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H. JUDD PAYNE, Vice-President in charge of Magazine Division

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SPOT NEWS

about WATROUS FLUSH VALVES from the Chicago Daily News Building

"The Watrous Flush Valves operating in the Chicago Daily News Building have given excellent service. The building was opened in 1929 and since that date the maintenance cost on these Watrous Flush Valves has been so extremely low that we haven't bothered to maintain a yearly record. We like their simple method of adjustment and their durability."

L. T. Schultz, Superintendent
Chicago Daily News Building

Data for wartime projects and postwar applications

Bulletin 858-W and Catalog 448 cover "V" model Watrous Flush Valves for essential wartime applications and the complete line of models and combinations for *postwar planning.*

Or see Sweet's Catalog File.

From the thousands of buildings where Watrous Flush Valves are installed, evidence similar to this report from the Chicago Daily News Building is constantly flowing in about the fine performance of Watrous Flush Valves.

The sound design and careful workmanship built into Watrous Flush Valves make their selection a source of constant satisfaction over the years to everyone concerned.

THE IMPERIAL BRASS MANUFACTURING CO.
1240 West Harrison St., Chicago 7, Illinois

Watrous Flush Valves

THE RECORD REPORTS

WPB "Consolidations" • New Processing Procedure • Building Committee for WPB • Materials Situation • Congress Marking Time • Private vs Public Housers • FHA's Postwar Expansion

IN THE WPB building is a sprawling, untidy room which anybody who knows his movies would recognize, at first glance, as being for the press. Flat-topped desks are heaped with newspapers, magazines and government releases. Not long ago there was added to these piles of debris an announcement (WPB-5293), which opened thus:

"By consolidating within a single agency full responsibility for practically all non-farm housing projects, the War Production Board has further simplified the procedure for the processing of housing construction applications, WPB and the National Housing Agency announced jointly today."

These consolidations of agencies, simplifications of procedure, etc., are announced so often, with nothing much happening afterward, that nobody pays attention to them. This provides an easy strategy, occasionally, for a government publicity man who, "for the record," wants to announce something important but who doesn't want too many people to know what he is announcing. This particular release may be the harbinger of a new housing program in the offing.

New Processing Procedure

Building of war houses has practically ended; the new program succeeds the old one. Housing will be allowed, in the words of the announcement, "to relieve situations of extreme general hardship in communities resulting from a lack of housing accommodations (only to the extent programmed by NHA and to the extent that WPB makes materials available or otherwise approves. No materials for this type of construction are being made available at this time)." Eight types of housing construction are "exceptions" for which applications must be filed and processed as heretofore.

"In transferring authority for the processing of housing construction applications to NHA, the War Production Board does not relax its control over materials, such control continuing under WPB Order P-55-c. The transfer is merely one of application processing giving the right of approval or denial to NHA which will in turn observe all WPB orders and regulations pertaining to construction and materials."

In general that means that eventually not only slum clearance but other building will be permitted. The contractor will have to get FHA to adopt his project as part of one of its programs and NHA will have to persuade WPB to release the requisite materials.

WPB Plus NHA

There may be good reason for believing that Blandford, who heads NHA, made a deal with Nelson of WPB assigning to the new program approximately the same amount of material previously granted for war housing. It was clear, last fall, that by June few additional war houses would be built, so Blandford could be forehanded. It was also clear that most materials, other than lumber, would be more plentiful, so that Nelson had little reason for taking from the building industry the little it now receives. Negotiations opened in September when Blandford told Nelson his problem. Since the new program would not open for months, in any case, neither side wanted to strike a bargain too quickly.

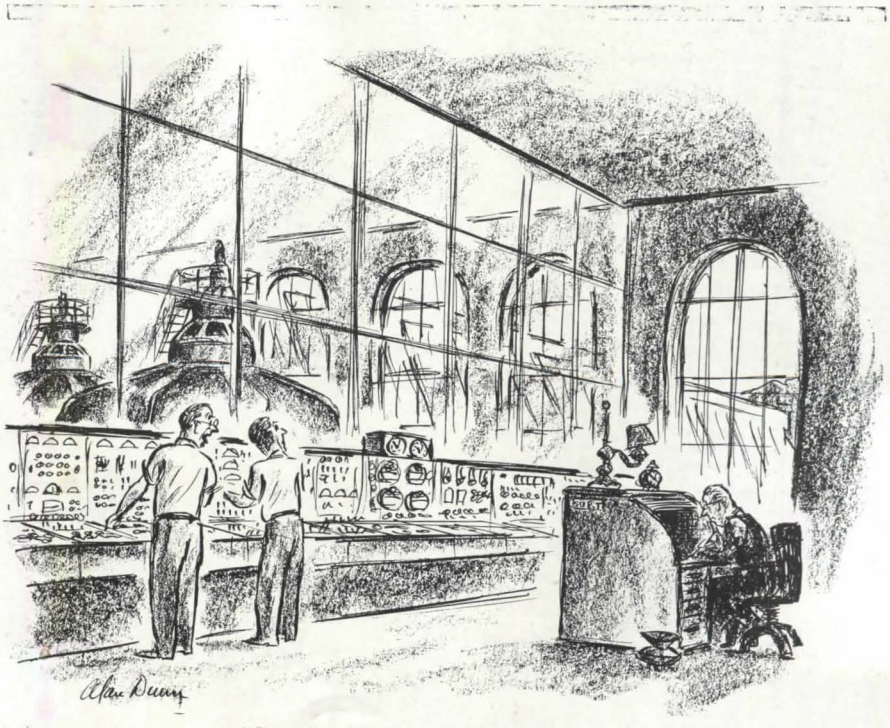
The agreement is not the kind of thing that lawyers draw up. Should the war take an unfavorable turn, there would be no materials for private building. WPB has agreed that the housing most needed hereafter is in crowded cities. There has not been an exact stipulation of amounts of materials to be released and no dates have been set, either. Applicants must "adequately establish the necessity for the proposed construction."

If there is good reason for starting the new program, there is equally good reason, at the moment, for not playing it up. NHA has scarcely started figuring out how to qualify builders under new schedules. Since lumber is limited, there must be quotas of some kind. If they are geographical, NHA will have to divide up the country, giving some areas more than others. At some point, Blandford will be ready for distress letters from builders, resolutions by chambers of commerce and telephone calls from Congressmen, telling him in violent language where the need for housing is most urgent. He is not ready for them yet.

Solid Construction

The new houses will be constructed as solidly as those built before the war. FHA officials say that they will feel safe in insuring their mortgages for the usual periods—20 to 25 years. But rooms will be small. There will be no "overlarge" closets and no spare space for children's toys or for summer storage of rugs, curtains and overcoats. Because all war housing is so designed as almost to compel people to keep

(Continued on page 10)



"I'm afraid he has a rolltop mind, too!"

Drawn for the RECORD by Alan Dunn

AMERICAN INSTITUTE OF

"or equal"

"Or Equal" to Go

Architects and building materials makers collaborate in eliminating a troublesome clause from specifications.

Joint meetings now being arranged in some 20 cities by local chapters of the American Institute of Architects and the Producers Council, national organization of manufacturers of building materials and equipment, will promote immediate practical application of the council's plan to eliminate the trouble-breeding "or equal" clause from construction specifications.

● **Quality at Minimum Cost**—Bane of the architect, engineer, general contractor, and subcontractor, the "or equal" clause had its genesis in the laudable attempt to obtain specified quality for the owner at minimum cost. A named product in the contract proposal was followed by the "or equal" phrase to permit bidders to submit the lowest obtainable price, based either on the named product or on another of equivalent quality.

Because what constituted an equivalent product frequently was subject to debate, a high-quality product often had to compete in price with one of inferior quality. When the "equal" product was in the borderline zone of debatable quality, the opinions of the architect and contractor clashed. One of them had to concede to the other, with resulting money loss to the contractor or with possible quality sacrifice on the part of the owner.

● **Only One Specified** — Under the new plan, the architect or engineer writing the specifications names the product on which the base bid is to be offered. General contractors, and through them the subcontractors, are free to submit proposals for alternative products, providing additions or deductions to be applied to the base bid if such alternative products are adopted.

With base bids and alternate estimates in hand, the owner and his architect or engineer decide which products to accept for incorporation in the structure, and these products are specified in the contract finally signed.

● **Based on Experience** — The plan, approved by the council in 1942, was adopted in principle by the architects in their annual convention last May. To put the adopted principle to work, local A.I.A. chapters and Producers Council clubs soon will hold their joint meetings, inviting the cooperation of organized engineering, contractor, and sub-contractor groups.

Certain architects and engineers for some time have eliminated the "or equal" clause from contracts, and the plan now advocated is based on the procedure which has proved most satisfactory to them.

From Business Week, January 15, 1944

The American Institute of Architects, as stated in the clipping from a recent issue of Business Week shown at left, adopted a plan in 1943 to eliminate the "or equal" clause from their specifications and to substitute a "base bid and alternate bid" type of specification.

The Herman Nelson Corporation has maintained for over thirty years that base bid and alternate bid specifications are the only ones which allow architects and their clients to obtain at the lowest cost the equipment best suited to their needs. The following is quoted from a Herman Nelson Catalog published in 1930:

"Value of equipment is not determined by cubage, weight or appearance, but by service. The standard for quality can only be fixed by naming a specific article. The more or less common practice of attaching the words 'or equal' in an effort to permit competition defeats the real purpose of the specifications unless they clearly state that the determination of equality shall rest solely with the Committee, its Engineer or its Architect. To be fair, the rules governing competition must be clear and definite and not subject to individual interpretation. The 'or equal' clause *sometimes* lowers the

herman nelson moline illinois

The Herman

Manufacturers of Quality Heating,

General Offices:

Factories at Moline

ARCHITECTS DECIDES

should go

cost of building but it *always* lowers its value.

"Architects and Building Committees who have been 'through the mill' will probably not challenge any of these statements but they may counter with this proposition: 'Yes, but if we specify exactly what we want, how are we to be protected against unfair competition, monolopy, or exorbitant prices by the manufacturer of the article specified?' This question is a reasonable one. Several solutions have been suggested but it has been found that the most practical one is the use of *alternate* bids, wherein the specifications provide that if the bidding contractors desire to submit proposals on substitute systems or equipment, they may do so, but shall file their bids based upon the plans and specifications and shall state in same the deduction or addition to be made in case such substitutions are accepted. The specifications should further provide that no substitution will be allowed after contracts are let. This method provides for fair competition, insures reasonable costs and places the determination of both quality and price in your hands."

The Herman Nelson Corporation congratulates the American Institute of Architects and the Producers' Council for the work which they are doing to promote the plan of base bid and alternate bid specifications.

In 1941, The Herman Nelson Corporation published a booklet which they furnished to school authorities. This booklet outlines the various types of specifications with their advantages and disadvantages and may be used by architects in discussion of specifications with their clients. A copy of this booklet can be obtained by returning the coupon below.

Nelson Corporation

entilating, and Air Conditioning Products

Moline, Illinois

and Chicago, Illinois

THE HERMAN NELSON CORPORATION, MOLINE, ILL.

Yes I am interested in obtaining a copy of your booklet "Your Specifications an Asset or a Liability?"

YOUR NAME HERE PLEASE TITLE

COMPANY

THE RECORD REPORTS

(Continued from page 1)

trunks in their backyards—a national magazine photographer is taking pictures of them—builders here foresee a big postwar premium on roominess. Put the other way, there might be a discount on the possibly "just too cozy" houses and apartments being built now.

Mostly, however, builders and operators are optimistic at least for early postwar years. Government officials and builders' associations here gather that they bank on a hectically bullish market. If OPA ceilings on property are removed, they expect to be able to get out, if they so choose, profitably. There will, of course, be bankruptcies among those who selected wrong spots in which to build. Operators who regard their properties as permanent investment are interested in early postwar prices on fixtures. Since the volume of private war housing, alone, is large, and since much of it will have to be remodeled, whether by present or new owners, prospects for the fixture industries seem rosy indeed.

WPB Building Committee

What is being done to release some materials, with L-41 still in force, resembles what is being done to reconvert the auto industry, or the manufacture of flatirons and refrigerators. Every industry is making demands. WPB has assigned officials to sit down at tables with those doing the demanding and to take notes. In the case of building construction, the instrument for this is a new committee headed by the former engineer, Harlow Lewis, now of WPB's Facilities Bureau. The committee, which includes technical men, will make recommendations on how to divide up the materials which will go to civilian industry.

Lewis's assignment is a broad one, going far beyond the housing industry. He will advise on what proportions of the materials should be given to industrial maintenance, plant construction, rural building, housing in the cities, etc.

C. of C. Advisory Committee

Lewis's group has met informally and unofficially with a committee formed by the Chamber of Commerce. A few weeks ago the Chamber set up its Construction Industry Advisory Group, including among its members architects, contractors, subcontractors, manufacturers and dealers in materials, realtors and mortgage bankers. A "Subcommittee on L-41," headed by Allen J. Saville, of the American Society of Civil Engineers, is especially interested in Lewis's activities.

Materials Situation

Briefly: WPB emphasizes the lumber shortage at every opportunity. At advisory committee meetings of the industries, somebody from the lumber division is at hand to tell the story and to offer the statistics. WPB's fear that the supply will be tight indefinitely does not win ready acceptance in the trade. It is argued that the mills, after all, have some open capacity and that the scarcity results exclusively from inability to recruit about 50,000 lumberjacks. Lumberjacks make tough fighting men, the Army knows. Loss of work later this year in war plants, it is thought, will shift men to the forests.

There is a large over-supply of concrete masonry materials, particularly in the northeast. There are surplus inventories of concrete pipe and manufacturing capacity is greater than estimated demand. Brick is in supply. There is a small deficit in calculated production of gypsum board, but WPB seems to be pushing its use. Laminated fiber shows a moderate production deficit. There are small surpluses for insulation, asphalt roofing and metal pipe.

On structural steel, deliveries are sometimes reported in five weeks but the average is about eight weeks. In about a month the large Geneva Steel plant in Utah will be complete and WPB will have to decide whether it is to operate. Sheet and plate are tight and probably will be throughout the summer.

Congress Marking Time

Until November it is a mistake to expect much of Congress. The whole House and one-third of the Senate are up for re-election. Because so many members have to spend more time at home, there are scores of gentlemen's agreements for postponing work on particular legislation. From now on betting odds will generally be close on whether either House can collect a quorum on a given day.

Private vs Public Housers

The Byrd Committee apparently is aiming its guns at the housing agencies. Local chambers of commerce are being asked to fill in a long questionnaire on "Federal Housing in Your Community." On all government projects the committee wants figures on costs, operating expenses, depreciation, etc. Chambers are advised to assemble data from savings and loan associations, savings banks, utilities, real estate dealers, etc., but to be sure to consult personnel managers and labor men as well as business. "We suggest," says the questionnaire, "that you also include in your report any criticisms of local people regarding FHA's work."

So far as Congress is concerned, hearing in the campaign against government-financed housing and slum clearance have just about ended. While there were hearings on District of Columbia projects, builders enjoyed a busy publicity campaign. Fulton Lewis made personal surveys and, project by project, broadcast the "horrors" of war housing, to which Blandford makes reply, explanation and refutation, stating ". . . all these charges either have no basis whatever or are completely misleading." But aside from the interested committees, there seemed to be little discussion of the subject in Congress.

Spokesmen for the several building associations are haggling academically over postwar prices of building materials. When the question at last comes up, they will probably support continuation of price ceilings while opposing continued control of rents and prices on real estate. Southern pine producers probably will fight price ceilings on materials.

Postwar Expansion

The Murray Committee is thinking of making NHA permanent, basing it on legislation instead of on executive order. There may be a good deal of talk about this but not much is likely to happen this year.

FHA is working up a program for postwar expansion and in doing so will be supported by the independent builders. National Association of Home Builders, for instance, spends much of its energy on this. The first actual step, however, will be an indirect one. The veterans' benefit bill will allow returning soldiers to borrow their down payments in buying insured homes.

◆ ◆ ◆

KLUTZNICK HEADS FPHA

Phillip M. Klutznick, formerly assistant administrator of the NHA, has been nominated by the President to succeed FPHA Commissioner Herbert Emmerich, who resigned to return to his work as associate director of the Public Administration Clearing House in Chicago.

Mr. Klutznick is fully conversant with FPHA activities both in Washington and in the field. As regional coordinator in the early defense housing program and later as an NHA Regional Representative, he programmed defense and war housing in more than 10 states. The Homes Use Service he

(Continued on page 12)

Bombers and Balm of Battles Out of This "Heart of Cold"

From producing an ever-increasing quantity of penicillin to building bombers . . . that is the range of war jobs on which you find Worthington refrigeration compressors—the "heart" of air conditioning and refrigeration systems.

To make enough penicillin—and quickly!—Worthington compressors must "freeze-dry" thousands of gallons of water-soluble mould to get only a few pounds of the life-saving drug. Similarly, other Worthington compressors help create stratosphere-like conditions for the testing of bomber engines.

Worthington makes more of the "vitals" of air conditioning and refrigeration systems than any other manufacturer . . . Diesel and gas engines, steam turbines, condensers, Multi-V-Drives, refrigeration valves and fittings, pumps and compressors. In many installations, Worthington has taken sole responsibility for major operating equipment, from the unit that powers the system to the compressor at its "heart".

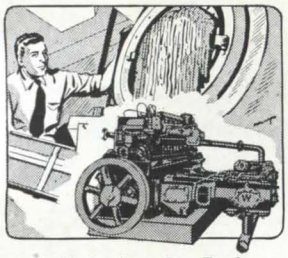
So also in hundreds of chemical and petroleum processes, explosives and synthetic rubber, aircraft, power and public services—machines with the world-wide-recognized Worthington trademark are everywhere part of the struggle for Victory and Peace. Worthington Pump and Machinery Corporation, Harrison, N. J.

BEHIND THE NAME WORTHINGTON

Power Plant Equipment • Turbines & Turbo-Generator Sets • Diesel & Gas Engines • Pumps & Compressors • Air Conditioning & Refrigerating Equipment • Power Transmission Equipment • Construction & Mining Machinery • Locomotive Feedwater Heaters • Welding Positioning Equipment • Liquid Meters

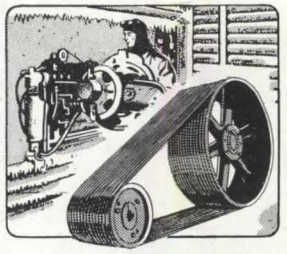
A WORTHINGTON "WORTH-SCOPE" *Giving You More Worth for Your Tax Money and War Bonds*

SEE HOW PRODUCTS OF "CLIMATE CONTROL" GO TO WAR FROM BOMBER PLANT TO BATTLEFIELD



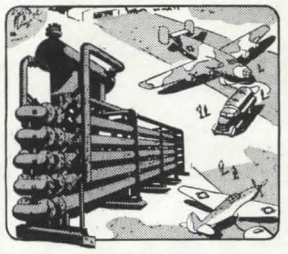
Self-Sealing Gas Tank

is made of synthetic rubber. In the manufacture of synthetic rubber, temperatures close to 100° below zero are required. A Worthington gas engine often drives a Worthington compressor in the refrigeration system.



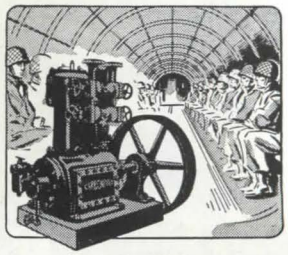
This Military Ice Box

tests aircraft equipment in a room varying from 100° below to 150° above zero. The Worthington Multi-V-Drive transmits power to the Worthington compressor which helps reproduce stratospheric conditions.



Bomber's Blood Stream

is made up of petroleum products, many of which are processed in the refineries with the help of equipment —such as the chilling machine illustrated above—bearing the famous Worthington trademark.



Invasion Rations

must often be stored months in advance in secret cold storage warehouses, many of which are equipped with Worthington refrigeration systems whose "hearts" are Worthington vertical ammonia compressors.

THE RECORD REPORTS

(Continued from page 10)

Phillip M. Klutznick

later headed was principally responsible for housing nearly two million war workers in existing structures and included the conversion into additional units of thousands of houses and buildings. As assistant administrator of NHA, he coordinated the war housing activities of the FPHA and other units of the NHA and has been the NHA representative before the WPB, the War Manpower Commission, and the military services.

Mr. Klutznick was closely associated for many years with the USHA. He is a former general counsel of the Omaha Housing Authority. He will face the task of completing the war housing program and supervising the management of projects which ultimately will shelter at least two million persons. The FPHA is responsible for all publicly-financed war housing except that on Army and Navy reservations, for the low-rent and slum clearance program operated under the former United States Housing Authority, and for various housing functions of other agencies placed in the FPHA when the over-all National Housing Agency was established by executive order in 1942.

WPB NOTES

Over-all Construction Order

Provisions of the over-all construction order insofar as re-siding and re-roofing is concerned were clarified by the WPB through issuance of Interpretation 6 to Conservation Order L-41.

The interpretation says that if an existing siding or roof needs repair, the minimum amount of repair work may

(Continued on page 14)

International News Photo

BEFORE THE EMBERS ARE COOL telegrams will notify customers that this management was unprepared for one of the commonest hazards of business . . . fire. Through neglect or shortsightedness this business may be crippled or destroyed. Experience shows that 2 out of every 5 burned-out businesses *never resume operations.*

FIRE HAZARDS HAVE MULTIPLIED. Increased number of workers; round-the-clock production; new materials; overworked motors . . . all these have increased your chances of a disastrous fire. Have you taken the necessary precautions to protect what you have built up?

FIRE CAN BE CONTROLLED. There is a proved way of checking this needless destruction *at the source, when it starts* . . . a Grinnell Automatic Sprinkler System. During the past ten years over 8000 fires in Grinnell-protected buildings have put themselves out before major damage could occur.

• • •

See that your buildings have this 24-hour-a-day protection before fire strikes. Get in touch with Grinnell now. Experienced engineers will help you plan protection for your buildings. Call them.

Grinnell Company, Inc.
Executive Offices: Providence 1, R. I.
Branch Offices in Principal Cities.

QUESTIONS AND ANSWERS
about Automatic Sprinkler Fire Protection

Q. What about water damage from many open sprinklers?

A. A record of 61,408 fires shows opening of 5 sprinklers or less in 75% of them, 2 sprinklers or less in 52%.

Q. My building is metal; its contents are non-combustible. Why should I have sprinklers?

A. A metal mill burned to ruins in an afternoon. Oil vapor had condensed on inside walls.

GRINNELL

AUTOMATIC SPRINKLERS

For Production Protection

THE RECORD REPORTS

(Continued from page 12)

be done to put the siding or roof in a suitable condition. However, if a siding can be put in proper condition by an application of paint, the reconditioning should be done in this way. If, on the other hand, the siding has so deteriorated that a paint job will not provide adequate protection, a new siding may be put on the building. The new siding need not be of the same material as the old siding.

This interpretation is not applicable where asbestos materials are used for re-siding or re-roofing as the use of these materials is governed by Order L-41-d.

Directives on Reinforced Concrete

National Emergency Specifications for reinforced concrete buildings (WPB Directive 9) have been amended to increase the amount of reinforcing steel that may be utilized, to exempt from their provisions small projects using less than five tons of steel, and to eliminate some of the paper work requirements for the construction industry.

A similar reduction in paper work requirements was made in Directive 8, governing structural steel for buildings, and Directive 29, governing stress grade lumber for buildings. Simultaneously, Directive 8 was amended to exempt from the specification provisions any project using less than 5 tons of steel. The amendments to the three directives became effective March 30.

In reinforced concrete construction, WPB Directive 9 is amended to permit the use of about 5 per cent more reinforcing steel, with a consequent reduction of about 10 per cent in the size of concrete beams and columns.

Cast Iron Bathtubs

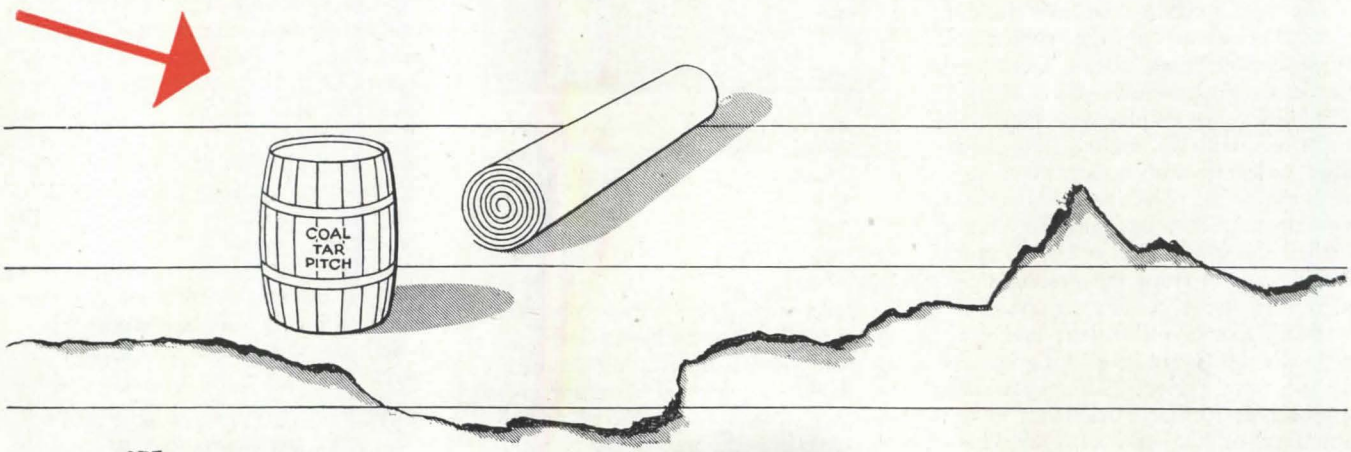
Continued limited production of cast iron bathtubs for limited distribution has been approved for the remainder of 1944. Sale of these bathtubs will be limited to orders for or ultimate delivery to the Army or Navy, for export authorized by the Foreign Economic Administration, or for installation in construction projects which have been authorized by preference ratings regularly assigned to war housing and other construction projects for which tubs are essential, such as hospitals and institutions.

FWA PROJECTS APPROVED

Two hundred and seventy-seven new war public works and services projects, for which the Federal Works

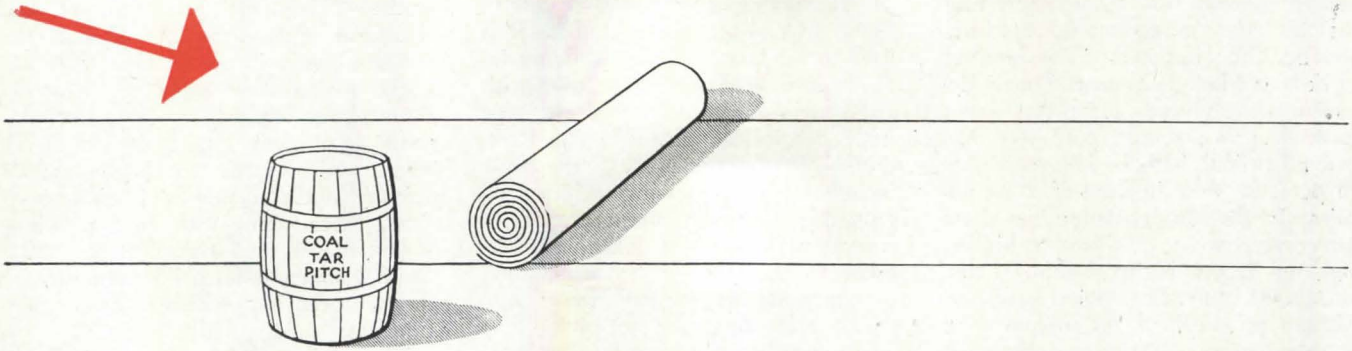
(Continued on page 126)

"coal tar pitch or equal"



still means

coal tar pitch



The grim necessities of war have been a powerful prod to American inventiveness, and many marvelous new things are coming out of the industrial activities of this wartime period . . . but no one has been able to find any method of roofing flat areas that can improve on the old, true-and-tried coal tar pitch.

Ever since the days of the Civil War, coal tar pitch has been widely used in roofing. During this war, some of the biggest roofs in the whole world have been built by America on war industries with Koppers Coal Tar Pitch.

In the years ahead, with the flat roof coming more and more into the picture for design reasons, and for utilitarian reasons, coal tar pitch is one material on whose performance you know you can count.—Koppers Company, Tar & Chemical Division, Pittsburgh 19, Pa.

KOPPERS

Coal Tar pitch roofing
Coal Tar pitch waterproofing

REQUIRED READING

AMERICAN HOUSING: PROBLEMS AND PROSPECTS

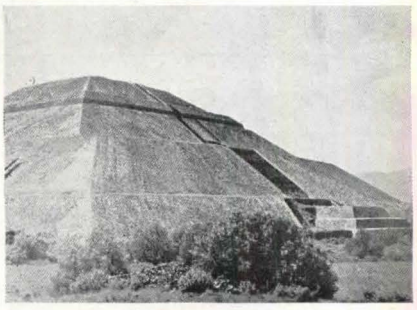
Factual Findings by Miles L. Colean and Program for Action by the Housing Committee of The Twentieth Century Fund. New York 18 (330 W. 42nd St.), The Twentieth Century Fund, 1944. 6⅜ by 9⅜ in. xxii + 466 pp. $3.00.

The part housing can play in our postwar economy is the subject of much conversation, a few facts, and conflicting judgments. Mass market possibilities and employment potentials make constructive action imperative. This welcome and timely book supplies the facts, objective analysis, and recommendations, covering all phases of the subject in logical order. It quite literally works from the ground up—beginning with a chapter on land availability and utilization, and ending with the Committee's program for the postwar period. This systematic approach is further carried out in the summary at the end of each chapter, in the detailed appendix (which includes an excellent bibliography), and in the index. In other words, this is a highly workable book, with many useful tables, graphs and charts.

The majority of the book is devoted to Miles Colean's research report, on the whole conservative, and entirely based on fact; happily it is almost completely devoid of suspicion-creating rhetoric and exaggeration. Statistics abound. For instance: "The housing stock as a whole is in an extremely deteriorated condition. In urban areas, more than 23 per cent of all dwellings had no private bath in 1940 and over 10 per cent were in need of major repairs. In the rural communities these percentages were considerably higher, and on farms higher still. Of the houses either needing major repairs or without private bath, 6.2 million were in urban areas, constituting almost 29 per cent of the urban supply. Disregarding the lack of private baths in rural areas, 4.3 million houses, representing over 27 per cent of the rural supply, were in need of major repairs."

A potential new housing demand of at least 1,300,000 non-farm units a year is predicted by Mr. Colean for the first postwar decade. This figure is based on population pressure and existing deteriorated housing; it is nonetheless considerably higher than the estimate made by a number of other authorities.

Mr. Colean and his research staff examined all phases of the prewar housebuilding industry to ascertain just how well equipped it is to meet the expected demand. The report is rather discouraging: "The picture is one of barriers built up from every side—



Pyramid of the Sun, Teotihuacan, Mexico. From "The Architectonic City in the Americas." James Sawders photo

from our land system, from our methods of taxation, from builder organizations, labor, real estate operators, mortgage lenders, and even from government itself—against the maturing of housebuilding to the stature of an industry capable of producing and distributing in sufficiently large quantities and at sufficiently low costs to meet the vast housing need the country faces."

On the basis of the research report the Housing Committee has drawn up its Program for Action, presented at the end of the book. Pointing out that the majority of the required million new dwellings a year in the first postwar decade should be medium and low-priced, varying from $2,000 or less to $4,000, the Committee says that "It is hard to see how the house-building industry in its traditional form, even with government aid, can effectively cope with such an assignment." The Committee's recommendations, therefore, include several pertaining to industrial reorganization: the strengthening of federal anti-trust laws and anti-racketeering laws; revision of building codes to eliminate the wasteful use of materials and labor and to permit the adoption of new structural methods, new materials, etc.; and "vigorous campaigns" by both federal and state government "to rid the housing industry of price-fixing agreements and restraints set up to protect existing contractor, dealer and labor groups from the necessity of adjustment to advancing techniques in production and distribution that may threaten their present interests."

Other Committee recommendations:

1. That NHA undertake a program of research on materials and construction techniques.

2. Revision and enforcement of zoning laws, and the development of time zoning to assure the amortization "after reasonable periods" and demolition of nonconforming buildings.

3. Extension of zoning to include areas beyond city limits that are likely to be affected by urban growth.

4. Provision for the utilization of various forms of public activity and public aid in meeting the housing problem.

5. Reduction of marketing costs through greater integration of the production and marketing function, etc.

6. Authorization for insurance companies to invest in housing.

It will be seen at a glance that these recommendations are very similar to those put forward by the Producers' Council in their postwar platform (see ARCHITECTURAL RECORD, Dec. 1943, p. 7) and the best of the innumerable other programs for the postwar building industry, including that of the California Housing and Planning Association reviewed below. This is encouraging, for these are recommendations that most of us would endorse, and the more frequently they are stressed, the more likely they are to be accepted and carried out.

THE ARCHITECTONIC CITY IN THE AMERICAS

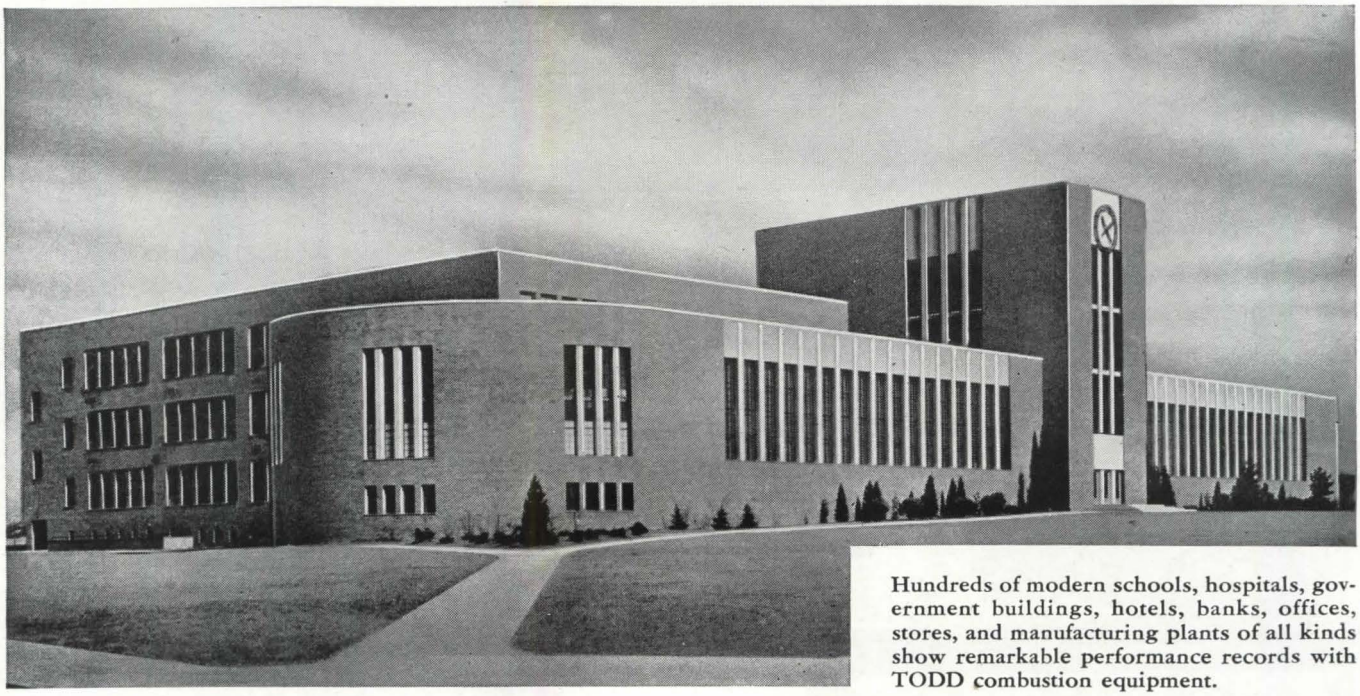
Significant forms, origins and prospects. By Hugo Leipziger. Austin, Texas (Univ. of Texas), 1944. 9 by 12 in. 110 pp., 40 plates.

"Any adequate theory of architecture and city building should include the questions of origin and nature of developmental patterns," Mr. Leipziger comments at the outset of this unusual study. "They are as important as structural and organizational characteristics. Only then will cities display again a significant unity of architectonic power and coherence, called by some an organic quality, when their builders have grasped the fundamental, spiritual, and philosophical issues of our time. Architecture has to deal with forms, shapes, and structures in space. But the material form becomes subordinate to the idea which is behind its functional and esthetic effects."

The point which Mr. Leipziger makes is well taken: that architecture is more than geometrical pattern, that it has a cultural significance and heritage which is highly important and which should not be tossed aside in favor of pure functionalism. This heritage is global in character, in Mr. Leipziger's opinion, with each country and each era making its own contribution. His discussion of the architectural achievements of the pre-Columbian civilizations — Mayan, Inca, Aztec and Toltec—in Mexico and South America is one of the best short studies on the subject that we have seen. Greek architecture, on which so much more has been written, particularly of late, is more sketchily treated; and Oriental and Gothic are dismissed in a few

(Continued on page 28)

The handwriting's on the wall...



Hundreds of modern schools, hospitals, government buildings, hotels, banks, offices, stores, and manufacturing plants of all kinds show remarkable performance records with TODD combustion equipment.

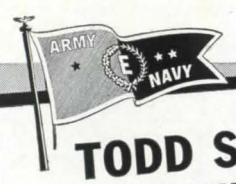
automatic heat and power a "must" for post-war construction . . .

A public enthusiastic over the engineering triumphs of America's war production will accept only the most modern equipment for new structures in post-war. In the power and heating field that means automatic liquid or gaseous firing systems.

Here TODD offers architects two important advantages. First, an enviable record for efficient automatic combustion equipment in all types of institutional, business, and industrial buildings. Second, an installation *tailored* to fit their specifications. There are over 50 types of TODD burners and air registers, meeting practically every combustion requirement. Also, whenever conditions indicate it, TODD engineers will arrange special equipment.

TODD burners' efficiency is three-fold. It provides the utmost in flexible response to rapidly changing heat and power demands. It insures fuel economy. It results in exceptionally low maintenance costs.

TODD engineers are always available for consultation. Call on them when you are formulating your heat and power specifications for post-war buildings.



TODD SHIPYARDS CORPORATION
(COMBUSTION EQUIPMENT DIVISION)
601 West 26th Street, New York 1, N. Y.

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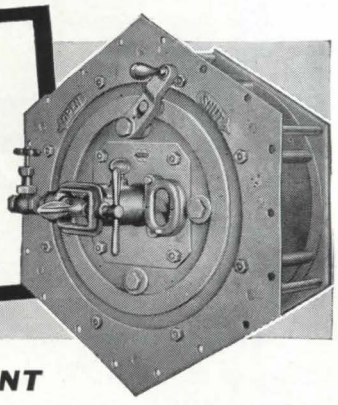
GALVESTON ★ HOUSTON ★ MOBILE ★ NEW ORLEANS ★ LOS ANGELES
SAN FRANCISCO ★ SEATTLE ★ TACOMA ★ BUENOS AIRES ★ LONDON



ON THE FIRING LINE OF AMERICA'S WAR PRODUCTION FRONT

(Continued from page 26)

brief sentences. This is enough for his purpose, particularly as his main concern is with architecture in the Americas, and hence with the pre-Columbian influence and heritage.

"The process which seems to be in operation toward a new architecture," Mr. Leipziger concludes, "is not so different from similar currents in modern art and science, utilizing the diversity of global contributions. Frank Lloyd Wright is the outstanding representative of modern architecture in whom such an approach has already found creative realization. . . . What is demonstrated in Frank Lloyd Wright's work should be utilized for our future educational procedure. We should give primary consideration to individual experience with original architecture and art objects of the past and present in which the functionalism of cultural consciousness is paramount."

The 40 plates at the back of the book are interesting in and of themselves, but especially so in connection with the text, in which frequent reference to them is made. With an ever increasing tendency in this country to look to our "southern neighbors" for inspiration of all kinds, this is a timely study no matter how reluctant some of us might be to see too strong a Latin American influence creeping across the borders into our own architecture. Yet the simplicity and symmetry of the pre-Columbian Pyramid of the Sun pictured above are as unregional as they are ageless. Influence of that kind would be welcome in any country.

A CHART FOR CHANGING CITIES

California Housing and Planning Assn. San Francisco 11 (402 Jackson St.), 1944. 21 pp. 2 plans.

Subtitled "A progress report on urban redevelopment, reviewing the record to date and surveying future possibilities," this slim little pamphlet concisely sums up the whole urban redevelopment picture. It is not merely the expression of the opinions of one housing group: half a dozen earlier publications on the subject are summarized and discussed, as are also various legislative acts and bills. Nevertheless, CHPA's strong enthusiasm for public housing is evident throughout, and the booklet as a whole lacks the impartiality which is so essential to any adequate discussion of a controversial subject.

"The concept of urban development," CHPA declares, "is that in the future all the evils we have recognized in connection with city and suburban life

(Continued on page 30)

A camel would have felt at home in this drop forge plant

Until Allen Engineers Took Over . . .

IN THIS huge structure of the Lindell Drop Forge Company, Lansing, Michigan, under-roof temperature in summer regularly hit 170° to 190° Fahrenheit. Floor working temperatures upward of 120° prevailed. O.K. for camels—tough on men intent on high production. That's how things stood when Allen got the nod to see what could be done about it.

Allen men, wise to the ways of air movement, thoroughly studied the situation, submitted a recommendation based on an objective of complete air-change once a minute. The Lindell management approved and Allen moved ahead. Seven 60 inch cowl ventilators that had been loafing on the job came off pronto. Equally fast, with the cooperation of local sheet metal men, seven 54-B Type "H" Allen Roof Fans went onto the ridge.

Result: complete satisfaction. With 60 air changes an hour, floor working temperatures moved down within reason. And incidentally—fumes and smoke that had been troublesome took to their heels along with the excessive heat.

This is just one case in point, Allen engineers have licked a good many tough ones. The reason is three-fold: experience, the right attitude, the right equipment. They take on ordinary or extraordinary ventilation problems with equal facility. If you have excess heat, dust, fume or moisture conditions, Allen men are ready and willing to take a look-see and tell you what you can do about it. And if you want it done—Allen has the proper gravity and/or power ventilation equipment to do the job and do it right. *The Allen Corporation, 9751 Erwin Avenue, Detroit 13, Michigan.*

THE *Allen* CORPORATION

ALLEN ENGINEERED VENTILATION

ENGINEERED VENTILATION FOR INDUSTRY

(Continued from page 28)

can be avoided or overcome." Whether or not such a lofty ideal ever can be accomplished remains to be seen; certainly if ever it is, mere wishful thinking will not have done the trick. Both careful planning and definite action are called for. CHPA's recommendations, therefore, are specific, though many are open to argument. They include:

1. "A master plan establishing a suitable land pattern for an entire metropolitan area or region," with "the closest working relations between the local housing authority and the planning body" and "complete support of the plan by the community."

2. "A first step should be rezoning of the city or metropolitan area in conformance with the new plan and (1) strict enforcement thereafter, plus (2) elimination of nonconforming uses." Time zoning is explained as a concept which "contemplates that nonconforming uses in a rezoned area must voluntarily be discontinued within a specified period, say five years, or become subject to abatement as in the case of public nuisances."

3. Acquisition of the necessary land and of peripheral land for future development. "Since the establishment of a new agency would require more extensive new legislation than to extend the powers of local housing authorities, we believe that the alternatives favor the local authority for this purpose."

4. (a) "In executing a master plan we urge that the public works aspects be started first or simultaneously with other development activity." (b) "The Achilles heel of practically all redevelopment undertaken by private enterprise in the past has been that low income families have been displaced to make way for higher income occupancy. . . . It seems obvious that satisfactory provision for rehousing present occupants must be made a *necessary* prerequisite to approval and undertaking any redevelopment of an occupied area."

5. "Since any drastic modification of real estate taxation is likely to take a good many years to accomplish, we are convinced that immediate application of the plan can only be realized on land publicly acquired, where traditional methods of assessment would not apply in any case. . . . In public ownership land could be made available to private enterprise at a rental which would provide a fair return according to the land use-value without imposing burdens which prohibit the most desirable use, as is too often the case today. Taxation on rental income rather than capital value is an issue on which real estate interests and public housers can join forces to mutual benefit."

