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**Cover:** From a rendering of Cidade Dos Motores by Paul Lester Wiener and José Luis Sert
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Dear Editor:

We have had an opportunity to read the article on "Lighting Design and Human Environment." Definitely the author has presented lighting correctly, as a fundamental part of human environment. He also made very interesting and well pointed criticisms of lighting design and construction. We, the lighting manufacturers, are first to admit the faultiness of the designs that have appeared on the market under the guise of lighting fixtures.

However, we do feel that this writer did not go far enough in his analytical discussion of the problem to take cognizance of the fact that lighting manufacturers are limited in design by the available shapes and sizes of light sources. Lighting equipment is a structural element the same as concrete, steel, and brick. Just as these materials have their limitations, so lighting equipment must have certain basic limits.

We know there is a current of feeling in the architectural field to discard manufacturers' designs of lighting equipment for their own individual designs, which is natural with these types of men in creative professions. Incidentally, looking more closely into some of the writer's criticisms and some of the examples of poorly designed lighting equipment, you'll find that many of the designs which he ridiculed were suggested originally by architects to meet some particular mode of decoration or interior planning.

Speaking individually for the designs of our company, special effort has been made to embody new fluorescent light sources in simple, unobtrusive luminaires executed in the most basic lines and modified only enough to soften the characteristic shape and inherent length of elongated fluorescent tubes.

GLENN WITTBRIDT
Advertising Manager
Edwin F. Guth Company
St. Louis, Mo.

COMPLIMENT FROM PANAMA
Dear Editor:

Relative to your PROGRESSIVE ARCHITECTURE publication, I want to fervently compliment you for the great work in its editing.

I am a draftsman, having received my certificate last year. Therefore, when I look over the magazine I find the articles written by the great architects of your country to be of great help.

I appreciate the country home shown in the May issue which was well shown. The architect of this work demonstrated a talent of the first magnitude.

EDMOND V. KARBICHE
Correo Aereo, Panama

IN TANGANYIKA TALK
Dear Editor:

PENCIL POINTS, old PENCIL POINTS is No. 1 on my list of friends, most beloved of my tutors and technical instructors; it has introduced me to some of the world's best men; unquestionably, best men and it has been of more esthetic value to me than I can assess. . . . Get hold of some darned Yank that knows the language to say it for me and to translate "bully for you" into 20th century Broadway talk. Then you will appreciate the delicacy of my complimentary framing!

ROBERT A. GOODE
Tanganyika, East Africa

THE ANNUAL AWARDS
Dear Editor:

I was very pleased to read your announcement about PROGRESSIVE ARCHITECTURE's annual awards, which I think is a splendid idea and should be of immense value to the profession.

LESTER C. TICHY
New York, N. Y.

BEST NOT BUILT
Dear Editor:

I like the idea of an annual award for best building. I think that progressive architecture would be served even better if an award or awards were made for designs of buildings that have not been erected. The best designs, in my opinion, seldom have a chance to be carried out, because of the ultra conservatism or lack of imagination of those who control the purse strings. So, give it a thought, please!

JOSHUA D. LOWENFISH
New York, N. Y.

SOUND OF REJOICING
Dear Editor:

Your letter announcing annual PROGRESSIVE ARCHITECTURE awards has been received with much rejoicing in these parts, notably for the basis upon which these awards will be made, and for the first really intelligent jury to judge the qualifications of work for which such standards are set.

Congratulations to PROGRESSIVE ARCHITECTURE; you may set some standards inadvertently for architectural competitions generally.

MARIO CORBETT
San Francisco, Calif.

YOUR QUESTION NOTED
Dear Editor:

I question the ability of any jury or any magazine to properly evaluate contemporary work.

ROBERT T. BICKFORD
Elmira, N. Y.

While his Seabee unit was moving along the road to Cavite, the largest naval base in the Philippines, Otto F. Bermel sketched this roadside scene. In the course of his duties as Chief Carpenter's Mate, he found many opportunities to record events ashore as well as aboard the flagship, "San Clemente."
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(Continued on page 12)
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JOBS AND MEN

(Continued from page 10)

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TWENTY YEARS in private architect's offices. Fifteen years and at present in Government. Experienced any type building project, community housing. Work traditionally or along modern trend. Preliminary schematics, contract drawings, checking, coordinating. Had charge of and prefer working in smaller office. Box 302, PROGRESSIVE ARCHITECTURE.

ARCHITECTURAL ENGINEER, age 31, registered architect in two states, college graduate, wishes position leading to partnership in firm. Available immediately. Box 303, PROGRESSIVE ARCHITECTURE.

ARCHITECT, registered, presently employed, desiring to locate in Southern California, seeks key position of responsibility, heading large project or drafting room, or chief of specifications. Thorough knowledge of materials and methods. Able to engender cooperation. University training, long experience, hospitals (federal, state, private), hotels, public buildings, churches, and educational institutions. Box 304, PROGRESSIVE ARCHITECTURE.

ARCHITECT with thirty years of practical experience, free-lance and with architectural offices, desires connection with architectural or contracting concern. Basis, 100 hours monthly for $400. Excellent designer in progressive, modern style (not “caboose”). Architectural artist, maker of many black-and-white and color perspectives. Write N. M., Room 1703, 22 W. Monroe St., Chicago, Ill.

INDUSTRIAL DESIGN AND ART GRADUATE, 33, with two additional years' college architecture, desires position with industrial designer, architect, or manufacturer. Five years' experience in mechanical engineering design and drawing. Excellent draftsman and letterer. Good at perspectives, delineating, clay modeling, and water colors. Knowledge of engineering production processes. Box 307, PROGRESSIVE ARCHITECTURE.

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SEPTEMBER, 1946 13
The Cidade Dos Motores featured in this issue results from the collaborative effort of Paul Lester Wiener and Jose Luis Sert, Town Planners. For their broad yet infinitely detailed scheme to develop a complete modern city, both have drawn on years of experience and accomplishment that have won for them international renown.

Wiener maintains a New York office with Sert, and also is president of Ratio Structures, Inc. He has built abroad and is a member of the American Society of Architects and Planners, American Society of Planning Officials, National Planning Association, National Committee on Housing, American Institute of Architects, and the Pan American Society. He has been decorated by France with the Legion of Honor and by Brasil with the Cruzeiro do Sul; and is an honorary member of the Instituto de Arquitetos do Brasil and a director of C.I.A.M.

PAUL LESTER WIENER

JOSE LUIS SERT

KENNETH KASSLER

(Congres Internationaux D'Architecture Moderne) American Chapter. He served as consultant to the Office of Production Research and Development of the War Production Board and also acted as director of Technical Studies at the New School for Social Research. He has lectured at universities in this country and was guest professor at the University of Brasil, Rio de Janeiro, and also at Sao Paulo, Brasil, and Lima, Peru.

Sert, widely known as a champion of modern architecture and progressive urban planning, is vice president of C.I.A.M., to which he also is the Spanish delegate. He is an honorary member of the Royal Institute of British Architects and a member of the American Society of Architects and Planners, as well as the planning committee of the Citizens' Housing Council of New York. He is vice president of Relief and Postwar Planning, Inc. In collaboration with C.I.A.M. he was author of a town planning book, "Can Our Cities Survive?" (Harvard University Press, 1942). He was Consultant Professor for Planning in the School of Fine Arts, Yale University (1943 to 1944). He has built several apartment houses, schools, country houses in Barcelona. In collaboration with G.A.T.E.P.A.C. he also built the central dispensary for Catalonia and a large housing development with community services, planned a recreation center for the city of Barcelona, and developed a master plan for this city together with the above mentioned group and the architects, Le Corbusier-Jeaneret. He also designed the Spanish Pavilion in the Paris World's Fair, 1937, in collaboration with Luis Lacasa.

The adroitness of Kenneth Kassler in blending the "Brookhouse" (p. 75) with its setting results in part from his thorough familiarity with the Princeton scene. He received his architectural degree from Princeton University and taught there from 1938 to 1953. He began active architectural practice two years later and has devoted most of his attention to residential work except for a year spent in Washington, on site planning for the Suburban Resettlement Administration, and for his war

NEAR QUESTIONS

- New houses in Massachusetts, Michigan, and California will be shown in the October issue—houses that are by no means average because the architects are all topnotch in their field. From Massachusetts will come three houses by Carl Koch, one of them done in collaboration with Robert Woods Kennedy. The Michigan house is one of the smaller examples of the distinctive work of Frank Lloyd Wright. A long comfortable house designed to take full advantage of the California climate comes to us from the office of Warster, Bernardi & Emmons of San Francisco. The landscaping in this instance is by Thomas D. Church.

- Key designs for a new building type—airport hotels for accommodation of passengers at large commercial fields—also will be shown next month. These are the work of Fred Bassetti, Cambridge designer who defines them as "an extension of service to solve the inconveniences and discomforts of present-day air travel." Such facilities may well become a necessity of the airport of tomorrow, and the editors offer this presentation to stimulate creative thought among our readers.

- Two important articles, one on "Functional Lighting" by William H. Kahler and a second on "Sun Control" from Richard Neutra, are included in the Materials and Methods section of the October issue. The first recounts an investigation by a Westinghouse lighting engineer into the problems of glare, reflected glare, intensity, etc., in four types of buildings: offices, schools, department stores, and industrial buildings. The numerous architectural devices and methods of design for control of sunlight penetration into buildings are discussed in the second article, which is based on material gathered by Neutra, internationally famous architect of Los Angeles, supplemented by a list of examples assembled by the editors. This featured survey should become valuable reference material for the designer's library.

NEXT MONTH

(Continued on page 16)
When you have a Flooring problem
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LOOK TO Tile-Tex IN '46 FOR THE BEST IN FLOORING
service—first as an officer with the U. S. Marine Corps directing construction and aircraft operations work in the South Pacific, then for a year in Washington as station development officer, Bureau of Aeronautics, Navy Department, supervising public works development of all continental Marine air stations.

Inventive and talented as a designer in many fields, Morris Sanders now is winning attention with his new Module Furniture (p. 86). In his 18 years in New York he has experimented, designed daringly, won numerous professional and public awards. From his board have come houses for town and country, department stores, restaurants, a Park Avenue beauty salon, buildings and exhibits for the New York World's Fair; as well as lamps, screens, radio cabinets, ceramic tableware, special-purpose lighting fixtures, and many new tools for the plastics field (in which he conducted some of the first experiments in furnishings). He also has written for technical and popular papers, given radio interviews, lectured here and in Canada, and served as an adviser to large companies on product development. During the war he helped to organize The Consumers' Durable Goods Branch of OPA, and along with other war jobs in Washington served as an adviser on conversion, substitute materials, manufacturing, and design. He is a graduate of Yale and traveled and studied abroad before starting his New York practice. He is vice president of the New York Chapter, A.I.A., and also serves as a judge of The Modern Plastics Competition.

L. N. Roberson, author of "Electric Radiant Heat," featured in the Materials and Methods section this month, is owner and manager of L. N. Roberson Company, engaged in the manufacture and erection of steel greenhouses and electrical heating and ventilating equipment, originally for agricultural purposes only. He also owns and operates a commercial nursery, where equipment is tested before being placed on the market. During the war he worked in the Hull Engineering Division of Todd Pacific Shipyard, then as electrical engineer for 13th Naval District Headquarters, Public Works Division; and when the war ended he resigned as Design Engineer in charge of Public Works Design Section, U. S. Naval Station at Seattle, Washington. Associate member of the A.I.E.E. and a member of the American Association of Nurserymen, he also is past president of the Washington State Nurserymen's Association.
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NOTICES

ECKBO, ROYSTON & WILLIAMS announce the opening of new offices at 121 Beale St., San Francisco, Calif.

ALBERT MELNIKER, A.I.A., recently of the Engineers Corps, AUS, has opened his office for the practice of architecture at 130 Bay St., St. George, Staten Island, N.Y.

Following ten years' service as manager of his municipality, HOWARD C. FRANK has reopened his architectural office at 126 Pittsburgh St., Scottsdale, Pa.

JOHN E. SOMERVILLE and MILO GRIFFS have opened an office recently at 230 E. Walnut St., Green Bay, Wis., for the practice of architecture and engineering, specializing in industrial and commercial plants and processes.

After four years in construction work for war plants, LEROY W. THOMPSON, Architect and Engineer, announces the reopening of his office at 355 Congdon Ave., Elgin, Ill.

THOMAS J. BIGGS, A.I.A., Architect, HARRY E. WEIHR, A.I.A., Architect, and SYDNEY W. CHANDLER, A.S.C.E., Civil Engineer, announce the formation of an association of architects and consulting engineers at 224 N. Congress St., Jackson, Miss.

RAYMOND BROWN, JR., has announced the opening of his office for the practice of architecture at 60 Main St., Torrington, Conn.

CHARLES E. THOMAS announces a partnership with GORDON SWEET for the practice of architecture under the firm name of THOMAS AND SWEET, ARCHITECTS. Their office is located at 224 Colorado Springs National Bank Bldg., Colorado Springs, Colo.

JOHN DUDLEY SCRUGGS AND CLARENCE ELLIOTT HAMMOND have opened an office for the practice of landscape architecture and engineering at 300 Central National Bank Bldg., Peoria, Ill.

GRAHAM LATTA, recently discharged from the Seabees, has returned to practice architecture at 940 Alma St., Glendale, Calif.

FRANCIS E. GRIFFIN, Architect, and formerly staff faculty member of the School of Engineering and Architecture at Howard University, has joined DONALD F. WHITE, Architect-Engineer, as an associate and co-partner of the firm WHITE & GRIFFIN, ARCHITECT-ENGINEER ASSOCIATES, 1727 St. Antoine St., Detroit, Mich.

HUSON JACKSON AND JOHN HANCOCK CALLENDER have announced the formation of a partnership for the practice of architecture, design, and housing research. JACKSON and CALLENDER are located at 299 Madison Ave., New York, N.Y.

DAVID MAXWELL has joined BERTELL, INC., New York design and development organization, as director of product development and company associate. Offices of the firm are at 40 E. 49th St., New York, N.Y.
Pop's Vegetables can't Drink...

INSTALL STEEL PIPING
ADEQUATE FOR TOMORROW'S NEEDS

... until Mom's Flowers are soaked!

"FIRST come, first served," may be a fine old copybook maxim, but it isn't so good when it's the "garden variety" with Pop's vegetables and Mom's flowers competing for water priority.

It's your responsibility, you who have a part in modernizing millions of America's old homes and building new homes--to see that there is plenty of free-running water throughout the house--enough to meet every growing demand of America's families. Remember that existing city water pressures are constant and that the increased water supply depends almost entirely upon steel piping of adequate diameter--much larger than was considered necessary 20 years ago.

