

The AMERICAN ARCHITECT



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TYPICAL ITALIAN LANDSCAPE, NAPLES, ITALY

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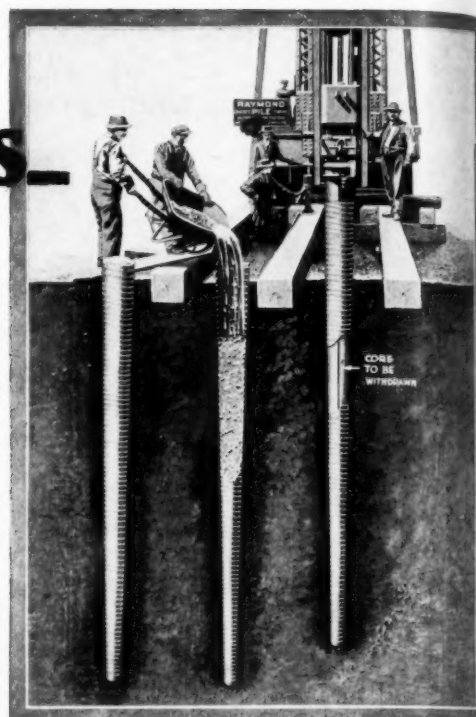
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Four Questions—



"A FORM FOR EVERY PILE—
A PILE FOR EVERY PURPOSE"

—and their Answer

SUPPOSE that Raymond Concrete Piles *were* formed by being cast-in-place in a mere hole in the ground, *instead* of in a spirally reinforced steel shell. It occurs to us that the average Architect or Engineer would insist upon satisfactory answers to the following questions:

1. To what elevation would water or other semi-fluid rise in the hole?
2. How much mud would become an ingredient of the concrete?
3. How much of the original moisture in the mix would be lost from absorption by the surrounding soil?
4. How much would the setting concrete be disturbed by ground pressure or pressure of adjacent pile driving?

A careful analysis of these suggestions should make clear that there is only one satisfactory answer—namely, to pour the concrete into a steel shell, *which is left in the ground*. In other words, to specify concrete piles formed by the Raymond Method.

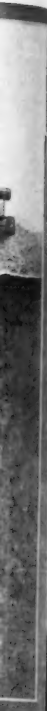
Raymond Concrete Pile Co.

New York: 140 Cedar Street

Chicago: 111 West Monroe Street

Raymond Concrete Pile Co., Ltd., Montreal, Canada

"A Form for every pile—A Pile for every purpose."



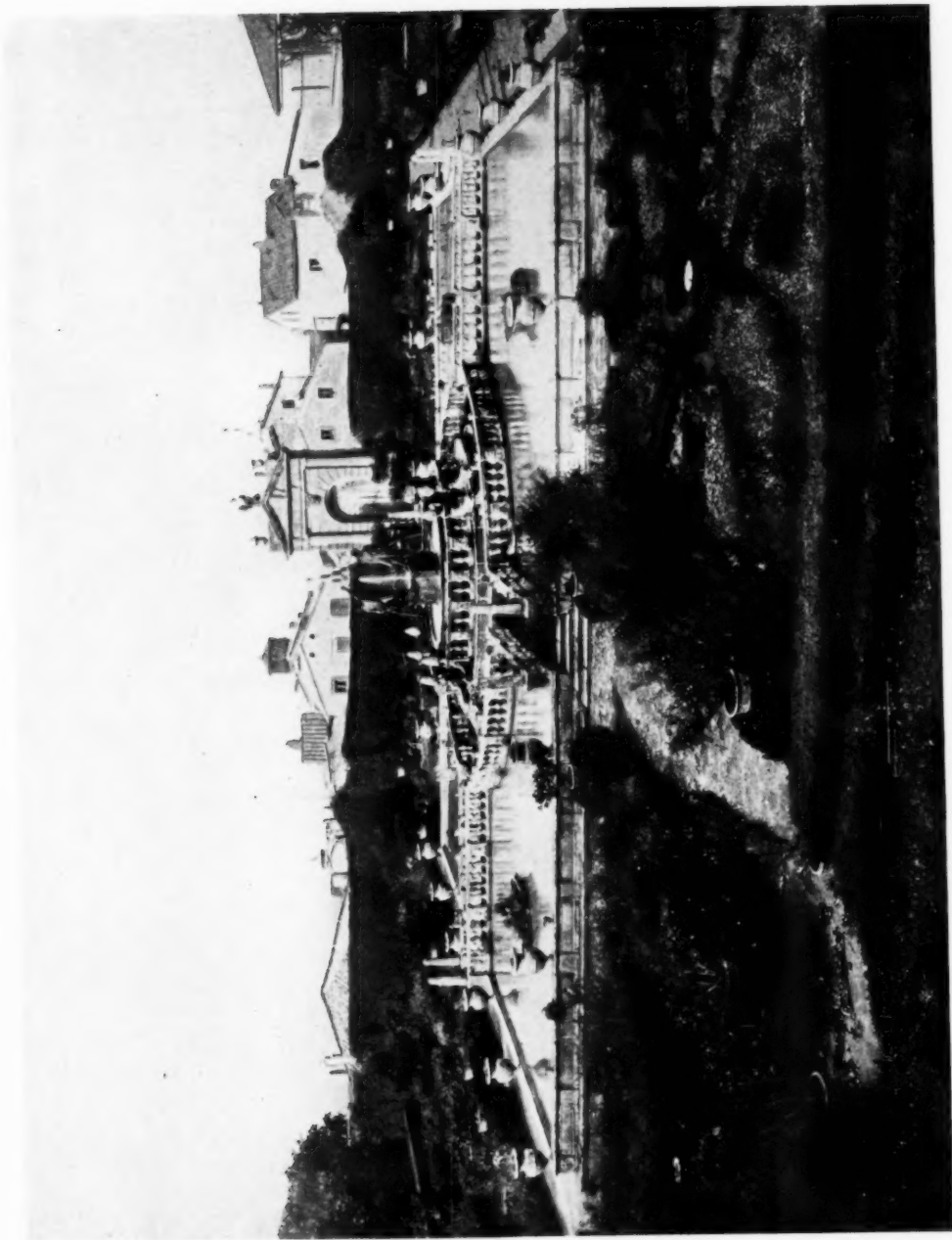
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FOUNTAIN IN THE GARDENS, BAGNAIA, ITALY

THE AMERICAN ARCHITECT

VOL. CXIV

WEDNESDAY, JULY 24, 1918

NUMBER 2222

Use of Government Money for House Building

With a Short Preliminary Discussion on Beauty

By WILLIAM ROGER GREELEY

In a communication to Mr. Greeley the editors suggested discussion of some practical topic of current interest. Mr. Greeley replied, enclosing the manuscript of an article, and accompanying it by a letter that is so practical a discussion of what is widely considered as an impractical subject, that it is printed herewith as an interesting foreword to the excellent article following.

The Editors, THE AMERICAN ARCHITECT.

The Editors, THE AMERICAN ARCHITECT:

YOU know that there is but one practical potent human quality, Beauty.

There are those who look wisely through their tortoise-shell rims, and, steeped in mechanics and chemistry, proclaim that we must be practical and forget the impulses of the imagination. There are such people. Most of them are apostles of Potsdam.

They are the exemplars of practical wisdom in its every branch and detail. They are men of science and of scientific calculations. They are going down to a crushing defeat at the hands of—what?

Of Beauty. The idealists are fighting them, the prophets of all that is unscientific and impractical and beautiful. They bear the banner of democracy—the inefficient government which is nevertheless a great brotherhood. They bear the banners of individualism—the stumbling-block of the organized state, but the breath of life to the spirit of man.

The puppets of practical Potsdam have knowledge, science, skill, efficiency and the power of organization. Why then are they not civilized? There is only one reason. They are blinded to all Beauty.

Sinking merchantmen is not so much uncivilized as it is ruthless.

Poison gas is merely a clever weapon.

Starvation of prisoners is cruel.

But to destroy wantonly what is beautiful, whether it is the masterpiece of nature or of man,

puts men outside the pale of civilization; they are by that sign barbarians.

There is no other practical, powerful, universal, civilized impulse. Men differ in religion—a hundred theologies clutter the globe. The only tenet common to Socrates and Isaiah and Paul and Swedenborg and Ingersoll and all the rest is the aspiration for a beautiful life. Each strove to describe that manner of living which appealed to him as most beautiful.

Men differ in all practical affairs. Systems of government and finance rise and are soon discarded. Some wise men are to be found on either side of all practical questions, but, since the dawn of history, all nations and all peoples have striven to express in all its most perfect forms their ideal of beauty.

Moreover, whereas in practical affairs you cannot be loyal both to monarchy and republic, income tax and single tax, or peace and war at the same time, in the realm of Beauty no style or period is excluded. You can admire the stately Classic without disloyalty to the Gothic, and in every variation and interpretation of the classic, whether by Brunelleschi or Wren or Bulfinch (the American Wren), you can find beauty.

The universality of art is its great credential.

In this country the architectural profession is called upon to develop housing for new industrial communities. Each section of the country has its own little rules in regard to gas ranges, set tubs, bulkheads and water pipes, and there is always room for disagreement and dispute. The effort is apparently to get the most efficient house for the

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least money. Rooms are squeezed, piazzas lopped off, and rigid economy practiced until it comes to the æsthetics of the situation. There are no real concessions here. Economical, durable, practical flat roofs are forgotten in favor of more expensive and even leaky pitched roofs and dormers. The pitched roof with low hanging eaves is the symbol of protection and shelter. It stands. The small pane wins its place for the window sash. The front doorway must have its bit of decoration, too. Great care is taken and much study and expense are lavished on the problem of securing beautiful proportions for the houses and in developing

attractive, interesting groupings on the streets.

Do the mechanics who are to be housed appreciate this? Do they demand it? Is it a prime essential of successful housing? Does the crow collect bright bits of broken china? Does the vain peacock strut in vain? Did Orpheus charm all nature? Do the peasants of France resent the destruction of Rheims? Has anyone disputed Keats?

"Beauty is truth, truth beauty,

That is all we know and all we need to know."

So I enclose a poor practical dissertation upon the use of Government money in housing.

WM. ROGER GREELEY.

A GLANCE at the brief history of State experimentation in house building discovers the use of three methods of governmental encouragement: (1) Special taxation, (2) direct financial aid, and (3) aid through improved land policies.

Under the first head comes the remission of customs duties on materials intended for use on wage-earners' houses. This method has been tried in Argentina, Brazil, Chile, Cuba, Austria, Belgium, France, and Spain. It testifies to their interest in the problem of housing their people, but is not a careful or scientific way of meeting this problem. It gives some encouragement to build, to a limited class, partly at the expense of the state.

A better device has been practiced in New Zealand, Northwest Canada, and in some of the German states—the taxation of unimproved land at a higher rate than improvements. Speculation in land is thereby discouraged and legitimate development promoted. One of the immediate effects is the more intensive occupation of land. People paying a high tax on land and a low tax on improvements naturally try to get along with a minimum of land and to develop a maximum of buildings thereon. Crowding results in the centers, but outside the land falls in value, and the owners, in order to market it, are forced to develop it more attractively with open spaces and other advantages over the crowded land in the centers. So a balance is eventually struck. It can be argued that a lack of individual initiative would quickly throw the outside land of falling value into the hands of the Government for taxes. Government ownership of agricultural and forest lands has proven not only a safe but very profitable investment to the communities that have tried it.

Direct financial aid (2) has been exercised through the medium of co-operative building and credit organizations, cheap money, easy terms, etc. It has usually been the local authority rather than

the state that has employed and practiced this method. The London County Council is a notable example.

Land reforms (3) have been tried extensively in New Zealand. Twenty-five years ago laws were passed providing for the breaking up of large estates, for their purchase and subdivision, for special taxation, and for the rental of crown land for 99 years (practically freehold). The area allowed to one man was not to exceed 667 acres of first-class land, 2000 acres of second-class land, 5000 acres of third-class land. The value of such land varied from \$100 an acre in the towns and \$15 in the villages, to \$10 for suburbs and 60 cents to \$5 for rural land. These figures are the minimum. The land was also leased for periods of 10 to 33 years at 5 per cent of the land value.

The Financial Aid and Land Reform policies have been combined in England, notably in the co-partnership tenant societies. In 1909 the Town Planning Act was passed, authorizing the Public Works Loan Commissioners to grant loans to Public Utilities Societies for housing purposes up to two-thirds the value of the houses plus the land, and on 30 to 40 year terms at $3\frac{1}{2}$ and $3\frac{3}{4}$ per cent, respectively. In 1914 the act was changed to provide for the loan of 90 per cent of the value at 4 and $4\frac{1}{2}$ per cent. This scheme figures out for combined interest and sinking fund at 5.78 per cent for the 30-year and 5.43 per cent for the 40-year terms. Tenants may then take out shares in the Co-partnership Society up to say \$1,000 with 5 per cent fixed as the maximum return.

The fifteen societies associated in the Co-partnership Tenants, Limited, have built, up to last year, 3702 houses and have spent apparently something in excess of \$12,000,000.

Recently a new plan has been devised in England, which the English journals seem to regard as a final solution of the present problem. The plan

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provides that the full cost of the housing development in the first instance shall be met by funds of the local authority by loan. The state assistance is to be equal to a certain percentage of the loan charges, sufficient to relieve the local authority of 75 per cent of the estimated annual deficit. The interest is to be at the full market rate. This plan involves virtually state and municipal partnership. The provision for aid by the Government is met only as a national emergency measure. The local authorities are required to furnish plans and balance sheets showing a development of not over 12 houses to the acre or 8 in agricultural districts.

It is desired that purchase money for the land be deferred until after the war. In addition to the above information, plans at one five-hundredth, showing public utilities, number of houses, etc., are to be furnished, and complete estimate of costs. This scheme of the English authorities marks the furthest advance in Government participation in housing that has yet been made anywhere in the world.

It further appears that whereas before the war and under normal conditions one form or another of Government housing had been adopted in the countries listed at the head of this article, including the greater part of the civilized world, nevertheless it was not until 1917 that the United States first awoke to this new demand on public authority. It was the state of Massachusetts which acted in that year by giving authority to its Homestead Commission to construct homes for working men.

Stanley Taylor in the *Forum* for April says: "Let manufacturers pay for recreation centers, expert advice, general improvements to the property, and even the cost of the land. This is a small investment for which to obtain a well-housed working force." This would be the solution from the manufacturer's point of view. He could not only establish his business on a better basis, but if the method was accepted as a general policy, could charge into the cost of his product the expense due to housing. In other words, the public would be paying for the housing through the medium of the manufacturer—a scheme whereby the latter would come out at least a little more than whole financially, and would be master of the situation ethically.

