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The AMERICAN ARCHITECT



One Thing You Must Do—

AND that is think new thoughts. As a business man, and architects must be business men, you are meeting new conditions, new methods, in all lines new obstacles, and while many of the conditions of today will pass away at the end of the war we shall never again have business as we have known it in the days gone by. We shall have good business and good times, but they will be good to that man and that man only who thinks the new thoughts, employs new methods, adopts new plans and becomes part of the new army of business.

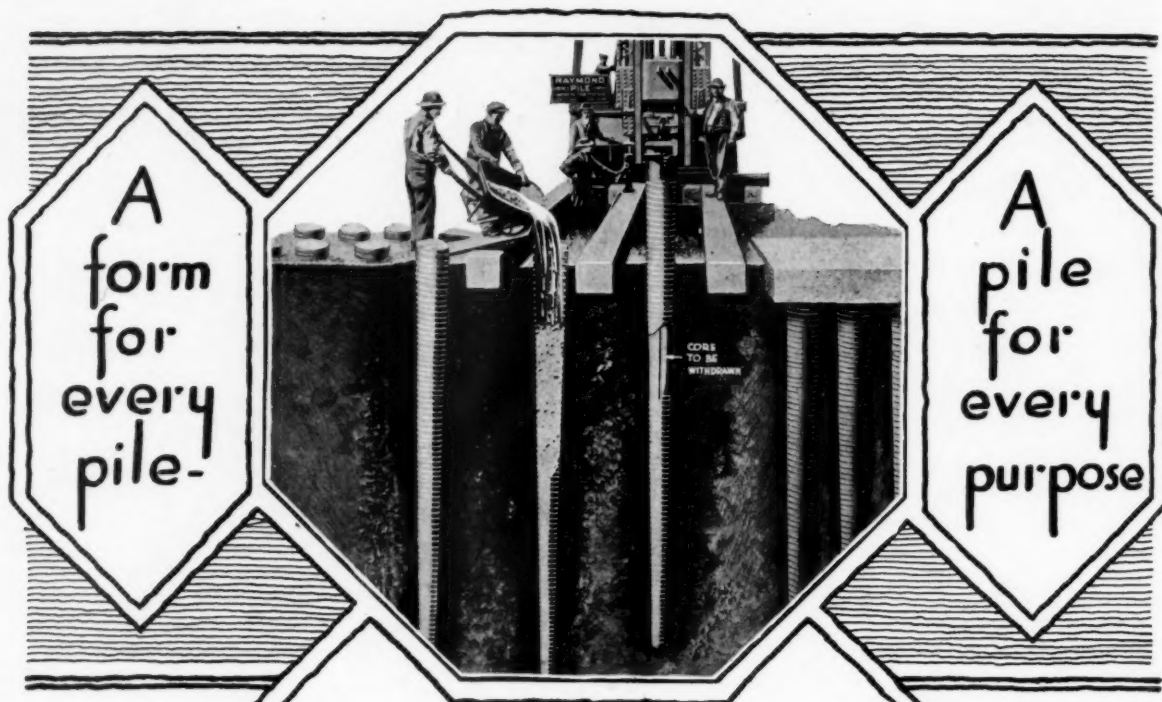
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Now is the time
to investigate

Raymond Concrete Piles

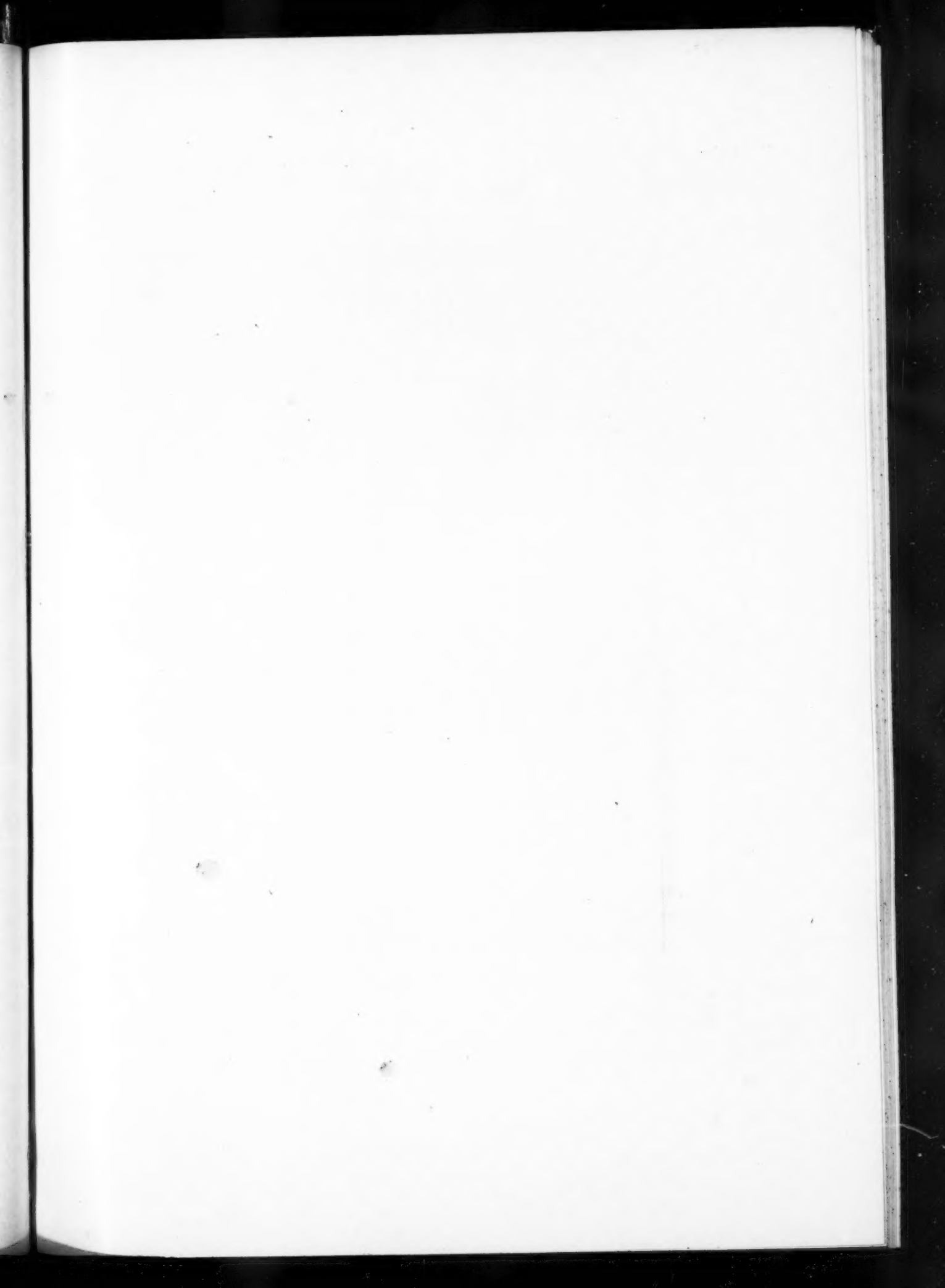
"Many Architects, Engineers and Clients are now less busy than normally . . . there is time to consider better arrangements, better and more economical materials and methods of construction. . . . Planning now will save much anxiety and many dollars later."

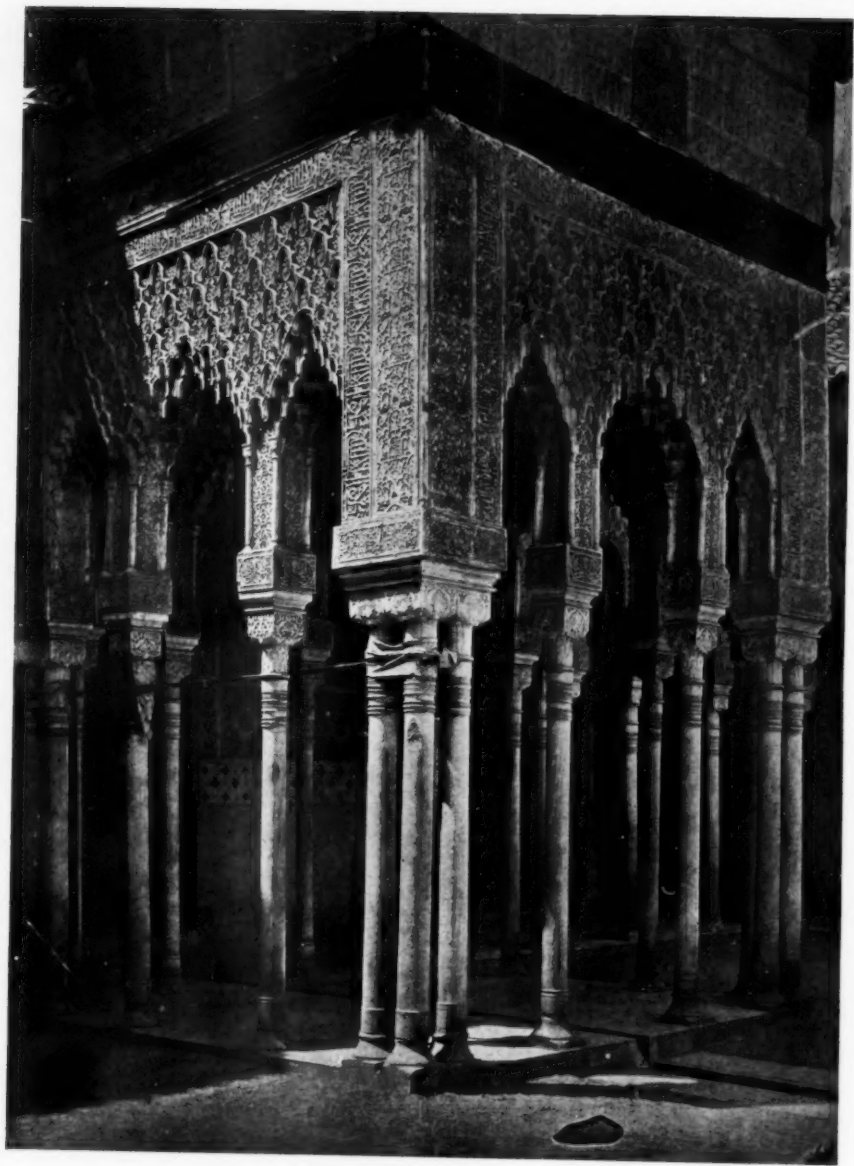
We cannot do better than quote this recent editorial ad-

vice of this journal—with one added paragraph.

Now is the time to investigate the better, more economical RAYMOND METHOD of concrete pile installation—the method which saves labor, materials and all anxiety regarding the pile column, because each concrete pile is cast in place in a spirally reinforced steel shell which is left in the ground.

RAYMOND CONCRETE PILE COMPANY
NEW YORK: 140 Cedar Street CHICAGO: 111 W. Monroe Street





DETAIL. THE ALHAMBRA, GRANADA, SPAIN

THE AMERICAN ARCHITECT

THE AMERICAN ARCHITECT

VOL. CXIV

WEDNESDAY, NOVEMBER 13, 1918

NUMBER 2238

The Era of the Bath*

By WOODS HUTCHINSON, A.M., M.D.

THE meaning of the bath goes deep, to paraphrase Carlyle's famous words on song. One of the most significant keystones of this age of science and sanitation is its hatred of dirt, both living and dead, and its token and crest is, in the language of heraldry, a bathtub *rampant, gardant*.

Never was a shrewder, more pungent characterization of an entire era in one phrase than Michelet's famous epigram on the Dark Ages, "*Un mille ans sans bain*," a thousand years without a bath. Those long, slow centuries loved dirt as much as they hated light; no wonder that they stagnated mentally and died like flies of one filth plague after another, until the population of Europe stood still or actually decreased in numbers for nearly a thousand years.

Of course we have all had dinned into us from our earliest and soapiest recollections that cleanliness was a virtue with a capital "V." This was emphasized by the taste of soap in our mouths, the rasp of a huckaback towel across our squirming infant features and the sting of the scrubbing brush on our scratched or chapped knuckles or newly cut fingers, and by the sacred ceremonies of Saturday night when we were plunged and parboiled in angular washtubs full of soap-suds, scrubbed till we howled, bundled into prickly new flannel night-gowns and hustled off to bed.

It was a good way to get the dirt off, and it must be admitted that heroic measures were needed for this purpose, but as a means of inculcating a love

of cleanliness it was a ghastly failure. Most of us, like Mark Twain in his boyhood days, groaned in spirit and were simply appalled at the dreary life-long prospect stretching out before us, of having to wash our faces and hands every morning in the week, every week in the year, year after year, world without end, until the day of our death. We were almost ready to declare life not worth living on such terms and lie down and die at the thought of it.

But the bathroom is something different. It means making duty a pleasure, and turns one of the chilliest and most repulsive of the virtues into a luxury. It works in us a thorough and complete conversion to the gospel of cleanliness; in the language of Scripture, "what we once hated, now we love."

When you possess a bathroom and have acquired the habit, you become a full and regular member of the one great aristocracy, whose dividing lines will never be wiped out, whose proud superiority over the Great Unwashed will never depart from them, the Order of the Bath, with the right to put after your name the magic letters "K. C. D. B." (Knight Commander of the Daily Bath). You feel different, you look different, you smell different, you act different, so much so that some progressive business houses order their salesmen to take rooms with baths in hotels, in some cases even though not stopping overnight, believing that a fresh-looking, clean, brisk salesman will "hustle" more vigorously, make a better impression and come back with more orders.

Many thoughtful and far-sighted hotel managers hold that every hotel ought to have a bathroom in connection with every bedroom.

You can almost tell when you enter the door of a house whether it has a bathroom or not. Beginning at first as an unheard of luxury, "a wild eccentricity of Earls," then an extravagance of sinful expensiveness, bringing a maze of messy, leaky pipes into the house to loosen the plaster of ceilings, flood the floors and freeze up and burst in cold weather,

*Dr. Hutchinson's article is the first of a series to be presented to readers of THE AMERICAN ARCHITECT.

The familiar sign on the modern apartment house "For Rent," extolling the artistic beauties of the premises, seldom fails to conclude with a reference to the number of bathrooms provided. Bathrooms may be said to indicate by their number the strength of the claim of their possessor to the title of modern gentility. And the man whose daily habit is the bath will, when traveling, demand facilities at each hotel where he stops that will enable him to continue this custom uninterruptedly.

So, then, the modern hotel proprietor loudly proclaims "a bath in every room," and his less well equipped business rival suffers by reason of a lack of bathrooms.

Dr. Hutchinson has presented the subject of the hygiene of bathing in his usually instructive and entertaining manner, and demonstrated the untruthfulness of certain time-worn beliefs as to the daily bath. The facts set forth give added force when presented as the opinion of a well-known authority.

So considered, it is a strong argument for the further extension of the sanitary equipment in houses, and one which can, with good results, be used when clients are disposed wrongfully to economize.

THE AMERICAN ARCHITECT

it is now one of the fundamental necessities of decent, healthful living.

"The tub that the plumbers rejected, the same has become the head of the corner." From a health viewpoint, after the kitchen and bathroom has become the most important single room in the house.

This is not merely for the sake of pure cleanliness of body alone, though this is worth much, but because it places the whole life of the Knight of the Bath, his clothing, his sanitary conscience about towels and tablecloths and napkins, and the handling of his food upon a higher hygienic plane.

Once he has sensed the pleasure in the fresh early morning of each day of being luxuriously and exhilaratingly clean from scalp to toe, he becomes endowed with a sort of sixth sense, an instinct against risks of contamination and infection which is of priceless value in steering him clear of and guarding him against scores of dangers to his health.

He finds himself more fastidious than before about his linen, his underwear, about public combs and brushes and drinking cups, about possible contaminations of his food and about coming into too close contact with other people who are of unwashed or slovenly appearance, who have unattractive mouthfuls of teeth, or pimples on their skin, or are sneezing, coughing or running at the eyes. And while each of these little instinctive repulsions is trivial in itself, in their total they build up a very real and valuable barrier against many genuine and serious risks to our health.

In short, we develop a real enthusiasm for cleanliness, a positive joy in being and feeling clean, which is of priceless value as a life-preserver. It is, of course, quite possible to get perfectly clean and sanitary in both body and limb by washing in, combined with dexterous splashing out of, an ordinary bowl. But it requires a degree of agility and gymnastic skill to "get over" every angle and promontory of your frame and involves so much splashing of the furniture and carpet and laying down of newspapers to stand upon, etc., that it is "quite a chore" and never really becomes a pleasure or an instinct. If you are in a hurry or behind time, or the room is too cold, or the towel for the day too pocket-handkerchief-like, or for any one of a dozen reasons, then you let it go for that morning with a sense of relief. It never gets into your bones like the thrill and plunge of the daily tub.

A bowl face-dip and splash down to the waist is, of course, perfectly adequate for purposes of cleanliness, and of great value in toning up and hardening the skin and protecting against the liability to cold, where no bathroom is accessible. But it isn't like a glorious souse and soak in a fixed tub, with hot and cold water and a shower overhead to finish off with.

So far inferior is it from every point of view in health comfort and efficiency that our slogan in the great campaign of industrial house building, which is already going on at our munition plants, and will swell to constantly larger proportions after the war, should be a bath for every bedroom, or failing that, a bathroom on every floor.

The Englishman achieves something approaching the same results by means of his long-famous tin tub, of the shape of an exaggerated pie pan, with a lip or half-spout to empty it from, which you see piled on top of his "boxes" everywhere he travels all over the globe.

But it is a chilly and grisly process, which requires great force of character to keep up, and involves a great amount of cheap labor on the part of underpaid servants in carrying up and pouring out and pouring back and carrying down again and emptying the two buckets of water required, one of which in winter has to be heated in and carried up from the kitchen in the basement.

It is good as far as it goes, but its labor cost is prohibitive in this country, and no Briton, however true blue, will bother with it for a moment if he can get a chance at a real American bathroom.

In point of real cleanliness, to say nothing of comfort, the English tub is far inferior to the American bath, and while the educated Englishman used to regard himself, and justly, as the cleanest person in the world, the modern American has now forged distinctly ahead of him, thanks to the ingenuity and enterprise of our American architects, our sanitary engineers and our plumbers.

It may be quite true, as the famous English pathologist and iconoclast, Sir Almroth Wright, some years ago startled the ears of the polite by declaring that bathing really softens and weakens the skin and deprives it of its natural oily coating and defense against germs. He even went the length of seeming to hold that we might wash our strength away, so to speak, by too frequent and incessant daily baths!

There is a certain small amount of basis for his pugnacious contention, in that if too hot water or too strongly alkaline soaps are used, an undesirable amount of the natural oil, which saturates the surface of our skins and keeps them supple, may be dissolved out, leaving the surface dry and harsh and liable to crack under cold or friction.

But this can be completely avoided by not using too hot water, by taking our hot baths entirely at night when the skin has ten hours in which to recover, and by using only mild soaps, which lather rather sparingly.