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SEPTEMBER, 1946 19
- St. Mary's Church in Boston, Mass., recently re-roofed with approximately 40,000 lbs. of Revere sheet copper by A. Belanger & Sons, Inc., Cambridge, sheet metal contractors. General contractors were the John Bowen Co., Boston, and the metal was supplied by The Herrick Co., Boston distributors.

HEADQUARTERS FOR THE FACTS ON SHEET COPPER CONSTRUCTION

REVERE believes that its responsibility only begins with the production of fine metals, and does not end until those metals are giving satisfactory service in the hands of users. Often, this means not only metallurgical research, but also extensive field and laboratory work in the practical application of Revere products.

As a result of such research, architects and contractors throughout the country now have new and vastly improved information on which to base sheet copper construction. Using the clear, simple charts supplied by Revere, sheet metal contractors are already taking wide advantage of the advanced engineering principles Revere has developed. These experts are convinced, as is Revere, that this new sheet copper construction will far outlast that done by former methods.

Nearly all prominent architects and contractors have Revere's new book on the subject, "Copper and Common Sense." We urge you to use the data in this book. It was prepared especially to help practical men in their day-to-day problems. Call on the Revere Technical Advisory Service, Architectural, for any further help you may wish. Revere products are sold by Revere Distributors in all parts of the country.

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Walls of plaster, cement blocks, or poured concrete can be made to take on new warmth and charm... when paneled with Weldwood Plywood.

In applying Weldwood panels to plaster or masonry, furring sticks should first be set up on 16-inch centers. On plaster walls, the furring is applied horizontally across the studs and is secured with 8d box nails. (See illustration at top.)

For masonry walls, vertically placed furring is recommended. The strips should be fastened with steel cut nails driven into pre-drilled holes.

The above suggestions are just a few of the many which you will find in the new WELDWOOD APPLICATION MANUAL. This booklet contains a fund of valuable, up-to-the-minute ideas for using Weldwood Plywood. It shows construction details and illustrates time-saving and money-saving application methods.

Today, Weldwood Plywood is filling a great post-war demand... in many types of construction. If, therefore, your dealer's stocks are temporarily low, please be patient, ample supplies will be available soon.
YOUR CLIENTS will expect a lot more than cooling from the air conditioning system you specify. They’ll want all five features of modern Better Air Conditioning.

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General Electric Company, Air Conditioning Dept., Section 6509, Bloomfield, N. J.

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Complete Air Conditioning
INTERCHANGEABLE MEMBERS
A wide variety of face members are interchangeable, because they are used with the same basic gutter assembly.

MULTIPLE USES
This face member is one of many which can be used as a shadow-box frame, bulkhead member, canopy face, or awning box cover.

You can create an endless variety of custom-styled store front designs with the K-47 Line of store front metals, because its members are interchangeable and they also serve multiple uses.

A typical example of K-47 interchangeability is illustrated in the upper panel at the left. It shows a few of the many face members which are used with this same gutter assembly. And an illustration of the multiple uses of a K-47 member is shown in the lower panel.

These two outstanding features enable you to obtain unparalleled flexibility and freedom in designing a limitless number of distinctive store fronts.

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Erected more than 60 years ago, the famous Potter Palmer "Castle" on Chicago's Lake Shore Drive has, from the first, been heated with this pair of Kewanee Steel Firebox Boilers, installed by L. H. Prentice Co. Yet . . . after more than 60 years on the job . . . they are still in serviceable condition. Originally installed for hand-fired coal, they were later equipped for oil burning.
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SAV-A-SPACE
Sliding Door Frame

Made by weld-pressing a plastic surface on phenolic resin bonded plywood, Laminex Plastic Faced Plywood combines the strength, flexibility and easy working characteristics of plywood with the permanence and hard surface of plastic!

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For further information contact your nearest Wheeler Osgood office

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SEPTEMBER, 1946 25
Two lines of PITTCO METAL with the same rich finish

PITTCO DE LUXE

Pitco DeLuxe Store Front Metal has a satiny-smooth finish, rich in tone and gloss, which has delighted both architects and store owners. They like it because it harmonizes perfectly with any material or color combination. And the Pitco De Luxe line also has rugged, sturdy strength and clear, sharp profiles assured by its extruded method of manufacture. Imaginative styling and the wide variety of bars, mouldings and sash in the De Luxe line permit the architect many effective combinations. For symmetry, strength and perfect finish, Pitco De Luxe is the ideal choice for impressive, distinctive store fronts of high quality.

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Pitco Premier, although lighter in weight and more moderately priced than Pitco De Luxe, has the same rich, smooth finish. And into the Premier line, too, has gone the same careful planning which has made the De Luxe line so popular. All Premier members were styled at one time so that perfect harmony would be inherent in the line...each Premier unit complementing the beauty of other pieces used with it. Pitco Premier construction can be set quickly and easily...a simple outside procedure that effects a substantial savings in setting time. In Pitco Premier architects will find a lightweight, economical metal with which to create pleasing, appealing store fronts.

PITTCO STORE FRONT METAL

“PITTSBURGH” stands for Quality Glass and Paint

PITTSBURGH PLATE GLASS COMPANY
Note the angle of the third and fourth purlin in the illustration above. These have been set to create a valley at the sump location.

for ROOFS and SIDEWALLS

Today the advantages of Mahon Steel Deck in both roof and sidewall construction are manifold... one advantage in roof construction—the creation of saddles by warping the Steel Deck in the drainage area, is accomplished by sloping the purlins to produce the desired angle for drainage to the sump location. This requires no cutting, fitting, or additional Steel Deck Plates, and it eliminates the necessity of constructing saddles of other material. Sump Recesses, illustrated at the left, can be furnished with Mahon Steel Deck to fit any sump or meet any roof pitch requirement. For complete information on Mahon Steel Deck, see Sweet's, or call in a Mahon engineer.

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Home Office and Plant, Detroit 11, Mich. • Western Sales Division, Chicago 4, Illinois
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Manufacturers of Steel Deck for Roofs, Sidewalls, Ceilings, Floors, Partitions and Doors. Also, Roof Sumps and Recesses, Rolling Steel Doors, Grilles, and Underwriters’ Labeled Rolling Steel Doors and Fire Shutters.

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It's no wonder there is such a growing demand for Herman Nelson Unit Heaters. These units, available in a wide range of sizes and capacities, have proved their superiority in thousands of industrial plants and commercial establishments of all types. Like other Herman Nelson Products, these unit heaters are designed and built for maximum operating efficiency and economy. They incorporate laboratory and "use-tested" features, resulting from 40 years confined exclusively to the manufacture of quality heating and ventilating products.

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Where specifications demand "performance and endurance for the life of the structure"... build with Mesker Heavy Duty Sash! Mesker engineers spent years perfecting the techniques for strength and durability that go into every step of their construction. Gruelling abuse and punishment tests, with laboratory models, have given them the know-how to produce windows that can "take it." Inspect a Mesker window... notice its double riveted-welded features... its important allotment of extra metal-thickness in every bar and muntin... note the lifetime durability of operating units, so typical of Mesker workmanship.

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long, pleasing horizontal lines for smart, distinctive modern design

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For absolute harmony in the most streamlined modern design, or for adding new zest to the most conventional structures, utilize the bright, sparkling, newness of Truscon Double-Hung Steel Windows. Their smooth, sweeping lines permit single or group arrangements that achieve exterior distinction and interior smartness. This window is also furnished in colonial muntin designs.

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There is a type and grade of Douglas fir plywood manufactured especially for every building need. Each must meet rigid standards of quality. Current production is constantly inspected ... constantly tested in the Douglas Fir Plywood Association laboratory. Choose the type and grade for your particular job by these "grade trade-marks," which appear on every panel. Use it with complete confidence; its dependability is backed by an industry-wide quality standard.

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Douglas Fir Plywood Association
Tacoma 2, Washington
Quick, comfort-giving heat with the simple flip of a switch! That is what the new, improved Built-in @ Quikheter affords.

@ Quikheters are ideal for those damp, chilly fall and winter days — days when regular heating plants are off... or for taking the chill out of the house on cold, blustery winter days.

Equipped with a genuine Nichrome heating element that should never wear out, these quick-acting units send forth a glow of warm air that will change the temperature of the average room in three to five minutes.

There is no need to wait for the heater to heat-up. There is no lost motion or electricity — no waste of fuel. @ Quikheters are hot the minute they are turned on. And they are neat and attractive, too—ideal for bathrooms, kitchen, and other rooms. They can be easily installed in the wall or in the base of mantles.

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Any estimate of the number, sizes and types of sterilizers required to take care of the various departments of a hospital should be based on bed capacity, amount of surgery and obstetrics to be done, and the general layout of the building. Consideration should also be given to possible future additions to the hospital. If finances permit the purchase of only a bare minimum of equipment, space should be provided for additional sterilizers that might be required in the future.

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Not all haunted houses are old. Many a new house starts to haunt its owner from the day he moves in. Haunt him with troubles, worries, and ever mounting expense. This has always been true. And it's even truer today with so many people wanting homes that there isn't enough good material to go around. But whether you can build today or not it's wise to start planning now. Planning to build so soundly that the ghosts of shoddy construction and flimsy materials will never rise up to haunt you. For, thanks to scientific research, new methods and modern materials assure you greater comfort and long-lasting freedom from annoying repair expense.

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See him first when you plan your own house. He will help you build better. Not today perhaps, but tomorrow sure! National Gypsum Company, Buffalo 2, New York.

Over 150 tested Gold Bond Building Products for new construction or remodeling add greater permanency, beauty and fire protection. These include wallboard, lath, plaster, lath, sheathing, wall paint, insulation, metal and sound control products.

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Gold Bond Gypsum Plaster is the perfect plaster for modern improved gypsum lath. It’s the perfect lath for new or old houses.

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Manufactured goods with national distribution must meet the test of practically every type of climate—from sub-zero arctic temperature to tropical moist heat. That is why it is important to use materials which will stand up to temperature and humidity variations. In thermoplastics, that means CELCON.

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That now...with Aquella adding the advantage of watertightness to the desirable construction qualities this type of masonry provides—you have a building material excellent in every respect.

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Aquella is the new, scientific way to insure watertightness inside or outside...above or below ground...on all porous masonry surfaces, such as brick, concrete, stucco or cement plaster.

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You’ll want this information for your waterproofing file

Write today for your copies of “Aquella and Concrete Masonry Construction,” and the “Key to Aquella Specification Types.”

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will include

ANEMOSTAT
DRAFTLESS AIR-DIFFUSION
for successful air-conditioning

On the boards today, the ultra-modern commercial and industrial buildings of tomorrow are being designed to assure unsurpassed production. Incorporating all the newest advances in architectural design, they will add much to worker efficiency and comfort.

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We are proud of the fact that PROGRESSIVE ARCHITECTURE has always been a professional magazine. In somewhat the same way that doctors use their medical journals and lawyers their law journals for the discussion of professional problems and the dissemination of professional knowledge—for the general elevation of the body of practitioners—all the architects must have available a fully illustrated publication intended solely for those engaged in the design of buildings, communities, and cities.

A magazine intended to reach a large lay group, or even a group engaged in related activities, obviously could not deal with professional matters in the same detailed, technical way that a purely professional magazine can. A medical journal edited for laymen, for example, would have to present medical material in the Reader's Digest manner; if its readership included X-ray technicians and morticians, it would be either vague or subdivided in its contents. The same thing is true of an architectural magazine. That is why PROGRESSIVE ARCHITECTURE, and before it PENCIL POINTS, has always insisted on remaining a magazine edited solely for the designing profession.

If this fact is granted, then the thoroughness with which a completed work of design or technical discussion is published becomes important. We believe that the casual showing of a plan and several pictures would not be a professional presentation. Our editorial judgment is weighted by the consideration that experts will be reading our pages, and those pages will be worthless if the experts do not gain something from the reading. That is why we have to refuse a good many interesting contributions; we prefer to use the available space to describe fewer projects more thoroughly. In this issue, for instance, Brasil's new city is rather completely studied. Its many excellences in town planning and building design could not have been explored, professionally, in less space. The same thing is true when we deal with important developments in materials and equipment. We could have printed one photograph of an electric radiant heating installation and covered its news value; we preferred to study its advantages and disadvantages, the methods of design and installation, and costs.

Professional editing differs from popular editing. We appreciate the fact that our readers evaluate the material we present month by month for its worth to them in their practice, not for its appeal to any other group.

The Editors
Brazil builds a new city

Cidade dos Motores, Brasil

Many planners have dreamed of designing a complete new city, but that chance has come to very few. PROGRESSIVE ARCHITECTURE is proud to present Brazil's Cidade Dos Motores, an industrial city for which ground is now being broken. Today there is a tropical Brazilian plateau on which the only buildings are a factory and some farms. Tomorrow a modern city of 25,000 people will begin to rise there. The Brazilian Government and a pioneering official—Brigadier-General Antonio Guedes Manis, the Chief of the Brazilian Airplane Engine Factory Commission, in charge of this whole regional development—recognized in their program that the haphazard growth of the region would repeat the chaos which exists in most industrial cities.

After they had completed a comprehensive study looking toward the growth of a new city, the planners were commissioned to make a master plan within flexible outlines and prepare working drawings. The program called for the new town plan to serve as a model for Brazil, to demonstrate a harmony of industrial efficiency with high living and welfare standards. The aim was to set a new town plan standard and at the same time use new techniques of construction. Mass produced building parts were to be used in a way that would produce variety of appearance as well as economies in construction cost. The following pages will show, step by step, with what complete success the planners met these aims from the over-all pattern to the last detail of construction.

The first stage was the development of the region. The expanded factories, the farms, and the airport are related to the site, to the highway, and to the city. Industrial, agricultural, and urban development have a planned relationship. The main highway by-passes the city, yet is linked to it in a logical manner.
Planned in four neighborhood units, the city is shaped to the contours of the plateau. Through it flows a canal, whose banks will be used for walks and pleasant recreational areas.

The cohesive arrangement of the four units makes traffic simple, and economizes on road surfacing. Planning throughout has been kept in the scale of the pedestrian citizen; average walking distance to the civic center is under a quarter of a mile. Peripheral roads allow for automobile access to the neighborhoods, but within the units all traffic is by foot, under covered passageways which protect from the tropical sun.

In each neighborhood unit there are several types of group housing. Some individual houses will be built on the outskirts of the city, at the foothills. In addition to housing, the neighborhoods will have their own community buildings, schools and playgrounds, dispensaries, shops, and restaurants.

In addition to these neighborhood services, there is a civic center located towards the center of the first two neighborhoods to be built, which will eventually serve the whole city. Tall apartment buildings together with the civic center form a "spinal" architectural composition in the center of the city.