TVA—DEMOCRACY ON THE MARCH

By David E. Lilienthal. New York (49 E. 33rd St.), Harper & Bros., 1944. 5 by 8¼ in. xiv + 248 pp. illus. $2.50.

The massive dams built by the Tennessee Valley Authority to harness the turbulent Tennessee River scarcely need a poet laureate to sing their praises. From the start they have been their own publicity agents, and highly effective ones, too. But in the light of the continually recurring criticism to which they have been subjected, their proud creators apparently felt that a more complete story of their achievements should be told. As chairman of the TVA, David Lilienthal was the logical person to tell that story. That he has made of it a really exciting book is an unexpected dividend, however, for, as he modestly points out in his preface, he is an administrator and not a professional writer.

Mr. Lilienthal's whole theme is adroitly summed up in his title—*Democracy on the March*. It is obvious that

(Continued on page 112)

A beckoning finger to the eager shopper is an entrance like this to some special department or salon in a large store. Permitting wide, clear vision of the attractions within, these panels and doors of Herculite Tempered Plate Glass are very good-looking in their own right. Sturdy, too . . . because tempering makes them 4 times as strong as regular plate glass of equal thickness. Architect: Edward M. Conboy.

INTERESTING WAYS TO USE GLASS IN COMMERCIAL BUILDINGS

Store fronts must have sales appeal . . . the ability to turn sidewalk traffic into store traffic. Pittsburgh Glass Products are calculated to supply the beauty and appeal you demand in the execution of your store front designs. Carrara Structural Glass in many colors, PC Glass Blocks, Herculite, Pittsburgh Plate Glass and Pittco Metal work as a team to help you create exteriors of distinction.

Let's Look at the Record

Cincinnati Union Terminal employs a lot of Alcoa Aluminum:

Doors, frames, transoms and trim for all main entrances and exits for vestibules, lobby, waiting room, etc.—exterior storefronts, window sills—grilles, frames and louvres for ventilating ducts—hand rails, brackets and facia for stairways —ceiling of marquees—counter screens, wickets and signs for ticket windows and information booths—frames for bulletin and train announcement boards — radiator grilles, lighting fixtures, concession screens and gates— miscellaneous trim.

"After eleven years . . . the aluminum installations have met all expectations"

Permanence, ease of maintenance and low upkeep; Alcoa Aluminum was selected for much of the exposed metal work here because it offered these advantages. Eleven years of service have proved the wisdom of this choice.

"In no instance has aluminum failed to live up to expectations", reports Mr. J. C. Bussey, Maintenance Engineer for the Cincinnati Union Terminal.

The superior performance of aluminum here and elsewhere is helping to ease the manpower situation during the war. It's an excellent reason for including Alcoa Aluminum products in your postwar designs. ALUMINUM COMPANY OF AMERICA, 2167 Gulf Building, Pittsburgh 19, Pa.

The Window of the Future is Aluminum

ALCOA ALUMINUM

Reg. U. S. Pat. Off.

LETTERS FROM RECORD READERS

Record:

I think it is historical within our particular professional world that two days after the Architectural League's prefabricated conference was terminated, on the note that prefabrication was just a 25-year advancement of the quality and number of standard components, like bricks or stoves, allowing any architect to design in any manner, that Mr. Churchill should come out, wham! bam!, with the announcement that the British have secretly engaged in setting up for an initial run of one billion dollars worth, one design emergency dwelling machine taking care of the advanced sanitary standards of living. It would have been inappropriate for him to have mentioned in his broadcast to England that this put Great Britain in a neat position to make an immediate postwar bid for furnishing the sixty billion dollars worth of housing required by now-bombed-out families of Europe.

You can count on it Russia will counter with a scientific model. What is the U. S. doing in this picture?

We need your editorial support to see that we, too, prototype a scientific unit demonstrative of American ingenuity. As an FEA emergency unit, it will, of course, need vast government subsidy, as big or bigger than any one of the ammunition bills; of course, all the component work must be done by private enterprise.

There need be no opinionated quarrel about that one prototype. It is entirely a matter of scientific criteria. It must render the greatest service with the least material, in order to successfully engage the energy conversion facilities of industry in giving the most service with the least weight of materials, least energy of formation and forwarding, least time of labor, and least motion of handling and assembly and service.

The problem will resolve itself with far greater simplicity than that of prototyping war aircraft. It will be a matter which ingenuity of engineers can quickly settle. That a bomber's nose has, of economic necessity, to be round instead of cubical, doesn't matter a damn bit. The natural external shapes of these living machines will be developed with equally impersonal logic. It is of the greatest importance that the trade journals and thereafter the press philosophy of our country be articulated in this direction.

Let's try to lift American sights towards making *constructive* contributions to world affairs consistent with our terrific starting advantage. In that way alone may we maintain front row position in world affairs. Let's get over our inferiority complex about the aesthetic and psychological validity of our own simple, forthright concepts.

—R. BUCKMINSTER FULLER

Record:

Your "Influencing owners and getting clients" series in collaboration with specialized magazines is a real step in the right direction.

I, for one, hope that you will plug it hard and even go so far as to include home magazines such as *House Beautiful,* etc. Such an article might discuss the value of even partial architectural service for small houses: selecting site, general advice, surveys of existing houses, supervision, etc.

Did you see the kind words of the *Current Journal* in regard to the Noise Reduction article?

—HAROLD R. SLEEPER, *Architect*

Record:

We greatly appreciate your series of articles designed to stimulate planning now for postwar building. Carrying these messages directly to the group most interested in the particular building type discussed by means of collaborating magazines, strikes me as a most brilliant idea, for unfortunately, too few laymen read architectural magazines.

Debunking the idea that the building of tomorrow will be built of materials not now in this world, may go still further in stimulating planning today, for it seems too many people are still hesitant in engaging an architect, believing that the future will bring forth radical and drastic changes in building materials.

—ADOLPH GOLDBERG, *President Brooklyn Chapter, A.I.A.*

Record:

Congratulations on your noble effort (Collaborative Series of Building Type Studies) to aid building industry of our country. This will be, to my way of thinking, one of the most outstanding ways of furthering progress and providing work for our many noble men and women who are keeping our land intact.

—GEORGE ERNEST ROBINSON, *Architect*

Record:

Your program of collaboration with specialized magazines . . . will provide an opportunity for architects to establish their true function in the eyes of the public, a function that is, I am ashamed to say, not generally recognized by members of the profession as their only *raison d'être.*

Public opinion has established diagnosis, deduced from symptomatic research, as the basic function of the doctor and holds him at least morally responsible for results. Perhaps your program will be the means of creating a public opinion which will similarly force a like responsibility from us.

—FRANKLIN O. ADAMS, *F.A.I.A.*

Record:

This is to tell you that I think you are doing a fine job toward influencing owners. The importance of studied building programs should be emphasized as noted in your *Nation's Schools* editorial.

—CARL J. MALMFELDT, *Architect*

Record:

Our office through the past years has been handling a much varied type of buildings—not specializing on any one type; and we have found that this kind of activity on the part of the magazine editors of architectural field has proven very helpful to the practicing architects. As a long-time member of the American Institute of Architects (and President for several terms of the Kansas chapter), I personally want to thank you for the past and present efforts of the ARCHITECTURAL RECORD in helping to keep the general public acquainted with the value of competent architectural service.

I have no definite suggestion to make —I feel you are doing a good job by the nature of your present program.

—CHARLES W. SHAVER, *Architect*

Record:

I was interested in the March number of the RECORD, since I do considerable school work. I wonder, however, whether the magazines are not giving a lopsided view of school design. All good school design is not "modern" as the magazine pages would suggest. There is some fine "modern" work and it should be illustrated, but the majority of laymen do not admire it, and the majority of architects do not design it. In fact there are parts of the country where the majority of buildings shown in the magazines would be quite inappropriate.

That does not necessarily mean that either the public or the profession is reactionary. It merely means that design in architecture changes slowly, that the good features of any innovation are gradually adopted. By all means, we should have illustrated the best "modern" buildings, but at the

(Continued on page 124)

Can you afford an architect

THE TRUTH IS, you can't afford to build *without* an architect! You must have his expert help unless you are prepared to face unforeseen expenses, such as repairing cracked walls, patching roof leaks, replacing unsatisfactory materials. The architect will design a house that avoids such heartaches—that fits your pocketbook as well as your dreams.

Stock plans, which may tempt you as a possible saving, may actually cost more than architectural service, because of things which go wrong. Remember, that plan was drawn by someone who had never seen your lot or met your family. And such cut-and-dried affairs are often devoid of good taste.

The architect will translate your hopes into your own personal home—not just a house. He will supervise it as it grows, protect your interests. There are literally hundreds of ways he can save you his total fee. Send for our new booklet telling how you two can best work together.

If you served on the board of a hospital or school, you would insist on an Architect-Engineer before building. Your home represents as important an investment—protect it the same way!

Plan your house now!
START RIGHT—
WITH AN
ARCHITECT.

EDWARDS
SINCE 1872
ELECTRICAL SIGNALING
Bells · Chimes · Telephones · Alarms
for Homes, Offices, Schools, Hospitals

FREE . . . GET THIS NEW ILLUSTRATED BOOK!

EDWARDS AND COMPANY, NORWALK, CONN.
Please send copy of book "How to Plan Your New Home."

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(Save Postage—Paste Coupon on Penny Post Card)

ATTENTION ARCHITECTS!

• Here is the third of a series of advertisements now running in Time and American Home, reaching over 4,000,000 families. This series tells the public of the architect's place in their postwar building plans. It's part of Edwards' campaign to stimulate business for the architect, to create happier living through better building. This campaign is endorsed by the American Institute of Architects.

• That the public is interested in this message is best proved by its overwhelming response — thousands of prospective home builders have already written for copies of the booklet "How To Plan Your Home".

• Any architect who has not seen this booklet is invited to write for copies now. Limited quantities are available, imprinted with the architect's name if desired. You'll find these booklets a valuable means of keeping in touch with the prospective client—they're of real help to him, and a constant reminder of *your* place in his plans.

FOR BETTER BUILDING

CHEMICALLY TRANSMUTED WOOD

A chemical means of converting ordinary wood into a whole new range of usefulness, now available for war purposes and offering many postwar applications has been announced by E. I. du Pont de Nemours & Company.

It permits construction, for example, of doors, windows and drawers that will not swell and stick or contract and become loose. Poplar becomes harder than hard maple, which can be made harder than ebony. The process enables more available, near-at-hand, cheaper species of woods to compete with costlier, scarcer varieties.

In the development of the new process, du Pont chemists paralleled studies conducted by the Forest Products Laboratory of the U. S. Department of Agriculture. A "built-in" finish is imparted by the treatment throughout the wood and not just on the surface. Forming an object of wood to final dimension and imparting the final surface finish may be achieved in one operation. Mars or scratches may be removed by simply smoothing and rubbing. Color also may be imparted pemanently throughout the wood by mixing a dye with the impregnating chemical.

Veneers sufficiently treated become self-bonding. They require no adhesive to be formed into plywoods, since heat and pressure fuse the product into a hard, dense substance.

Even sawdust, shavings and similar wood wastes may be molded into articles, and dyes or pigments incorporated. Other cellulosic and fibrous products, including cotton, farm wastes, paper and leather, also lend themselves to the treatment. Likewise it is applicable to bamboo and similar cane and fiber materials.

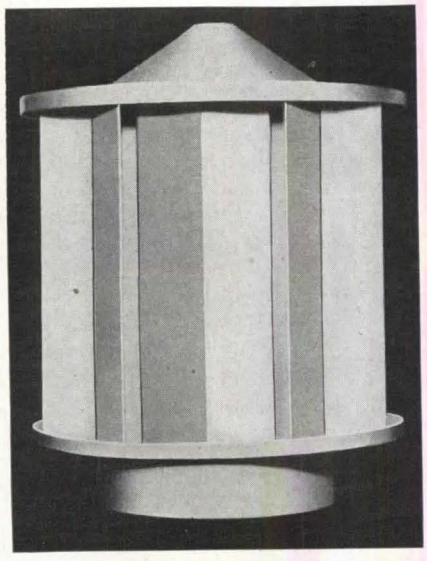
Methylolurea is the chemical agent that effects these fundamental changes. It is compounded by the addition of urea to dimethylolurea. Both materials are white, water soluble solids. They are produced from ammonia, carbon dioxide and methanol, which are synthesized from coal, air and water. Urea results from the reaction of ammonia and carbon dioxide. Formaldehyde, which is derived from emthanol, condenses with urea to form dimethylolurea. Both urea and dimethylolurea are commercially available and inexpensive chemicals now being produced on a large scale.

The methylolurea is impregnated into the structure of wood in a water solution. Methylolurea reacts with components of wood to form hard, water-insoluble, unmeltable resins within the piece of lumber being treated. Natural acids present in timber initiate the reaction. Heat, such as kiln drying, speeds the conversion of the methylolurea into resins within the wood.

The process appears to be applicable to large items such as structural timbers as well as to items as small as smoking pipe stems and musical instrument reeds.

For timbers and lumber required for the construction of trestles, towers, homes, buildings, boats, airplanes and the like, the treatment may be applied to leave untreated inner fibers in a more resilient, flexible state to withstand impact stresses while a hardened, dent-resisting, high strength shell is produced on the surface.

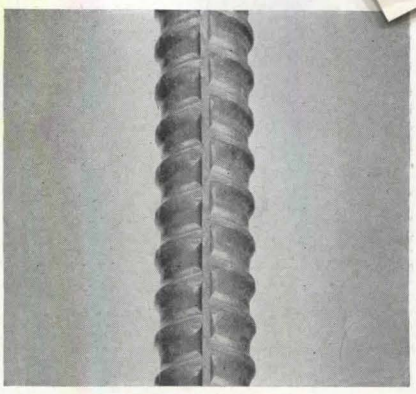
This would allow the lumber to bear heavier loads or, conversely, would permit lighter construction. Outer zone treatment would improve dimensional stability of the treated piece, would increase flame resistance and resistance to rot and insect infestation.



WIND-ACTUATED EXHAUSTER

Developed for gravity and mechanical exhaust systems in marine, industrial and commercial applications, the wind-actuated *Agitair* Exhauster is said to give positive ventilation regardless of wind direction or velocity. The unit is weather-proof and light-proof, with no moving parts; elimination of down draft is claimed.

Many standard sizes are available and special arrangements can be provided wherever required. Units with watertight dampers are made for marine use. Special finishes are applied for unusual salt or corrosive atmosphere applications. Air Devices, Inc., 17 E. 42nd St., New York 17.



REINFORCING BAR

A new type of concrete reinforcing bar, called *Inland Hi-Bond,* is designed to give the greatest possible bonding value between concrete and steel. To increase the effectiveness of reinforcing steel in concrete through improved load transfer, reversed double helical ribs of proper height extend between diametrically opposed longitudinal ribs. The helical ribs are spaced at close intervals and so dimensioned as to provide potential bearing and shearing areas which, in addition to having the proper relationship to each other, are properly proportioned to the effective strength of the bar. Inland Steel Co., Chicago.

BUILDING WIRE FOR WET LOCATIONS

A small-diameter *Type SNW Flamenol* building wire for wet locations has been added to the standard Type SN Flamenol for dry locations. The new wire has a special thermoplastic insulation with low moisture absorption. It is designed for use in accordance with Section 3035 of National Electrical Code for installations in raceway systems in wet locations, and is approved by the Underwriter's Laboratories in sizes 14 to 4/0 inclusive. The wire is self-protecting and requires no braid. Its finish is hard, smooth and glossy, striped for grade identification. Dirt and foreign matter do not readily adhere to its surface. The small diameter saves space permitting more conductors to be used in one conduit or duct, or permitting smaller conduits or ducts to be used. General Electric Co., Appliance & Merchandise Dept., 570 Lexington Ave., New York.

ALUMINUM ALLOY

An aluminum alloy, said to be as tough as structural steel but very light in weight, has been developed by the Reynolds Metals Company and is being produced in large quantities for the construction of fighting planes, the company has announced.

The alloy, designated by Reynolds as *R-301,* is no lighter by volume than other alloys, it is explained, but its

(Continued on page 46)

Farsighted Home Builders will call for Copper and Brass

● Wartime maintenance difficulties with materials less durable than copper and brass, have convinced many homeowners of the economy of rustproof construction. Today, when many postwar homes are being contemplated, messages such as this in Better Homes & Gardens and American Home should help to create a desire for good design and quality materials.

4431

 (Continued from page 44)

greater strength permits the use of thinner and consequently lighter sheets. R-301 is actually an alloy coated with another alloy to make it corrosion-resistant. It can be formed, hammered, rolled or drawn, and then heat-treated, to develop maximum tensile properties in the hardened condition. It is said to possess excellent welding characteristics.

Production of the new alloy at present is entirely given to military uses, but many postwar uses are predicted.

WELDED LEAD

The traditional wiped joints in lead pipe are made with solder containing tin. To conserve this critical metal, the plumbing trade has adopted lead welding and inaugurated an educational campaign for the craftsman. The illustration shows an example of lead welding in a privately financed housing project in Oklahoma City which conforms to the plumbing code and meets the requirements of the plumbing inspectors. Skilful lead welding may well become a postwar alternate of wiped joints.

STANDARDS

Masonry Standard Published

In the interests of better design and construction of buildings, the American Standards Association has announced publication of the American Standard Building Code Requirements for Masonry (see ARCHITECTURAL RECORD, Feb. 1944, pp. 100, 102). This is one of a related series of building standards being developed by technical committees of the ASA, and the first to be completed in the field of masonry.

The Producers' Council reports that nationwide adoption of the masonry code, which was sponsored by the National Bureau of Standards and approved as an American Standard by the ASA, is strongly recommended by four national trade associations directly interested in the production of masonry materials—the Structural Clay Products Institute, the National Concrete Masonry Association, the Portland Cement Association and the National Lime Association.

The Producers' Council has urged building code officials in 2,000 communities to adopt standard code requirements for masonry as a means of lowering the cost of building and improving the quality of masonry construction.

Machinery Code Revised

The latest revision of a code aimed at cutting down the industrial hazards present in the use of woodworking machinery, has just been approved by the American Standards Association. The American Standard Safety Code for Woodworking Machinery is intended as a guide for the safe installation, operation and maintenance of woodworking machinery, including cooperage operations and the making of veneer. It deals particularly with "point of operation" hazards on woodworking machinery, and is the second revision since the standard was approved in 1924. One section deals specifically with plant layout.

CELLAR DOORS

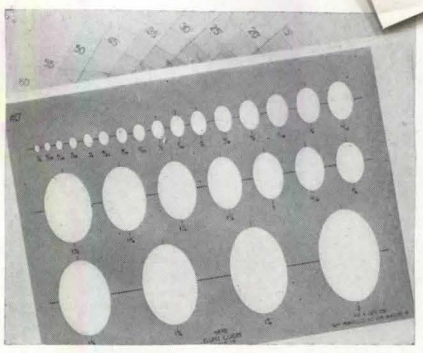
Looking toward an increased postwar market, one manufacturer of cellar doors suggests that the prewar tendency on the part of architects and home designers to permit "Dead End" cellars was caused by:

1. Failure of the simple and economical wooden bulkhead to stand up; it leaked, warped, shrank and swelled; it was a fire hazard, a food for termites and a constant source of trouble.

2. There was nothing on the market at the time to take its place, so that the advent of oil heating was the excuse for its good riddance.

"We firmly believe," this manufacturer states, "that an outside cellar-way to the yard is just as necessary to good living as the inside stair and that with a simple, economical and permanently trouble-free method available, it will be more and more insisted upon."

Three designs of all-steel bulkheads are offered by this company: Style O-3, of flush construction throughout, using 12-gauge copper steel; Style O-2, similar in construction except that doors are 10-gauge Diamond Pattern Plate for hard usage and underfoot security; Style O-1, of 12-gauge copper steel throughout, with paneled door and sides. All the bulkheads are equipped with two hinges to each door, a sliding bolt for locking the doors from the inside, and a lift-handle. The Bilco Co., 164 Hallock Ave., New Haven, Conn.



ELLIPSE GUIDES

A time-saving device recently announced is a series of precision-cut ellipse templates said to meet professional accuracy requirements. The guides are .020 thick celluloid templates and are made in a set of 10, with angles from 15° to 60° by 5° increments. Templates of 60°, 55°. 50°, 45° and 40° have ellipses from ⅛ to ⅜ in. increasing by 32nds, then by 16ths to 1 in., then by 8ths to 2 in. Templates of 35°, 30°, 25°, 20° and 15° progress the same, but start with sizes of 5/32, 3/16, 7/32, 1/4 and 3/8 in. respectively.

The templates are equally efficient for either pencil or ink. Vertical and horizontal axes are clearly indicated for ready location and adjustment to position. The templates are furnished either as a set of 10 or separately. The A. Lietz Co., 913 S. Grand Ave., Los Angeles 15, and 520 Montgomery St., San Francisco 11.

PLASTICS

Smithsonian Exhibit

An interesting new indication of the expected postwar importance of plastics is the plastics and resins exhibit just installed in the Smithsonian Institution, Washington, D. C.

Prepared by the Plaskon Division of the Libbey-Owens-Ford Glass Co., Toledo, Ohio, the exhibit shows how urea-formaldehyde plastics and resin glues are compounded and used in the manufacture of a wide variety of products. The display is divided horizontally into two sections, the top section featuring Plaskon urea-formaldehyde molding compound, and the bottom featuring Plaskon resin glue.

In addition to photos showing the molding and bonding processes, actual products are displayed. These include buttons, surgical windows, refrigerator and kitchen hardware, fluorescent fixtures, a structural section of an aircraft wing made with resin-bonded plywood and assembled with resin glue, and an airplane pilot seat made in one piece by the low-pressure molding of canvas and Plaskon resin glue.

(Continued on page 116)

Balanced talents

✦ The grass on the other side of the fence always looks greener. There is a current trend that emphasizes this old saying rather than "cobbler stick to your last." Aircraft and automobile factories are flirting with fabrication in the housing field; gas stations may soon be selling trowels, fish-hooks and overalls; the cigar store is already a haberdashery, the drug store a restaurant. Contractors offer complete design services. Some of the design profession's fences are tumbling down, or are being crashed, and there are strangers grazing in old pastures.

✦ Such invasions of new and old fields should be stimulating and the competition should produce interesting results, unearthing dormant talents. It is enterprising and venturesome, for it involves risks as well as promise. Those who prefer to "bear those ills we have than flee to others we know not of" may become stogy, narrow, smug, unprogressive. Not so those who sally forth into adjacent fields.

✦ Individual architects and engineers, including those in the armed forces and in war production, as well as those making postwar sketches and surveys, are formulating plans for their own future practice. And it pays to define at the outset the fields that can best be cultivated, those offering the greatest satisfaction to one's self and the greatest chances of success. Then to make one's plans accordingly.

✦ But any such plans should be flexible enough to be changed to incorporate any opportunity in other fields along the road. For who can tell where clients will crop up, or where they can be cultivated, or what talents their problems will require. Flexibility, adaptability, ability to expand or contract are profitable virtues in changing times (and times are always changing).

✦ This suggests associations, or limited partnerships, perhaps different ones for different projects, or temporary affiliations, their permanence depending on the success and probable future prospects for the combination.

✦ Which brings us to the need for balanced talents. Talents do differ; "the architect" is not a uniform product. The necessary talents (including knowledge and experience) are all too rarely found in any one man. A talent for design will need the balance of talent in engineering, in business administration, and in "public relations" (client garnering). "The architect" is then a cooperating team, a firm of balanced talents, both among the partners and among the employees carefully chosen for specific competence.

✦ Too many architects and engineers have come to grief because of strength in only one department of their offices, with weakness in others. Their clients have grieved too, and aloud, so that the profession as a whole has been blamed.

✦ Whatever fields of creative service look greenest in the postwar era, we believe they will yield the most in accomplishment, profit and satisfaction to those architects, engineers, designers, builders—call them what you will —who operate on the principle of balanced talents.

Kenneth K. Stowell

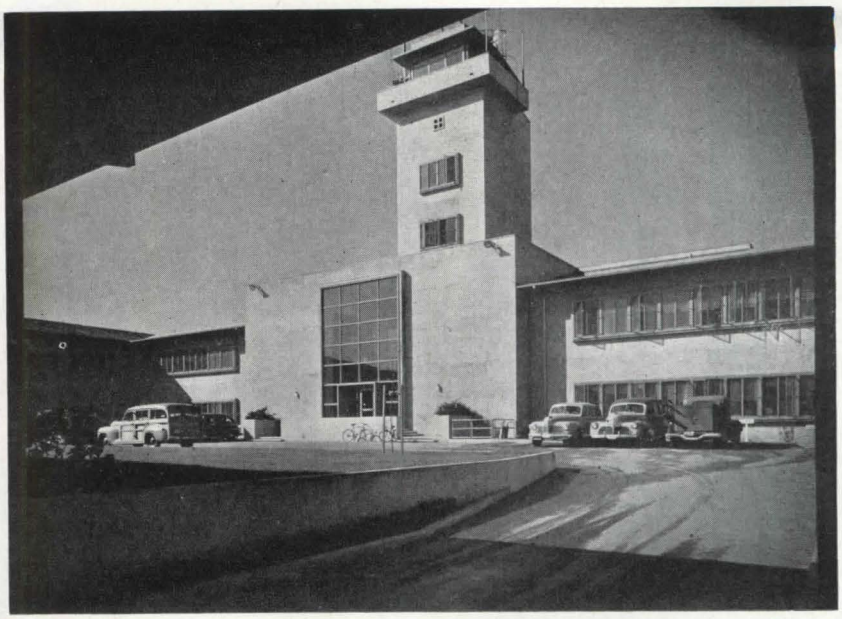
ROOSEVELT NAVAL BASE, TERMINAL ISLAND

Headquarters of The Naval Operating Base, Terminal Island, Long Beach Harbor

Allied Engineers, Inc., Architects and Engineers

Allied Engineers, Inc.: Donald R. Warren, chief engineer; Adrian Wilson, chief architect; Paul R. Williams, associate architect; S. B. Barnes, structural engineer; E. L. Ellingwood, mechanical engineer. Design, plans, and construction under the supervision of the Bureau of Yards and Docks, Navy Department, Washington, D. C., Vice Admiral Ben Moreell, chief of Bureau. Contractors: The Guy F. Atkinson Company and The George Pollock Company, San Francisco

Maynard L. Parker photos



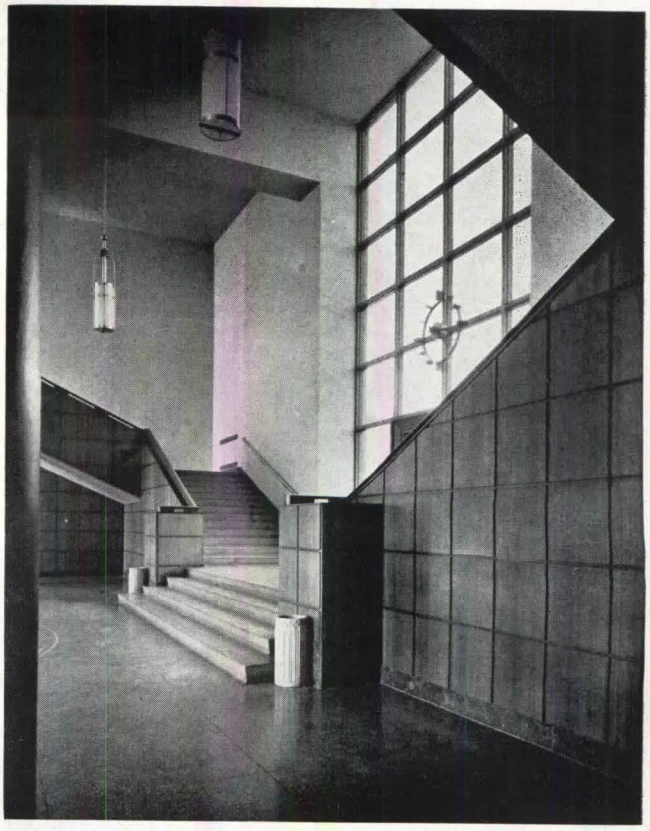
The Administration Building, focal point of the Base in view as well as in purpose, houses offices of Captain Schuyler F. Heim, Commandant of the Naval Operating Base, his staff; and Captain Frank R. Walker, commanding officer of Roosevelt Base and the Small Craft Training Center. The Administration Building also houses the Fleet Post Office and the brig. At the right is a rear view from the court. Below: overall view of the front elevation

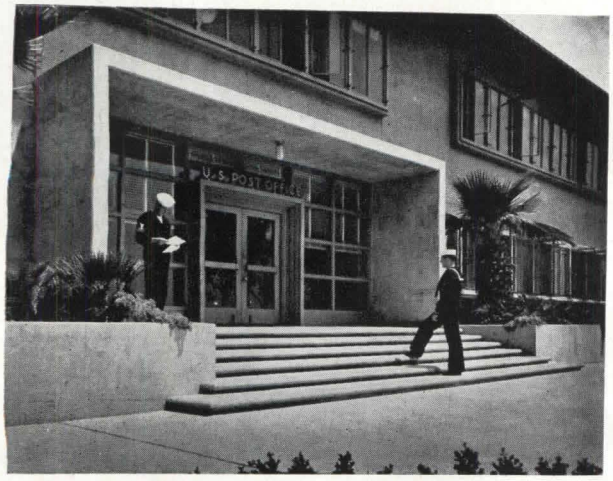
CONCEIVED back in "defense" days as a permanent peacetime operating base, hurried and enlarged after Pearl Harbor, Roosevelt Base, the "Flag Ship" for the 22 naval activities comprising the Naval Operating Base, stands as impressive evidence that America intends to keep a watchful eye on the Pacific for years to come. It is the largest fleet operating base in the country, and was planned to bring together on man-made Terminal Island the various Navy shore activities previously scattered around Long Island Harbor. Of course the full story of present activities is not for publication now; this presentation is but a limited glimpse of buildings in the permanent group. Even this cannot include technical details; it can only show something of the architectural character that will distinguish the base, a character achieved entirely by grouping of masses and of fenestration, without ornamentation of any kind.

About a third of the base is devoted to administration and recreational facilities; two thirds to industrial warehousing, ship repair, etc. Recreational facilities were particularly emphasized, to provide for a large peacetime fleet personnel. Adjoining the recreational group here shown there will be extensive outdoor sports areas. The base also includes great landing docks, still water landing areas protected by inner breakwaters, and a fleet landing building.

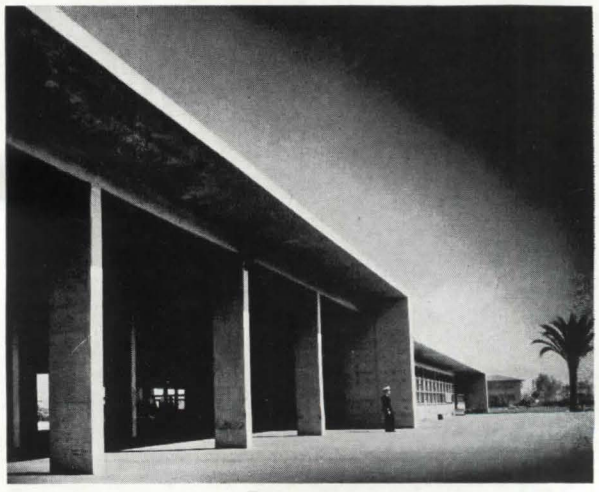
All these permanent buildings are supported on piling, and are designed for lateral forces anticipated in an earthquake area. Exterior walls are of reinforced concrete; in the rush exposed surfaces have not yet had brush finish coats. Standard size plywood sheets were used for forms, carefully planned to avoid complicated formwork patterns.

Above and right: interior views of the main lobby of the Administration Building. The decorative note is supplied by the wall panels of ¼-inch plywood cut into blocks and applied with open joints. Floor and stairs are of travertine. Below: post office entrance, in south wing

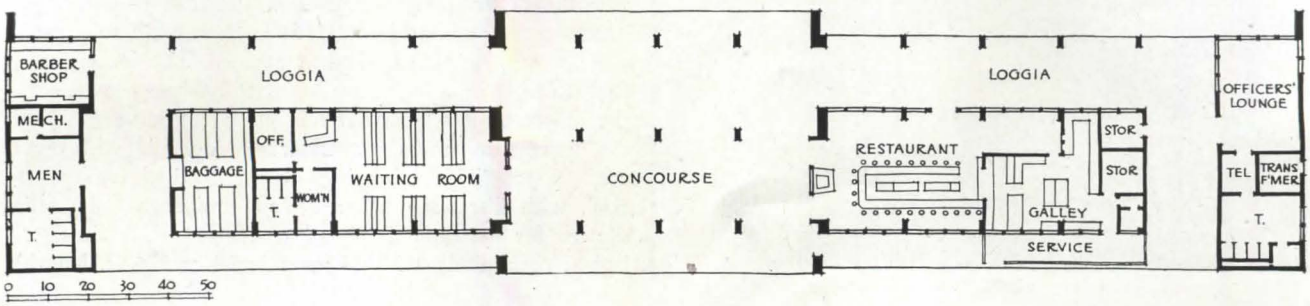




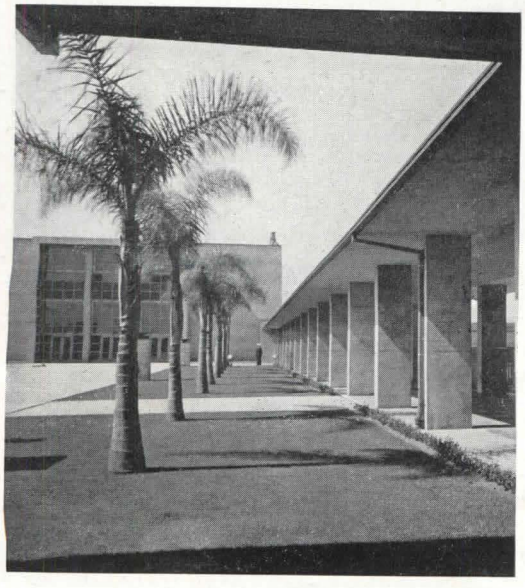
FLEET LANDING BUILDING



Too BUSY now and closely guarded, the fleet landing building was planned as the peacetime meeting place of fleet personnel and sweethearts, parents, friends. Opposite this building are landing facilities and docks for small boats serving ships at anchor. In normal times civilians will be able to drive in and park their cars near the building, which will provide attractive waiting rooms for that impatient interval until the men of the fleet come ashore. Facilities include main waiting room with telegraph, telephones, and baggage check service; restaurant and dining facilities, officers' lounge, barber shop and toilets, and wide concourse for hurrying sailors.



ENLISTED MEN'S RECREATION GROUP

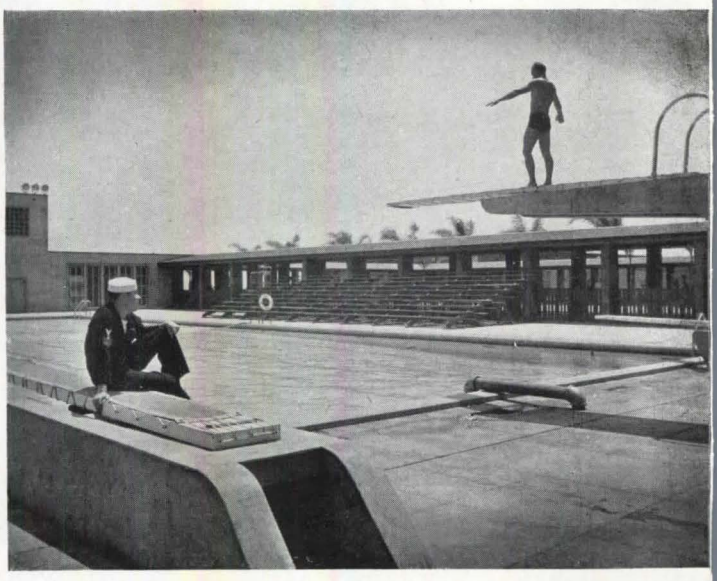


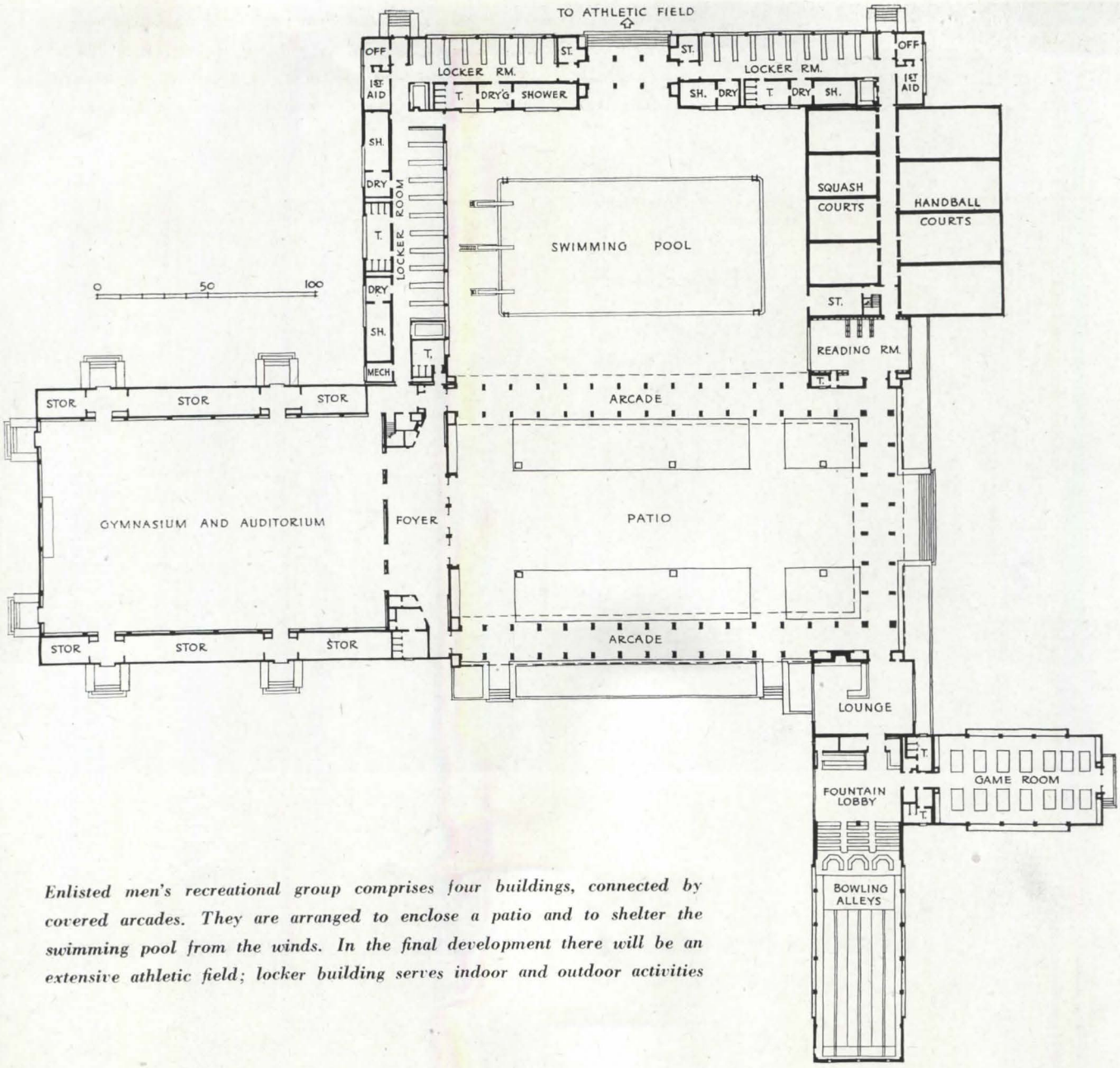
BUILDINGS in the recreational group, like other principal ones, were designed primarily for peacetime use, to welcome, entertain and guard the health of men of what is presumed to be a large Pacific fleet. The groups include four principal buildings connected together with covered arcades, and enclosing a patio and a swimming pool. The Auditorium and Gymnasium building is 120 ft. wide by 190 ft. long, with a height of 36 ft. It is complete within itself as an auditorium, with foyer, ticket booths, projection equipment, ventilating equipment; and it connects with the locker and shower buildings for convenience when it serves as a gymnasium. It is large enough to provide three regulation size basketball courts. The locker room and showers building is arranged to enclose the pool for protection against wind, and is placed to serve the pool, the gymnasium and the outdoor athletic field with equal convenience. The swimming pool is full tiled, fresh water pool, with filtration and treatment equipment. It is designed for swimming meets under standard inter-collegiate regulations, with 11 lanes in 60 or 120 ft. lengths.

Opposite page and left: views of main entrance of auditorium-gymnasium from various positions in the open court. Note massive concrete pylons capped with metal reflectors, forming indirect light standards. They give a subdued lighting in the patio

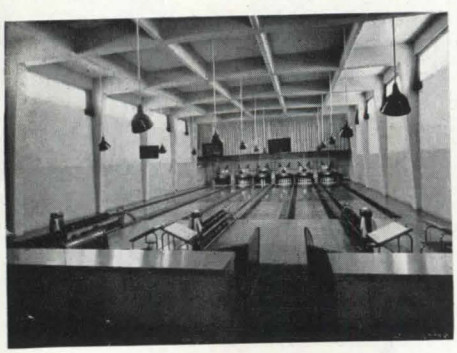
Below: two views of library and reading room for enlisted men. The walls are of 1/4-in. slashed grained plywood in a natural finish. The ceilings are plastered; the floors are of colored concrete

Below, left: auditorium-gymnasium is large enough for three regulation basketball courts. Below, right: swimming pool for enlisted men is 60 by 120 ft. Bottom: enlisted men's lounge and reception room; walls are of 1/4-in. slashed grained fir plywood, panel at fireplace is tile, mantle trim of polished bronze





Enlisted men's recreational group comprises four buildings, connected by covered arcades. They are arranged to enclose a patio and to shelter the swimming pool from the winds. In the final development there will be an extensive athletic field; locker building serves indoor and outdoor activities



Left: bowling alley has walls and ceilings of rough insulation board, for both thermal insulation and sound treatment. Increased column thickness at the top is to provide for lateral earthquake stresses. Center: foyer of auditorium; wainscot is mahogany plywood. Right: billiard room in recreational building

OFFICERS' RECREATION BUILDING, ROOSEVELT BASE

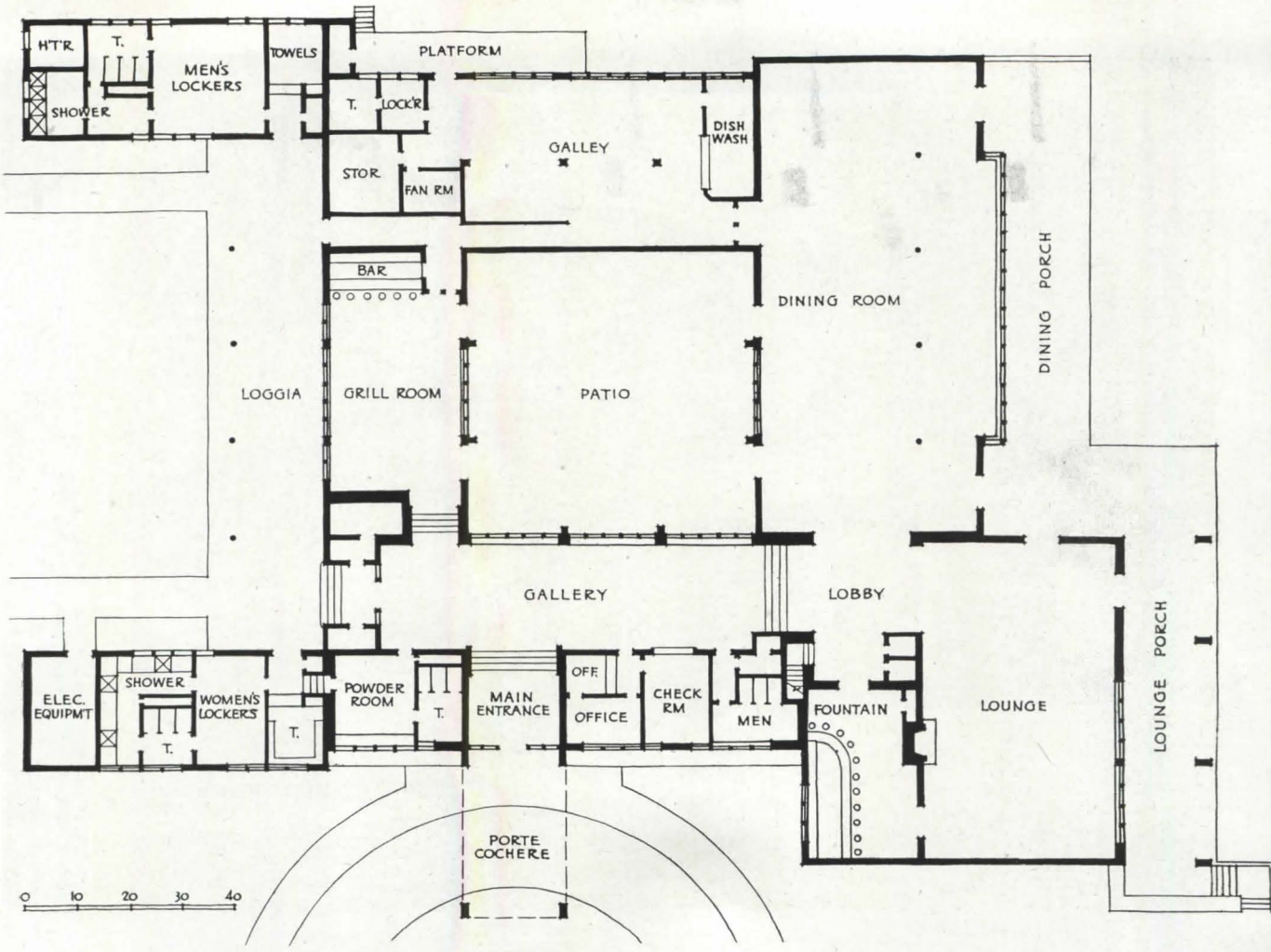
THIS BUILDING is planned to provide for normal activities for fleet officers and for entertainment of their guests. It contains large dining areas, grill rooms, lounges, fountain bar and facilities for women guests (plan on page 69). The central patio, useful for itself, also gives double fenestration and extra sunlight for the principal rooms. The building is oriented for waterfront views from the dining and lounge porches.