The income tax is a similar institution, and illustrates the point even more clearly. The Government says to its wealthy citizens, "We have no real fundamental plan as a basis for taxation, so we will ask you to raise the money for us. Whatever you make you must give a percentage of to us."

So the manufacturer or purchaser charges into the cost of his kerosene or other commodity enough to pay all ordinary expenses plus something more

for the income tax, and he is sure to provide generously for this additional item. The Government has farmed out its sovereign power of taxation, and put it into the hands of the distrusted wealthy class. This is exactly what a plutocracy welcomes, but a democracy should be founded not upon the financial ability of the few, but upon the responsibility of the many. We have been apostles of individualism in this country, and our principle has been "every man look out for himself and the devil take the hindmost"—a very good principle until the majority are hindmost.

We have felt that if a man had a larger family than he could support, it was strictly up to him. Then we learned that the children in such cases became a menace to the community, physically and morally, and we had compassion for them, as they suffered under conditions for which they were in no wise responsible. To-day we try to maintain with state money, not only all criminals, but all insane, feeble-minded, indigent or destitute persons.

If it is right for the state to feed and clothe and care for idiots and other defectives, is it not right for the state to stop producing them in the first place? In other words, is there not a common responsibility for humanity totally different from the "Devil take the hindmost" idea? Have we not arrived at a point where it is evident to us all that we stand or fall together? There can be no isolations. We are all either laborers or loafers, and the loafers are being legislated out of existence or confined to hard labor. Soon we shall realize that all our labor is essential, and that whoever is unable to share it is a drag on society—a burden for the rest to carry.

Therefore, we are directly interested in the health and happiness and the productiveness of all. One of the important ways of meeting this need by common action is in providing the ways and means for wholesome housing for that portion of our citizenship which we find *at present incapable* of helping itself. Massachusetts has begun by trying to learn how these people can be helped; how much it is necessary to spend to build them a suitable house; how easy it is to secure financial assistance in paying for it, and how great is the longing of the ill-housed for better homes. Practically the only side of the question not touched by the state is the land question, which, to be sure, is one of the fundamental issues.

The national Government has had to plunge vigorously into the housing business to provide communities for war industries. The ultimate plan of disposal of these communities is not fully developed or disclosed. Certain questions arise regarding the future of the houses. Liverpool's experience with

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"rehousing" showed that new houses on old sites were always occupied by a higher class of tenant than the dispossessed. This was a cause of great anxiety, and has happened in every instance in this country. It may be that the apprehension is without good reason, for it is not impossible that the people dispossessed are indirectly benefited by new housing.

No reform can be at once immediate and wholesale. Evolution is very slow and gradual processes are the surest. The reformer cannot walk into a city of slums with a panacea under his arm and bring the millennium at a single visit.

Good housing introduced at any point in the scale is bound to affect the general situation, for those who occupy the new houses must necessarily release their previous houses for occupation by people still lower in the economic scale. This process of "moving up" must obtain all along the line with a resulting benefit even to the lowest in the scale.

It would follow as a corollary that the kind of housing to build is any kind that can be successfully marketed. The laws of supply and demand are still operative. The Massachusetts Homestead Commission is trying to build houses at a price below the market possibility in an attempt to rehouse the poorest class before the others are taken care of. If you want the poorest class to be properly housed without delay there is only one way to accomplish it,—pay them enough so that they can afford decent houses. They themselves will then discover the ways and means. The history of the world is a witness to this fact. Any other method is artificial and unnatural. It may be that their net income can be raised without an increase in wages. Destroy private land monopoly and the first big item is saved. Prohibit the sale of fictitious food, another

benefit accrues. Put a stop to the breeding of an unemployable class of feeble-minded. All these things help increase the net wage. If this last statement seems to be inconsistent with a preceding one to the effect that good housing is the ounce of prevention for feeble-mindedness, etc., the answer is that the social evolution is a progress resembling military progress. Every part of the line of defence and offense must be watched, and all action correlated. As it is impossible to achieve a victory of arms except by maintaining a strong unbroken interrelated line, so it is equally futile to advance and improve social conditions without comprehensive planning and concerted action.

Another point, about which there is some anxiety, is the use of present large housing facilities after the war, when the community may shrink in numbers. It is reasonable to believe that if numbers of the new and better type of houses are vacated by such a shrinkage, the natural laws of supply and demand will lead people to give up unwholesome tenements in the city, and move out to these houses, thereby bringing about the gradual destruction of the worst housing in the community. If this can be expected, it will bring about a benefit to the communities which we cannot hope to reach in any other way.

Furthermore, the presence of a considerable amount of good housing in a community is likely to prove a determining factor in the continuation of industry in that community. A manufacturer looking for a location for a new plant is as likely to consider good housing as an inducement as he is any other advantage. In other words, good housing can be classed with good railroad facilities, the presence of cheap water power, low freight rates, etc., as one of the assets of a locality, insuring its permanence as an industrial center.

Convention of the National Federation of Building Industries of the United States

Atlantic City, N. J., July 15-16

The Proceedings

WHEN the American Institute of Architects decided not to hold the convention of the building industries called for June 14 at New York, a group of those interested effected a temporary organization on that date at the Engineers' Club in New York. At that meeting a committee was appointed to consider further action, and through them the Chamber of Commerce of the United States was enlisted to undertake the task of federating the building industry. Through that organization a call was issued for a convention, to be held at Atlantic City, July 15-16.

In the interim the New York committee worked out all of the convention details in a complete and comprehensive manner, and with the exception of one or two minor instances the program was carried out as scheduled.

The convention was opened by Harry A. Wheeler of Chicago, president of the Chamber of Commerce of the United States. After the customary patriotic remarks pertinent to the war situation he spoke of the industry as comprised of the manufacturer of building materials, the agencies for selling them, the contractor, labor, the architect and the engineer. As these component parts run on parallel lines, thus never being in contact, it was only through such an organization as it was proposed to effect that the interests of all could be co-ordinated in one central body.

By this means each particular interest could secure a contact with the Government through a large and well-organized body which devoted itself to that particular purpose. In peace times this same organization would serve to the benefit of all under those conditions.

The responding address was made by William B. King of Washington, attorney for the National Association of Builders' Exchanges. The temporary and permanent organizations were effected with Allen Walker of New York, Eastern district representative of the Chamber of Commerce of the United States, in the chair. Mr. Walker is an experienced and first-class mechanic in this line, and put through the program according to the timetable, and sidetracked any efforts to modify the prearranged schedule. Thus the convention can

scarcely be said to express the voice of the industry, but rather that of the New York committee. E. A. Roberts of Cleveland served as secretary throughout both organizations.

Committees on credentials, resolutions, survey of the building situation, convention finances and reception and organization were named.

The committee on credentials reported that fifty-five national associations, representing every branch of building material production, and including some labor federations; fifty-five regional associations, comprising supply associations and local builders' exchanges, and fifty-three individual manufacturing firms from all states were represented. This was the representation of the building industry in numbers, in the order of its parts as enumerated by President Wheeler in his opening address.

During the convention an address was made by United States Senator Calder of New York.

Senator Calder, being intimately associated with the building industry, has its interests at heart, and recited some of his efforts to improve the deplorable condition which now exists. He stated that the total value of building operations in 1915 was \$1,800,000,000, and that this year the total, aside from governmental operations, would probably be \$300,000,000. This tremendous shrinkage in ordinary building operations represents an economic loss to the nation as a whole. It threatens to bring about a shortage of living accommodations everywhere that would make further economic loss through larger rentals, now increased 50 per cent in many instances. The Senator has at all times opposed the stand of the Treasury Department in discouraging the building of houses and the financing of building operations.

Louis A. Post, Assistant Secretary of Labor, also addressed the convention, and defined the attitude of the Administration regarding labor. He explained the workings of the Taft-Walsh commission in deciding disputes involving labor problems. He also explained that labor was as necessary to the prosecution of war as the soldier, and that war workers were to be given a distinguishing badge to indicate their service. In order that workers should find employment with non-profitmaking con-

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cerns, badges would only be given to the employees of firms that are approved as not being those which seek and find excessive profits.

The committee on permanent organization presented articles of organization which were adopted as follows:

ARTICLES OF ASSOCIATION

The undersigned organizations, each through its representative, hereby agree to and establish the following articles of association:

1. A voluntary association to co-operate with the United States Government in carrying on the war, to co-ordinate industrial activities and to conserve resources, shall be and now is created, to be known as the National Federation of Building Industries, referred to hereinafter as the Federation.

2. The Federation shall be managed and its policies devised and carried out by a body of delegates to be known as the Building Industries War Service Committee, referred to hereinafter as the War Service Committee.

3. Any association of building material manufacturers or dealers, or of contractors engaged in building, or of architects or engineers, or any association of other persons, firms or corporations related to building, may become a member of the Federation and be represented in the War Service Committee upon the following conditions:

(a) Members may be either national associations or regional associations.

(b) A national association is an association composed of members whose places of business are located or whose products are distributed at large over the United States.

(c) A regional association is an association composed of members whose places of business are located and whose products are distributed principally in a single city, district, locality, state or region.

(d) Each national association shall be entitled to three delegates and three votes in the War Service Committee, and each regional association one delegate and one vote in such committee. If less than three delegates are present from a national association they may cast the entire vote of such association.

(e) Each national association shall contribute \$300, and each regional association \$100, to the organization fund, in both cases payable ten days after notice of election, and there shall be no dues prior to Jan. 1, 1919.

(f) The admission and classification of any association shall be made by the Committee on Credentials, to be appointed from the War Service Committee by the president. The War Service Committee may review the action of this committee.

(g) At least one delegate from each member association present at any meeting of the War Service Committee shall be some other person than a paid employee of such member association.

4. Any member of a member association, individual, firm or corporation engaged in any business that has no association may become a sustaining member of the Federation upon payment of \$100 a year and may attend the meetings of the War Service Committee, take part in such meetings and receive all published matter of the association, but shall have no vote as a sustaining member.

5. The War Service Committee shall elect at each annual meeting three members of the Executive Board to serve three years without salary. At the first election, nine members of the Executive Board shall be elected and the tenures so arranged by lot that the terms of three shall expire each year. The Executive Board shall carry on its business under such rules as it may adopt.

Vacancies in the Executive Board may be created and such vacancies filled by a two-thirds vote of the War Service Committee.

Vacancies may be filled by the Executive Board until the next regular or special meeting of the War Service Committee.

6. The Executive Board shall elect annually by majority vote to serve one year, a president of the War Service Committee, who shall be chairman of the Executive Board, and shall also elect a vice-president and treasurer of the War Service Committee, and these officers shall serve without salary.

7. The Executive Board shall appoint, to serve during their pleasure, an assistant to the president and fix his compensation. He shall be the staff representative of the president and of the War Service Committee. Subject to the approval of the Executive Board, or of such committee as they may establish for administrative supervision, he shall provide, maintain and conduct offices, facilities and staff and shall cause the board or its committees to be provided aid in their inquiries and negotiations and to be furnished reports upon subjects with which they are to deal, and staff service in framing and declaring policies. He shall cause members of the federated bodies to be provided with means and advice for prompt consideration of matters which they desire to have considered by the Executive Board, or for prompt action insofar as such matters involve precedents already adopted by the board, and he shall in general be charged with the promotion of the aims of the organization and the co-ordination of its constituents for results.

8. The War Service Committee shall meet on the first Monday in November, 1918, and quarterly thereafter, and not less than ten days' notice shall be given of the place and hour of each such meeting. One of such meetings shall be designated as the annual meeting and the Executive Board may arrange for such larger attendance of representatives of the member associations as they deem fit, without, however, changing the ratio of voting as hereinbefore provided. The Executive Board may call special meetings of the War Service Committee at any time or place upon not less than ten days' notice, and a special meeting of the War Service Committee shall be called on written request of twenty delegates. A quorum of the War Service Committee shall be twenty-five.

9. The Executive Board shall maintain facilities for continuous communication with the individual members of the several trades and occupations through the member associations and shall provide that the board shall at all times know what are the practical problems and needs in the several regions, that the members of the Federation everywhere may know accurately and promptly what the War Service Committee is doing and prepared to do, and that all concerned may have convenient means of co-operation for the common end.

10. The War Service Committee may pass by-laws necessary and proper to carry these articles of association into effect, including power to fix the dues.

11. These articles of association may be amended by the War Service Committee by a two-thirds vote of those present at a regular or special meeting, notice of proposed change being given in writing twenty days before such meeting to every member of the War Service Committee.

The adoption of these articles and the appointment of an Executive Board was the principal work of the convention. The Board nominated by the committee and elected consists of the following persons: B. F. Affleck, Chicago; Col. J. R. Wiggins, Philadelphia; John H. Kaul, Birmingham; A. N. Maddock, Trenton; Charles Gompertz, San Francisco; John A. Kling, Cleveland; W. L. Klaus, Pittsburgh; W. S. Dickey, Kansas City; Rudolph P. Miller, New York.

The resolutions first presented the slogan of "win the war" and pledged the Federation to take up the burdens, sustain the sacrifices and supply the resources to achieve this end, and also to create new

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values for a basis of credit which is so essential to this war undertaking. The wider diffusion of knowledge of war activities by the Government was declared to be desirable to prevent undue congestion, movement of local labor and relieve transportation troubles.

A resolution favoring the abolition of the cost-plus system of contracting Government work created some discussion and was referred back to the committee, as was another resolution favoring a Government board on building materials.

The Federation is to be congratulated on the personnel of this board; it is quite representative, both as to the elements comprising the industry and geographically. There is no doubt but that the board would have more truly represented the industry had it included representation of the architectural

profession, which is undoubtedly an important factor in the industry in its broad conception, and it is to be expected that its scope in this respect will be extended at a future time. They are strong men familiar with association work, and have been leaders in building up the special associations to which they are accredited.

The Michigan Society of Architects, represented by its president, E. A. Schilling, was the only representation that the architectural profession had in these proceedings.

Although the committee which arranged the details of this convention did not seek the aid of the architectural press at any time, and which aid would have been freely given, THE AMERICAN ARCHITECT congratulates the Federation on the work done, and is in complete accord with it and its aims.

Address of Hon. William M. Calder, U. S. Senator from New York

THIS gathering is representative of every branch of the building industry of the country, not only the men who actually construct the building, but also those who manufacture the different component parts of which the building is constructed. You are here in these war days for the purpose of creating an organization that will be helpful to the Nation. It is your intention to formulate your plans to have that as the fundamental object in view.

We are interested in winning the war, and any American who has not consecrated himself to that purpose is unworthy of the name. When the declaration of war was made and the country found itself with a mobile army in Continental United States of less than 50,000, almost the first act of Congress was to authorize its increase to 2,000,000, and it was found necessary immediately to construct cantonments, build all sorts of munition factories and construct buildings of every character both for the Army and Navy to carry out our war plans. If there had not existed large organizations, not only for the construction of these structures but for the manufacture of the materials to be utilized in their building, it would have been impossible properly to take up the great construction program that the Government had called upon the builders of the country to carry out. No line of industry has done more to get the Nation ready than the one in which you are engaged, and for that reason it is exceedingly important that the building industry shall be maintained in its highest efficiency.