The population density is about 100 persons to an acre, a figure reached after considering climatic conditions, walking distances, and maintenance problems. Accessibility and usability for the individual have determined this city's plan in all its elements, with the over-all result well fitted to a challenging terrain.
Here is the neighborhood developed as an integral part of the city, with its open areas functioning as usable, thoughtfully planned community space. Repetition of a constant module for all buildings (3.5 meters, or about 11½ feet) provides a pleasing consistency. Nothing is mechanical or tiresome about the unit plan, yet the arrangement is well studied. Open spaces and free arrangement of the buildings should result in pleasant and varied vistas.
FIRST STAGE OF CONSTRUCTION
WILL BE A COMPLETE NEIGHBORHOOD

First neighborhoods to be constructed will be the two in the center of the ultimate city, shown at left. The photographs indicate the southerly one of these two units, studied more fully in a diagrammatic model.

Of the 6200 people living in this quarter of the city, some 2400 will be housed in dormitory buildings, 1200 in eight-story apartments arranged near the city's principal interior street, and about 2600 in three-story apartment blocks freely disposed within the neighborhood. Each of these living units will have its own parking space and will be near the neighborhood community facilities.

The elementary school is convenient to all family apartments and adjoins a large playground area. The community building is on another side of the playground. Neighborhood shops are conveniently located with road access for deliveries. The bachelor dormitories are close enough at hand to make use of community facilities in the civic center and yet are near the highway which leads to the factory. Thus bachelor activities will least interfere with the daily life of the families in the neighborhood.
THE CIVIC CENTER
DESIGNED AROUND A TOWN SQUARE AND A PROMENADE

The civic center of the new city features a "praca," or town square, and an element more familiar in Brasil than here—the "corso," or "passeio," a promenade which caters to the natural desire to parade, to meet, to see and be seen. Three main divisions of the civic center have been defined: the administration, amusement, and commercial section; the cultural section; the sports section.

The administration, amusement, and commercial section is built around the town square and along the promenade. Here are a shopping center, a hotel, a moving picture theater, and a central restaurant and cafes. Coffee houses are under the moving picture theater which is built on stilts and connected with the praça by two ramps. On the other side of the main highway, reached by a pedestrian overpass, is the cultural center. Principal buildings here are a technical school with its workshop, exhibition halls, and a library. Beyond the cultural center is the sports area, with a stadium and its auxiliary structures designed to serve people from surrounding regions as well as the city's population. The church is on the hillside between the first two neighborhoods.

Pedestrian circulation is segregated from all vehicular traffic. Roads and parking lots feed the civic center from the sides but do not cross the praça or the corso.

The shopping, restaurant, and cafe facilities are under a continuous slab on posts, a sort of extended parasol, which starts near the canal and extends around the corso and the praça past landscaped patios and pleasant fountains. The designers point out an antecedent to this in the Arab bazar, where shoppers are protected from the sun and a free architectural arrangement is possible under the "parasol." The corso itself has been so scaled that it can be covered by awnings.

The visualization above has been developed from general layouts and the site plan, together with estimated building cubages based on the needs of the total population of 25,000. It is expected that the final designs for the various buildings will be made by several leading Brasilian architects.
FRONT ELEVATION. Three of many facade patterns possible by alternating and reversing one typical apartment plan. Living rooms have louvred pivoting wall; bedrooms a single window on this elevation.

REAR ELEVATION. Outside corridors are protected by pierced masonry units.
THREE- STORY APARTMENT BUILDING

ASTONISHING VARIETY FROM FEW BASIC ELEMENTS

The standard wall systems for all apartment buildings are discussed on the following spread. Familiarity with these makes the various facade elements readily recognizable as living rooms, bedrooms, or corridors. There are numerous types of three-story buildings. Some are entirely made up of simplex apartments. Others have duplex units above simplex apartments (and vice versa) or interlocking schemes whereby a simplex fits in between two duplexes on the living-room floor. From such combinations, reverses in plan, and different location on floor levels, a great variety of accommodations and appearance is achieved.
3 SPECIAL WALL SYSTEMS

PROVIDE PROTECTION AND VENTILATION

A simple honeycomb concrete structure is the basic construction system used for all apartment buildings—the eight-story unit which follows as well as the three-story type pictured on the preceding two pages. The same forms can be used throughout, as only the thickness of the walls will vary.

The aim is to obtain maximum variety of combination using the fewest possible standard elements. The pleasing play of light and shadow which patterns the facades results from three wall systems specially devised for corridors, bedrooms, and living quarters, respectively. They are inexpensive solutions to the problems raised by strong sunlight, driving rains, and the need for through ventilation.

No buildings are more than one apartment deep, and the corridor runs along an outside wall. Since the customary "brise de soleil" was deemed too expensive, the pierced concrete screen construction (Type 1) was developed for corridor walls. Living rooms, the architects felt, should be as open as weather permits. Hence they designed a pivoting wall section (Type 2) large enough to act as door, window, or awning, depending on its position. Bedrooms must remain cool, so the ventilated cavity-type "double membrane" wall was developed, to be built of precast concrete units (Type 3).

All precast concrete parts are vibrated and can be rapidly demolded, making it possible for each mold to produce at least sixty units a day.
SUN-BAFFLE
To protect corridors against excessive sun and driving rain, the precast box here pictured is laid up as a masonry unit. About a foot deep with an opening eight inches by eight inches, it makes possible an open, light passageway, with doors and windows to the apartments fully protected. Manufacture and erection can be simply accomplished by local workers.

PIVOTING WALL SECTION
This pivoting counter-weighted panel will serve many functions at the end of the living room. When it is fully open, it lies in a horizontal position above head-height and acts as an awning. Partly open, it provides sun protection while allowing breezes to circulate at top and bottom. In particularly bad weather, it can be completely closed and then functions as a wall. Construction is a light wood frame with tongue and groove slats. Fixed glass panels at the sides provide light at all times.

DOUBLE MEMBRANE WALL
Photographs show the precast concrete units which will form a ventilated cavity wall at bedrooms. Air is free to circulate between the inner and outer wythes. Units are full-story height, cast in a T-section for greater stability of the thin membrane. The flange, or wall face, is 14 inches wide, and an inch thick. As in the case of the sun-baffle above, local labor can easily manufacture the simple unit on the site. Windows can be simply set in a precast concrete box frame.
BRASIL BUILDS A NEW CITY

FRONT ELEVATION OF SIMPLEX ARRANGEMENT. As in the case of the three-story buildings, various patterns are made possible by reversing a typical two-bedroom apartment plan.

REAR ELEVATION OF SIMPLEX. The west facade of the simplex building presents seven floors of pierced-wall corridors above an open walkway. Occasional breaks in the corridor wall permit greater vision.

FRONT ELEVATION OF DUPLEX ARRANGEMENT. Pairs of bedroom floors are sandwiched between levels where duplex living rooms and the one-room apartments occur. Section shows the corridor and access to apartments at living-room floors.

CROSS SECTION OF DUPLEX
EIGHT-STORY APARTMENT BUILDING
TWO BASIC TYPES, WITH VARIATIONS

Like the three-story buildings, the eight-story apartment blocks are made up of various assemblies of apartment types. In some, entire buildings are of 2-bedroom simplex apartments, arranged in rows on all eight floors (illustrated by the elevation at top of opposite page). The other major type is constituted of interlocking combinations of 3-bedroom duplex apartments and small living-bedroom simplexes. Facade variations occur in both types, however. In the case of the all-simplex buildings, either regular-checkerboard or offbeat-staggered patterns result, depending on whether or not unit-apartment plans are used in reverse. In the buildings where duplexes are combined with one-room apartments, different ordering of floor levels produces design variety. In some of these buildings, bedroom floors of duplex units occur conventionally above living-room floors; in others, this arrangement is reversed, and living floors come above bedrooms. Bottom elevation, facing page, shows the design result where both of these schemes are used in a single building. Eight-story units are served by elevators in freestanding shafts connected by bridges to entrance corridor levels.
DORMITORY BUILDINGS
FOR UNMARRIED MEN

Located on the western side of the city are the nine-story dormitories for bachelors. In the first neighborhood there will be three such buildings, each housing 801 men. This location places the buildings across the canal from the family dwellings, allows separate playground space for grownups, and ranges them close to the civic center, where it is assumed that bachelors will spend much of their spare time.

On the first two floors the bedrooms, with five men in a room, are reached by a corridor in the rear of the building. Above the second floor, the dormitory wings are protected on both east and west by cantilevered balconies which also serve as passages for access to the various bedrooms. On these upper floors the rooms have one, two, or three occupants. The balcony rails are of precast concrete, secured and tied together from the third floor level to the roof parapet by vertical tubular rail supports. Fixed glass and ventilators above entrances provide ventilation and light. Sliding, louvered wood doors open to the corridor-balconies, while the central halls are left open to allow full circulation of air.

A wing in the center of the building at the rear contains all of the washrooms, with showers, lavatories, and toilets.
EDUCATION AND RECREATION AREAS
FORM THE NUCLEUS OF THE NEIGHBORHOOD

Neighborhood centers, planned for family living, are developed around a children's section and an adults' area.

Included in the children's services are several 30-crib creches for babies under two years old, a kindergarten (another will be built if it appears to be needed), an elementary school, a dispensary with a prenatal clinic, and a lactorium for milk pasteurization. In addition there are play areas and swimming pools.

In the adult section the canal is widened to form a large swimming pool, near which is built a sun-shed for the bathers. The community club is housed in a building which, until the civic center is completed, will also contain a restaurant, kitchen, bakery, and local milk plant. Eventually the space these services occupy will be available for meeting rooms, playrooms, and adult classrooms.

On the periphery of this community nucleus will be other services, such as the dispensary, laundries, repair shops, grocery stores, bicycle parking space, management offices, etc. Reached easily from any of the apartment buildings, protected from any traffic, here is the core of community life.
THE SCHOOL is organized around an administration and control unit from which branch out corridors leading to individual classrooms and their patios. Advantages of this scheme are that the full plan can be built in stages, study and play areas are pleasantly interrelated, and classroom noise is naturally baffled. Walls open out (operating like garage doors) from classrooms to patios.

THE KINDERGARTEN has four classrooms, each for 30 children, opening to individual outside play areas. A covered walk surrounds the building and extends to the service and administration wing. Food will be prepared in a small kitchen and delivered by carts to the playrooms. A system of concrete vaults makes possible cross ventilation in the center of the building. Access from the inner to the outer play space is by means of counterbalanced, pivoted glazed wall sections.
Designed to seat 650, the cafeteria for factory workers provides two serving lines leading into two main dining areas. Though the lines approach from different directions, the food preparation space supplies them efficiently, and traffic in and out is well controlled. Storage and basic preparation spaces are small, since a central "food factory" will supply partially processed foods to all local cafeterias.

The roof is a 2-way concrete slab on posts rising from a central low point to help carry off warm air and food odors. This construction permits walls to be opened where orientation is favorable. Sun screening is provided by concrete blocks and pivoting shutters, and fixed louvers allow continuous cross ventilation.
THE INDUSTRIAL AREA
HAS BEEN CONSOLIDATED, ENLARGED

The industrial zone of the city has been planned to achieve the same architectural unity evident elsewhere. A control building straddles the entrance road, which then continues through the area between the factories and their administration units, passing under bridged connections. The administrative pavilions are tied together by a covered passageway, and between them lies the cafeteria (see plans below).

FIRST FLOOR. Food preparation, service, and dishwashing have been efficiently organized.

SECOND FLOOR. Directors' dining room occupies best corner. Space is separated for luncheon conferences.
RELATED and carefully studied buildings make the neighborhood. INTEGRATED neighborhoods make the city.
CORRELATED city, industry, transportation, and site make the region.
The master plan for the Cidade dos Motores is, of course, primarily designed for the fullest satisfaction of the physical and spiritual need of its population. Experiences in scientific planning are utilized in the town plan. The master plan is not merely a predetermined pattern; it charts the course of the development of the city for a period of about ten years, and it follows the program of industrialization and agriculture for the region. The city will grow neighborhood by neighborhood; experiences gained in one will influence the design of the next. The master plan is flexible enough to absorb unforeseeable changes. It is, at the same time, a defined framework into which the increasing population will be organically and integrally fitted.

Since man is the measure of all things, let us take a family of four, consisting of father, mother, and two children, and see how their lives can evolve within the twenty-four hour life cycle.*

The man probably works in the factory and lives with his family in one of the apartments. He may walk under a protected passageway, which shields him from the sun, to the nearest bus station (an average of 200 feet from his home) and arrive at the factory within a few minutes; or he may take his bicycle from the shed provided in the apartment group and bicycle along the river front, protected by shade trees, reaching his destination within an average of seven minutes.

During lunch hour he may return home but, more likely, he will remain at the factory where a large cafeteria serves a well balanced meal.

His wife will probably take her baby, under two, to a nursery near her apartment. Here scientifically prepared food is available and care and advice can be obtained. During pregnancy she can obtain prenatal care and other medical advice in her own neighborhood dispensary.

Her other child may go to kindergarten or the near-by elementary school. She can reach all these places unhindered by traffic and at most times protected by covered passageways which in this climate are of vital importance. The kindergartens and schools are planned with the advantages that modern experience affords, and with play areas and landscaped patios to aid the spiritual and mental development of the children. Health services are available near home, incorporating recent findings of medical science.

When the family is reunited at night, near-by neighborhood clubs and swimming pools provide recreation. Dinner may be served at home or taken in the neighborhood restaurants, where carefully prepared diversified menus are part of the nutrition program. An evening walk in the Latin manner is made sociable and agreeable by the civic center, passeio, praca, moving picture theater, and coffee houses. Here the social life of the whole town takes place, where one meets, can see and be seen. Because of the heat of the tropical sun, walking distances from one part of the town to another are held to less than a quarter of a mile.

On Sundays family life evolves according to the Brazilian pattern. Especially in the early evening hours when the sun begins to set, young men and women go strolling arm in arm, listen to concerts played on the praca, and walk along the palm-lined corso and the river-front promenade. During the day football matches are played in the neighborhood sport fields and there may be swimming tournaments or national and regional football games in the stadium.

Most modern cities lack a civic nucleus such as existed in the past. The old praças and passeios in Latin America were built so that the whole community could partake in gatherings and festivities. These were laid out according to the town planning charter of Philip II of Spain (1573). Many Latin American towns still have a clearly-defined civic center where people can gather together as they used to on the old village greens of New England, but the Cidade dos Motores will be the first modernly-planned city that maintains this good traditional feature, bringing it into relationship with present day life.

Our town plan aims, as far as any such plan can, at creating a physical and spiritual background against which the modern Brazilian way of life may be carried on, with ever greater health, happiness, and efficiency.