The photograph above views the building from the south waterfront, toward the lounge and dining terraces. For much of the year in this climate the terraces should be popular places, and add considerably to the useful area of the building. At the left is the main entrance and porte cochere, done in characteristic simplicity with mass concrete and fenestration providing the visual interest.

Above: main entrance gallery of Officers' Recreation Building, looking toward lobby of lounge and dining room. Walls are Philippine mahogany wallboard plywood 1/4-in. thick, with butt joints; ceiling is acoustical plaster with lighting recesses of plain plaster. Below: representative of the simple freshness of interiors is the Officers' lounge, with the massive and modern and masculine furniture

Wartime photographs of the officers' lounge can only show handsome interiors. If they are stimulating for an unfettered simplicity, the view could be truly inspiring if the curtains could be open, for the windows look toward the harbor

Left: the grill room in the Officers' Recreation Building looking toward fountain bar. The floor is of wood in parquet pattern. Sides are large windows, opening on patio and loggia; end wall is of mahogany plywood. Right: view of galley



Officers' Recreation Building. Main entrance is at the west side; dining and lounge porches toward the south have the harbor view. In peace times, officers' guests will find parking space near the entrance. Below: view of the dining room

DISPENSARY BUILDING

A NECESSARY part of any military establishment, the dispensary provides for emergency treatments and minor illnesses, not for general hospitalization. The first floor contains a main entrance lobby, pharmacy, doctors' offices, sick call rooms, ward and solarium, operating room and attendants' spaces, X-ray room, and garage. The second floor is primarily devoted to dental offices, and eye, ear and nose treatment rooms. Views show the main elevation.

OVERLOOKING CONNECTICUT HILLS

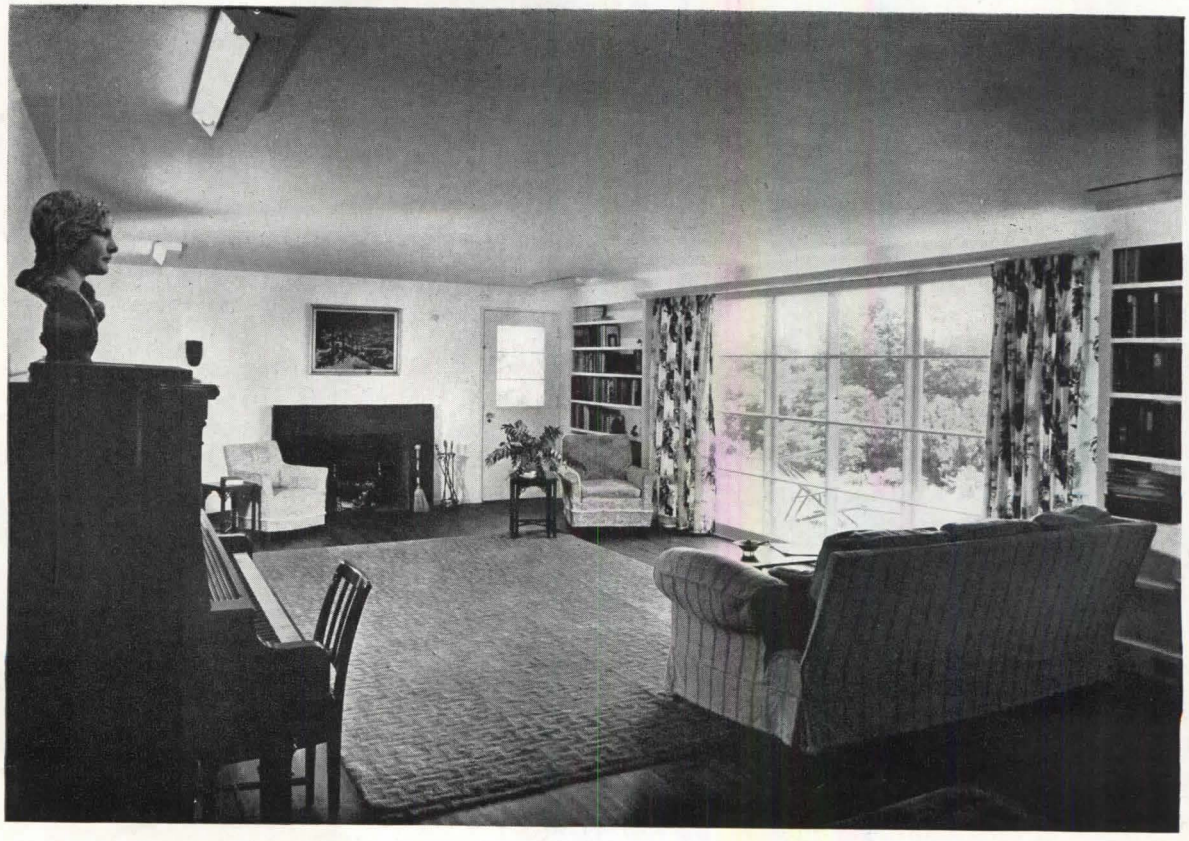
Residence for
Mr. and Mrs. Stowell Rounds
Cannondale, Connecticut
Louis Gelders, Architect

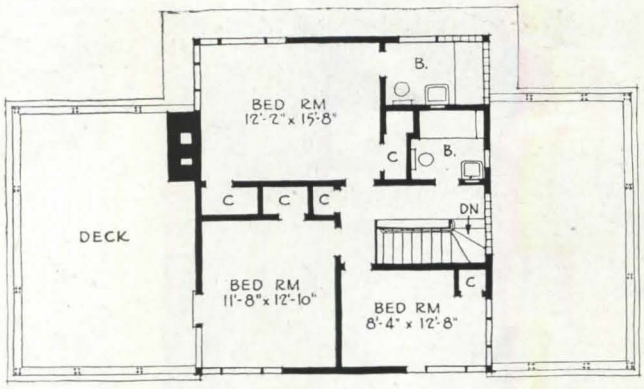
FROM ANY PART of the living room, or dining room for that matter, one can enjoy a broad view out over the countryside. It was planned that way. And the master bedroom and library share the view. But it is the wide, high and low window of the living room that gives the greatest expanse toward the setting sun. The knife-like prentice extending out almost three feet from the glass shields this window from glare and heat.

The plan is open, spacious, hospitable. The rooms are conveniently arranged for servantless living, 'though servants quarters are planned, for addition at a later date north of the service entry and above the west side of the garage. Then too a screened porch south of the living room and a large west terrace can be completed.

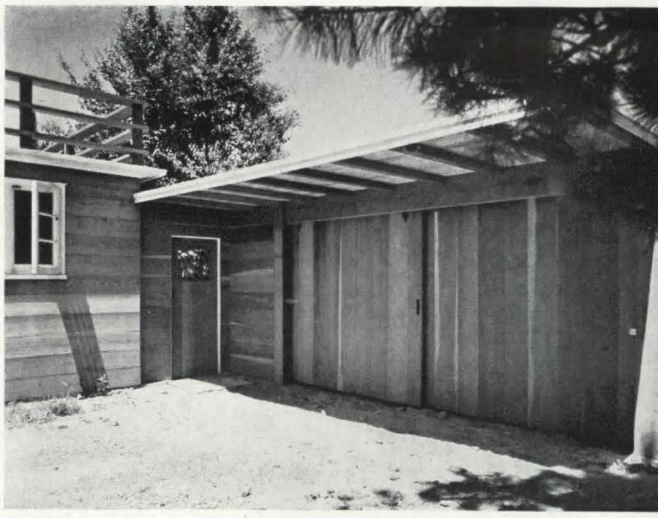
The covered entrance porch is broad and ample, opening on an uncramped hall. Glass blocks give a welcoming light, taking the place of traditional leaded sidelights of Colonial days.

The entrance front with its gravel forecourt, before the base planting was completed. The stained matched boarding of the first floor contrasts with the vertical lines of the board-and-batten of the second floor . . . Below: The view is an integral part of the living room. At night curtains may be drawn, and diffused, non-glaring light is supplied by the indirect fluorescent fixtures over the window and on ceiling

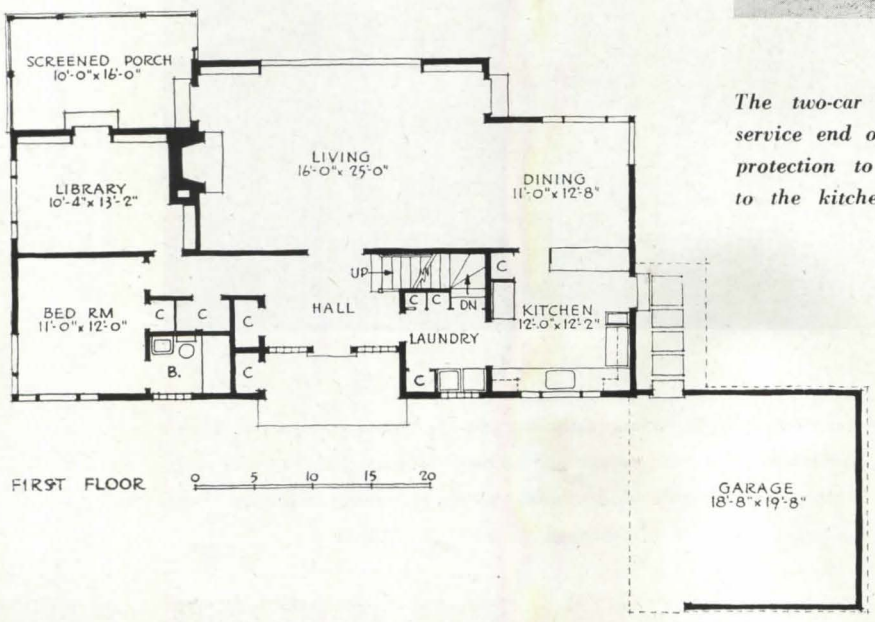




SECOND FLOOR

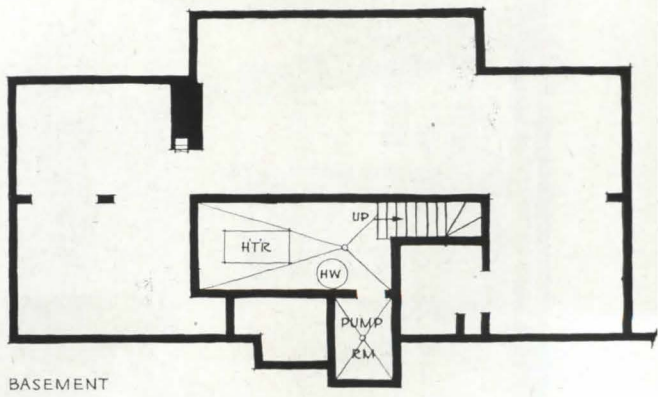


The two-car garage is unobtrusively placed at the service end of the house. The broad overhang offers protection to those carrying packages from the car to the kitchen via the service porch (door at left)

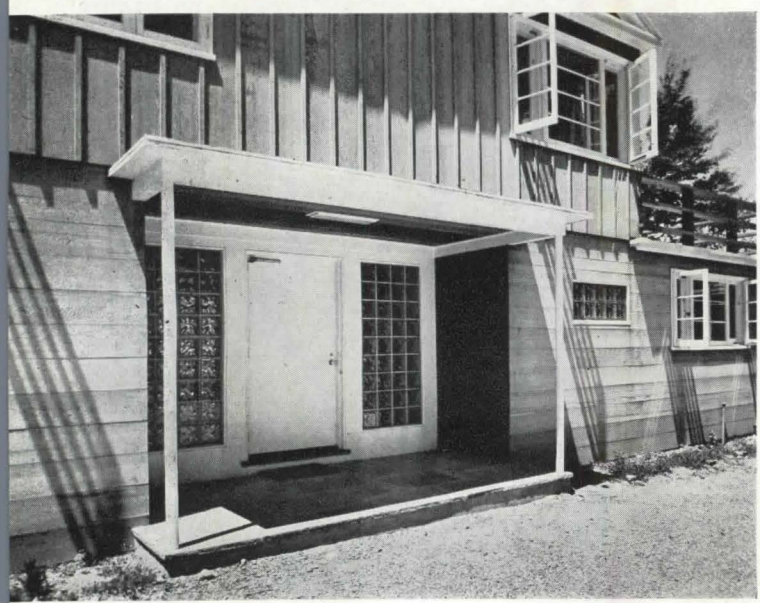


FIRST FLOOR 0 5 10 15 20

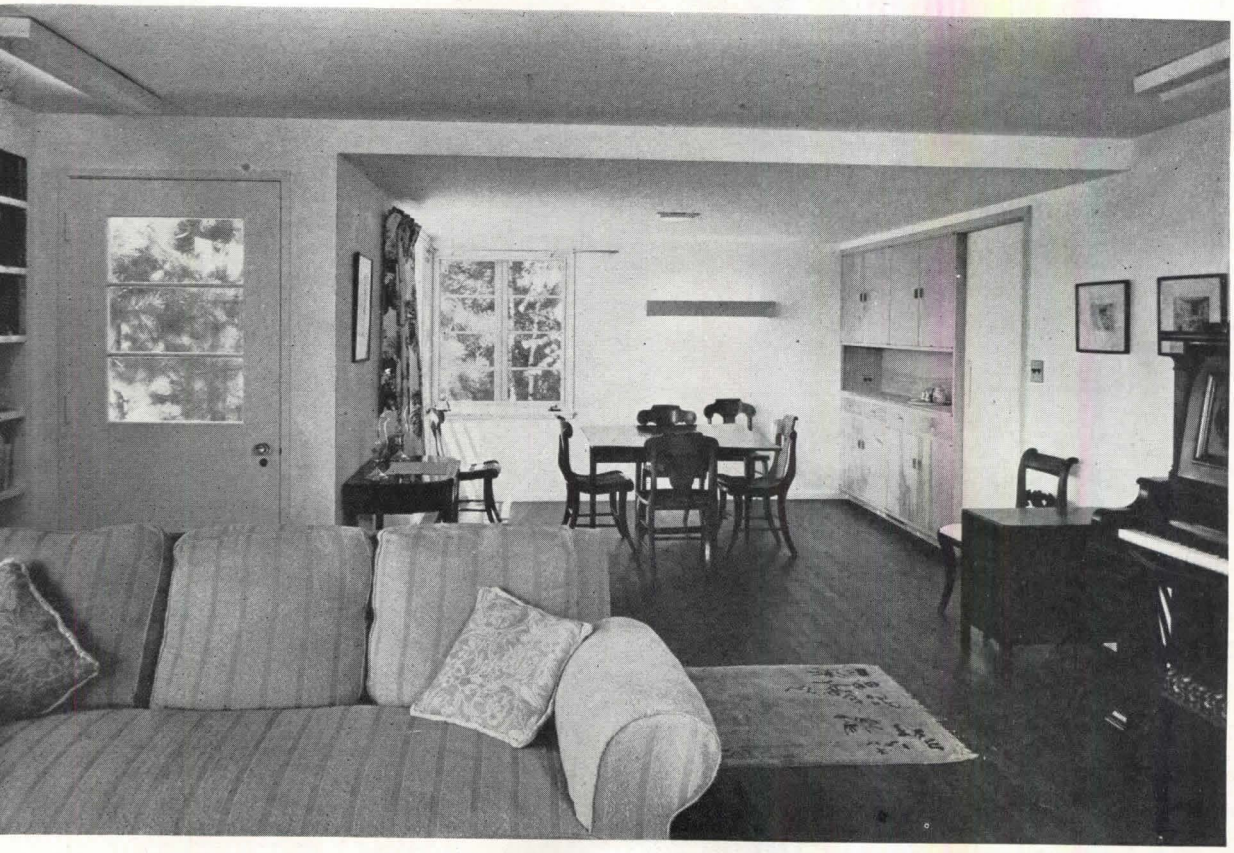
The plans are designed to fit the owners' way of life. Living and dining room are one, making for both convenience and spaciousness; and a pass-cabinet shelf saves many steps between kitchen and dining table



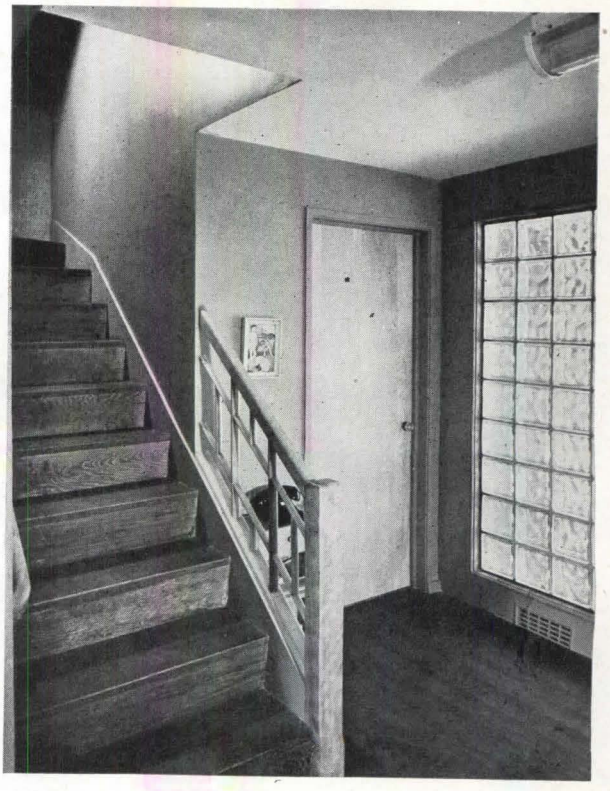
BASEMENT



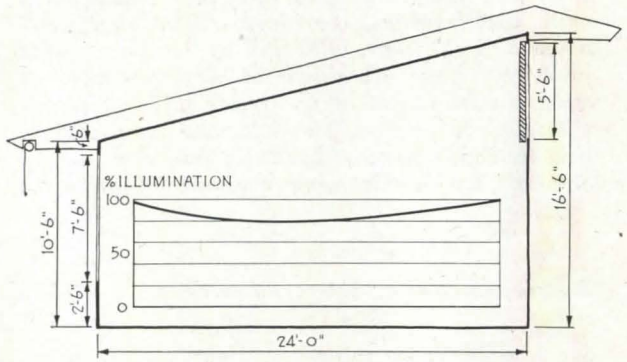
At the left of the entrance is an unusual handy out-door closet, *welcome to both visitor and housekeeper as snow and mud can be left outside with skiis and such*



Above: The dining space at the north end of the living room. Cabinets and shelves at right are available from both dining and kitchen areas. Lighting is indirect except for directional-lens light above table. Below, left: The living room window is structurally braced and double glazed; indirect lighting above. Below, right: A glimpse of the hall and stair. Door leads through laundry to kitchen



16 WAYS OF DAYLIGHTING CLASSROOMS



A "Spotter's Guide"

to advanced models that outperform the average by several hundred percent. The same principles apply to other rooms

By Douglas Haskell, Associate Editor

THIS IS a kind of "spotter's guide" to new classroom models developed for the sake of better daylighting. New types have been evolving in remarkable numbers during the past decade and a half, and the progress they represent is phenomenal. Formerly a design could still be called "good" even though the inmost row of desks received only one-tenth as much light as the row next to the windows; and brightness contrasts of a range of more than a thousand to one were accepted with little criticism. By comparison, some of the models reproduced on the next pages achieve a lighting intensity that varies throughout the room by only about one-tenth and gives the inmost row of desks adequate daylight even in mid-winter; and more than one model reduces the brightness range to well within the 100:1 ratio which is deemed the present-day approachable ideal. In both respects the best examples represent progress of the order of several hundred per cent in magnitude. Such examples, unfortunately, represent only a small proportion of recent schools built; there is obviously need for dissemination of results.

In collecting examples it was soon found that a splendid series of studies had already been prepared, under guidance of the Sight Conservation Council of Northern California. On the committee of study were Dr. Charles Bursch, Chief, California State Division of Schoolhouse Planning, and members of his staff.* The committee visited a homogeneous group of schools of advanced design in the San Joaquin Valley. The great advantage in this method was that readings and observations were made by the same people under similar conditions, facilitating comparison. Reports were issued by Leland H. Brown, assistant professor of electrical engineering, Stanford University. These schools are used as the nucleus of the present collection; but other schools are included from more northerly climates.

At first it had been hoped that every model in the "guide" could be documented with full comparative data; but unhappily it soon became evident that data obtainable are not generally commensurate in reality. Daylight involves a large number of variables (summarized on page 82) and the absence of information on some one of them may invalidate a reading for comparative purposes. Also, rules for taking readings are apparently not yet sufficiently uniform to supply interchangeable data.

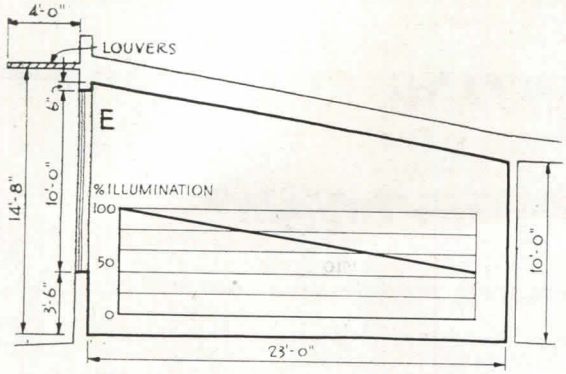
Despite such handicaps, it is suggested that this kind of a study has value, especially insofar as it calls attention to precisely the variable elements. Just as there is no one best universal airplane (but there are planes that perform exceptionally well for certain kinds of mission) so too there appears to be no one best classroom model but there are efficient designs for certain combinations of climate, orientation, building plan and height, artificial illumination system, and educational program.

Letters were sent to the architects and also the school superintendents of schools reported, and the commentary takes into account the replies of both. In more than one instance, the architects performed unselfish service by answering the question, "What changes would you make in the light of experience if you had this design to do over?"

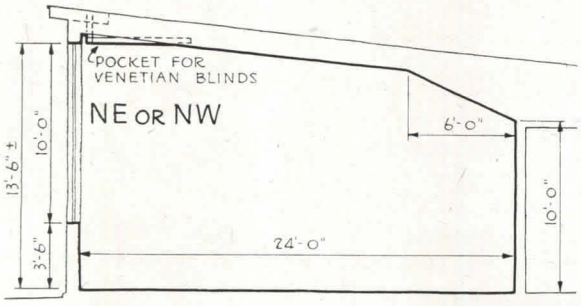
The question how best to relate daylighting design to the requirements of artificial illumination is not treated in this compilation. During the period of war restrictions, some new school units have been erected, even in courtyard situations, with no wiring whatever, and are said to have given satisfactory performance around the year in southern climates, by virtue of well-calculated design. Nevertheless this imposes very obvious restrictions upon the long-term use of the school, especially in view of the trend toward around-the-clock use by the community. Combinations of daylighting and electric lighting are often to be preferred to a strained effort to obtain optimum results under unfavorable circumstances by daylighting alone even for regular school hours. A superintendent remarks, "Since ——— School was built, artificial illumination in this district has increased by an average of about 150 per cent."

The systematic study of school daylighting might well engage the collaborative efforts of such agencies as state educational departments, the U. S. Public Health Service, and leading school architects, in order that the study of important variables now summarily treated might be reduced to order. A practical example of the kind of work that may be done in this direction, on a modest scale, is the study by Mr. Dalla Valle on a nomograph method of calculating interior illumination in relation to sky brightness. Pending collaborative scientific studies, it is suggested that architects follow the example of successful practitioners and test their ideas by small-scale models. These will, incidentally, yield results very useful in dealing with rooms other than schoolrooms.

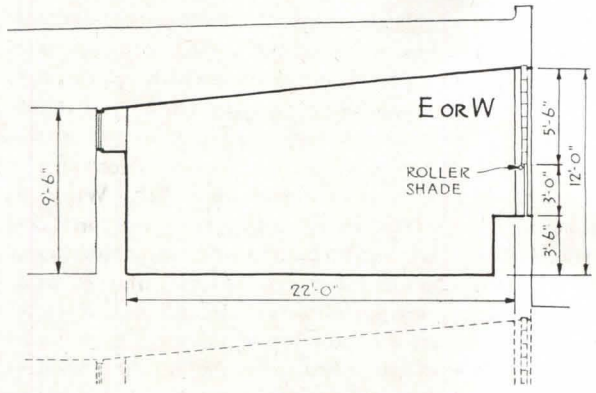
* The Committee consisted of Dr. Bursch, Mr. Clark Baker, executive secretary of the Sight Conservation Council of Northern California, Mr. Doyt Early, architect, Division of Schoolhouse Planning, and Professor Leland H. Brown, of Leland Stanford University.



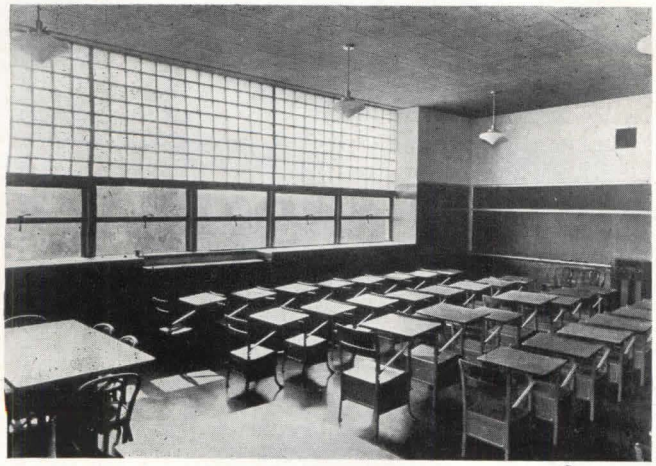
A. *Classroom plan oblong; glass area, 43.5% of floor area; lowest intensity, 44% of highest intensity. Brightness range, 113:1. Louvered horizontal sunshade. Oakdale School, California, Frank Mayo, arch't*



B. *Similar to Oakdale but with different orientation; extra ceiling slope not essential (see text). Ross School, Marin Co., California, Carl F. Grommé, arch't*



C. *Based on Kensington Junior High School, Maryland, Rhees E. Burkett, architect (v. American School and University Annual, 1943). No readings. Photo below shows existing classroom. Directional glass block are now available for such installations as this*



1. UNILATERAL LIGHTING

Economy still dictates unilateral lighting in most schools of more than one story and in most schools with central corridors. "Well designed" schools of the past, adhering to "recommended practice," have obtained about one-tenth as much illumination at the inner wall as at the window. In some of the solutions presented in this section, the ratio has been raised to nearly one-half, an improvement of about 500 per cent.

A. *Sloped ceiling, louvered awning*

This is one of several schools closely grouped in the San Joaquin Valley and reported on by Prof. Leland Brown of Stanford University after an inspection trip by members of a committee under leadership of Charles Bursch, Chief of the Division of Schoolhouse Planning.*

"The very highest levels of illumination encountered in the survey were found in this school, rooms in which the lowest illumination at the farthest desk was 100 fc. at 10 a.m. on a clear September day." This room showed an inmost row of desks with 44 per cent as much light as the window row. The brightness range was relatively one of the lowest: 113:1. Contributing factors: open surroundings, high ceiling at window, reflecting slope, high proportion of glass (.435 floor area), pipe mullions, window shaded not by solid roof overhang but by open louvers.

B. *Double ceiling slope not needed*

The architect generously reports that the second ceiling slope at the rear of the room has not justified itself, contrary to logical expectation. The ceiling pocket for venetian blind storage is an excellent idea because it permits simple manipulation and fixed louvers, assuring maximum reflection efficiency. Proportions of the room are very similar to Oakdale (above) but orientation is more northward. Comparison is, however, impossible because, subsequent to erection of the school, the town is reported to have rescinded permission to thin out the dark surrounding woods, which impair light at the source.

C. *Directional glass block*

Like other unilateral schemes, this is adapted to plans with central corridors, also to more than one story. Glass block are of directional type reflecting light to a sloping ceiling which, at the rear of the room, is quite low. Glass block as diffusing medium require little care, almost no maintenance, no manipulation. They create more brightness contrast than venetian blinds perfectly adjusted to shut out sky, but adjustment is rarely perfect and, when it is, the blind cuts down total light more than glass block. (For measured tests on both block and blinds, see appropriate titles in bibliography, page 83.) Directional glass block send more light to far ceiling.

Clear glass sash beneath the block preserve the view

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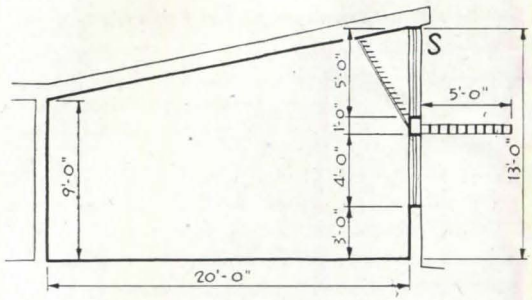
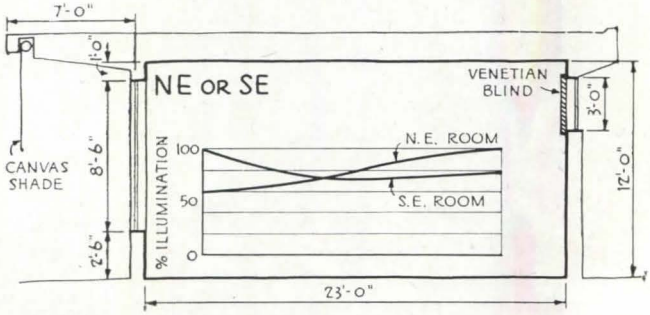
* *See Bibliography, page 83*

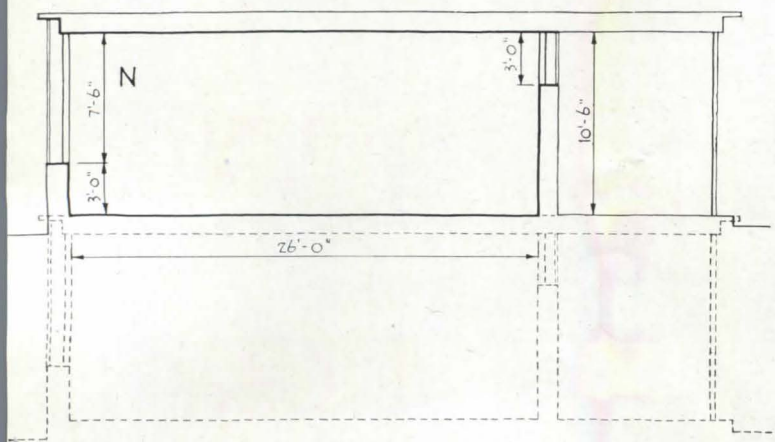


D. *Orientation reversed for nothern climate, to use sun warmth. Sloped interior louver panel (see text)*

***NOTE:** Diagrams are all shown at 3/32-in scale. Captions give information in whatever form it is available.* **Intensity** *of illumination reaching any desk (from directly above) is measured in foot-candles.* **Evenness** *of illumination throughout the room is measured in percentages, taking the most favorable point as 100.* **Brightness range** *is the ratio between the brightest and darkest values visible in any direction to a person in the room. Examples: an intensity of 15 fc. minimum is acceptable, of 25 fc. or more, ample. If the lowest intensity is more than 20% of the highest, the evenness is far better than average. A brightness range of 100:1 or less is highly desirable, but is rarely attained in schools actually built*



A. *In the case of NE exposure, open, lowest intensity is 60% of highest; brightness range, 360:1; for SE exposure, open, lowest intensity is 72.5% of highest; brightness range 725:1; for SE, shaded, remarkable evenness of illumination, with the lowest intensity 87% of the highest; brightness range not given. Fowler School, Cal., Franklin & Kump, architects*



B. *Shown as second story of a possible 2-story plan. Minimum intensity nowhere fell below an ample 25 fc. Exeter Union High School, Cal., Franklin & Kump*

for seated children; are supplied with roller shades for the short daily period of direct sunlight to outermost row of desks.

D. *Reversed for solar heating*

California architects are fond of large north windows for maximum diffusion. In northern climates this would turn the most vulnerable side of the school to the weather. Hence this proposal of our own to turn around the California scheme, put the lowest side of the building to the north, and profit by positive use of the sun for solar heating. Despite southern exposure of large windows, no direct light enters. Diagonal position of upper panel of louvers increases efficiency in throwing light to the back of the room.

2. BILATERAL LIGHTING

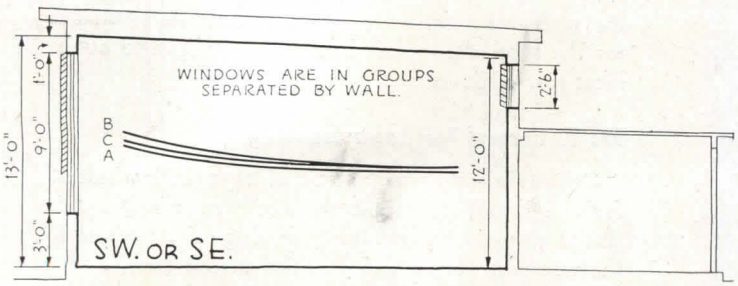
Bilateral lighting has been highly developed, with the purpose of a more even spread of light that can be secured by unilateral lighting at its best. Objectionable cross-shadows must be avoided by carefully diffusing the light from the secondary transom or clerestory windows.

A. *Level ceiling; solid roof projection shading the larger windows*

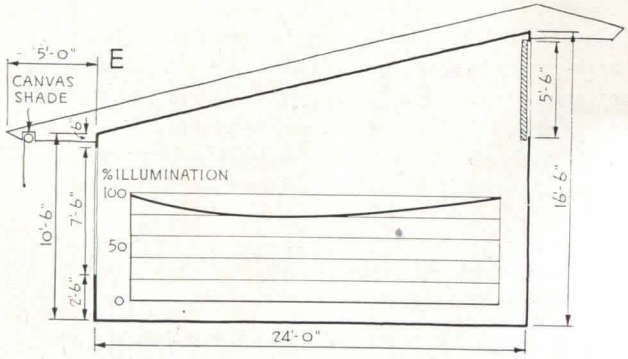
The illumination curve is noticeably more level than in unilateral types. Bright buildings in the neighborhood, and more southerly orientation for some of the rooms, introduced glare problems in this particular situation. Where windows face SE, very favorable evenness of illumination (see graph) was accompanied by excessive brightness range of 725:1. When the solid canvas drop awning, under the solid porch roof, was used to cut out glare, the *evenness* of illumination became almost perfect, while the *intensity* was lower but still very acceptable at 23 fc.

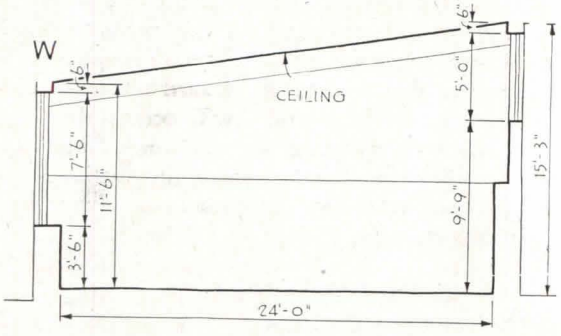
B. *Level ceiling, solid roof projection beyond transom windows*

Given the chance to face the main windows north, the same architects were able to work out a solution of extreme structural simplicity and involving no accessory controls whatever to be managed and maintained. The principal writes, "We consider our classroom lighting virtually perfect . . . No one has ever suggested an awning, shade, curtain, or blind on any classroom window. On the brightest days no one complains of glare. There is no glare." (Footcandle readings were not obtainable at publishing on a comparable basis with the other nearby schools.) In the cause of advancing the art, the architects themselves generously point out a very minor flaw not noticed by anyone else. A person standing at the extreme left of the room sees a small slice of bright south sky through the transom window. The proposed remedy is not reported but it would seem easy to obviate this condition by (a) raising the ceiling height which is unusually low and (b) setting a few louvers high up on the *porch* posts where they would cut off no useful light from the room.



C. *Based on Jenny Tucker Baker School, Mountain View, Cal., Kistner & Wright, arch'ts. Fc. readings in existing plan (1 ft. lower than shown) 39 to 21 fc. average. Windows are not full-length of wall; glass area in existing plan, 23% of floor area; in proposed plan, glass area would be approx. 29% of floor area*





Da. *(Upper diagram). Glass area, 54% of floor area; lowest intensity, 80% of highest. When the venetian blinds over transom lights are set for best illumination, brightness range is 300:1. Unusually high ceiling and steep slope; good elimination of cross-shadows. Shafter School, Shafter, California, Franklin & Kump, architects*

Db. *(Lower diagram and photo). War daylighting to serve in emergency, without artificial lights. Venetian blinds as controls in place of overhang and drop awning. Walter Colten School library, Monterey, Cal., Robert Stanton, architect*

C. *Maximum auxiliary shading devices*

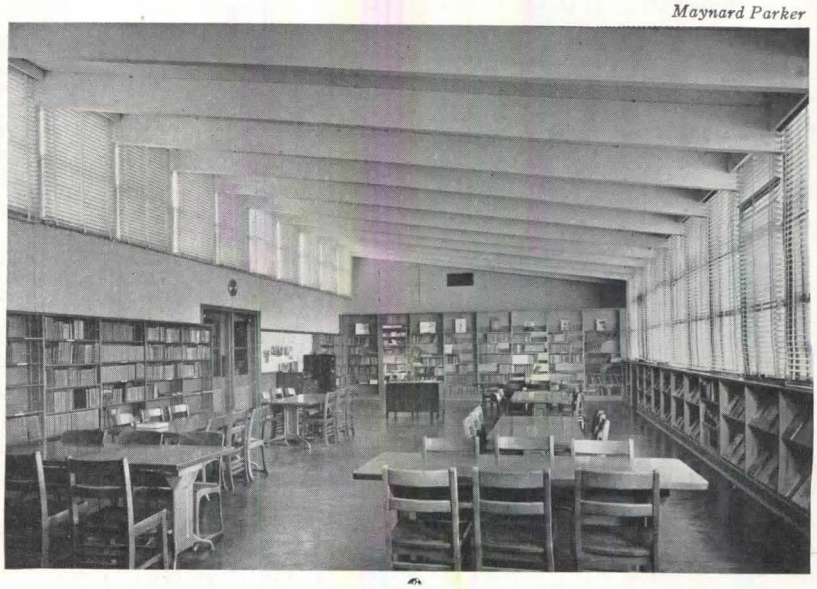
The drawing shows the building with modifications proposed by the architects on the basis of experience. Modifications include raising ceiling 1 ft. and introducing 6 500-watt silver-bowl reflector bulbs in concentric ring fixtures on photo-electric controls. Illumination in existing building shows a very level curve, and brightness contrast is reported low; but intensities are also low, partly because of a relatively small glass area (windows are intermittent), partly because of shading by blinds. The theory of over-all shading is that children do not need the view.

D. *Slope upward toward transom windows instead of main windows*

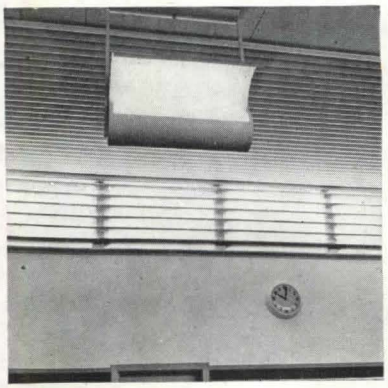
This school is interesting because the roof, instead of sloping downward from high main windows, slopes upward toward unusually high, large, transom windows. Even when maximum light was entering from the main, lower windows, illumination was best at the inner row of desks, reports Professor Brown. The combination of high large transom windows and the slope were such that with correct adjustment of the venetian blinds almost shadow-free illumination was provided, eliminating the objectionable cross-shadows usually encountered in bi-lateral lighting. Illumination curve was remarkably level. Because the sky was visible, the brightness range was moderately high at 300:1. Teachers preferred some visible sky to cutting off light. Venetian blinds, thinks the Committee, *should not be adjustable* because inexperienced teachers and janitors lost 17 per cent of possible light through poor adjustment. Blades should lock in optimum position. Again, the later type of open-trellis or awning louvers above the larger windows would perhaps have been an improvement over the earlier solid type of overhang and the canvas drop-awning shown here.

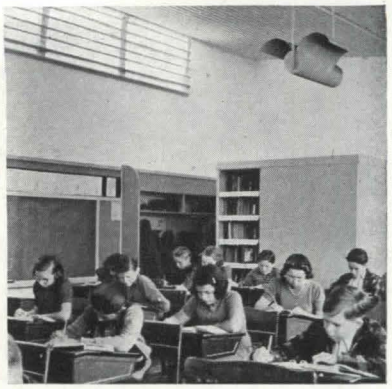
The second diagram shows the same general scheme, as used in a wartime school addition where dependence on daylighting efficiency is so complete that the architects have dispensed with artificial lighting for the duration, even though the location is in a court.

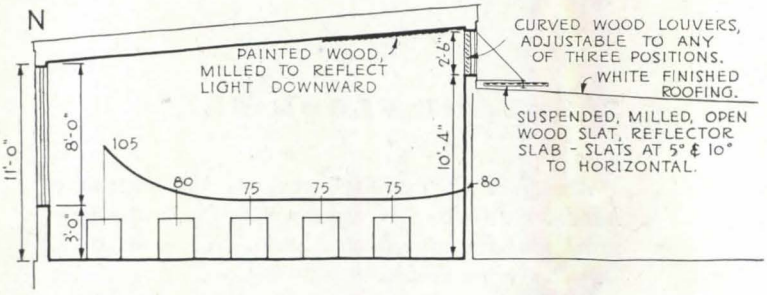
Maynard Parker



Louvers shown in photos can be set in any one of three calculated locking positions, reflecting light to ceiling. Milled board reflects it down, mainly to innermost seats where it is most needed. See diagram below, of San Andreas School





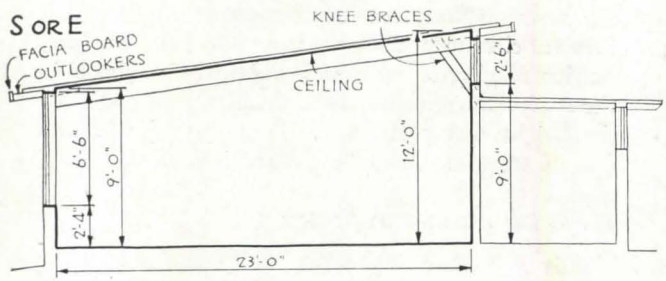


E. *An elaborate system of auxiliary daylighting by clerestory windows and reflectors. Photos above show the interior appearance. The scheme was developed by means of progressive models. Glass area is 45% of floor area; lowest intensity, 71.5% of highest intensity. San Andreas, Cal., George C. Sellon, architect*

E. *Low horizontal reflector outside*

This design makes a start toward employing an expedient other designers have generally neglected: the effect of bright low-level reflecting surfaces outside the building to throw light up to the ceiling. (In northern climates, incidentally, snow sometimes accomplishes this to perfection but in so doing adds a new variable.) The device consists of a milled reflector on the low corridor roof. There is a second milled reflector inside, under the ceiling (see photo).

