for radiant, rugged lifetime beauty without a penny's worth of maintenance expense... And there is no finer tile you can specify than American-Olean.

- Here is one of many reasons you can specify American-Olean tile without a worry. This machine sizes and measures A-O tile so you can be sure all tile shipped on your order is dimensionally accurate.

FREE! The Color Book Of Tile
QUICKEST, EASIEST WAY TO SPECIFY TILE—The most complete, most helpful tile book ever produced, 100 pages, including 30 of typical installations in full color; plus color charts of wall and floor tile, trim and hand decorated inserts. Full architectural data and ready-to-use specifications. If you have not yet received your copy, or if you need another, write today.

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Executive Offices: 950 Kenilworth Ave., Lansdale, Penna.
It pays in many ways to recommend

Vanishing Door Hangers and Track
BY Richards-Wilcox

Silver Streak
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Vanishing Door Hangers and Aluminum Track

Today's greater demand for small homes makes the full utilization of every inch of space more imperative than ever. And the answer to this need is an entirely new Vanishing Door Hanger by Richards-Wilcox that is designed for thin-wall installation and noiseless operation. R-W Silver Streak Vanishing Door Hangers and Aluminum Track are adapted for use on parallel residential wardrobe doors, or for any doors in any room of the house. Note these points of special importance to you and your customers:

- Four types of hangers to accommodate various size doors and building requirements.
- Bronze hanger and aluminum track to withstand salt air for seaboard use.
- Adapted to thin wall to save space and reduce building costs.
- No interference with room furnishings or decorations.

- Tight fit of door to floor avoids drafts, loss of heat.
- Adapted to single sliding and parallel sliding house doors.

For more information, contact our nearest office or request one of our illustrated folders describing in detail the uses and advantages of SILVER STREAK.

A PIONEER FOR ANY ROOM THAT SLEEPS
AURORA, ILLINOIS, U. S. A. • Branches in all principal cities

1880-1951 OVER 71 YEARS

out of school

(Continued from page 152)

in George Orwell's "1984" who in the middle of a speech changed sides so cleverly that the audience cheered those who a moment before had been an enemy and booed those who had just been called friends?

You are entering a world that has no more logic than human emotions themselves. It will require human understanding, great patience, and a sense of humor to get along in it. It will require courage; courage to fight for what all the rest of us are willing to fight for, the belief in our country and in free man. It will take even greater courage to fight for higher standards of democracy, while fighting for a peaceful world in which a democratic life may flourish. And this last in particular is your job.

The question of the maintenance of standards of living is still with us. For the architect and builder, and above all, for the physical planning technician, the preservation of the amenities of living during periods of stress is a test of conviction, patience, and endurance. It takes a stubborn man with a tough hide to maintain the purpose behind zoning ordinances and building codes, when a town is being packed full of defense workers. It takes good moral standards for an architect or builder to resist quick and easy money in shoddy design and construction, when there is a premium on every square inch of space and on every nail. And it takes a clever man to invent satisfactory expedients with an eye to getting rid of them ultimately.

There is no way that we have discovered in which it is possible to train you, in school, to meet these situations. Such training begins the minute you step out of school and assume some measure of mature responsibility. Those of you who may have been able to sandwich office experience in with your school training have an idea of what is the consistency of such responsibility. For the rest, your first steps into maturity may well establish the direction you may ultimately take. You are just about to take these steps.

Back in November 1949 P/A I wrote a column, the subject of which was "Ordeal by Disillusion." This had to do with the first office experiences of a trainee during his transition from student to licensed architect. Since that time, some progress has been discernable in the attention which the subject is now getting from several directions. I thought it might be of interest to know that others are thinking about you at this moment. While it may be

(Continued on page 156)
Year after year, more B & G Boosters are installed than any other pump built for the same purpose! This preference is based on the better design and precision workmanship which have produced an amazing record for failure-proof dependability.

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out of school
(Continued from page 154)

too early for you to benefit directly from this thinking, through your own experience you may be able to assist others who will follow.

I have just had a letter from Harlan McClure, associate professor of the School of Architecture, University of Minnesota. For nearly a year he has been chairman of a committee to study and rewrite the Minnesota State Registration Examination for Architects.