*The town planner should also establish the relationship between places of dwelling, work, and recreation in such a way that the daily cycle of activities going on in these various districts may occur with the greatest economy of time. This is a constant factor determined by the rotation of the earth on its axis. (The Town-Planning Charter, Fourth Congress of CIAM—International Congress for Modern Architecture—Athens, 1933)
"BROOKHOUSE," NEAR PRINCETON, NEW JERSEY

KENNETH KASSLER
Architect

DANIEL U. KILEY
Landscape Design

Planned primarily as a study or retreat—some 300 yards from the owner's home—this imaginative little structure is also used for entertaining and dining. In a day when mundane functional considerations usually take top priority (and frequently consume the entire budget), it is a delight to focus on a building that was planned for pure pleasure. It is also illuminating to see what pleasant architecture results—in the hands of a skillful designer.
APPROACH from bridge.

LANDSCAPE PLAN by Daniel Urban Kiley.
"BROOKHOUSE," NEAR PRINCETON, N. J.
KENNETH KASSLER, Architect

Built on the site of an old icehouse overlooking the ice pond on the owner's farm, the house is oriented for protection against late afternoon summer sun and the most agreeable view.

The whole parti is based on the relation of the house to the pond and the desire to obtain as much openness as possible. The main room and adjacent terrace are large enough to accommodate a sizable number of guests. Kitchen and storage facilities are purposely limited in size, since their use is only occasional.

The structure is of local quarry stone and frame. Exterior wood finish is of natural rough sawn battens over boarding. Roofing is of wood shingles. Terraces are of exposed aggregate concrete.
SLIDING WALLS provide maximum openness.

“BROOKHOUSE.”
NEAR PRINCETON, N. J.

KENNETH KASSLER, Architect

Throughout the house, interior surfaces are of either wood or stone; no plaster is used. Roof trussing is of fir; walls of the main room are finished in knotty pine, laquered and waxed; flooring is pine end-grain block. The dining bay opens onto a small balcony so placed that it commands a view of the wooden arch suspension footbridge spanning the stream just above the house site.

STUDY CORNER alongside shelves and cupboards.

FIRESIDE looking toward dining alcove.

DINING BAY; bridge beyond.
This footbridge connects the main house and gardens (located some 300 feet back on the right bank of the stream) with the "Brookhouse" shown in the preceding pages. Over page are construction details of the bridge, which is an outstanding example of coordinated architectural and engineering design. Use of the minimum of materials in precise relationships here produces an esthetically satisfying result. The arches are built up; at joints, top members, which are in tension, are secured to steel plates; bottom members, in compression, hold their position without such mechanical fastening. The wood suspension members which support the footway are splayed outward so that stresses are applied to resist any tendency to splitting at the joint (see stress diagram). Comparable considerations governed design of sway bracing and of arch sidefiller pieces which tie the arches to the concrete abutments. All lumber is zinc chromated under pressure.
WOODEN ARCH FOOTBRIDGE
PRINCETON, N. J.

KENNETH KASSLER, Architect
KRAEMER LUKS, Consulting Engineer
An end of the master bedroom has been set off for dressing space by the use of sliding opaque glass doors which are suspended from track hangers. The ceiling acts as a lighting source, since flashed opal glass panels are suspended below fluorescent fixtures. At one end of the dressing space a drawer unit has cupboards above, while on the long wall sliding doors (on floor tracks) conceal hanging space and additional drawers. No applied hardware is needed, as cupboard and cabinet doors are fitted with recessed wood pulls and drawers have hand slots.
DRESSING ALCOVE IN MASTER BEDROOM

McSTAY JACKSON CO.

CHICAGO, ILL.

Designers
WATERPROOFING AND DAMPPROOFING

PART II

I—SURFACE COATING METHOD is a system of dampproofing with film coatings. Materials frequently used:

1. Colorless Type:
   (a) Paraffin, tung oil, and mineral spirits
   (b) Aluminum stearate and mineral spirits
   (c) Linseed oil, turpentine, and paint drier
   (d) Molten paraffin
   (e) Chlorinated rubber and benzene
   (f) Organic oil and gum varnishes
   (g) Proprietary solutions and emulsions

   Advantages:
   (a) Where transparency is a necessity, and after determining that moisture is penetrating through masonry, and after correction of structural defects

   Disadvantages:
   (a) Cannot fill holes in masonry
   (b) Cannot correct structural defects
   (c) Effectiveness lasts for limited period of time

2. Resin-Emulsion Paint Type:
   (a) Civil Aeronautics Administration Spec. CAA-577
   (b) U. S. Navy Spec. 52P75

3. Oil-Base Paint Type:
   (a) Fed. Spec. TT-P-24

II—FACE JOINT METHOD is a system of dampproofing by (1) repointing and tooling joints and (2) grouting, or filling cracks in or between joints and adjacent masonry units. Materials frequently used:

1. Repointing:
   (a) Mortar, same as originally used
   (b) One part Portland cement, three parts lime putty, 12 parts sand

2. Grouting:
   (a) Portland cement and fine sand
   (b) High-early-strength cement, flint, and sand
   (c) Portland cement and flint
   (d) Wax (paraffin and tung oil)
   (e) Proprietary mixtures

III—FLASHING METHOD is a system of dampproofing by diverting water from vulnerable parts of a wall to the exterior. Materials frequently used:

1. Metals:
   Lead, zinc, aluminum, monel metal, tin (terne) plate, galvanized iron, copper (plain and corrugated), copper-bearing galvanized steel

2. Coated Metals:
   Lead-coated copper, fabric-coated copper, asphalt-coated copper, bitumen-saturated wire mesh, asphalt-saturated-cotton over wire mesh

3. Miscellaneous:
   Kraft paper, saturated canvas, roofing felts and cap sheets, copper-coated fabric, asphalt-saturated cotton, im-
pregnated and non-impregnated fabrics laid in mastic

4. Principles of Flashing Design: Investigate material for:
   (a) Corrosion resistance of metallic flashings with regard to atmospheric conditions and contacting masonry and mortar
   (b) Solubility of bituminous materials insofar as staining of masonry is concerned
   (c) Resistance to perforation and pliability without fracture for required contours
   (d) Effectiveness of bond with adjacent materials

5. Design:
   (a) Locate flashing at all vulnerable points; direct water to exterior (through mortar or weep-holes)
   (b) Stabilize copings above through-wall flashings
   (c) Provide sufficient number of clear weep-holes in cavity and non-cavity walls
   (d) Avoid intricate flashing design.
MODULE FURNITURE

A new type of unit furniture based upon a six-inch module, designed by Morris Sanders and manufactured by The Mengel Co., offers the designer storage pieces conceived on an architectural basis.

Late in July, the Mengel Co., possibly best known to architects as plywood and door manufacturers, held the first public showing of Mengel Module Furniture. Before that, Morris Sanders had spent nine years perfecting, simplifying, and finding a commercial sponsor for his brainchild, which consists of a series of standardized, assemblable, interchangeable storage pieces. Five units are in production, with more to be added to the line if demand warrants; the initial five may be assembled in almost endless variety. Ingenious as the furniture and its assemblies are, it remains utterly simple—a result of the exhaustive study which went into its design.

The basic unit is 18"x18"x36", consists of four sides and a back, and may be used horizontally as well as vertically. All four sides contain bolt holes in which can be inserted the simple metal "Module Connectors" that secure adjacent units in an assembly. Into the same holes may be inserted drawer slides or aluminum-channel shelf brackets, etc. Units may be fitted with solid or grilled doors, with sliding plate glass doors, with shelves or drawers, with one of three types of standard bases, or with wood spacers used, for instance, to separate top units of a two-tiered chest from the base. Other sizes now in production are 12"x18"x36"; 12"x24"x36"; 18"x18"x18"; and a flat unit, 6"x18"x36", useful both as a drawer case and as a small table top. Additional auxiliary parts include specially designed metal-dowel hinges, table legs, etc. Assembly of the most complex piece can be accomplished by the average housewife; the screw-slots in the bolt heads are so designed that a 25-cent piece works them more easily than the conventional screwdriver. The bolt holes may also be used for wiring radios or lights; when not in use, the holes are filled with removable plastic plugs that provide an appearance distantly reminiscent of Early American pegged cabinet work. But Module furniture is far removed in conception from such handicrafted forebears. It owes something to the sectional bookcase of the early 1900's and other predecessors; however, it is designed for mass production using contemporary materials and techniques. Although its price—it is on sale in department stores, at first in New York, later in most cities—is upper medium, probably it will eventually be produced in a different wood at lower prices. The present material is mahogany-surfaced, resin-bonded plywood, with strong, machine-milled, specially mitered joints at case corners, and with an integral, permanent, synthetic-resin finish that preserves the light caramel color of natural mahogany. Drawers are of molded plywood, with integral sides and bottom and rounded interior corners, easy to keep clean.

The furniture itself is a strong incentive to individual experimentation. It can be used as free-standing pieces, as storage walls, or built-in; even the standard handles and drawer pulls can easily be replaced with hardware to suit individual tastes.
ELECTRIC RADIANT HEAT

By L. N. ROBERSON. President. L. N. Roberson Co., Seattle, Washington

We have wondered for years about the possibility of heating houses economically and well with electricity. PROGRESSIVE ARCHITECTURE here presents the first description published in the United States of an electrically powered radiant panel system, economical at least where electric rates are reasonable, with individual room controls, requiring no central heating plant. A discussion of the system appears also in this month's issue of HEATING AND VENTILATING.

A Swedish electrical engineer, noticing the snow melting above an overloaded power cable, wondered if he could use a similar system to start his vegetables early and eventually developed a lead-covered, soil-heating cable, which was soon being used for a number of applications other than its intended purpose. To meet some of the new requirements, another cable, insulated with plastic of high water, acid, and alkali resistance, and smaller (approx. ½ in.) in diameter, was developed by the L. N. Roberson Company. The Roberson cable, called "Heatsum," has high electrical strength and the ability to withstand continuous temperatures of 167°F.

In 1940 the author explored the possibilities of using electric heat in the plaster, only to find that it had been done in England since about 1907. However, little design data were available and dire predictions as to results were received from all quarters. Professor Lionel H. Pries, of the School of Architecture of the University of Washington, offered one of the few bits of encouragement, based on personal observations of hot water radiant heat installations in this country and abroad. The Puget Sound Power & Light Company also cooperated by providing test meters for segregating the load. It soon became apparent that electric radiant heat was entirely practical with the electric rate prevailing in this area and a number of installations were made.

There are now over 150 installations using "Heatsum" cable for electric radiant house heating. The Federal Housing Authority has been approving loans on houses so heated for about five years. Insurance companies have been willing to insure all the houses so heated. The Underwriters' Laboratories say that, inasmuch as electric radiant heating does not become a complete system until it is installed, its safety is a matter for local inspection authorities. Some state and city codes are so worded that legislative action may be required before installations can be made, while other inspection authorities are very cooperative.

Features of the system that have excited favorable professional comment include: absence of a central heating plant, freedom of design afforded by the elimination of duct work or piping, and individual room control. Other factors, common to most types of radiant heating, are: cleanliness; the appearance of newness in houses so heated even after five or six years of occupancy; no odor or dust; and in ceiling panel systems, a temperature differential between floor and ceiling of only 2 to 3°F.

MATERIALS, SYSTEM DESIGN, CONTROLS

A Roberson electric radiant heating system consists of standardized lengths of "Heatsum" cable secured in intimate contact with wall, ceiling, or floor surfacing materials, connected through ordinary junction boxes to a power source, with each panel or group of panels controlled by a simple room thermostat and wall switch. Lengths of cable (or heating elements) are available in 250, 500, 1500, and 3000 watt capacities.

Design procedure is based on conventional convection heating using an air thermostat to meet individual requirements, usually a temperature between 58 and 72°F. Examination of the comfort zone for radiant heating shows that, as the air temperature approaches 70°F in the average well designed room, the heating panel temperature also approaches 70°F if it is of correct size. As the outdoor temperature drops the increased radiation loss causes a demand for more heat, resulting in increased panel temperature.

This makes a much simpler condition to control than to maintain an air temperature of 64°F and a panel temperature sufficient to balance outside conditions, particularly when outdoor temperatures rise slightly above the inside air temperature, a condition which would call for heat when no heat would be supplied by the panel if it were controlled by air temperature alone. While there are controls now on the market for meeting conditions of this type, their installation cost would be increased considerably when used with electric radiant heat where each room is individually controlled.

When considerable moisture has to be...
FIGS. 4 and 5—Top, dinette and kitchen, Newbern house; dark switch controls heating. Rooms had not been redecorated in 4 years when this photo was taken; note fresh appearance. Same is true of adjoining dining and living rooms (bottom photo, same house) which have independent thermostats and switches for controlling each room independently.

removed from the plaster and temporary circulating heaters are used to aid drying, the body feels increased warmth from the radiant heat as soon as the circulating heaters are disconnected, even though there may be an actual drop in air temperature of several degrees. This is true because body-heat loss is greater with convection than with radiant heat. To prevent such losses one should try to avoid cross drafts which introduce excessive air circulation. On the other hand, it has been possible successfully to heat rooms or porches open to the weather on two or three sides, so that the occupants may enjoy them even during cool days and evenings. See Fig. 13, which shows such a room heated by a panel in the ceiling— which is quite high (approximately 18 ft at the ridge). A floor panel would have been equally satisfactory.