I have had something to say upon this subject on the floor of the United States Senate, but what I

said there has not met with general approval. I have complained that it was a mistake for the Treasury Department to discourage the building of houses and the financing of building operations. I have pointed out that while in 1915 the total building operations of the country reached the enormous sum of \$1,800,000,000, this year outside of the government construction the total would be less than \$300,000,000. I have indicated, too, that in many of the large cities of the country the failure to build homes for the people has brought about a condition whereby rentals have increased in some instances 50 per cent, and that next year, unless relief is obtained, there would be a dearth of living accommodations for our people. I have not approved either of the Government's going into the business of building homes by the wholesale for its workmen, for I am of the opinion that with the enormous profits made by the great munition and shipbuilding plants they could in most cases take care of the housing of their own men if the Government insisted that it be done. In this connection it is well to point out that Congress has already appropriated \$110,000,000 for this purpose, and if we are to take the opinion of men who are attached to this house-building bureau of the Government, \$1,000,000,000 will be required in the not far future. This entire scheme, in my judgment, is conducive to waste, inefficiency and extravagance. I have felt that the best results were to be obtained both for the Nation and your industry by disturbing as little as possible the ordinary conduct of your trade.

I think it highly important that an organization should exist in this Nation composed of every ele-

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ment in the building industry so that the Government will be thoroughly informed upon the country's needs and the possibility of meeting them. There exists in Washington the War Industries Board, presided over by Mr. Baruch, which has been performing wonderful service for the Nation. It is the business of this Board to co-ordinate the war needs of the country that the very best results may be obtained from the standpoint of the Government necessities, having in mind always the preservation of the producer's ability to maintain his plant in the highest state of efficiency. I have felt, however, at times, that this Board lacked real information, that very often it was apt to make a decision that might cripple business because it did not have full knowledge of the facts. An organization such as you have perfected here can be most helpful in laying the facts before this Board. Let me cite a case that I have in mind: Very recently the Navy Department notified 64 manufacturers, tenants of the Bush Terminal Company of South Brooklyn, that on December 1st the Navy Department would require the space occupied by these concerns. At the request of a group of men in Brooklyn, who are prepared to supply additional factory accommodations for these concerns, I called at Mr. Baruch's office to obtain his approval of priority orders for building material to construct these new factories. This work was to be done by private capital and all we asked was the material. Mr. Baruch's building expert expressed doubt as to our getting it. Upon personal inquiry I found that it was possible to secure all necessary material to construct these factories without in the slightest degree disturbing the Government's needs. In a case like this one, your proposed organization could be of valuable assistance both to the Nation and your own calling.

In Secretary McAdoo's letter to Samuel Gompers of February 15th of this year, among other things, he said, "The successful financing of the war depends in large part upon current savings; upon the difference between what is made and what is spent." It might be inferred from this that wealth-producing industries are regarded by the Secretary of the Treasury as essential to the winning of the war. If this is so, what industry is more productive of wealth than the one in which you are engaged?

In his address before the United States Chamber of Commerce in this city some months ago, Secretary Baker said, "There is but one answer to the destruction of the wealth of the world that has been going on, and that is the production of new wealth. Therefore, the primary function of business is to produce." In line with this it is thought by many that the authorities should encourage pro-

duction in such manner as to improve the national tools of industry, so that they may be operating with increasing efficiency until they are drafted for specific war purposes. This is not business for pleasure, or in the ordinary meaning, business for profit—but business to win.

Luxury building had practically ceased before the war commenced owing to the increased cost of building, which then amounted to approximately 30 per cent; and now, with a proposed further increase of some 25 per cent in cost of the transportation of building material and the difficulty in securing funds, it is doubtful if any but necessary buildings would be undertaken.

The building industry is a national facility. Its product is in great demand and will be in even greater demand when the war is over. It is therefore in the interest of the public welfare that this national facility should be conserved.

Through its highly specialized organization, the building industry has, up to three years ago, been able to produce modern, fireproof, hygienic office buildings with elevator service, etc., at less cost per cubic foot than the old six-story office buildings cost thirty years ago.

The world is divided into two camps, one highly efficient but in which the people and all are for the government; and the other less efficient, and while not conserving natural and human resources, in which the government has been for the people.

The United States probably possesses more than half the tools of industry of the entire world, and it follows that if these tools of industry are properly organized the United States is able to produce more than half the munitions of which the entire world is capable—and in addition produce sufficient wealth to continue a prolonged conflict.

Unless an emergency exists so great as to require the United States to risk the future for the present, is it not safer to plan for a war of long duration, so that we may become economically stronger month by month and meet, as the war develops, all emergencies and reverses, rather than to follow the English precedent—which was to release labor, materials and capital for immediate use regardless of the future reaction? But even in their emergency the English policy was not applied to the entire British Empire, and that policy cannot be applied throughout a vast country such as ours, with its different and varying conditions of finance, labor, transportation and climate.

England was compelled to sacrifice her future to her present—but England could take comfort in the knowledge that others stood behind her to carry on business and wealth production. No nation stands behind us. Responsibility for the war, not only in a military, but in financial and industrial aspect,

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rests upon us, and the policy of sacrificing the future to the present should gradually be modified with these facts in view.

All now fully concede that industrial mobilization should have been prearranged and adjusted before the war, and all now realize that the nation is in a position of great difficulty in endeavoring to prosecute war and simultaneously adjust economic affairs. But few appreciate the sacrifice being made by able and patriotic men who have volunteered for this service, and few realize the obstacles placed in their path by well-intentioned citizens through lack of understanding.

The work of the war must be done. The ideal condition will be when we can avail ourselves of the energy of all our people and the capacity of all our plants and use all our material in hand for the simultaneous production of wealth and munitions. This could be done if all the people and the capacity of existing plants could be enlisted in one task or the other by standardizing the work and distributing it to existing plants with their present organizations. Otherwise new organizations must be created and labor and material distributed to them.

As a Nation we are drifting from individualism toward various forms of governmental control, and it is vital for the present and future welfare of the country that these forms of government control should be constructive rather than purely regulative. Moreover, a full knowledge and correct correlation of the facts is impossible at this time, and regulative control based on partial knowledge and incomplete analysis of facts is dangerous. Unfortunately, successive forms of regulative control neutralize one another and become ineffective.

A constructive national policy is the only safe and effective national policy. All now see that it would have been better to have manufactured existing types of machine guns until the improved type had been perfected; to have manufactured the existing types of airplane motors until the im-

proved type had been perfected; to have followed the evolution of shipbuilding and produced the present-day type of cargo ship rather than delay and experiment with other types. Experiment with the new, but continue to turn out products along the old lines until the new is perfected.

To abandon constructive intent is to shut off the source of power and attempt to run on the momentum of previous construction achievement, thus making of time an enemy rather than an ally. To shut off the wealth-producing industry of a nation is like shutting off the motive power of an airplane—instead of controlled and accelerated progress it means an involuntary landing within a limited radius.

No industry in all the country is more wealth-producing than the building industry. It creates wealth; it makes additional taxable property on which taxes are more easily collected than from any other source. It increases land values, in fact it is the fundamental source of wealth, and if any line of endeavor should be encouraged, it seems to me the one in which you are interested ought to receive the fullest consideration.

In my judgment, it is imperative that you have the Government at Washington understand how all important this whole subject is to the immediate needs of the Nation.

The Nation's building operations this year totaled approximately \$1,200,000,000; next year it will hardly exceed \$700,000,000. In many cities of the country there are large numbers of building trade mechanics walking the streets. It is true, there has been a demand for some of these men in other callings, in the adjustment of business along the line of war necessities, but there will come a time and that very soon when the workmen formerly needed by the building trade will, without the slightest inconvenience to other lines, return to their previous occupations. The country, too, will see the wisdom of encouraging a proper and conservative financing of the Nation's building needs.

Address of William B. King, General Counsel of the National Association of Builders' Exchanges

THE Chamber of Commerce of the United States is recognized as the national voice of business. It has been used particularly during this war as the means of communication on many occasions between the authorities of the Government and the business of the country. It is particularly agreeable to the building industry that this commanding organization should have undertaken to call the representatives of the various

branches of this great industry together for the purpose of war federation.

This call is in pursuance of a policy very early declared in the progress of the war by Walter S. Gifford, Director of the Council of National Defense, who said: "Each industry would best serve the Government if it were organized on a nationwide basis with complete representation of all members of the industry. Organization along state

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lines or by localities is admirable for chambers of commerce and local civic associations, but our industrial life is not so bounded. Industries are not largely affected by state lines. A national organization by industries is the form of organization that will best serve the Government both in time of war and in time of peace. We have never needed such organized industry as much as we need it now when we are engaged in this great war, and we never have needed it as much as we shall need it after this war is over, when we shall be in the midst of a world competition of unknown proportions. If we had had such an organization of business in this country at the outbreak of the war, the problem of mobilizing industry for war would have been simple."

This policy has been followed consistently and numerous national organizations of diverse occupations, many of them in the building industry, have been formed for war purposes and have rendered great national service. It is a matter of surprise that the building industry as a whole has never before responded to this invitation and formed a national organization. It is the second largest productive industry of the country, with an annual product of \$2,000,000,000 in enduring wealth. It involves production of many materials, their distribution through many dealers, and their use by many contractors and workmen. It engages the services of two professions—Architects and Engineers. Its very complexity is the chief reason why federation has never before been attempted. Yet this is the very reason why it should be done. Separate organizations of trades are valuable, but each takes a partial and one-sided view. An organization on broader lines is needed, which can view the entire industry as a whole in its relation to the war, adjust differences, provide substitutions of materials and methods made necessary by abnormal conditions and aid in adapting the industry to the war to the most effective end. Co-operation and co-ordination in the various branches of the industry are to be achieved.

The same spirit of co-operation is not only desirable but is confidently expected in the relations between this organization and the Government. The chief business of this country today is—war. All other business is secondary to this. The relation between all business associations and the Government was splendidly stated by the Southern Pine Lumber Associations in a paper presented to the War Industries Board, saying: "The lumbermen recognize that they are partners with their Government in bringing this world war to a satisfactory conclusion."

The Government is the senior and managing partner in this business, but has recognized that all

the partners must co-operate to succeed in this great business. It welcomes aid from all sources. It will be the duty of our organization first of all to render such aid to the fullest extent of the resources of the industry.

We all recognize that the profound disturbance of the building industry, which has taken place, is the normal result of the war. We are making no complaints. We are proud to suffer in such a cause. But our leaders at Washington have no desire to cause more disturbance than is actually necessary. They are glad to see any productive industry making progress when this is consistent with war needs. There is no desire to kill business. Necessary injury is a matter of great regret. We are, therefore, confident of our official welcome not only when we come to Washington with proffers of aid to carry on the war, but with suggestions whereby labor can be employed wisely in productive industry. The spirit of co-operation can be confidently looked for between the governmental authorities and our organization.

This discussion of principles, then, brings me to the practical statement of what can be done by our War Service Committee:

1. We can render aid to the Government by centralizing our resources and consolidating our information.
2. We can make suggestions in regard to the policy of the Government so as to limit the harm necessarily done and to leave the building industry the largest practicable scope for activity.
3. We can aid in holding the organization of the entire industry during the war so as to resume work with the least possible delay when peace comes.
4. We can serve as a center of education and information for all the branches of our entire industry so that all matters of importance may be disseminated throughout the entire trades.

I shall not undertake to specify what can be done under each of these headings, but may suggest some things from actual occurrences. Late last month, an official from the Department of Labor came to me to ask if the National Association of Builders' Exchanges could give the Department information in regard to labor conditions throughout the country. This is to be gathered in connection with the new plan that all labor shall now be distributed through governmental agencies. The existence of that association permitted the collection of a large amount of information to be begun at once through many different sources. Had this federated organization been in existence at that time, the collector of information could have proceeded on a far wider scale.

Another much more important instance is in

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point. The impression was made upon the public by various statements coming from a number of governmental authorities that the Government positively objected to building and that anyone attempting to build except for the Government, or for direct war needs was unpatriotic and hindering the war. So strong was this impression that the distinguished Senator from New York—Mr. Calder, referred in the Senate to the Treasury Department, "Advising the banks against loaning upon mortgages on real estates." Secretary McAdoo wrote a letter of denial that put a quite different aspect upon the subject. But the actual impression which the public had erroneously obtained was more in line with Senator Calder's view than with Mr. McAdoo's explanation. Had the building industry been represented by a competent organization at Washington when this very idea first gained currency, early efforts would have been made for correction and due publicity of the right idea. Many idle mechanics would doubtless have been put to work.

Inquiries made by the National Association of Builders' Exchanges in various parts of the country indicate a surplus of skilled and unskilled labor in some parts of the country and a deficiency elsewhere. A strong and well supported federated building organization might take steps to equalize the needs and supply of various parts of the country.

The spirit with which such an organization is created and supported is the measure of its endurance. We must expect it to be animated with high patriotism so as to accept all due sacrifice willingly. We must expect it to accept gracefully the decisions of the leaders of the Government, even if they do not accord with our ideas of wisdom; we must expect to sink our own contentions at times in the common good, giving and taking at all times with good-will, recognizing the interdependence of all parts of the building industry; we must hope that this spirit will help the industry as a whole to be relieved from needless sacrifice and to do its share in promoting the public welfare in peace and in war.

The National Association of Builders' Exchanges pledges itself to do its share toward the winning of the war and the welfare of the country through the federation of the entire building industry toward these ends.

The National Association of General Contractors

DURING the convention of the National Federation of the Building Industry at Atlantic City, July 15-16, a group of general contractors present as delegates from building exchanges, or as individuals, felt the need of better representation of their industry in a federation of this kind. The feeling was that a building exchange was representative of the material and supply interests rather than that of contracting.

On call of T. T. Flagler of Atlanta, Ga., about thirty general contractors from all parts of the country met in informal conference. This meeting resulted in a tentative organization being formed, represented by the following committee:

D. A. Garber, chairman, New York.
N. F. Hoggson, New York.
M. D. Smith, Detroit.
E. J. Thomas, Memphis.
George Watson, Dallas.
J. W. Cowper, Buffalo.
C. P. Mossard, Des Moines.
N. H. Mayo, Boston.
C. W. Gompertz, San Francisco.
T. T. Flagler, Atlanta.
A. P. Greensfelder, St. Louis.

The organization will be undertaken on national lines at once, and promises to eventuate in an association which will represent the contractor without reference to allied interests. The need of such an organization has been apparent for many years, and while well taken care of locally in some instances, present conditions and the future outlook warrant the formation of an association national in scope.