And as the natural oily coating of our skin, if it be allowed to accumulate too long upon the surface, picks up and incorporates with itself any dust, lint,

THE AMERICAN ARCHITECT

germs, or other dirt which may be flying about, the protective paste or plaster which is thus formed is not of a desirable or sanitary character, and the protection which it affords of a distinctly negative sort, such as we are better off without.

Sir Almroth speaks approvingly of the calloused and seldom-washed palm of the day laborer as exhibiting the highest degree of resistance against germs. According to this standard, the alligator and the rhinoceros should be the healthiest and longest-lived animals afloat. But as a matter of fact the overwhelming actual experience of both family practice and hospital work shows that it is precisely in this horny and unwashed type of hand that we find the most serious infected scratches, festering cuts, boils and felons.

The horny and grease-coated skin has begun to die on the surface and crack, and it is the skin which is most thoroughly and vividly alive, through every millimetre of its thickness, which is the best protection against disease and resists infection most vigorously, no matter how soft, flexible and pink-and-white it may be.

Sir Almroth's idea of the skin protecting us merely by its thickness and toughness and waterproofness reminds one a little of the story of the man who, after taking a course of baths at a celebrated spring, said that he had been left soaking so many hours of the day in that salty water that it had worked through his hide and rusted his iron constitution, and he had never been the same man since.

Briefly, what is actually done by the daily bath is first to give an invaluable fillip and stimulation to the circulation, to the skin and to the whole nervous system, which wakes one up for the day and puts one in tune for "hustling" as almost nothing else can.

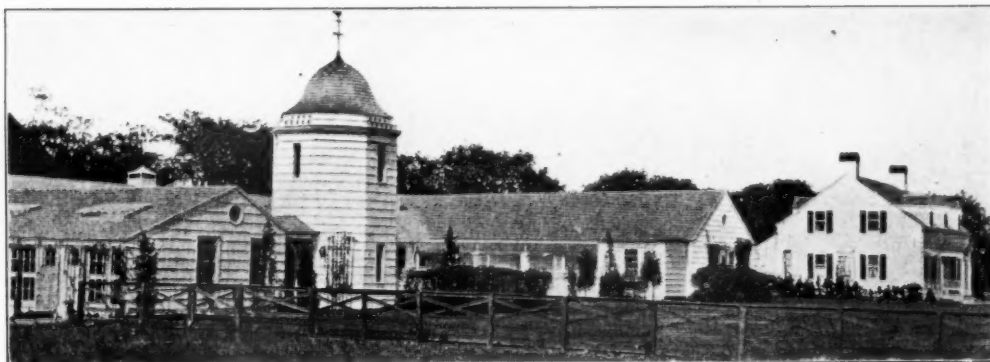
Second, it cleans, braces and tones up the skin,

not only the outside skin but the inside skin as well, that is the lining of the nose, throat, bronchial tubes and stomach, by recoil or *contrecoup* as the French say. This renders it very much less likely for chilling to occur in drafts or wet and fog, and while, of course, colds are pretty nearly pure infections, the question whether their germ-seed will take root in the soil of our noses, throats and lungs depends upon the vigor and resisting power of our mucous membranes. After sleeping with open windows, the cool morning bath or splash is the best preventer of colds and coughs known.

Third, it very greatly diminishes our liability to many forms of skin disease, such as eczemas, acne, and the like, and is an absolute barrier against infestation by parasites of all sorts, whose names are not considered fit to mention in polite society.

Such emergencies most fortunately are comparatively few in peaceful life, but the far and away most important and effective remedy against the now famous and celebrated "cooties," in the dugouts and billets of the Western Front, is warm shower baths at least once or twice a week for all the soldiers on active duty. And apart from and in addition to their intolerable annoyance and discomfort and sense of disgrace, these pests are of even graver significance yet from the fact that two of the greatest plagues of armies, typhus fever and trench fever, have been clearly proven to be carried and only carried by their bite.

Sterilizing the clothing with superheated steam, smearing the body with parasiticide salves and frequent changes of clean underwear have pretty nearly stamped out this intolerable little pest on our Western Front. Every soldier coming back from the war will demand a bath at least three times a week and better still every day, as one of the prizes of victory, and insist upon its matchless benefits being extended to the whole community.



A FARM BUILDING GROUP

ALFRED HOPKINS, ARCHITECT

Tenement House Provisions for United States Housing

TENEMENT and apartment houses are considered generally undesirable and will be accepted only in cities where, because of high land values, it is clearly demonstrated that single and two-family houses cannot be economically provided, or where there is insistent local demand for this type of multiple housing. In any case, they will be accepted only where the Bureau of Industrial Housing and Transportation is convinced that local conditions require or justify their use. They must conform to local building ordinances, to the general provisions of these standards, and to other special provisions to be issued by the Bureau of Industrial Housing and Transportation.

1. *Arrangement.* Buildings are not to be more than two rooms deep. This means either that rooms shall open on a street or on a rear yard or on an interior park sufficiently large for grass and trees to grow in it and of a sufficient size to admit direct sunshine into all rooms opening on it, at some period of the day, except rooms with northerly exposure. Buildings are not to be over four stories high.

2. *Cellar.* To be under whole building, minimum height, 7 feet; to be well lighted, cross ventilated, and paved.

3. *Fireproofing.* If over 3 stories high, to be fire-resistant throughout; if over 2 stories high, a non-fireproof building, the area of which exceeds 3,000 square feet, to be divided by fire walls of brick, terra cotta, stone or concrete into area not exceeding approximately 3,000 square feet each. All openings in such walls to be provided with fireproof self-closing doors.

Adequate means of egress to be provided direct from each apartment to street or yard by additional stairs, or by fire tower or stair fire escape (fire escape less desirable). All such additional means of egress to be remote from the main stairs and separated therefrom and from the other parts of the building by walls of brick, terra cotta, stone or concrete, with fireproof self-closing doors at all openings.

All stairs and stair halls to be fireproof and inclosed in walls of brick, terra cotta, stone or concrete, with fireproof self-closing doors at all openings.

Dumb-waiters and elevators will not be accepted in stair inclosure; they should be inclosed in fireproof shafts with fireproof doors, those of dumb-waiter to be self-inclosing. Inside cellar stairs to be

inclosed with walls of brick, terra cotta, stone or concrete with self-closing fireproof doors.

In a flat-roofed, non-fireproof tenement house containing more than 4 families, all stairs to extend to the roof, and to be provided with a bulkhead. If 4 families or less, scuttle with ladder is sufficient.

4. *Heating.* Normally central system.

5. *Material of Walls.* Walls to be of brick, terra cotta, stone or concrete.

6. *Plumbing.* Each apartment to be provided in the kitchen with set washtubs with covers, preferably two, rim 36 inches above floor.

Sink to be in kitchen, rim 36 inches above floor.

Water closet to be in well-lighted and ventilated compartment with window of $4\frac{1}{2}$ square feet minimum area to outer air, and with impervious floor, not concrete.

Bathtub (shower is not sufficient).

Lavatory, preferably to be in bathroom.

Sufficient additional water closets to be provided in the cellar or basement for the accommodation of engineer.

7. *Rooms—Height of.* Minimum height 9 feet in the clear.

8. *Rooms—Number and Use of.* For higher-paid workers, five-room type preferred with parlor, large kitchen, three bedrooms and bathroom. Dining room and kitchenette may be provided in place of large kitchen. Four-room type to be provided sparingly for higher-paid workers. Six-room type, with four bedrooms, or three bedrooms and parlor convertible into fourth bedroom, suited for abnormally large families only, and should be provided sparingly; six-room type should normally have parlor, dining room, kitchen, three bedrooms and bathroom.

For lower-paid workers, four-room type desirable, with parlor, kitchen, two bedrooms and bathroom. A few three-room tenements may be provided.

One-room and two-room apartments will not be accepted.

No apartment of over six rooms accepted.

9. *Rooms.—Size of.* One large bedroom to be provided, size 9x11 to 12x14 feet.

Small bedrooms, minimum size 80 square feet; minimum width 7 feet.

Parlor, 10 x 12 to 12 x 14 feet.

Dining room, 9 x 11 to 12 x 14.

Kitchen (where there is no separate dining room), 10 x 12 to 12 x 14 feet.

Kitchenette (only where there is a separate dining room), minimum width 6 feet; normal minimum area 70 square feet.

10. *Windows.* Each room to have at least one window direct to outer air, not less than 12 square feet in area between stop beads. Each public hall and stair hall to have window with minimum area of 12 square feet direct to outer air, at each story.

Interior Industrial House Construction

By MILTON DANA MORRILL*

IN the consideration of the best interior construction for industrial houses, let us take for example those built and owned by a manufacturing or holding company to be rented by the families of the employees.

These houses must be expected to stand hard service. They will be occupied by one family after another, and moving furniture is hard on the house interior. There will be some large families with several children and many with three or four lodgers. Experience shows that some of these families will keep their houses spotlessly clean, while other will be indifferent as to dirt, insects, fire risks and care of the house generally.

The interior of the industrial house should fulfill the following requirements:

(1) The rooms should be light and cheerful, free from dampness, warm in winter and cool in summer.

(2) Such a house interior should be free from dust-catching woodwork. The surfaces and finish should be as waterproof as possible so that the house may be washed out, scrubbed and thoroughly cleaned between rentals.

(3) In the construction, cracks, crevices and concealed spaces should be avoided, as they are likely to harbor and offer a breeding place to vermin and insects.

(4) The construction should be fire resisting or, better, fireproof.

(5) The construction should be reasonable in first cost, permanent and capable of resisting hard usage with a minimum expense for upkeep and repair.

Let us consider three of the possible types of interior construction for industrial houses: (1) A house with masonry walls, the usual wood floor beams, board floors, lath and plaster ceilings, wood stud partitions lathed and plastered; a non-fireproof construction. (2) A house with masonry walls, reinforced-concrete floor slab covered with wood sleepers and board floor, bearing partitions of concrete or tile; fireproof. (3) A house with a concrete floor and cement finish partitions concrete or tile; fireproof.

*From the Proceedings of the American Concrete Institute.

The first type of construction is the least expensive in first cost and has the advantage of being the kind to which we are all accustomed. An interior of this kind with wooden floors, door casings, base and window trim seems the most comfortable and home-like. We would like to stop here and forget that most disastrous fires gain their headway in the open spaces and dry timbers of these wooden floors. We would also like to forget that these concealed spaces in the partitions and floors form ideal breeding places for insects and vermin. A house interior of this construction can never be completely cleaned. One untidy or careless tenant can ruin it. What is worse, through the neglect of proper precautions in case of tuberculosis, for instance, he might imperil the health of future tenants.

The second type of construction is an improvement over the first. The fire hazard is eliminated by the concrete floor slab. The wooden floors laid over the concrete give the house a familiar and homelike aspect. For the industrial house this type of construction has the disadvantage of being the most expensive.

The third type is a house with a concrete interior. Such a house can be made sanitary to a degree. There are no hidden spaces in the construction, therefore insects must live in the open if they live at all. On a trip of inspection to Nanticoke, Pa., the writer saw one of these concrete houses being scrubbed out from top to bottom in preparation for a new tenant. After occupancy for many years these houses will be in good condition and soap and water will make them fresh and clean again just as it does to-day.

The house with a concrete interior has the further advantage of permanency and capacity to withstand hard usage. The expense of upkeep and repair therefore is reduced to a minimum and depreciation becomes almost nil except on the doors, windows, plumbing fixtures, etc. Fire insurance becomes unnecessary, as such houses have little to burn.

On the other hand, there are objections to the house with the usual concrete interior. During the past five years the writer has had opportunity to

THE AMERICAN ARCHITECT

inspect eighty-three houses with concrete interiors.

The interior appearance of the majority of these dwellings is crude and unfinished, while from a structural standpoint the superiority is very marked. The question therefore arises, how may the interior appearance of the concrete house be so improved as to make it more attractive and comfortable?

Let us look into the possible changes that might be made in the finishing of the interior of a concrete house and see if some of the objections and faults cannot be overcome. We must remember that the art is new and that most of the useful things about us were not in their first stages the beautiful articles that they are to-day. One error that some of us have heretofore made is in trying to produce such houses at too low a cost. In the interior treatment just as in the exterior construction we can afford to go to more expense than is usual in the ordinary house, for the building is for all time. It is almost an axiom that the permanent building is the low-cost building in the long run, and a concrete house with a concrete interior should with a minimum of repairs give service for a long period of years.

The cement floors have perhaps been considered as the greatest drawback in the fireproof house. There is no denying the fact that the cement floor without rugs or matting is a hard surface upon which to live; however, most of our modern hotels and office buildings as well as the modern tenements are now using cement floors, and no serious complaint is made after the tenant has become accustomed to them.

If the cement floor could be given a more attractive finish, prejudice against it might be overcome to some extent. Such floors might be finished with a

terrazzo surface and at a cost that is not excessive where machine grinding can be employed, or the floor may be finished with a surface of white portland cement and marble dust. A floor of this sort can be waxed and polished much the same as a wooden floor. In some of these types it is proposed to use a cove base of hard wood which is let in flush with the cement. This would serve as a tacking strip for carpets if such are desired.

The treatment of the interior walls of the concrete house does not differ materially from houses of other construction. For industrial houses it is generally conceded that painting is the most sanitary and satisfactory finish for the walls. The usual wood trim or casing around the windows and doors may be used, or if desired this can be altogether omitted, the plaster returned with a slightly rounded corner, making a simple and sanitary finish.

In the industrial house, built-in fixtures and cupboards should be bracketed from the walls where possible, as this leaves the floor space clear for ease in sweeping and cleaning. Curved corners where walls meet and at the base and ceiling help in cleaning also. In time the wash-tub, bath-tub and kitchen sink for the industrial house will without doubt be molded in concrete, but at the present stage of the art, enameled iron is far better and less expensive material to use for these fixtures.

In the house with a concrete interior the stairs may be of the same material. The risers and treads can be precast and set in place. The stair railing can be made likewise. Where cost permits, decorative tile or precast panels may be set in the house walls; stenciling makes also an attractive way to apply simple decoration.



FARM BUILDING GROUP.

ALFRED HOPKINS, ARCHITECT

After-the-War Priority of Building Materials in England

The Council of the Society of Architects, London, on the invitation of the Building Materials Supply Committee of the Ministry of Reconstruction, has submitted its views as to the supplies of building materials and has suggested an order of priority in the use of such materials, as follows:

1. Work of national importance, such as buildings required to accelerate shipbuilding or for other urgent public services.
2. (a) Necessary buildings for essential industrial purposes.
- (b) Housing accommodations of a low rental value.
- (c) Reinstatement of premises damaged during the war.
- (d) Essential maintenance repairs.
3. Schools, sanatoria, and similar work where urgently needed.
4. General housing accommodation.
5. Buildings of a non-productive kind, but urgently required in the interest of the public.

All other buildings are to be considered on their merits and priority to be granted according to their national importance.

The Council strongly urges that if priority and control is instituted, the following points should be most carefully considered by the committee:

1. All schemes for building work whether for Government departments or for industrial works, cottages, and other classes of buildings, should come before one committee only, and because certain building work may be carried out for or by a Government department, such work should not therefore be given preference, but it also should be decided entirely on the basis of national importance.

It is suggested that no Government department or local authority should have power to commandeer any building material, but that the purchase of such material should be regulated according to the national importance of the work for which it is required.

2. A priority committee for post-war building work should be instituted and started immediately, so as to ensure a continuity of policy and form a means whereby prospective building owners or their architects can get in touch and consult a controlling authority on building work after the termination of the war.

It is suggested that the committee should consist of fourteen members, and be constituted as follows:

One member each nominated by the Society of Architects, the R. I. B. A., the Surveyors' Institu-

tion, the Quantity Surveyors' Association, the National Federation of Building Trades Employers, the Institution of Municipal and County Engineers, the Trade Unions Council, respectively, in addition to six members nominated by the Government and one member nominated by the Government as chairman of the committee.

Types of Buildings in Mexico

Raymond Burnham, vice-president of the Chicago Chapter of the American Association of Engineers, describes in the *Monad*, the official organ of that association, types of buildings in Mexico. In the course of his article Mr. Burnham says:

In traveling through any of these southern countries one can readily distinguish the sections that are rich in gold and silver by the number and grandeur of their churches. These churches are most interesting, and some are truly gorgeous in their carvings and mural paintings when the locality happened to be gifted by possessing a real artist, while others are grotesque in the badly proportioned and crude results of the efforts of some amateur whose religious fervor and ambitions greatly surpassed his artistic capabilities. This desire to build churches, however, resulted in a distinct form of architecture and in many structures of note.

I have seen in the ruins of a church in Panama a flat brick arch that causes one to marvel how it stands, and yet it is still there, covered with moss and with little bushes growing along its top, and that in a country subject to earthquake. A favorite form of arched ceiling and roof combined in these old churches in Mexico was made in the following manner: The nave of the church was spanned at intervals by arches of great hewn timbers cunningly framed together in a semi-circular arch. Along the length of the nave over these arches were laid heavy hewn timber purlins. Curving over these purlins and laid close together, taking the semi-circular form of the arches, were round poles possibly one and one-half or two inches in diameter, and on top of this was lashed a light thatch of some sort. Then about one foot of adobe mud was plastered on that, and faced on the top with a hard, white mortar made from native limestone burned in their kilns. It is a peculiarity of many of these towns that one can see them for hours as one rides along the trail, and they present a most alluring sight to a trail-weary traveler. They seem like oases set in the sun-dried brown of the surrounding hills—a little dot of green orange and pepper trees with the gleaming white roof and spires of the cathedral.

Recent Legal Decisions

ARCHITECT AS ARBITRATOR—BIAS

It is well settled that the engineer or architect of one of the contracting parties may legally act as arbitrator of all disputes between the parties as to the construction of the contract or arising out of or incidental to its performance, if, in the absence of bad faith or fraud, he shall be chosen by all parties to the contract acting with knowledge of his employment, even though from the nature of the employment he may be unindifferent and biased.

Marsch v. Northern New England R. Co., Massachusetts Supreme Court, 120 N. E. 120.

ALLEGATION OF BREACH OF CONTRACT

In an action by contractors against a city upon a contract for the construction of a sea wall and other public works, it appeared that the contract did not require completion of the work within the time specified as a condition precedent to recovery. It was therefore held that an allegation in the plaintiff contractors' declaration that the city without legal justification terminated the contract by ordering the contractors to cease work and to cease to hold further possession of the ground was sufficient as showing a breach of the contract by the city, although this order was given about three months after the date specified in the contract for the completion of the work.

Jonas v. Palm Beach, Florida Supreme Court, 79 So. 438.

EXTENT OF SUB-CONTRACTOR'S LIEN

The Nebraska Supreme Court holds that under the Nebraska Lien Law the subcontractor's right to a lien for services or material furnished to the contractor does not depend upon the terms of the contract entered into between the owner and the contractor. The court points out that some statutes, such as those of California and Illinois, in express terms make a subcontractor's lien depend upon the contract between the owner and the contractor by providing in substance that liens of subcontractors should not exceed in amount the contract price agreed upon between the owner and the contractor; but the Nebraska statute contains no such restriction.