Adjacent rooms, even though not separated, are individually controlled to compensate for temperature variations due to solar and other heat sources, because radiant heat does not flow from room to room in the same manner as convection heat. Electric ranges, toasters, mangles, lights, and even electric refrigerators emit heat which adds materially to the total heat available; this auxiliary heat may be used to advantage depending on how quickly the individual room thermostat responds to compensate for the additional heat in a particular room, whether from one or

<table>
<thead>
<tr>
<th>House</th>
<th>No. Rooms</th>
<th>Cu ft Air Space</th>
<th>Connected Heating Load (KW)</th>
<th>KW Consump. 1945</th>
<th>Total Annual Bill 1945</th>
<th>Annual KW per cu ft</th>
<th>Annual Cost per cu ft</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6</td>
<td>16,750</td>
<td>12.</td>
<td>30,510</td>
<td>$253.49</td>
<td>1.82</td>
<td>$0.015</td>
<td>Brick Veneer</td>
</tr>
<tr>
<td>2.</td>
<td>5</td>
<td>6,400</td>
<td>10.5</td>
<td>26,460</td>
<td>245.78</td>
<td>4.07</td>
<td>$0.058</td>
<td>Frame</td>
</tr>
<tr>
<td>3.</td>
<td>6</td>
<td>7,750</td>
<td>9.2</td>
<td>12,740</td>
<td>144.20</td>
<td>1.65</td>
<td>$0.019</td>
<td>Frame</td>
</tr>
<tr>
<td>4.</td>
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<td>6,000</td>
<td>9.0</td>
<td>16,500</td>
<td>157.19</td>
<td>2.75</td>
<td>$0.026</td>
<td>Frame</td>
</tr>
<tr>
<td>5.</td>
<td>5</td>
<td>6,500</td>
<td>7.5</td>
<td>20,080</td>
<td>170.04</td>
<td>2.95</td>
<td>$0.025</td>
<td>Frame</td>
</tr>
<tr>
<td>6.</td>
<td>5</td>
<td>6,450</td>
<td>9.0</td>
<td>16,000</td>
<td>160.65</td>
<td>2.48</td>
<td>$0.016</td>
<td>Frame (also 2 HP pump)</td>
</tr>
<tr>
<td>7.</td>
<td>5</td>
<td>7,800</td>
<td>7.5</td>
<td>15,258</td>
<td>121.44</td>
<td>1.95</td>
<td>$0.016</td>
<td>Brick Veneer</td>
</tr>
<tr>
<td>8.</td>
<td>8</td>
<td>22,800</td>
<td>15.5</td>
<td>24,168</td>
<td>226.46</td>
<td>1.06</td>
<td>$0.031</td>
<td>Frame</td>
</tr>
<tr>
<td>9.</td>
<td>5</td>
<td>6,150</td>
<td>13.5</td>
<td>19,062</td>
<td>191.35</td>
<td>3.10</td>
<td>$0.027</td>
<td>Frame</td>
</tr>
<tr>
<td>10.</td>
<td>6</td>
<td>9,280</td>
<td>10.5</td>
<td>29,768</td>
<td>246.49</td>
<td>3.21</td>
<td>$0.018</td>
<td>Frame</td>
</tr>
<tr>
<td>11.</td>
<td>5</td>
<td>8,000</td>
<td>9.5</td>
<td>14,318</td>
<td>144.55</td>
<td>1.79</td>
<td>$0.024</td>
<td>Frame</td>
</tr>
<tr>
<td>12.</td>
<td>4</td>
<td>9,950</td>
<td>18.3</td>
<td>22,180</td>
<td>228.54</td>
<td>2.24</td>
<td>$0.013</td>
<td>8&quot; Brick furred &amp; Plastered</td>
</tr>
<tr>
<td>13.</td>
<td>7</td>
<td>19,500</td>
<td>19.5</td>
<td>30,557</td>
<td>249.41</td>
<td>1.65</td>
<td>$0.022</td>
<td></td>
</tr>
</tbody>
</table>

Average: 2.36

REMARKS: All houses have ceilings insulated with 3 to 3½ inches of noncombustible fill type insulation. Houses 7 and 12 also have walls insulated. House 8 has three baths, House 12 has two baths. House 12 has 52% glass walls.

House 7 consumption and cost figures include a 2 HP pump.

Cost and consumption figures include electricity consumed for all purposes, including lighting, cooking, water heating, etc. All of the houses were heated by radiant heat from "Hectrum" cables installed in the ceiling or floor.

The houses listed in this table are on various rate schedules and for that reason the kilowatt hour consumption is a better index as to performance than is cost.

The rates varied from $.7 of a cent to 1 cent per kilowatt hour on the final step. Most of the homes were on the final rate step after using approximately $85.00 worth of electricity.
from a combination of several heat sources. Fig. 5 shows adjacent rooms, separately controlled, with the thermostat in each room visible. Data available from actual installations with "Heatsum" cable show roughly half the power consumed is used primarily for purposes other than heat, although the final result from the major part of this miscellaneous power consumption is usable heat.

**HOUSE DESIGN CONSIDERATIONS**

Fruit and flowers mature rapidly and so should be kept from under direct radiation. We also try to make ceiling heating surfaces as large as possible in order to keep the radiating surface temperature low, because high temperatures from overhead panels may cause discomfort, particularly to light-complexioned people. Houses with concrete floors show effects of condensation in "sweating" of the floor around the edges of rugs and carpets on the bare concrete when only the ceiling, walls, or both, are the source of heat. This may be remedied by placing the element in the slab when concrete floors are used.

A concrete floor requires approximately four hours to come up to temperature, drops 10°F overnight when turned off, and requires about a week to drop back to normal temperature of soil below it. Plaster ceilings and walls reach a comfortable temperature in approximately 30 minutes from a cold start, although it may be several hours before the heat shuts off for the first time. After the plaster has a sufficient heat charge the element is rarely "on" more than one-third of the time. Moreover, the highest demand recorded in a 6-year period was 34% of the connected load. Tests conducted in the winter of 1945 on the author’s residence (Fig. 10), by Washington State College in conjunction with the Puget Sound Power & Light Co., showed that the power consumed per room when the heat was turned on and off during the day, was the same as when left on continuously.

Double glazing apparently causes no greater heat saving than single glass in electric radiant heated homes. Present data actually show a lower power consumption for single glass, although more information, secured under controlled conditions, is required on this subject. Apparently double glazing reflects a greater part of the solar heat than single glazing. Brick veneer homes show a greater over-all heat economy than frame houses, while a calculation of comparative heat losses through walls would indicate the reverse.

There is less than 3°F differential from floor to ceiling with electric radiant heat even with a 20- to 22-ft ceiling, and with the heat in the ceiling. Cold "shadows" remain under tables and desks when the angle from the extreme sources of ceiling heat is less than 45° off the vertical. In such cases part of the heat should come from a wall or floor panel. If the wall is exposed, insulate with incombustible fill or bats.

**INSTALLATION OF THE CABLE**

Ceilings, walls. Where attics are accessible, "Heatsum" cable may be attached to the top of the plaster lath or plaster board from the attic side by insulated staples; or by loops of asbestos cord attached to the plaster board with a stapling machine; or with patching plaster. It may also be similarly secured to the surface to be plastered. When plastered in, the cable acts as a reinforcing over the plasterboard joint. No other metallic reinforcing should be used at any point where it will have to be crossed by the cable; this condition will cause a hum in the wire when the heating element is "on."

Plastering. When the element is plastered in, a standard brown coat is placed over it and allowed to dry at least three days before heat is applied through the embedded cables to finish drying. The plasterer should apply the brown coat parallel to the elements. For this reason, wall elements are run vertically. The brown coat should be thoroughly dry before applying finish coats. If the surface is sand-finished, heat may be turned on in three or four days, or as soon as the surface appears dry. Turning it on sooner may cause a water mark at each run of element which will show through water-mix paints. Putty coats should set for seven or eight days before applying heat, in order to prevent checking as the putty sets.
### TABLE NO. 2 ONE YEAR'S MONTHLY BILLS — HOUSE NO. 12

<table>
<thead>
<tr>
<th>Month</th>
<th>KWH Used</th>
<th>Amount Billed</th>
<th>Non-Heating</th>
<th>Heating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>C WH</td>
<td>KWH</td>
</tr>
<tr>
<td>January</td>
<td>2610</td>
<td>$ 26.27</td>
<td>414</td>
<td>$ 4.63</td>
</tr>
<tr>
<td>February</td>
<td>2890</td>
<td>29.07</td>
<td>962</td>
<td>10.28</td>
</tr>
<tr>
<td>March</td>
<td>2430</td>
<td>24.47</td>
<td>888</td>
<td>9.76</td>
</tr>
<tr>
<td>April</td>
<td>1620</td>
<td>16.37</td>
<td>632</td>
<td>8.00</td>
</tr>
<tr>
<td>May</td>
<td>1220</td>
<td>12.37</td>
<td>682</td>
<td>8.30</td>
</tr>
<tr>
<td>June</td>
<td>800</td>
<td>9.15</td>
<td>558</td>
<td>7.45</td>
</tr>
<tr>
<td>July</td>
<td>620</td>
<td>7.89</td>
<td>588</td>
<td>7.66</td>
</tr>
<tr>
<td>August</td>
<td>660</td>
<td>8.17</td>
<td>580</td>
<td>7.56</td>
</tr>
<tr>
<td>September</td>
<td>860</td>
<td>9.57</td>
<td>836</td>
<td>8.00</td>
</tr>
<tr>
<td>October</td>
<td>1360</td>
<td>13.77</td>
<td>798</td>
<td>9.15</td>
</tr>
<tr>
<td>November</td>
<td>2980</td>
<td>29.97</td>
<td>818</td>
<td>9.25</td>
</tr>
<tr>
<td>December</td>
<td>4130</td>
<td>41.47</td>
<td>914</td>
<td>9.95</td>
</tr>
<tr>
<td>Totals</td>
<td>22180</td>
<td><strong>$228.54</strong></td>
<td>8470</td>
<td><strong>$101.81</strong></td>
</tr>
</tbody>
</table>

### TABLE NO. 3 TYPICAL DESIGN CALCULATION FOR A CEILING PANEL HEATED ROOM

1. Ceiling area in sq ft (256) X "U" factor for plaster board and plaster plus 3/8" vermiculite insulation = 0.07 Equals 18 Btu/deg.F
2. Floor area in sq ft (256) X "U" factor for hardwood floor over fir sub-floor = 0.34 Equals 87
3. Window area in sq ft (37) X "U" factor for glass = 1.13 Equals 42
4. Net exposed wall area in sq ft (169) X "U" factor for brick veneer, 1" wood sheathing, 1/2" rigid insulation, 1/2" plaster = 0.20 Equals 47
5. Cubic contents (2048) X Hourly air changes (1) by infiltration, 1 wall exposed (Btu/degree/cu ft of air) = 0.018 Equals 37

**TOTAL Nos. 2 to 5**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Btu/deg.F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>213</td>
</tr>
</tbody>
</table>

A. No. 1 (above) (18) X Maximum ceiling temp. minus minimum outside design temp. = (84 - 10) Equals 1,332 Btu

B. Total of Nos. 2 to 5 (213) X Surface temp. of room side of exposed surfaces minus outside design temp. = (50) Equals 10,650 Btu

**TOTAL Items A. and B.** 11,982 Btu

Correction factor for heat gain from lights, space occupied by furniture, etc. X Total Btu divided by Btu/kwhr Equals Maximum heating load

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11,982</td>
</tr>
<tr>
<td></td>
<td>5,413</td>
</tr>
</tbody>
</table>

EQUALS 2.8 kw Maximum design demand

CHECK:* (1 1/2) (2048) 

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>3.07 kw</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,078</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,000</td>
<td></td>
</tr>
</tbody>
</table>

* As room has over 2,000 cu ft of contents, 1 1/2 watts per cu ft is used. Had the room had under 2,000 cu ft, 2 watts per cu ft would have been used.
Finishes. So far we have found no finish—water paint, paint, or paper—which is adversely affected by this method of heating, except that the finish stays clean for a long time with electric radiant heat. We have found that a dark area will appear on an uninsulated portion of a ceiling after a few months. Hence, care should be exercised in placing insulation to make sure that it covers the entire ceiling area, and even laps over any adjacent unheated area if necessary.

Floors. Magnesite flooring may be poured over the "Heatsum" element in much the same manner as plaster. The scratch coat is usually poured first with considerable sawdust added. The element is then stapled to the scratch coat and covered with the finish coat. In concrete floors, the cable should be evenly spaced in parallel lines over the area to be heated, and laid approximately one inch below the finished surface. Leads may be brought from the concrete to a terminal box in conduit providing the leads are insulated from each other by loom, glass or asbestos sleeving, or other suitable means. Not more than the two leads of one circuit may be enclosed in one conduit. A two-hole rubber cork may be used as a stopper in the concrete end of conduit.

Thermostat location. The thermostat is located 5 ft above the floor, in the room it controls. Where practical, it is placed over the switch controlling the circuit and on an inside wall that does not contain a heating element. Presence of a heating element in the wall adjacent to the thermostat causes erratic temperature control.

DESIGN CALCULATIONS

We try to obtain a "U" factor for insulated ceilings between .005 and .007 (this is usually obtained with 3½ or 4 in. of incombustible insulation), and an exposed wall and floor factor of approximately .25. For concrete floor slabs on the ground we use .19 providing suitable insulation is used between the slab and the footings or exposed walls. (Otherwise we increase the factor to .30.) We assume a soil temperature of 50°F. These slab assumptions are empirical, based on the theory that sandy soil in this area acts as floor insulation as well as a means of heat storage; performance of actual installations indicates that these factors are adequate. For concrete walls and other types of construction, we use the factors shown in the ASHVE "Guide."

When the "U" factors are approximately as outlined, and the minimum design temperature outside 0°F or above, a quick check of the load required may be made by allowing 1½ watts per cu ft for large rooms (over 2,000 cu ft) and 2 watts per cu ft for rooms under 2,000 cu ft of space to be heated. Of the heating elements available, one should use the size larger than the total wattage required per room. Where more than one element is required, use of two or more of the same size simplifies control. Each room is figured as a separate unit. The Roberson Company maintains an engineering department to assist in design and installation. A nominal charge is made for this service when drawings are prepared.

SUMMARY

1. Electric radiant heat is economically practical on electric rates of one cent per kilowatt hour. When higher rates prevail, one must consider whether added convenience and other desirable features warrant the additional operating cost.

2. No heating plant or fuel storage space is required.

3. Individual room control is simply accomplished.

4. Conventional plaster is entirely satisfactory; conventional finishes may be used.

5. Maintenance is extremely low; practically the only replacement is on toggle switches. Four element breaks have occurred in 150 installations. About 30 minutes is required to locate and repair such a break and it is only necessary to open up a small hole, approximately 1½ in. long by ¾ in. wide.

6. Heat calculations for electric radiant heating are the same as for other forms of radiant heating although we use some shortcuts.

7. Electric radiant heating provides the same all-pervading warmth and cleanliness as other radiant heating systems.

FIGS. 13, 14, 15—C. R. A. Pearce Residence, Seattle; Paul Kirk, architect for remodeling in 1940. Original unit heated by hot water radiators; dinette, kitchen, bath, by hot water radiant panels; living room, dining room, outdoor living room by electric radiant heat. In dinette, hot water panels were replaced with electric ceiling panels after 5 years. Entire heating is to become electric radiant according to present plans. Left-hand photo shows electric radiant heated outdoor living room (see text); bottom photo, indoor living room heated by electric panels in ceiling, which is approximately 20 ft high at ridge.

FIG. 16—Portable electric radiant heating screen plugs into suitable outlet, affords heat enough for small bedroom or bath. Screen is also available in larger sizes—3 or 4 panels, has thermostat controls, is manufactured by Electric Radiant Heat Co., Seattle, Washington.
MANUFACTURERS' LITERATURE

Electricity

5-31. Hauler Outlets and Floor Boxes (No. 72), AIA File 31-C-72, Frank Adam Electric Co. Reviewed August.