Book Notes

LESSONS ON FORM. A Manual of Free Hand Drawing, by A. Blunck, Architect. Full cloth, 125 pp. Size 9 x 12 inches. Price \$3.00 Cleveland, Ohio, J. H. Jansen.

Learning to see form in all its correct proportions and learning to draw it are decidedly distinct things. Many men will have the most correct appreciation of form, of music, or a keen sense of color. With all the natural gifts in this direction they will often lack the ability to draw, to play a musical instrument, or to paint. These fortunate, or, as some regard them, unfortunate ones have the keenest appreciation, but lack the ability to express it. And it is doubtful if they can ever be taught to do so.

Then there are those who have a certain dextrous faculty and who can set down in form the things they see before them. The relative skill in doing this, indifferently or well, marks the degree of artistic ability. But a man who has no appreciation of form nor any ability of draftsmanship can, in but the rarest instances, be taught either to see correctly or to draw.

There are no end of drawing books, each one claiming to present a method that will enable the beginner easily to surmount the obstacles that beset the way to correct draftsmanship.

One may attain certain correct forms of penmanship from following a copy, but it is doubtful if the art student can perfect himself in correct expression of form by such a process.

The only safe and sure method is the sketch "direct from nature," under the critical eye of a competent teacher. To those who are unable to avail themselves of the schools or whose daily work keeps them close, books like this will have a certain value, especially when they have been as carefully and as progressively prepared as in this instance.

BEYOND ARCHITECTURE. By A. Kingsley Porter. Stiff paper boards, 200 pp., size 5½ x 8¾ inches. Price, \$2.00. Boston, Marshall Jones Co.

Most readers of the scholarly books relating to the profession of architecture will, to a greater or less degree, be familiar with the essays that Mr. Porter has grouped in this book under the general title "Beyond Architecture."

To review them to the extent their merit entitles them would be to enter into a discussion of many abstract subjects; in some cases to take issue with

the author's contentions, and, in short, to take up in extenso the eight essays that comprise the book. The prescript that Mr. Porter has written to reintroduce, and in book form, this collection of essays is a delightful bit of clever writing. He states:

"Misborn in a time of cosmic upheaval, this volume appears an inconspicuous baby of peace, whose feeble wail, notwithstanding the unreasoning vastness of parental ambitions, is likely to sound more than ever unavailing amid the shrapnel and groans of a great war. Before abandoning it upon the doorstep of that public opinion, which is so largely responsible for its existence, I feel impelled to fasten about its neck something in the nature of a birth certificate, unnecessary and odious as I hold in general such documents to be. I hence make formal avowal that it was conceived in the most respectable possible manner, that is to say, in the lecture hall, than which, as is well known, nothing is more restrained, more chaste, more completely free from all suspicion, not only of scandal but even of legitimate pleasure. The material was subsequently worked over into a series of articles which eminently respectable periodicals were induced to publish. * * *

"I have a presentiment that this wayward and unconventional infant may have sad need of all the backing it can muster against the powers of banality and Philistinism. In common honesty, however, I must add a confession. One day I became aware, quite to my own surprise, that these articles were something more than a series of detached essays, that collectively they formed an outline—fragmentary, it is true, but still not entirely without coherence—of a new system of architectural criticism. I consequently determined to gather them together to form a little book. This gave me the opportunity—and I come now to the point—of making many changes in the original versions. As the copy at present stands, there is no telling whether anyone would print it, except Mr. Jones, who, as everyone knows, through having served the public in Mr. Cram's "Gothic Substance" delicious but forbidden fruit, has no longer left to lose even the shred of an orthodox architectural reputation."

The following essays are presented: Against Roman Architecture; Art of the Middle Age; Gothic Art, The War and After; The Gothic Way; French Gothic and the Italian Renaissance; The Art of Giotto; Paper Architecture; and Art and the General.

THE AMERICAN ARCHITECT

THE AMERICAN ARCHITECT

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The Building Industry, Now and in the Future

IN any adjustment of the building industry of this country, intended to meet existing conditions, there are certain elements that should be considered carefully before there can be any action by the Government toward building, or by the building industry toward the Government, that will stabilize present and future operations. As the second largest industry in this country, for building in its volume gives precedence only to agriculture, the importance of effective co-operation with the Government is apparent.

Such effective co-operation will properly consist in, first, the organization and proper interrelation of all the building interests in the United States, so that there may be had an accurate estimate of the resources in materials that are or can be made available. It is certain that much of the confusion in the past and the uncertainty of the Government's policy toward essentials in building operations has been brought to pass by conflicting and often inaccurate statements of those who, it has been assumed, were in a position to speak with the force of an authority, armed with accurate information.

Further, the different bureaus and commissions of the Government which have had supervision in these matters have each, independently of the other, set about the compilation of data, which when completed has served as a basis for official action. This action by different boards has been so widely divergent that the result has been to create in the minds of those in the building industry a very decided confusion and a tendency to halt any attempts at building.

Naturally this chaotic condition is having a disastrous influence on all those engaged in the building industry.

The co-ordination of all available information as to building, by a centrally controlled and representative commission of building interests, would at once create a state of certainty and set at rest the disquieting influences now so harmful.

President Wilson's executive order, placing Government building under the control of the Department of labor, has centralized governmental action as far as industrial housing relating to war work is concerned. The centralization on the part of the building industry of all work incidental to supplying information in that field to the Government would speedily work a much-needed reform.

The attainment of these purposes would work to the successful outcome of the second feature—the continuance of all building operations that will not interfere with the Government's building plans.

The absence of any accurate knowledge of conditions in the building industry is, perhaps, the reason for the sweepingly prohibitive orders that have been issued, since the Government would naturally pursue a safe course as to its own operations and private enterprises would suffer. Those familiar with present conditions know that, in many fields of building, operations could continue without any interference with Government work; and the only way to gain permission to continue this production of permanent wealth during war time is to supply the Government accurately with every detail of information.

The third consideration, and one that is of vital importance, greater perhaps than the two discussed, is the keeping in a state of efficiency every department of building, and particularly the manufacture of materials, so that when peace is declared this country may be prepared to enter the field at once fully equipped to meet what will be the greatest period of building activity ever experienced. Attention has been directed many times in these pages to what will undoubtedly happen in the building industry when this war is over.

The complete abandonment of building operations in Europe, the devastation of certain areas in

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France and Belgium have created a demand that must be supplied at once. To meet this demand for housing, to refer to but one class of building, will require enormous stocks. As Europe has given all of its energies to war and has practically stopped all manufacturing not allied to its war operations, there will not be available in Europe any considerable quantities of building materials for some time after we have returned to peace.

But the after-war demands will be immediate, and it is logical to assume that to this country Europe will turn at the outset for all its many and pressing needs.

If the present attitude of our Government toward the building industry is continued how can we hope to meet this demand? Just now we have in the Government one principal customer. Every manufacturer will give precedence to that important customer. But when war is over the Government's need will automatically cease, and we shall once more return to competition for trade wherever it may be secured.

If there are no stocks, no easily available raw materials, if the restrictions of war times and the short-sighted policy of the Government has so widely scattered necessary labor, how shall we hope to meet this sudden and imperative demand? Building instead of being based on the selection of the best and most permanent materials will go forward through the necessity for haste in an unfor-

tunate and expensive way. We shall see duplicated all over the world conditions similar to those present in cities where conflagrations have laid waste large areas; where necessity has compelled the erection of a class of buildings that stand for many years as an annoying example of wasted opportunity. It is well to keep the Government advised, as at first set forth; it is equally desirable that we should be permitted to continue every building operation now that will not interfere with Government work; but, if we are not to be distanced by every other nation in the race for commercial supremacy, it is of even greater importance that steps be taken at once to create a supply to meet what will certainly be a very large demand.

It is in this direction that the building industry should really give its most serious consideration. Particularly is this true of the manufacturer who, during the period since our entry into this war, has patriotically met every wish of the Government, even though it has in many cases practically brought his business to a standstill. These things entitle the manufacturer to the consideration of the Government, not when the war is over, but now.

If every branch of the building industry is mobilized, brought under a central, controlling body, we may hope for the consummation of these essential things. If it drifts aimlessly, without purpose, one need not be endowed with a spirit of prophecy to forecast the future.

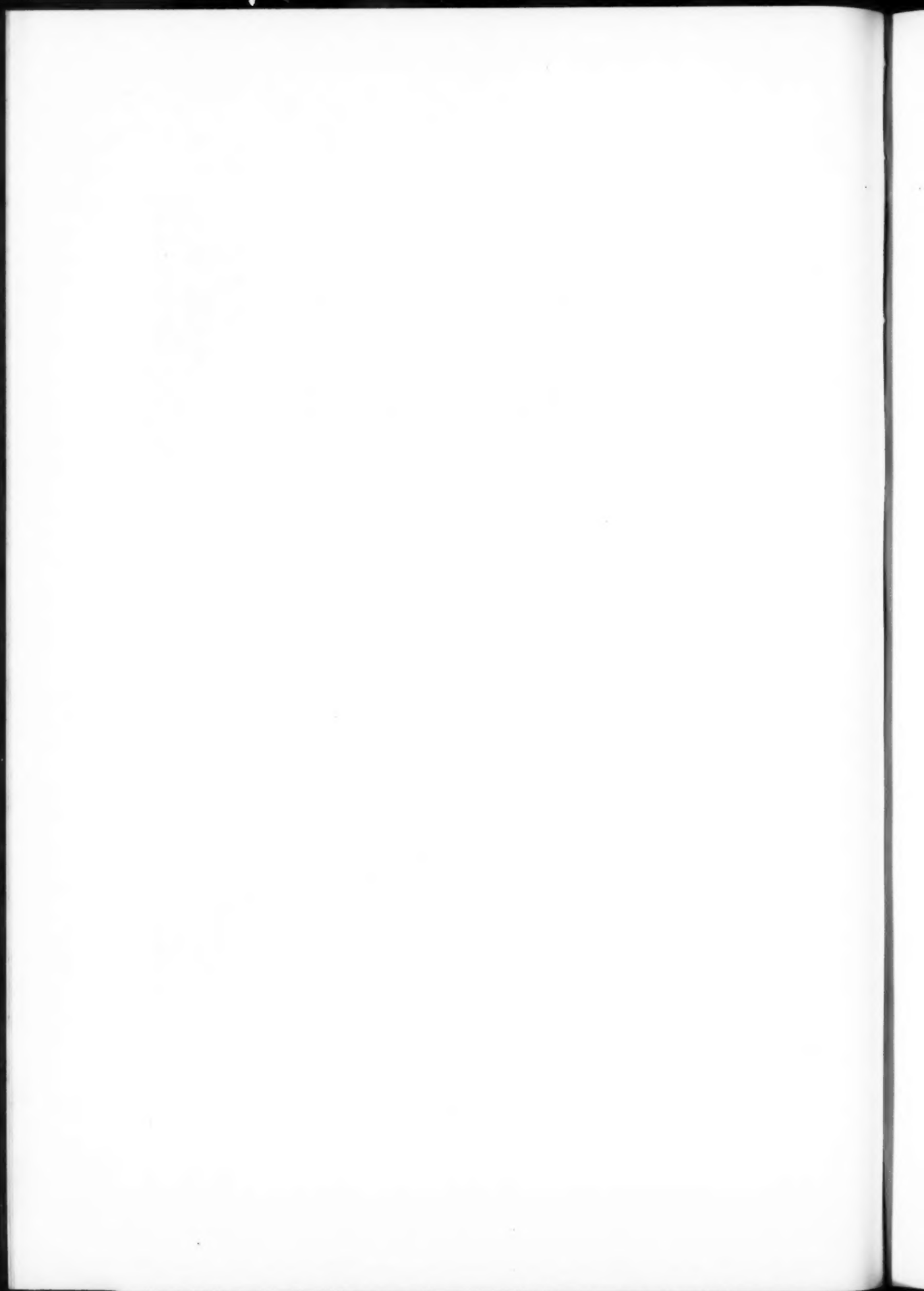


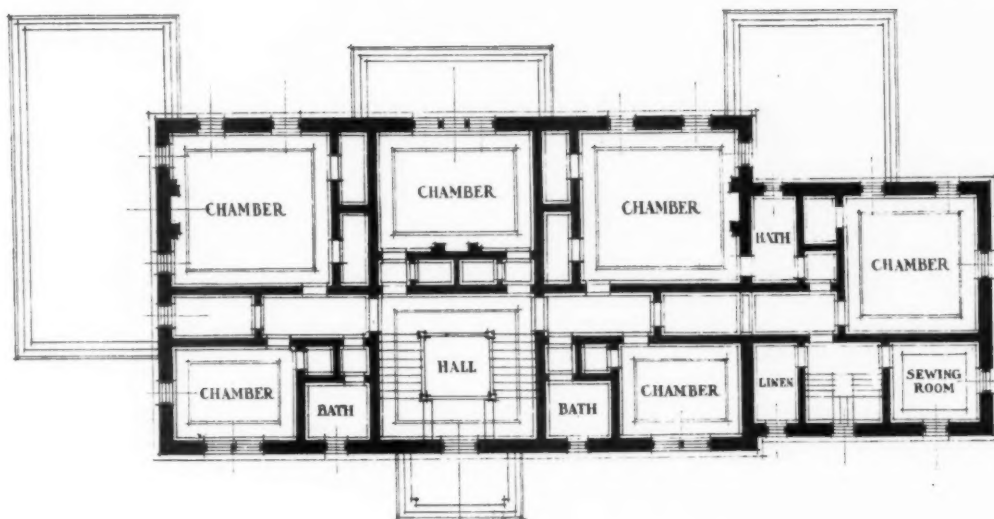


PLATE 26

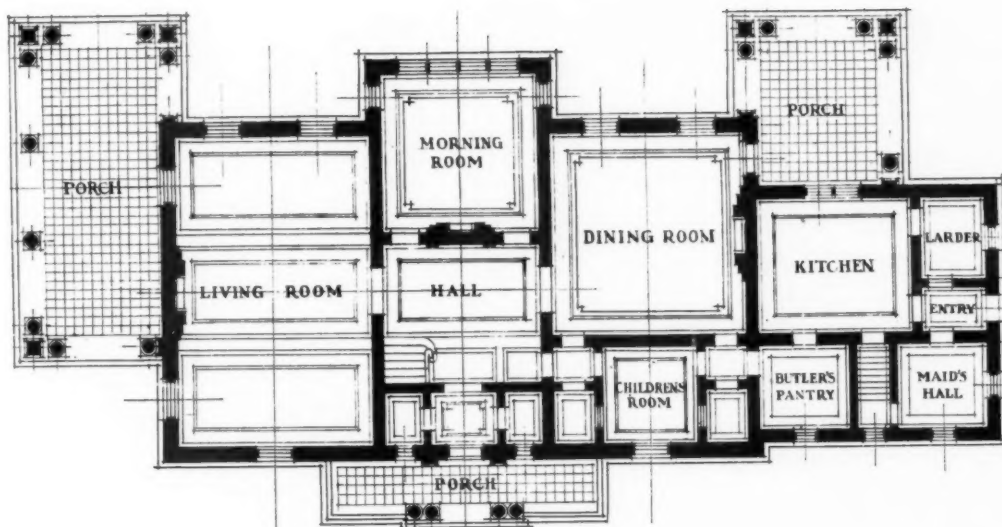
HOUSE OF W. A. DUPEE, MILTON, MASS.