Indiana has a statute similar to the Nebraska statute, and its constitutionality has been questioned on two grounds, namely, that it impairs the obligation of the contract between the owner and the

contractor, and that it deprives persons of their property without due process of law by permitting subcontractors who are strangers to the contract to subject the owner's property to the payment of their claims. But in *Barrett v. Millikan*, 156 Ind. 510, 60 N. W. 310, it was held that the act was not unconstitutional in these respects for the reason that the owner enters into the contract with full knowledge of all the statutory obligations imposed upon him, and thereby he binds his property by his own voluntary act.

Coates Lumber & Coal Co. v. Klaas, 168 N. W. 647.

RELEASE OF LIENS BY SUBCONTRACTOR

A subcontractor at the request of the general contractor executed a release of liens to be used by the owner in securing a loan on a mortgage on the building. It is held that the subcontractor could not repudiate the release because a check given to him at the time by the contractor was not paid, where it appeared that the release was not obtained from him by fraud on the part of the contractor, that the contractor was not acting as the owner's agent and that the subcontractor told the owner that he had executed the release and that he could pay out all the money due on account of the contract.

Brewer v. Meyers, 68 Pa. Superior Ct. 391.

WAIVER OF NECESSITY FOR SPECIFICATIONS

A contract for the restoration of a building provided that all work was to be done as it was in the original building except "changing the windows in lodge room from casement to windows hung on weights," and that A., an architect, "shall be the sole arbiter of what work shall be new and what shall be repaired." In an action for balance due under the contract the Mississippi Supreme Court holds that the contract was not void for uncertainty. As the contractor performed in accordance with the contract and procured a certificate from the architect he was held entitled to recover, although there had been no specifications prepared as provided by the printed portion of the contract requiring the work to be done according to "specifications prepared by —, architects," not naming the architects, since the defendant, by permitting the work to go on without requiring further specifications waived such requirement.

Moreland v. Moselage Benevolent etc. Order of Elks, 78 So. 947.

Laboratory and Office of A. D. Little, Inc.

The Riverway, Cambridge, Mass.

KILHAM & HOPKINS, *Architects.*

AS Franklin brought lightning out of the clouds, so Arthur D. Little has brought chemistry from its academic remoteness in the high seats of learning down into the very heart of the business world.

Chemists of the Middle Ages bent all their efforts to transmute baser substances into gold. Our more recent chemists have had no fixed purpose in their experimentations, but have loved the abstract study of the elements, and the spirit of adventure among strange forces has kept them eager.

article that you are buying, whether that article be wool, copper, dyestuff, maple syrup, soap, gasoline, flour, tracing paper, horse-radish, shoes, or T N T, no matter what your doubts, they will be dispelled at this breeding-place of miracles. The acid test will be applied and you will know the quality of your purchase and consequently its market value, without the uncertainty of the written guarantee of trade.

In order to perform miracles regularly on a business basis from nine to five, week days, Aladdin has



BASEMENT PLAN

Now the wheel of fortune brings us back the old alchemist, Americanized, a man who turns all the baser substances to gold. The baser substances are given an enhanced value, and the gold flows into the pockets of this alchemist's clients.

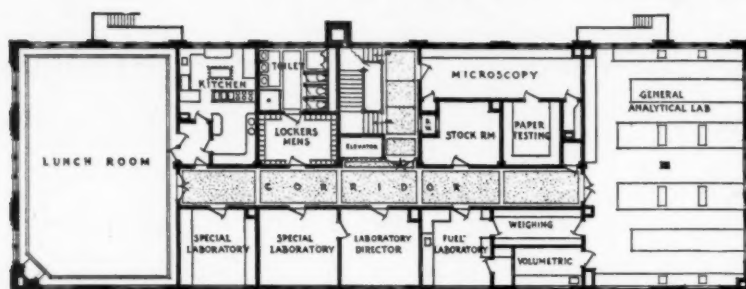
If you want to buy your coal by the B. T. U., paying for heat instead of weight, and getting something that is designed for the cellar rather than the roof, here you can have it arranged for you. If your mill is embarrassed with a seemingly useless waste product, here you can be shown for a modest fee how to convert it into a profitable commodity of commerce.

If you are not certain about the quality of the

built him a cave on the Charles River Basin a couple of minutes from the heart of Boston.

This cave contains one of the most complete organizations conceivable. On the first floor are the administrative offices, a publicity department, a bookkeeping and filing department, and an industrial chemistry museum. The second floor houses the only special industrial chemistry library on record, a draughting department, a number of special research laboratories and a large laboratory and offices for general research. The top floor has a general analytical laboratory with offices, and special laboratories for fuel analysis, microscopy, paper testing, photography, textile work, water analysis,

THE AMERICAN ARCHITECT



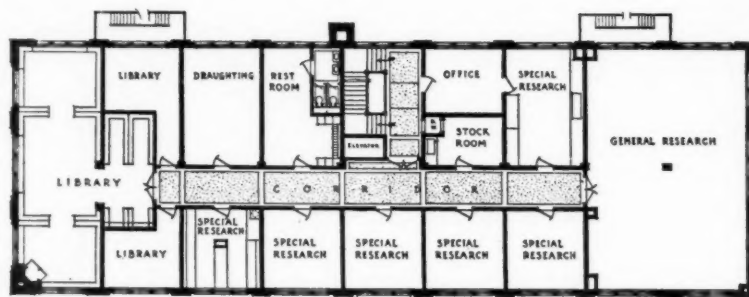
THIRD FLOOR PLAN

metallography, etc. At the western end of this floor is a lunch room with kitchen for serving the entire staff.

The basement contains one of the most important items of the entire organization, a complete pulp and paper mill for the experimental manufacture of all grades and kinds of paper, and the determination of the paper values in various waste products of other industries. At the western end of the basement is a large laboratory for full-size tests to supplement smaller laboratory tests made upstairs. These tests are called "try-outs." The remainder of the basement is occupied by coal preparation rooms, grinding room, shop, stock room, with electric lift to subsidiary stock rooms on the various floors above, sample-storage and file rooms.

This, roughly, is the list of activities provided for. Such a program requires a very complete me-

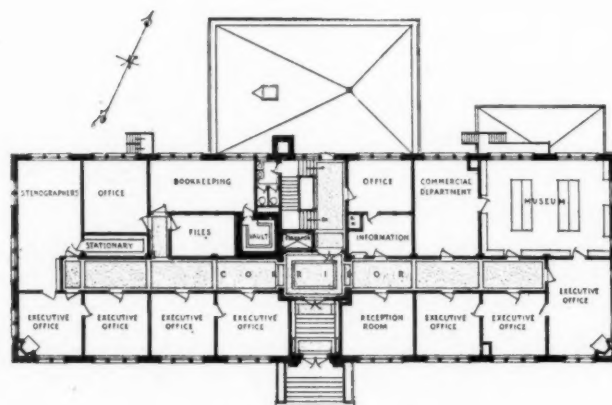
chanical equipment. The laboratories are supplied with steam, both high and low pressure, vacuum, compressed air, hot and cold water, distilled water, gas, electricity for light and power, direct and indirect phases and varying voltages. This requires gangs of pipes in every part of the building, with hundreds of outlets at the benches. The pipes are run in parallel groups, exposed in the rooms and on the basement ceiling. The pumps for vacuum and compressed air are automatic, and the ports in the laboratory cocks are nicely adjusted for vacuum, etc.



SECOND FLOOR PLAN

The general construction of the building is fire-proof, with a minimum of steel, floors and roof being of fireproof construction and piers of concrete. All construction bays are equal, so that the building can be repartitioned at will to form new room units. The floors are finished in linoleum, except the main laboratories, which are red tile, and the corridors and toilets, which are terrazzo. The walls are hard plaster, painted.

For the comfort of the employees the company has provided not only the lunch room, but ample rest rooms, bubbling fountains and a roof terrace over the one-story "L." Under one roof, therefore, are housed all the many activities of a new and interesting industry, offices, laboratories, lunch room, library, museum, and publicity department. If any facility were wanting, good neighbors are not far away, for the building itself is alongside the new Massachusetts Institute of Technology on the Esplanade.



FIRST FLOOR PLAN

THE AMERICAN ARCHITECT

THE AMERICAN ARCHITECT

Founded 1876

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VOL. CXIV NOVEMBER 13, 1918 No. 2238

Building Materials and Reconstruction

WITH A CONCRETE EXAMPLE OF A METHOD OF
RECONSTRUCTING ARCHITECTURAL PRACTICE

WITH the signing of the armistice on November 11, the return to peace is now near. This will mean that the suspension of building operations all over the country will end and that by next Spring as far as building reconstruction is concerned we shall be started on a wonderful period of activity.

From every direction reports are received that those connected with the building trades are keenly alive to the true meaning of this activity. The field of basic materials is being thoroughly gone over. Stocks are being located, possibilities of labor and transportation considered.

Meantime, the Government has taken steps that will release large quantities of material and a vast amount of labor, all of which will soon be available for redistribution. The United States Shipping Board has, for example, already cancelled large contracts that will contribute to this release of materials, particularly steel for structural purposes.

It would seem that the lessons of preparedness learned at so great a cost at the time we entered into this war have been well considered, and that the action now being taken by builders' organizations throughout the country is prudent and timely.

THE emergence from the deep gloom of building inaction to the bright glare of an unprecedented activity will be quick. Preparedness will make us greet this rapid transition with equanimity and a sense of sureness. Architects have had a long period of enforced idleness. Will they be as ready with their part of the work as will undoubtedly other elements of the building trade?

If they have heeded the repeated admonition to induce clients to consider when times were quiet, the features of prospective building, their reward will be quick and large. If they have not, they will be distanced in the race, and perhaps by other and heretofore dependent branches that have worked under their direction.

THE movement toward preparedness in the building field is more or less pronounced in every department except that of architecture. An exception has come to our notice. It is the advertisement in *Bankers' Journal* of Mann & MacNeille, architects of New York, reproduced on page 582.

Will not a client in search of an architect be impressed by the variety and efficiency of service indicated in this advertisement? Can any just person detect in it any debasement of the ethics of professional practice? Is not a firm, organized in this efficient manner, prepared to prove that as architects they are master builders? And finally, should not such an advertisement command the respect of the best element in the profession of architecture as a very proper effort to rehabilitate architecture and clothe it in its original dignities?

St. Louis Sets Good Example

LIBERTY Loan posters have served a very useful purpose, aside from their chief motive as an appeal to buy bonds. The constant reiteration of certain phrases—the best form of advertising appeal—not only emphasized the necessity to support the loan, but also suggested methods of economy to enable every man, woman and child to do their bit.

Take for example the homely instance of the man who foregoes a new winter overcoat and has his old one renovated. He conserves material and is enabled to lend the dollars saved thereby to the Government.

The City of St. Louis has started a movement analogous to such a case. Like every other city, building in St. Louis was at a standstill. Materials were not available, building could not go forward. Then, some wise men in the Southwest proceeded to make a survey of their city and they were not long in discovering that there were no end of ramshackle structures that could very well be spared.

THE AMERICAN ARCHITECT

In ordinary times this old material would be simply "second-hand," but just now, every bit of it was found to be, in one direction or another, available and valuable.

The suggestion that St. Louis rid herself of useless and unsightly buildings and with the material salvaged erect new ones on their sites to make the city a healthier and better place to live in was accepted with enthusiasm. The Chamber of Commerce took the initiative in the movement. Its action was promptly endorsed by the religious, educational and civic organizations of the city. At the very outset the matter was placed on a common sense basis.

The purpose, as set forth, was not merely one of æsthetic development, but the more practical and necessary one of improving sanitary conditions and thus insuring a better health rate.

In St. Louis, as in every other city, the responsibility for the continuance of undesirable structures lies directly with property owners. If the owner is not disposed to improve his property and if he maintains a building whose delapidation is a reproach to its neighborhood, he may do so. The Chamber of Commerce in St. Louis is seeking the passage of laws which would give the building commissioner the power to remove all such undesirable structures.

As was to be expected, in the progress of a movement so drastic and mandatory, there is a certain political element seeking to retard the progress of this reform. But the bulk of public opinion so strongly endorses this cleaning away of undesirable buildings, and the conditions are now so very favorable to such an effort that it is not believed the movement can be stayed.

Every city in this country may read a lesson in this movement. Economically nothing could be simpler. As a means of conservation, nothing could be more in accord with the present necessities of the country, and as an opportunity to accomplish with the most far-reaching good results, the most desirable ends, nothing could be of greater importance.

If we only could eliminate the enormous cost of human lives, which unfortunately we cannot, the lessons we shall have learned in the prosecution of this war would be fairly worth the enormous amount of money we have paid in the learning.

The example set by the action of the City of St. Louis is only one of thousands of epoch-making

things which have been done since the war began and each one suggests some equally economically good one for the future.

St. Louis' progress in a campaign in which she will have the sympathy of every good citizen will be watched with much interest.

Converting a Factory Building into a Modern Hospital

ENGLISH architectural journals have freely expressed the opinion that it is in the United States where the best development of the industrial building has been attained.

In this country, school houses and industrial buildings have perhaps been more carefully considered during past years with reference to their sanitation and hygiene than any other types. The reasons for such care on the part of school buildings needs not be discussed; they are plainly evident. But in the matter of industrial buildings the factors that suggest good hygiene and perfect sanitation are more complex, and while based on the same humanitarian principles, are further complicated by problems of economics, business thrift and foresight.

The American manufacturer is gradually learning the value of good architecture as a commercial asset. He has also learned that by surrounding his labor with good working conditions he is enabled to increase the quality of his product, and by the contentment of his employees with their surroundings, reduce to a minimum the now very important item of labor turn-over.

As indicating an example of the thorough manner of industrial building construction in the United States, the factory of Richman Bros. Co. of Cleveland, Ohio, may be cited. This building, designed by Christian, Schwarzenberg & Gaede, architects and engineers, was awarded the medal of merit by the Cleveland Chamber of Commerce for the best factory building erected in Cleveland during 1916.

It has now been taken over by the United States Government for conversion into a 1000-bed hospital. We learn that to make it serve its new purpose as a thoroughly safe and efficient hospital building, but few, if any, alterations were necessary.

This building was in part illustrated in *THE AMERICAN ARCHITECT*, issue of February 21, 1917, and its engineering features fully discussed in the issue of October 30, 1918.

Criticism and Comment

An Unusually Interesting Letter

Editors' Note—Seldom is there presented an opportunity to trace the inception and growth of an architectural project and the influences controlling the selection of the architect, better than in the instance as set forth in the following letter from the Secretary of the Peoples Savings and Loan Association, Sidney, Ohio, whose building was fully illustrated and described in *THE AMERICAN ARCHITECT*, issue of Oct. 23.

Mr. Studevant takes the general public into his confidence in the frankest way, freely gives expression to his earnestness as to the artistic capability of his architect, and at the same time reveals to the architectural reader an ideal type of client. With such an attitude toward the architect, and with so well developed a respect for his ability and judgment more generally shown, there would be no interruption to our artistic progress in this country and we would steadily advance toward the highest plane of national architectural development.

The curtain has been drawn aside to disclose a semi-confidential relation in order that the very good purpose may be served of demonstrating to architects that their good work will always speak for them, and to point out to clients the only attitude that they should assume toward the profession to assure the most satisfactory outcome.

Mr. Studevant's letter follows:

October 26, 1918.

The Editors, THE AMERICAN ARCHITECT:

I have watched this company for thirty-two years as it grew from nothing (the first week's receipts being slightly in excess of \$600) to assets of \$2,700,000.00 in a county seat town of 8,000, with a total population of 25,000 in the county, a per capita of \$108.00.

Some fifteen years ago I began to dream of a building of our own. You may not know that it is more difficult to get a satisfactory location in a

town like Sidney than it would be in New York. The town is built around a public square upon which the County Court House is located. This gives us four squares fronting the Court Square, and it was necessary for us to have one of the corners. After negotiations covering a period of five years, we bought the corner on which we had been doing business for twenty-five years, taking title on Nov. 1, 1916.

Somewhere during the dreaming period I heard of a wonderfully original architect who, claiming that "form followed function," had never built two buildings alike, but I did not know, or at least did not remember his name or address. Accidentally in 1914 on a trip to Europe I met a man from Cedar Rapids, Iowa, who told me of a unique bank building in that town and later, following that clue, found it was a Sullivan building; still later I found he was finishing a building in Newark, Ohio, and from there I got his address. In 1916, when the possibility of getting our present site either on long lease or purchase seemed reasonably sure, I learned he was visiting Ohio, and I asked him to return home via Sidney, to get some first hand information. He came. We acquired the property a few months later and in December, 1916, we had him return to Sidney and make us a pencil sketch of what was afterward the building you have illustrated, and we contracted with him. The plans were completed about June 1, 1917. In the meantime the old building had been wrecked and all the material that we could anticipate had been purchased. We were unable to get a bid on the whole contract, so I took charge of buying the supplies and materials and we put the building up ourselves with the aid of a local builder. We moved into this building on May 31, 1918.

I have written a long letter to tell you why and how we retained Mr. Sullivan, and I trust it may be of some interest to you.

L. M. STUDEVANT.

Sidney, Ohio.

THE AMERICAN ARCHITECT

"Shall Architects Advertise?"

The answer to this often repeated question will be found in the following advertisement of Mann & MacNeille, which appeared in a recent issue of *Bank-*

Committees in all lines of industry to assist the Government in mobilizing most effectively the country's industries for prosecution of the war. It is evident that it is necessary to begin to outline a general program of organizing business for the period of reconstruction.

Single industries, acting individually, can scarcely hope to prepare for reconstruction on the scale that will be necessary, and a federation of all the War Service Committees of all the industries will be of inestimable value in co-operating with those agencies of the Government to be created to deal with this subject.

The conferences will include general sessions at which questions common to all industries will be taken up, sessions of Committees within particular industries at which specific industrial problems will be discussed, meetings of related War Service Committee groups, and conferences of individual War Service Committees, National Councillors of the Chamber of Commerce also will hold separate sessions.

SAFEGUARDING BUILDING LOANS

MANN & MACNEILLE, ARCHITECTS AND CONSTRUCTION ENGINEERS, OFFER THEIR EXPERT SERVICES TO INSTITUTIONS OR INDIVIDUALS AT THE TIME WHEN INVESTMENTS IN BUILDING LOANS OR BUILDINGS OF ANY TYPE ARE CONTEMPLATED.

THIS ORGANIZATION COMPRISES ARCHITECTS, ENGINEERS AND CONSTRUCTION EXPERTS IN ORDER THAT RESIDENTIAL, MERCANTILE AND CIVIC PROJECTS MAY BE CARRIED OUT IN THEIR ENTIRETY THROUGH COORDINATING DESIGN AND PERSONAL SUPERVISION OF CONSTRUCTION. THE UTILIZATION OF SUCH SERVICES CONSTITUTES INSURANCE AGAINST WASTEFULNESS, DEPRECIATION OF COLLATERAL OR THE DANGER OF UNSAFE LOANS.