Dear Carl: In one of your columns, I believe in November 1949, you discussed that haphazard period of architectural education which occurs between graduation from the professional curriculum and emergence as a full-fledged practitioner. This period should be something more than an "apprenticeship" as it is sometimes called. It should be, above all, regarded as a period of training as it is in the case of medical internship. Thoughtful practitioners and educators alike are, or should be, seriously concerned with the problem of giving direction to this period.

It seems to me there are two principal parts of the problem. The first is the form of registration examinations and the second is the quality of office training.

In Minnesota, the law permits the Architectural Registration Examinations to be taken in two parts, although this year will be the first time they will actually be offered that way. The first part of the examination will be devoted to the theoretical areas required in the Syllabus of the N.C.A.R.B., that is to say: Structural Design, Truss Design, Architectural Theory, Architectural History, and Mechanical & Electrical Equipment for Buildings. This portion of the examination may be taken by persons who have just completed the professional curriculum in an accredited School of Architecture. Upon successful completion of this portion of the examination, they will be designated Architects-in-Training, which is certainly more accurate than other descriptions now in use. The second part of the examination will be offered to these persons when they have completed an acceptable period of office training. This examination will include the remainder of the required Syllabus, or in other words, areas disclosing the results of the persons' practical experience such as supervision, counselling, and administration, etc. I believe this state is taking a necessary step in developing the two-stage examination and giving legal recognition to the period of architectural internship.

This year, we are also revising the form of examination questions in this state in an attempt to bring the mechanics of examination procedure up to date. Experts in the field of educational testing have repeatedly pointed out the disadvantages of the essay or free-answer type of questions, yet most state board examinations continue to employ

(Continued on page 158)
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(Continued from page 154)
Restless minds that "detour" often are struggling to work in rooms which are overheated or too chilly. Johnson Automatic Temperature Control keeps each room at the "health level" and maintains proper temperatures for comfortable study conditions. Fortunately, the many comfort advantages of a carefully planned Johnson system also offer school administrators important fuel saving opportunities. A Johnson Control System designed for each building—room by room—assures the best possible modern temperature control service . . . and saves tons of fuel annually for the budget. That is why Johnson Control Systems are America's favorites in school buildings everywhere.

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OUT OF SCHOOL
(Continued from page 158)

of themselves), there are a series of other problems to be answered, not the least of which is what office system can be worked out to establish some kind of uniformity of experience and training. The economics inherent in the situation baffle me. And it is going to be very hard to define the specifics of each job, particularly in small offices. It is here that I question an artificial division between draftsmen and young hopeful. How is each to know what he is doing? And isn't draftsmanship experience necessary training? No, I worry about the division of labor in an office. Can't you hear a young man on the architectural local refuse to get off at a way-station, because he only makes express stops. This won't sit very well up front.

Being sceptical of office control or the uniformity of training possibilities in the office, I rely on the very obvious benefits of the two-stage examination for a license as a first change in present procedures. I also believe that universities and colleges, through in-service training during the regular school programs, can speed up comprehensive architectural training. This has been discussed at length in several previous columns. More important for the Architect-in-Training could be two types of adult education—(1) institutes or seminars run by local A.I.A. and A.I.P. (American Institute of Planners) Chapters; and (2) the other, similar programs developed through Chapters in cooperation with local colleges or universities, whether or not architectural or planning schools exist in them. The point, and an obvious one, is that to make the two-stage state or national registration examinations mean anything and to provide a real equality of opportunity, local Chapters have a primary educational responsibility.

Walter Taylor, Education Director of the A.I.A., has pushed with limited success the development of a Chapter-sponsored seminar program. A number have been started in various parts of the country. However, there does not appear to have been a great deal of uniformity or follow-through. Part of the problem may be in the gaps between meetings, the difficulty of organizing, and the resistance of "adults" to being educated.

If I were a young grad today, looking for a start and wanting to qualify for registration at the earliest time allowed by law, I would work on my local Chapter to start and to continue an adult-education program for architects-in-training at once. Certainly you graduating today are the ones who should have the major interest in this problem. And since you would be the student

(Continued on page 162)
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out of school

(Continued from page 160)

or trainee, or whatever, if you don't take some initiative yourself and assume responsibilities to assist your local Chapter in program and organization, it is doubtful if any local programs, cooperative with educational institutions or not, can survive.