Fireplace Equipment

6-66. Your Fireplace, Majestic Co. (25 cents per copy—make check or money order payable to Majestic Co.) Reviewed August.

Flooring

"Idea" portfolios on store modernization, based on trade association recommendations. Armstrong Cork Company.

6-70. Store Planning Ideas for the Appliance Dealer Who Wants to Build a Successful Store.
6-71. Maximent, 4-p. illus. folder describing advantages of Maximent, an aggregate and cement mix (dry-packed) for finishing concrete floors. Specifications. Maximent Corp.

6-72. Industrial Flooring and Marine Decking, 6-p. illus. pamphlet explaining types, applications, and characteristics of "Millinery" heavy-duty synthetic resin flooring with abrasive surface. Miller Marine Decking, Inc.


Gypsum and Gypsum Products


Hardware


8-122. Schlage Luster Sealed Aluminum Locks (Form 361), illus. consumer folder on a push-button, knob-keyed lock with "alumiluted" finish. Detail drawing. Schlage Lock Co.

Heating and Heating Equipment


8-104. Aldrich Heat-Pak Oil-Fired Boilers (B1452-10), Aldrich Co. Reviewed August.

8-105. Quick Heat Oil Furnaces for Automatic Heating, 6-p. illus. folder on an automatic oil furnace unit with pressure fan, for small houses. American Stove Co.


8-124. Radiant Heating the Smart Modern Way With Radiant Baseboards (Form 859B), 4-p. illus. folder; hollow-cast baseboards for hot water, 2-pipe steam, or vacuum heating systems. Burnham Boiler Corp.


8-108. Electrol, A Complete Unit for the Small Home (Form 578), Electrol Incorporated. Reviewed August.

8-125. Electrolode Electric House Furnace,illus. 2-p. sheet on electric central heating unit for warm air systems for small houses, offices, plants. Electrolode Corp.

8-126. Hero Residential Oil Burner, illus. pamphlet (6%x6%); oil-burning iron fences. Hero Oil Burner Corp.


8-127. Petro Automatic Boilers (Form 7), 4-p. illus. folder on 2 sizes of oil burners for average houses; E.D.R. ratings. Petroleum Heat and Power Co.

8-114. No Basement Necessary with the Quaker Hi-Bay (611), Quaker Mfg. Co. Reviewed August.

8-115. Rexoil Fuel Saving Oil Burner (611), Ref-Rexoil, Inc. Reviewed August.

8-128. Munsnow Certified Vertical Steel Tubular Heaters (216C), 4-p. illus. bulletin on gravity and forced warm air units for commercial and industrial buildings, auditoriums, schools, church es. Specifications. Stainless & Steel Products Co.

8-129. Triplex Products That Assure Hot Water at Its Best (Bulletin 256), 16-p. illus. booklet. Hot-water heating system with accessories: circulators, flow control valves, distributors, expansion tanks, air eliminators, control units, pump pumps, etc. Triplex Heating Specialty Co.

Hospital Equipment

Laundry layouts for hospitals of varying sizes; plans; water, steam, power, and equipment requirements; recommendations. American Laundry Machinery Company.
8-120. Typical Laundry Layout for 25-Bed General Hospital.
8-123. Typical Laundry Layout for 50-Bed General Hospital.
8-133. Typical Laundry Layout for 100-Bed General Hospital.
8-143. Typical Laundry Layout for 150-Bed General Hospital.
8-155. Typical Laundry Layout for 200-Bed General Hospital.

8-130. Sterilizers, Operating Lights, Infant Incubators, Laboratory Apparatus for Every Hospital, looseleaf portfolio of data including size standardization of sterilizers; price lists. Wilmot Castle Co.

Affixing Means

1-52. Nailock Steel Channels, Sanyometal Products Co., Inc. Reviewed August.

Air Treatment

1-53. Strato-Liminator, illus. consumer folder (6x4%) and data sheet; ceiling-mounted fan with circular directional vanes for recirculating room air. Wil ster, Inc.


Awnings

1-54. Aluminum Awnings Are Something Between You and the Sun, illus. folder (6x9) on roll-up aluminum awnings for store fronts. Aluminum Awnings Co.

Communication Systems


Controls

3-64. Pennsylvania Automatic Controls for Heating Service (Bulletin 1508-K), Penn Electric Switch Co. Reviewed August.

Doors

4-57. Berry Aluminum Overhead Type Garage Doors, 4-p. illus. folder. 60-lb all-aluminum garage door (residential); specifications; installation instructions. Berry Door Co.


4-58. Truscon Straight Slide Steel Hang gar Doors (C-20), 24-p. catalog. Descriptions, illustrations, specifications, for manually or motor operated straight slide doors and tall doors. Truscon Steel Co.

Drafting Room Equipment


4-60. The New Universal Boardmaster, 8-p. illus. pamphlet explaining operation of drafting device convertible to changing requirements. Universal Drafting Machine Co.
Insulation

9-52. PC Foamglas Core Wall
Insulation (G1653), 12-pp. Information on Foamglas block, methods of installing. Detail drawings; data on fitting wall ties. Table of heat transmission types; specifications. Pittsburgh Corning Corp. Reviewed August.


Kitchen Equipment

11-10. It's Fun To Plan Your Own Kitchen with Curtis Cabinets, Curtis Companies, Inc. Reviewed August.


11-13. The Leader (CT1-46). 4 pp., illus. on electric ranges for houses. From General Electric Co.


From General Electric Co. Reviewed August:

12-7. The New Circline Mazda Fluorescent Lamp (CL45).


12-7.8. Castle Lights (Cat. 45), 56 pp., illus. Hospital operating room lighting: construction and installation details, specifications; special and general surgery lights, portable and cone lamps. Wilmot Castle Co.

12-7.9. Lanson Converters, Pneumatic Tubes, Traveyectors (Form 116), 4-p. illus. folder on materials-handling converters and pneumatic dispatch tubes of industrial and commercial use; restaurants, hotels, hospitals, etc. Lanson Corp.


12-7.11. The Threading of Wrought Iron Pipe with Byers Genuine Wrought Iron Pipe with the theory of threading and types of threading equipment in general use." A. M. Byers Co.


12-7.17. Florintite (BK-216), 22-p. illus. catalog on asphalt-base roofing products; shingles, sidings, roll and cold process roofings, etc. Data on accessory products, built-up roofing materials, coatings, insulating wool, insulation board products, wallboard, hard board. Florintite Co., Inc.

Plastics

16-111. Plastics Primer, 16-p. reprint on properties, fabrication, uses of Styron, Ethocel, Saran plastics. Dow Chemical Co.


16-113. Pressure Flow Charts. Folder presenting 8 pressure flow charts for determining correct pipe sizes; based on tables from the University of Wisconsin. Five selection tables for finding correct size of sealed air chambers for static pressure requirement. Wade Mfg. Co.

16-114. Pressure Flow Charts. Folder presenting 8 pressure flow charts for determining correct pipe sizes; based on tables from the University of Wisconsin. Five selection tables for finding correct size of sealed air chambers for static pressure requirement. Wade Mfg. Co.


Refrigeration. Industrial

18-35. Overhead Blower Units for Low Temperature Cooling (Cat. 110), Rempe Co. Reviewed August.

18-36. Florintite (BK-216), 22-p. illus. catalog on asphalt-base roofing products; shingles, sidings, roll and cold process roofings, etc. Data on accessory products, built-up roofing materials, coatings, insulating wool, insulation board products, wallboard, hard board. Florintite Co., Inc.

Skylights


Scissors


Steel Joists


Storage Equipment

19-56. America's Checking Habits Are Being Changed, 2-p. illus. reprint of an article on the "history" of locker checking equipment for travelers. American Locker Co., Inc.

Television


Trims

20-28. Beautify and Protect with Loxit Metal Mouldings and Accessories, 30-p. illus. catalog (4x9) on metal mouldings for: flat or oval tops; wallboard slip-in shapes; kick and push plates; edgings, divider bars, cap strips, coves, carpet strips, nosings, thresholds, grilles. Loxit Moulding Co.

Valves

Two 2-p. illus. folders describing corrosion-resistant, austenitic alloy valves for industrial piping. Alloy Steel Products Co.


22-17. Aloyco Stainless Steel Corrosion Resistant Valves.
WHAT ABOUT AQUELLA?

Of course we've followed the conflicting reports on Aquella waterproofing materials. There must be many among our subscribers as baffled as we were; therefore we publish the following, which is based on facts made available to us principally by William S. Elliott, Chief, Materials Section, Dept. Public Works, New York City. Other individuals have corroborated his statements.

Aquella was originated in France, to dampproof structures in the Maginot Line. When used there, it developed to have the ability to waterproof concrete underground, even when subject to considerable hydrostatic pressure. It was brought to this country and submitted to the National Bureau of Standards, where the claims made for it were substantiated. The New York City Board of Standards and Appeals approved its use in city work. Then, early in July 1945, Kurt Steele (pseudonym of an author of popularized technical articles; in private life, a professor of philosophy) bought a house in Connecticut that had a leaky cellar. A local lumber dealer persuaded him to try Aquella. Steele bought $30.50 worth, and he and his wife and daughter applied two coats to the inside faces of his cellar walls.

Before the application, the walls had leaked like the proverbial sieve; almost immediately after, a torrential rain storm burst, but the cellar stayed dry. Steele, intrigued, dug into the material's background, found the report of the N. Y. C. Board of Standards and Appeals, and in it found quoted the NBS report dated 8 December 1942, whose concluding sentence read: "The contents of this report are confidential and are not to be used for advertising, publication, or sales promotion." On the basis of these two reports plus his own experience and testimony from others, Steele wrote an article, "At Last—Dry Cellars," for the December 1945 "Forbes" magazine. The article was condensed under the title, "Water, Stay Away From My Wall," in the January 1946 "Readers' Digest."

The two magazines, the N. Y. Board of Standards and Appeals, and NBS were flooded with inquiries. Aquella's competitors—who are almost numberless; it is a highly competitive field—of course protested at the publication of the "confidential" NBS report in popular magazines. On December 29, 1945, the National Bureau of Standards wrote a strong letter of condemnation to the publishers concerned, and for a time also sent this letter to all who inquired about Aquella. Later, NBS withdrew this first letter and substituted a second, generally milder; but meanwhile competitors seized on the hasty initial action, circulating thousands of copies of the first letter. Nevertheless, Aquella's sales grew. The Federal Trade Commission proposed a campaign to limit the use of the word "waterproof" in advertising, picking Aquella as an example, but the campaign lagged and is now dormant. Quite recently the Secretary of Commerce has withdrawn all condemnatory correspondence, standing by the original report. And even more recently, the test chambers shown above have been applied to other buildings, showing that eventually they will be of the greatest importance. In brief, it is glass whose surface can be electrically heated to dispel condensation. Developed for glazing for airplanes traveling at high altitudes, it is made possible by solving a problem hitherto considered impossible: the finding of a transparent substance (trade name: "Nesa") which will conduct electricity and can be applied to the surface of sheet glass. Used in safety glass, Nesa is applied to the inner face of the outer lamination, next to the vinyl plastic inter-layer; the glass outer layer protects against contact with electrical current. At opposite edges of the sheet are applied bus bars of silver paste which, fired, become metallic silver to which conductors can be soldered. For airplanes, 0.8 watts per sq ft glass area are used, supplying approximately 1740 Btu per sq ft; on a 14" x 33" windshield this requires 293 volts where resistivity is 125 ohms per sq in. Nesa hasn't yet been fully tested for permanence although it appears to last indefinitely under very disadvantageous conditions. Can you see what such a product may eventually do for extensive glass areas in buildings? Heat loss through glass, condensation, air conditioning problems—we find it hard to wait for the perfection of a product which should end these nuisances.

SELF-HEATING GLAZING

From the Pittsburgh Plate Glass Co. comes a war-born product which, though not yet adapted to buildings, should eventually be of the greatest importance. In brief, it is glass whose surface can be electrically heated to dispel condensation. Developed for glazing for airplanes traveling at high altitudes, it is made possible by solving a problem hitherto considered impossible: the finding of a transparent substance (trade name: "Nesa") which will conduct electricity and can be applied to the surface of sheet glass. Used in safety glass, Nesa is applied to the inner face of the outer lamination, next to the vinyl plastic inter-layer; the glass outer layer protects against contact with electrical current. At opposite edges of the sheet are applied bus bars of silver paste which, fired, become metallic silver to which conductors can be soldered. For planes, 0.8 watts per sq ft glass area are used, supplying approximately 1740 Btu per sq ft; on a 14" x 33" windshield this requires 293 volts where resistivity is 125 ohms per sq in. Nesa hasn't yet been fully tested for permanence although it appears to last indefinitely under very disadvantageous conditions. Can you see what such a product may eventually do for extensive glass areas in buildings? Heat loss through glass, condensation, air conditioning problems—we find it hard to wait for the perfection of a product which should end these nuisances.
**TABLE 4. COEFFICIENTS OF TRANSMISSION (U) OF MASONRY WALLS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a wind velocity of 5 mph.

<table>
<thead>
<tr>
<th>TYPE OF MASONRY</th>
<th>CONCRETE (IN L 2, 3, 4)</th>
<th>BUILDING (IN L 2, 3, 4)</th>
<th>ANCHORED (IN L 2, 3, 4)</th>
<th>BRICK (IN L 2, 3, 4)</th>
<th>INTERIOR FINISH (PLUS INSULATION WHERE INDICATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>SOLID BRICK</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>HOLLOW BRICK</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>STONE</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>POURLED CONCRETE</td>
<td>0.90</td>
<td>0.90</td>
<td>0.86</td>
<td>0.86</td>
<td></td>
</tr>
</tbody>
</table>

*Based on 4" hard brick and common remark brick.

**TABLE 5. COEFFICIENTS OF TRANSMISSION (U) OF BRICK AND STONE VENNER MASONRY WALLS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a wind velocity of 5 mph.

<table>
<thead>
<tr>
<th>TYPE OF PARTITION</th>
<th>INTERIOR FINISH (PLUS INSULATION WHERE INDICATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>HOLLOW TILE</td>
<td>0.90</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>0.90</td>
</tr>
<tr>
<td>Light Weight Aggregates</td>
<td>0.90</td>
</tr>
</tbody>
</table>

*Based on 4" hollow brick.

**TABLE 6. COEFFICIENTS OF TRANSMISSION (U) OF FRAME PARTITIONS OR INTERIOR WALLS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a wind velocity of 5 mph.