JAMES PURDON, ARCHITECT





SECOND FLOOR PLAN



FIRST FLOOR PLAN

PLATE 27

HOUSE OF W. A. DUPEE, MILTON, MASS.

JAMES PURDON, ARCHITECT



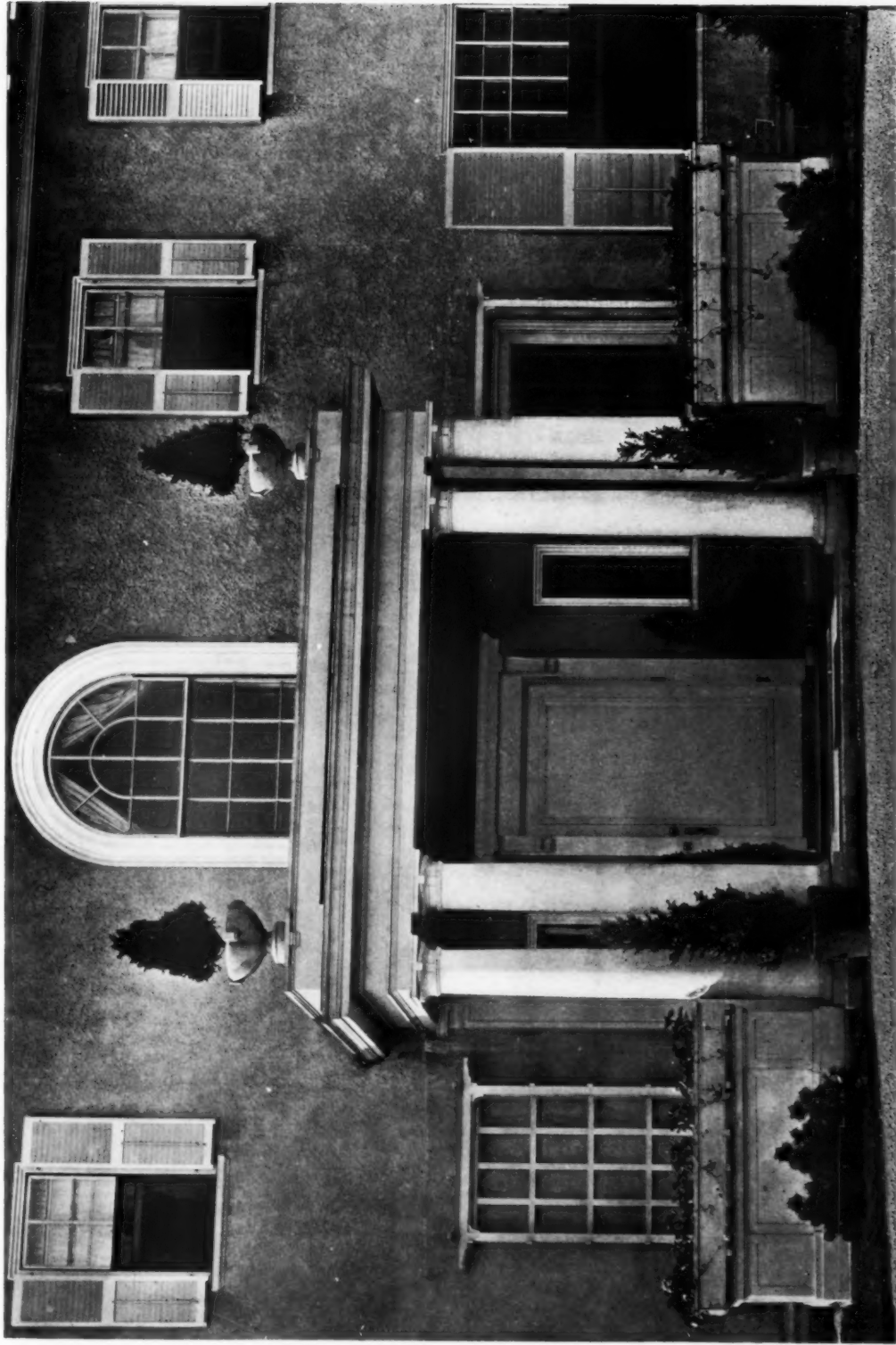
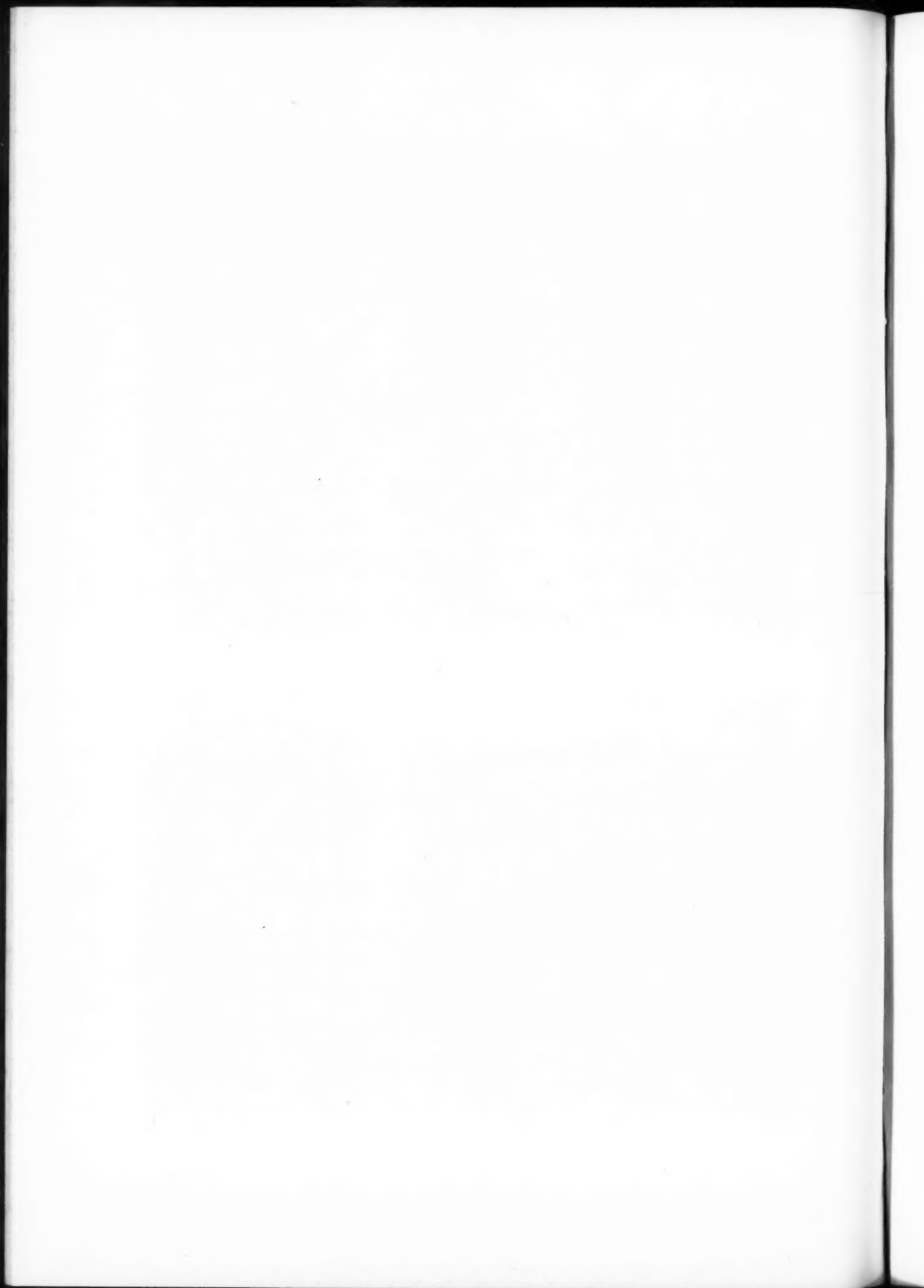


PLATE 28

HOUSE OF W. A. DUPEE, MILTON, MASS.
JAMES PURDON, ARCHITECT





HALL

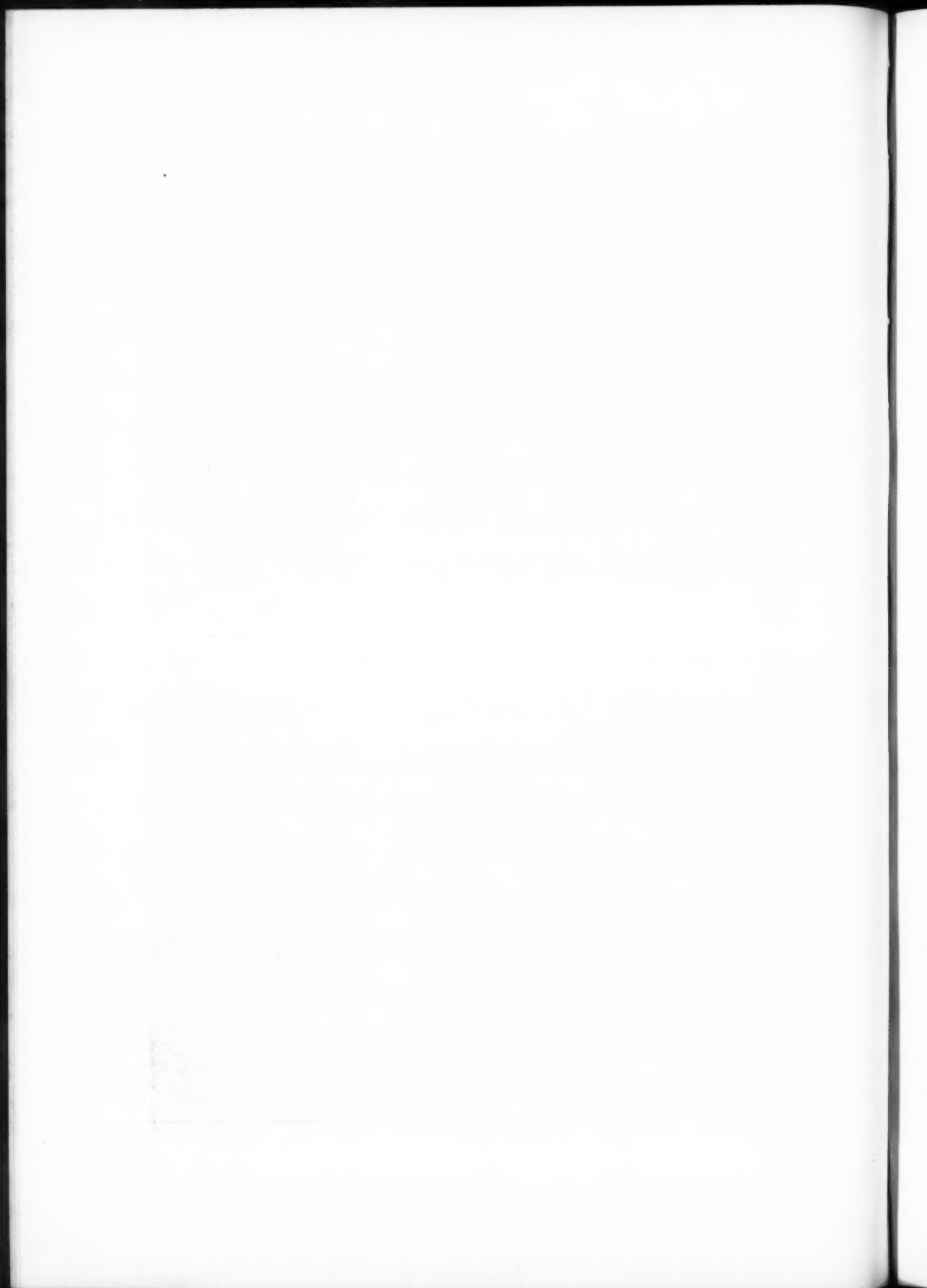


PLATE 29

LIVING ROOM

HOUSE OF W. A. DUPEE, MILTON, MASS.

JAMES PURDON, ARCHITECT





SUN PARLOR

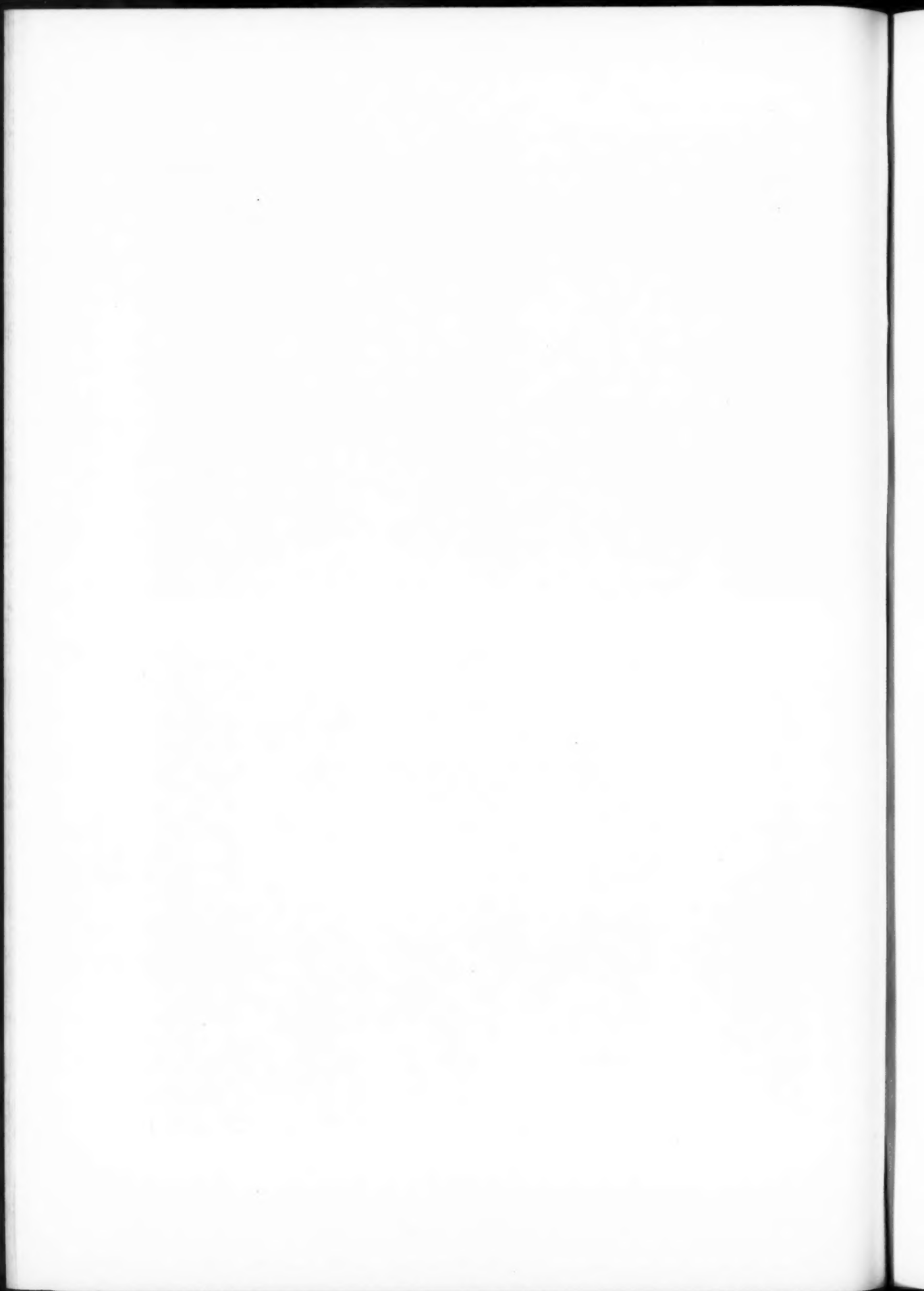


PLATE 30

DINING ROOM

HOUSE OF W. A. DUPEE, MILTON, MASS.