If you do not assume such a responsibility, you have no kick coming if local Chapters fail to come across. And the volunteer services of older men genuinely eager to help the younger, will quickly fade out unless a real enthusiasm is maintained.

Local Chapters can get assistance from national headquarters. The A.I.A. Committee on Education has been given the architect-in-training as an assignment. Bear down on that Committee to come up with a suggested series of subjects to be covered in an adult-education program for Chapter sponsorship. Push for the two-stage exam and for the sake of your brilliant future, your dream castles, and your profession, get in and pitch.

NOTICES

New Addresses
BAROVETTO & THOMAS, Architects, 718 Alhambra Blvd., Sacramento, Calif.
HARE & HATCH, Architects, 125 Broad St., New York 4, N. Y.
AMERICAN 3 WAY-LUXFER PRISM Co., INC., Daylight Engineers, 270 Park Ave., Suite 214, New York 17, N. Y.
STEWART M. CAMERON, 1264 Pender St., W., Vancouver, B. C., Canada.
RAMEY & HIMES, Architects (formerly RAMEY, HIMES & BUCHNER), 1206 E. Waterman, Suite 210, Wichita, Kans.
BUCHNER office established at Tulsa, Okla.
WALTER Wisznia, Architect, 2709 Swanter Dr., Corpus Christi, Texas.
KURT GROSS, Architect, 82 S. Third St., Sante Jose, Calif.
RALPH J. BISHOP, Architect, 1526 W. Riverside Ave., Spokane 8, Wash.
GERALD A. PERKINS, Architect, 811 Crescent Blvd., Glen Ellyn, Ill.
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June 1951
To what extent does an architect have an exclusive right in the use of plans he has drawn, in the reproduction of these plans, or in the reproduction of a building originally constructed according to plans designed by him?

Can an architect, after preparing plans for and supervising the construction of a building and being paid for the work, prevent the owner from using these plans in the construction of other buildings?

Does he have any rights against third persons who reproduce in almost identical detail a building like one he has designed for a client?

This column will not discuss the ethics of the situation involved, but will confine itself to the legal issues raised.

Two recent examples illustrate the type of situation which may arise. In one case an architect had drawn plans and specifications and supervised the construction of a unique residence for a client. Some months later he discovered that a house, copying in every respect the one he had designed, had been built in an adjoining state. On inquiry, he learned that the probabilities were that the contractor who had been employed to erect the building for which he had prepared plans, had been requested by another person to construct a building like the original one; and the contractor, complying with this request, had constructed the second residence in exact conformity with the plans prepared for the first building.

In the second situation, a hospital architect was associated with a consultant in preparing plans for a proposed hospital building. The working drawings were completed and the consultant received a complete set of plans. The hospital project then contemplated did not proceed, but the plans were submitted by the consultant to another architect who used them for another hospital in a different locality.

We will first consider the rights to ownership and use of plans as between owner and architect. Generally, the rights to the plans prepared by an architect for his client are provided for in the contract between the parties. The standard form of contract adopted by the A.I.A. contains the following provision on this point:

"Drawings and specifications, as instruments of service, are the property of the architect whether the work for which they are drawn is constructed, and the architect paid for his services. The owner cannot resist the architect's demand for payment for his services on the ground that the architect has not delivered the plans to him. Even where the owner decides not to build, he must pay for the plans which

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it's the law

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the architect has prepared—and is entitled to keep.

In the absence of such an agreement between the client and architect, a somewhat different rule applies. An architect is ordinarily no longer the owner of the plans and specifications which he designs and which are furnished to and accepted and paid for by the owner. In such case, on acceptance of and payment for the plans, the owner is entitled to them. They become his property, and the architect cannot subsequently prevent the owner from using them in constructing another building. Nor does he have a right to receive additional compensation when they are used again, since he has already been paid for them under the original contract.

The fact that there may be a custom among architects that an architect is entitled to retain the plans which he prepares for a client, is not necessarily conclusive on others outside the profession. A client is not bound by this practice, if at the time he entered into a contract with an architect he did not know of this custom, and the contract did not include a provision covering it. He, therefore, cannot be compelled to pay the architect for his services in preparing the plans unless the plans are delivered to him, though he may have decided not to use them.