<table>
<thead>
<tr>
<th>INTERIOR FINISH</th>
<th>DOUBLE PARTITION (Plates or Both Sides of Stud)</th>
<th>INTERIOR FINISH (PLUS INSULATION WHERE INDICATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Metal Lath and Plaster</td>
<td>0.69</td>
<td>0.39</td>
</tr>
<tr>
<td>Stripped Board (1/2&quot;)</td>
<td>0.69</td>
<td>0.39</td>
</tr>
<tr>
<td>Wood Lath and Plaster</td>
<td>0.62</td>
<td>0.34</td>
</tr>
<tr>
<td>Concrete Block (1/2&quot;)</td>
<td>0.62</td>
<td>0.34</td>
</tr>
</tbody>
</table>

**TABLE 7. COEFFICIENTS OF TRANSMISSION (U) OF BRICK AND STONE VENNER MASONRY WALLS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a wind velocity of 5 mph.

<table>
<thead>
<tr>
<th>TYPE OF PARTITION</th>
<th>INTERIOR FINISH (PLUS INSULATION WHERE INDICATED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>HOLLOW TILE</td>
<td>0.90</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>0.90</td>
</tr>
<tr>
<td>Light Weight Aggregates</td>
<td>0.90</td>
</tr>
</tbody>
</table>

*Based on 4" hollow brick.

**TABLE 8. COEFFICIENTS OF TRANSMISSION (U) OF FRAME CEILINGS & FLOORS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on a wind velocity of 5 mph.

<table>
<thead>
<tr>
<th>TYPE OF CEILING</th>
<th>INSULATION BETWEEN, ON TOP OR BOTTOM OF JOISTS</th>
<th>WITH WOOD OR PLASTER (Plates on Top or Bottom)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Hardboard</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Panel or Board</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Lath and Plaster</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Light Weight Aggregates</td>
<td>0.09</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*Based on 4" hard board.

**TABLE 9. COEFFICIENTS OF TRANSMISSION (U) OF CONCRETE FLOORS ON GROUND WITH VARIOUS TYPES OF FINISHING**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the ground and the floor.

<table>
<thead>
<tr>
<th>TYPE OF FLOOR</th>
<th>INTERIOR FINISH</th>
<th>INSULATION BETWEEN, ON TOP OR BOTTOM OF JOISTS</th>
<th>WITH WOOD OR PLASTER (Plates on Top or Bottom)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Concrete Floor</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Lath and Plaster</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Light Weight Aggregates</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*Based on 4" concrete floor.

**TABLE 10. COEFFICIENTS OF TRANSMISSION (U) OF CONCRETE FLOORS ON GROUND WITHOUT INSULATION BETWEEN, ON TOP OR BOTTOM OF JOISTS**

Coefficients are expressed in this per hour per square foot per degree Fahrenheit difference in temperature between the ground and the floor.

<table>
<thead>
<tr>
<th>TYPE OF FLOOR</th>
<th>INTERIOR FINISH</th>
<th>WITH WOOD OR PLASTER (Plates on Top or Bottom)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Concrete Floor</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Lath and Plaster</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Light Weight Aggregates</td>
<td>0.09</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*Based on 4" concrete floor.

**Coeficients of insulation.**

When comparing the use of insulating materials for various purposes, the data presented in this table shall be used as a basis for computing the energy required to maintain a given temperature in buildings.

**Building Products Facts**

**Building Data Sheet 2**

**Building Products Facts**

**Building Data Sheet 2**
TABLE 9. COEFFICIENTS OF TRANSMISSION (U) OF CONCRETE FLOORS & CEILINGS

<table>
<thead>
<tr>
<th>Type of Ceiling</th>
<th>Thickness of Concrete (in)</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Concrete</td>
<td>3</td>
<td>0.25</td>
</tr>
<tr>
<td>1/2&quot; Lath</td>
<td>3</td>
<td>0.16</td>
</tr>
<tr>
<td>2/3&quot; Lath</td>
<td>3</td>
<td>0.11</td>
</tr>
<tr>
<td>3&quot; Lath</td>
<td>3</td>
<td>0.08</td>
</tr>
</tbody>
</table>

*The figures in Column 2 are based on combined coefficients computed to extend the values in Table 14 beyond the range of the ceiling area. The board shall be exposed to the outside wind surfaces in order for the values in Table 14 to be applicable.

The coefficients in Table 14 are based on 1/8 pitch roofs for which the value of u, or the ratio of the ceiling area to the area of the roof, is 1.0. Since these combined roof and ceiling coefficients are based on combined wind and ceiling areas, small reductions in the pitch do not greatly affect the coefficient. An increase in pitch above the 1/8 used for computing the values would increase the combined coefficient, and vice versa.

TABLE 10. COEFFICIENTS OF TRANSMISSION (U) OF PITCHED ROOFS

<table>
<thead>
<tr>
<th>Type of Roofing</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Shingles</td>
<td>0.08</td>
</tr>
<tr>
<td>Roll Roofing</td>
<td>0.12</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.11</td>
</tr>
<tr>
<td>Wood Asbestos</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.08</td>
</tr>
<tr>
<td>Wood Asbestos</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Coefficients corrected for framing.

TABLE 11. COEFFICIENTS OF TRANSMISSION (U) OF FLAT ROOFS COVERED WITH BUILT-UP ROOFING, WITH LATH & PLASTER CEILINGS

<table>
<thead>
<tr>
<th>Type of Roof Deck</th>
<th>Insulating Boards</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat Roof Deck</td>
<td>0.19</td>
<td>0.14</td>
</tr>
<tr>
<td>Preferred Material</td>
<td>0.16</td>
<td>0.13</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.14</td>
<td>0.11</td>
</tr>
<tr>
<td>Asphalt</td>
<td>0.11</td>
<td>0.10</td>
</tr>
<tr>
<td>Wood</td>
<td>0.08</td>
<td>0.07</td>
</tr>
</tbody>
</table>

*Coefficients are expressed in ft per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on outside wind velocity of 15 mph.

TABLE 12. COEFFICIENTS OF TRANSMISSION (U) OF FLAT ROOFS COVERED WITH BUILT-UP ROOFING, WITH LATH & PLASTER CEILINGS

<table>
<thead>
<tr>
<th>Type of Roof Deck</th>
<th>Insulating Boards</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat Roof Deck</td>
<td>0.17</td>
<td>0.15</td>
</tr>
<tr>
<td>Preferred Material</td>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.13</td>
<td>0.10</td>
</tr>
<tr>
<td>Asphalt</td>
<td>0.10</td>
<td>0.08</td>
</tr>
<tr>
<td>Wood</td>
<td>0.08</td>
<td>0.06</td>
</tr>
</tbody>
</table>

*Coefficients are expressed in ft per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on outside wind velocity of 15 mph.

TABLE 13. COEFFICIENTS OF TRANSMISSION (U) OF PITCHED ROOFS

<table>
<thead>
<tr>
<th>Type of Roofing</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Shingles</td>
<td>0.07</td>
</tr>
<tr>
<td>Roll Roofing</td>
<td>0.10</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Asbestos</td>
<td>0.05</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Coefficients corrected for framing.

TABLE 14. COEFFICIENTS OF TRANSMISSION (U) OF PITCHED ROOFS

<table>
<thead>
<tr>
<th>Type of Roofing</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Shingles</td>
<td>0.08</td>
</tr>
<tr>
<td>Roll Roofing</td>
<td>0.12</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.11</td>
</tr>
<tr>
<td>Wood Asbestos</td>
<td>0.09</td>
</tr>
<tr>
<td>Wood Shingles</td>
<td>0.08</td>
</tr>
<tr>
<td>Wood Asbestos</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*Coefficients are expressed in ft per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on outside wind velocity of 15 mph.

TABLE 15. COEFFICIENTS OF TRANSMISSION (U) OF DOORS & WINDOWS

<table>
<thead>
<tr>
<th>Type of Door or Window</th>
<th>Coefficient of Transmission (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>0.09</td>
</tr>
<tr>
<td>Metal</td>
<td>0.07</td>
</tr>
<tr>
<td>Glass</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*Coefficients are expressed in ft per hour per square foot per degree Fahrenheit difference in temperature between the air on the two sides, and are based on outside wind velocity of 15 mph.
In this Fade-Ometer test for light-fastness, all 36 hues of PRISMACOLOR are exposed to 96 hours of ultraviolet light... the equivalent of a full year of sunshine... and not one shows appreciable fading!

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America has produced no better material for toilet room walls, stiles and partitions than Carrara Structural Glass. Its practical qualities of permanence, easy cleaning and strength are as noteworthy as its polished beauty. Carrara is available in 10 attractive colors. Here is a dormitory toilet room, done in Carrara Glass, at Allegheny College, Meadville, Pa. Architect: Jens Frederick Larson.
IN PUBLIC BUILDINGS

A new method of setting Plate Glass was applied in this recently completed Air Lines office. To minimize reflections, the glass was set in a protruding V-shape, protected against light from above by a dark, non-reflecting canopy and from below by plants and a black sidewalk. For such applications as this, Twinwindow, the window with built-in insulation, is excellent. It allows clear vision, virtually prevents condensation on the glass, cuts heating and cooling costs substantially. Architect: H. Roy Kelley.

Windows in office buildings, both from the design and functional standpoint, merit unusually careful attention from the architect. To be sure of good-looking, clear-vision windows, many architects specify Pennvernon Window Glass, a quality glass which possesses a degree of clarity, freedom from distortion and beauty exceptional in a sheet glass. Twinwindow, Pittsburgh's new window with built-in insulation, is well suited for use in modern office buildings like this. The Bankers Insurance Building, Macon, Ga. Architect: W. Elliott Dunwoody, Jr.

Stair rails can be beautiful ... when they're made of Herculeite Tempered Plate Glass. Herculeite is four to five times stronger than ordinary Plate Glass of the same thickness, much more resistant to impact. This glass—with its combination of strength, transparency and good taste offers the architect new design possibilities both in public building and residential interiors. Architects: Holabird & Root—A. R. Clas, Associate.

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REVIEWS

FOUR CITIES OF AMERICA

Prairie City, The Story of an American Community. Angie Debo. Alfred A. Knopf, 501 Madison Ave., New York, N. Y., 1944. 245 pp., illus. $3.00


Local pride frequently assigns a unique personality to each community; there is bustling New York, brawny Pittsburgh, or booming Los Angeles. Although these four books apparently are dedicated to the principle that each city is different from all others, the truth is that Green Peyton's San Antonio appears very much like Struther's Burt's Philadelphia; while Blake McKelvey's erudite tale of Rochester's growth is almost background reading for Angie Debo's biography of an imaginative Prairie City. People and their cities, one must conclude, are fairly alike all over.

The thousands of miles and scores of years which separated these cities could not submerge the repetitious tale of rugged individualism, wasteful as planless expansion and boosting, extreme provincialism, recurrent bigotry, sudden generosity, and pervading nostalgia for the imagined past. The importance of regional, national, and even world events upon each city's development helped create this uniformity, a uniformity completely unnoticed by the authors. In Burt's book of anecdotes, the revolutionary upheavals which were prevalent from Maine to Georgia during the late 18th century become exclusively Philadelphian; Rochester, as McKelvey presents it, almost alone suffered from the mob rule and reaction which affected the nation during and after the Jacksonian era; the common American brew of Puritanism and libertinism, of bigotry and democracy, of immorality and righteous prohibition, of hell-raising and stolid boring appears uniquely San Antonian in Peyton's book! Faults like these are to be expected in such books, for their authors confess strong prejudices in their introductions.

The most interesting of the four books—and certainly the most valuable as a story and as a sociological study—is Angie Debo's Prairie City. Not any actual community, Prairie City is a composite Oklahoma town which began as a crossroads settlement in the run of 1889. It grew, prospered, swelled, boomed, and contracted through fifty hectic years. Today it has but a few score farmer and merchant families living in and about a country town. The amount of effort was tremendous to wrest the present small settlement (named "city" when only one frame structure had been erected) from undeveloped land. In default of intelligent forethought, three generations spent millions of dollars and phenomenal effort. Only the boundless wealth which they tapped by one-crop farming and oil

(Continued on page 106)
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or whether you’ll be hearing complaints for specifying
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REVIEWS
(Continued from page 104)

wells made possible the recorded rise in living standards.

Miss Debo's story, based upon historical research, follows the settling families and the later strains. The illustrations are photographs and pictures of actual communities in the same area of Oklahoma. She assimilated her material so well that Prairie City seems to live.

The book about Rochester is a source from which might be written a Prairie City type of story. In fact, Miss Debo probably accumulated as much material as Mr. McKelvey presents here; yet by selecting what was interesting and pertinent and then by casting it all as a story, she produced a more unified and engaging volume. Rochester's history of settlement and growth, based upon water power and geographical position in the fertile Genesee valley, is potenti­ally fascinating; McKelvey's book will remain essentially a student's reference for the 1812-1854 period it covers.

Prairie City and Rochester present almost parallel pictures of pioneering—the northern city blessed by earlier arrival, better geography, and more diffused resources. Both were products of unregulated self-interest. The uncertain results were hardly commensurate with the tremendous efforts expended by individuals, together with government aid, land grants, and subsidies. The motives of self-interest rather than natural cooperation led each man to exploit self, neighbor, and nature. In both books there is a strong, albeit unconscious, argument for democratic planning.

Although Green Peyton was not born in San Antonio and although Struthers Burt has deserted Philadelphia for Wyoming, both writers out-rave themselves in describing those respective communities. Their cities are each uniquely impulsive, reserved; swaggering, modest; self-conscious, uninhibited; progressive, reactionary; provincial, large; generous, stingy. When they must mention a few of their beloved towns' more unsavory aspects, these authors seem almost to regard these with local pride, loving them all the more for their faults.