Because the main windows face north, they require no shading controls. The illumination level is smooth and intensity good.



F. *Similar to E, above, but in a more northerly location and with reversed orientation. Fc readings, taken at noon, August, in room facing E, ranged from 100 or more to 60; in activity alcove, 100 or more to 20. Facia board held out from building on outlooker helps to shade the main windows in the morning, reflect afternoon sunlight into them*

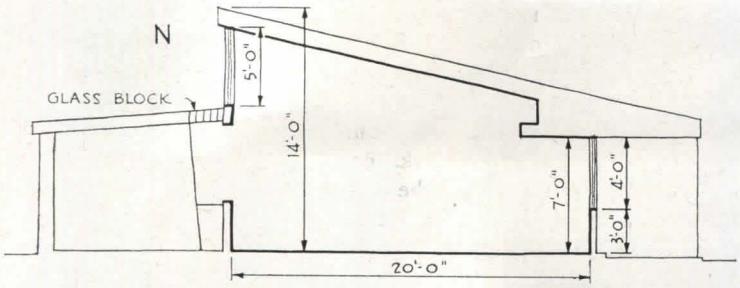
F. *Clerestory north or west*

In general scheme, this resembles E, with some changes in proportion fitted to a more northerly climate. The corridor roof has been faced with white asbestos instead of special milled board to act as an exterior reflector. In winter snow will occasionally do still better (but in areas of still greater snowfall, clerestory construction must be carefully handled to avoid leakage). Illumination level is good.

The use of a facia board, held away from the building on outlookers, as a shade against morning sun and a reflector for afternoon sun, suggests further development of such dual-purpose reflectors, at some distance outside the room.

Hedrich-Blessing

Photo shows the system in use, also the lighting fixtures. Rugen School, Glencoe, Ill., Perkins, Wheeler and Will, architects



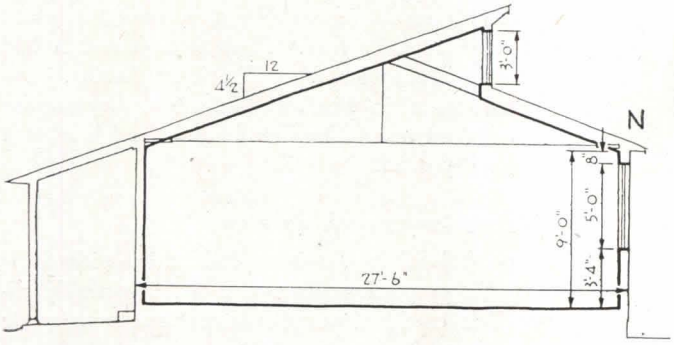
G. *Glass block, used as skylight in corridor ceiling, admit light down through the showcase underneath and diminish the effect of brightness contrast. Louvers or additional block would probably be needed at clerestory window to cut down sky glare. View windows to south require no control devices, being well shaded. Proposal by Richard J. Neutra in the March, 1944, issue of the* Architectural Record

G. *Clerestory north instead of south*

This proposal by a pioneer in bilateral lighting, presented in March Architectural Record, involves some very interesting possibilities. No manual shade controls or louvers are needed at the large clerestory windows, because these face north. Although they open a view to the sky there is no sudden brightness contrast, because additional light is filtered down into the room through the glass-block skylight immediately adjoining, and in through the showcase. There is lessened dependence on the south window for light; it gives a generous view. The overhang at this window is so low and wide that the bright southern sky is shut out and poses no problem of manual control.

3. SQUARE FLOOR PLANS

An effect of "activity" programs in education has been to elongate classrooms of average span until lengths have been obtained as great as 45 ft.—too extended for supervision. A solution has sometimes been sought by increasing depth instead of length, thus making the rooms more nearly square. These deep square rooms set a new daylighting problem for the designer.



A. *Light thrown well back into the room from high up, though maximum possible window area is only 29% of floor area. Readings not yet available. Montalvo Migratory School, California, R. S. Raymond*

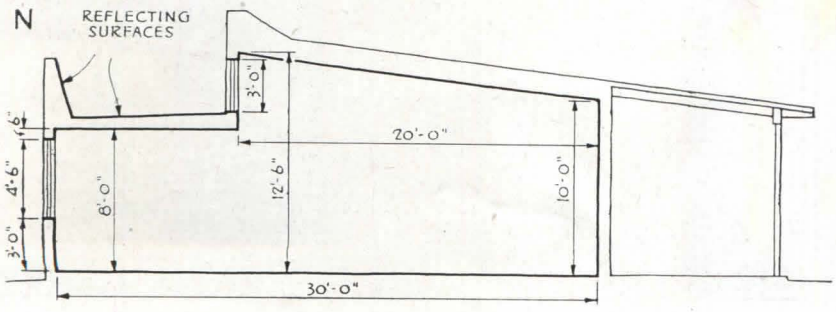
A. *Unilateral clerestory*

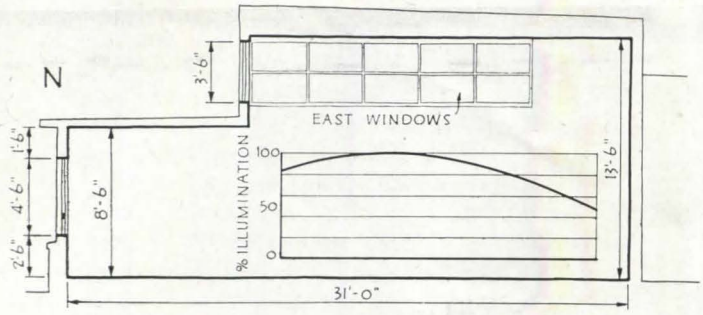
This design involves only the simplest and least expensive construction, yet brings light far back into the room. (Note that the arrangement, although it involves clerestory windows, is unilateral.) The proportion of glass is less than in most of the schools in the study (though well above the average school) yet the height makes it count. Both sets of windows face north, so no elaborate shading is needed.

B. *With parapet reflector*

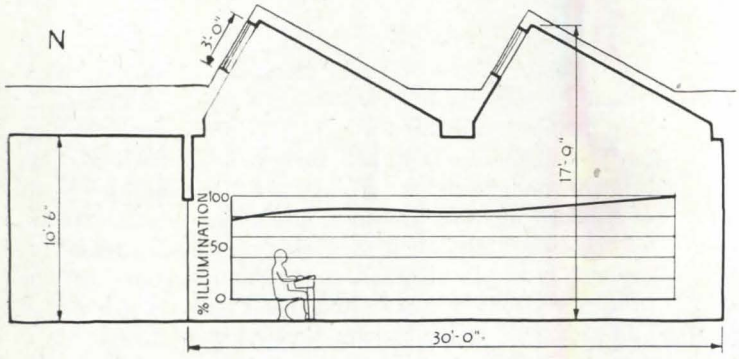
This is a most interesting and stimulating idea. The details would have to be modified in northern climates, where the low roof would act as a snow trough. The parapet is so arranged as to catch sunlight from the south and reflect it back into the room. The effect was measured for the Record by the superintendent, Mr. Frank F. Otto, who covered the parapet with black cloth on a clear day and found that this reduced inner-wall readings from 50 fc. to 30 fc. and 28 fc. In other words, the parapet accounted for better than two-fifths of the illumination at the far

B. *Parapet as a reflector is very effective, judged by fact that when it was blacked, readings at interior wall were reduced from 50 to 28 fc. On a clear March day at 2 p.m., intensity was virtually level at 50 fc., with a rise to 53 fc. at approximate center line. In December, at 1:45 p.m. with rain, the curve was: 8 ft. from window, 26 fc.; 18 ft., 45 fc.; 28 ft., 22 fc. Paso Robles School, Frank Wynkoop & Associates*





C. *A series of monitors, similar to those of factories, admit east as well as north light to the interior of the classrooms in this school. Clerestory windows extend across the full width of the north face, and across most of the east face, of each monitor, as shown. Each monitor is continuous with the south and east wall of the classroom to which it belongs, leaving an offset, low-ceiling area to the north and west. These areas are used for shop and library purposes. In the main area under monitors, lowest intensity is 57% of highest when shades are up. When venetian blinds are adjusted for maximum illumination, the lowest intensity is 50% of the highest. Under the first condition, the brightness range is 174:1; under the latter condition, only 15:1, but with the intensity much lowered. (See text). Avenal School, Cal., Frank Wynkoop and Associates, arch'ts*



D. *Factory sawtooth system Extremely high and level illumination, with the lowest intensity 84.5% of the highest, and with a minimum fc. reading of 28 as late as 5 p.m. on a clear September day. Teachers complained of glare for them. No view. Hanford School, Cal., W. D. Coates, arch't*

inside of the room. At 2 o'clock on this clear March day the intensity was absolutely level throughout the depth of the room except for a 6 per cent hump along the center line. The least favorable mid-December reading, taken during rain, still gave 22 fc. at the innermost row of desks, or 50 per cent as much as the highest reading in the middle of the room.

C. *A "monitored" effect*

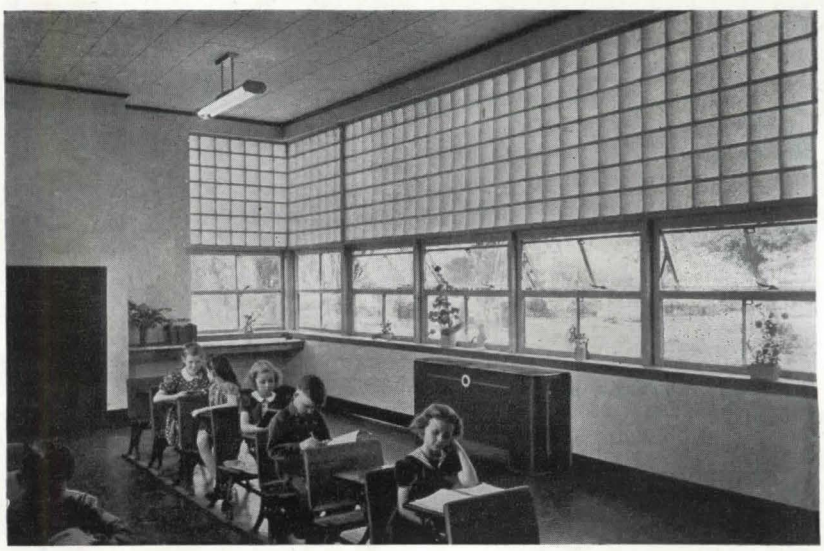
This design suggests factory monitors, except that the clerestory windows go around an angle instead of being opposite one another. Under the northern offset (next to windows) is the workshop area, and under the western offset is the library section of the classroom. Desks in the main classroom area face a blackboard on the south partition.

Light is best in the main classroom area and falls off in the library section where, in the farthest corner, the nearest light source is nearly 30 ft. distant. Artificial illumination has been installed here, under the low ceiling. In the main classroom, evenness of illumination is very satisfactory, and would be excellent if eastern clerestory windows were continued all the way to the front of the room.

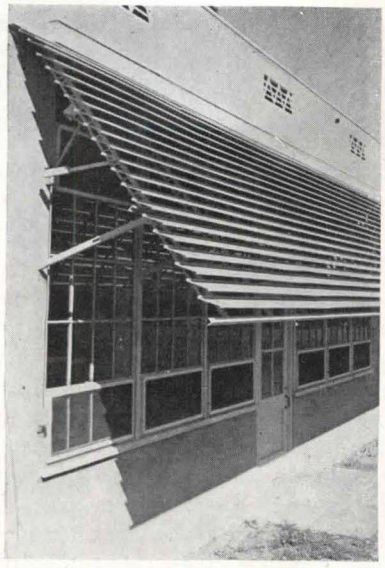
The brightness range in the main classroom area is admirably short. With shades up it is reported at 174:1, and with venetian blinds correctly adjusted, it is extremely favorable, at only 15:1.

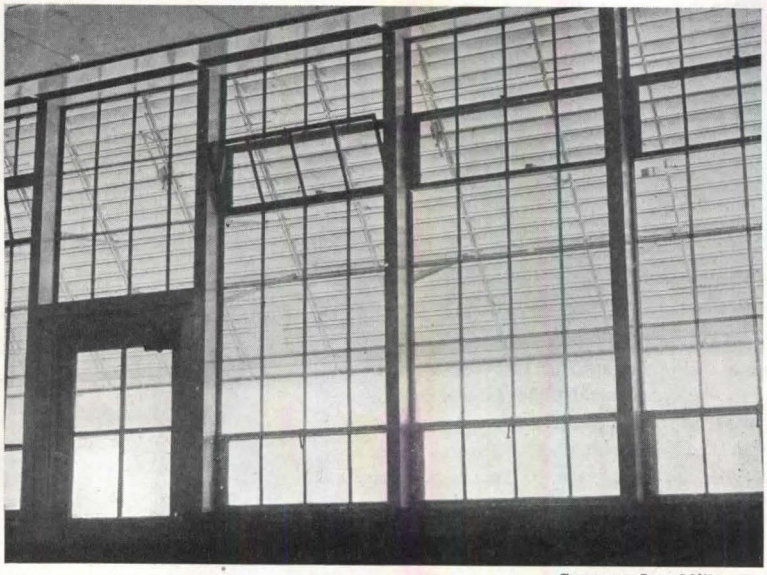
D. *Transverse sawtooth skylight*

As might be expected, for children facing south this design produces almost ideal evenness of lighting intensity (minimum illumination 84.5 per cent of maximum) and remarkably short brightness range (15:1). In Professor Brown's estimate, a fully adequate intensity was to be expected practically every day of the year. The intrinsic difficulty of such a design lies in unavoidable overhead glare for the teacher facing north, and exclusion of outside view (two conventional view windows in the outside wall were found objectionable in the lighting arrangement, and were covered.) One teacher had the skylights calcimined but this cut the illumination by half.

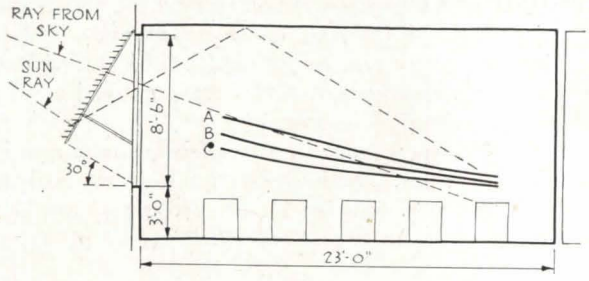


E. *Corner room in Gridley School, Illinois, Deal and Deal architects. A sawtooth plan could be used systematically to secure deeper daylight penetration*





Courtesy Lee Miller Co.



Illustrating the contention that slanted venetian awning with thin blades can (a) throw light farther back than a vertical blind because of the flatter blade angle, or can (b) shade out solar light and heat entirely. Best results are reported when blades are set to admit 1-in. slits of skylight (see section and photo at right). This produces intensities charted in line A, 93 fc. to 28 fc. Line B charts lower intensities with complete shading; line C, still lower, with sun obscured. R. S. Raymond, arch't

SUMMARY OF DAYLIGHTING FACTORS

WITHOUT TOO much difficulty, many architects have made their own experiments with models. This has enabled them to take into account many more factors than are covered in most of the general surveys. In rapid review, here are the main variables involved: five external ones pertaining to the environment, and seven internal ones that represent choices in design.

A. *Environmental Factors*

1. Sun arc. Heliodrons are purchasable to reproduce sun angles for any latitude and any time of day and year. A home-made heliodron may be constructed, if one remembers that the polar axis, north of the equator, is tilted 18° away from the sun December 21st, 18° toward it June 21st. The sun arc, of course, determines the possibilities of direct sunlight in the building.

2. Sky brightness. This varies greatly, according to time of day, conditions of overcast, geographic location, and position of the particular segment of sky vault visible through a window. Sky brightness is a major factor determining the amount of diffused light available for the room; it also determines the amount of window glare that may have to be shaded.

3. Reflections from surrounding buildings and grounds. This is a purely local site factor. Failure to take this into account may result in adoption of a design that has been excellent elsewhere but will fail here. Positive use can be made of a strong reflection factor in roofs, pavements, or grounds immediately adjoining the building, by designing for re-reflection from the ceiling. Snow, incidentally, introduces a wide variation not to be forgotten.

4. Climate. Other climates than the southwest offer splendid opportunities for new daylighting solutions, if only architects will be alert. In California, for example, north windows are greatly preferred for diffusion of brilliant sunlight and for coolness; in Minnesota this kind of window might be the worst, and a large south window might be used with the new shading controls, for its factor of solar heat. Incidentally, neither in discussion nor in practice relative to solar heating has nearly enough attention been paid to the extreme importance of shelter from wind for large solar windows.

5. Adaptation to lot. This may necessitate an orientation not ideal, may demand compensatory devices.

B. *Building Design Factors*

1. Building height. Multi-story schools are usually characterized by central corridors which enforce unilateral, not bilateral, daylighting solutions. High ceilings are not economical here, and therefore more attention must be paid to efficient reflection of unilateral light far back into the rooms. A possible solution not yet exploited is a two-story building only one room deep (see page 77).

2. Floor plan of rooms. Classrooms of normal 24-ft. span may have lengths from 30 to 45 ft. A new trend is toward enlargement in depth rather than length, yielding rooms approximately 30 feet square. These usually demand auxiliary clerestory lighting.

3. Ceiling height and slope. Light entering at the top of the window is perhaps three times as useful as light entering at the bottom. A sloping ceiling more efficiently diffuses "horizontal" light from the window down to the

working plane of desks. When the system is bilateral, transom light directed against a matte sloping ceiling is diffused, makes no pronounced cross-shadows. However, by raising the whole ceiling to the high level instead of sloping it, more light may be gained through enlargement of windows opposite. Therefore some authorities prefer a high, level, ceiling for bilateral lighting.

4. Interior finish. Recommended reflective factors are 80 per cent at ceilings and upper walls; 65 per cent above chalk boards; 50 per cent at pinning boards; and 30 per cent (in place of the customary 8 to 10 per cent) at the chalk board itself.

5. Horizontal continuity of windows. Discontinuity is one of the most objectionable sources of sudden, extreme brightness contrast between the windows and the intervening wall. It is now generally considered better practice to continue windows to the front of the room, leaving no blank wall next the chalk board to create a pocket of darkness where relative reflective value is already low. Any veiling fog on the board may be controlled by louvering arrangements.

6. Shading and diffusion devices. Where possible, the preference is strongly for design requiring no special construction (requiring maintenance) or adjustment (requiring operation by teachers who, again and again, have been proved too busy). Shading devices, introduced where necessary, are either exterior or interior: exterior ones cut down solar heat before it enters through the glass, interior ones permit its entry; either condition may be desired, according to climate. In operation, there are three general types: solid (roof overhangs, drop awnings, heavy window-shades); louvered (fixed or movable awnings, venetian blinds, or window-shades composed of narrow wooden strips); or translucent (diffusing glass, glass block, thin fabric shades).

At the exterior, the California committee expressed strong preference, in general, for open louvered overhang arrangements rather than solid ones, because the latter were said to cut off all light from the valuable top of the window. In any louvered arrangement, careful positioning of the blades is required; in venetian blinds the committee recommended the thinner blades and proposed manufacture of types with pre-set locking positions instead of freely adjustable ones. Blades set to exclude all direct sky view reflect too much of the light to the near part of the ceiling; a compromise must be struck, involving some skyview seen between blades, for optimum performance.

In tests with various types of interior shades in California, differences in illumination throughout a classroom with no shades were brought down from 10:1 to 3:1. White cloth shades provided the highest general level of illumination of all devices tested, but at the cost of the highest brightness contrast at the window itself. They were considered suitable only in positions not exposed to direct sunlight. A type of shade consisting of relatively narrow wooden slats beveled to reflect light to the ceiling was found to be best suited to bright locations, i.e., south and west exposures. Even then it was thought that they should be provided with a lowering device so that on dark days the upper part of the window might be exposed. "The best compromise between glare and room illumination for all shading devices appears to be when the upper two feet of the window is open, and the balance is covered by shade."

In northern climates with less sky brightness, more stress might be placed on the milder, translucent devices. It is too bad that the California tests provided no data on diffusing glass or glass block. Block are now manufactured in a design that operates prismatically to reflect light upward to the ceiling for re-reflection. Such reflective block are started at a height of approximately 6 ft., above ordinary diffusing block carried to that height.

7. Artificial illumination. Recommended optimum ceiling heights for daylighting, about 15 ft., are suited to either prismatic downlight or indirect light, the former perhaps more efficient, the latter perhaps more economical. In square plans with clerestory, special attention must be paid to illumination of the part with lower ceiling. Photocell control of electric lights as auxiliaries in dark situations is highly recommended.

Selected Bibliography. Leland H. Brown: The Control of Natural Light in Classrooms (deals with shading devices), Illuminating Engineering Society Transactions, Je., 1939, vol 34:606-620; The Design of Classrooms for High Level Daylight Illumination, IES Trans., Mar., 1941, vol. 36:411-424. Ives, Knowles, and Thompson, Daylight in Buildings, U. S. Public Health Bulletin No. 218, April, 1935. Rapp and Baker, Daylight Illumination of Interiors Fenestrated with Glass Blocks, IES Trans., Oct. 1941, vol. 36:1129-1156. Kimes, Survey of Sch'l Fenestrat'n (master's thesis).

GRAPHIC ESTIMATING OF DAYLIGHT

*By J. M. Dalla Valle**

THE ARCHITECT frequently desires information regarding the amount of daylight illumination which will be provided by windows of a given size. Conversely, he wishes to determine how many windows must be provided in a room to secure a given amount of daylight illumination. The accompanying nomograph and table furnish a simple means for obtaining the answers to both of these problems.

It is obvious that building orientation, time of day, latitude, altitude, and sky conditions are important variables affecting the light received within a room. We may simplify these variables considerably, however, in the following manner. We are generally interested in ascertaining the minimum amount of daylight illumination received in a room under extreme conditions. Hence, we may consider the illumination in a room having a northern exposure at 4 P. M. on December 21. Sky-brightness data in relation to light received through northerly-exposed windows are available for this hour and day. These data are combined in the nomograph and table. The latter

* *Research Director, American Air Filter Company, Inc. Method based on the work of Ives, Knowles and Thompson, Studies in Illumination, Public Health Bulletin, No. 218, U. S. Public Health Service, Washington, D. C.*

gives the brightness of the whole clear sky for different latitudes and areas of the United States at 4 P. M. on December 21, and establishes the criteria for determining the *minimum* daylight illumination at any point in a given room. Hence, the *maximum* dimensions and number of windows required are determinable from the table and nomograph.

In the nomograph, the scale of illumination received from a window (assumed unobstructed) makes allowance for dirtiness. It further assumes that the windowsill is roughly three feet from the floor and that the interior walls and ceiling of the room are white.

Provided that the sky-brightness is known or that there is no direct sunlight received through the window, the nomograph may also be used to determine illumination at any time of the day. If the window is obstructed, the solid sky-angles for the window may be determined, divided by 4π ($= 12.57$), and multiplied by the total sky-brightness at any hour to obtain the approximate amount of light received from the sky.

The use of the nomograph is best illustrated by the following examples:

EXAMPLE A

In a factory room located near Boston, Massachusetts, are two windows, each having a width of 5 ft. and height of 6 ft, and spaced 4 in. apart. What is the *least* amount of daylight illumination to be expected at any time up to 4 P. M. on a cloudless day at a point 18 ft. within the room:

1. Number of window heights to the point in question within the room $= 18/6 = 3$
2. Window width $= 2 \times 5 = 10$ ft.
3. Locate point 10 on *A*-scale and point 3 on *B*-scale.
4. Connect points *A* and *B* and draw line to intersect C-scale. C-scale reading $= 0.039$.
5. The value 0.039 is the ratio of the room illumination to the sky-brightness.

Refer to table and since Boston is latitude 40° (approximately) and is an eastern state, obtain value of sky-brightness of 120 candles per square foot. Hence

$$\frac{\text{Room illumination}}{120} = 0.039$$

Hence, room illumination at point 18 ft. in the room is $0.039 \times 120 = 4.7$ candles per square foot. Ans.

EXAMPLE B

Determine from the data of the above problem how high the windows must be in order to obtain at least 10 candles per square foot at the point in question:

1. $$\frac{\text{Room illumination}}{\text{Sky-brightness}} = \frac{10}{120} = 0.083$$
2. From the point on this *C*-scale for this value connect with the value 10 on the *A*-scale. The intersection of this line on the *B*-scale gives 1.8 and this is the ratio of the distance of the point from the window to the window height, that is

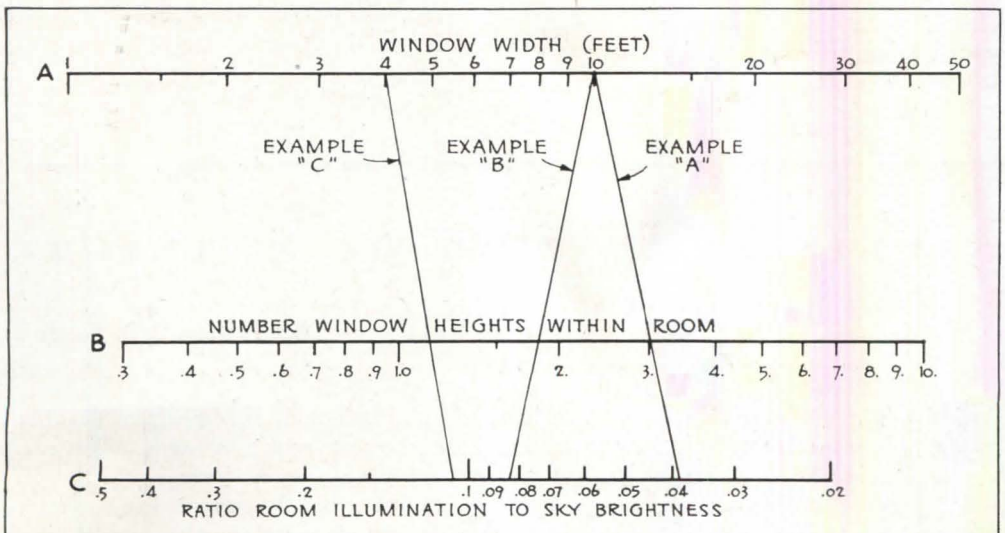
$$\frac{18}{\text{Window Height}} = 1.8$$

Hence, the window height must be $18/1.8 = 10$ ft.

EXAMPLE C

If the window height is fixed at 6 ft. and it is desired to obtain at least 30 candles per square foot on a clear day at a point 7 ft. from the window in a room located in latitude 35° in the western-plateau region, what is the minimum window-width which will achieve the required illumination?

1. Sky-brightness for latitude 35° in Plateau States is 270 candles per square foot (from table).
2. Point required on *C*-scale is therefore $30/270 = 0.11$
3. Point on *B*-scale is $7/6$ ($= 1.2$)
4. Connect the point on the *C*- and *B*-scales and draw line extending until it intersects with the *A*-scale. This gives the window-width, 4 ft.



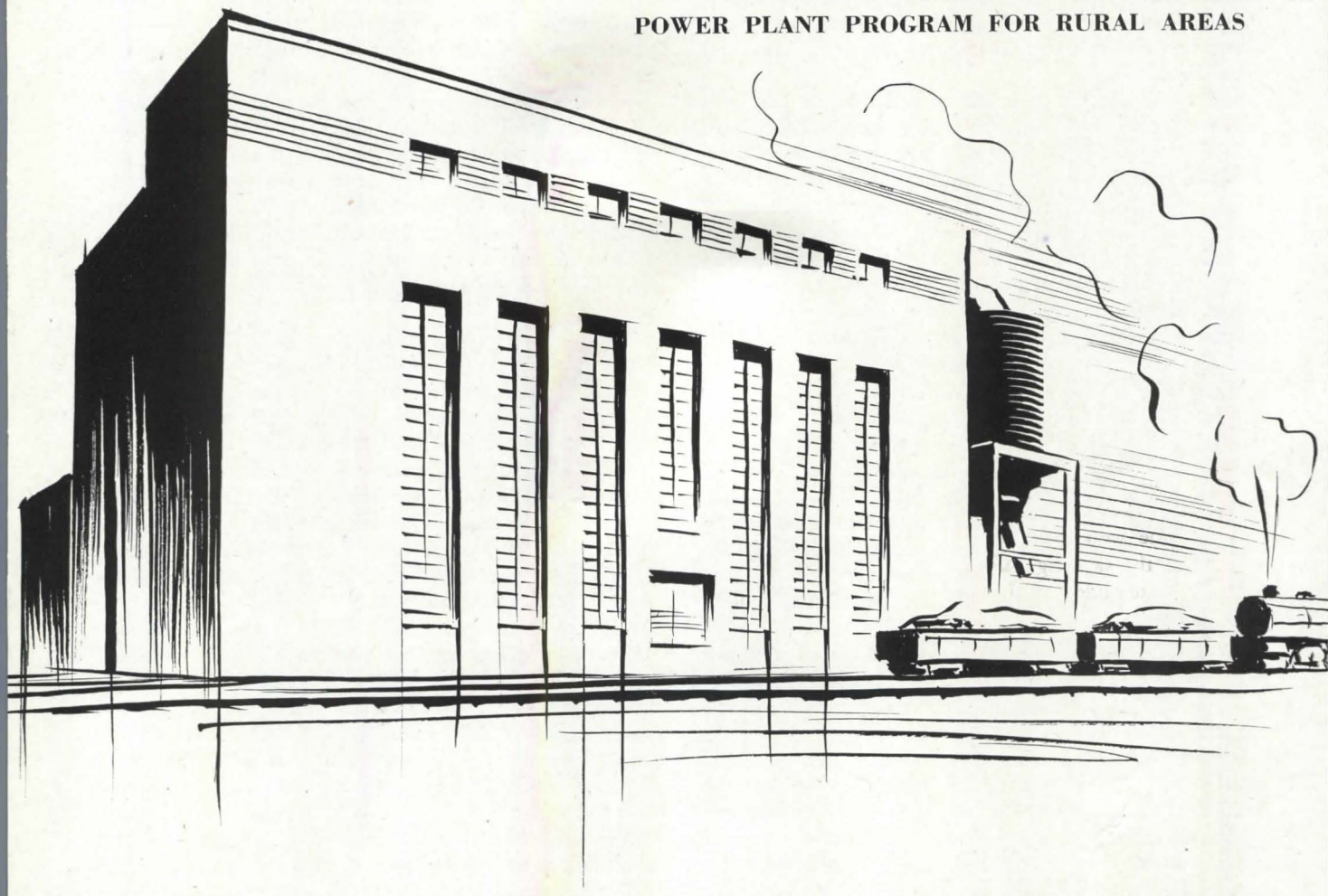
AVERAGE BRIGHTNESS IN CANDLES PER SQUARE FOOT OF THE WHOLE CLEAR SKY, ACCORDING TO LATITUDE, AT 4 P.M. ON DECEMBER 21 FOR DIFFERENT REGIONS OF THE UNITED STATES.

REGION \ LATITUDE	30	35	40	42
EASTERN STATES	180	170	140	120
PLAIN STATES	235	220	180	160
PLATEAU STATES	290	270	215	180

POWER PLANTS

Architectural Record's Building Types Study Number 89

Prepared in Collaboration with POWER PLANT ENGINEERING



Anybody inclined to worry over the architectural future might just pause to remember the many types of buildings which in recent years have emerged from a back-alley limbo into the realm of enlightened design. Power plants are a notable example, as this collaborative study bears witness. Perhaps design improvement came from the inside outward, starting with technical advancement in methods and machinery, and finally getting mixed up with those intangible but powerful considerations of pride of workmanship and of ownership. At any rate, power plants now offer further proof that industrial progress always demands more and better design.

This editorial collaboration with *Power Plant Engineering* testifies to the recognition of that fact in technical as well as architectural circles. Engineers know something of good design, and they like it. And they find a nice parallel between logical layout, well chosen materials and finishes and inspiring appearance on the one hand, and good operating results on the other. Thus Architectural Record and *Power Plant Engineering* join in presenting some advances in technical and architectural design, to a joint audience representing ownership and operation as well as design.

ARCHITECTURE AND THE POWER PLANT

By F. A. Fairbrother, Associate

Albert Kahn Associated Architects and Engineers, Inc.

As THE power house is such a vital element in any industrial enterprise, it is entirely fitting that it be treated architecturally with the dignity and respect due its importance. It must be remembered that the power house is very close to the heart of the manufacturing operation, and should thus be especially close to the heart of those responsible for the success of the whole enterprise. That it works this way is well known to any architect or engineer who has attended the final inspection of a well designed, clean, efficient plant. The pride of the owners and their operating engineers is very evident; one will hear enthusiastic discussions of even such details as interior finishes and color schemes.

Sometimes the power house or boiler house has been quartered in a very unprepossessing structure, and we believe it would follow naturally that results from operations would likewise be uninspiring. Considerations of pride, esprit de corps, and of emulation permeating all departments should result in the provision of adequate, commodious and well designed space for this department.

The architect specializing in power houses must, of course, condition his thinking to the fundamental economic purpose of the project immediately on his drawing board. The profit motive is the sole reason for its being, and the architect who adds unnecessary cost for the sole purpose of architectural embellishment is not doing his best either for his client or for himself. It is, however, a tenet of this organization and its founder that the proper study of proportion and mass, the suitable choice of materials and proper placing of openings will lead to a successful architectural result with little need of applied embellishment. The cost of the buildings so studied has been found in our experience to be no greater than for those on which no care has been given to design.

Within the broad confines of economic and technical restrictions is a wide opportunity for individual initiative and ingenuity in achieving balance and harmony with the properties at hand.

It has been said that one cannot do much, architecturally, with a coal pile. But the same coal stored within the building, raised to the proper height in a coal bunker and housed in a well designed exterior will become a vital and interesting feature of the building. Similarly, equipment which cannot feasibly be housed within the building, such as ash storage silos, air receiver tanks, cooling towers, overhead pipe bridges and like items, cannot by any stretch of the imagination be thought of as beautiful. The power house architect must regard them as a part of the whole conception of power production. He must try honestly to mitigate the stern necessity for their presence by a careful attempt to locate them in proper harmony to the whole and to play up such features as may contribute to a well proportioned ensemble.

To accomplish such a commendable result requires the combined efforts of both the designer of the power house as an efficient mechanical instrument, and the architectural designer seeking for harmony of mass, color and texture.

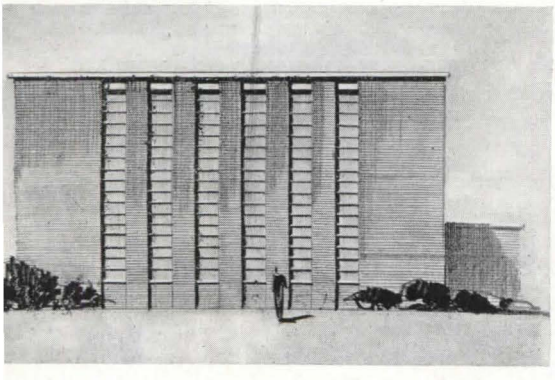
The interior of the power house is not a place to indulge in "architectural" features. The finest sort of utilitarian equipment, however, being of most functional use and character, is also good architecture. The greatest interest, of course, within the power house will be the equipment.

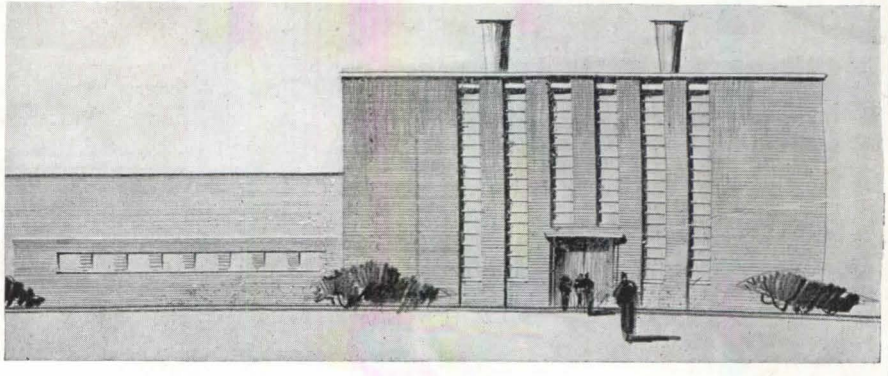
The interior walls can be treated with light and easily cleaned surfaces. The usual thought must be given to the study of proper proportion and of interesting and practical materials.

One question certain to come up in any discussion of the postwar trend in industrial architecture is the matter of window versus windowless plants, particularly power houses. Certainly as many (and probably more) power houses have been built with windows as without them. To this writer there appears no good reason why these buildings should not have windows, and many times both interior facilities and exterior design would seem to require them. However, large areas of inaccessible windows, lighting only the upper levels of boiler-room walkways or coal bunkers, would seem of little value.

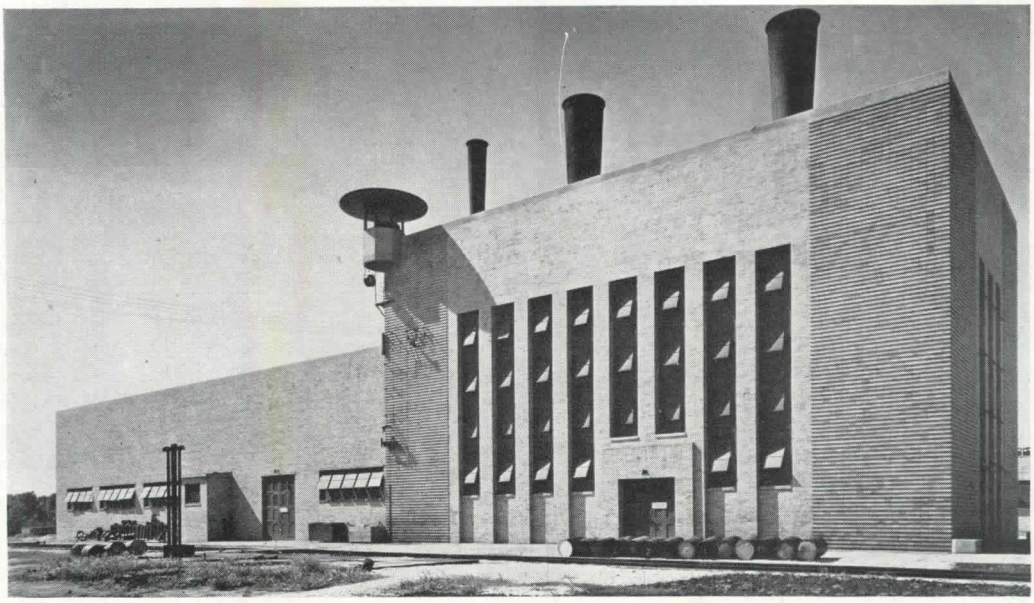
Blackout restrictions imposed early in the war dictated many cases where windows had to be omitted, and I do not believe it would appear from an examination of illustrations in this special section that the architectural design of power houses suffered from this limitation. It will be noticed that in some cases we built in window openings and blocked them in, so that sash can be installed after the war.

Whether power houses in the future will be built with or without windows will depend largely on the trend in the entire manufacturing area. Some research experts foresee the entirely windowless plant taking precedence





Hedrich-Blessing photo



Power plant for the Amertorp Corporation Forest Park, Ill.

in the not distant future. The Albert Kahn organization has taken no arbitrary stand on the question. There are human factors involved which have not yet been properly weighed. There certainly are psychological reasons why some glimpses of out-of-doors would be desirable.

Louis Kahn, head of our company, tells an interesting story about the labor reaction to one blackout plant we designed and erected to government order. The plant was opened in mid-winter and there was little employee reaction to the opaqued windows. But in the first balmy days of spring, window breakage went up alarmingly during the dayshift hours. Special vigilance disclosed that whenever a guard's back was turned, a man at the bench would pick up a wrench or other heavy object and hurl it through a window. They wanted the feel of that outside air. The human equation is having a constantly greater influence on the trend of industrial architecture. Another new influence is the airplane.

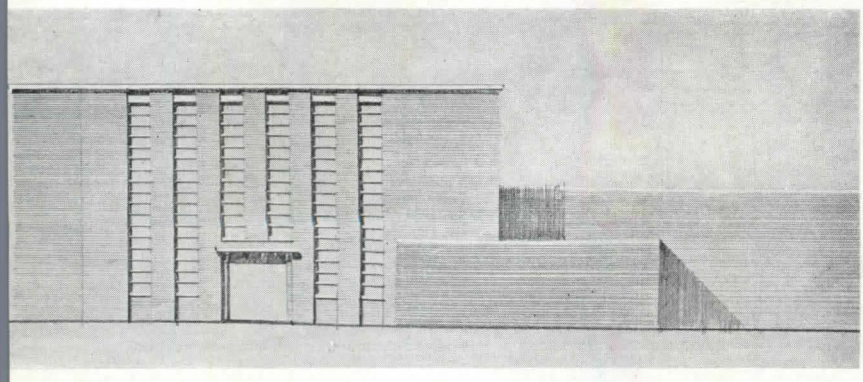
The tall masonry or steel stack has been replaced in many cases by shorter, funnel-shaped, induced-draft stacks. A certain element of strength seems lost when one of the typical and certainly most functional features of the power house is missing. Practical considerations dictate such matters. It is, of course, necessary that tall stacks be eliminated in the vicinity of airfields.

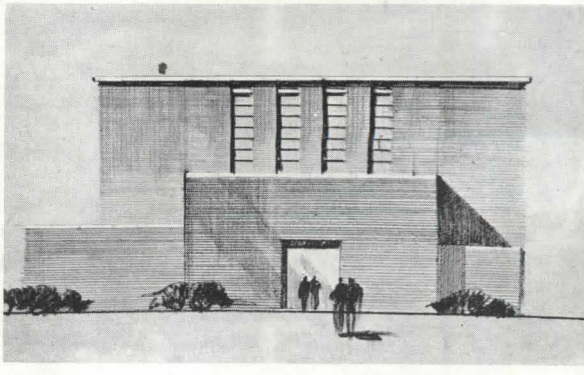
It is true that some of the operations enclosed in the typical power house could be successfully carried out in the open, for example the oil refinery and its maze of stills, tanks, balconies and ladders. But it is equally true that compressors, turbines and other equipment of a like vulnerable nature cannot be left out at the mercy of the weather.

Inasmuch as we must have a power house building, it is well to include within the walls as much of the equipment as can properly be installed there. Some items of equipment, on the other hand, often cannot feasibly be given space within the building. The architect must be content to dispose of them in as reasonable a manner as circumstances will allow.

In spite of the repetitive character of features making up the usual power house, opportunities for originality in the design studies of these problems are not by any means exhausted. An interesting problem was presented in a power house built recently as part of an industrial plant in the south, and a few of the sketch studies for this building are shown herewith. Rough studies of the sort shown, made quickly, help immeasurably in development work.

The whole trend of industrial architecture, it seems to me, whether power plants or the general manufacturing area, will be influenced by so many variable factors that any arbitrary predictions and definitions are pointless. Those industries which have given industrial architecture its greatest impetus have always been characterized by an open mind. That is an attitude commended to every man in this profession.





PROCEDURES IN POWER PLANT DESIGN

By F. A. Fairbrother, Associate

Albert Kahn Associated Architects and Engineers, Inc.

DESIGN of a power house must be considered as a cooperative enterprise between the architect and the power engineer, and the closer the cooperation can be, the better will be the result. The architect will understand, of course, that in power plant work he will not have much freedom in the sizes and disposition of forms and masses. His task is to house a multitude of large and complicated equipment, and his work will go smoothly only if he coordinates it fully with that of the power engineer.

In our own organization the preliminary layout of the power house and its equipment is the responsibility of the power division of our mechanical department, since here we have worked together for years, and we know the power engineers will consolidate their ideas into a form that can be developed into a reasonable building.