JAMES PURDON, ARCHITECT





SUN PARLOR



PLATE 31

VERANDA

HOUSE OF W. A. DUPEE, MILTON, MASS.
JAMES PURDON, ARCHITECT

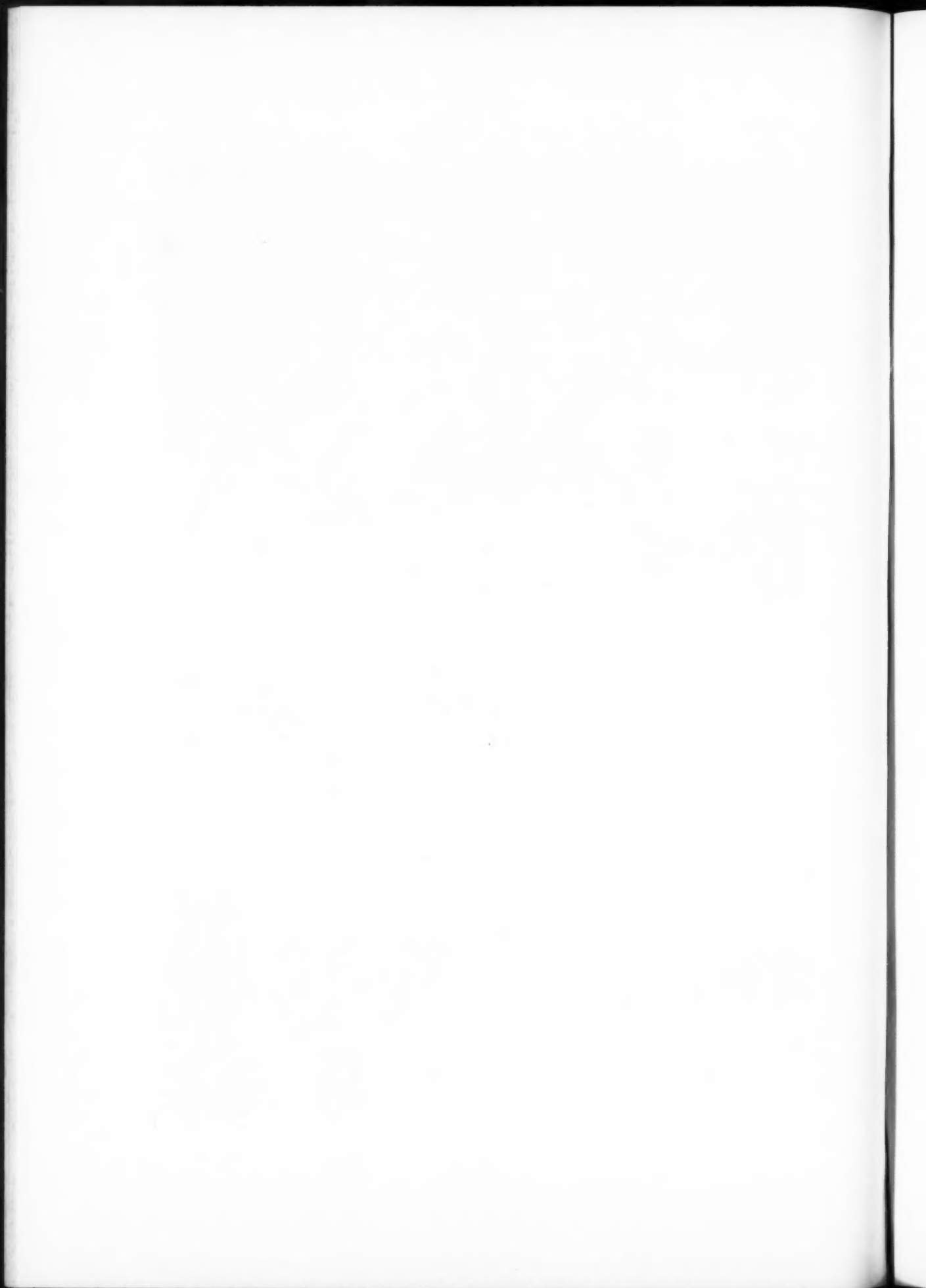




PLATE 32

HOUSE OF EDWIN H. HEWITT, ARCHITECT, MINNEAPOLIS, MINN.

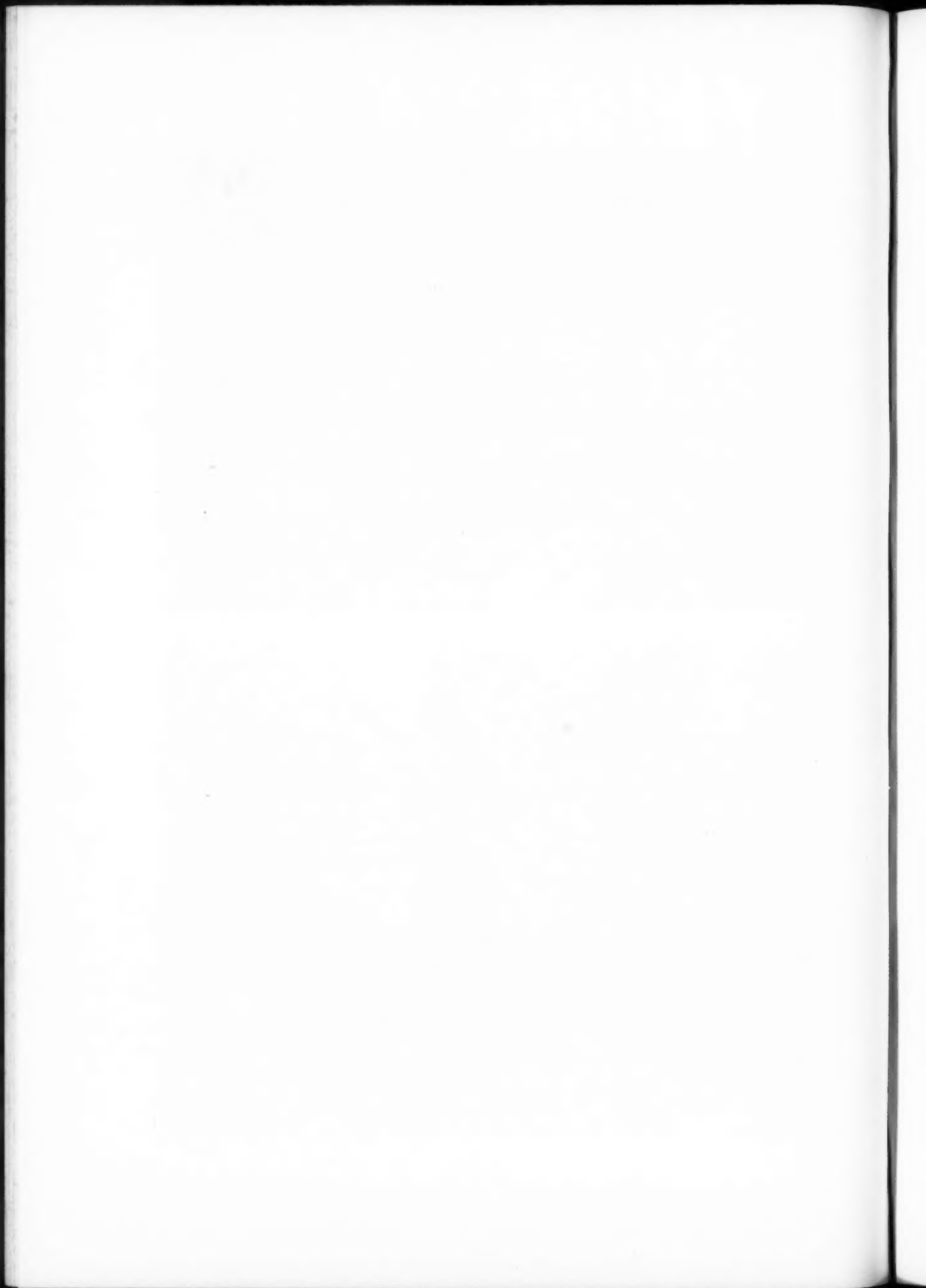




PLATE 33

STUDIO

HOUSE OF EDWIN H. HEWITT, ARCHITECT, MINNEAPOLIS, MINN.

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Color in Decoration*

By E. JORDAN

RUSKIN, who "could not consider architecture perfect without color," is sounder than he is usually found to be in the expression of his artistic preference, and it is the re-discovery of color in decoration and the taste for full brilliant colors that, together with the more accurate reproduction of historic styles, has marked the twentieth century as distinct from the nineteenth.

Certainly, in the middle ages in England, builders were not content with leaving their buildings grey and drab, but color decoration was universal. Romanesque and Gothic wooden ceilings, were treated with color and often partly gilt. The same taste for full color is noticeable during the early Renaissance when the principal rooms of palaces and great houses were lavishly decorated. The modern reproduction of an Elizabethan interior with a white plaster and uncolored oak wainscot, is but a pale reflection of the magnificence of great houses; and some of the few monuments in churches which preserve their original coloring give a more correct idea of the Elizabethan taste in color than an interior in which the tints have faded from the plaster, and the paint vanished from wainscot and chimney-piece.

The taste for color decoration seems to have lost ground in the first half of the seventeenth century, early Jacobean wainscot was left its natural tone, and the plaster work of the school of Inigo Jones is not colored at all. The woodwork of the latter school, to judge by the interiors at Wilton, Thorpe Hall, and Coleshill, was usually painted white, but in lesser country houses the taste for the natural surface of oak wainscot prevailed. In the later Renaissance—Wren's period—wainscot was usually left unpainted and unstained, though varieties of painting and graining are recommended by a seventeenth century author, John Smith, who gave the world an account of the "whole art of vulgar painting" in 1676. Evelyn, who ranked as a connoisseur in building, speaks of a room wainscoted with painted fir at Euston, but that did not please him so well as "Spanish oak without paint." Graining, which is a painted imitation of wood and also a painted imitation of marble, was certainly practiced, for an early eighteenth century diary speaks of a room, "painted in veins like marble; dark and white streaks." The English craftsman, however, evidently delighted in displaying the fine figure of English and Norwegian oak to the best advantage

in the large panels of the period, and color decorations such as a painted paneled room once in St. Botolph's lane, and now in Sir John Cass's Schools in Duke Street, Aldgate, is most unusual. Here the room, painted in 1696, has its large panels filled with decorative paintings and Chinese subjects and another chinoiserie hangs over the doorway; the best of the wainscot is painted light green, which as has been recognized, is the best background for paintings. Green is a color said by Wilde in his *Intentions* to have been favored by Wainewright the murderer, who "had that curious love of green which in individuals is always the sign of a subtle artistic temperament, and in nations is said to denote a laxity, if not a decadence of morals." Green has been so frequently used in decoration that it seems impossible to associate it with decadence; in the early and middle Georgian period nearly all the great houses, to judge by contemporary accounts, had a saloon or drawing-room painted olive green picked out with gold. Hogarth's famous second scene in "Marriage a la Mode" has an olive green drawing-room, and the same hue appears in a great many of his interiors and conversation pieces. The rooms at Wanstead, since destroyed, were when visited by a lady in 1756, glaringly magnificent, "more especially so as the rooms are, instead of white, painted dark olive green, but this most likely will soon be altered."

This use of color instead of the natural wood synchronized with the use of pine instead of oak for wainscot, which became the universal wood in the Georgian period. In the later years of the eighteenth century, as in France, pale colors—green, blue, and pink—were in fashion, and an innovation was Robert Adam's tinting of stucco ceilings to "take off the glare." The Empire period saw these fall into disfavor, and a heavier Etruscan or *soi-disant* Pompeian color-scheme in their stead, both in France and in England. In a room of the Empire period, as described, the ceiling is enriched with a reddish-brown rosette, while the frieze is sky blue; on the sides of the mirrors sky-blue pilasters are bordered with violet and white grape-leaves for ornament, and the light brown panels with violet borders are ornamented with green parols and cameos with blue backgrounds and white and red ornaments.

The taste for heavy—what Mr. Ruskin would call impure—colors lasted through the greater part of the Victorian period, when chocolate paint was in favor for the dining-room, passages, and dark

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rooms. The graining of wood-work was also very common. Artistic forms of graining, such as the grained maple effect of Adam's library at Nostell, were in use before the Victorian period, but this latter period was the period of graining *par excellence*.

The advantage of graining is that it lasts longer than probably any other method of treating wood-work, while it does not show finger marks to any extent. The disadvantage was that the Victorian painters restricted themselves most monotonously

to oak graining, with the result that this is to the present taste symbolical of all Victorian shams and compromises. At the present day as far as the larger houses are concerned, woodwork is now generally treated in parti-colors, that is to say a different shade (or color) is used for the panels of the door to the stiles and rails, or the enrichments, returning to the old practice are gilt, and many schemes for mural decoration are carried out entirely on the old architectural lines, but with an added note of modernity in the use of color.