Few books demonstrate better than these the irrational emotional ties which cities hold on men. Professional anti-urbanists like Louis Bromfield never will comprehend the spiritual appeal of urban life. Yet this great reservoir of sentiment and training in close, co-operative living, when properly channeled by education, should provide the emotional support which urbanism is seeking today. Philadelphia is not the unique and wonderful city of Burt's book, nor is San Antonio quite the fabulous prodigy Peyton describes; it is a tribute to these cities, however, that these are among the images they create in the minds of two discerning, able, and amusing writers.
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GUIDE TO PUBLISHED WORK

COMMERCIAL

Office Buildings
American Discount Co., Atlanta, Ga.—BURG & STEVENS, ARCHITECTS AND ENGINEERS. A modern 2-story office building designed simply, with ease of access to all services, etc., rather than pomposity of architecture. Photos, floor plans. (Jul. Progressive Architecture, p. 42)

Showrooms
A Showroom in Milan—C. PILANTI, ARCHITECT. A showroom in a building designed by G. LUSCHI, ARCHITECT. Wood is a major part of the building. Photos, sketch, floor plans. (Jun. Interiors, p. 60)

Showroom in the Garment Center, New York City—MORRIS LAPIDUS, ARCHITECT. An impressive showroom achieved in a daringly simple space. Photos. (Jun. Interiors, p. 86)

COMPETITIONS

W.T.A. Competition for Holiday Centres. Presented were 60 projects, the first 3 of which Mrs. Martin Luther King, Jr., will select 5 of the projects. (Jul. Architectural Record, p. 42)

Entertainment

Radio Studios
Radio Station KBSG, Seattle, Wash.—DONALD WRIGHT WILLIAMS, ARCHITECTS. A radio station in a modern building of its own, with a strong style in its simple conception. Photos, floor plans. (Jul. Progressive Architecture, p. 50)

HEALTH

Hospitals
Elements of the General Hospital, Pt. II—HOSPITALITIES SECTION, U.S.P.H.S. Second in a series showing how a large hospital can be divided into smaller units. (Jul. Architectural Record, p. 76)

Sanatoriums
The Building is Part of the Treatment, Sunnyvale Sanatorium, Ottumwa, Iowa—DANE D. MORGAN, ARCHITECT. The patients' wings of this modern tuberculosis sanatorium are all 1-story, facilitating superintendence and the close relationship to the outdoors which is important in the treatment of tuberculosis. Photos, elevations, floor plans. (Jul. The Modern Hospital, p. 96)

HOUSING

Apartments
Low-Cost Apartments, Calif.—ANDERSON & SIMPSON, ARCHITECTS. Plans for rebuilding and expansion of these apartments indicate that the total cost can be lowered by reduction at the item level. Photos, elevations, floor plans. (Jul. The Modern Architectural Record, p. 121)

Housing Projects
Development of the St. Pancras Way Site, St. Pancras—GRAHAM, DABHAM, ARThUR, ARCHITECT. This scheme provides for 120 1- to 5-room apartments, with the houses mainly 5-story in height, with balconies, and a surfaced and enclosed playground. Photos, floor plans. (Jun. Architectural Design and Construction, p. 147)

Shackwell Housing Scheme, Hackney—FREDERICK GERHARD, ARCHITECT. Some of the latest theories of housing layout have been applied to this housing scheme, ensuring that whatever the age or activities of the residents, they are provided with all of the necessary comforts of dwelling; and also that there is every opportunity for play and recreation. Photos, elevations, floor plans. (Jul. Architectural Design and Construction, p. 147)

Housing Development at Church St., St. Marylebone—STANLEY HALL & EASTON AND ROBERTSON, ARCHITECTS. A characteristic feature of this project is the norh and south layout of the buildings with views to the east and west. (Continued on page 110)
This useful catalog gives complete descriptions and illustrations of Edwards new Clock Systems, and includes specifications for their installation. Built to offer the finest in centrally controlled automatic time-keeping, Edwards complete Clock Systems fully meet all requirements in schools, colleges, institutions, public buildings and industry.

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Prefabricated Houses for Japan—TORIO GANDOLFI, ARCHITECT. The influence of Japanese design upon modern Western architecture, and illustrative plans and data on current Japanese activities in prefabrication. Photos, sketches, elevations, floor plans. (May Domus, p. 3).


Three American Houses With a Unit—HUGH STUBBS JR., HARWED A. HARRIS, ALDEN H. DOW, ARCHITECTS. Three homes containing the Enry-Warner utility unit, from the series previously published by The Architectural Forum, "with problems technically (if not economically) very interesting to us too at the present time." Model photos, floor plans. (May Domus, p. 19).

Week-End House Into Permanent Home, Calif.—HARRY GLADSTONE, DESIGNER. A doriesc seaside vacation house, remodeled into a year-round home; another solution to the housing shortage. Photos. (Jul. House Beautiful, p. 44).

Plan it This Summer, Build it Next Summer—BURTON ASHFORD BURKHE, ARCHITECT. A summer house of simple design, well organized for maximum space and minimum upkeep. Photos, floor plans. (Jul. House Beautiful, p. 72).

Small House with Big House Performance, Tucson, Ariz.—CARL REISEN, ARCHITECT. A lot of room instead of a lot of rooms was the keynote in designing this small, modern, 1-story house. Photos, floor plans. (Jul. House Beautiful, p. 73).

Even a Small House Costs Money, Conn.—MRS. MICHAEL BLAKE, OWNER-DESIGNER, Photos, Roof plans. (Sep. House Beautiful, p. 84).

House in Princeton, N. J.—RUDOLF MOCK, ARCHITECT. An example of "transitional" residential architecture, tending to the modernistic in the exterior while retaining the traditional in the interior, thoroughly contemporary in interior planning and amenity. Photos, Roof plans. (Jul. Progressive Architecture, p. 60).

House in Oconomowoc, Wis.—GROEGE PERDE, W. WILLIAM KOCK, ARCHITECTS. A rational, easy-to-maintain, 2-story scheme for a family with four children, simply planned, with an extremely open treatment. Photos, floor plans. (Jul. Progressive Architecture, p. 64).

The Colonel and His Lady Built a Home in 2 Weeks. A prefabricated house built in one of the canyons in the Los Angeles area, complete with patio, and finished on the outside with knotty pine. Photos. (Jul. The American Home, p. 28).

They Built a Guest House First ... and Live In It! Atlanta, Ga.—RICHARD L. ACK, ARCHITECT. A 3-bedroom house to comfortably tide the artist-writer Mendelson couple over the war period until they could build a large main house and use the present one as a guest house. Photos, floor plans. (Jul. The American Home, p. 24).


3 Modern Young Men Lead a Modern Life in This "Swiss Chalet," Mount Kisco, N. Y.—WILLIAM LESCAZE, ARCHITECT. The home of Samuel Barber, Gian-Carlo Men-
The habit of accuracy is so strong in engineers that drawings which are merely clear and legible are not enough. Creative men want their drawings to look professional, not only in essentials, but in details. K & E has equipment that can help you in both endeavors...drawing instruments and materials so well conceived and precisely made that many engineers and draftsmen regard them as valued partners throughout their professional careers.

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GUIDE

(Continued from page 112)

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SEPTEMBER, 1946 123
double check

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This is the first of a series of illustrations by Hugh Ferriss demonstrating the adaptability of Architectural Concrete for apartment buildings — hospitals — schools. Architectural Concrete combines architectural and structural functions in one economical, fire-resistant material. Watch for future illustrations and details.

ARCHITECTURAL CONCRETE

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Edited by Don Graf

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This book is an authoritative and comprehensive volume on all phases of hospital design, construction, costs and equipment—by one of the best known hospital consultants.

It is a thorough, well illustrated study based on a lecture series given at the Architectural League of New York under the auspices of the New York Chapter of the American Institute of Architects and the Department of Public Works, New York.

This material has been greatly augmented and includes discussions by Doctors Roberts, Tarran and Blum. There are also chapters by Thomas H. Creighton, and A. Gordon Lorimer.

The book will be of unquestionable value to architects, engineers, designers, draftsmen, hospital administrators, municipal boards of health and public works, and members of the medical and nursing professions.

To be published about October 1st. Orders Accepted Now. About 250 pages. Price $9.00.
A LOT OF ACTIVITY GOES ON IN THE
EDITORIAL OFFICES THAT NEVER RESULTS
IN PUBLISHED MATERIAL. Miscellaneous
 correspondent piles up, related to
 architectural matters, but not publish-
able for one reason or another. Some-
times it comes unsolicited, like the letter
before me, condemning the qualified
hospital architects' list, which ends
with, "This is a personal letter, not to
be published." Sometimes we instigate
 correspondance, through what may be
an over-extended sense of duty to the
profession we publish for.

FOR EXAMPLE, THE MOST RECENT OF THE
POPULAR HOME MAGAZINES TO BEGIN A
PLAN SERVICE SENT US A RELEASE AN-
OUNCING ITS SCHEME. Six very fine
architects were designing houses for
that magazine, which would publish
them and then sell plans and specifica-
tions—ten dollars for the first set and
five dollars for each additional set. The
home magazine felt it was not bypassing
the architect because it would send each
plan buyer, along with his merchandise,
a letter which said, "you may wish to
consult a local architect on adapting
these plans..."

Maybe it was none of our business.
Maybe we were wrong, but we wrote to
that magazine, in part, as follows, and
sent copies to the six architects:

"Editor, Blank Magazine:
You are to be congratulated on the
excellent selection of architects... This
fact makes the bald announcement that
the plans and specifications are for sale
ten bucks all the more astounding.
You must know...surely all those swell
architects do—that there are going to
be some pretty ghastly simulations of
your stock designs built in the wrong
places all over the country. The very
excellence of the designs will make it
more impossible for a local builder to
carry them out without proper super-
vision... I'm familiar with the argu-
ment that these are better stock plans
than your readers can buy from a local
lumberyard, and are therefore a step
forward... that they bring good archi-
tecture to the man who can afford to
buy a house but has only ten dollars in
his pocket to pay an architect... If
this is so, then the various schemes for
selling ten dollars worth of architecture
with some control—approval of the
region and the site, insistence on archi-
tectural supervision, etc.—are surely
better.

Editor, Progressive Architecture"

THE REPLY WENT AS FOLLOWS:
"Editor, Progressive Architecture:
Having just completed a coast to coast
trip... I am definitely convinced that
anything—and I say anything—that
contributes to or tends to influence, even
in small measure, better houses for the
average family, both in design and con-
struction, is in a step in the right direction
...I know each one of us is primarily
concerned with his or her own problems,
and prestige, but somewhere along the
line the ultimate homeowner deserves
some consideration... You know better
than I do how very busy architects are at
the present time and how few of them
can afford or are willing to spend time
designing the average small house...
Don't you sincerely believe that the
architectural profession, like doctors,
has a social obligation to help provide
a better environment for families of
modest means?
Editor, Blank Magazine"

ANYONE WANT TO ANSWER THAT LET-
TER? In the meantime, the six archi-
tects began reacting. Some of the cor-
respondence follows:

"Editor, Progressive Architecture:
I can't quarrel with you. Anyway, it
cost me more to design the house than
the fee I got from the magazine.
Architect A"

"Editor, Progressive Architecture:
There is nothing I can do but agree
wholeheartedly with you... the houses
are never built in strict accordance
with the plans, and are usually built
by someone trying to save money on
architects' fees... However, in count-
less towns and small cities there are no
architects for these people. I can think
of no other way for the profession to
help... Perhaps it's better to give these
people some exposure to decent design,
even though they may not carry it out
properly, than to have it completely
inaccessible.
Architect B"

"Editor, Progressive Architecture:
The carbon of your letter came at a
time when emotions in our office were
already strong on the subject... Dear
Doris Blake: We are being asked to
give up our virtue (architectural) in
the interest of better architecture for
the subscribers to Blank Magazine.
What we want you to tell us, Doris,
is... should we?... If there is
enough of a principle involved in with-
drawing from the project and if you
see that as the course which would do
the profession and the resident build-
ing public the most good, we could be
persuaded to do so... Please tell me
what I should think. I place my little
hand trustingly in yours.
Architect C"

WE REPLIED:
"Dear Architect C:
Isn't it a little late to consider with-
drawing? If the preparation of stock
plans for sale is wrong, it was wrong
before I wrote Blank Magazine. Doris
Blake doesn't feel, dear Constant
Reader, that you have a moral right to
back out now for that reason. May this
be a lesson to you.
Editor, Progressive Architecture"

HE LAMENTED:
"Editor, Progressive Architecture:
If we are going to sin, it should at
least be profitable or fun.
Architect C"

THEN WE GOT A COPY OF THE FOLLOW-
ing LETTER:
"Editor, Blank Magazine:
We are concerned about our relations
with Blank Magazine. As we review
the correspondence it becomes evident
that there has not been a meeting of
minds... As the house now stands
we are unwilling to have it published
under our name. We could feel the
design justified for one specific client
... but we do not wish to sire this
plan for publication and repeated re-
production... It is our wish to be re-
lieved of further interest in this project.
Architect C"

WE WERE STARTLED INTO EJACULATING:
"Dear Architect C:
My God—the power of the press!
Editor, Progressive Architecture"
Here's TILE PROGRESS for you...

In 1928

building was booming!
Most fine buildings in many price classes were made more valuable
by the use of ceramic tile for both
service and beauty. Tile was one
building material that, even then,
had no "or equal".

When tile contractors bought
satin-finished tile, it came to
them in barrels, somewhat travel-
worn, and only approximately
standard in size and form. But
it was the best material of its
day for many purposes.

Today

... finer, stronger, more beauti-
ful satin-finished Suntile actually costs
less than it did in 1928!

Made of selected materials by scientifically
controlled methods, it has twice the exact-
ness of size and form, greater resistance to
wear, plus beauty beyond comparison with
the 1928 product. And, today, Suntile is
carton-packed right to the job.

Two other factors give today's Suntile other
exclusive values not possessed in 1928:

1. Controlled Color Balance assures pleasing
   color harmonies in any selected
   range and holds color uniformity to a
degree never before possible.

2. The Suntile Organization of Author-
   ized Dealers in all principal cities,
   whose Suntile installations bear the
guarantee of good material and good
workmanship, means real tile satis-
faction.

Color Balanced

THE CAMBRIDGE TILE MFG. CO.
CINCINNATI 15, OHIO

Member of the Producers Council
Tomorrow's homeowners will expect their homes to be wired so they can enjoy the full convenience of Electrical Living.

That means enough circuits and outlets, wire of ample size, modern circuit protection, and quality wiring devices and workmanship.

In the new Home Wiring Handbook, charts clearly show and explain the right number of circuits to include in each of four groups of homes in the popular price class. A typical page is shown above.

The same comprehensive assembly of pertinent technical information on all other phases of electrical needs is included in this 120-page reference book. Use this valuable timesaver to guide you in designing and planning homes. Costs one dollar. Send coupon below.

---

Westinghouse Electric Corporation
Extension Training—Industrial Relations Department
306 Fourth Avenue, Pittsburgh 30, Pa.

Gentlemen:

I enclose $1.00 for a copy of your "Home Wiring Handbook".

Name: ____________________________

Street: ____________________________

City: ____________________________ State: ____________

---

CHART A

EQUIPMENT AND ROOMS SERVED BY CIRCUITS IN HOME GROUP A

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>Number of Circuits</th>
<th>Rooms Served</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Lighting and Appliances</td>
<td>1</td>
<td>All Rooms</td>
<td>Increase in number of rooms that can be served by the general lighting and appliance circuit.</td>
</tr>
<tr>
<td>Electric Space Heating</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appliance Circuits in Bathrooms</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Appliances</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Induction Heating Group</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each installation of electrical equipment is a variable factor in determining the number of circuits required.