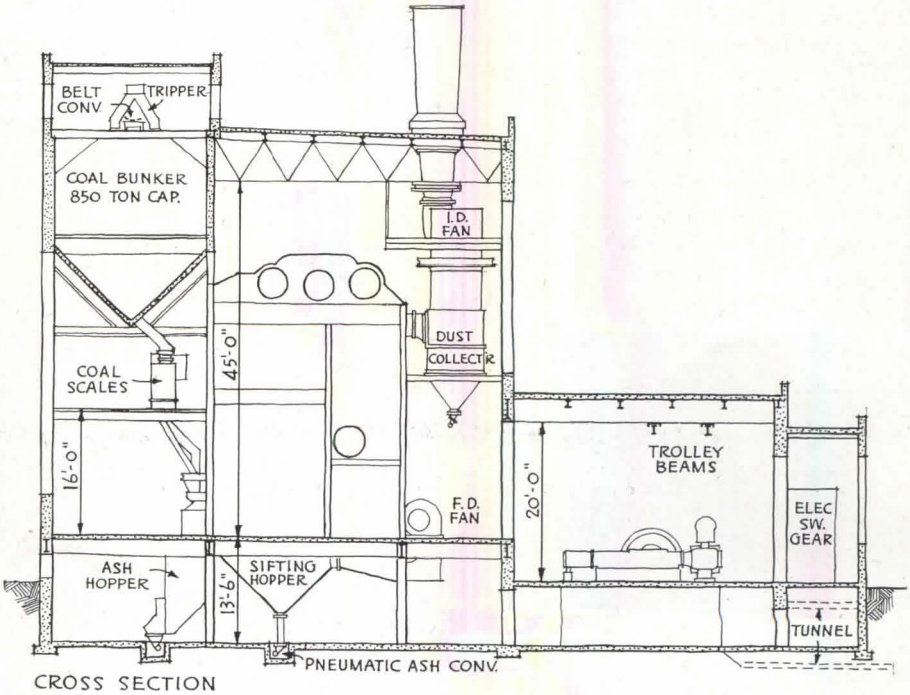
It would seem that it is of great advantage to have the department charged with such layout an integral part of the whole organization, as it enables the different department heads to confer at will and not be dependent on occasional interviews as would be the case if the work were carried on by separate organizations.

Together this team (architects and engineers) will confer with the client's plant engineer to learn just what is desired, and to decide on the types of boilers, blowers, compressors and mechanical handling, etc. In some cases, also, the refrigeration units will be installed as part of the power or boiler house units.

From this conference the engineer will prepare estimates of cost of the recommended equipment, together with sketch plans and sections showing the arrangement and clearances required for the proper functioning of the equipment and from an operational standpoint. The architect up to this point has had little to do with this preparatory work, but he will now confer with the engineer and consider the necessity of the different requirements as outlined. The architect in general will accept the engineer's recommendations, unless he sees a conflict with the plant's future development, difficulty in bringing in oil and services, or feels that the location can be improved for better functioning. Minor changes can be made, but in general the architect will design the building along strictly functional lines.

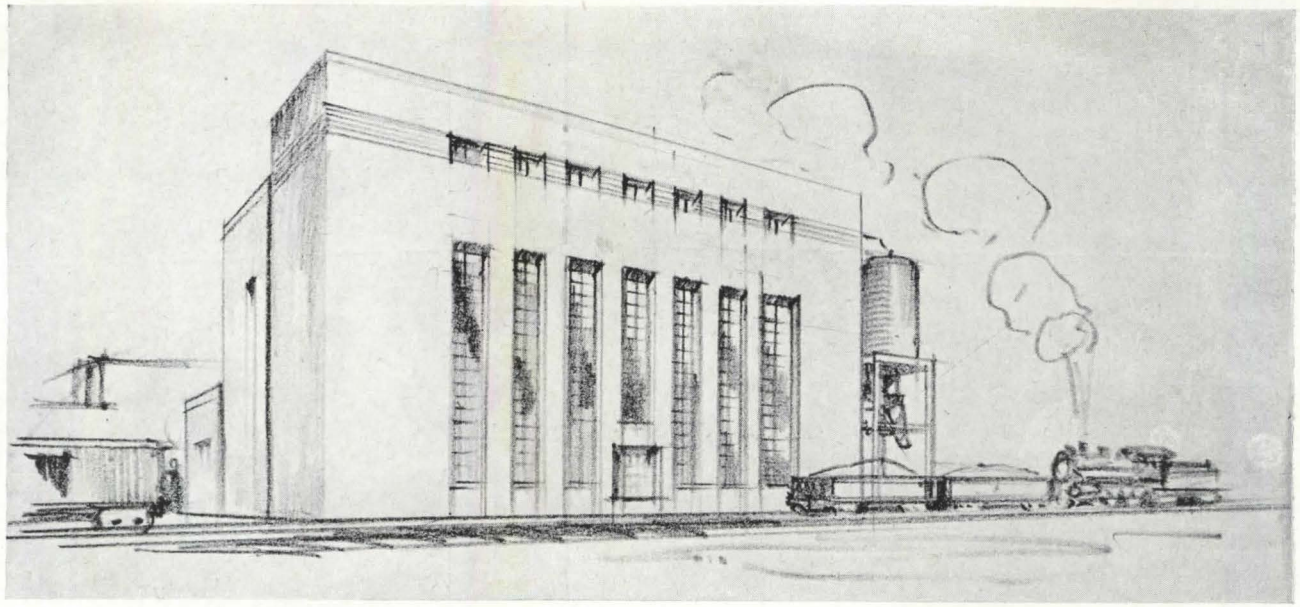
A perspective should be prepared and estimates made of the completed structure, including all trades and equipment. It is well at this stage to prepare comparative costs for oil and coal to be submitted for the owner's approval. The plant engineer is thus able to give his approval and the "go-ahead" for the work. It is now the duty of the design engineer to send out plans and specifications for equipment bids, and until such equipment is actually purchased there is little more the engineer or architect can do. So much variation will be found in the size and types of boilers, stokers, oil burners, pumps and compressors, generators, etc., that it is not feasible to make working drawings for such a building until the equipment is purchased and drawings for the equipment are in hand.

It sometimes happens that such pressure develops to get ahead with working drawings of the power house and to try to fit the equipment in afterwards, that the attempt is made. This may be because preliminary bids must be taken or other factors are compelling. The result is always the same. So many changes are required that the plans must be practically made over, and the office budget for getting out the job takes a severe wallop. Such conditions were especially prevalent on war jobs where used equipment had to be installed.



CROSS SECTION

Architectural design begins when the power house equipment has been decided upon; in fact Kahn designers usually wait until the equipment has been bought. Here are plan and section, prepared in the Kahn office by the power engineering department, which delineate the planning problem for architectural designers. Some changes can be made for architectural orderliness, but these drawings set forth the basic problem. These are for a power plant now being designed for construction after the war

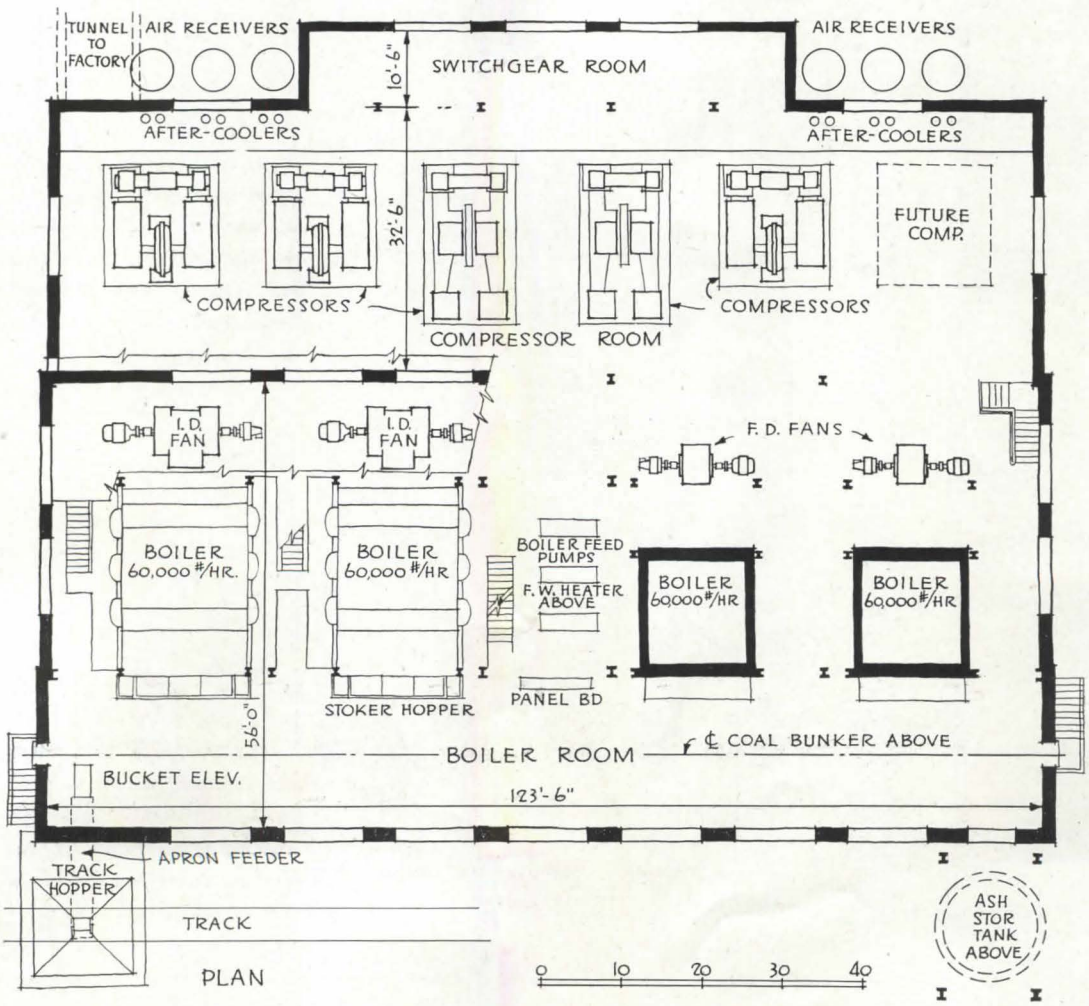


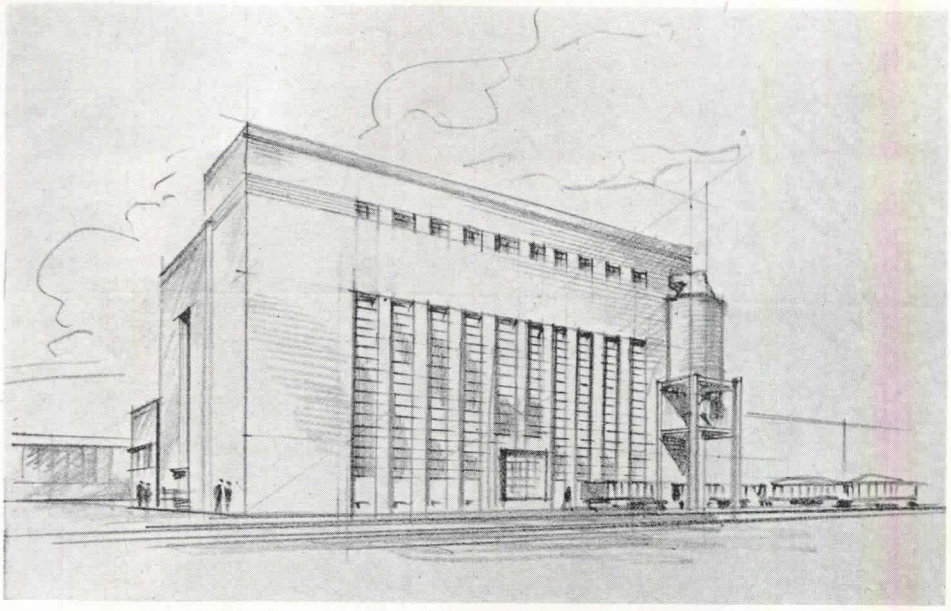
One of the preliminary studies for the postwar power plant shown in plan and section below

It is easy to see why bids must be taken for equipment even before starting working drawings for the building.

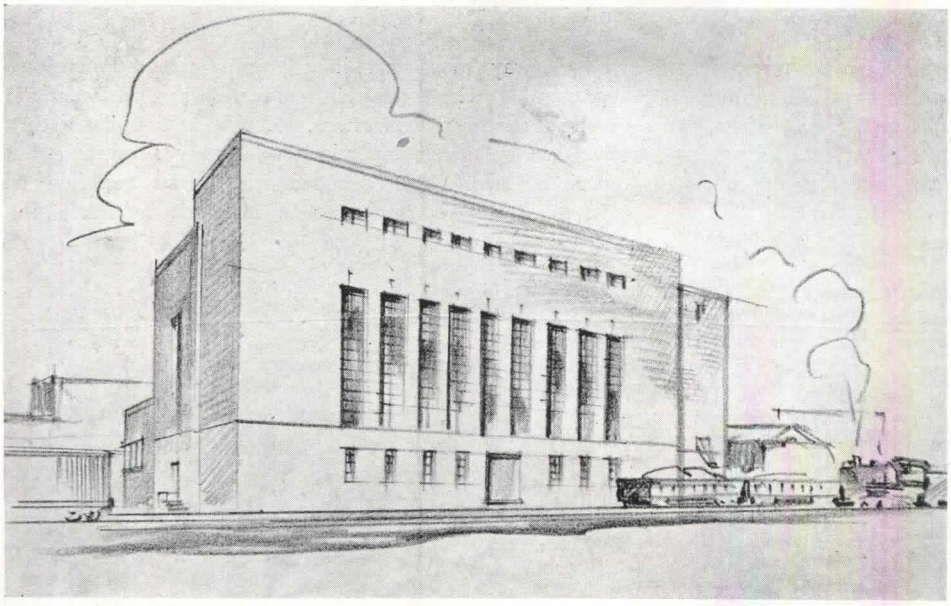
Meanwhile the designers' room is busy making studies of the building, developing proportions in mass, fenestration and detail. These studies will involve, of course, further consultations with the power department to find what leeway may exist in changing room dimensions.

Shown herewith is the plan and section of a project as laid out by the power department. It will be noted that they have indicated walls and windows, some general sizes, but especially have shown control dimensions for heights, clearances, etc., which must be observed in developing





Kahn architectural designers, having received a basic plan and section from engineering department, make several quick sketch studies, to check disposition of masses and to study fenestration schemes



Here the architectural designers get really tough about the ever-present ash storage tank, and block it in at the side of the building behind brick walls. They also try different arrangement of windows

Still another disposition of the ash storage tank, this time in a tower jutting out in front, where the tank logically wants to go. They try this one to see how the fenestration might be arranged

working drawings. These drawings serve also as the means of obtaining approval of the proposed layout by client's engineering and operating staff. From these drawings of the plan and section as laid out by the power department the designer makes subsequent rough studies and free hand perspectives and details, as the elements of the design become clarified.

As the equipment to be used is decided upon it becomes possible to establish definite clearances for boiler framing, supports and framing around compressors, provision for drawing tubes and shafts, etc. At the same time further detailed drawings for piping, installation of equipment of various sorts are being made by the power department, and the job captain in the drafting room has his crew under way with the working drawings.

Many details must be considered in the preparation of working drawings where moving equipment is to be installed. It must be possible to get the equipment into the structure and equally possible to replace it if necessary because of failure or obsolescence. It must be possible so to arrange moving equipment that vibration is not imparted to the structure. Therefore expansion joints, open or filled with a suitable non-extruding material, must be provided around the bases supporting such equipment.

An excellent method of treating the bases of equipment, especially where they project above the surrounding floor level, is to provide a black terrazzo finish on the sides of the bases and a border with a cove at the junction. The border may be made of the width necessary to fit the pattern of the adjacent finish of the floor, such as quarry tile. This material we have found excellent for the floors of power plants, even around the boilers, because the modern plant is far different in operation from the old-fashioned kind as dust and grime are missing.

The personnel employed in the boiler house must have office and locker space, toilets and shower rooms. While dirt and dust from the handling of coal and ash have been eliminated, still repairs must be made and maintenance must be constant. A maintenance shop is usually required, with a certain amount of shop equipment.

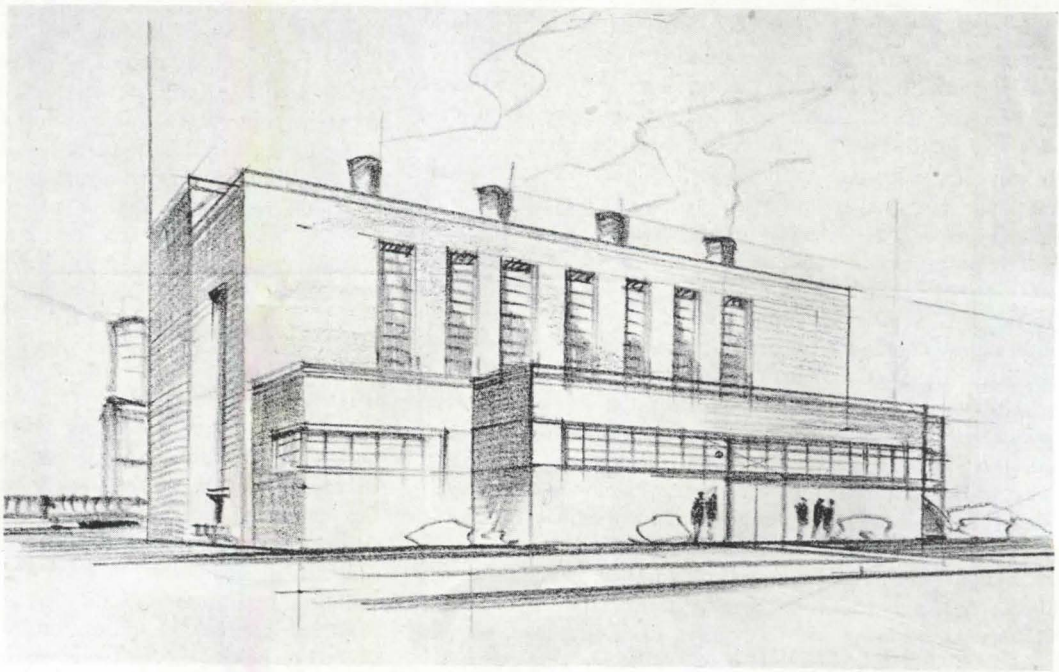
If windows are provided in the building most of the ventilation may be taken care of by them. But in the case of blackout buildings some mechanical means must be provided. In either case enough incoming air must be made available for replacing that drawn out through furnaces and stack; otherwise combustion will be starved. Moreover, excess heat must be removed from the upper parts of the building, either by windows or by louvers. Inasmuch as large quantities of air are exhausted from the upper parts of the building, cooler air will be drawn in below. Therefore some heating must be provided in lower areas where men are at work.

The power plant and the rest of the industrial plant are (or were, prewar) strictly masculine institutions, and should so appear in the straightforward functional character of their design. Therefore, one would find normally little chance to practice "design" in the interior of the power plant. This does not, however, preclude the use of suitable materials well placed.

The color of wall surfaces both of paint and glazing can be both functional and attractive. Bands of color well used in the walls, either as wainscot or otherwise, and in the equipment can be in harmonious contrast. Studies of the color of machinery as affecting the work and safety of the employees have been found of great value, increasing visibility, efficiency precision and minimizing accidents. Colors indicating relative dangers or uses of areas have been standardized.

It has been found wise wherever possible to provide stairs rather than ladders between different levels of the service walkways around boilers and other equipment. Ladders, of course, must sometimes be used, and we have made a practice of providing hoop enclosures around them to prevent falls. Railings must be provided around stairs and walkways. Wherever upper-level working platforms or walks are provided they are built with a curb or other guard to prevent tools being pushed off or dropped on persons below.

The rear elevation also comes in for its share of study in the preliminary stage



ENGINEERING IN POWER PLANT DESIGN

By F. K. Boomhower
Chief Engineer, Mechanical and Electrical Departments
Albert Kahn Associated Architects and Engineers, Inc.

FROM THE early days of the industrial power plant, there has been steady progress in the development and efficiency of steam and power generating equipment, and continual improvement in the structural and architectural design of the buildings that house the plants. Old time plants were usually crowded, little or no thought being given to the possibility of expansion. Lighting was given minimum attention. The plants were necessarily dirty because of the methods of handling coal and ash; no attention was given to the comfort of the operating crew—that was not considered necessary. The plant structure was merely an enclosure to provide protection from the elements for the equipment. The plant was usually something which just grew and was treated as an unwanted necessity.

The client of today, however, has an entirely different point of view toward his power house plant. He expects, of course, the latest steam and power equipment, but he also expects refinements in the building. He must have ample space provision, light, easy access to all parts of the building, locker rooms, and other facilities for the operating crew, an office for the chief operating engineer, and a small laboratory for checking the treatment of water for the boilers. Today the labor unions have their say about power plant design, and recently have been in a position to dictate to a certain extent the physical conditions in the plant in which they will work.

The engineering features which enter into the design of a boiler or power plant for the modern industrial building are quite numerous.

Location of the Power Plant

The design of the power plant starts with a study of the most suitable location within the property lines of the industrial plant site. The principal factors entering into this decision are: (1) the availability of a railway spur line; and (2) suitable space for fuel storage.

The spur line in question is separate from that serving the factory areas; there should be a line intended exclusively for the delivery of coal or oil to the power house. It must be adequate to hold both loaded and unloaded cars without the necessity of switching to permit the spotting of cars required for other purposes.

The storage area must be adjacent to the boiler house, so that the fuel, if coal, may be easily stored and reclaimed. If the fuel is oil, there must be sufficient tank capacity either above or below ground, in compliance with requirements of the National Board of Fire Underwriters.

Another factor to be considered is the location of the plant with respect to the manufacturing buildings. While this relationship affects the length of piping and other service lines, a still more important factor is the usual connecting tunnel. Naturally economy dictates the shortest possible lengths.

In some instances there will be another location factor: the direction of prevailing winds, particularly if the plant is very close to residential property. Regardless of the design of or the equipment installed in a plant, a certain amount of soot or fly ash will be emitted from the stacks, which at times is objectionable. The escape of soot from a stack caused by blowing the boiler tubes has frequently caused trouble, unless the plants have dust collecting equipment. In general, however, the direction of the prevailing wind is not a major factor. Speaking of soot, it is important that any aerial high tension lines or outdoor substations be so located that the products of combustion will not pass over the insulators, as there is some danger of shorting and breakdown due to the coating of carbon particles which will accumulate on the surface of the porcelain when it is moist.

Selection of Boilers

After the location has been chosen comes the study of load conditions in the plant. Both the maximum and the minimum steam demands are calculated. Included in the steam demands, besides those of generating equipment, will be heating requirements of the building served, the process steam load, water heating, and perhaps other uses for steam. When these figures have been assembled, the size and number of boilers are determined.

A prime consideration in the size of the boilers is the requirements at minimum load. It is customary to select a boiler size so that at the average minimum load one or more boilers may be operated at good efficiency. With the size of the boilers thus determined, the maximum demand then establishes the number of boilers required. Since the efficiency curve of a steam generating unit is quite flat from two thirds to full capacity, the designer will usually find ample range in the selection of boilers so that three or four units may be found suitable.

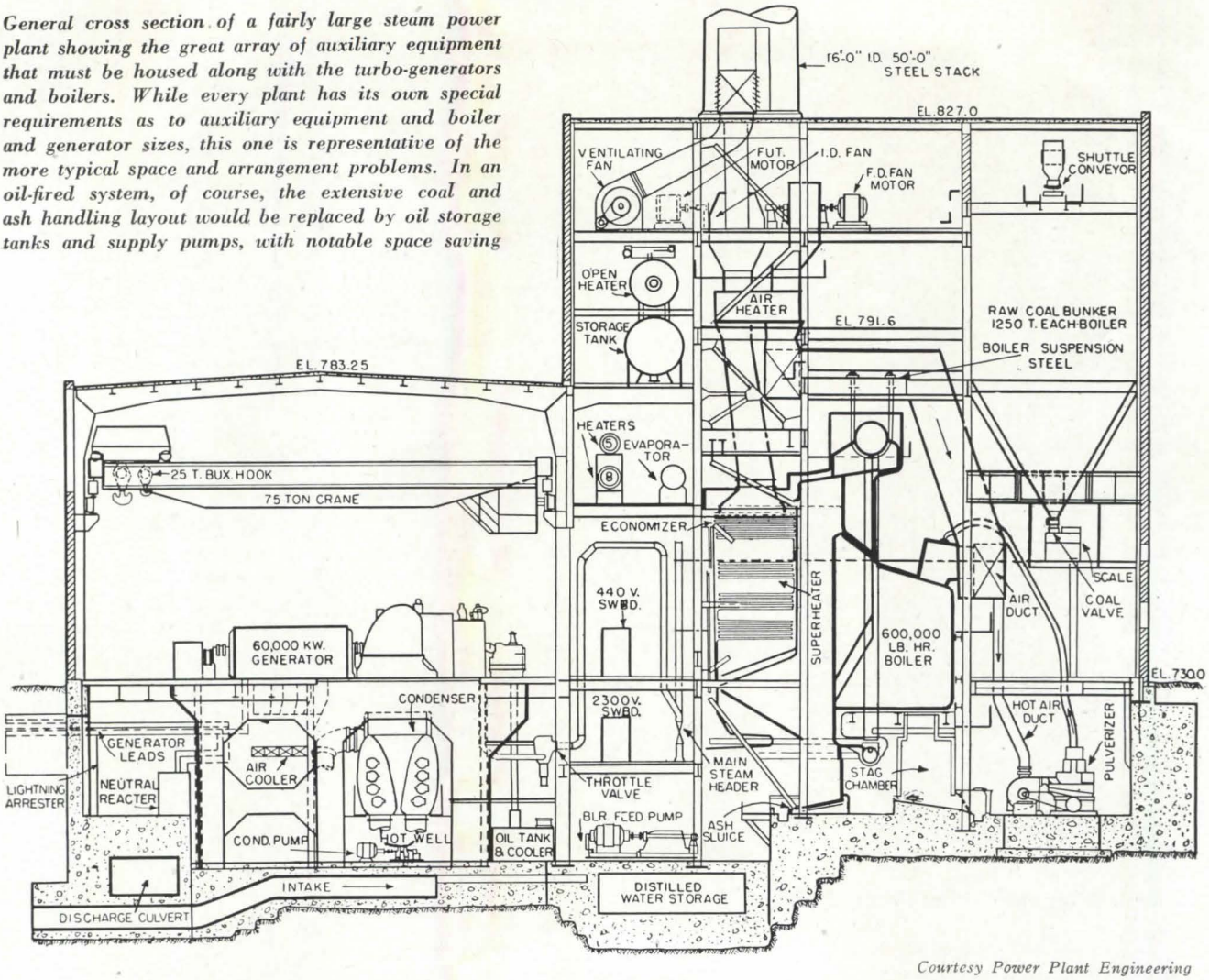
As part of this process, consideration should always be given to the possibility of future expansion, as it has been the history of nearly all industrial projects that they increase in size and output, requiring increased output from the boiler plant. Many plants have been erected without apparent thought to this possibility; the inevitable result is distorted design, ugly external appearance, and generally a makeshift interior arrangement conducive to indifferent and inefficient operation. There are other considerations entering into the provision for future expansion, having to do with equipment, mentioned later in this article.

Choice of Fuel

Next comes the selection of the method of firing the boilers. There are three types of fuel in most general use: oil, coal fired with stokers, or pulverized coal. While the design is naturally based on engineering economics, with due consideration for the preference of the owner's operating engineers, there are many factors which enter into the design of the boiler house itself.

With oil firing the problem of fuel storage and transportation is simplified, as the only fuel handling equipment required consists of pumps and piping. No space is necessary below the boiler room operating floor, there is

General cross section of a fairly large steam power plant showing the great array of auxiliary equipment that must be housed along with the turbo-generators and boilers. While every plant has its own special requirements as to auxiliary equipment and boiler and generator sizes, this one is representative of the more typical space and arrangement problems. In an oil-fired system, of course, the extensive coal and ash handling layout would be replaced by oil storage tanks and supply pumps, with notable space saving



Courtesy Power Plant Engineering

no ash to be removed, and a minimum of soot is discharged from the stacks.

When coal firing with stokers is found advisable, the most suitable design requires a space below the firing floor, in which are placed the ash hoppers, wind boxes, siftings hoppers, ash removal equipment, and a part of the coal conveying machinery. A suitable height for this space in the usual industrial power plant is 14 ft. from floor to floor.

A coal bunker is required from which coal is delivered to the stokers or pulverizers. This is placed above and in front of the firing end of the boilers. As a provision for possible future expansion, the bunker should extend along the outer wall of the building. This arrangement permits a comparatively inexpensive increase in capacity by the addition of a second row of boilers facing the first, both rows supplied from the original bunker and forming a central firing aisle.

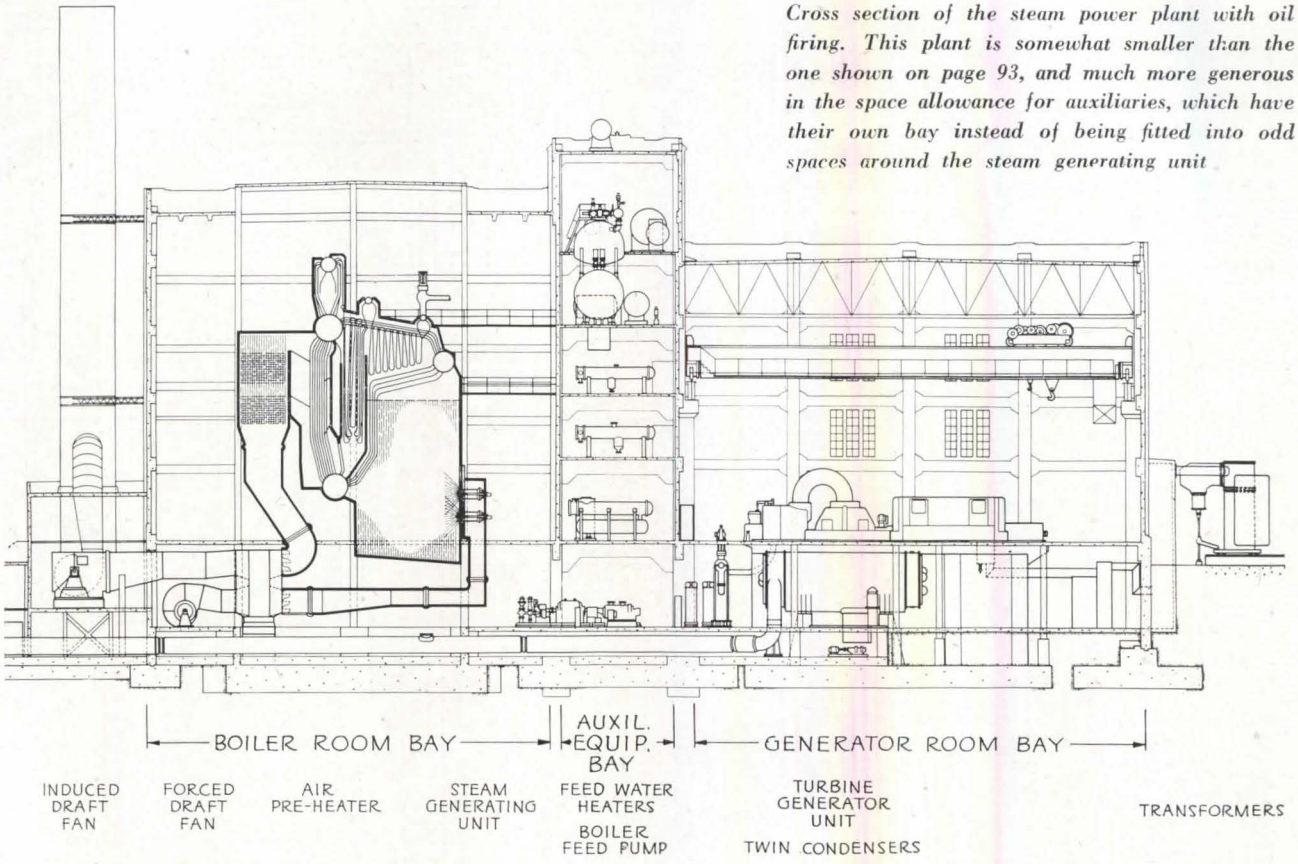
The Size of the Boiler House

The boiler house plan should also provide for future expansion, beyond the addition of the second row of boilers, by addition to the length of the building. Thus all obstructions such as track, coal hoppers, and ash storage tank should be so placed, if possible, as not to interfere with either side or end expansion.

Another major element in determining the size of the boiler house is the overall space requirements for auxiliaries. These include feed water heaters, boiler feed pumps, water treating equipment. Forced and induced draft fans may also be required if the old tall chimney is eliminated in favor of the modern low stacks. There should also be a space allowance between the boiler settings and the end walls of the building.

Cost factors may require that the expense of a coal bunker be excluded. In this case, coal will have to be stored outside the boiler house, perhaps in one or more coal silos built adjacent to the building, to which coal may be delivered from the cars, stored, and then delivered to the stoker hoppers by coal handling machinery. This method alters the boiler room design by the removal of the overhead bunker and reduces the first cost of the structure. It does, however, involve double handling of the greater part of the coal in the silo by the elevators. Moreover, in cold climates the coal, if sufficiently moist, is subject to freezing. Consequently, there will be difficulties in handling in the silo and in the conveyor delivering coal to the boiler room. This method of storing coal alters the design by reducing the maximum height of the building.

If a chimney tall enough for natural draft is to be installed, it will usually be found advisable to superimpose it on the building framework at the roof line. This method is desirable not only from the standpoint of first cost, but also to improve the neatness of the design and the general accessibility. These considerations hold regardless of whether it is constructed of self-supporting steel or brick.



Cross section of the steam power plant with oil firing. This plant is somewhat smaller than the one shown on page 93, and much more generous in the space allowance for auxiliaries, which have their own bay instead of being fitted into odd spaces around the steam generating unit

Other Elements of the Power Plant

Even though the factory may purchase its electrical power, the power plant will usually include one or more of these other major equipment items: (1) Power generating equipment; (2) air compressors; (3) air conditioning equipment; (4) control boards and switching equipment.

In most of our large wartime industrial plants, electrical power is purchased from outside; thus the "power house" is technically better known as "boiler house." Instead of the electric generators, then, there will be merely a transformer substation, usually placed outdoors.

In practically all cases, however, there is a sizable installation of air compressors to supply compressed air to the factory. Air compressors are usually housed in the boiler house in a section immediately at the rear of the boilers, and arranged in a row either parallel to the boilers or at right angles to them. The latter arrangement is sometimes more desirable if air conditioning is to be included. Locating such equipment in the boiler house is advisable because the operation and maintenance are naturally a part of the duties of the operating engineers. Naturally this work can be done better, and with fewer men, if the equipment is located in the boiler house rather than in some remote part of the manufacturing building.

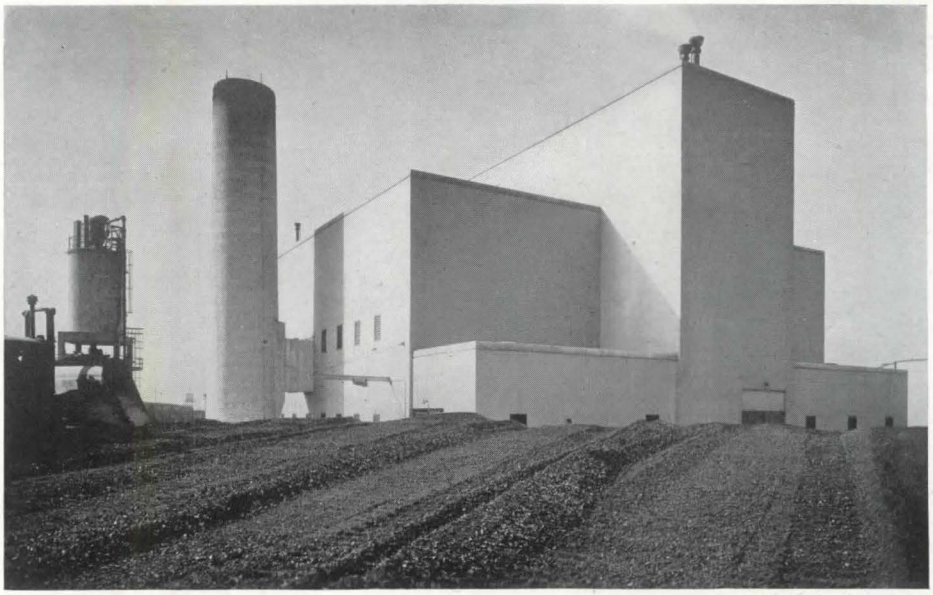
Compressors or other heavy reciprocating machinery should be placed as near grade level as design conditions will permit, so as to avoid vibration and still use a minimum of concrete foundation. The compressor section should be designed with sufficient height to permit the installation of a traveling bridge crane for the erection and maintenance of the equipment. The crane must have a hook clearance above the floor sufficient to lift and move the heaviest piece; this will usually be about 18 ft. This requirement of course governs the height of the compressor room roof.

Air conditioning equipment, still a relatively new development for the large factory, has altered considerably the design of industrial power plants. While air conditioning purely for the physical comfort of the employees has not often been permitted in wartime plants, it is frequently necessary to improve manufacturing conditions, where uniform temperatures should be maintained for the sizing of major parts of steel, aluminum, or magnesium to fairly close limits. Air conditioning frequently involves the installation of refrigerating machinery with capacities up to the equivalent of the melting of 8,000 tons of ice per day.

Air conditioning equipment is commonly located in the air compressor section of the boiler house, where it also will be under the care of the boiler operating crew. The installation usually requires floor space on two different levels, the upper level having a traveling bridge crane of perhaps ten ton capacity.

An idea we have frequently used is to omit the usual partition between the boiler room and the compressor room. It is entirely possible to design the ash and coal handling and burning equipment so as to prevent the escape of dust. Boiler room dust was of course the reason for the partitioning between boiler room and compressor room. With oil firing this problem never was a factor.

A partition, while requiring floor space equal only to its thickness, usually will be found to require some two to four feet additional, and interferes with free access between the boiler and compressor sections of the building, and with the ventilation of the boiler room.



Hedrich-Blessing photo

Stacking coal, at the Wright Lockland plant, to prevent spontaneous combustion. It is leveled off and packed down by bulldozers to keep air from reaching inside of pile

Modern Methods and Equipment

The modern boiler does not have the solid heavy brick wall construction of the earlier one. It has insulated refractory walls supported by cast brackets mounted in sections on structural steel shapes. The walls are cased on the outside with steel or asbestos cement plates and cooled by natural or forced air circulation. The refractory faces of the settings on the furnace side are protected by steel tubes in which water circulates as a part of the boiler water system. Furnace design has developed to a point where the maximum permissible heat release from the burning fuel, in Btu. per cu. ft. of furnace volume, is quite definitely known for the various kinds of fuel and methods of firing.

Steam pressure and combustion are under automatic control to maintain uniform steam pressure and the highest average efficiency with variable loads. Feed water level in the boilers is also automatically controlled. Motor or turbine driven centrifugal pumps feed water to the boilers at a temperature of 225°. Feed-water heaters eliminate the dissolved gases such as oxygen and carbon dioxide, to avoid corrosion of the internal steel surfaces of the boilers as well as of the steam and condensate piping.

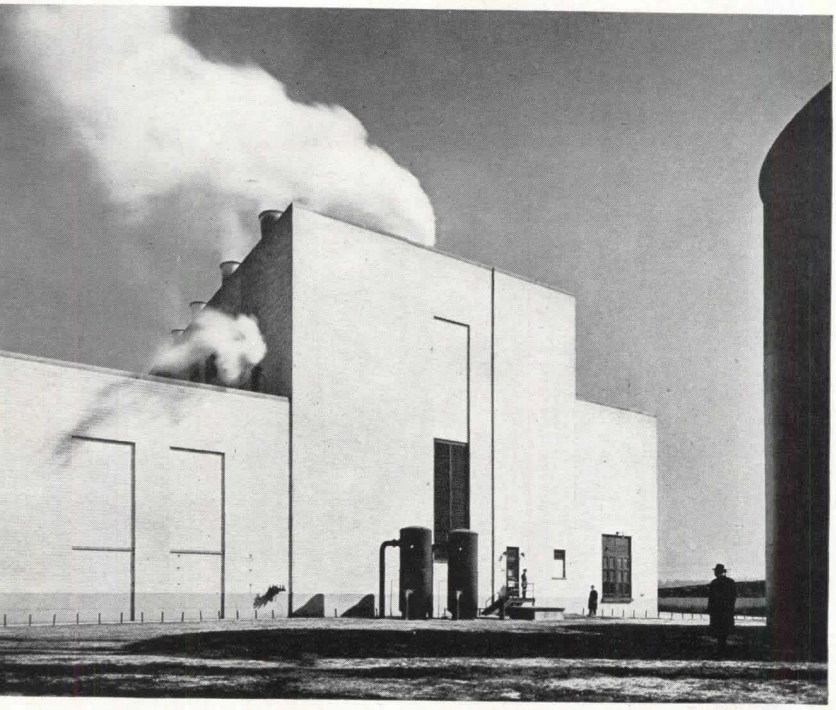
Manual handling of coal has been entirely eliminated. Coal is handled to and from a stock pile and to overhead bunkers or silos and to stokers by modern coal handling machinery.

Spontaneous combustion in coal storage or stock piles has been virtually eliminated within the past six years, because of new methods of stocking. The basic cause was oxidation, which was made possible due to the improper dumping of coal. It was found that when coal was simply dumped on a pile, the larger pieces rolled to the bottom, forming a mat through which air could reach the center at the bottom of the pile. Oxidation would start a slow heating, which gradually increased until a combustion temperature was reached. Spontaneous combustion may be prevented by so stocking the coal that the segregation is avoided and air is prevented from reaching the interior of the pile. This is simply a matter of leveling out the pile and packing it firmly. Coal is transported from the car to the stock pile with a wheeled scraper and caterpillar tractor with blade. In the illustration accompanying this article, the tracks of the bulldozer are clearly visible in the coal pile in the foreground.

Ash removal from industrial plants, formerly a source of considerable dust nuisance, may now be done without the escape of any dust, and in many plants where the fly ash and dust emitted from the stacks would be objectionable, it is eliminated by the installation of centrifugal or electrostatic separators. The use of either type requires the installation of induced draft fans. These in turn eliminate the necessity for high stacks and breechings.

With the development of the airplane and growth of airplane travel another limitation has been placed on the height of stacks or chimneys in the vicinity of airports, in that the maximum height shall not be over a line at a five-degree angle with the horizontal with the vertex at the airport. Instances have recently occurred where it has become necessary to remove the stack and install induced draft fans to meet the requirements of the National Board of Aeronautics at Washington, D. C.

The main operating floor of boiler and compressor rooms are generally red quarry or gibraltar floors. Walls are wainscoted up to about eight feet with salt glazed blocks. Piping, pipe covering and other surfaces are finish painted to leave a smooth glossy surface—all with the intent to provide an interior which may be maintained in a neat clean condition with a minimum of effort. The psychological effect alone on an operating crew in a plant well designed and finished is sufficient to return good dividends on the added cost which may be required through better maintenance and operation than would be obtained with the same equipment poorly arranged and housed in a building designed and constructed at a minimum of expense. A plant in a neat and clean condition is, in nearly all cases, a plant being well operated.