HOUSE OF W. A. DUPEE, MILTON, MASS.
JAMES PURDON, ARCHITECT

(For additional illustrations see plate section)

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Steel Requirements for War Purposes

General J. J. Pershing has requisitioned practically all the surplus steel of the country for manufacture of shells and railroad rails, says the *Minneapolis Journal*.

All steel in the country must be devoted to war purposes, and manufacturers of steel articles not essential to the conduct of the war will be unable to obtain raw material unless Chairman Bernard Baruch of the War Industries Board succeeds in developing a new surplus.

General Pershing's requisition calls for 2,000,000 tons of shells and other projectiles and for 1,200,000 tons of rails and other steel products, in addition to previous requisitions. Chairman Baruch recently estimated war industries would use all but 15 per cent of the visible supply of steel this year.

General Pershing's new requisitions will take all of that margin.

Some idea of the enormous amount of metal being used for war purposes is given by the War Department estimate that 100,000,000,000 shells, containing an aggregate of 3,000,000 tons of steel, have been used by each side since the beginning of the German drive, March 21.

The additional requisition for two-thirds of that amount for shells alone is regarded as an indication that General Pershing believes the struggle on the western front has only begun. The *Journal* adds:

"It is alleged by one high Government official that the War Department has more steel to-day than it can use in three or four years. In one shipyard the Emergency Fleet Corporation has 60,000 tons, more than a year's supply. Mr. Baruch has called for an inventory of the entire stocks of steel on hand in the industries controlled by the navy, the War Department, the Shipping Board, and other Governmental agencies, with a view to readjusting the apportionment."

Chairman E. N. Hurley of the Shipping Board has recommended that the allocation of steel be regulated according to the overseas transportation facilities.

"Because of the abnormal demand for iron and steel products created by the war it has become evident that the demand far exceeds not only the present supply, but it is feared the supply that can be made available during the war," Edwin B. Parker, chairman of the Priorities Division of the War Industries Board, said recently. He admitted it probably will be necessary to cut off the supply of steel to non-war industries almost entirely.

One hundred and fifty thousand tons of steel have been allocated to the Japanese Government by the War Industries Board, completing the first step in

the reciprocal agreement entered into whereby Japan will build ships for the United States.

The steel is being rushed to seaboard for quick transportation.

Monthly Output of Steel

Iron Age estimates that the country's output of steel ingots during May was slightly less than in April; this notwithstanding the month's largely increased production of pig iron. The trade calculation is that that month's steel production is on the basis of 42,300,000 tons per annum—which, except for April, is the highest pace of the year to date, and represents nearly 90 per cent of capacity. When it is considered that production fell to a 25,000,000-ton rate at one time earlier in 1918, it may be seen how far the work has been speeded up. The *Iron Age* cites one trade estimate, based on visible requirements, that the Government will take 85 per cent of the current output. This would give some chance for private consumers, but it would mean continuance of the recent great curtailment in the use of steel for other purposes than war.

A Timely Warning

The certainty that in many localities where anthracite coal has heretofore been used exclusively there will, next winter, arise the necessity for the substitution of bituminous, makes the warning of the Fuel Administrator of Minnesota, which we print below, both timely and prudent. This warning can very well be generally extended all over the United States. Much of the hardship experienced last winter due to the shortage of coal was the result of a condition not generally foreseen.

That conditions next winter will be little, if any, better, is a foregone conclusion, and discomfort and actual menace to health will be the result of our own unwillingness to heed these warnings.

The letter of Jno. F. McGee, Minnesota State Fuel Administrator, follows:

"Inspections made by experts of the heating plants generally in the city of Minneapolis disclose that large numbers of them are improperly constructed and equipped for the economical use of coal, particularly bituminous coal. Some of these plants were able to operate with smokeless coal, but that being no longer available, changes must be made to meet the actual conditions that confront owners of such plants. The waste in Minneapolis annually, due to improper construction, equipment and firing of plants, is enormous, and, considering the present fuel conditions of the country, it be-

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comes necessary to remodel or reconstruct and re-equip all such defective heating plants. This work must be undertaken as soon as the weather will permit, and must be carried promptly to completion."

After War Problems

Industrial reconstruction after the war is occupying the minds of leading men of commerce in all the Allied countries, states *The American Artisan*. Great Britain has gone so far in recognizing the imperative nature of this matter that she already has a Minister of Reconstruction in the person of the Honorable Christopher Addison. What he has to say on the subject, therefore, may be taken to represent the trend of thought in the British Empire. The problems are essentially the same for all concerned, although there are notable variations in the economic conditions of the several nations which constitute the Allies of the European war. The Honorable Mr. Addison's comment is pertinent to America as well as to England. In substance, he declares that the war has taught and is teaching us many great lessons.

First and foremost, the war has removed some of our narrowness of vision. It has made us realize that a good many of our class prejudices are wholly artificial and harmful. It has also shown very clearly that this country has never made as much use as it ought to have made of brains; and that a few highly trained scientific men have accomplished much in supplying the armies and making them efficient and successful. We are learning that it pays to employ brains, and pay them properly. The country will never overcome the devastation of this war unless as a nation it increases its productivity.

To overcome the results of the war we need four things—better co-operation between capital and labor; better conditions of life; better training; and better industrial methods. No real progress can be made in increasing output until in some way capital and labor can get together without bitterness and suspicion for the settlement of their differences.

Increased output calls for labor co-operation. Labor's interest in an increased output must be secured. Labor must understand that it is for its best interest to discourage anything that tends to limit output; and in the increased output labor must enjoy its legitimate share of benefits. Increased output cannot be obtained without the hearty co-operation of labor, and that cannot be won if its full rights are not respected.

It is often the fear of unemployment that makes labor hostile to improved methods. We can never

expect a man to put his heart into introducing new methods that may turn him out into the streets. There must also be improved conditions of housing. Nearly every village has such a problem; and the output of food from the land is intimately associated with the housing problem. National health depends largely on how the communities solve the housing problem.

Hereafter, industrial progress, as never before, will demand a closer relation between the factory and the laboratory. There are too few well-trained experts in the country, but their number is going to be increased and a larger compensation paid. There has been too great "stand-offishness" between the business community and educational authorities. Science must be brought more and more into the industrial life. Certainly there must be a larger conception of outlet. Trade must become better organized. Germany has been able successfully to invade the British market because it organized its buying and selling on comprehensive lines.

Preparing After-the-War Construction Program

"An ounce of prevention is worth a pound of cure," says the old proverb.

Adequate foresight now may prevent a host of evils that will follow in the years to come, comments *Improvement Bulletin*. After the Civil War there was a long period of reconstruction, in which trade conditions were unsatisfactory. There are many and diverse opinions as to what will follow in the wake of this war. It would seem that intelligent co-operation would go a long way in heading off many of the evils that might come from simply blundering up to the period of reconstruction without definite planning regarding it.

A comprehensive plan for the development of the immense horsepower now going absolutely to waste in the streams of the Northwest would, no doubt, give an impetus to the industrial development of this vast region.

A campaign of education might advantageously be started at this time in the smaller, unprogressive towns, of which too many exist, where there is no sewage-disposal system, where there is lack of an adequate waterworks system, or where the streets need paving. Concerted action at this time looking forward to a definite program of public utility construction at the close of the war would undoubtedly not only be beneficial to these communities but would furnish work for the soldiers returning to the vocations of peace.

The time for these towns to consider the prob-

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lems involved in paving, waterworks, street lighting, sewage disposal, and similar essentials of modern American life, is not after the war is over. The time is NOW. Defer the work, by all means, if it is not immediately necessary to the health and comfort of the people until after the war, but "get busy" now on the preliminaries. In every such town a campaign of education is necessary before the work is done. Now is the time to build public sentiment and get the plans started. When the boys come back from France let them know that the town they are coming to will soon be a modern American town, with the utilities that every good American town should have.

Some of our trade associations may very well devote a part of their time to a thorough study of probable after-the-war conditions, with especial thought to the inauguration of a long era of prosperity immediately after the winning of the war.

Housing Conditions in England

So great is the need for new housing in England that housing plans to be put into execution after the war cannot be much further postponed. In a recent issue the *Timber Trades Journal* of London says:

"The longer the war continues the worse become the housing conditions. In spite, therefore, of the obvious objections to building under war conditions, it is quite possible that the time may arrive when a start will have to be made, irrespective of whether peace has been brought about or not. A very bad state of affairs in some of the eastern districts of London has been revealed by the report of the committee appointed by the Garden Cities and Town Planning Association. The committee expresses itself as deeply impressed with the crowding together of houses and factories in the narrow streets and with the high rate of infant mortality. In the three parishes of Stepney, Poplar and West Ham, with a population of 731,276, it is estimated that 167,911 persons are living under conditions of overcrowding, a state of affairs brought about by the great development of the dock system under the port authority. The committee adds that the housing question is likely to be a determining factor in the dock system; that additional housing accommodation is a matter of the utmost urgency; and that its consideration cannot be indefinitely delayed. Finally, definite proposals are submitted for the erection of 12,000 additional houses at once. This instance is only one among many, and if the war continues much longer England will have to imitate the example of Germany in East Prussia, and tackle this problem under war conditions.

The Sun Dial and Its Significance

DATES BACK TO BIBLICAL TIMES

To measure time by the sun's shadows, writes a contributor to *Granite, Marble and Bronze*, is the work of the sun dial. It is an instrument of very great antiquity, the earliest mention of it having been made in Isaiah XXXVIII. 8, and before clocks and watches became common it was in general use as a timekeeper.

Some investigators declare that the Egyptians and Babylonians first began to reckon time by scientific methods, but others credit the first sun dial made to mark the divisions of the day with any degree of accuracy to a Grecian philosopher who lived about 540 years before Christ.

Many passages from ancient literature have been culled by sundial historians to illustrate the estimation in which these horologes were held at different periods of their development. Epicurus regards them as "a fine invention to hinder us from forgetting to dine," while another less eminent character called upon the gods to confound the fellow who "invented hours" and doled them out so that no one could eat "until it pleaseth the sun."

The art of constructing dials to suit the place and situation was then an important branch of mathematical study; now the subject is more an object of curiosity than utility. Although men can now turn their clocks around to suit their convenience the sun dial persists in recording time by the shadows of the sun and refuses to change with modern whims and ideas.

Pyramids and obelisks seem first to have been utilized as gnomons to intercept the sunlight, and east shadows indicating the hours, a famous example being the obelisk brought to Rome from Egypt by the Emperor Augustus, and there set up surrounded by a pavement in which bronze dial lines were sunk.

The Romans placed dials on their temples, baths, town and country houses, and on their tombs; the Turks on their mosques; the Chinese set them up in every available place; ancient examples were found by early explorers in Mexico and Peru, and these, because mounted on beautiful pillars, were destroyed as savoring of idolatry.

After the seventeenth century human progress became too rapid for sun dials. Grandfathers' clocks and unnumbered millions of ticking timepieces were adopted in due time.

A modern, hustling civilization had no "further use for ancient methods of marking time," and unfortunately, sun dials were buried in the forgotten past; their construction had become almost a lost art.

Department of Architectural Engineering

Properties of Flooring Materials

THERE are so many factors that enter into the right selection of a flooring material that many are apt to be overlooked because some of them are more commonly brought to our attention, causing others not to be properly considered. The importance of selecting the right material for the particular usage it is to be put is obvious. Buildings are naturally divided into classes according to the occupancy, and this occupancy should influence the selection of the kind of flooring material to be used. The cost has a relative influence, but should be subordinate to the adequacy of the material for the specific use. The rapid changes in all matters pertaining to building construction have affected the matter of flooring materials as they have the other materials used in that industry.

The flooring materials have been considered in a group and their physical properties relatively evaluated by H. M. Hooker, C. E., in recent articles in *Building Management*. It is frankly stated that the articles are written for the primary purpose of explaining the characteristics and methods of applying composition flooring. As this is a comparatively new floor finish it will be of interest and the table of relative physical values will be of real service, whether the reader is in full agreement with all the minor details or not.

The values in the table are those given by Mr. Hooker, but the averages (item 19) are calculated by others. Before defining and explaining the properties (items 1 to 18) the relative importance of the items is given as appraised by Mr. Hooker.

This list comprehends all of the properties that would affect the value of a flooring material, and was formulated after considering fourteen standard conditions of use in restaurants, toilets, factories, hospitals, schools and residences. Such values can only be arrived at by appraisal based on experience and its attendant judgment, and no two lists would agree in detail, but this list offers a working basis for the thoughtful appraiser.

Relative Importance of Floor Material Properties

1 Acid resistance.....	12
2 Alkali resistance.....	12
3 Appearance	70
4 Crushing strength	13
5 Durability	56
6 Elasticity	33
7 Fire resistance	42
8 Lightness (weight)	1
9 Non-abrasion	79
10 Non-expansion	5
11 Non-slipping	72
12 Plasticity	60
13 Quiet	79
14 Resilience	77
15 Sanitary	96
16 Structural strength	13
17 Thermal insulation	57
18 Waterproof	62

In the study of the nineteen flooring materials the writer used recognized data wherever available, drawing on such sources as the manuals of Box, Merriman, Trautwine, Rankine, Kent and Thurston, the Smithsonian Physical Tables, transactions of the American Society for Testing Materials, and such data as could be procured from the U. S. Bureau of Standards. The above sources were lacking in many respects, and the writer resorted to private tests and appraisal for supplementary information.

Definitions and comment on the properties of the materials are made by the writer and presented in the order given in the table.

1—Acid resistance. The values are based on resistance to a concentrated solution of acid, and no one of the materials is immune from its attack. In places where strong acid solutions reach the floor, clay tile or paving brick are the most desirable. These instances are infrequent and the resistance to acid is generally limited to occasional contact with dilute solutions, and under these conditions

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composition flooring would meet with the requirements.

2—Alkali resistance. For normal usage it appears that all the materials, except one, are practically immune against the attack of alkali solutions. Composition flooring can be washed with the usual soap, lye or other floor washing compounds, but is not entirely immune from its effects.

3—Appearance. The rating for composition flooring is based upon single color composition work. The recent advances made in this respect

Marble, tile and mosaic are known to withstand usage of more than 1000 years, but composition flooring will outlive the usefulness of the building in which it is installed, except in the rare instances of certain monumental buildings. In general, composition flooring may be considered immune from the feebleness of old age.

6—Elasticity. Rubber tile and linoleum are naturally the most elastic of flooring materials, with composition flooring about midway between them and clay tile and like floors.