Apart from the question of ownership of plans on completion of his services, the architect is the owner of his plans before they have been accepted and paid for. As the product of his skill and ability, they are property for which he is entitled to be remunerated. The client cannot, therefore, by fraud or deception deprive the architect of the right to complete the contract while retaining the benefits of his work.

In one case an owner who represented to the architect that he was through with his services and did not intend to build, while secretly planning to use photographic copies of the architect’s plans, was held guilty of fraud; and his misrepresentations in this regard vitiated any settlement made with the architect to his prejudice.

The architect’s recovery under such circumstances was held not to be limited to payment for the reasonable value of the services he had performed, but included the profit he could have made if permitted to carry out the terms of the contract. Under the contract employing him to prepare plans for and supervise construction of the building, his loss was ascertained by allowing him the contract price less the costs and ex-

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NON-SLIP FLOORS

(Continued on page 166)
The new Senior High School in OAK RIDGE, TENNESSEE utilizes the 3 in 1 gym plan offered by HORN Factory installed for guaranteed satisfaction, HORN FOLDING GYM SEATS AND FOLDING PARTITIONS increase maximum "gym time".

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it's the law
(Continued from page 166)

The architect's right to be safeguarded against appropriation of his plans by other persons is protected by the common law of copyright. This is distinct from copyright secured under the Copyright Law (which will be considered in a subsequent column) and operates independently of any statute. The common law of copyright protects the architect's right in the design or plan which he has created only so long as he retains control of the work and until it is "published" (a term of art meaning some act which renders the work common property). As a creator of a unique intellectual production the architect has a property right in any architectural plan he has designed and no copyright statute is required to protect him against use of the plan by anyone without his permission. As long as the plans and copies of the plans remain in his office, in his client's hands, and with other similarly situated, they are personal property, and no other person may, without his authorization, take them or use them without becoming liable to him for their use.

If the plans or copies of the plans are stolen, the architect may maintain an action to recover them. If they are lost, the court may grant him relief by barring the finder from using the plans without his knowledge and using them in the construction of a building, there is little question that the architect who designed them has a legal remedy for such unauthorized use.

However, where a client employs an architect to prepare plans for a building and the architect without his knowledge or consent copies the plans of another architect, the employer is not responsible for his illegal act. As to the preparation of plans, the architect is said to be acting for himself as an independent contractor and not as an agent for whose wrongful act the owner would be liable.

A problem which arises more frequently is that regarding the architect's protection against copying of his plans once the building has been built.

As pointed out above, the architect is protected by common-law copyright against appropriation of his work so long as he retains control of his design or until he releases it for general and unrestricted "publication." Once the work has been "published" the architect no longer has an exclusive right

(Continued on page 170)
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At the Government's famed atomic energy plant in Oak Ridge*, AUTO-LOK windows are to be found in the 450 multi-family dwelling unit No. 5; in the Blair Gate, White Wing Gate and Gallagher Gate Guard Structures; in the Ammunition Storage Building and Fire Station No. 6.

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either in the design or its reproduction. What amounts to unrestricted “publication” has from time to time been considered by the courts.

In an early case it was held that an architect had a common-law right of property in his design of a novel and artistic porch only before its “publication,” by its application to a building which he erected. It would seem under this holding that once an architect’s idea has been embodied in concrete form in a house that all the world can see, common-law copyright cannot prevent anyone from copying his idea.

It has also been held that the filing of plans with a building department amounts to a “publication” so as to terminate the architect’s common-law copyright. What this means, so far as the right of other persons to copy the work is concerned, can perhaps best be illustrated by setting forth the fact situation in a case in which this principle is applied.

An architect had prepared plans and specifications for a residence and filed the plans with the building department to procure a building permit. A house was erected under his supervision according to his plans and he received compensation from his client for these services.

The defendant, a person who was not connected with either of the parties, liked the house and desired to have one built like it. He asked the architect how much it would cost for a duplicate of his plans and specifications, and on finding the figure named too high, he told the architect that he could get the same work for less money. He subsequently procured the services of another architect who prepared plans for a building which, when constructed, conformed substantially to that which the original architect had designed.