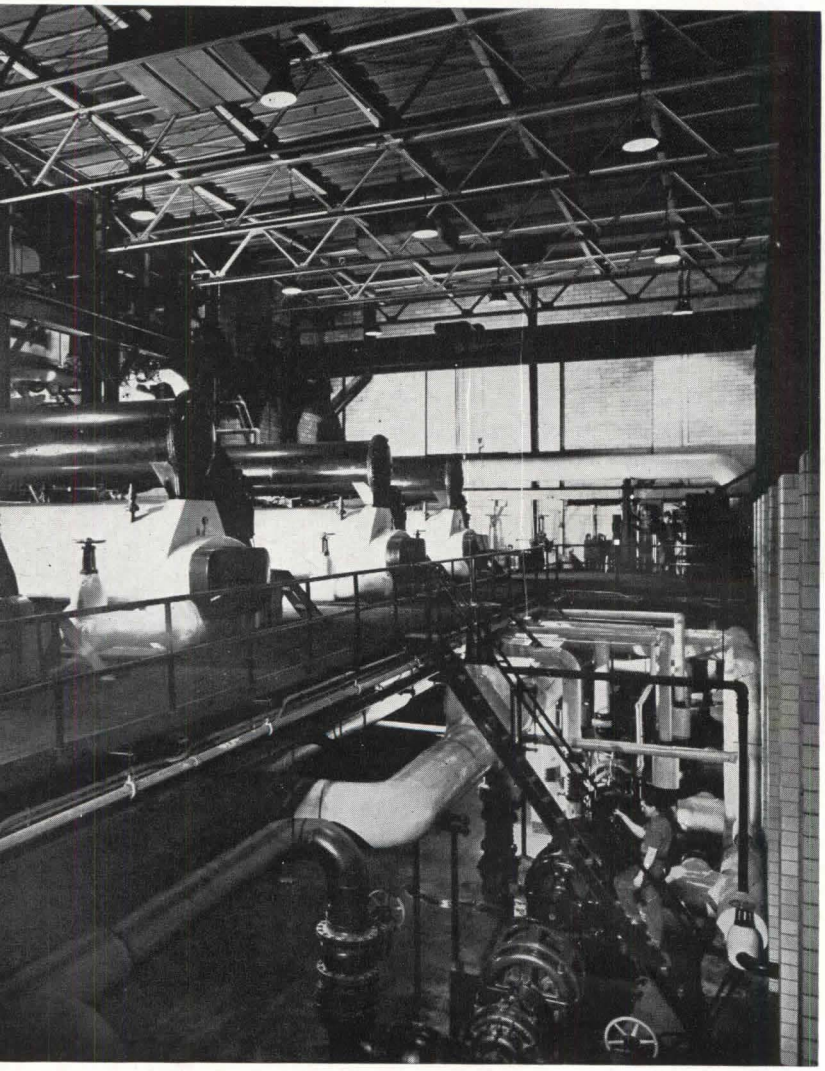
POWER PLANTS FOR WARTIME PRODUCTION

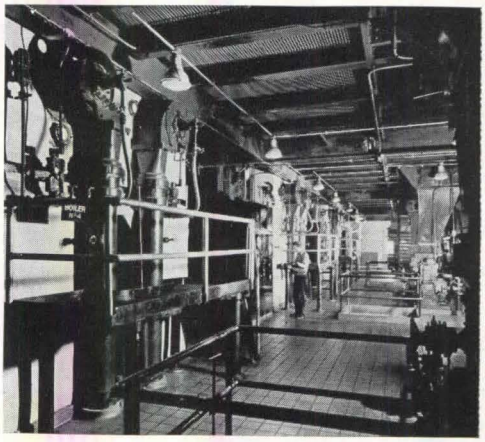
Albert Kahn Associated Architects and Engineers, Inc.

PICTURES on these two pages are the first published views of two wartime power plants for the great Wright Aeronautical Plant at Lockland, Ohio. The first one, shown on this page, was designed in the early "defense" days for what was then planned as the largest single manufacturing structure. But original plans were stepped up later until a second plant (next page) was added.

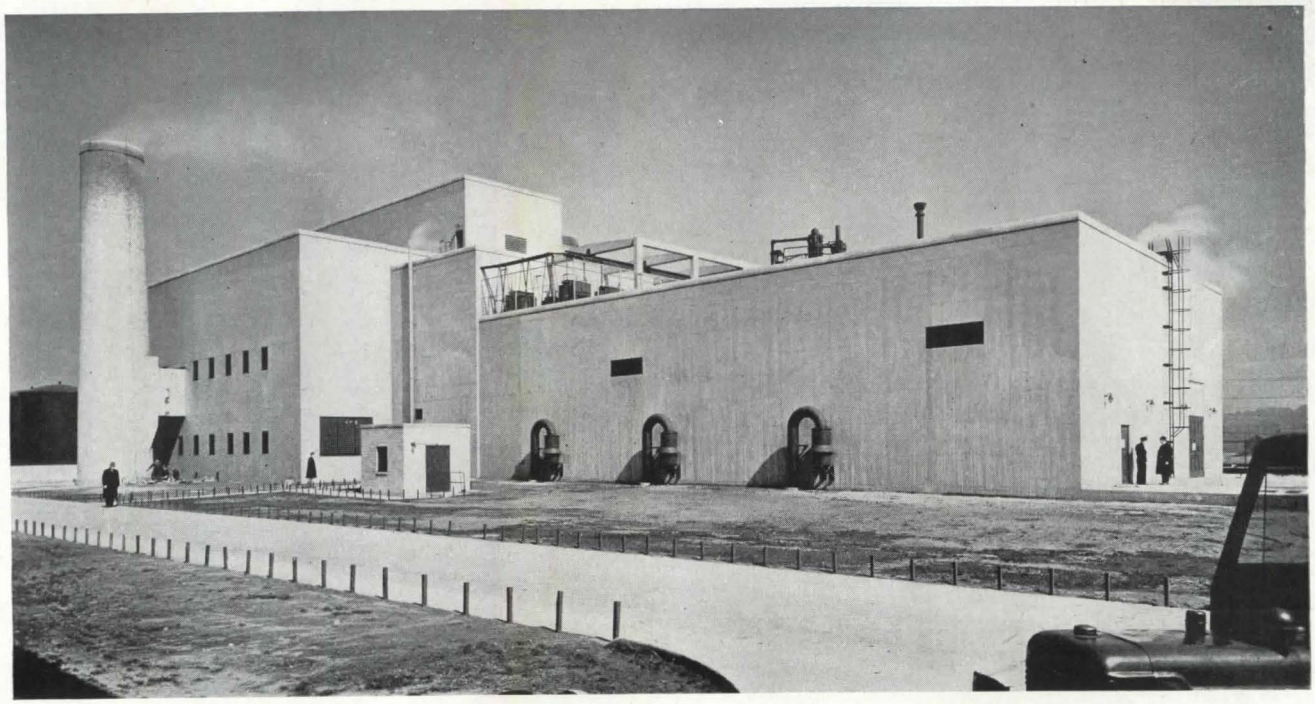
In these boiler plants, pioneering for many that came later, the earlier threat of hostile bombing led to a "blackout" design. Feeling that windows might later prove desirable, the architects used the device of recessed panels, bricked in, which could easily be converted to regular sash after the war. Also noticeable are the short stacks, to eliminate a hazard to aircraft.

On the next two pages are views of other power plants serving in wartime production, all designed by the Kahn organization.

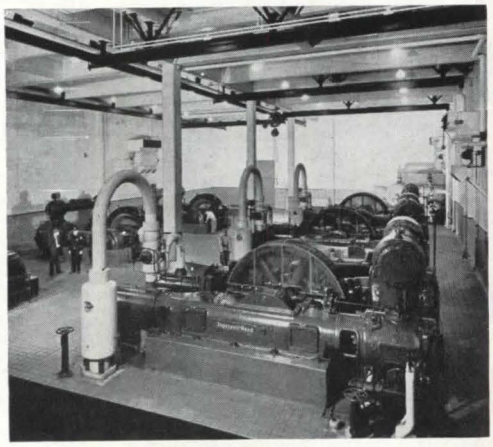


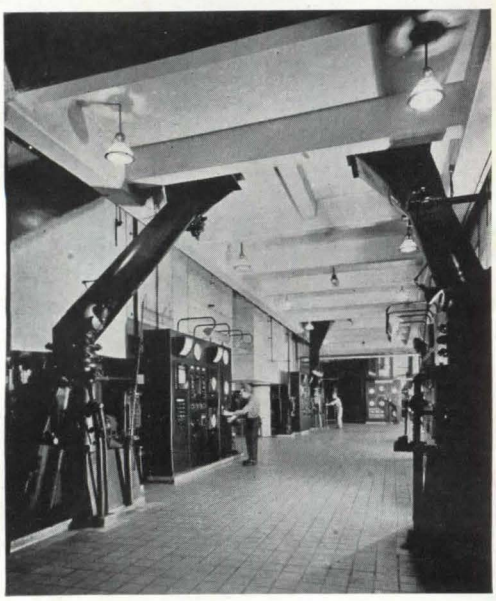


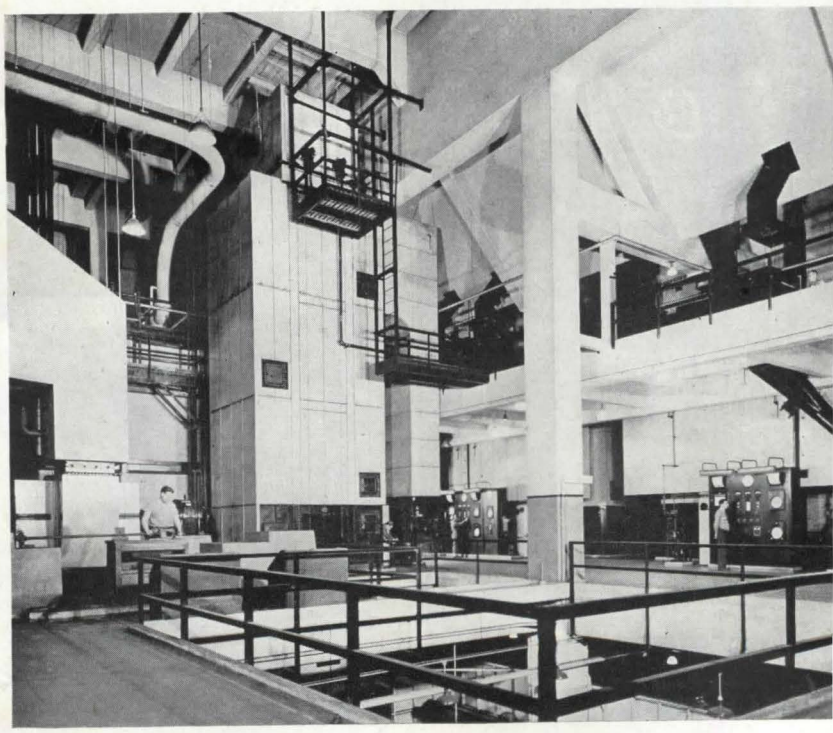
The No. 1 boiler house at Lockland contains four huge boilers, fired by pulverized coal. Small photograph above shows the main firing aisle and control panels. A major element in many industrial boiler plants is air conditioning equipment. Photo at left shows the large installation, in two-level air conditioning room



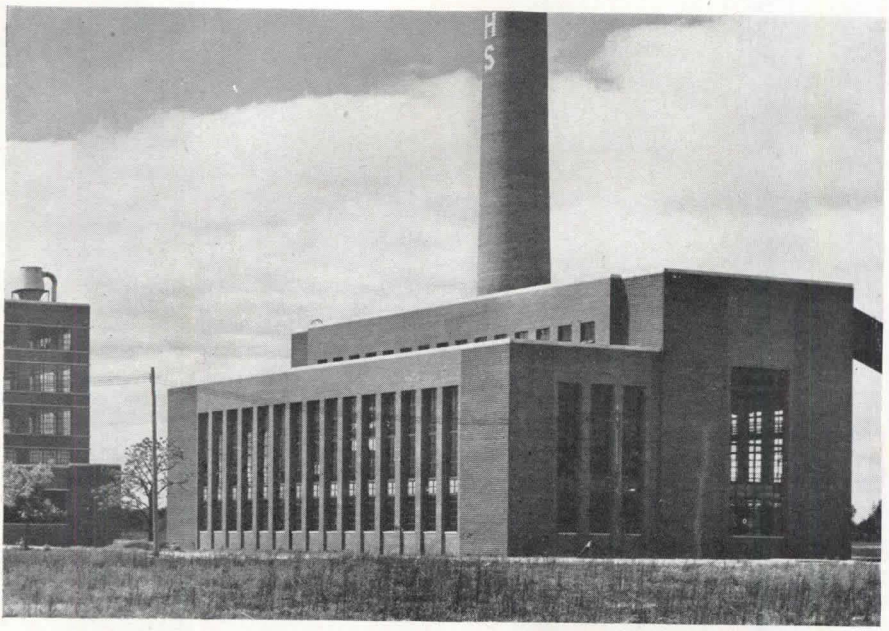
Hedrich-Blessing photos





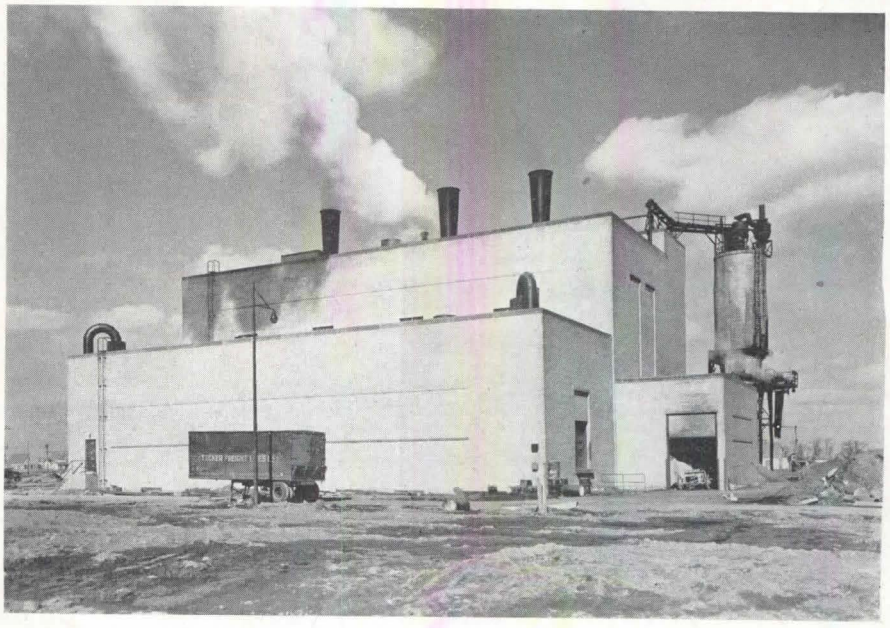


Demands for steam and compressed air went up so fast, with the great expansion of the Wright Aeronautical plant at Lockland, that a second power house was necessary. Views on this page show the No. 2 plant. Notice in the top view the shortened stack, made possible by induced draft fans. View immediately above shows bunkers, air ducts, boiler control panels, and space (foreground) for a future boiler. Smaller views are of air compressor room, and main firing aisle in the boiler room

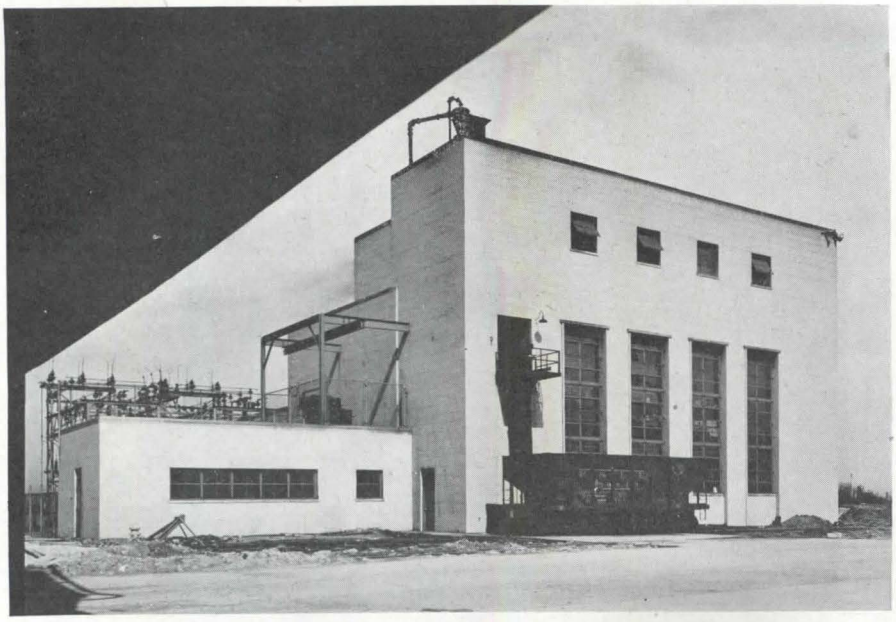


Designed before the war, this power plant for the Burroughs Adding Machine Company, Plymouth, Mich., has plenty of window area, is one of the cleanest from the standpoint of exterior architectural treatment

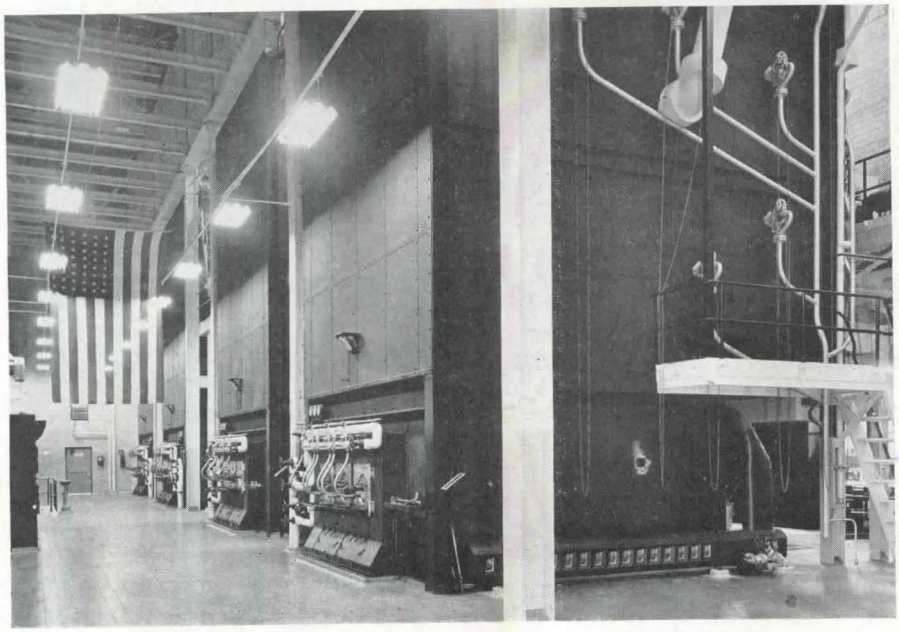
Interior of the Burroughs power plant. It was one of the first plants to break away from the common practice of putting a partition between boiler and generator rooms. Coal dust is not allowed to escape



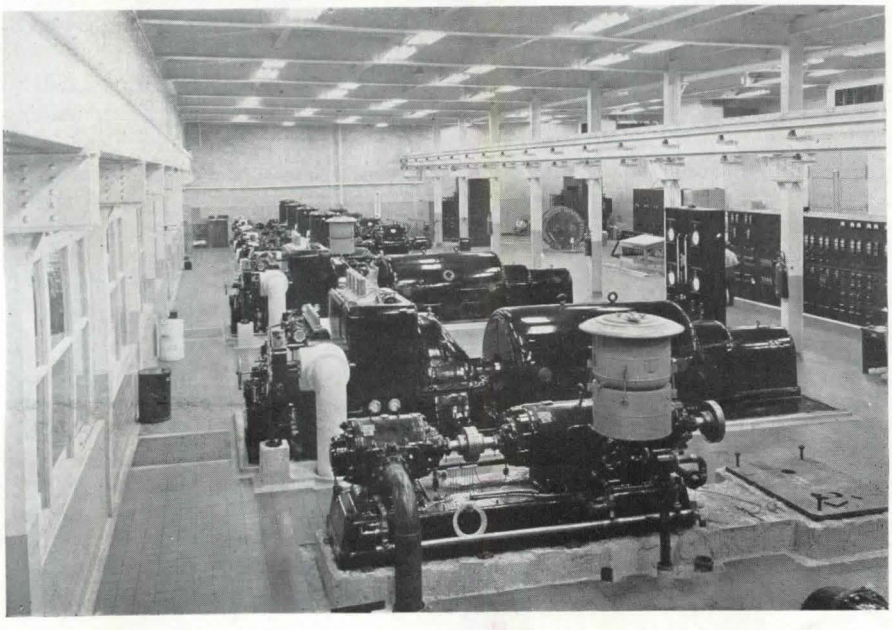
This huge boiler house was built for a large aircraft engine plant, which must still remain unidentified. Here again window panels were built into walls, in case it is desirable to install sash after the war



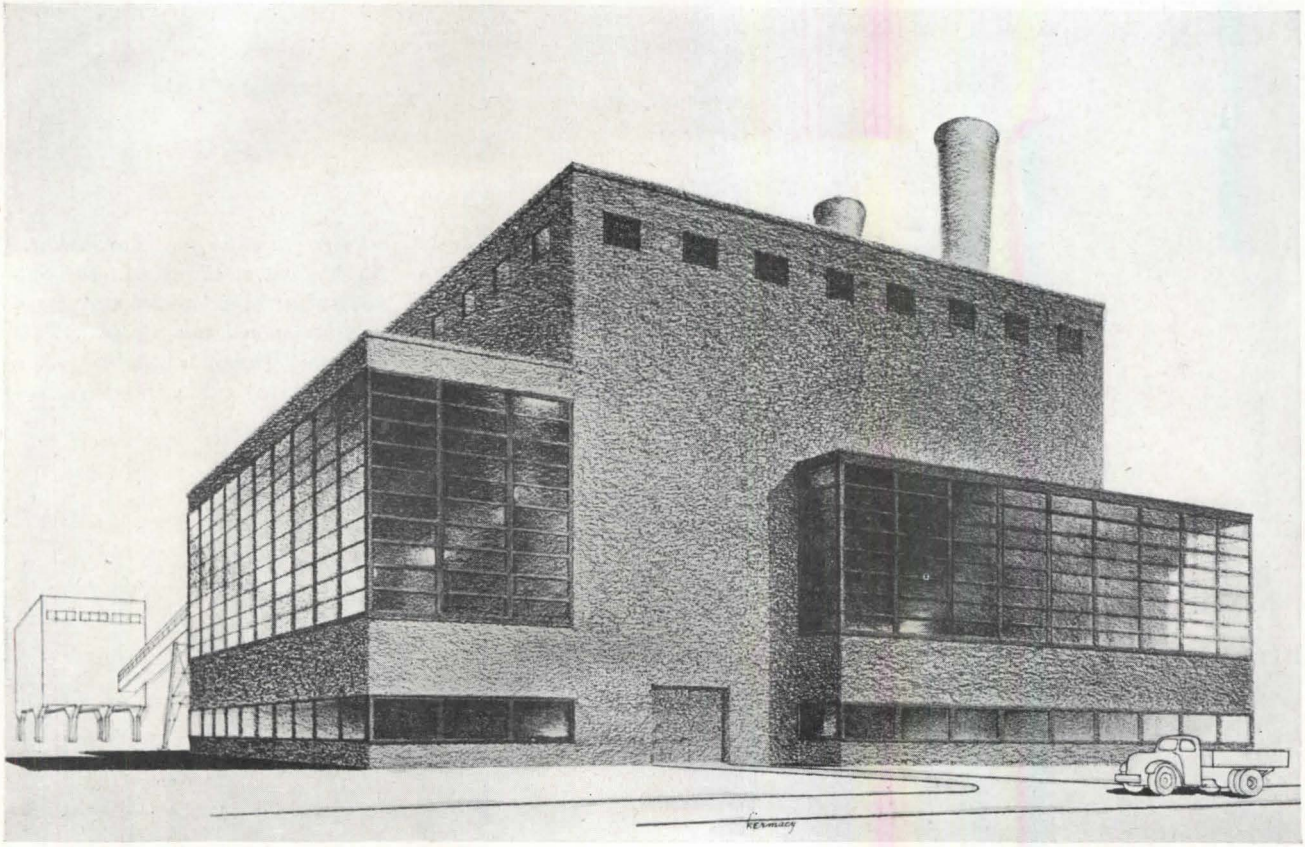
Boiler house for the Thompson Aircraft plant at Cleveland. This is a typical wartime boiler house providing steam and compressed air. But electrical power is purchased; note transformer substation, left rear



When the boiler plant for the Ford Willow Run bomber plant was planned, oil firing was highly questionable. This view therefore shows oil-fired boilers but also provisions made for possible coal bunkers



General view of air compressors and turbo-generators in the Willow Run power house. Note the overhead craneways, which are always included in generator or air compressor rooms to facilitate repairs



POSTWAR POWER PLANT SHOWS PROGRESS

Two versions of a power plant for Joseph E. Seagram & Sons, Inc.

Smith, Hinchman & Grylls, Inc., Architects and Engineers

ALMOST any architect would approve the above rendering of a power plant designed for postwar construction. He would certainly vote it a functional and fresh and imaginative design, as befits a postwar plan. It represents, nonetheless, what its designers regard as a fairly conventional scheme, at least in one major respect. The rendering on the opposite page, an alternate for the same plant, is based on a more unconventional idea, developed to guard against excessive obsolescence.

The difference is a matter of supports for the building and for the heavy equipment to be housed in it. The first scheme is the conventional one of integrating building supports with equipment bases. The second provides separate supports, so that the building is entirely independent.

Smith, Hinchman & Grylls have run across cases where a perfectly sound power plant building had its economic life cut short because the steam and power generating equipment in it had become obsolete. This second scheme, then, makes it possible to replace machinery and its supports at a later date, without also removing the building.

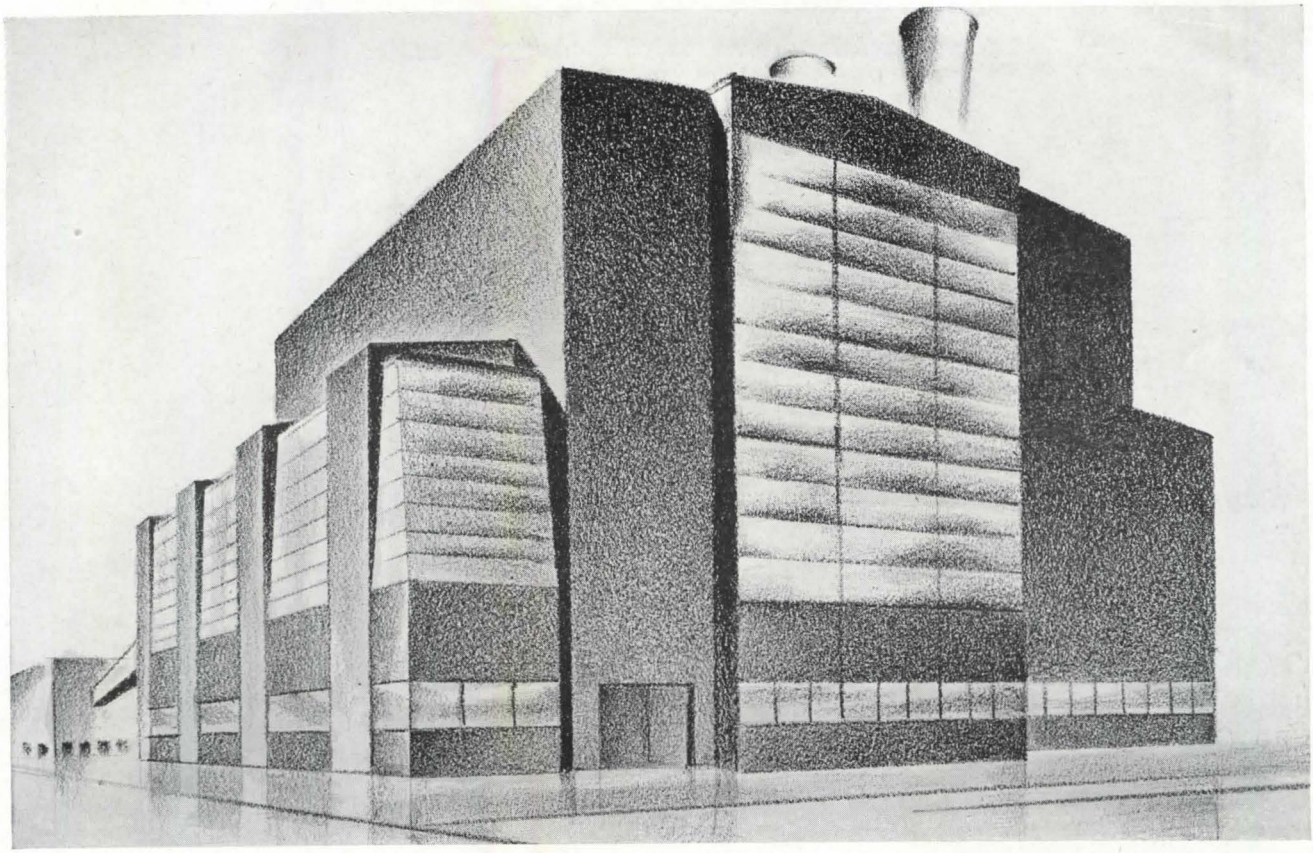
The difference is more specifically illustrated in the sections on pages 102 and 103. Figure 1 is a cross section of the plant contemplating the use of steel in the conventional "integrated" scheme. In the "unintegrated" scheme in Figure 2, designed for construction in reinforced concrete, the boilers would have their own supporting structure complete with runways, operating galleries and access stairs, entirely separate from the building framework.

Aside from this structural innovation, the design illustrates a problem frequently encountered in power plants for industrial establishments—the complications of plant process in the equipment of the power plant. This one is for a huge distillery, and suggests another innovation through the use of waste stack gases for drying by-products.

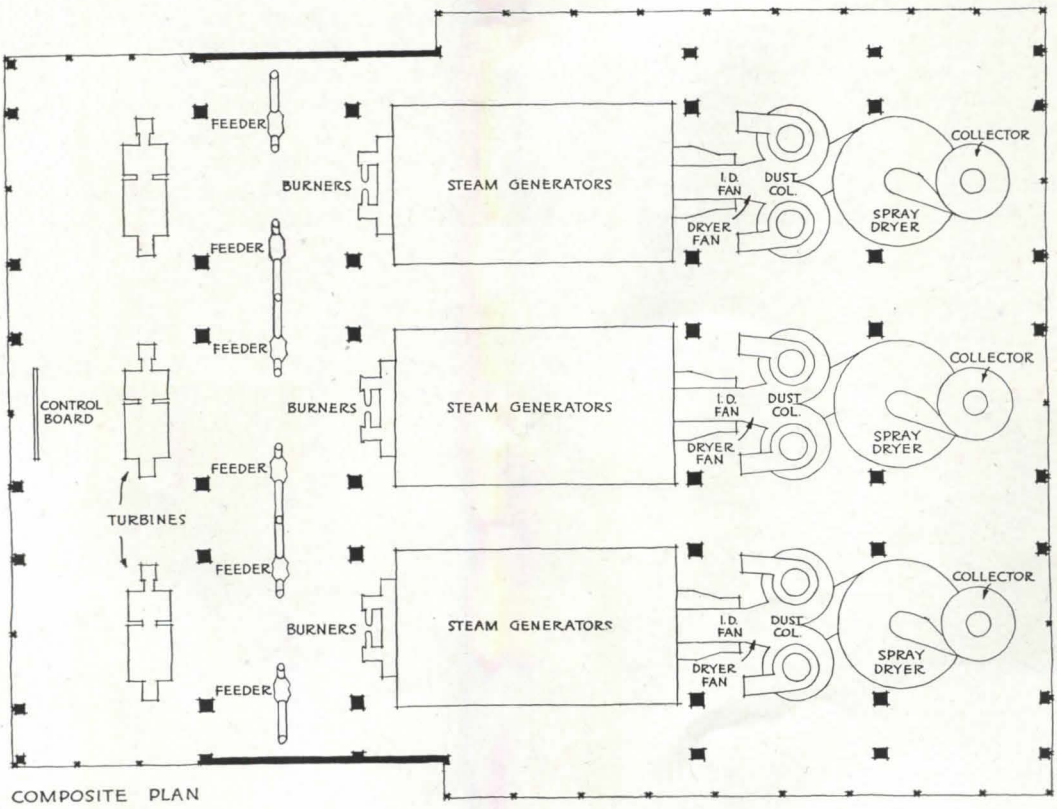
First by-product is the spent grain that is marketed to compounders of stock feed. This is the grain remaining in the "beer" as suspended matter after the alcohol has been driven off. This dealcoholized beer with its grain content as it is drawn from the bottom of the still is largely known by the inelegant but descriptive term, "slop." Incidentally, by a simple change in terminology, "slop" becomes "stillage," and can then be sold for food as well as for feed.

Other by-products are the carbon-dioxide given off in large volumes in the fermenting process which may be recovered and liquefied, or made into dry ice, and the vegetable oils obtainable from the grain by de-germing before milling or by washing the spent grain with a solvent after drying.

It is the drying operations on the stillage that are particularly recognized in the designs contemplated by the accompanying studies. Some further description of the handling of the stillage will aid in understanding them.

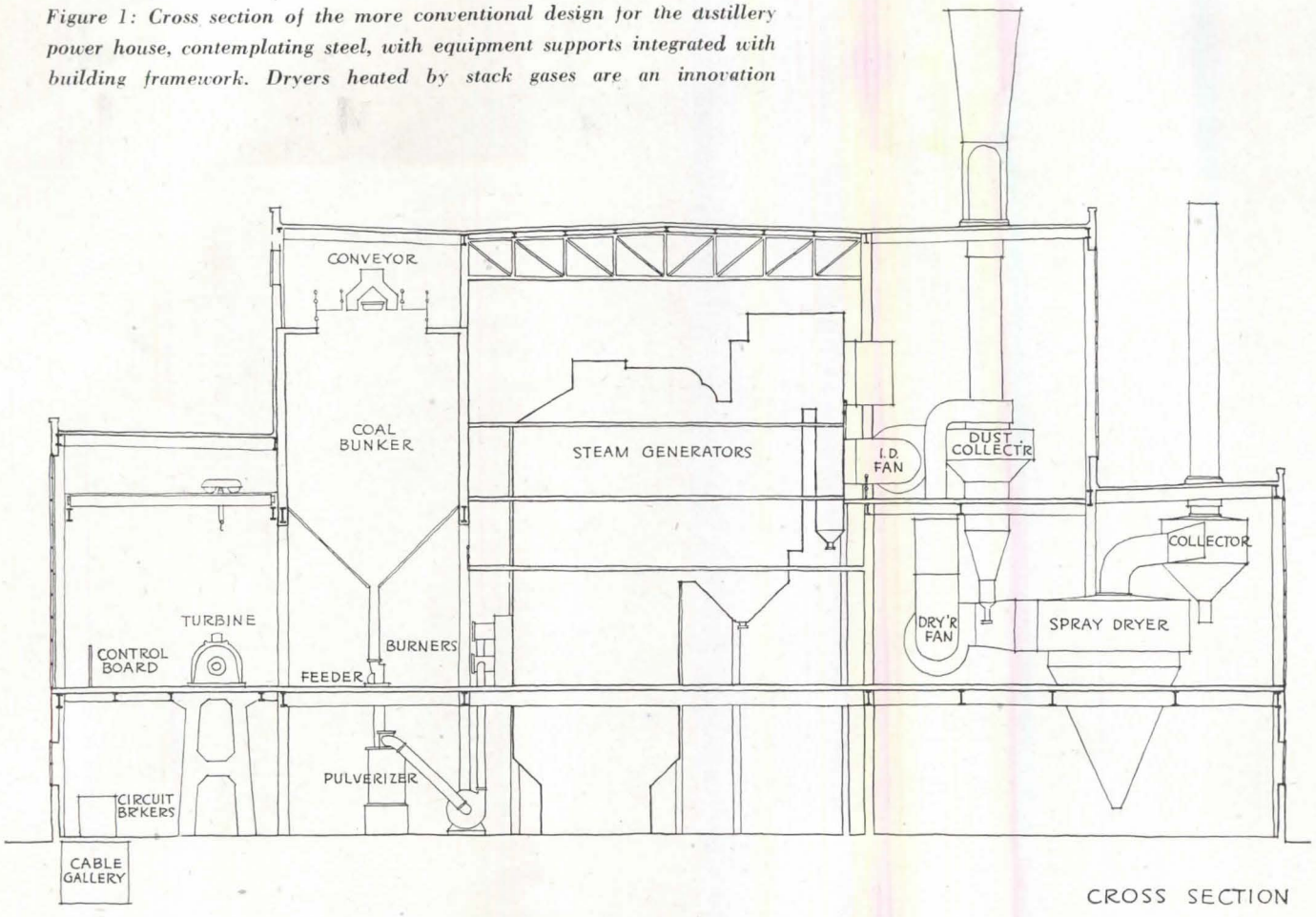


One version (rendering, opposite page) has the supports for heavy power equipment integrated with the building framework. In second version (rendering above) supports are separate, so that equipment could be replaced when obsolete



COMPOSITE PLAN

Figure 1: Cross section of the more conventional design for the distillery power house, contemplating steel, with equipment supports integrated with building framework. Dryers heated by stack gases are an innovation



It is the usual practice to strain the insoluble portion of the grain from the stillage, drying it in a conventional rotary dryer, heat being supplied by steam, waste stack gases or direct firing. The thin stillage is concentrated in multiple effect evaporators, and in many plants is mixed with the spent grain and dried with it. More advanced practice provides for drying this concentrated stillage, generally termed syrup, separately. The drying of the syrup may be accomplished on a steam heated rotary drum dryer similar to that used for producing powdered milk, or in a spray dryer. It is this method of drying that is contemplated by the preliminary designs accompanying this article

From the diagram in Fig. 3 it may be noted that the pressures at which the steam is required for processing operations is within such ranges that the greater part of this steam can be supplied as exhaust, or extracted, from the turbine generating units supplying the plant's electric power. These requirements usually considerably exceed the amount of exhaust steam that becomes available if the generating of electric power is limited to that used by the distillery itself. From this standpoint the engineers have found from their heat balance studies that steam generat-

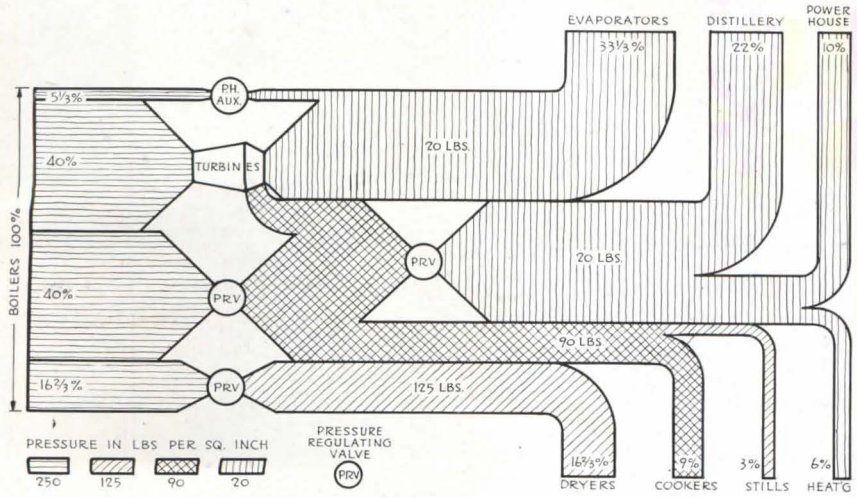
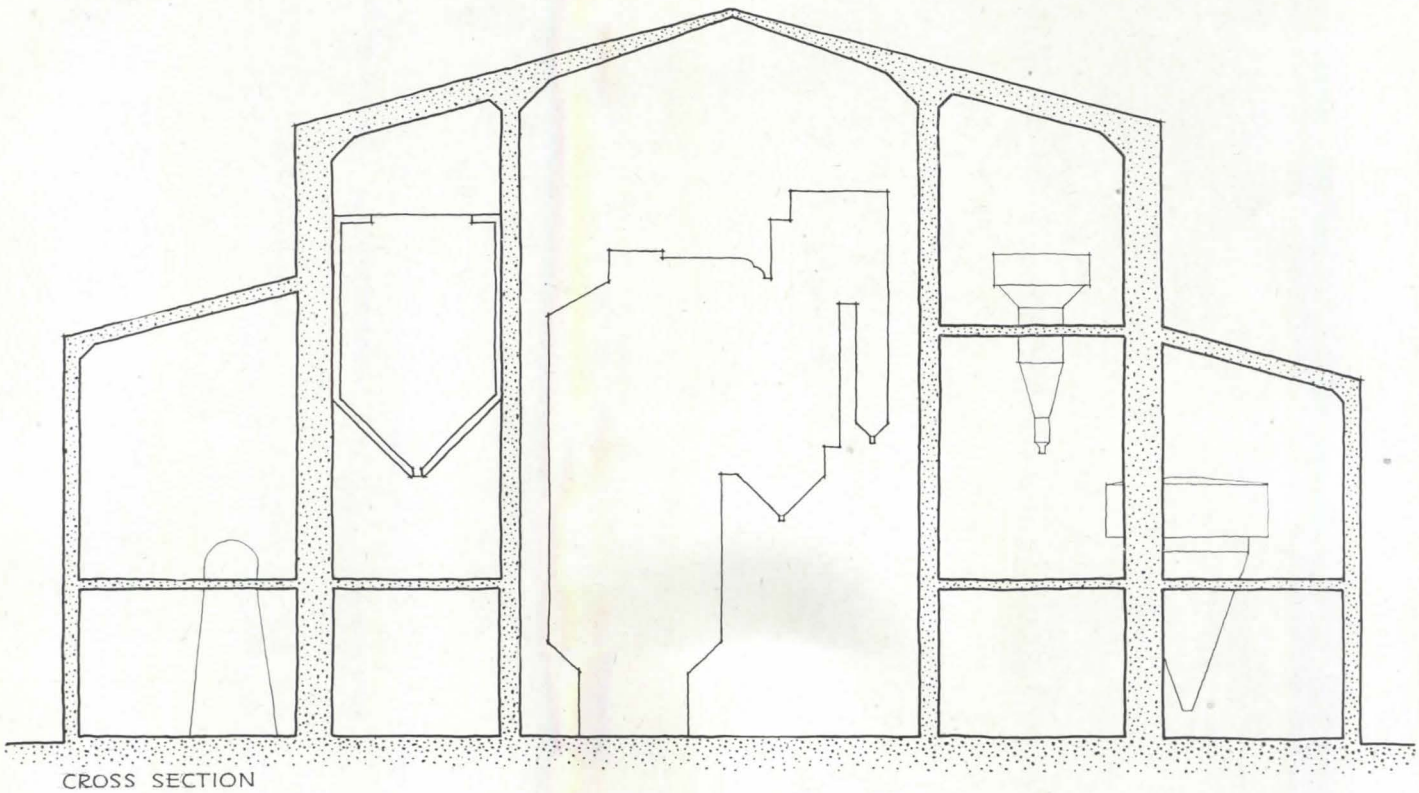


Figure 3: Steam utilization at a distillery. Exhaust, or extracted, steam is used for plant processes

Figure 4: Chart of electric power utilization in a distillery. By-products consume most of the power

Figure 5: How electric power and steam consumption (per gallon of whiskey) vary with plant operations

Figure 2: Building framework, here shown in reinforced concrete, is independent of supports for boilers and turbines, which normally have a shorter economic life than buildings. This scheme permits equipment to be replaced



ing units of high pressure are not called for in meeting the design conditions of the moment. It is their experience, however, that development and improvement with the processes and operations in a progressively operated industrial plant, and especially in the distillery field, call for more and more things to be done electrically. It is their judgment that the selection of steam generating equipment, whose pressure and temperature characteristics will enable electric power to be generated more efficiently than the heat balance requirements initially indicate, is well warranted in establishing the design of the plant. Thus improved efficiency generation later provides extra capacity for electricity.

The design contemplated by both of these cross-sections is basically the same particularly in combining with them the drying of the syrup utilizing spray type dryers operated by the stack gases from the boilers. The engineers do not represent that the engineering has been carried to a point where this arrangement for supplying heat to the spray dryers can unqualifiedly be adopted over other possible methods, but studies indicate the possibilities, and the opportunity for economy is readily recognized.