THE INTERESTS OF CLIENTS ARE GUARANTEED AND SAFEGUARDED BY THE LONG AND VARIED EXPERIENCE OF THE FIRM IN PRIVATE MERCANTILE AND CIVIC WORK.

HORACE B. MANN,
Architect.
PERRY R. MACNEILLE,
Engineer.
Housing Expert.
RICHARD A. WALKER,
Designer.
WILLIAM W. GAY,
Landscape Architect.
HENRI C. HEPS,
General Manager.

MANN & MacNEILLE Architects and Construction Engineers

Grand Central Terminal
70 East 45th Street
NEW YORK CITY

INDUSTRIAL WORK.
Housing, Plants.
CIVIC WORK.

Mercantile.
Institutional.
RESIDENTIAL WORK.
City, Country.
LANDSCAPE WORK.
Design, Planting.
ENGINEERING WORK.
Design, Construction.

ers Journal of New York. Further reference to this will be found in our editorial pages.

To Discuss Reconstruction

Plans for assembling at Atlantic City on December 4, 5 and 6, the National Councillors of the Chamber of Commerce of the United States in conference with the War Service Committees, are announced by the War Service Executive Committee of the Chamber of Commerce of the United States.

The meeting will bring together from 2,000 to 3,000 industrial leaders to discuss problems that have arisen with the war. National Councillors of the Chamber, representing the more than 1,100 commercial and industrial organizations which comprise its membership, will attend the conference.

The main purpose of the conference will be the determination of practical methods whereby industry may co-operate still more closely with the Government through a more centralized scheme of organization. This probably can be accomplished best by the creation of a federation of all the War Service Committees. Questions of reconstruction will also be taken up.

For nearly a year the National Chamber has been engaged in directing the organization of War Service

Nothing Goes to Waste

The Salvage Service, something entirely new in our army, was started last January. There are already several salvage plants in operation and more are being organized. The activities of the Salvage Corps operating them extend from the front lines back through the training camps and lines of communication to every base port. All worn or damaged articles of whatever nature are collected and converted into useful supplies or used in the repair of other articles. Even empty tin cans are collected and the tin and solder salvaged.

The Salvage Service is effecting a saving to the Government considerably in excess of \$100,000 each day. But the saving in money, while of great importance, is not the vital part of the work. It is saving material imperatively needed at the front, material that no expenditure of money can immediately replace. It is directly saving ocean tonnage which is seriously needed, every week indirectly releasing labor for service in the shipyards, on the railroads and in other essential industries in the United States.



PLATE 145

LABORATORY OF ARTHUR D. LITTLE, INC., CAMBRIDGE, MASS.

KILHAM & HOPKINS, ARCHITECTS

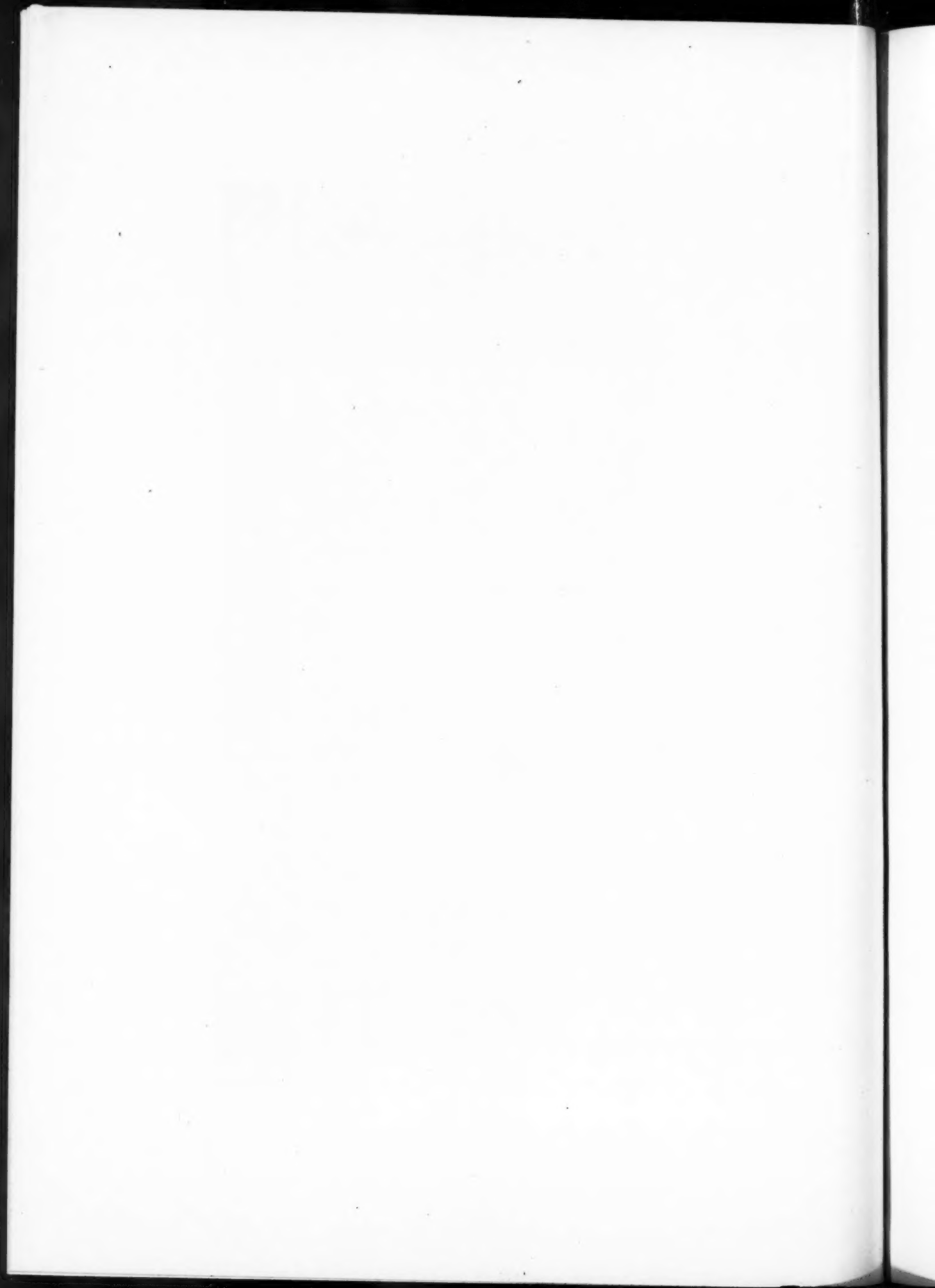




PLATE 146

DETAIL OF MAIN ENTRANCE

LABORATORY OF ARTHUR D. LITTLE, INC., CAMBRIDGE, MASS.

KILHAM & HOPKINS, ARCHITECTS

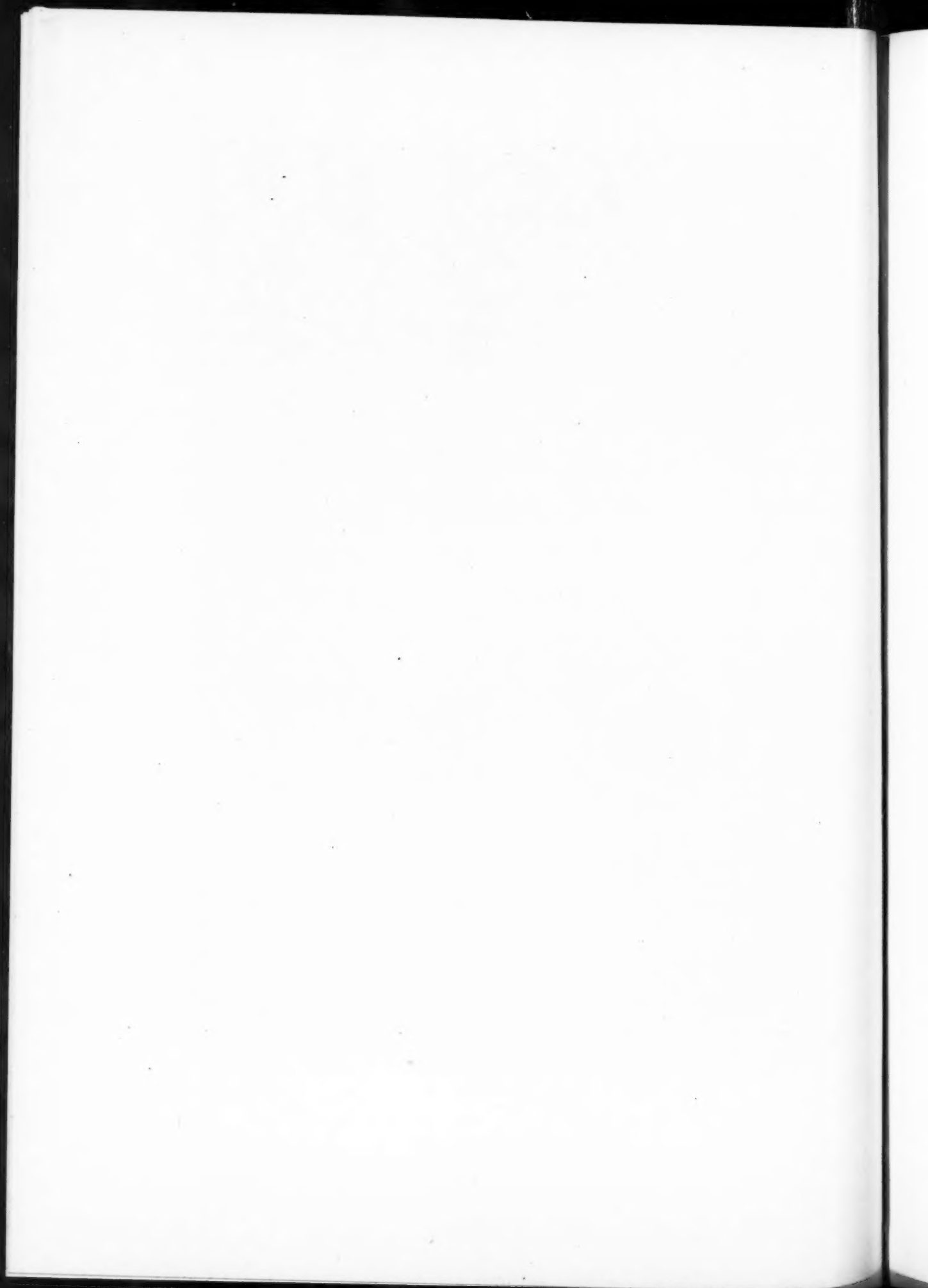
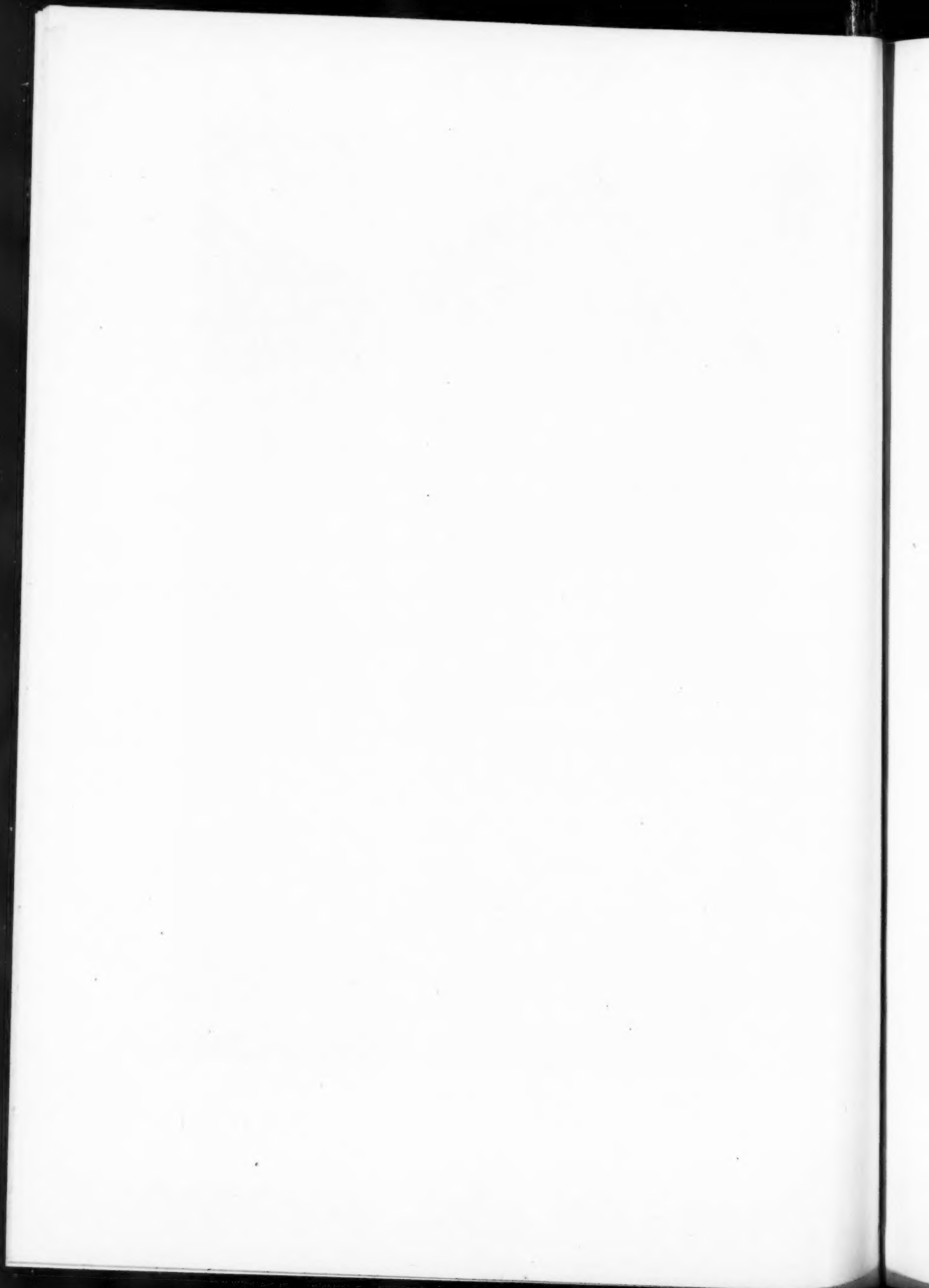