The architect then sued the owner of the second building to recover the value of the plans, claiming that they were copies of the plans and specifications filed by him with the building department. The court dismissed his complaint, stating that he had lost his common-law right of copyright by filing the plans with the building department. It emphasized that he had superintended the construction of a house under these plans and had been paid for the work. This, the court said, is as far as common-law right of copyright extends since the law protects him only in the first “publication” of his work. The court stated:

“When the architect has permitted the work to be filed in a public office as a step in furnishing the basis on
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172 Progressive Architecture
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These are just a few of the many reasons why Cleaver-Brooks boilers were specified. Being completely self-contained and compact in design, requiring minimum head room and floor area, Cleaver-Brooks boilers presented no installation problem.

Cleaver-Brooks Self-Contained Boilers are available for oil, gas, combination oil and gas firing, 15 to 500 hp, 15 to 250 p.s.i., for heating and processing loads. Write for the catalog.
it's the law

(Continued from page 170)

which he is to receive compensation for his work, we are of opinion that . . . the plaintiff has published his work to the world and can have no exclusive right in the design or in its reproduction. This would seem to be especially true where the plans and specifications have been used in the construction of a building and the building has been exposed to the gaze of the public and has afforded to the plaintiff the full value of his services."

There was no evidence in the case that the defendant-owner or anyone acting in his behalf had copied the plans on file in the building department. It is doubtful, however, that had this been the case, the result would have been different, particularly since the court was of the opinion that all of the property rights in the plans, if they had any value as property after publication, belonged to the client for whom the architect had originally prepared the plans rather than to the architect himself.

In another case where a house was built with the consent of an architect and according to his plans and was thereafter open to the public for inspection, the unrestricted exhibition of the house amounted to a publication and the architect's right to protection was extinguished. The facts in that case were that a magazine of national circulation had offered a prize for the best modernization of an old residence. A savings and loan association entered the competition by modernizing an old house in Kansas City and for this purpose employed an architect, paying him $250 for his plans. The house was thereafter advertised as being open for public inspection. Subsequently the plans were used by the defendant members of the association in erecting two other houses, and the architect sued them for unauthorized use of his plans.

The defendants, in their pleadings, admitted that they knew that the plans in question at all times remained the property of the plaintiff and entered into the contract with him in contemplation of this fact.

The question then arose whether in view of this understanding the defendants wrongfully appropriated and used

(Continued on page 176)
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it's the law

(Continued from page 174)

the architect’s plans. The court decided that the unrestricted exhibition to the public of the house with his consent was a “publication.” It stated that if the idea itself was “published” with his consent he was not protected by a restrictive clause in the contract with the association. The court added that if there is an intention to render the work common property, then “publication” has occurred, and the intention of the author is not determined by what he says, but what he does.

Two other interesting points raised by the defendants were not considered by the court but it might be well to mention them here since they afford possible examples of a defense to a claim of infringement. The defendants alleged that the architect’s plans were included with his consent in an article written for a national real estate journal and that this amounted to a “publication.” They also alleged that exhibition of the plans at a Better Homes Show sponsored by a city real estate association amounted again to a “publication” of the plans.

While that point was not decided by the court, it would appear that publication of the plans in magazines of wide circulation and/or their unrestricted showing at an exhibition are such “publication” to the world as to render the work common property.

Whether a contractor who was originally employed to construct a building according to the architect’s plans, may later construct an identical building, presents a somewhat different problem since the contractor bears a fiduciary relationship to the architect. This relationship arises out of the previous contract employing him to construct the building, at which time he had full access to the plans. This question is, therefore, outside the scope of this column.

The contractor does, of course, have a right to the possession of the architect’s plans while he is engaged under a contract with the owner to construct a building according to such plans. He is entitled to use the plans as long as they are necessary to the execution of the work. While he is engaged on the project, any unwarranted taking of the plans by the architect so as to deprive the contractor of their use, constitutes a trespass for which the architect will be held liable even though he remains the owner of the plans.

Following completion of the work, however, the contractor has no further interest either to the possession or the use of the plans and, depending upon the contract between owner and architect, they become the property of the owner or remain that of the architect.

(To be continued)
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Doubling in GLASS

This storefront presents display windows two stories high, with displays on two levels. One is on the floor and the other on the grid-pattern overhang.