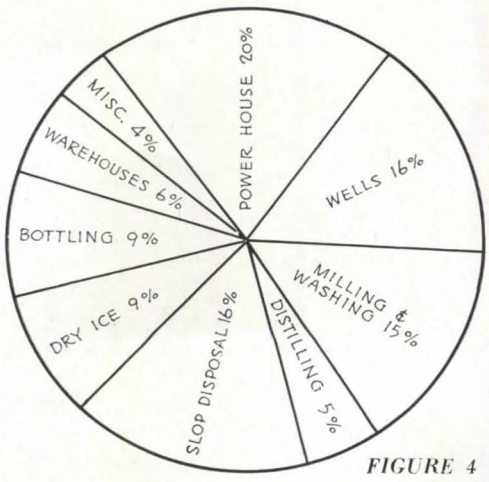
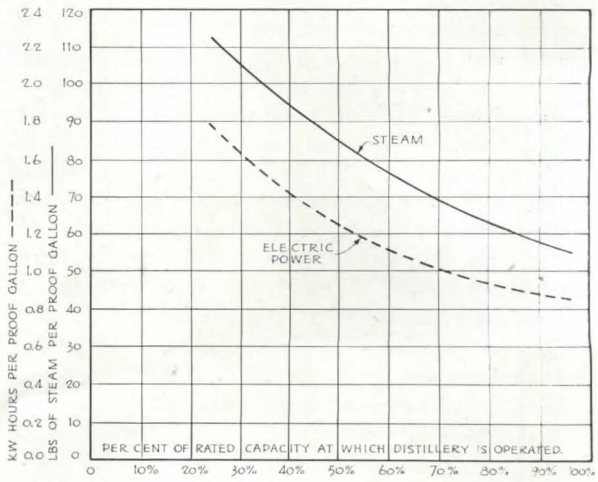


FIGURE 4

FIGURE 5



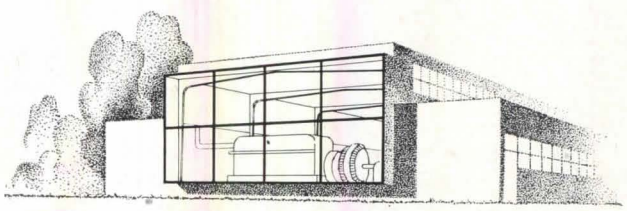
POWER PLANT PROGRAM FOR RURAL AREAS

The Dairyland (formerly Tri-State) Power Cooperative, one of the prewar REA plants. Roland A. Wank, architect; A. Y. Taylor & Co., engineers

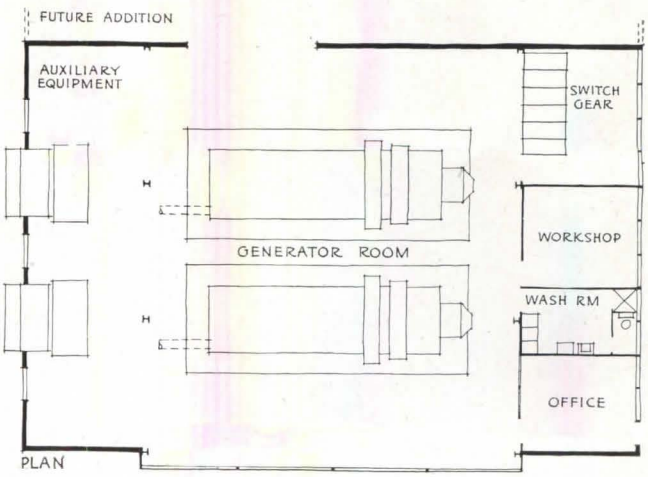
To continue its program of extending electric service to America's farmers, the Rural Electrification Administration is making ambitious plans for financing power plants and extending transmission lines after the war. Already some 60 generating plants have been built, some 811 wire systems have been installed, the REA financing them for cooperative farmer groups. REA reports that there are still seven million farms (four out of every ten) without electric service.

Usually local architects and engineers have gotten the commissions to design the buildings. Most of the plants are relatively small, using diesels for driving the generators, and all of them are located in small communities. It is worth pointing out that, along with electricity, the REA is taking advanced architectural design into remote places.

Henry Shotwell, REA architect, has been giving advance study, in collaboration with REA engineers, to future small diesel plants. The perspective sketch and plan at the right show a basic scheme which groups the necessary elements in logical order, and which provides for easy expansion. The length of the building would naturally depend on the number of generating units installed or contemplated for the future. This placing of equipment minimizes wiring and piping runs, and permits of considerable flexibility in the office, washroom and workshop areas, as local conditions might dictate.



A basic scheme developed by Henry Shotwell, REA architect, and REA engineers for diesel electric plants for postwar



HOUSEHOLD CLOSETS, PART II

Assemblies of Basic Units

Research by Larch Renshaw, A.I.A.

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
MAY 1944

These schematic diagrams of closets are a continuation of the Time-Saver Standards Part I, which were published in the November, 1943 issue. Part I covered basic elements of household closets (such as shelves, poles, drawers, and accessories) which can be assembled to serve various storage needs. Part II shows possible and useful standards for assemblies of the basic units as suggestions for architects and designers planning closets for the personal use of a man, a woman, and a child. Dimensions are approximate and will differ with the structural details.

CRITERIA

Good closet design requires planning, arrangement and fixtures contributing to:

A. Convenience
   1. Ease of access
   2. Maximum visibility
   3. Orderliness
   4. Maximum availability or reachability
   5. Maximum of used space

B. Preservation
   1. Of pressed condition
   2. Of freshness (ventilation)
   3. From moths
   4. From dust
   5. From pilfering

These are not all simultaneously obtainable and some are mutually exclusive, for instance, eliminating doors gives maximum availability, but minimum security from dust, moths, and pilfering; or maximum reachability would involve unused space at top and bottom of closet.

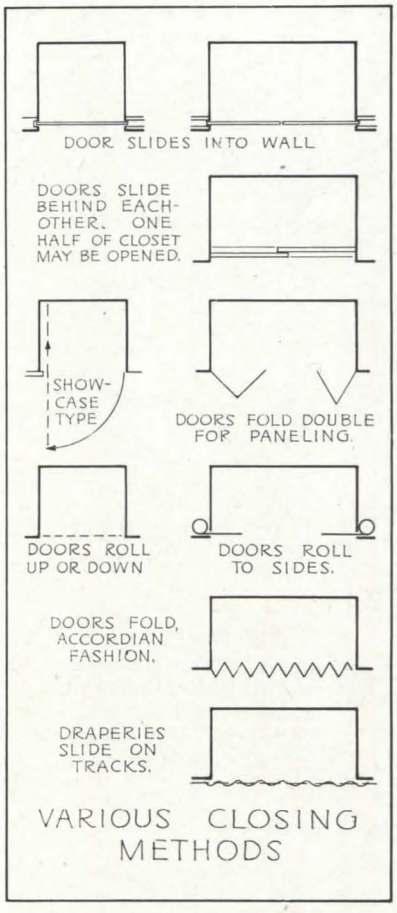
DOORS AND PLANS

The obvious, and in most cases most efficient and economical, doors are the usual flush single and double swinging doors. They are omitted from the chart at right which shows alternate closet closing schemes. Hooks, racks, and accessories on swinging doors increase efficiency, using space in the closet otherwise unoccupied.

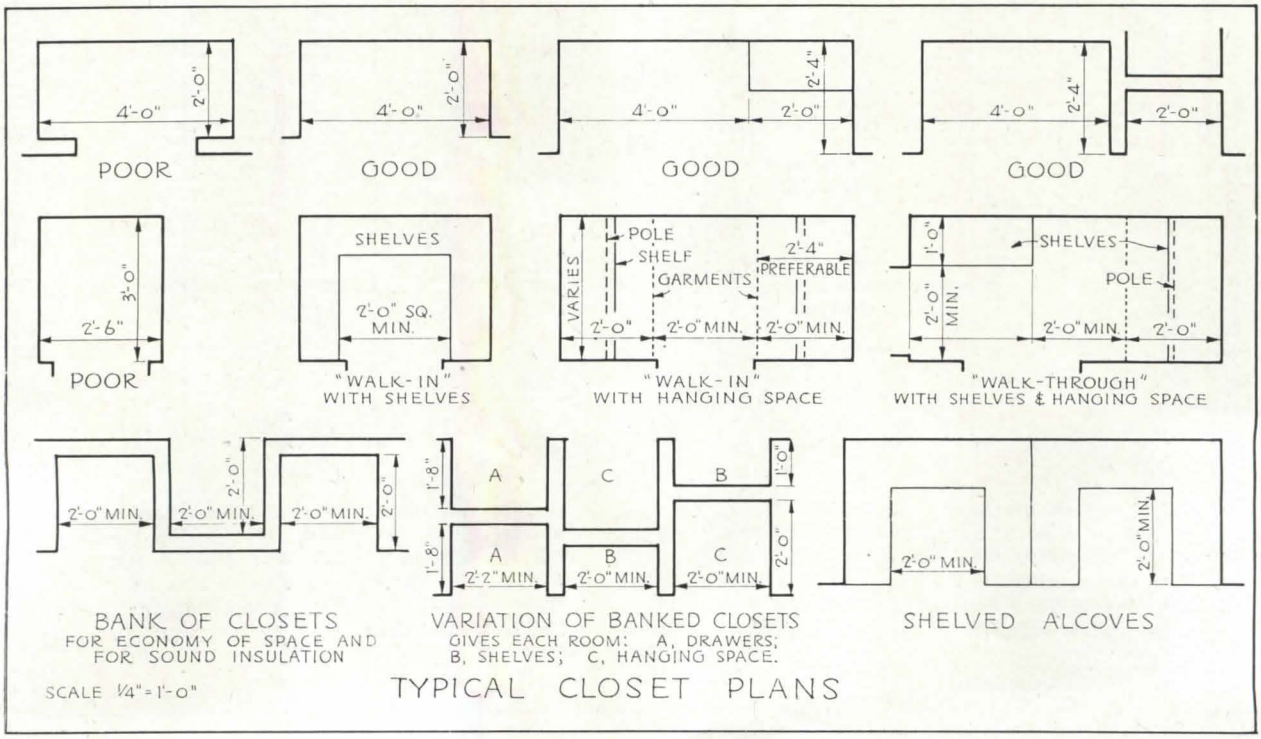
The alternate closet closing methods may involve more complicated or more expensive construction, though they may obviate the objection that swinging doors form an obstruction in the room.

Banks of wardrobe type closets with sliding or rolling doors are becoming more and more popular. Fitted with drawers or trays, they take the place of bureaus, chests, and chiffoniers and make for more spacious uncluttered rooms.

Doors which expose the full width of the closet are preferable for both visibilitity and reachability. "Walk in" or "walk through" closets naturally use more area than others with no "circulation." In some cases, however, a single door to a large "walk in" closet may be justified by the need for maximum wall space for furniture.



VARIOUS CLOSING METHODS

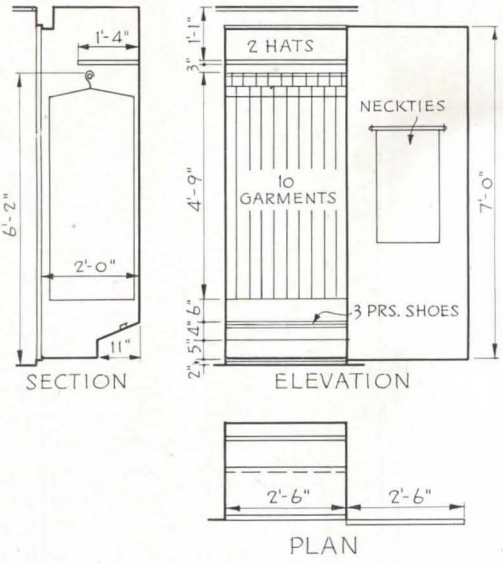


TYPICAL CLOSET PLANS

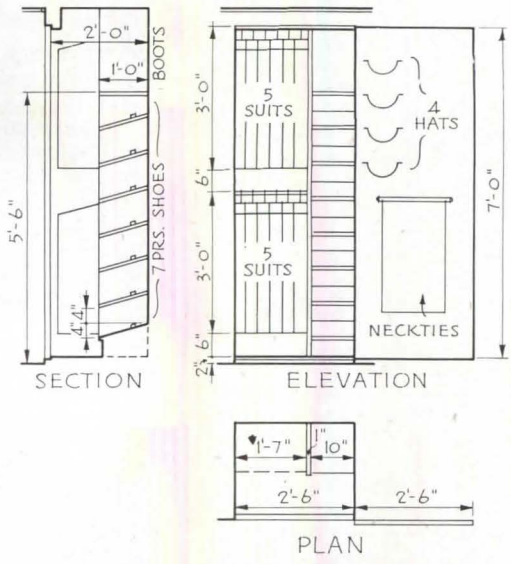
ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
MAY 1944

HOUSEHOLD CLOSETS, PART II

Bedroom Closets for Men

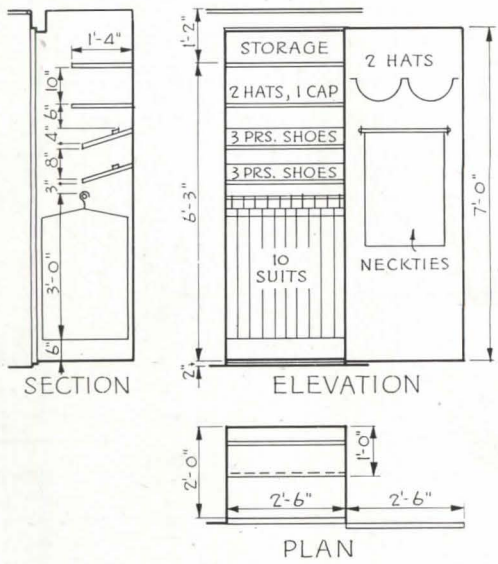


A minimum size closet of a usual type. Shoes can be stored on the raised shelf-rack and three additional pair on the floor in front of the rack. Door could be arranged for hats as shown below, leaving shelf for other storage.

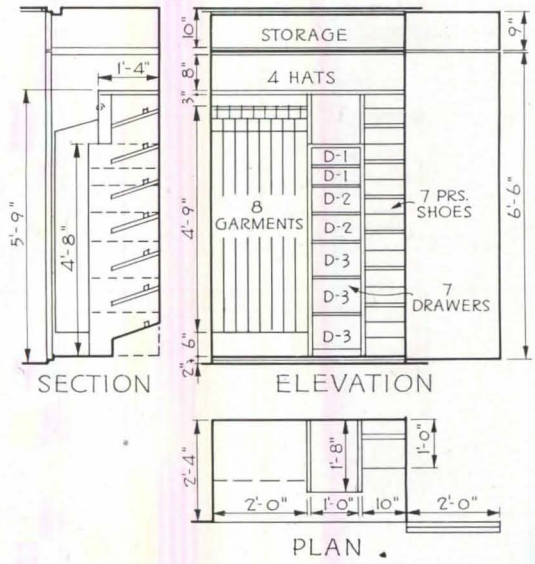


Minimal closet arranged to make shoes more visible and reachable. There is space for hats without crushing or for night clothes hooks if hats are normally stored in a hall closet. Neckties might be in two tiers.

SCALE OF ALL DIAGRAMS ON THIS PAGE 1/4" = 1'-0"



An alternate to the scheme above giving maximum view of shoes and an additional shelf. Trousers would have to be folded over the crossbar of the suit hanger rather than being hung separately from the pole with trouser-hangers.

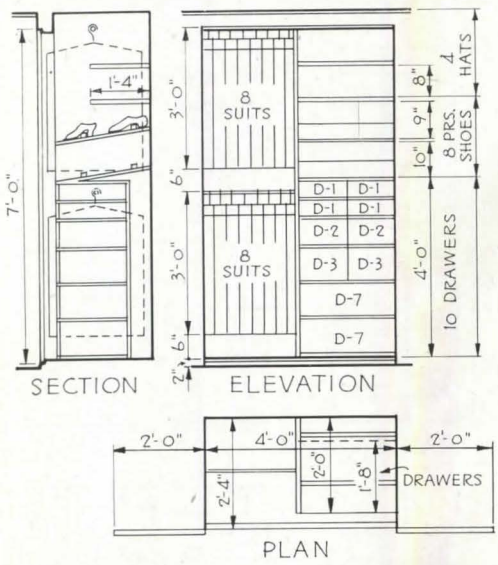


A four-foot closet with seven drawers for shirts, socks, underwear, etc., and a vertical tier of shoe racks (as above). Night clothes and bathrobe hooks are best on the right hand door, necktie racks flat against the left hand door.

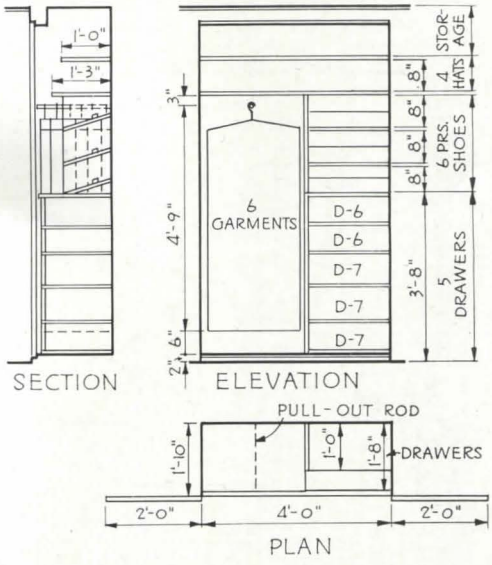
HOUSEHOLD CLOSETS, PART II

Bedroom Closets for Men (continued)

ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
MAY 1944

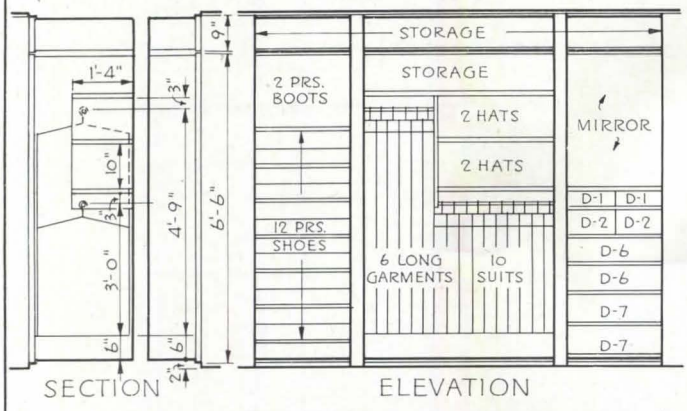


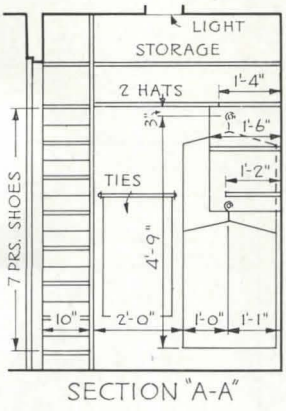
Another four-foot closet with ten standard drawers conveniently arranged. Shoes are placed tandem above the drawers for visibility and reachability. Poles are one above the other, requiring reaching.

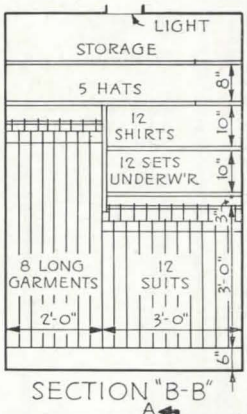


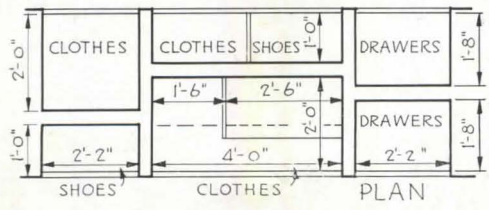
A solution to the shallow closet problem. A pull-out rod takes care of the suit, coat and trouser hanging. Five drawers take the place of a small bureau or chest. Shoes are at "no stoop, no squat, no squint" levels.

SCALE OF ALL DIAGRAMS ON THIS PAGE 1/4" = 1'-0"

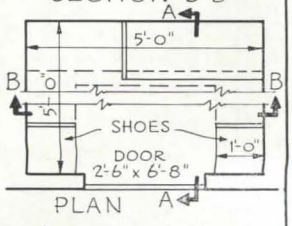








Wide wardrobe closets of more luxurious size planned as part of walls separating two rooms. Four doors, sliding or swinging, can be used. Lower portion of shoe-tiers could be replaced with mothproof "dead-storage" drawers.

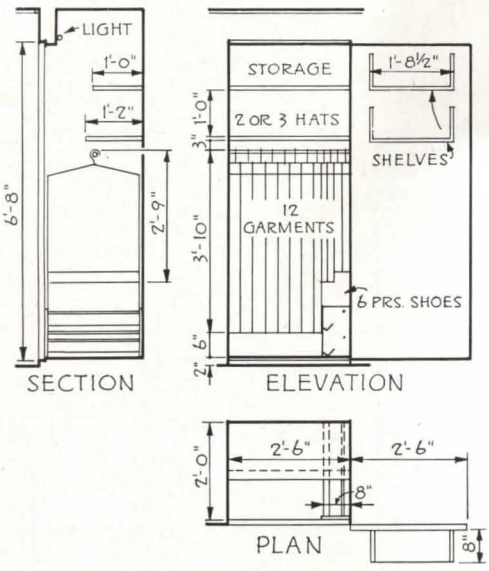


A deep walk-in closet. High tiers of shoe racks flank the door jambs. Shelves for live and dead storage on three sides, upper levels. Suit poles range the back wall. Ties are on the left wall, night clothes hooks on right wall.

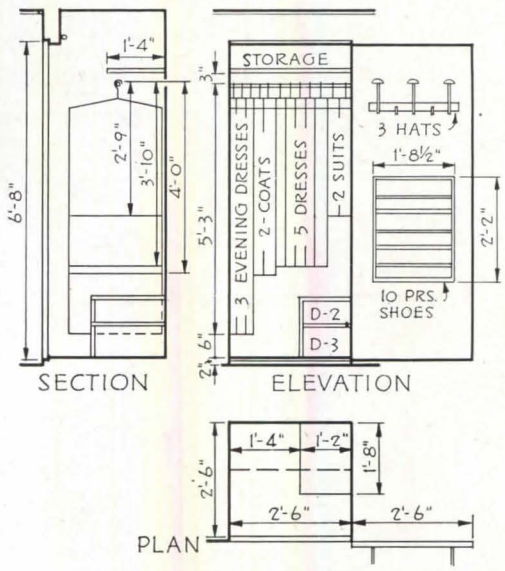
ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
MAY 1944

HOUSEHOLD CLOSETS, PART II

Bedroom Closets for Women



A small closet with shoe racks at the side under short hanging garments. Additional shoe pockets might be placed on the door under the hanging shelves. These handy shelves fold into the space in front of the hat and storage shelves.



An alternate minimum closet arrangment with a high pole for long dresses. Two drawers below the shorter hanging garments. Depth of closet permits a door type shoe rack and a hat rack. Wide hats can go on upper shelf.

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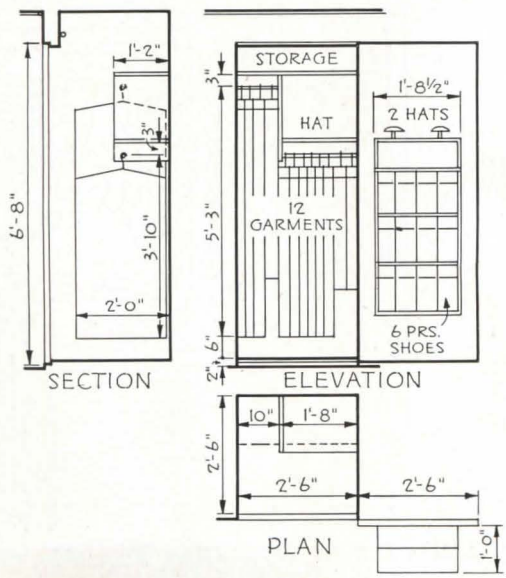
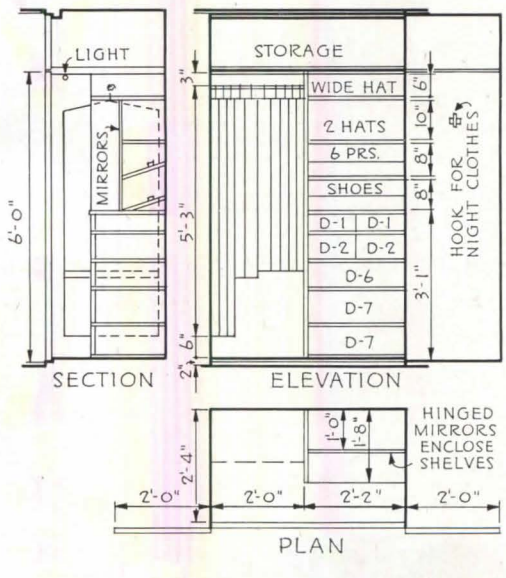


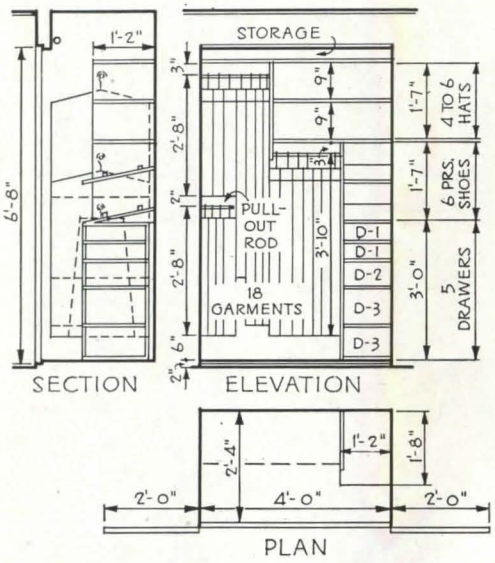
Alternate to closet above. It provides a high pole for hanging evening dresses and a lower pole for other dresses and suits. A large hat shelf is provided above the low pole as well as a hat rack and shoe pockets on the door.



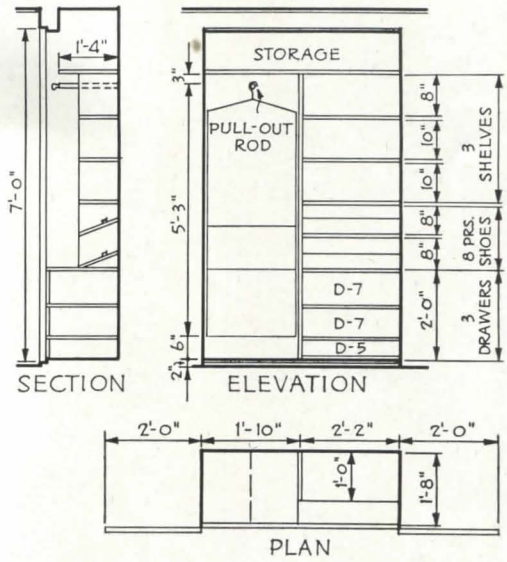
A four-foot closet combining hanging and shelf space with drawers for stockings, underthings, and what-not. Shoes are easily seen and chosen from the almost eye-level cleat rack above the drawers. Hat storage on the shelves.

HOUSEHOLD CLOSETS, PART II

Bedroom Closets for Women (continued)



Another four-foot closet with a short cantilever pole at the left allowing two-decker hanging. Closet drawer space would naturally be supplemented by a bureau or other furniture. A shoe rack on the door would increase capacity.



The shallow closet problem solved by the use of a pull-out rod firmly anchored to the back wall. Drawers again at lower right with cleated shoe shelves above, and hat shelves above them. Drawers may have to be shorter than standard.

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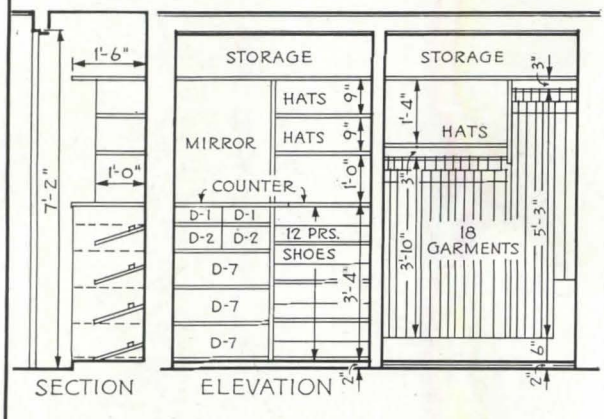
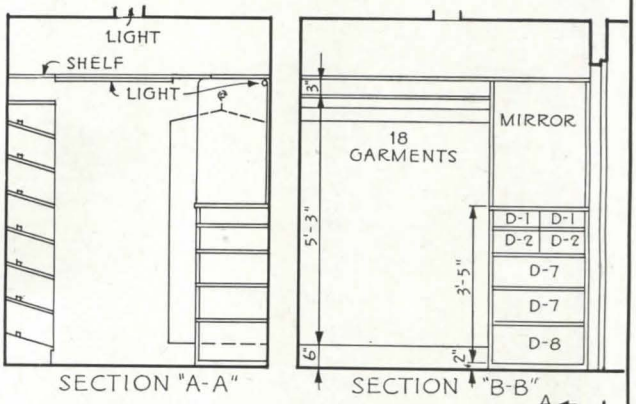
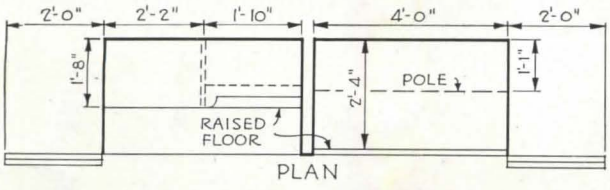
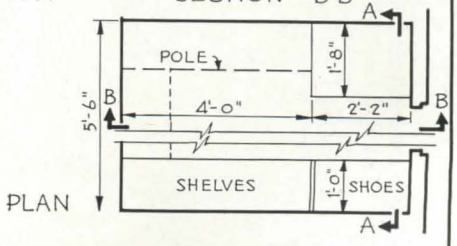






Large double wardrobe type closet, almost half devoted to hanging space. Left half fitted with large and small drawers and wide shelf-counter with mirror above. Sliding doors may be preferred and center partition minimized.

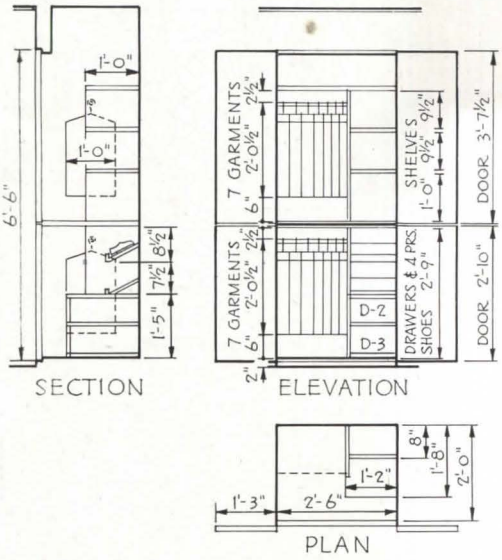


A walk-in closet, shoe racks and shallow shelves at one side drawers and hanging pole at the other. Drawers next to door are convenient but hazardous if left open. They could be placed at the back with hanging space near door.

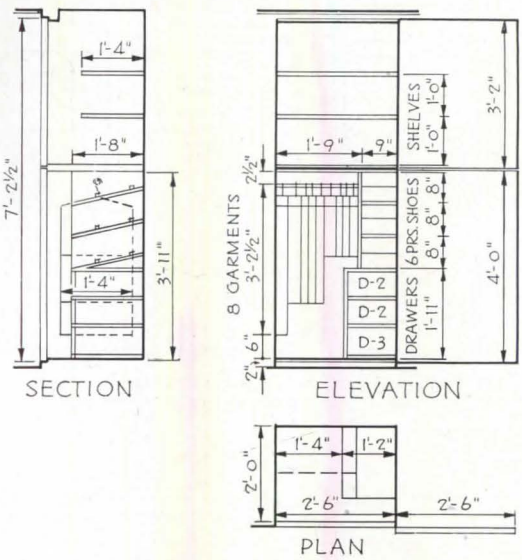
ARCHITECTURAL RECORD
TIME-SAVER STANDARDS
MAY 1944

HOUSEHOLD CLOSETS, PART II

Bedroom Closets for Children



Closet for infants up to about 5 years old Low hanging pole shelves and drawers permit habits of care and orderliness to be developed at an early age. Upper part would be used by adults. Note two sets of doors.



Small closet designed for a child of from 6 to 10 years. Pole at higher but easily reached level. Drawers and shoe racks at convenient heights. Ample shelf room provided above for the storage of possessions.

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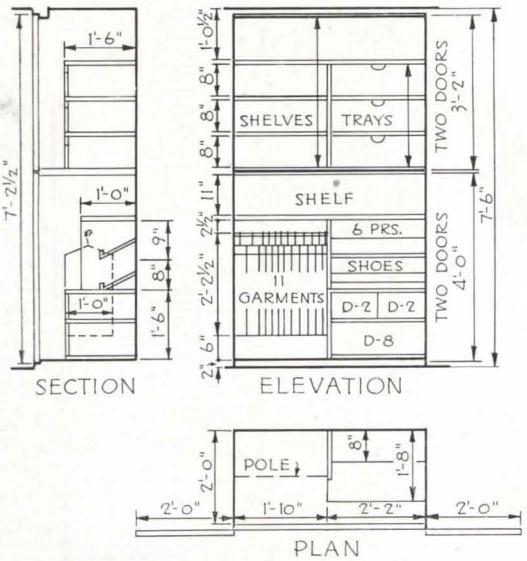
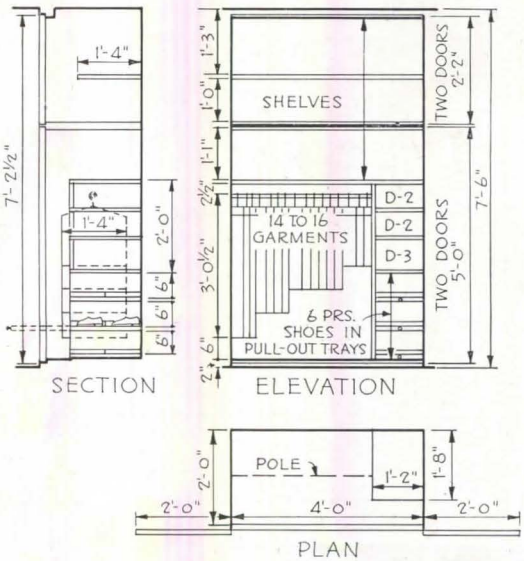


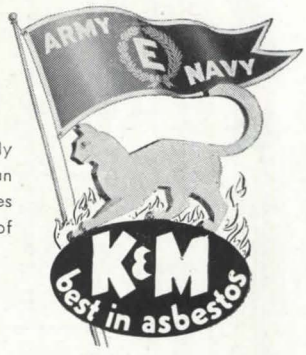
Alternate, and larger, closet for an infant up to 5 years of age. Trays or drawers for folded garments at an upper level for adult use. Hanging space, drawers and shelf available to child using the lower doors.



Closet for youngster up to 10 years old, providing greater length of hanging pole and different shoe arrangement, trays instead of cleat racks. A large shelf for hats, toys, or "collections" available to child.

The Austin Company—Architect, Engineer, Manager

Nearly a million square feet of K&M "Century" Apac in this mighty aircraft plant!



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he has set out to disprove the frequent criticism that the TVA is undemocratic. "The methods of democratic development represented by the TVA," he says, "are distinctive, but their roots lie deep in the soil of American tradition and common experience. They are methods that differ from those customarily employed both by private enterprisers and public agencies. Nevertheless the TVA experiment has been carried on under the existing rules of the game of American life. . . . Property rights and social institutions have undergone no drastic amendment."

TVA's dams unquestionably have brought under control a river with a bad habit of frequently flooding its banks, and no doubt under TVA's beneficent guidance thousands of acres of erosion-scarred soil have been restored by the planting of soil-holding crops. In addition "In tens of thousands of farmyards and farm homes you can see the change this power has already wrought. There are refrigerators in the kitchens. The water is carried by an electric pump instead of by the women, young and old, with their water pails. There are hay driers in barns, freezing lockers in the crossroads stores. There are community food dehydrators, small motors to grind feed, cut the wood, turn a small lathe. Power is curing hams, processing sweet potatoes, cooling milk in the new dairies."

Here, Mr. Lilienthal assures us, is a government project which not only has worked, but has benefitted the very people whom it was intended to benefit. And here is a government project which was dropped whole into the lap of *one* agency instead of parceled out among half a dozen or more. Unity of purpose, unity of method, were achieved at the beginning of the project, and have been maintained throughout.

NEIGHBORHOOD CONSERVATION

A Handbook for Citizen Groups. By A. C. Kayanan. Cleveland 14, Ohio (Housing Center, West Mall Drive), Regional Assn. of Cleveland, 1944. 8½ by 11 in. 37 pp. 25c.

From time to time someone suggests that the citizen should have a share in the planning of his city. Once in a while someone even does something about it. Cleveland is a jump or two up on the rest of the country now that this handbook has appeared. Graphically, with a minimum of text and a maximum of pictorial matter, this manual presents the advantages of neighborhood conservation, what neighborhood conservation is, how it works. The illustrations are excellent, ranging from a group of three showing that "the slums need clearance and rebuilding, the areas being blighted need conservation, and the better areas need protection," to a number of before-and-after diagrams showing what can be done to eliminate bad crossings, provide parking space, etc. The least city planning conscious citizen would find something of interest in this booklet—which, of course, is its purpose. Given fairly wide distribution, it will assure action by setting up a concerted yowl for it from an aroused citizenry.

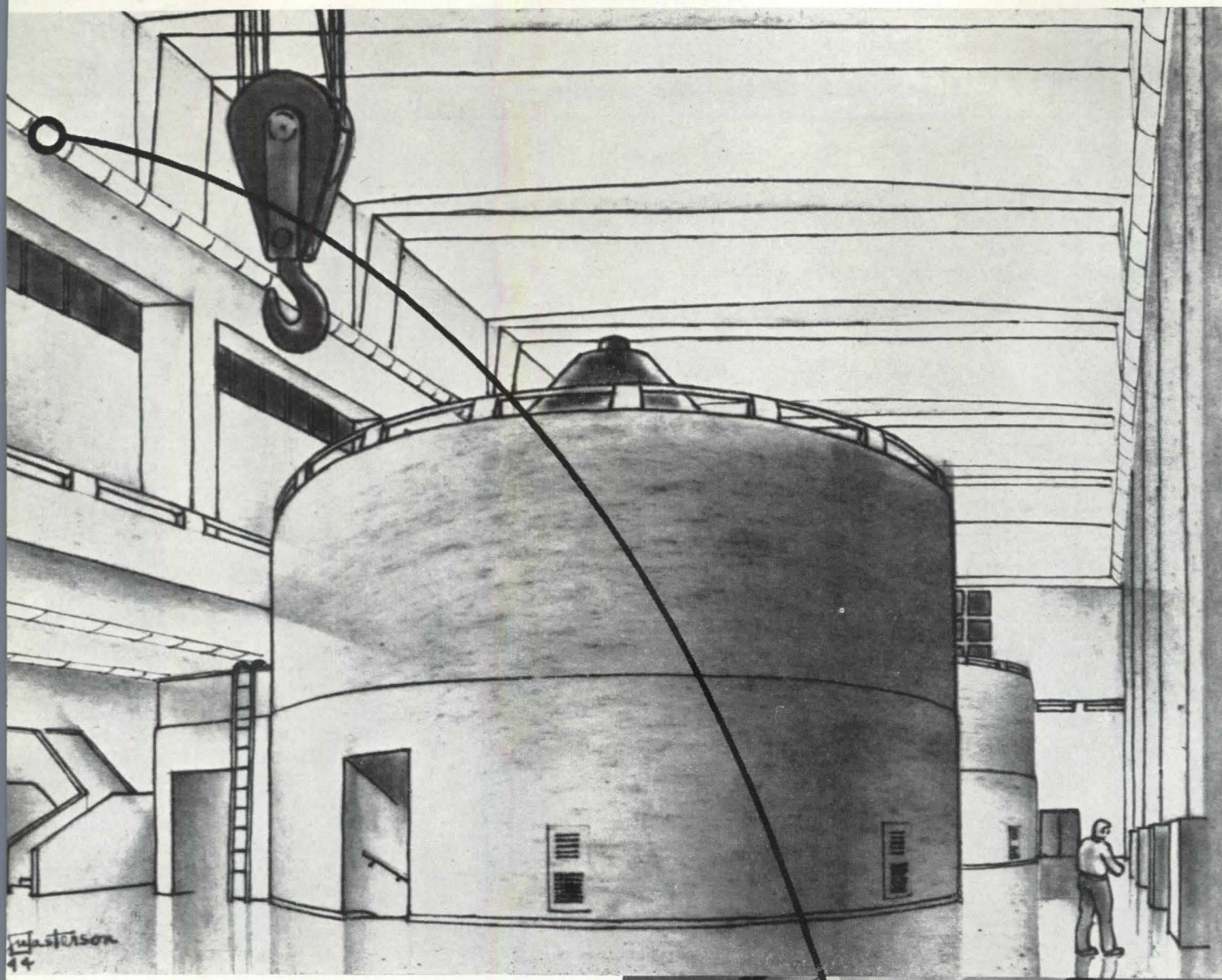
PERIODICAL LITERATURE

BUILDING THE FUTURE

By Henry J. Kaiser. American Savings and Loan News, Cincinnati, Ohio (22 E. 12th St.), March 1944, pp. 98-100, 127.

As everyone should realize by this time, Henry Kaiser belongs to the "it-can-be-done" school. Nothing is too big or too impossible for him to tackle. And his optimism is contagious. When he says, as he does at the end of this

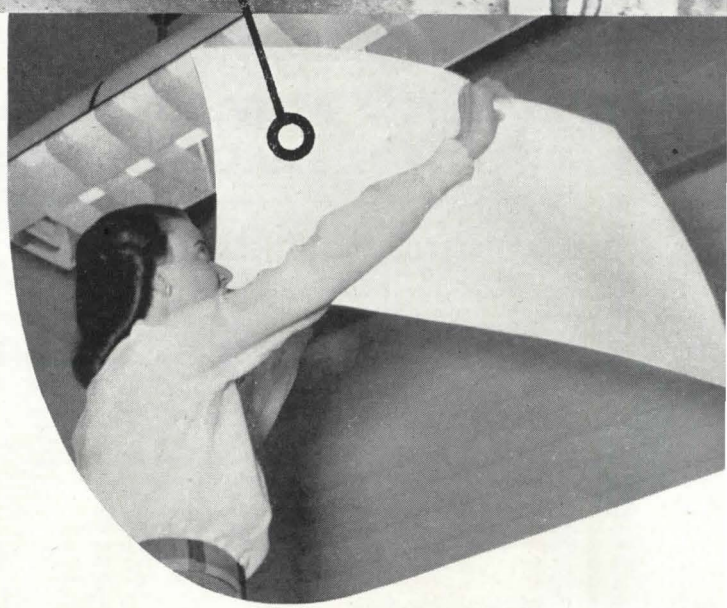
(Continued on page 114)



PLASTICS

FOR POWER PLANTS

and all modern buildings where architects and designers are concerned with the best appearance and performance in the execution of their plans. The General Electric Company will be pleased to co-operate and offers technical advice and information on the use of plastic materials. Write Section C-288 for information that will help you find the solution to your planning problems.



Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS.

FIFTY YEARS IN THE PLASTICS INDUSTRY

GENERAL ELECTRIC

PD-288

Insure *Your* Future By Buying More War Bonds And Saving Them

 (Continued from page 112)

article, that the housing needs and desires of the nation could keep millions employed for years after the end of the war, you tend to believe him—partly because you *want* to believe him, and partly because his arguments are convincing.

What he says of housing needs and goals, of course, is not news to anyone in the building field. Nor is it news that he built a complete city in 90 days to house some 35,000 of his workers. What *is* news is the plan he presents for a larger city with broad streets, parks and playgrounds, schools, churches, health centers, and a garden for every home. At present only a dream, this city probably will be built, because Mr. Kaiser expects it to be.

Out in his Portland shipyards a questionnaire was passed around to 91,000 people. One of the questions asked was, "After the war, what is the first thing for which you will spend your savings?" Of the 80,000 who replied, 26 per cent said that they would buy a new home. Of the 65,200 war workers in the Portland area who want to stay there after the war if they can get jobs, 17,000 want to build homes. "If they were able to do so," Mr. Kaiser comments, "they would create more employment than the 65,000 now enjoy."

Make home ownership attractive, is Mr. Kaiser's advice; encourage home buyers to shorten the mortgage period as often as possible, "for there is something in the full and outright ownership of property, and particularly residential property, that gives stability and soundness to the social structure." Be honest in advertising. Tell the whole story of home ownership—that the cost of the dwelling does not include the cost of land and utilities, nor of taxes and upkeep—and perhaps cut down the number of foreclosures.