PLATE 147

EQUITABLE TRUST BUILDING, MADISON AVENUE, NEW YORK

WARREN & WETMORE, ARCHITECTS



THE AMERICAN ARCHITECT

NOVEMBER 13, 1918

VOL. CXIV, NO. 2238

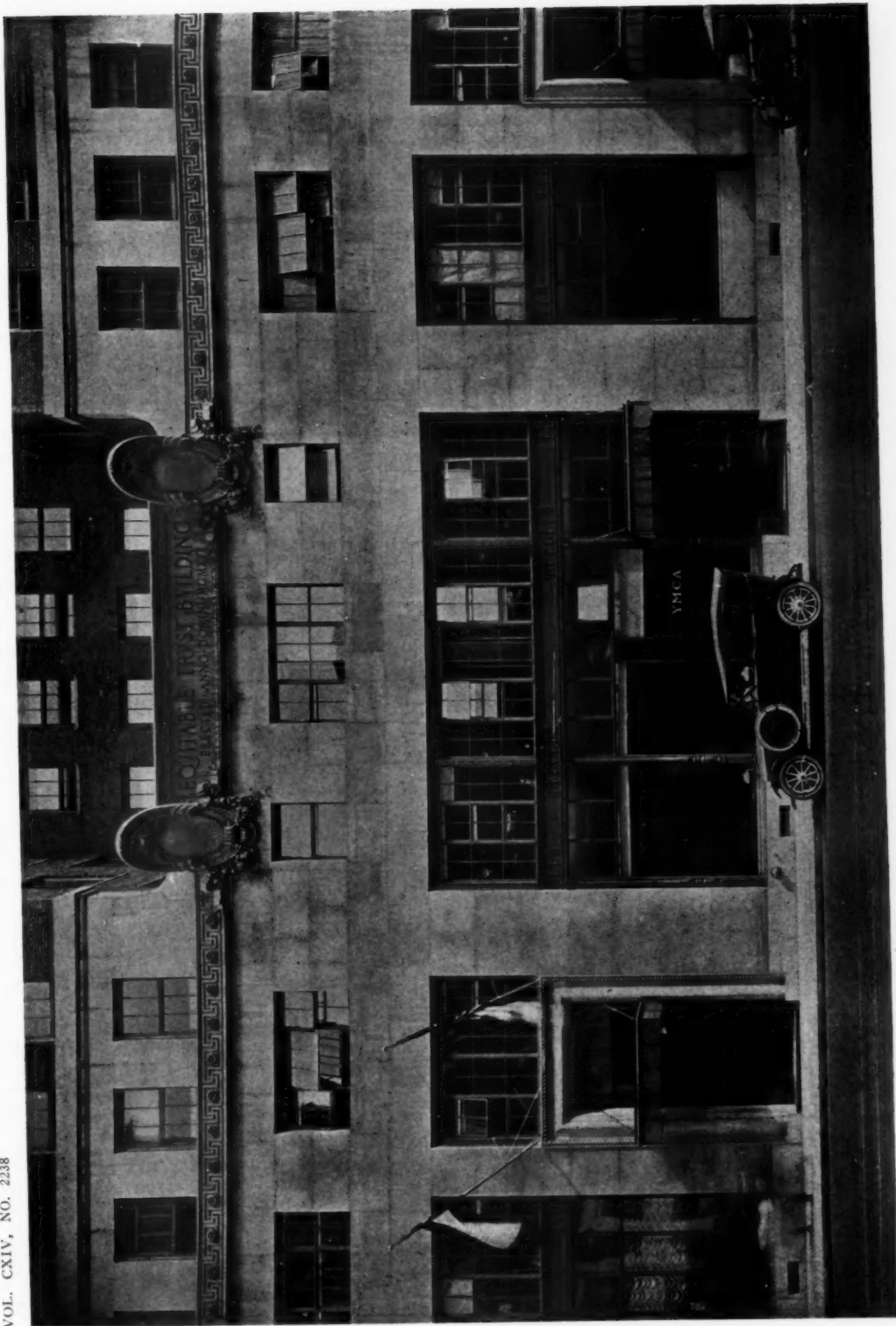


PLATE 148

EQUITABLE TRUST BUILDING, MADISON AVENUE, NEW YORK
WARREN & WETMORE, ARCHITECTS

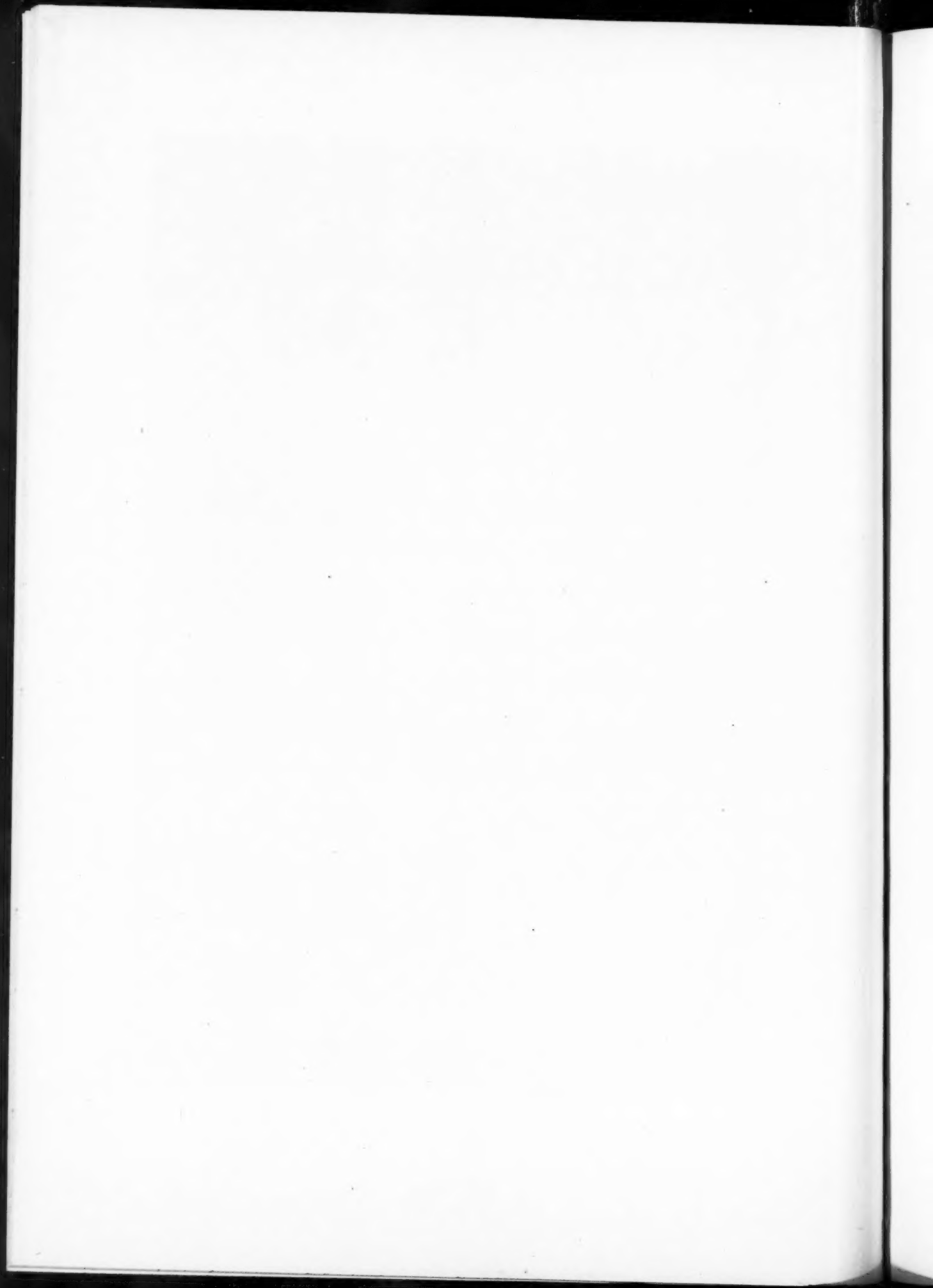


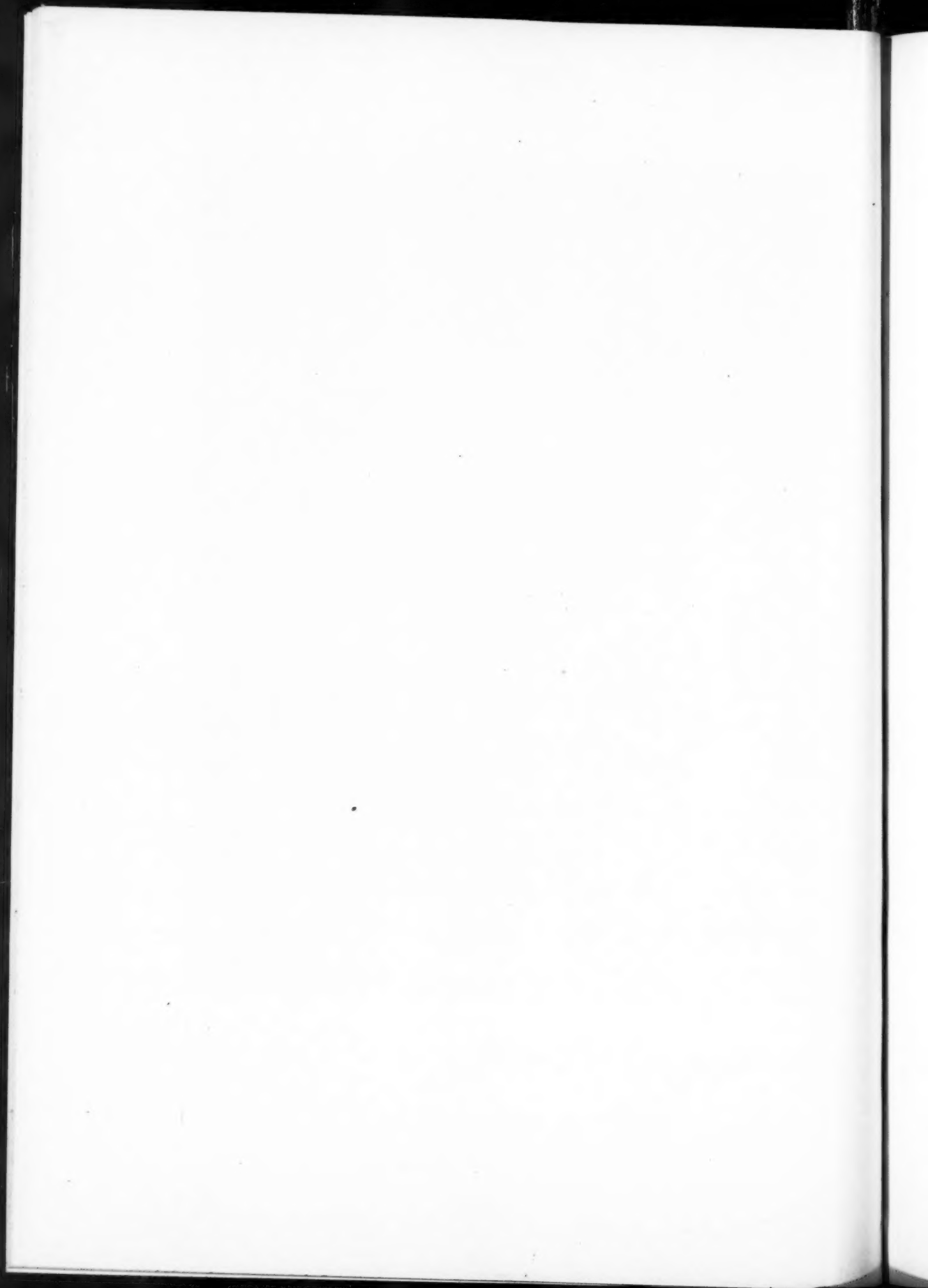


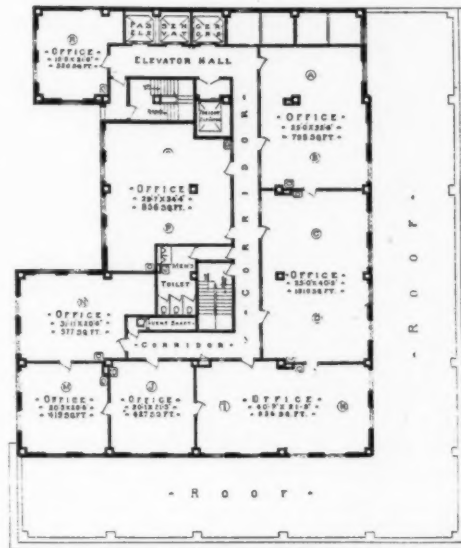
PLATE 149

MAIN CORRIDOR

EQUITABLE TRUST BUILDING, MADISON AVENUE, NEW YORK

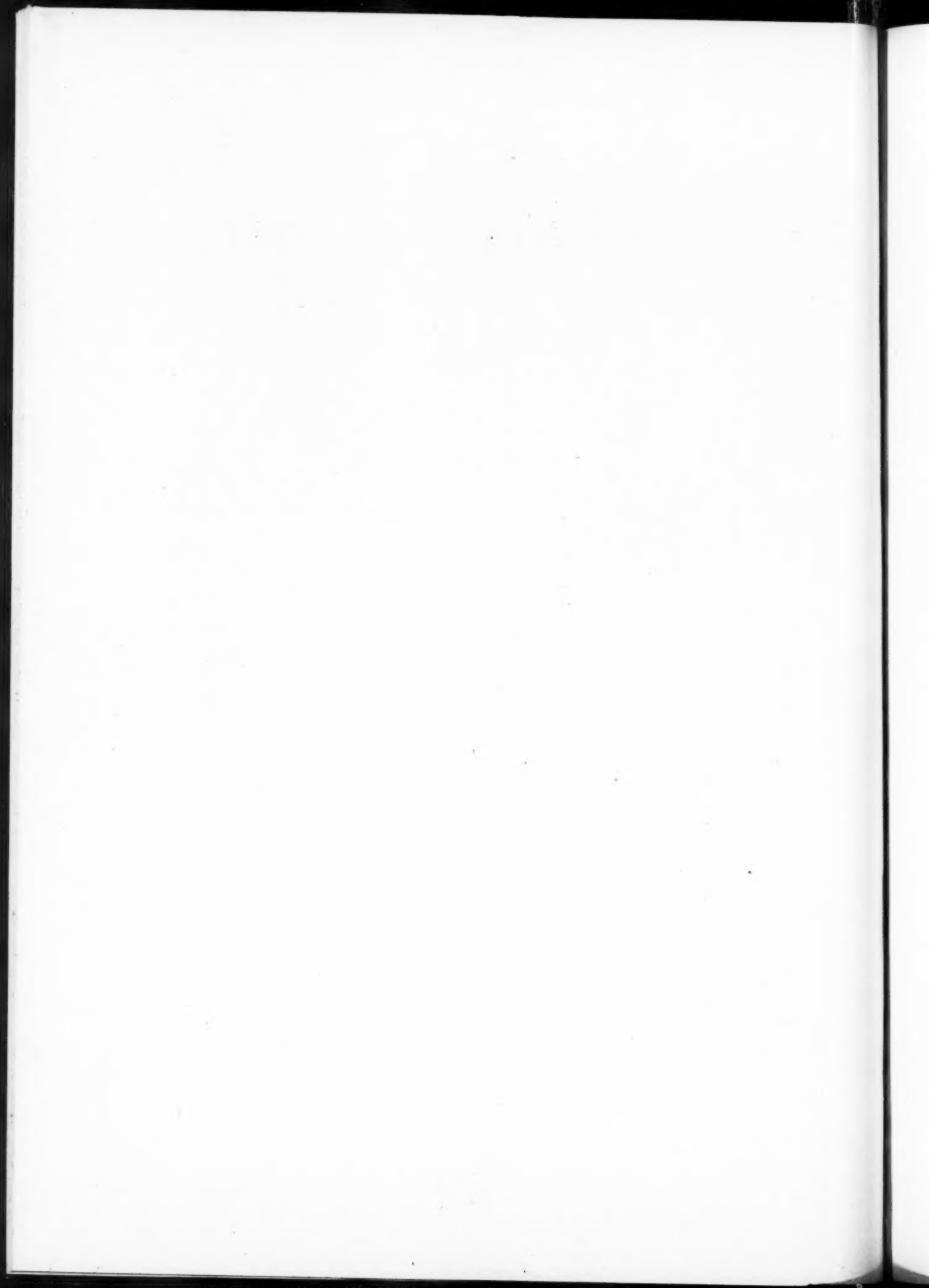
WARREN & WETMORE, ARCHITECTS





EQUITABLE TRUST BUILDING,
MADISON AVENUE, NEW YORK

WARREN & WETMORE, ARCHITECTS



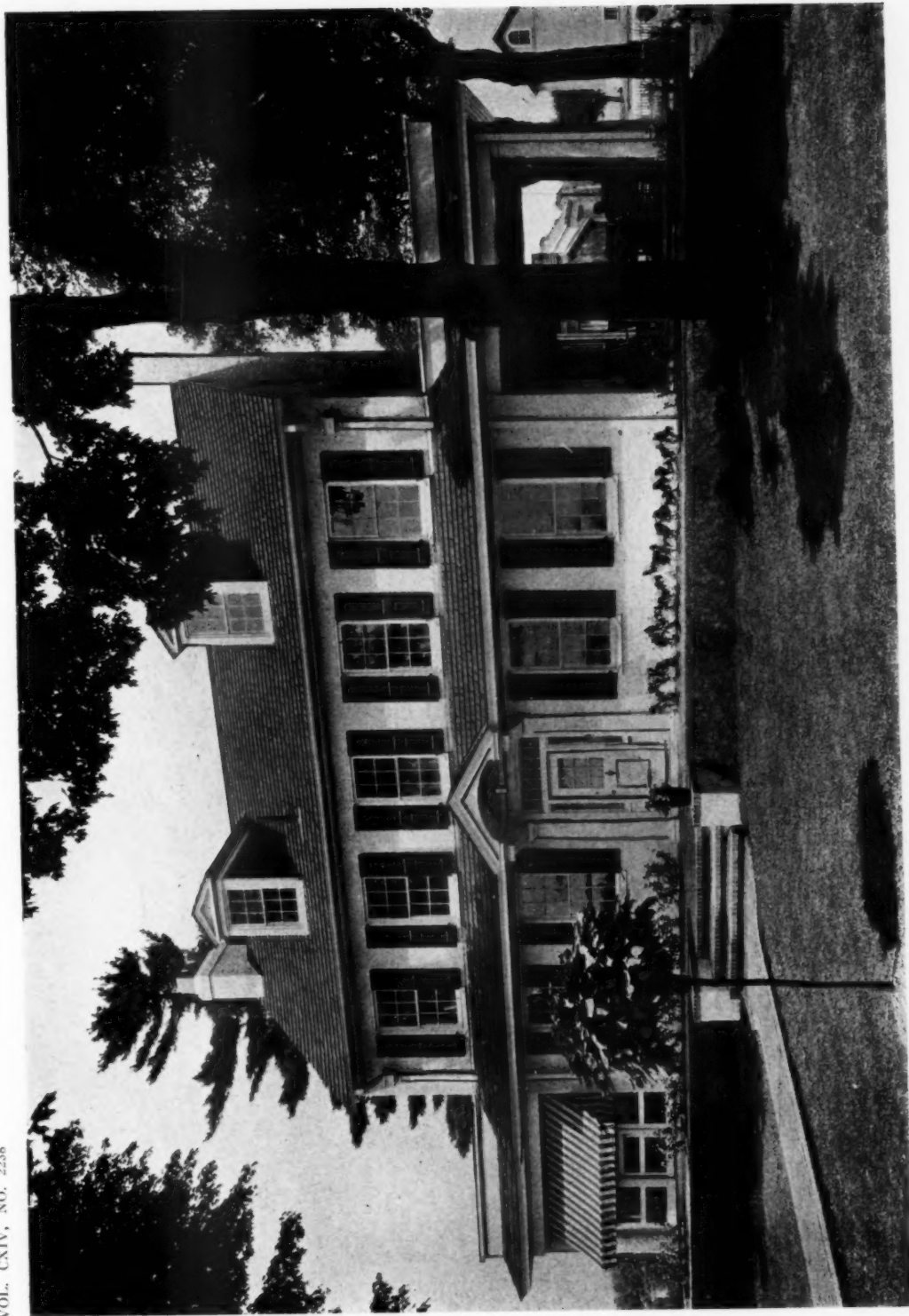


PLATE 151

HOUSE OF E. B. MALONE, TAYLORSVILLE, PA.
C. E. SCHERMERHORN, ARCHITECT

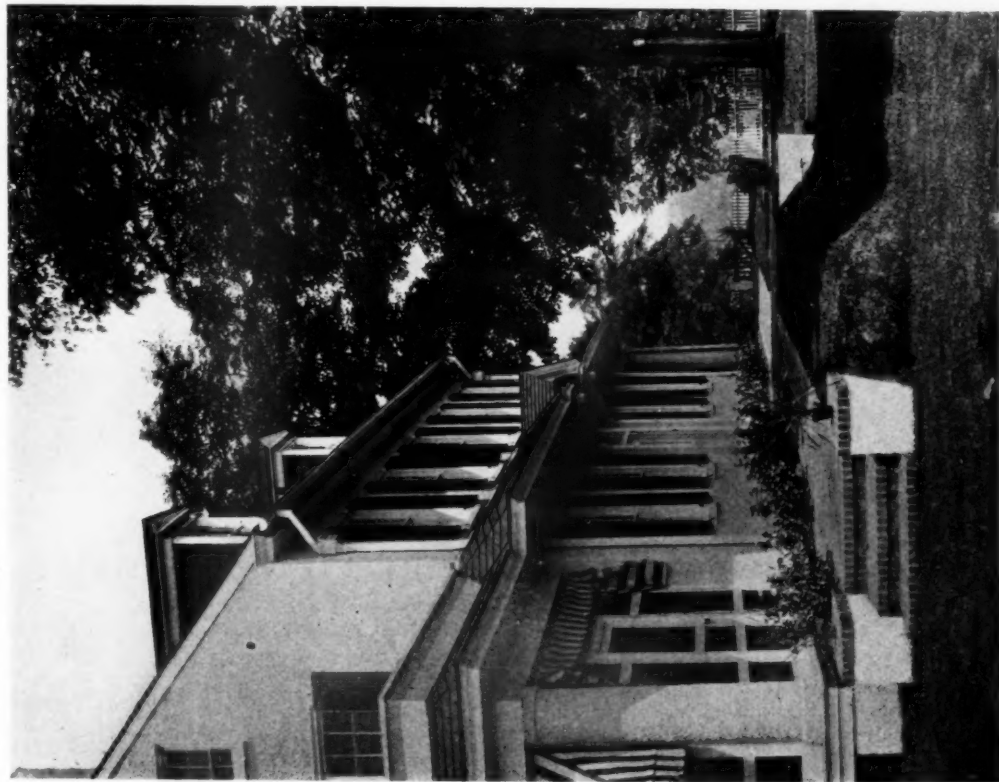
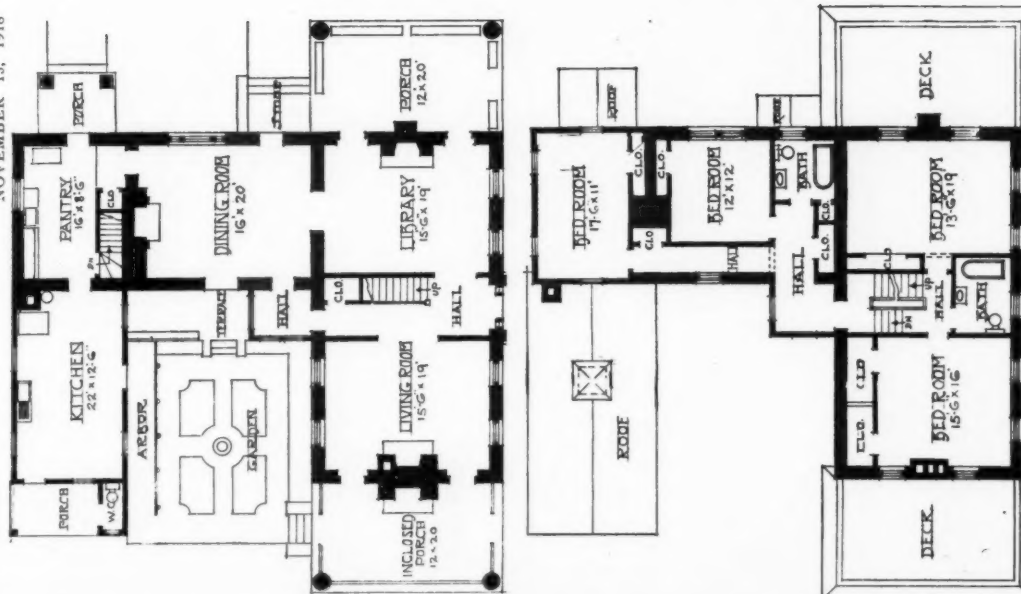


PLATE 152

HOUSE OF E. B. MALONE, TAYLORSVILLE, PA.