Double display through mirrors, too. Their use at each end of the storefront reflects a view of the interior before the eyes of passing traffic.

Double-glazing with Thermopane* insulating glass is provided in the windows at street level. It helps guard against steam and frost—provides clearer visibility on cold days. Notice the difference in the picture. The upper windows glazed with single glass are steamed, but the Thermopane windows below are clear.

Design applications for many types of glass are illustrated in our Visual Fronts Book. Write for your copy and ask, also, for a booklet on Thermopane Storefronts.

LIBBEY·OWENS·FORD

7061 Nicholas Building, Toledo 3, Ohio
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Who designs a building? We on the P/A staff feel rather strongly that the entire architectural organization does—that the guy who throws in a good idea from the drafting room, the specification writer, certainly the "designer," and the job captain, all have something to do with the ultimate result. I know from my own experience that the superintendent on the job, making quick decisions under the pressure of actual construction conditions, often appreciably affects the final design. Many times we wish that full credit of this sort could be given when a building is published (you may have noticed that, whenever we secure the information, the responsible members of the organization are listed) but all too often the pretty pictures and the nice captions appear in the name of an "architect" who may have been rather pleasantly startled when he saw what he had produced.

In the case of the smaller organization where the principal is himself the strong designer and co-ordinator, this crediting of the architect alone is as it should be. The younger people in the office are in a sense apprentices, no matter how responsible their jobs may be, and their time for full professional credit will come. As a matter of fact, the stronger and more sure of himself an architect may be, the more likely he is to give credit, and to ask that credit be given, to responsible associates and co-workers.

It is in the case of the large organization that the particular person in charge of a project may not get the kudos due him. When a firm grows to huge proportions, it becomes almost anonymous, insofar as the design of particular structures is concerned. The principal partners, of course, make the ultimate overall decisions, and determine policy; but the man in charge of a particular job may be operating in as responsible a capacity as many an independently practicing architect, yet never be noted in the professional press.

Skidmore, Owings & Merrill is a remarkable firm in many respects. Not only is it large and scattered (offices now in New York, Chicago, San Francisco, Oak Ridge, Tokyo, and within the last month, Portland—see our NEWSLETTER for details) but through its individually able and hard-working partners, S.O. & M. is insistently generous in giving credit to members of the organization who deserve credit. We like this policy and we go along with it wholeheartedly. When it came to preparing copy for the Oak Ridge feature in this issue, however, we began to realize that in a planning accomplishment of this magnitude even an extended list such as we have at the beginning of the story did not give all the credits that should be given. Therefore, on this page I am reproducing an organizational chart of the Oak Ridge office of S.O. & M., as it was when the postwar design phase was in full swing.

Even this extensive chart does not give all the credits that might be mentioned. I know, for instance, that Tom Flavin has been office manager down there since the first group went to an unidentified town early in the war. And I remember that time well, because a neighbor of mine—Herb Mathiasen, who is now superintending the Lever House job in New York—went down at that time also, and even over drinks after bridge we couldn't extract from him (because he didn't know) what it was all about.

Another phase of this business of credits which gives editors headaches is the matter that Bernard Tomson is getting into, the legal aspects. Who "owns" the idea in the design sense? I have just been looking at a patented scheme for arrangement of apartment rooms in a housing structure. If we were to publish it, and around the country apartment houses were built which approximated it, who could tell whether there had been simultaneous developments of the idea, whether there had been bald copying, or whether that intangible inspiration which comes from reading and seeing and thinking many things had been the reason. We once published a house—gave it an Award as a matter of fact—and then got an angry letter from another architect who claimed that the design had obviously been stolen from one of his. In that sense, there was an awful lot of plagiarism during the Middle Ages; going back further, some lusty Romans might well have been sued by the estate of Ictinus (and in turn have passed on the basis for possible claims to their descendants during the Renaissance and even to some of the Italian immigrants to the United States during an earlier period.)

I am particularly sensitive to the problem right now, because I am working on an issue which will show several related "ideas" in planning, by several designers, and I have a feeling that I am building up the possibility of bitter letters ("What do you mean, this is a new conception—I did it in the Saint Reno hotel in 1929"). Do you want to start a good argument among some of the great modern designers? Just to make you feel happy that you're not an editor, I guess.