HEATING THE POSTWAR HOUSE

By Robert K. Thulman. Heating and Ventilating, New York (148 Lafayette St.), March 1944, pp. 68-75. illus.

There will be three major differences between the postwar house and its prewar predecessor, in the opinion of this author, that will affect heating. First, the postwar house will be slightly smaller; second, it will be cheaper; third, it will lose less heat.

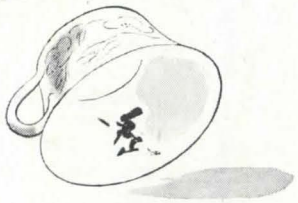
The lower heat loss, due in large part to wider and more effective use of insulation, is Mr. Thulman's chief concern here. He goes rather thoroughly into the reasons for the comparative unpopularity of insulation before the war, and makes a few predictions as to the first postwar decade. Fuels, panel heating and service water heating are discussed briefly, and a number of excellent diagrams and charts are included.

NATIONAL PLANNING AND HOUSING

Task, New York 17 (211 E. 49th St.), Spring, 1944.

This fifth number of *Task* is given over in its entirety to the always controversial subject of national planning and housing. A dozen articles by almost as many authors are as varied as they are interesting. Included among them are discussions of unity in planning, what we have learned from the war, what the postwar plans really are (another survey), an evaluation of the NRPB, and a description of one much-talked-of war housing project. The editors, with their tongues happily in their cheeks, present a "challenging and inspiring folio of postwar plans." Talbot Hamlin contributes a vital word on "A Policy for a Cultural Heritage." The result is a composite picture that is vividly descriptive.

WHY LOOK HERE FOR THE POST-WAR BATHROOM



when *experience* tells you so much

When shirt sleeves are rolled up and the "some-day-soon" homes actually get down to the blueprint stage, they're sure to reflect the teachings of past experience. Bathrooms especially will combine eye-pleasing design with the serviceability and long life that time has proved are worthy of your reputation—and the homeowner's investment.

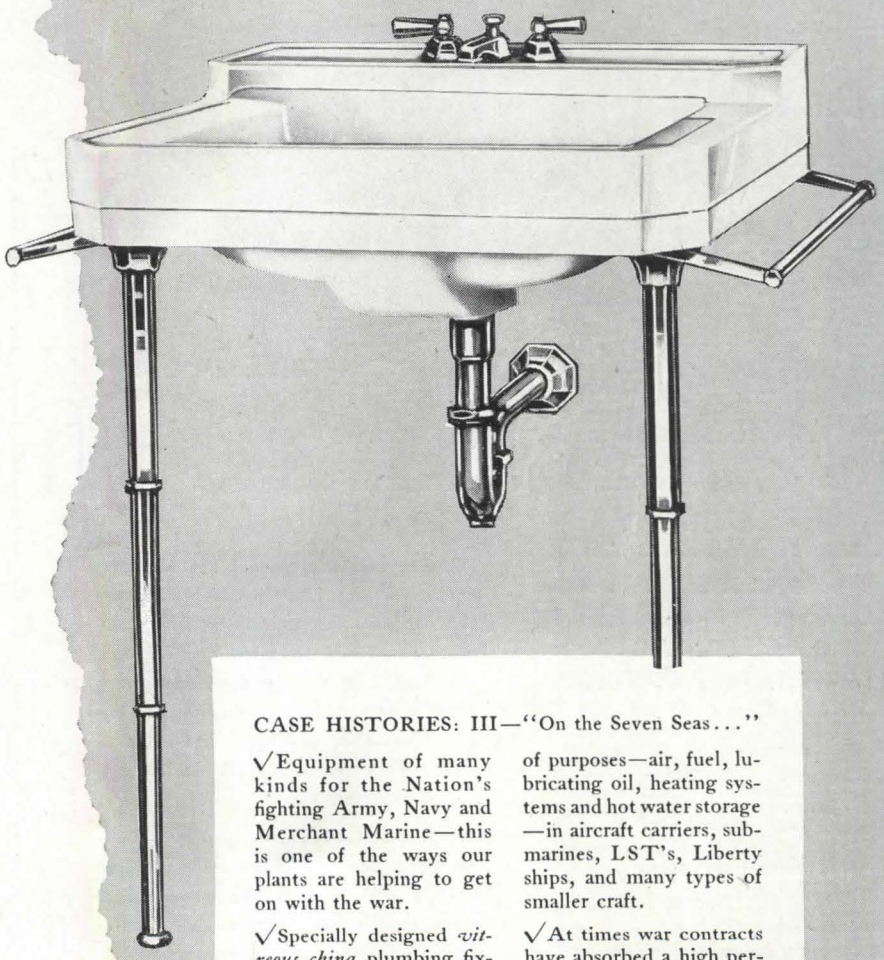
The famous Winston Lavatory shows why on both counts there has long been a preference for Case plumbing fixtures. Here is the *permanent* cleanliness and beauty of *twice-fired* vitreous china, the utility of an integral shelf, extra large basin, anti-splash rim and concealed front overflow. Fittings and accessories—styled to "fit" equally well in the mansion or the cottage—complete a fixture that denotes quality in every detail.

Case experience, revealed in so popular a lavatory as the Winston, is a mighty sound starting point for the post-war bathrooms of your clients and customers.

W. A. Case & Son Mfg. Co.
Buffalo 3, N. Y. Founded 1853.

Case

LIFETIME PLUMBING FIXTURES



CASE HISTORIES: III—"On the Seven Seas..."

√Equipment of many kinds for the Nation's fighting Army, Navy and Merchant Marine—this is one of the ways our plants are helping to get on with the war.

√Specially designed *vitreous china* plumbing fixtures for combat vessels building on the Great Lakes and on the Pacific Coast. Steel engine housings for the Army's fleet. Steel portholes for cargo vessels. Thousands of *welded* tanks for a variety of purposes—air, fuel, lubricating oil, heating systems and hot water storage—in aircraft carriers, submarines, LST's, Liberty ships, and many types of smaller craft.

√At times war contracts have absorbed a high percentage of our production, with resulting delays in the flow of products for civilian use. We cannot promise any improvement in "civilian" production until after the successful invasion in the West.

IT'S NOT OVER YET
Buy More War Bonds

 (Continued from page 46)

Plastics and Rubber "Wed"

The "marriage" of plasticized vinyl chloride resins with certain butadiene type synthetic rubbers to effect vulcanizable blends which possess most of the best properties of each material, creating a new and valuable series of elastomers, has been announced by the chemical division of The B. F. Goodrich Company.

Compounds which the company is now offering, subject to WPB allocation, are mixtures of its Geon vinyl resins and Hycar oil-resistant synthetic rubber in which butadiene and acrylonitrile are principal ingredients. Geon resins as such will be furnished, with instructions for compounding with oil-resistant synthetic rubber when this is desired.

Vulcanizable blends ranging from 75 parts of oil-resistant synthetic rubber such as Hycar OR and 25 parts of the Geon resins to 50 parts of the rubber and 50 parts of Geon are easily processable by well-known rubber industry techniques, and yield products serviceable over a wide range, the company reports.

Compositions made from these blends can be extruded, molded, calendered or spread. A mirror-like finish can be produced.

Combination of the two materials produces high resistance to the effects of sunlight and ozone, increased resistance to benzene and similar aromatic solvents, both in swelling and cracking, low temperature flexibility combined with excellent heat resistance, improved flexing life, gear resistance, resilience and oven aging.

Plastic Upholstery

Fireproof plastic upholstery, developed by the U. S. Rubber Company, has been ordered by the Navy as mandatory equipment for all combat ships, to provide added protection against fire. The upholstery covering, which will be used on furniture of all new Navy combat ships and old ships returning to service after repairs, is non-smoldering, gasoline and oil-resistant, and durable under wide temperature ranges. It is also being used as turret lining and seat covering in both bomber and fighter planes.

The plastic upholstery is expected to be widely used after the war in night clubs, theaters, civilian airplanes, ships, buses and trucks.

Plastic Board

Another new product of the U. S. Rubber Company is a plastic resin board which is being used by both Army and Navy and for which many postwar uses are predicted in airplane manufacture, luggage, wall paneling, flooring, table tops and house furnishings.

The plastic board is washable and not affected by gasoline, oils, acids, most alkalis or alcohol. It can be made highly decorative. Light in weight and able to withstand strains and excessive vibration, the board is being used for helicopter cabin structures and other airplane parts.

Insulating Material

Especially designed for insulating purposes in the field of electronics in high frequency requirements is a new pyro-plastic known as *PemQue*.

In the molding of PemQue a Pyro-Welding process is employed which permits the components of the plastic to be welded to such a density that machining to tolerances of .005 is said to be practical.

Advantages claimed for PemQue: high resistance to mold and fungi

(Continued on page 118)

 (Continued from page 116)

growth; imperviousness to moisture; dependability under stress. International Products Corp., 2554 Greenmount Ave., Baltimore.

RUBBERLESS FLOOR RUNNER

A new composition floor runner called *Dura-Val* is said to look, feel and wear like rubber, yet, using no rubber, requires no priority and is available for immediate delivery in any desired quantity. It has a ribbed, non-skid surface, is washable and waterproof.

Recommended by its manufacturers for general industrial use in machine shops, processing and production plants, in offices, basements, stores, theaters, etc., Dura-Val Floor Runner is made in rolls 36 in. wide by 30 ft. long. So-Lo Works, Inc., Loveland, Ohio.

TRACING PENCILS

New to the Kimber-ly Drawing line are tracing pencils in four grades, especially developed for making blueprints from original pencil drawings on tracing paper to eliminate the necessity of inking in drawings.

The No. 1 pencil is intended to heavy bold faced lettering and outside borders; Nos. 2 and 3, for the drawing itself; and No. 4, for shading areas. General Pencil Co., 67-73 Fleet St., Jersey City 6, N. J.

WATERPROOFING

Now available to the general public for the first time, "Stopzit," a guaranteed waterproofing product formerly manufactured by the S and E Waterproofing Corp., is now being packaged and marketed by the Evercrete Corp.

Stopzit is used to waterproof and beautify all kinds of masonry, and is especially recommended for basements, playrooms, laundries, swimming pools, etc. Made in white and grey, Stopzit is said to be very simple to use. It comes in one gallon and five gallon containers. Evercrete Corp., 19 West 44th St., New York 18.

THE LIGHTING FIELD

Heat Lamp

A new 375 watt reflector type infrared heat lamp, the *Birdseye RE-40,* made in clear and ruby glass, is designed to produce higher drying temperatures. Heat-proof Superlok base, ceramic heat reflector disc and built-in reflector are standard features. Wabash Appliance Corp., 335 Carroll St., Brooklyn 31, N. Y.

40-Watt Fluorescents

Two companies have announced new 40-watt fluorescent units for use in offices and drafting rooms. These are the *Bedford* and *Ranger* units of Curtis Lighting, Inc., and the *Excelux* of the Edwin F. Guth Co.

The Bedford units, for two and three 40-watt fluorescent lamps, and the Ranger for four lamps, can be used both individually and in continuous rows. Both have steel wiring channels and "Fluratex" non-metallic reflectors. Curtis Lighting, Inc., 6135 W. 65th St., Chicago 38.

The Excelux luminaire, for four lamps, provides full-screen diffusion through a diffusing-shield of contiguous, multiple prisms. Available for unit type installations in close ceiling and suspension models. The Edwin F. Guth Co., 2615 Washington Ave., St. Louis 3.

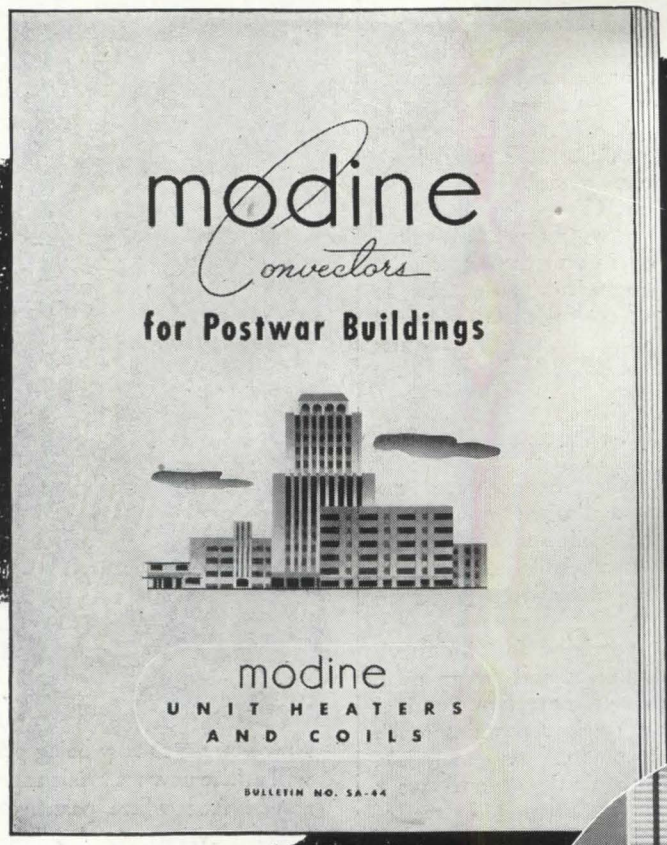
"Tracked" Installation

Another commercial fluorescent fixture using four 40-watt lamps features metal "tracks" for simpler installation. The tracks are fastened to the ceiling with toggle bolts or Ackerman and the

(Continued on page 120)

Get this NEW CATALOG...

then you can put modine convectors in your postwar specifications NOW!



Here is a book designed for architects to use—not just look over. It's for architects who are planning postwar buildings—and expect to get actual work started immediately after the war is won. Architects who want to incorporate real improvements in heating—the comfort, convenience and economy of the most modern copper convectors. Architects who want to know exactly what those convectors will be like so they can put them right into the specifications now. That's exactly what's in this book.

Coupon brings New Catalog SA-44.

EXPERT ENGINEERING HELP ON CONVECTION HEATING

Modine representatives offer you their expert experience as heat transfer specialists and their complete co-operation in incorporating modern convection heating in the design and modernization of your postwar buildings.

Look in your phone book for Modine representative's name—"Where to Buy It" section.

RIGHT NOW, WAR PLANTS CAN GET MODINE UNIT HEATERS

ARMY E NAVY

Projection Recessed Type Modine Copper Convector.

MAIL COUPON TODAY

Modine Manufacturing Co.
1773 Racine St., Racine, Wis.

Without cost or obligation send me *new* Catalog SA-44.
I am an ☐ Architect ☐ Engineer
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MODINE MANUFACTURING COMPANY
1773 RACINE STREET • RACINE, WISCONSIN

FOR BETTER BUILDING

(Continued from page 118)

fixture simply slides into place on them. Unit is completely wired, ready for hanging. Underwriters' Laboratories approved. Model 2044, Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago.

Streamlined Ballasts

Designed to fit the contours of wartime lightweight fluorescent fixtures is a new line of Tulamp 40-watt ballasts housed in streamlined, drawn-steel cases.

The ballast is arranged for external mounting atop the fixture, with leads out the bottom of the ballast case. This makes possible the installation of ballasts atop a very narrow and shallow wiring channel in an exposed position and allows appreciable reductions in the amount of critical metal required for the manufacture of the fixture. General Electric Co., Schenectady, New York.

FOR PRODUCT DESIGNERS

Sweet's Catalog Service has announced that a limited number of copies of Sweet's File for Product Designers is now available to architects and engineers currently engaged in product design.

Compiled especially for industry's product development and design men, this bound file of some two hundred manufacturers' catalogs contains much essential information on materials, finishes, parts, techniques and work equipment. It is distributed free of charge to qualified applicants. For further information address Distribution Manager, Sweet's Catalog Service, 119 W. 40th St., New York 18.

AUTOMATIC CONTROLS

Synchro-Start has produced an attractive booklet describing for architectural engineers the various automatic controls, governors, and solenoids, etc., for use with various types of engines. In addition, they take one visually through their efficient plant, by means of photographic illustrations.

HEATING TRENDS STUDIED

An analysis of heating trends and markets, and the possibilities for new designs for boilers and heating equipment for residences, commercial and public buildings, has been inaugurated by the Fitzgibbons Boiler Company. Mr. Ray C. Malvin, general plant manager, and recently appointed vice president, is in charge of this work in connection with the company's postwar

(Continued on page 122)

FOR BETTER BUILDING

(Continued from page 120)

committees. Public demand and market studies are being made under the guidance of Mr. O. F. Noss, M.E., assistant sales manager. This work anticipates the conversion of the company's facilities from war work to peacetime production in the shortest possible time.

REINFORCING STEEL TO BE STUDIED

A basic study of the uses of steel bars for concrete reinforcement is being inaugurated by a Committee on Reinforced Concrete Research recently organized by the American Iron and Steel Institute. Membership of the committee includes representatives of 21 producers of both new billet and rail steel concrete reinforcing bars.

The Committee has outlined an initial program of work covering a minimum of three years. In general it is planned to study the extent of any gaps which may exist in the technical data on which design regulations and specifications are customarily based. It is then proposed to initiate programs of research for the purpose of developing new test data or of supplementing existing data.

Work is already under way on a comprehensive investigation of problems relating to the proper design of square and rectangular footings. A second project will involve the investigation of unit stresses permissible in the design of reinforced concrete slabs and beams.

A CORRECTION

Our apologies to the Coroaire Heating Corporation for the misspelling of their name in the item describing their gas fired home heater in the March "For Better Building" (p. 114). The correct spelling is Coroaire, not Coraire.

OPPORTUNITIES AVAILABLE

STORE PLANNER WANTED

A rapidly expanding organization doing store planning and modernization has openings for designers. An architectural background is desirable but practical experience doing store design and interior planning essential. Preferably the men wanted have the ability to make sketches, know color and display—having had experience in a store or fixture designer who specialized in store work. A real opportunity for a man who is imaginative, hard working and wants to get ahead. State training, education, experience, pertinent personal data and salary requirements. *Box 8,* ARCHITECTURAL RECORD, *119 West 40th Street, New York 18, N. Y.*

Power generating plant of Philadelphia Electric Company, Chester, Pa. where Lupton Metal Windows are installed. Consulting Architect—Paul Cret; Engineers—United Engineers & Constructors, Inc.

In war plants all over the country, Lupton Metal Windows and Doors are providing the abundant daylighting and controlled ventilation so important in all-out production. Flexible in design, they meet every requirement of industrial construction. Strong, trouble-free, weather-tight. And back of the Lupton line is an experience of more than forty years in metal window design.

See our Catalog in Sweet's

MICHAEL FLYNN MANUFACTURING CO.
E. Allegheny Ave. at Tulip St., Philadelphia 34, Pa.

LUPTON
METAL WINDOWS

same time, we should have the best modern buildings based on the traditional style which may have as many points of advantage as the "modern" building and be to many people, more beautiful.

I suppose this letter sounds like the effusion of an old fogey, but I sometimes get the impression that the architectural magazine is representing the viewpoint only of the callow youth of the profession. Possibly they are right and tradition is all wrong, but I am more inclined to feel that the great architecture of the future will evolve from the building and the design of the past, rather than from the brains of those who feel that it is not necessary to have any knowledge of what has gone before.

I see in the magazines many buildings that are apparently published just because they are different from traditional design, and not because they have real beauty or improvement in use. Can't we have more buildings that are fresh and modern, but that don't feel it necessary to abandon everything connected with traditional design?

—CHARLES F. CELLARIUS, *Director Great Lakes District, A.I.A.*

Record:

I think your idea of influencing owners is a very fine one. Personally I believe it has already brought results. We have attempted to influence people to plan now. We have been particularly fortunate and I cannot attribute it to any exceptionable sales ability on my part. However right now we have more than we can do, getting out plans for postwar work. The planning runs from houses to hospital construction and school work.

There is no doubt in my mind but what your efforts have made many people conscious of the fact that they should plan now.

—CHARLES ALTFILLISCH, *A.I.A.*

Record:

I think your plan of reaching clients through their respective trade papers is a splendid idea. Very few prospective builders would have access to the architectural journals.

The specialization that has developed in modern day planning warrants a separate approach to the various fields. School houses have been well handled in your recent issue of ARCHITECTURAL RECORD, and *Nation's Schools,* to acquaint both the educator and architect with the scope of this field.

—THOMAS J. HIGGINS, *Past President Natl. Council on Schoolhouse Construction*

Record:

Your collaboration service and the particular feature in *The Nation's Schools* came to my desk at an opportune time. I enclosed it in a letter addressed to a nearby school district requesting an interview with their Board relative to their announced program. We believe it will bear fruit.

—MILTON MC GINTY, *Architect Salisbury, McGinty & Werlin*

Record:

I think you have a marvelous idea of approaching the prospective client for construction of public and industrial buildings. There is nothing you could add to your article in *The Nation's Schools,* except that there be some way of sending a series of this type to officials who might have charge of construction; hence, a great deal could be accomplished.

—CARL W. SCHUBERT, *Architect Boyum, Schubert & Sorensen*

Architects Now Design Functional Kitchens

With the Help of Hotpoint-Edison Commercial Kitchen Plan Service

Forward looking architects know that postwar buildings requiring mass-feeding will be only as modern as their kitchens. That is why, more and more, they are taking scientific food service engineering into account in designing kitchens for hotels, restaurants, schools, hospitals and institutions.

32 years experience in mass-feeding projects make Hotpoint-Edison Commercial Kitchen Plan Service a ready source of practical information. With this help you can plan kitchens of maximum efficiency. It is yours for the asking, with no obligation.

Modern electric kitchens eliminate many former problems. The kitchen can be located where you want it—where it will be most convenient and will provide the best food arrangement. There is no longer any need to be limited to a certain location because of such problems as ventilation or excess heat radiation.

Compact and efficient. Clients like the way Hotpoint-Edison Electric Cooking Equipment economizes on space and reduces labor. With proper layout, it eliminates all lost motion. And it not only saves work directly connected with cooking, but also with cleaning, renovating and maintenance.

For a new building you will find many advantages in bringing in just one fuel for light, power and cooking . . . electricity which must be provided anyway. It gives maximum efficiency with minimum cost for installation and maintenance.

Equipment now available for some clients. Government regulations now permit manufacture of a limited quantity of equipment for essential civilian use. Consult your local Hotpoint-Edison distributor or write to us. Edison General Electric Appliance Co., Inc., 5625 West Taylor Street, Chicago 44, Illinois.

For outstanding achievement  in War Production

THE KITCHEN OF TOMORROW WILL BE ALL-ELECTRIC

Hotpoint Edison

COMMERCIAL ELECTRIC COOKING EQUIPMENT

RANGES • BAKE OVENS • ROASTING OVENS
DEEP FAT FRY KETTLES • BROILERS • GRIDDLES

OLDEST AND LARGEST MANUFACTURERS OF ELECTRIC COOKING EQUIPMENT

FOR VICTORY — BUY U. S. WAR BONDS AND STAMPS

 (Continued from page 14)

Agency has allotted approximately $16,000,000 of Lanham Act funds, have been approved by the President. The projects are spread over 42 states, Alaska and Hawaii.

WAR HOUSING EQUIPMENT

Contractors on publicly-financed war housing projects will furnish in the future items of equipment heretofore handled through mass purchase by the Federal Public Housing Authority.

Such items as plumbing and heating equipment, and lighting fixtures, will be included in construction contracts again as they are under normal building conditions. Inclusion of ranges and ice boxes is at the option of FPHA Regional Directors.

The FPHA has a stockpile of equipment which will be sufficient for the next three months' housing demands. In the meantime, FPHA has begun liquidation of the central buying activities through which more than $80,000,000 of equipment has been purchased for approximately a billion dollars of war housing.

BUILDERS CALLED READY

Evidence received from scores of cities throughout the country shows that immediately after the war private home builders will start their programs providing adequate housing for families of low-income at costs from 20 to 35 per cent less than the same dwelling units could be provided by public housing agencies, according to a recent statement by Robert P. Gerholz, president of the National Association of Home Builders.

"There is good reason to believe that the tremendous savings of taxpayers' money to be realized by turning full responsibility for rehousing slum families over to private builders is fully recognized by the leaders in Congress who are preparing to legislate in this important field," Mr. Gerholz said. "The next step is for the builders to demonstrate clearly to their communities that they are willing to devote a large part of their efforts to this important segment of the residential construction field. . . .

"In Washington, D. C., conceded by many to have the worst slums in the nation, a group of more than 50 of the Capital's most prominent home builders appeared before a Senate subcommittee and pledged their willingness and demonstrated their ability to build in the brief period of six years enough low-cost, low-rent housing to accommodate every family now living there in substandard and slum dwellings.

ENGINEERS RESEARCH

To stimulate and assist local private interests and government units in expediting completion of engineering and architectural plans looking toward postwar employment in the construction industry, the committee on postwar construction of the American Society of Civil Engineers on March 31 created a research and development division and appointed Vincent B. Smith, associate editor of *Construction Methods,* to act as executive director. The committee further named Mark B. Owen, of Hastings-on-Hudson, N. Y., to serve as full-time director.

The research staff will compile and issue comprehensive inventories for the guidance of public officials, industrialists, engineers and architects. These inventories will provide accurate information relating to the volume of private and public postwar construction planning in progress or completed in various sections of the nation, classified as to types of projects.

(Continued on page 128)

It's called "Post-War Dreamitis" . . . and it's catching!

IT'S a disease. And the funny thing about it is that you may have caught it and don't even realize the fact.

The symptoms sound more amusing than alarming. The patient thinks about post-war and the house he plans to build. He sees visions of partitions that appear and disappear as he touches a button. Houses that glitter with glass and plastics. Houses that revolve with the sun, where he lolls in comfort not equalled since the days of ancient Rome.

There are at least two alarming things about "Post-War Dreamitis", if you sincerely want to build a house some day soon:

1. You lose time worrying about impractical ideas, when there is no time to spare.

2. You get confused with dream ideas. And if you don't look out, you'll miss entirely the many new improvements in building and in materials that are ready and waiting.

For example, new "floating type" plaster walls and ceilings that reduce room-to-room noise and cut down on repair expense. Fireproof gypsum sheathing at no more cost than old-style inflammable sheathing. High efficiency rock-wool insulation that brings year 'round comfort, and pays for itself even in the low-priced home by fuel savings. Washable wall finishes in colors, and noise-reducing materials for rooms where quiet is desired. These are just a few of the products which National Gypsum research has ready for your post-war home . . . products that can be specified *now*.

START PLANNING NOW

You should start now if you want to avoid the rush later on. Most authorities predict 1,000,000 new homes a year in the 10 years after the war. So the man who begins planning today has the jump on the market. One of the best ways to begin is by seeing your nearby Gold Bond lumber or building material dealer, or a local contractor or architect. These men know building. They can tell you how to get the house you want and how to finance it up to 70% or 80%.

The main thing to remember is that if you start now—today—with your planning you'll probably be living in your new house while the man with "Post-War-Dreamitis" will have nothing more tangible than his dreams.

M. H. Baker, President
National Gypsum Company

TO ARCHITECTS!

Architects know better than anybody that it takes more than dreams to build houses. It takes definite plans and specifications. To avoid visionary dreaming by the public and encourage practical planning, National Gypsum is running this series of ads in National Magazines. Then, when building restrictions are lifted, the whole building industry—architects, manufacturers, dealers and builders—will be able to start right in building comfortable, efficient homes for the people of America. National Gypsum Company, Buffalo, New York.

BUILD BETTER WITH GOLD BOND

Wallboard • Lath • Plaster • Lime • Metal Products • Wallpaint • Insulation • Sound Control

 (Continued from page 126)

PRODUCERS' COUNCIL

Restriction-Removing Plan

A plan for automatically removing wartime restrictions on the building of private residences, schools, stores, and other urgently needed civilian construction as fast as the necessary materials and manpower are released from the war program has been recommended to the WPB by Douglas Whitlock, president of The Producers' Council.

Under the proposed plan the WPB would grant permission for civilian construction to begin, without determination of the relative essentiality of each individual project as is the present practice, in any community where the following conditions exist:

1. The construction is to be located in a War Manpower Commission Class III, Class IV or unrated area which has been so rated for one month or longer, and where it may be presumed that an adequate supply of labor is locally available.

2. The applicant for permission to begin construction certifies that the work shall start within 30 days of the date of his application.

3. The applicant certifies that not more than 10 per cent of the value of materials required for the construction shall be obtained on a preference rating of AA-3 (or higher, if specifically applied for and granted for obtaining any particular item), and that the remaining materials can be obtained either without a rating or with a rating lower than AA-3.

New Bidding Practice

A new "Bidding Practice for Building Materials," to replace the controversial "or-equal" clause, is being advocated by The Producers' Council, and has been approved in principle by the A.I.A., according to an announcement by F. J. Plimpton, chairman of the Council's technical cooperation committee.

The main points of the plan are:

1. All basic bids are to be based on exactly the same materials and equipment, thereby being truly competitive.

2. The specifier may name one or several makes of a particular building product, but if more than one, he indicates which one is to be used as the basis for the regular bid.

3. The specifications also permit any bidder to submit an alternate price on any other named or unnamed materials or equipment which he thinks will meet the requirements. He does so by submitting what additions or deductions from his basic bid should be made if such alternates are used.

Financing Residence Resale

Construction of new homes for the millions of American families who will need and want new living accommodations after the war would be greatly stimulated by providing adequate financing facilities for the resale of existing residences and by encouraging direct investments in housing by large holders of investment funds, Frederick M. Babcock, chairman of the Postwar Committee on Finance of The Producers' Council, stated in a recent address before the Philadelphia Real Estate Board.

"Many of the families which desire and can afford to purchase new homes are handicapped by the fact that they already own older dwellings which often cannot readily be disposed of," Mr. Babcock said. "By revising the policies of the FHA in such a way as to permit that agency to insure loans on existing construction with down payments as low as those permitted in the purchase of a new house, the resale of the older properties would be greatly facilitated."

(Continued on page 130)

that home-makers are interested in STEEL building products

WE OFFERED your prospective clients a book which tells them how to have better homes — with steel construction members and equipment—for less money. These are some of the thousands of replies received from one advertisement. They are still coming in.

Today's home-planners are interested in good-looking, durable home equipment made of steel. They appreciate the economies steel effects by minimizing repairs and replacements, the safety and protection which its fire- weather- and vermin-proof qualities insure.

These people will be thinking of steel building products when they discuss their plans with you. They know that steel is the ideal material for structural members, roofing, closets, cabinets, colorful equipment for bathrooms and kitchens.

The book so many home-makers have sent for contains complete information on U·S·S Steel Products for use in residence construction, items equally appropriate in modern and conventional buildings. "85 Ways to Make a Better Home" is the title, and readers are instructed to consult an architect to find out how they can have better looking, more durable homes by taking full advantage of the versatility of steel.

We shall be glad to send your free copy of this book when you fill in and return the convenient coupon.

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

This home builder's guide sets you up as the final authority on the many applications of steel products in new or remodeled dwellings. It will help you to show your clients all the places where steel can be used advantageously.

SEND NO MONEY *It's Free*

United States Steel Subsidiaries
621 Carnegie Building, Pittsburgh 30, Pa.

Please send my free copy of "85 Ways to Make a Better Home."

Name_____

Address_____

City_____ State_____ AR44A

UNITED STATES STEEL

THE RECORD REPORTS (Continued from page 128)

NEW OFFICES

Van Doren, Nowland & Schladermundt have taken offices at 220 E. 42nd St., New York 17. This is a new firm of industrial designers formed by the association of Roger L. Nowland, Peter Schladermundt and Katherine B. Gray, three of the former partners of Norman Bel Geddes, with Harold Van Doren, of Harold Van Doren & Associates.

Mr. Van Doren is the author of the standard text, "Industrial Design," and winner of the 1941 American Design Award. Mr. Schladermundt, a graduate of Yale School of Architecture and registered as an architect in the State of New York, was formerly associated with Henry Dreyfuss. He was chief designer of the New York Central "Mercury" and "Twentieth Century Limited." Mr. Nowland, special lecturer on product development and design at Massachusetts Institute of Technology, was chief design engineer of the World's Fair Futurama; Miss Gray was office manager and director of information at the New York World's Fair.

Norman Bel Geddes & Company, reorganized since the dissolution, March 15, 1944, of the above partnership, is continuing under the same name and under Mr. Geddes' personal direction, at its present address, 50 Rockefeller Plaza, New York 20. Three new partners have been taken into the firm: Robert L. Newman, Jr., as executive director; Major Nathaniel B. Wales, as technical director; and Frederick H. Boynton, controller.

Mr. Newman was formerly associated with the U. S. Rubber Co., and recently with the 20th Century Fox Film Corp. Major Wales, recently assistant chief and consulting engineer to the Combat Vehicle Section of the Ordnance Department, is the inventor of the Kelvinator Refrigerator, Bendix Washing Machine, and many other industrial devices. Mr. Boynton for the past ten years has been a staff member of Ernst & Ernst.

Alfred C. Williams, A.I.A., has opened a new architectural office in the Phelan Building, 760 Market St., San Francisco 2, Calif.

Clarence A. Smith, II, architect, has announced the opening of his office at 5 Ivy Street Building, N.E., Atlanta 3, Georgia.

DESIGN OF THE MONTH

The Pittsburgh Plate Glass Company has announced resumption on May 1 of its "Design of the Month" service, available only to practicing architects. Published monthly since 1936, this service was discontinued in June, 1942. As previously, the designs will consist of a four-color process reproduction of a finished rendering, the plan and an interesting detail for a different type front each month. Explanatory remarks and legend identifying new products used, or a new application of older products, also will appear.

(Continued on page 132)

LIBRARY FOR SALE

Approximately three hundred and fifty volumes formerly owned by a late prominent and active Chicago architect. Should be of value to schools, libraries or young architects entering practice. For further particulars apply to Architects Realty Trust, Room 1737, 7 South Dearborn Street, Chicago 3, Illinois.

REVOLUTIONARY NEW WINDOWPANE FOR EVERY TYPE OF BUILDING

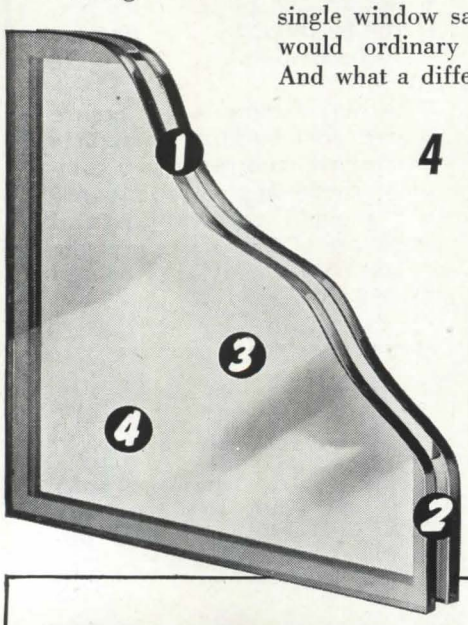
Thermopane

THE WINDOWPANE THAT INSULATES

with the BONDERMETIC SEAL

Climaxing fourteen years of research, L·O·F THERMOPANE is the first successful windowpane ever made with permanent, built-in insulation. It is made of two panes of glass, separated by an insulating layer of air, and sealed around the edges at the factory with a metal-to-glass bond. This *Bondermetic Seal* has withstood tests up to 4,000 pounds per square inch without failure—dramatic proof of its amazing strength. You install THERMOPANE in a modified single window sash, just as you would ordinary window glass. And what a difference it makes! Cuts heating costs amazingly. Deadens street noises. Keeps homes warmer in winter, cooler in summer.

In short, THERMOPANE, the new patented insulating windowpane, makes possible an entirely new standard of comfort and economy in the homes of tomorrow that you design, build or finance. It provides all of the benefits of double-glass insulation without the seasonal problems of putting up and taking down extra sash. There's no *extra* glass to keep clean. For a descriptive booklet, write Libbey·Owens·Ford Glass Company, 1054 Nicholas Building, Toledo 3, Ohio.



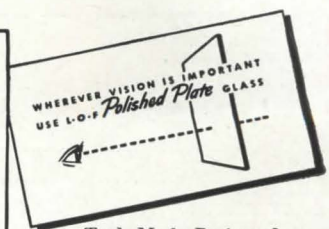
4 IMPORTANT FEATURES OF THERMOPANE

1. **INSULATING AIR SPACE.** The air inside the Thermopane units is scientifically cleaned, dried and hermetically sealed. This layer of air gives Thermopane its high insulating efficiency.
2. **BONDERMETIC SEAL.** This metal-to-glass seal permanently bonds two panes of glass into a single unit. Strong and weatherproof, it seals the insulating air space from dirt and moisture.
3. **NO FOGGING UP.** Because of the patented *Bondermetic Seal*, and the insulation afforded by the sealed-in air, frosting up and condensation are eliminated on the two inner surfaces.
4. **ONLY TWO SURFACES TO CLEAN.** The inner glass surfaces are specially cleaned at the factory . . . always stay clean.

L O F

LIBBEY·OWENS·FORD

a Great Name in **GLASS**



Trade Marks Registered

THE RECORD REPORTS

(Continued from page 130)

RADIO THEATER DESIGN CONTEST

Station WGN, Chicago, has announced a $10,000 prize contest for its "theater of the future," a radio studio seating 2,000 persons.

The proposed theater will be the keynote of a new 8 or 10 story building to be erected by WGN as soon as materials are available, on a site just south of Tribune Tower, Chicago, overlooking Michigan Avenue and the Chicago River. There will be a separate design competition for the building itself, details to be announced later.

Basic requirements on which the theater contest will be judged are, in order of importance: acoustics and utility; visibility; beauty of design. The stage should be approximately 60 ft. square, capable of seating an orchestra of 75 pieces, a chorus of 40, and the principals of a musical cast. It should be adapted for dramatic performance, and should allow for control rooms, flyloft, lighting equipment and storage space. The auditorium may have one or two balconies.

Further details of the contest will be announced shortly. Prizes will be as follows: first, $5,000; second, $2,500; third, $1,000; 15 prizes of $100 each.

SUMMER COURSES

The Institute of Design, Chicago (formerly the School of Design in Chicago) has announced a summer term of 11 weeks, June 12 to August 25, for day and evening classes, and a summer session of 6 weeks, June 26 to August 5, for day classes only. Courses offered include Basic and Product Design, Prefabrication, Architectural and Interior Design, Mechanical Drafting and Blueprint Reading.

ACADEMY AWARDS

The Alumni Association of the American Academy in Rome has announced the winners of the prizes in the 18th Collaborative competition for students of architecture, landscape architecture, painting and sculpture, in art schools throughout the country. The problem was a municipal center for Appleton, Wis.

All three prizes of $100, $60 and $40 respectively were won by teams from the University of Pennsylvania and Pennsylvania Academy of the Fine Arts, the architects and landscape architects being students at the University and the painters and sculptors at the Academy. First prize went to Irving J. Maitin, architect and landscape architect, Madeleine Robertson,

(Continued on page 134)

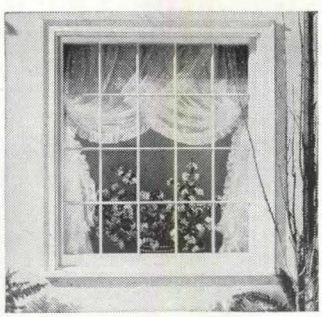
Give Them MORE WINDOWS the Easy Curtis Way!

● Check this yourself: More and more people who plan to build after the war want *more windows* in their homes-to-be. And that's *your* opportunity to design and build more charming, more livable homes, with right windows, rightly chosen.

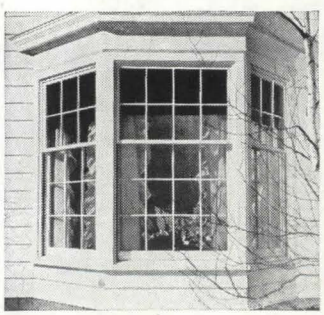
For your postwar plans, Curtis offers more than three-fourths of a century of research and successful experience in window manufacture. That's why you can be sure of correct styling—easy operation—weather-tightness—and economical installation when you choose Curtis Silentite. Here are a few Silentite window applications.

●

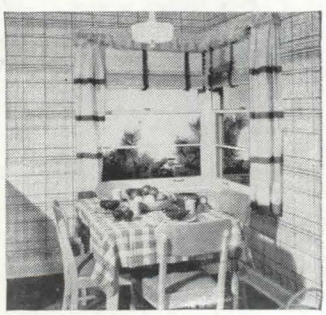
Window groups can be used to advantage even in the smallest homes. This group of stock Curtis Silentite double hung units assures greater weather-tightness because the windows are accurately pre-fit and thoroughly weather-stripped.



A stationary Curtis "picture" window, such as this, expresses the trend toward more window area in postwar homes. Notice the attractive design of these windows—the narrow muntins. Curtis offers several different sash styles.



Bay windows need not be costly—when they are made up of Silentite stock units. Bays, too, are a means of increasing effective living space in small homes—and of adding charm and distinction, as well. Curtis makes many different styles of bays.



Corner windows are modern and stylish—and they will prove increasingly popular in postwar building. Curtis Silentite double hung windows eliminate pulleys, cords, weights—are always easy to operate—treated to add longer life.

CURTIS WOODWORK IS SOLD BY RELIABLE DEALERS EVERYWHERE

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. . . Although the present Curtis Silentite window line goes further, we believe, than any other in meeting modern window needs, Curtis research is constantly directed toward window improvement. That is why it is worth your while to keep in touch with Curtis for the latest news on windows and other stock architectural woodwork. Mail coupon for free window booklet.

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1866 CURTIS WOODWORK
SILENTITE PRE-FIT
the "*Insulated*" window

(Continued from page 132)

painter, Eda Castle, sculptor; second, to Jorge Bonino, architect and landscape architect, Marian Freeman Holland, painter, Amelie Zell, sculptor; third, to Joan Nichols, architect and landscape architect, Gertrude Schobinger, painter, and Paul Greenwood, sculptor.

EXHIBITIONS

Modern Buildings

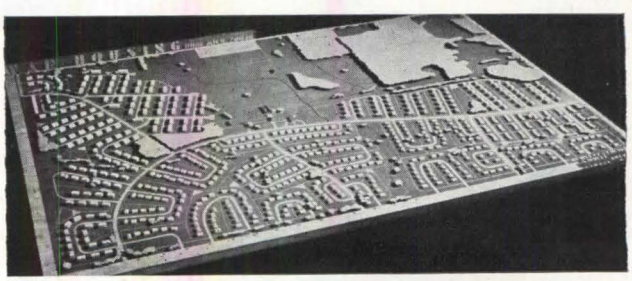
Photographs of outstanding examples of recent American architecture are currently on view at the Museum of Modern Art, New York City, as the architecture section of the Museum's 15th anniversary "Art in Progress" exhibition.

The photographs are of 47 buildings in many parts of the country, and include private houses, apartment houses, community housing, schools and other educational buildings, community centers, civic buildings, shops, office buildings, factories, public utilities and bridges. Selection was made by the Museum's Architecture Committee and a special Advisory Committee. Among the architects whose work is represented are: Frank Lloyd Wright, John Funk, Gardner A. Dailey, Harwell Hamilton Harris, Walter Gropius and Marcel Breuer, John Yeon, Edward D. Stone, George Howe, Philip Johnson, Vincent G. Kling, William Lescaze, Gregory Ain, Richard J. Neutra, Skidmore, Owings & Merrill, Philip L. Goodwin and Edward D. Stone, Raphael S. Soriano, William Wilson Wurster, Albert Kahn Associated Architects and Engineers.

Dutch Architecture

A photographic exhibition of modern Dutch architecture and city planning will be held in Washington's historic Octagon house, national headquarters of the A.I.A., starting the second week this month. The show is being arranged by the District of Columbia Chapter of the A.I.A.

The pictures, many of them 30 by 40 in. enlargements portraying the old and the new in Dutch architecture, will be supplied by the Netherlands Information Bureau, with the local architects handling the arrangements of the show.



A CORRECTION

The RECORD owes apologies to O'Dell, Hewlett & Luckenbach, architects of the Norwayne housing development in Wayne, Mich., shown in the model above. Plans from FPHA "prepared by Skidmore, Owings, Merrill & Andrews," to whom the RECORD naturally attributed the scheme, were used in preparing the illustrations shown on pages 92 and 93 of the March issue in conjunction with two excellent schools of—O'Dell, Hewlett & Luckenbach!