C. E. SCHIERMERTHORN, ARCHITECT



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THE AMERICAN ARCHITECT

Educators Organizing To Support Engineering Research Bill

A national committee of educators is being organized to support the Smith-Howard bill, now in Congress, for the establishment, in connection with state-supported universities or engineering schools, of engineering experiment stations for the promotion of engineering and industrial research. More than thirty-five educators, representing as many institutions, have already become members.

San Francisco Chapter Elects Officers

At a recent meeting of the San Francisco Chapter of the American Institute of Architects the following members were elected to office for the coming year: Sylvain Schnaittacher, president; William C. Hays, vice-president; August G. Headman, W. B. Faville, William Mooser, Smith O'Brien and Charles Peter Weeks, directors.

Special Courses at Harvard

The announcement made for the Graduate School of Business Administration of Harvard University for the ensuing year contains an innovation in that special one-year courses have been provided to meet the present national needs for trained specialists in certain lines of work. These courses do not lead to a degree but count for a degree if the student returns to complete the work. While the school is primarily for college graduates it has also accepted, without candidacy for a degree, non-college men of qualified preparation if they have had at least three consecutive years of business experience and are over 21 years of age. The special one-year courses above referred to are for men above the draft age and for those who are unfitted for military service. This plan includes a one-year course in accounting, one in industrial management and one in business statistics.

The Architect of the Future

Mr. C. H. Blackall in *THE AMERICAN ARCHITECT* for June 5, 1918, has contributed one of the most instructive articles on "Architecture After the War" that has ever been published in any journal or magazine, and every architect ought to read, study and memorize this contribution to our architectural literature.

It is high time that architects should have the

courage of their convictions by immediately in co-operation, meeting existing conditions and preparing themselves for the future by combining every thought with all their energy and resources, in order to be more efficient in producing results, which after all are the things that count. These things will be forced upon us whether we will have them or not. They will have us.—S. N. CROWEN, A. I. A., in October *Bulletin*, Illinois Society of Architects.

Additional Curtailments Announced In Materials

The Priorities Division of the War Industries Board announces the following additional curtailments in industry to conserve material, labor, capital, fuel, and transportation for more essential war purposes:

Composition roofing, rag-felt floor covering and building board industries.—In so far as it manufactures composition roofing made of rag-felt or asbestos or combinations thereof or building board or building paper made of wood pulp, waste paper, gypsum or cement, or combinations thereof, to confine its distribution of same to the United States Government and the Allies, to constructions licensed or authorized by the War Industries Board and to structures in which its use may be allowed by permit of the War Industries Board, and to repairs and replacements; and in so far as it manufactures floor coverings made of bituminous rag-felt or felts thereof for and during the period from Oct. 1 to Dec. 31, to reduce its consumption of materials to a basis of not exceeding 40 per cent of three-twelfths of its 1917 consumption and to reserve from general disposition sufficient quantities to take care of Government requirements.

An Educational Credo

The Metropolitan Museum of Art in New York has inaugurated a very useful work in making more generally available to workers in the arts and crafts, the extraordinarily valuable and greatly varied collection of the Museum.

It has adopted an educational credo, from which we read:

"We believe that every human being is born with a potential love of beauty, and whether this capacity lies dormant or springs into activity depends largely upon his education, using this term to include not merely his acquirements in the school-room but all the influences at home and elsewhere that shape his character. Assuredly this latent power to find rest

THE AMERICAN ARCHITECT

and happiness in those things which appeal to the eye is capable of development.

"We believe that whether the cultivation of this faculty adds to the earning capacity of its possessor or not, it does unquestionably increase his happiness, and this in turn reacts upon his health of mind and body. Thus eyes that know how to see beauty and a mind that can appreciate its spirit are genuine assets to the individual, of greater value now than ever before, and through the individual to the community, the state, and the nation."

Allied War Salon

An Allied War Salon, shown under the auspices of the Division of Pictorial Publicity of the Committee on Public Information and the Committee on Arts and Decoration of the Mayor's Committee on National Defense, will be held at the American Art Association, Madison Square South, December 9 to 24.

Mr. Albert Eugene Gallatin, chairman of the Committee on Exhibitions of the above Division, and also chairman of the Committee on Arts and Decoration, has collected the pictures for this exhibition, co-operating with Mr. Duncan Phillips of the American Federation of Arts, and Mr. Augustus Vincent Tack, of the Liberty Loan Committee. After being shown in New York, the exhibition will be broken up into units and shown throughout the country, under the auspices of the American Federation of Arts.

The exhibition is designed to acquaint our people with the extent of the Allied effort and to set forth their ideals. It will minister to their morale, and, since the standard of excellence will be high, will do its part in raising the standard of art appreciation in this country. Plans are now being considered for a permanent war museum, such as those which are being formed in England and France, to house such material as has been gathered for this exhibition.

Substitution of Materials

The efforts being made by architects and builders to find adequate substitutes for materials that are made non-available through Government restrictions have demonstrated that radical means and methods have been employed.

In one case of especial note, states the *New York Times*, a great warehouse has been constructed without steel beams as wall supports, heavy wooden 14 by 14 timbers being employed in the structure which is being erected in the warehouse district of

New York. Another instance is cited of a three-story building which has been constructed entirely of hollow terra cotta tile, the outside walls carrying the load of the entire building with the exception of several concrete columns in the floor, also built of hollow tile and through which are run the only steel members used in the structure, steel tension rods. The floor construction is of the long span type and the building is to be used for office purposes for the Government.

The success of this piece of construction has attracted a great deal of attention especially since it has been the assumption of the laity that this form of clay product building materials could not be used to sustain loads with success. Since this type of construction permits the use of material that has no special demand in the war program, builders, architects and prospective owners having plans held up for necessary construction work may be now able to proceed under Government permission since the supply of this material is on hand in large quantities.

Americans Reconstruct Italian Village

A cablegram from the American Red Cross Commissioner to Italy, dated from Pisa, states the following plans of a new enterprise in connection with the refugee problem:

Steps were taken here to-day toward building a model American village, for the purpose of providing new homes for people made homeless by the war. On a site comprising thirty acres of ground, adjacent to the leaning tower and other world-famous monuments of Pisa, ground was broken in the presence of the king, head of the Italian Red Cross, Major Chester Aldrich, and other officers of the American Red Cross. It is expected the village will be completed in ninety days.

The buildings will be made of cement. There will be a public square, church, school house, hospital and public eating kitchen. Modern sanitary facilities will be installed. The water supply will be brought over the aqueduct built by the Medici five hundred years ago, which still is in perfect condition. The site will provide homes for two thousand and refugees from the Venetian district.

It is proposed to transplant to the new village industries with which the refugees are familiar. The entire project is under the supervision of the American Red Cross, and is regarded as one of the most interesting undertakings in the effort to deal with problems relating to the refugees from devastated and threatened districts.

Why Metal Feels Colder Than Wood

A correspondent puts to the *Scientific American* a question which expresses a thought that has occurred to many people. He wishes to know the "inherent temperature" of a few materials; namely, gravel, wood, such as oak or pine, ordinary bridge steel and lead. "You will notice," he says, "a considerable difference in the temperature of the metal of the telephone on your desk and the wood desk itself, though they both are surrounded by the atmosphere at one temperature. Again, when we get out of bed in the morning the carpet on the floor is not uncomfortable to our feet, but when we step on the mosaic pavement in the bathroom we notice it is considerably colder than the carpet. I am led to believe that materials must possess what could properly be called 'inherent temperatures,' and that they do not necessarily assume the temperature of the atmosphere adjacent to them."

Our well known contemporary replies what the querist terms "inherent temperature" is the same as is known in science as "thermal conductivity," or the capacity to absorb heat, or to allow heat to pass into the material. The approximate relative conductivity of the materials above named is expressed by these numbers: oak, .58; sand, .24; lead, 83; hard steel, .60; soft steel, .111. The reason why a piece of metal feels cold and a piece of wood at the same actual temperature feels warm is that the metal takes heat out of your hand more rapidly than the wood and so the hand feels cold from the loss of heat. If the wood and the metal were at the same temperature as your hand they would then feel the same when tested by the hand. The hand is deceived by the difference in the withdrawal of heat from it, and you conclude that the metal is colder than the wood. A thermometer will not be so deceived and will indicate the real temperature of the various articles. It is a fact that articles which have been in the same place for a time will all be of the same temperature when tested by a thermometer.

Terrazzo

A writer by the name of Sagredo, states an exchange, in referring to building construction in Venice, tells how Venetian pavement—to-day referred to as terrazzo floors—was laid. In A. D. 900, the usual method was to lay down a floor of heavy planks, upon which a thick layer of mortar and small pebbles was spread out and beaten down to a hard surface; upon this again a second layer of cement mixed with pounded bricks was spread, and this was beaten with heavy wooden beaters till it was perfectly hard and even. It was from this

beginning that the so-called "Venetian pavement" soon developed. For rich people caused small pieces of colored marble, and even mother-of-pearl, to be set into the cement of the second layer, which was then no longer beaten, but rolled with a ponderous stone roller and then rubbed down with a smooth stone and sand and water, and at last polished to a brilliant surface. So the roller for finishing concrete pavement is not so much of an innovation after all.

After-War Industry

We may expect, says the National City Bank of New York, that, after the war, there will be a waiting demand for many kinds of goods and equipment so urgent that for a time price will be a secondary consideration. The whole world is doing without things it would gladly buy, is wearing out equipment and falling behind its wants. It is falling behind in house-building, for example; in road-making, in railway extensions and in the development and improvement of public utilities. Automobile construction has nearly ceased, and the cars in use will be nearly worn out. Clothing will be worn out the world over, and stocks of cotton will be low, therefore there will be a good market for cotton. Not only is there the rebuilding and rehabilitation of the war-devastated districts to be done, but the development of the backward countries looms up with more definite and immediate promise than ever before. The world is not going to seem so large, or its divisions so separate and distinct from each other as in the past. Foreign countries will not appear so remote and difficult of access to Americans. Undeveloped resources which will contribute to the comfort and welfare of mankind will not be neglected anywhere if stable government and protection to investments can be had. The stir of the war will be in the blood of all nations and the impulse to do things will be manifest. These are the conditions favorable to a period of enterprise and activity, and which will tend to sustain prices or moderate their decline. Nevertheless, it is inevitable that prices will be upon a declining scale and this will be the factor of uncertainty and danger in the situation, as falling prices, shrinking values in inventories, stocks of goods and capital investments, have a depressing influence. Prices must decline, for one reason, because the conditions which occasioned the rise will be reversed. The millions of men withdrawn from industry will be returned to it, and the millions of women who have entered industry will not all leave it as soon as the war is over and we again have peace.

Community Houses as Monuments

An interesting idea being put forward by *The American City* is that of the erection of community houses as fitting memorials to the brave men, living and dead, who have joined the colors and given of their time and life for the sake of liberty. And it is proposed that the name Liberty Buildings be used for such structures.

There is no question but what memorials may well take on some practical form, nor is there any question but what we should erect something, many things in fact, to commemorate the greatest crusade of the world and to show our appreciation of the brave men who participated therein. And the position is well taken that these structures should be made to assist as well as commemorate.

Of course these structures mean permanence, a thing of keen interest to the clayworking industry, for it has been established that there is nothing in the way of structural material which has greater permanence than well burned clay.

The idea should furnish a fruitful theme for architectural designs and beget a series of offerings which will add new character to the architecture of the country.

A Conference in United States on Rebuilding France

Various problems of reconstruction in France, Belgium and Italy with relation to the United States, are now being considered in this country. At a preliminary meeting held at the Metropolitan Club in New York the matters of rebuilding in France were discussed.

Albert Breton of the Guaranty Trust Company said that he did not think France would accept from the American people a receipt for the debt which she had incurred here and that he was not afraid of any economic penetration on the part of the Germans. George W. Wickersham, who some time ago made the suggestion that the debt be canceled, maintained that the greatest problem to be met after the war will be that of preventing Germany from obtaining by peaceful means the economic supremacy which she has failed to obtain through military domination.

Mr. Chevallion, who has just come from France after making a complete survey of the devastated regions, announced that the French Minister of Blockade had just appointed an agent to America to inform this Government of the needs of France for reconstruction. He said that the first problem was not that of money, or even of material, but of

labor, and the next consideration was the psychology of the refugees.

"There have been 500,000 French repatriated," he continued, "and in many cases they have been absorbed into the life of other parts of France. When it is remembered that their original homes have been so completely obliterated that there is only a sprinkling of red dust where a village had stood, one can understand that the former inhabitant may not care to return. When two or three working members of the family have been taken away there is still less desire. In the region around Rheims some of the ground is snow white from the lime which has been turned up by the shells. Soil experts can say of it nothing more than, 'You must plant pine trees and then wait 100 years.' Those are some of the conditions that must be kept in mind in planning reconstruction."

Other speakers were Frederic R. Coudert, L. H. Baekeland, Vittorio Faloni, representing the Italian Ambassador, and Allen Walker of the United States Chamber of Commerce. Francis H. Sisson of the Guaranty Trust Company presided.

Some of the Properties of Pure Nickel

Pure nickel, says *Waste Trade Journal*, should not be confounded with the inferior metals usually sold as nickel, which consist mostly of steel, brass or German silver with a thin plating of nickel. Nickel is essentially an American product. For many years it has been a general practice to have the ore which has been mined in this country and Canada reduced to its various forms by European manufacturers. Previous to the war most of the material imported into this country as foreign stock was the American metal worked into the form of sheet, strip and finished articles of manufacture by foreign concerns.

Pure nickel does not rust or oxidize, and consequently every danger of poisoning, generally caused by verdigris, is eliminated. Neither will the metal tarnish like silver or some of the alloys, such as German silver, and, even though the surface be injured there is no danger of corrosion resulting as in a plated article.

While not so good a heat conductor as aluminum, nickel utensils are made of a thinner material, which more than overcomes the difference. Pure nickel has a melting point of about 2,600 degs. F., whereas aluminum has one of only about 1,200 deg. There is not the same possibility of softening under constant use. The metal is also much more resistant to the action of the acids commonly found

THE AMERICAN ARCHITECT

in food products. The silver-like appearance of pure nickel does not change in use.

In the chemical field there are many uses for this metal. The surface of pure nickel is not attacked by acids nor alkalies, in the dilute form usually encountered in ordinary service. In fact, it is practically immune to the attacks of all alkalies, regardless of their strength, and is largely resistant to the action of most acids. Nickel has a high tensile strength and in the sheet form, being homogeneous throughout, is ductile and easily formed by spinning or stamping. No special equipment is necessary for manufacturing articles from these sheets, the same tools and metals being employed as with German silver and hard alloys.

Alloys of Zinc

Ever since the war commenced stories have appeared regarding the wonderful properties of zinc alloys that have been discovered to take the place of alloys of copper, such as brass and bronze.

The Germans got the credit for the first discoveries, owing to their well known shortage of copper, but other nations are now getting into line.

Alloys having a zinc base have been known for possibly 100 years, but they were very different in physical properties from what may be termed the "modern" zinc base alloys. These latter alloys contain aluminum, without which in some proportion, such alloys are very inferior. The older alloys contained no aluminum, because aluminum was then unknown as a commercial metal. They were known as Fantainmoreau's bronzes and consisted of zinc alloyed with copper and iron and a small percentage of lead. The modern alloys of this type are modern because they contain aluminum, which is a modern possibility in alloys.

Black Walnut

Of all our native woods, only black walnut will do for airplane propellers and gunstocks. The airplane propeller blades must be exceedingly tough, says Robert F. Wilson in an exchange. They revolve so rapidly in action that those on seaplanes are sometimes splintered by water dashing against them. Properly seasoned walnut gun stocks will not warp away from the metal parts of the guns. Mahogany is the only substitute for black walnut; but, leaving its high cost out of consideration, it must be imported from the tropics, and our ships now-a-days are too precious to be spared for such commerce if we can obtain suitable wood at home.

The war has brought the first great demand for black walnut that there has been for twenty-five

years. Each airplane must have not one or two, but four or five propellers, the extra ones to be on hand in case of breakage; and this country is setting out to build airplanes by the tens of thousands. It takes one hundred board feet of walnut to make a single propeller. Add to this the supply needed for gunstocks by millions and millions, and it is easy to see why the Government's construction program calls for 60,000,000 feet of black walnut lumber each year.

Fallacies in Lighting Economies

Removing reflectors or shades from lamps in order to "get more light" defeats the object, states the report of the annual meeting of Illuminating Engineering Society. The raw light from glaring bare lamps is less effective than a smaller quantity of reasonably diffused light not exposed to the eye. Attempting to economize by reducing the number of lamps or by using smaller lamps indiscriminately is unwise. In nearly every case ample illumination is essential to useful accomplishment. The most successful conservation is elimination of waste of light, not reduction of use of light.

An English View of the American Industrial Building

In the course of a discussion on the future of industrial building in England after the war, the *Architects' and Builders' Journal* of London, states that it is to America that England will have to look for developments and new departures in factory construction. We read:

For a long time it was to America that we had to look for developments and new departures in factory construction. American examples, illustrated from time to time in this journal, have only too plainly demonstrated this fact, which is not altogether humiliating when its underlying cause is explained. As we have observed on other occasions of apology for the out-of-date notions of factory building that seem to prevail in this country, British practice in factory construction is primitive because its tradition of factory building was established before principles could be formulated, and the younger country, building later, has built much better. Of America it has been written by a Chinese observer that "over her unencumbered plains the Genius of Industry ranges unchallenged, naked, unashamed; whereas in Europe it has still to fight for its supremacy, for there it is confronted with the debris of an earlier society." When America shows us the better way, we must needs

THE AMERICAN ARCHITECT

follow it; and hence it is that our newer factories have been built after the American model, which with slight modifications, will doubtless be followed pretty generally when, after the war, unprecedented activity in industrial building sets in all over the country. When the demand for additional factories has been satisfied, or perhaps before, the owners of old factories will be anxious to rebuild; for it is certain that the old tumbledown sheds which passed for factories cannot compete with buildings of the new and scientifically designed type, which architect, engineer, works manager, and experienced contractor co-operate to produce.

Architecture a Course in Students' Army Training Corps

Architecture has been added to engineering, medicine and other courses of study approved for the Students' Army Training Corps. It will, therefore, be possible for young men who had intended to follow this profession after the war to enter it now as members of the S. A. T. C., thus meeting the Government requirements leading to a commission. Courses are offered both in architecture and architectural engineering.

Dr. Warren P. Laird, head of the Architectural School of the University of Pennsylvania, said these courses are still open to students, having been approved too late for timely general announcement. "Approval of architecture as a subject of study under war conditions," he said, "is based upon the recognized fact that a training in architecture is well calculated to develop in the student a logical process of reasoning, inventiveness and resourcefulness, the exercise of imagination, and the formation of judgment—qualities that are invaluable in an officer."—*Philadelphia Ledger*.

Encouraging Use of Highways

Highway transport committees operating under the jurisdiction of the Council of National Defense, states *Improvement Bulletin*, are being organized in each state in the Union to encourage the use of highways as one means of strengthening the nation's transportation resources. The Council of National Defense believes that the highways of the country may prove of great value in carrying on the war work of the country by affording an easy and satisfactory method of transportation in the smaller unit of the community and may relieve

much of the strain to which the railway lines are subjected. In connection with the operation of the highways transport idea, however, the burden of poorly improved roads will be brought to the fore with such a marked emphasis as never before has been seen. In order to get the greatest benefit from the highway system of the country, it naturally follows that the highways must be in the best possible condition. Some of the states already have developed the highway transports committees to a high state and have done much to improve conditions which previously existed. The formation of the committee in Minnesota is progressing rapidly under the direction of Charles M. Babcock, state highway commissioner, who has been appointed by Governor Burnquist as chairman of the State Highway Transports Committee.

Zinc As a Roof Covering

Zinc, states *The Metal Worker, Plumber and Steam Fitter*, of a ductility or toughness which will allow it to be worked as easily as lead, can now be procured. This fact is brought to attention because zinc can be furnished in any desired quantity without interfering with the restrictions of material for war work. For this reason it is suggested that architects and builders in this country subject zinc to the same practical tests it has received abroad.

Formerly, the cost of zinc roofing has been far in excess of that of a good tin roof. Manufacturers of zinc claim it can be used as a substitute for copper, and that on account of lower cost might eventually replace it. It is claimed that zinc has greater expansion and contraction than copper.

As evidence of the durability of zinc as a roofing material it is pointed out that there exists in different parts of the United States zinc covered roofs that have withstood the wear of time for more than thirty years.

Housing Conference in Iowa

What is said to be the first housing conference of representative citizens ever called by the chief executive of any State was held recently at the Iowa State House, Des Moines. The purpose was to consider the housing conditions at present existing in the State, with a view to submitting recommendations for legislation on the subject to the next general assembly.

Department of Architectural Engineering

Standardized School House Design*

Part II

MACHINE SHOP

1. *Size.* 2 classroom units.
2. *Capacity.* 20 pupils.
3. *Equipment.*
Wall tables in front of windows when possible.
 - 4 engine lathes.
 - 1 shaper.
 - 1 sensitive drill.
 - 1 upright drill.
 - 2 speed lathes.
 - 1 hacksaw.
 - 1 floor grinder.
 - 1 wet grinder.
 - 1 universal miller.
 - 1 electric furnace.(All the above individually motor-driven.)
 - 1 sink.
4. *Storage of Clothing.*
 - 1 wardrobe with maximum capacity for 25 pupils.
 - 1 teacher's locker.

MILLINERY ROOM

1. *Size.* 1½ classroom units.
2. *Capacity.* 40 pupils.
3. *Equipment.*
 - 1 cutting table.
 - 10 pupils' tables.
 - 40 chairs.
 - 1 style "C" case.
 - 1 locker cabinet, 24 compartments.
 - 1 sink.
4. *Storage of Clothing.*
 - 1 pupils' wardrobe.
 - 1 teacher's locker.

MUSIC ROOM

1. *Size.* 1½ classroom units.
2. *Capacity.* 80 pupils.

3. *Equipment.*

- 80 opera chairs without tablet arms.
- 1 cabinet for sheet music.
- 1 blackboard, on which is to be painted the musical staff.
- 1 piano.

PLUMBING SHOP

1. *Size.* 1 classroom unit.
2. *Capacity.* 20 pupils.
3. *Equipment.*
Wall tables, wood tops, in front of windows wherever possible.
 - 1 table with steel top.
 - 10 gas furnaces.
 - 1 sink.
4. *Storage of Clothing.*
 - 1 wardrobe with maximum capacity for 25 pupils.
 - 1 teacher's locker.

PRINTING SHOP

1. *Size.* 1½ classroom units.
2. *Capacity.* 20 pupils.
3. *Equipment.*
 - 2 presses, motor-driven.
 - 1 paper cutter.
 - 1 wire stitcher.
 - 6 type cabinets.
 - 1 imposing table.
 - 1 sink.
4. *Storage of Clothing.*
 - 1 wardrobe with maximum capacity for 25 pupils.
 - 1 teacher's locker.

SCIENCE ROOM

1. *Size.* 1½ classroom units.
2. *Capacity.* 40 pupils.
3. *Equipment.*
 - 1 teacher's demonstration desk.

*Continued from our issue of November 6, 1918, page 559.

THE AMERICAN ARCHITECT

- Tables and seats for grades 7 and 8 or possibly grade 9.
- 1 apparatus cabinet.
- Blackboards.
- 1 electrical outlet for projecting pictures, etc.
- 1 workbench and 1 switchboard.
- Opaque shades, 1 lantern, and screen for lantern.
- 4. *Storage of Clothing.*
 - 1 pupils' wardrobe.
 - 1 teacher's locker.
- 5. *General.* The room to be selected may be an interior room and may front on the playground, as noise is not objectionable.
- 6. *Sliding Doors* between science and adjoining room in at least one building in a district for demonstration purposes.

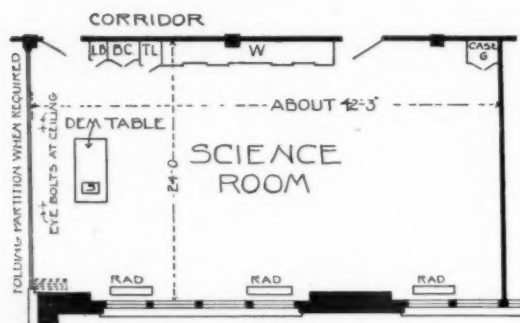


FIG. 8. SCIENCE ROOM IN ELEMENTARY SCHOOLS

Showing Standard Equipment.

Cabinet "G," wardrobe, teacher's locker, book cabinet, library book case and demonstration table will be provided in general and plumbing contracts.

Other equipment in furniture contract.

When column occurs back of book cabinet or library book case, such cases will be brought out flush on front with wardrobe.

Dimension "A" from nearest column to partition line of standard class room unit shall be marked on plans, in feet and inches, so that wardrobe will be in the proper location in case the partition is installed later.

The science room, see Fig. 8, shows the fixed equipment to consist of the library bookcase, book cabinet, teacher's locker, wardrobe and apparatus cabinet "G." The demonstration table has a sink with water supply. Two eyebolts are attached to the ceiling from which lantern screen can be suspended.

SEWING ROOM

1. *Size.* 1½ classroom units.
2. *Capacity.* 40 pupils.
3. *Equipment.*
 - 1 cutting table.
 - 10 sewing tables with drawers.
 - 10 footstools.
 - 10 sewing machines (5 each of 2 different types).

- 1 type "B" case for exhibition purposes.
- 1 sink.
- 1 blackboard.
- 1 ironing board.
- 1 electric iron.
- Electric outlet.
- 3 cases for kit boxes.
- 4. *Storage of Clothing.*
 - 1 pupils' wardrobe.
 - 1 teacher's locker.
- 5. *General.* Ample storage space may be had above the wardrobe.

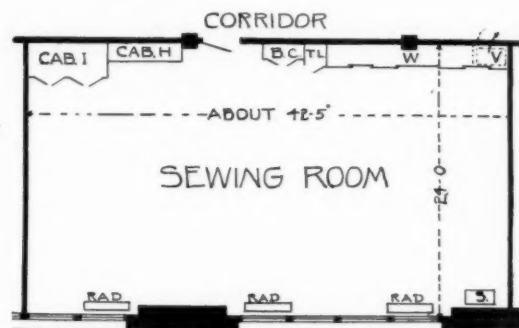


FIG. 9. SEWING ROOM IN ELEMENTARY SCHOOLS

Showing Standard Equipment.

Cabinet H (kit case), cabinet I (display case), wardrobe, book cabinet and teacher's locker will be provided in general contract.

Sink will be in plumbing contract.

Other equipment in furniture contract.

When column occurs back of book cabinet, such cabinet should be brought out flush with front of wardrobe.

The sewing room, Fig. 9, has an area of 1½ classroom units, equipped with the book cabinet, teacher's locker and wardrobe. These with cabinet "H" for kit cases and the display case (cabinet "I") and the sink constitute the built-in fixtures.

SHEET METAL SHOP

1. *Size.* 1½ classroom units.
2. *Capacity.* 20 pupils.
3. *Equipment.*
 - 2 workbenches, steel top.
 - 1 workbench, wood top.
 - 1 bench for grooving machine.
 - 1 stake bench.
 - 1 painting bench.
 - 1 case, style "I."
 - 1 squaring shears.
 - 1 cornice brake.
 - 1 sink.
4. *Storage of Clothing.*
 - 1 wardrobe with maximum capacity for 25 pupils.
 - 1 teacher's locker.

THE AMERICAN ARCHITECT

WOODWORKING SHOP

1. *Size.* $1\frac{1}{2}$ classroom units, in large schools 2 classroom units.
2. *Capacity.* 24 pupils.
40 pupils (large schools).
3. *Equipment.*
 - 12 double benches.
 - 20 double benches (large schools).
 - 3 shop cabinets.
 - 1 lumber rack.
 - 1 glue and staining bench.
 - 1 glue heater.
 - 1 key cabinet.
 - 1 paint cabinet.
 - 1 sink.
 - 1 lathe.
 - 1 band saw.

All initial equipment of hand tools to be supplied through Bureau of Buildings.
4. *Storage Space.* To be provided for within the room.
5. *Storage of Clothing.*
 - 1 pupils' wardrobe.
 - 1 teacher's locker.

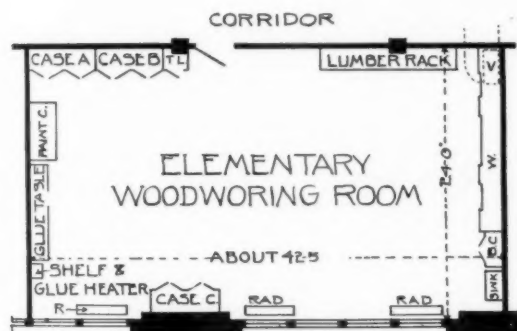


FIG. 10. WOODWORKING SHOP IN ELEMENTARY SCHOOLS

Showing Standard Equipment.

Cases A, B, and C, gas heater shelf, wardrobe, book cabinet, teacher's locker and lumber rack will be in general contract. Sink and gas plate will be in plumbing contract. Other equipment in furniture contract.

Fig. 10 shows the plan of a $1\frac{1}{2}$ classroom unit woodworking shop. Along the corridor wall are placed shop cabinets "A" and "B," the teacher's locker and the lumber rack. On one end wall is placed the pupils' wardrobe, book cabinet and the sink, on the other end wall is placed the paint cabinet and the glue and staining bench and the glue heater, while shop cabinet "C" is placed on the outside wall. The work benches, lathe and band saw will be placed on the floor space.

AUDITORIUM

1. *Capacity.*
 - (a) Buildings of 48 classroom units or more, 580.
 - (b) Buildings of 38-40 classroom units, 550.
 - (c) Buildings of 26 classroom units, 400.
 - (d) Buildings of less than 26 classroom units—capacity smaller.
No auditorium less than 350 capacity.
 2. *Seats.*
 - (a) Type.
Opera chairs with adjustable tablet arms.
 - (b) Height of
 - $\frac{1}{3}$ nearest platform, 15 in.
 - Middle $\frac{1}{3}$, 16 in.
 - Rear $\frac{1}{3}$, 17 in.
 3. *Platform.* 36 in. high in new buildings.
 - (a) Separate platform for piano at side.
 - (b) Portable blackboard, no fixed furniture.
 4. *Wardrobes.*
 - (a) 40 per cent of capacity, to be placed in playground space contiguous to auditorium if possible.
 - (b) Teacher's lockers, 2 in or near stage entrance or ante-room.
 5. *Roof of—*
Playspace for kindergarten and first-year children.
- The storage of clothing is summarized as follows:
1. *Classroom.* Wardrobe in each.
 2. *Auditorium.* Wardrobe for 40 per cent of capacity. To be placed in playground space contiguous to auditorium if possible.
 3. *Shops.* Wardrobe with maximum capacity for 25 pupils in each shop.
 4. *Gymnasium.* Of 2-classroom unit area, wardrobe with maximum capacity for 46 in each gymnasium.
 5. *Playground.* (Interior.) Racks and hooks with shelves above.
 6. *Teachers' Lockers.*
 - (a) One in each classroom, shop, gymnasium and each room of instruction.
 - (b) 2 in or near stage entrance of auditorium (or ante-room).
 - (c) 8 for indoor playground.
 - (d) 4 near teacher's room for extra or visiting teachers.
 - (e) Mirror on outside of door in each classroom locker for teachers.

If the capacity of a building organized for a single session is 2000; for example, we are planning to accommodate at least 500 additional pupils by placing classes of the upper grades on a double session when necessary. With this object in view, the above recommendations are made.

(To be continued)

The Non-Conforming Building in Zoning

By HERBERT S. SWAN, Secretary, Zoning Committee, New York.

NEXT to controlling the erection of new buildings, nothing is more important in zoning than to regulate the use of old ones. The latter is as necessary as the former to protect "spotted" districts against steady deterioration.

It is clear that it would be exceedingly difficult, if not impossible—and if possible, most inequitable, to treat existing buildings that do not conform to the regulations in the same manner as those that do. All existing uses have been established under the sanction of existing or past laws and are therefore entitled to protection. But this does not apply to changes or extensions of non-conforming uses. A new use or an extended use has not acquired a vested right to exist. To prevent its introduction into a restricted district, therefore, presents no question of equity like that of continuing an existing use.

In making this distinction between the continuance and the change of a non-conforming use the New York Zoning Resolution, it is believed, goes a long way in ultimately healing the wrongs suffered by restricted neighborhoods in the days of unregulated building through the invasion of inappropriate uses. In time the consequence of obliging the change of use in non-conforming buildings to be as far as possible in conformity with the regulations of the use district in which the building is situated will undoubtedly be to "weed out" many of these sporadic uses and thus restore the district to its proper character.

General Provisions of the New York Law

Under the New York resolution the non-conforming uses in restricted districts are subdivided into three classes:—first, nuisances, trades especially noxious or offensive by reason of the emission of odor, dust, smoke, gas or noise; second, manufacturing, other than that included with nuisances, occupying either more than a quarter of the floor area in the building, or a floor area greater than the lot area, whichever happens to be the greater; and third, business, embracing all trades and industries other than those included with nuisances and manufacturing.

The continuance, extension and change of use in all non-conforming buildings and the conditions and limitations under which such buildings may be reconstructed or structurally altered are defined in a very painstaking and precise manner by the resolution. These restrictions are very appropriately

more stringent in the case of nuisances than in the case of manufacturing or business.

The Nuisance Uses

The nuisance uses are subdivided into forty-five separate and distinct classes. Blacksmith shops, for instance, are in class 4; boiler shops in class 5; breweries in class 6; carpet cleaning establishments in class 7; garages for more than five cars in class 15; stables for more than five horses in class 36, etc.

Once structurally altered, a building used for a nuisance cannot have its use changed into another nuisance. The converse is also true—if the use has been changed from one nuisance into another, the building may not thereafter be structurally altered. For the purpose of continuing the particular nuisance use existing July 25, 1916, structural alterations are allowed in a building only up to 50 per cent of its value exclusive of foundations.

The law makes no distinction between nuisance uses situated in residence districts and those situated in business districts. Both are treated identically the same in all respects.

How do these provisions apply to a specific nuisance, say a brewery? To what extent may a brewery be extended? Into what other uses may it be changed? And to what degree may the building be reconstructed?

The conduct of a brewery, like that of any other nuisance, is restricted in the following ways:

1. The brewery may be continued and the building in which it is situated may be reconstructed or structurally altered to an extent not exceeding 50 per cent of its value exclusive of foundations, provided absolutely no extension is made to the floor space used for brewery purposes. Structural alterations in excess of 50 per cent of the value of the building are allowed only if the brewery is changed to a use permitted in the district.

2. The brewery may be changed into a nuisance use of any other class, say a soap factory, a paint works, or a lard refinery, provided the building in which it is maintained has in no wise been structurally altered since July 25, 1916. This provision is as broad as it is long for when a nuisance of one class has been changed into a nuisance of another class, the building in which it is situated may not be structurally altered after the change unless the use is changed to a use in the non-nuisance class.

3. The brewery may under no circumstances be extended at the expense of a non-nuisance use. The

THE AMERICAN ARCHITECT

extension of the brewery may be effected only at the expense of floor space used by other nuisances at the time the law was passed, *i. e.*, other nuisance uses must be discontinued in order to permit the enlargement of the brewery.

4. A brewery which has in any manner been reconstructed or structurally altered since July 25, 1916, may not be changed to a nuisance in another class. Changes of use in such cases are limited to non-nuisance uses.

5. A brewery which has had its use changed since July 25, 1916, to a non-nuisance use may not thereafter be changed back again into a nuisance use. In other words, when a nuisance use has once been changed into a non-nuisance use, future changes of use in the building are restricted to uses in the non-nuisance group.

These limitations apply not only to breweries, but to all nuisances. Extensions of use, changes of use, and structural alterations made in buildings contrary to these provisions since the adoption of the resolution are in the nature of violations unless they have been specifically sanctioned by the Board of Appeals after a public hearing at which all property owners immediately affected were notified to appear and have their objections heard. The exceptions of this character that may be granted by the Board of Appeals are very restricted by the law except in the case of stables and garages.

Manufacturing and Business Uses

The restrictions controlling alterations and changes of use in non-conforming buildings of the non-nuisance class are less stringent. Thus a building used for manufacturing purposes may be changed into any other line of manufacturing or business with or without structural alterations, whether the building be situated in a business or a residence district, provided the alterations do not exceed 50 per cent of the value of the building exclusive of foundations. A manufacturing use may, moreover, be extended throughout any building in a business district and throughout any building other than a dwelling in a residence district, "dwelling" being defined to include not only private houses but apartment houses, boarding houses and hotels. If altered in excess of half its value a manufacturing establishment must be changed to a conforming use.

Business establishments situated in residence districts are subject to substantially the same control in matters pertaining to structural alterations, changes and extensions of use as factories.

A non-conforming use once changed into a use that conforms with its use district cannot again be changed back into a non-conforming use.

Operation of the Restrictions

Theoretically the control exercised over non-conforming buildings by the New York resolution is almost ideal; on every hand it attempts to strike a fair and even balance between the right of existing uses to continue and the safeguards required to protect restricted districts. In practice, however, the operation of the law, though eminently satisfactory on the whole, has, of course, not been without its shortcomings. These have, in part, been due to a certain lack of definiteness and clarity in the provisions of the law and, in part, to the abnormal conditions brought on by the war.

A word describing these difficulties may not be amiss:

One matter which has hampered the enforcement of the law, and which threatens to become increasingly more serious with time, is the lack of a building census showing clearly the exact use of every non-conforming building. Without such a census taken as of the time the law was passed, it is obviously not possible for the authorities to secure a uniformly complete enforcement of the law throughout the city. Non-conforming uses are smuggled in, prohibited uses extended and changed, structural alterations made in violation of law—all without any knowledge on the part of the officials except as these matters are brought to their attention through citizen complaints, and if the citizens are somnolent, the complaints, of course, do not materialize. This condition, one might presume, would prejudice the stability of the whole zoning scheme—but that paradoxically is not the case at all. When it concerns zoning it may almost be said there are no somnolent citizens in New York. Let a man attempt to alter a livery stable into a public garage and the whole neighborhood is immediately up in arms. That, however, is not to say that there would not be a more consistent enforcement of the law if there were a census. Equipped with the data afforded by such an enumeration, properly indexed and kept up to date by the inspectors of the several departments charged with the supervision of buildings in the routine performance of their work, the city would possess the necessary proof in case of violations to insist upon a summary compliance with the law. The need for such a census has been frankly admitted in New York by the authorities, and had it not been for the stress caused by the war, it would no doubt ere now have been completed.

Another point which has been a source of some embarrassment in the administration of the law is its neglect to define what constitutes a "structural alteration." This inadvertent omission has been responsible for a certain amount of confusion in determining:

THE AMERICAN ARCHITECT

1. What alterations may or may not be made in buildings which have had their use changed;
2. What changes of use are or are not allowable in buildings which have in some wise been altered; and
3. When a building has been structurally altered up to 50 per cent of its value.

The question that presents itself in either case is: What alterations are structural alterations? Nobody would probably dispute that the rebuilding or removal of a bearing wall constitutes a structural alteration. But how about the construction of a new runway? The installation of an additional elevator? The substitution of a fire-retarding wall or ceiling for a non-fireproof wall or ceiling? The answer given to such queries often decides whether a building which has had its appointments changed may be put to a new use or whether a building which has had its use changed may be altered.

Immediate vs. Ultimate Ejection of Non-Conforming Uses

The heroic way to treat non-conforming buildings is, of course, to eject them bodily from the restricted districts. That solves the problem at one stroke. But, all things considered, it appears exceedingly questionable whether this method will in the end produce the most satisfactory results.

To give an offending use placed in a restricted district no quarter most certainly either prompts it to do everything possible to have itself placed in a district sufficiently unrestricted to admit of its continuance, or incites it into furious opposition against all zoning. The first has the effect of unnecessarily extending the less restricted districts; the second, of prejudicing the adoption of any plan.

If the use is allowed to continue, both of these difficulties can be overcome. Self-preservation is the strongest activating motive of every business—grant it the right to exist, and it will submit without much ado to regulations curtailing its rights to extensions, changes and structural alterations. These regulations, if designed with a view to preventing any exaggeration in the offensiveness of the use and ultimately to eliminating it altogether will gradually achieve the same result as initial banishment, but with this difference—no violence is in the meantime committed against the undesirable use. Final expulsion, accomplished in this automatic manner, is, it seems, the ideal. Certainly the non-conforming building cannot be left uncontrolled. Not to limit the extent to which it may be structurally altered, or the manner in which it may have its use extended or changed, is to confer immunities and to intrench it permanently in the district to the injury of neighboring owners, who are obliged to improve and maintain their property in accordance with the use district regulations.

S. A. T. C. Architectural Engineering Curriculum

THE Committee on Education and Special Training of the War Department has issued a special bulletin on Program in Architectural Engineering. The program is not prescribed, but is an example of what will be approved. It is intended to indicate how existing programs may be modified by eliminations and condensations so as to meet the needs of the present emergency. The program covers eight terms of twelve weeks, but it must not be inferred that every student entering on such a course will be kept at college until he completes it. The time that he will be permitted to pursue the course will depend on the needs of the service and the academic record of the student. In addition to the instruction indicated in this course, eleven hours per week of military instruction are prescribed for the first two terms of the program, and six hours per week for the remainder of the program. The total time to be devoted to military and academic instruction, including examinations, lectures, recitations, laboratory work and supervised study, is 53 hours per week. The hours set forth in the program represent the total time devoted each week to the subject named. The subject, War Issues, which must be combined with English Composition is prescribed for two terms with nine hours per week for lectures, recitations and study.

For the first, second, third and fourth terms this course is the same as for Civil Engineering, except that the total time allotted to Surveying is five hours per week.

	<i>Hours per week</i>
<i>First Term</i>	
Mathematics	12
Chemistry	12
*Drawing and Descriptive Geometry or Surveying	9
War Issues and English Composition....	9

	<i>Hours per week</i>
<i>Second Term</i>	
Mathematics	12
Chemistry	12
*Drawing and Descriptive Geometry or Surveying	9
War Issues and English Composition....	9

	<i>Hours per week</i>
<i>Third Term</i>	
Mathematics	12
Physics	14

*These courses will be divided between Surveying and Drawing in accordance with the season of year in which they come and the number of students registered. The total time allotted to Surveying is equivalent to 5 hours per week for one term.

THE AMERICAN ARCHITECT

Mechanism and Applied Mechanics.....	15
*Drawing and Descriptive Geometry or Surveying	6

	<i>Hours per week</i>
<i>Fourth Term</i>	
Mathematics	9
Physics	14
Mechanics	15
*Surveying or Drawing.....	9

	<i>Hours per week</i>
<i>Fifth Term</i>	
Materials and Testing Laboratory.....	10
Graphical Statics	6
Theory of Structure.....	6
Heat Engineering	12
Working Drawing	4
Structural Design	9

	<i>Hours per week</i>
<i>Sixth Term</i>	
Theory of Structures.....	9
Hydraulics	9
Hydraulics Laboratory	3
Electrical Engineering	9
Electrical Engineering Laboratory.....	3
History of Construction.....	2
Structural Design	12

	<i>Hours per week</i>
<i>Seventh Term</i>	
Theory of Structures.....	12
Engineering Laboratory	3
Concrete Laboratory	5
Structural Design	13
History of Construction.....	2
Planning	12

	<i>Hours per week</i>
<i>Eighth Term</i>	
Theory of Structures.....	12
Structural Design	24
Sanitary Science and Public Health.....	1
Building Construction	1
Planning	9

In view of the possibility of the student not being permitted to complete the eight terms, and also in consideration of the present tendency to remodel technical courses of study, several suggestions present themselves in connection with this proposed program. Presuming that the student is well trained in arithmetic, has sufficient knowledge of algebra to use ordinary equations and mathematical formulas, and understands the principles of plane geometry and a few of the ordinary problems in

trigonometry, it would appear that the study of graphic statics should be undertaken as soon as the student has become fairly well versed in descriptive geometry. As descriptive geometry is a foundation of all engineering and accurate draftsmanship, this should be the kind of drawing first given attention to. From purely a draftsman's standpoint, descriptive geometry does not require any particular skill as a draftsman, but it is necessary, and the drawing involved is of the most simple kind viewed from a manual standpoint. As this study can be taught with the use of models, mathematical training is not essential to the student. A study of graphic statics should be carried on concurrently with work in the testing laboratory, and introduced in a course at the earliest possible moment.

The testing laboratory work is a visualization of the theoretical analysis, and will give the student a better understanding of his later work in mechanism and applied mechanics. The theory of structure is closely allied to graphic statics, and it is entirely proper to teach it in connection with that study. It is also desirable that study of planning, building construction and structural design be undertaken during the first four terms rather than in the last four. Simple problems in structural design can be taught the student within a few days after his entry into the school. It is not necessary that he should know the entire theory before starting this work, but instruction in actual designing and the use of standard formula will enable him to better understand the higher mathematics which will follow. Work in planning at an early stage will develop the student's powers of observation and reflection, and will put him in touch with the work he is intending to follow.

The object of these suggestions is to show the importance of putting the student in direct contact with his work at the earliest possible moment. The ordinary student of engineering, spends the first two years of his course studying subjects without any direct application to actual work, and unless he is given enough practical applications during his student days, he may even graduate knowing theoretically all *about* such factors as the moment of inertia, section modulus and bending moments, and not knowing what they really *are* and their importance in actual designing. For this reason it is becoming apparent to educators that from the very first, practical applications should be made even before the theory is taught.

In a case of a student of the S.A.T.C. being called away at the end of his fourth term, he would know absolutely nothing about architectural engineering, and that is the object of his student work. In other words, teach him how to do it and later,

if circumstances permit, teach him why he does it. In this way he will be fitted to be of service to himself and others in less time than in any other way.

A prominent educator, who is at the same time a successful professional and business man, has remarked that the S.A.T.C. is a blessing in disguise. His reason for this opinion is that many of this class of students would, under ordinary conditions, never have an opportunity to come in contact with a higher educational training or the places in which such training is given. The influence of these surroundings is bound to have a beneficial effect on the young man, and will induce him, if possible, to carry on such studies after he is discharged from the army, and who will also be likely to influence others to undertake the work which is so interesting to him. It would follow then that the attendance at our universities and colleges would be increased in the future.

Another effect that the S.A.T.C. will probably have bears on the methods of teaching. From the very moment that these students enter the S.A.T.C. they have continually held before them the main object for which they are being trained, and this object is that they are to be soldiers, and they are never permitted for a moment to forget this fact. A faculty of teachers who are conducting S.A.T.C. courses will necessarily be influenced by the fact that they are compelled to keep the objective continually before the student. The result will be that when a student enters a university with the idea of being trained for the architectural or engineering profession, that he will immediately be in continual contact with the fact that he is being trained to engage in these professions and instead of spending two years in purely theoretical training, he will from the very first be in practical contact with the future work for which he is preparing himself.

It has been said by a prominent educator that the average technical student has no appreciation of what he is aiming to become during the first years of his training and that this method is entirely wrong. He suggests that the usual course be reversed and that the student be put in contact with the practical phases of his future work from the very start. In this way, his interest is kept and greatly stimulated, and it would undoubtedly result in graduates being better fitted to undertake real work than they are now. It is a sad commentary on our educational methods that the newly graduated realize that they know absolutely nothing about the business for which they have been training themselves, and that the work which they have done has been purely development work, and that they have to learn the details of their profession after graduation.

Rigidity of Riveted Joints

THE work of the experimental laboratories connected with American universities is a valuable source of engineering information. The equipment used and the care exercised in carrying out the investigation is of such a nature that the results are accepted without question.

Bulletin No. 104, Engineering Experiment Station, University of Illinois, Urbana, entitled "Tests to Determine the Rigidity of Riveted Joints of Steel Structures," describes tests made on six types of riveted joints connecting horizontal beams to vertical columns.

The object of the tests was to determine the rigidity of riveted joints which connect the members of steel-framed structures. From the introduction is quoted "If the geometrical element of a frame is a triangle, the members may be joined with frictionless hinges and the frame will resist external forces. If, however, the geometrical element of a frame is a rectangle, shear in the frame due to external loads produces turning moments on the connections, and in order to prevent the frame from collapsing the connection must be designed to resist movement. The distribution of the stresses in a rectangular frame depends upon the rigidity of the connections. In analyzing the stresses in such a frame, it is customary to assume that the connections are perfectly rigid. If the connections are not perfectly rigid, it is apparent that the actual stress may not be equal to the computed stress. In addition to determining the rigidity of riveted connections, analyses have been made to determine the effect of a lack of rigidity upon the distribution of stresses in a frame."

The discussion in this bulletin is limited to the effect of the rigidity of connections upon the distribution of the stresses in a rectangular frame subjected to shear. The most important example of this type of frame is the wind brace in steel skeleton buildings.

Of the six types of connections tested, two can be considered as perfectly rigid without introducing serious errors into the results. Four of the types tested cannot be considered perfectly rigid.

The bulletin is by Wilbur M. Wilson, Assistant Professor of Civil Engineering, and Herbert F. Moore, Research Professor of Engineering Materials. The apparatus used and the thorough study of the many measurements of deformations taken, indicate the thoroughness of the investigation, and the result should be of great value to those interested in the design of steel frames, and the bulletin will be a valuable addition to the structural engineer's library.

Industrial Information

In this Department there is published each week information as to the development of materials and methods, derived from reliable sources.

Gravity Standard Conveyors

Any force in nature which is at all times indomitable, which no art or wisdom of man can alter or counteract, which is unchanging and consistent in all its aspects, fires the imagination and urges new ways of converting it into a wider and wider range of usefulness.

The principle of gravity, always dependable, has been made by the Minnesota Manufacturers' Association the foundation of a system of indoor transportation the value of which is indisputable.

The claims made for Gravity Standard Conveyors embrace the following points:

A rapid, steady flow of merchandise is possible from the packing or storage space direct to the car.

No intermediate handling is necessary; automatic transfer of merchandise may be made to and from gravity roller conveyors to gravity spiral chutes or to continuous moving tray elevators.

Safety is insured to merchandise in its downward travel.

A simple connecting means is provided between floors.

No time is lost in waiting for slow freight elevators.

Employees are kept on their respective floors.

Labor is saved and the capacity of the plant is increased.

The system is flexible so that rush orders can be shipped easily and promptly.

Catalogues are supplied by this company upon application to their home office in North Saint Paul, Minn., or branch offices in New York, Chicago, Cleveland and Buffalo. The conveyors are made in a large variety of sizes and forms, adaptable for every use of indoor transportation. Graphic descriptions of great interest are printed in the literature of the Minnesota Manufacturers' Association, which will prove of considerable value to architects.

The Concrete Builder

As a "concrete" example of the ambitious way in which manufacturers are educating the public up to the efficient use of their products, let the Portland Cement Association be cited. This association which now has offices in sixteen large cities and headquarters at 111 West Washington Street, Chicago, publishes a bi-monthly magazine under the above

title, which is devoted to the use of concrete about the farm and home.

The first November issue, now off the press, contains ten timely articles illustrating with photographs and plans, some of the practical uses to which concrete may be applied. In each instance it is pointed out how national interests may be furthered, how production may be increased, conservation augmented, labor economized, by the use of this important material. It is felt that war time essentials and peace time industries are being supported in an able way by the efforts of this association.

Ankyra Anchor Bolts

The Ankyra Mfg. Co., 149 Berkley Street, Wayne Junction, Philadelphia, is sponsor for an anchor bolt which they state is being used with considerable satisfaction by architects and builders acquainted with its value.

"Ankyra" consists of a longitudinally perforated metal sleeve which, upon being inserted in a hollow wall and collapsed by a specially devised tool, forms a triangularly shaped winged nut. The nut is an integral part of the sleeve itself. Accordingly, the repeated insertion and removal of the screw is possible without danger of disarrangement or loss.

One of the former deterrents in the wide use of sheet metal has been the necessity of predetermining the location of fixtures and hardware in order that a suitable means of fastening might be provided. "Ankyra" is alleged to eliminate this difficulty in so far as it permits fixtures to be applied at any place without reinforcement.

Since the screw may be loosened or tightened without causing any indirect results, it would seem that perfect alignment could easily be obtained. The use of "Ankyra" is further said to relieve the architect of the necessity of detailing for trim before the walls are put up and relieves the contractor of the labor and supervision charge of placing inserts.

In fastening fixtures on wire lath, usually so awkward a procedure, the three-winged nut as obtained in "Ankyra" is of particular use, since with it, some portion of the metal is certain to be encountered. If the screw strikes a solid portion of wall instead of a hollow, it may be used as an expansion bolt and not collapsed. In this position

THE AMERICAN ARCHITECT

much strength is claimed for it. The illustrated booklet issued by the makers gives a convincing test made under Government auspices to demonstrate the permanence of fixtures attached with "Ankyra." Perfect security with ability to remove the fixture without revealing a defaced wall is a further qualification claimed by the makers to enhance the value of the device.

It is stated that Ankyra bolts can be applied quickly and inexpensively. They are declared to be permanent in any kind of wall, whether glazed or hollow tile, stucco, concrete, lath and plaster, wall-board, expanded or hollow sheet metal.

Further information will be furnished by the Ankyra Mfg. Co., on request

Pressweld Radiators

Progress in modern heating must needs keep pace with progress in other aspects of building, and the certain conditions which develop as cities grow larger, buildings taller, coal scarcer, and time more valuable, have logically evolved significant improvements in methods and media of heat radiation.

A noteworthy example of this is the Pressweld Radiator, made by the American Pressweld Radiator Corporation of Detroit, Mich.

The Pressweld Radiator is said to be about one-fourth the weight of a cast iron radiator. The economy in fuel consumption is, therefore, evident in that three times as much metal would have to be constantly heated and reheated.

This light weight enables a Pressweld Radiator to be attached to the wall, leaving free space below. Thus may the floor be kept clean and unmarred by

sagging. The radiator is smooth, so that it does not readily catch dust; it has plenty of space between sections so that cleaning is possible without inconvenience.

The Pressweld Radiator is so designed as to be adaptable for either water, steam, or vacuum heating systems, for gas and electric heaters, for dryers, engine coolers, for varied types of refrigerating installations, etc. The sections are made of two welded plates, open top and bottom; these openings, also welded, make tight and non-leakable joints both in seams and openings. The thinness and smoothness of the metal cause a better conductivity than is usual in cast iron radiators, and the resulting capacity for rapid heating therefore economizes fuel.

The Pressweld Radiator is said to occupy less space than a cast iron radiator of equal capacity and thus increases the available space so desired in apartments and office buildings. It can be placed under work benches and other places where bulkier radiators will not go. All these features make the Pressweld Radiator easy to handle and install in large quantities. They can be removed from cars, transported and erected with the minimum of labor and expense.

The Pressweld Radiator is made in numerous sizes and styles, and each one is said to be rigidly inspected before leaving the factory. It is stated that Pressweld Radiators have been in successful operation for years without showing any appreciable deterioration.

If architects will address the American Pressweld Radiator Corporation, Detroit, Mich., for their booklet on Modern Heating, they will receive valuable information on this important subject.



FARM BUILDING GROUP

ALFRED HOPKINS, ARCHITECT