PROPERTIES OF FLOORING MATERIALS

Properties	Materials															
	Asphalt	Clay Tile	Common Brick	Composition	Concrete	Cork Tile	Face Brick	Limestone	Linoleum	Maple	Marble	Mosaic	Oak	Paving Brick	Rubber Tile	Slate
1 Acid resistance.....	50	100	80	10	50	30	90	30	25	30	30	90	33	100	0	40
2 Alkali resistance.....	50	100	95	10	70	80	95	95	0	90	95	100	90	100	10	95
3 Appearance.....	0	85	0	80	45	85	40	20	75	90	100	85	95	30	80	40
4 Crushing strength.....	9	50	31	40	30	2	47	74	2	14	100	40	15	79	0	74
5 Durability.....	5	100	60	70	90	50	70	98	5	50	100	100	50	100	0	99
6 Elasticity.....	60	5	0	50	1	70	1	3	100	90	3	5	90	5	100	3
7 Fire resistance.....	0	100	100	100	100	0	100	100	0	0	100	100	0	100	0	100
8 Lightness (weight).....	32	20	32	53	32	100	27	6	71	83	6	30	81	16	32	0
9 Non-abrasion.....	95	40	0	100	10	95	5	12	100	95	20	40	95	30	30	20
10 Non-expansion.....	0	50	56	70	0	98	56	45	90	96	45	50	100	54	0	32
11 Non-slipping.....	100	30	100	100	70	100	90	98	100	50	100*	0	50	30	100	99
12 Plasticity.....	30	4	0	50	1	95	1	3	100	95	3	4	95	4	100	3
13 Quiet.....	75	5	10	75	5	100	7	6	96	50	6	5	50	5	98	6
14 Resilience.....	40	4	0	90	1	100	1	3	100	90	3	4	90	4	95	3
15 Sanitary.....	70	75	6	100	90	40	25	50	70	35	85	75	35	50	0	60
16 Structural strength.....	1	25	6	30	5	3	7	20	0	60	20	4	56	8	0	20
17 Thermal insulation.....	60	0	10	98	5	100	8	5	...	90	5	0	90	0	90	5
18 Waterproof.....	100	90	0	90	100	25	5	90	50	25	90	90	25	10	0	95
19 Averages.....	43	49	32	67	39	68	37	42	58	63	50	46	63	40	41	44

*Unpolished.

warrant the rating on that basis. Where variety of color or patterns is desired, such effects cannot be secured by this material.

4—Crushing strength. This property is very seldom a flooring requisite, as excessive still loads would be placed on the floor substructure and a floor finish would only be subjected to crushing stress by a moving load, such as a heavily loaded truck. Disintegration from this stress should not be confounded with the effect of abrasion.

5—Durability. Durability is defined as resistance to the effect of time rather than resistance to mechanical treatment. The effect of time, in this case, is limited to the result of temperature and humidity changes and decay of the flooring struc-

7—Fire resistance. All materials are subject to damage under fire conditions, and in this rating those given 100 points are those that are incom-
 bustible. Composition flooring will withstand a temperature of 1700 degrees Fahr., be chilled and reheated without being destroyed. Of all the comfortable, elastic floor materials, it is the one that is fire-resisting.

8—Lightness (weight). Composition flooring is the least in weight of the fire-resisting materials. It weighs slightly more than wood and much less than concrete.

9—Non-abrasion. The dust of abrasion creates a serious objection to the use of many materials for certain occupancies. It damages the things on

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which it falls, affects the durability of machinery and is unhealthful; it accompanies the destruction of the flooring from which it is abraded. Toughness is an element which prevents abrasion and is possessed by linoleum and composition flooring to a high degree.

10—Non-expansion. As the difference in expansion between hard floor materials and their foundations under ordinary temperature changes is very little, this factor has but small influence on the value of flooring materials.

11—Non-slipping. Immunity from being slippery under all conditions is a most important factor in a flooring material, as it bears directly on safety to life. There are a vast number of accidents and considerable loss of life due to slippery floors and stair platforms and treads.

12—Plasticity. (In this case the term flexibility represents the property more correctly.) When buildings settle unevenly the floor assumes a warped surface, and the property of flexibility in a flooring material prevents cracks, as it permits the material to assume a new position without disruption. Linoleum, cork and rubber tile and wood are ideal in this respect, while clay tile, terrazzo and mosaic are the opposite. Composition flooring is midway between the two classes and will properly adjust itself to normal settlement warping.

13—Quiet. Quietness is an essential property in many occupancies, and composition flooring possesses this quality to a marked degree.

14—Resilience. That characteristic of a flooring material, by virtue of which it recovers when put to work when a load has been placed on it, has much to do with the fatigue of the foot traveler over its surface. Resilience is desirable and is a most pleasing feature that a floor can possess. For restaurants, offices, factories and places where people are forced to stand for hours it is a cash asset. Rubber, cork or linoleum may be slightly more tiring than composition flooring, as their greater softness offers more frictional resistance to the feet. Composition has a well-balanced measure of resilience and hardness.

15—Sanitary. A floor free from cracks and construction joints and with a low degree of absorption is a sanitary floor because it can be kept clean. Composition flooring is installed in a plastic condition and admits of placing the floor, base and wainscoting in a monolithic mass and obviating the construction joints common to other floors, except concrete.

16—Structural strength. The resistance to rupture by bending is not an essential to flooring materials, but the strong adhesion between composition flooring and its base causes them to act

together, and thus it adds to the strength of the total floor construction.

17—Thermal insulation. Owing to the presence of air cells to a marked degree, cork possesses the best insulating value of any flooring material. This property has no especial value, as the transmission of heat through floors is not common to buildings having properly designed and operated heating plants.

18—Waterproof. Two factors determine the waterproof quality of a floor, and they are the porous or absorbent character of the material itself and the joints or seams which, as usually installed, permit the passage of liquids through them. Composition flooring is practically non-absorbent, considered as a floor.

The rate of absorption is as follows:

½ hour immersion.....	0.5 per cent
2 hours' immersion.....	1.1 " "
24 hours' immersion.....	1.4 " "
48 hours' immersion.....	1.9 " "

Under constant immersion there is a gradual softening of the regular commercial composition which disqualifies it for swimming pools and other places of continuous wetness. If the material is intermittently dried there is no deterioration. It may be used in places which are wet at intervals as in the case of showers, bath and toilet rooms. Its jointless character is a great advantage in these places.

The averages given are of no particular value, owing to the little general importance of many of the properties. This is instanced in the case of white and yellow pine. The added wearing value of an edge grain yellow pine far exceeds any flooring merit white pine may possess except for light usage when exposed to the weather.

Material	Price per sq. ft.	
	1,000 sq. ft.	10,000 sq. ft.
Marble	1.25	1.00
Cork tile	.85	.75
Rubber tile	.60	.50
Clay, tile, ceramic, encaustic.....	.60	.50
Mosaic tile	.60	.50
Slate	.50	.45
Terrazzo	.40	.35
Composition flooring	.33	.25
Wood, hard maple (no fill).....	.18	.16
Asphalt	.25	.15
Linoleum	.12	.10
Cement finish	.08	.06

The cost of floors varies with the area to be covered; the larger the installation the lower the

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cost per square foot. On a concrete foundation the cost of composition and wood flooring is about the same, as the former can generally be set off against the cost of wood sleepers, cinder concrete fill and the hardwood flooring. Mr. Hooker gives the above comparative costs under conditions of 1912, based on areas of 1000 square feet and ten times that area:

Composition flooring involves chemical mixtures and reactions both in the manufacture of the materials and in the process of installation. The best results require a nice adjustment of many factors. On the surface it may appear that the engineer, architect or owner is free to follow the same practice as when specifying Portland cement concrete. With the concrete he will specify Portland cement, sand and aggregate, each to conform to certain established standards. He will specify a standardized mixture and with honest workmanship the resulting concrete will answer his purposes. Even though one batch of material contains a little too much sand and another is a little deficient in cement, ordinarily no serious damage results to the finished work, as he has a factor of safety between him and trouble. He is also protected by the fact that the Portland cement, the material which might give him the most trouble, has been manufactured in a standardized plant under careful chemical supervision with direct reference to passing certain established tests and previous to use these tests have been applied.

With composition flooring, however, he is in quite a different situation. The materials are manufactured and delivered to his job subject to no standard tests. Proper preparation of foundation, mixing of materials and installation, each requires far greater knowledge and accuracy in proportioning and skill in finishing than is required with concrete. Under certain conditions the foundation should have a priming coat which would be harmful under others. An excess of chloride will cause a bloom, or efflorescence, on the finished work. Insufficient chloride will weaken the product materially. A temperature of 50 deg. or a temperature of 90 deg. at the place of installation calls for different methods in application. Troweling is a nice art in which both time and method have much to do with the appearance and durability of the finished floor. If, however, all of the steps of the process from the raw material are intelligently carried through according to known and definite procedure, the resulting product will be durable, attractive and a source of permanent satisfaction. For these reasons the architect or engineer will designate the material of that manufacturer, or of those manufacturers, which he knows from investigation is of a sufficiently high standard. He may, of course, often-

times with wisdom, add the words "or equal," in order to secure wide competition. He should never do this, however, unless he is prepared to investigate products before unknown to him that may be offered at lower figures than the known. He should always require the manufacturer to lay his own material and to guarantee it for at least one year against cracking, chipping or other structural defects in the composition flooring.

This material may be laid upon wood, concrete, iron or steel foundations. It cannot be laid directly upon plaster, King's Windsor cement, adamant plaster, plaster board, brick or terra cotta.

It may be laid upon new or old wood floors. The wood flooring should be well seasoned, not over six inches wide and not less than seven-eighths of an inch thick. It must be securely face-nailed to each under beam. Where possible this underflooring should be laid rough side up. It must be such that it will not sag under the load for which the floor is intended. The best practice is to apply expanded metal lath, about 27 gauge, or similar reinforcement on all wooden foundations. Some concerns, however, omit the metal reinforcement under certain conditions. The omission cuts the cost only about 1.57 cents per square foot. The added protection from its presence more than offsets this saving. Whatever slow chemical reactions may be set up between the metal and the material are so unimportant as to be negligible.

The foundation, when of concrete, should be of a fairly rich mixture composed of Portland cement, clean, sharp sand and an aggregate of steam cinders, gravel or broken stone in a proportion not weaker than 1:3:5. It is important that the mortar which flushes to and near the surface under tamping be not less than 1:3. Otherwise, while the composition will adhere firmly to it, there is danger of cleavage in the concrete just below its plane of contact with the composition. A rough wood float finish is desirable. The concrete should be thoroughly set and dry before the composition is applied.

Iron and steel foundations should be rough finished and unpainted.

The materials to be used in the case of any high-grade floor are prepared at a factory and delivered to the job in two units, the magnesium chloride and the dry mixture.

The magnesium chloride is furnished either in concentrated solution or as a solid salt. In either case enough water is added to bring it down to the proper strength, 21 to 22 deg. Beaumé, where the temperature at the place of installation is around 70 deg. Fahr.

The dry mixture is a mixture of all other ingredients. Where two coats are used, and two coats

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is the best practice, the material for each coat is separate. Where more than one color is desired, the material for each color is separate and no coloring is done on the job.

In winter it is necessary to have artificial heat where the material is being installed so that a temperature of from 50 to 70 deg. Fahr. may be maintained. At much below the former temperature the chemical reactions which take place in setting will not go forward. When there is difficulty in maintaining at least 50 deg. Fahr. an increase in the strength of the chloride solution one or two degrees Beaumé will help, as it hastens the reactions. It is never wise, however, to raise the strength above 24 deg.

Just before applying the regular flooring material the foundation, whether of wood, concrete or metal, should be wet down with the chloride solution as above prepared. The powdered material should be mixed thoroughly with the solution until the mass is pasty like mortar plaster. It should be laid at once, and where possible all of the floor to be installed at one time should be mixed in one lot to secure an even set and the best results under the trowel. When darbying off fresh material to make it even and level, care should be taken to avoid tearing open the surface. The trowel should be applied when some setting is noticed under the pressure of the thumb. The surface should then be brought to an absolutely even level, the trowel being kept as flat as possible, so that under the final troweling later, when the floor is harder, every particle of the floor surface will be touched by the trowel. The second, and usually the final, troweling should be given when the floor surface gives a slight ring when tapped with the trowel. If troweled when too soft, the surface may not be perfectly sealed and there is danger of efflorescence, or bloom; if when too hard, uneven coloring may result. Generally speaking, however, the harder the surface under the final troweling the more compact and smooth the surface of the floor. Final troweling should be done in one direction only. The finish has been a subject of much study and experiment. Owing to the uneven results of inexpert troweling, various auxiliary methods have been tried to secure an even, uniform surface. Resort has been had to the scraping and tooling customary with hardwood floors. This has given an even, fine looking floor at the time of finishing. Grinding and burnishing along lines followed in the treatment of terrazzo have fully attained the immediate end sought. In both

the above practices the floor is afterwards gone over with a trowel and an effort made to close and seal the surface. These processes, unfortunately, remove the "fat," or fine material drawn to the surface under previous troweling, and leave a much less perfect seal against the rising of the salts from the material and discoloring, and against the absorption of moisture into the material. Much the best practice is to finish with trowel only. The expert mechanic will deliver a surface that has all of the smoothness and evenness of the scraped or burnished finish. Burnishing and scraping are destructive makeshift methods used to take the place of expert troweling.

The flooring will usually take its initial set in from four to six hours. Travel should be kept from it for seventy-two hours, though it will stand careful walking after thirty-six hours. Where other construction must go forward over new work, as is sometimes the case in new buildings, the composition flooring should be protected with sawdust, fine shavings or building paper. The best coating is one-half inch of sawdust or fine shavings. Wherever possible this flooring should be the last material installed.

Composition flooring as regards the wisdom of after-care is like wood flooring. It may be left permanently untouched by any dressing and the result is a durable wearing surface. This is prevailing practice. If, however, at intervals of a few months, it is gone over with an inexpensive mixture of oil and wax that can be secured from any flooring manufacturer, its beauty is greatly enhanced and its life prolonged. Four parts linseed oil to one part kerosene makes a fair dressing.

Linoleum as usually installed does not wear out from above, except when frequently washed with a strong lye. It gives out through the rotting of the web or matrix on the bottom. The oxidized oil and fine cork which constitute the wearing surface are deposited on one side only of this matrix. After the linoleum is laid the moisture and foreign substances which accumulate in some measure beneath it, together with the air, cause a gradual destruction of this fibrous base. In the case of cement concrete the abrasive action of the concrete surface is also destructive. Where the linoleum is laid over a composition flooring base, and cemented to it, the life of the matrix is indefinitely prolonged and the linoleum may be expected to last until worn through from above. At the same time a warmer and more comfortable floor is secured.

Shoring and Replacing Columns Under a 15-Story Office Building

THE shoring up of a structure during the removal and replacement of important supporting members is an undertaking that demands careful designing and execution. The importance

on Euclid Avenue, with a depth of about 233 ft. extending through to Vincent Street. Occupying the Euclid Avenue frontage of this property and with a depth of 61 ft. 10 in. was the former New England Building, a fifteen-story structure exclu-

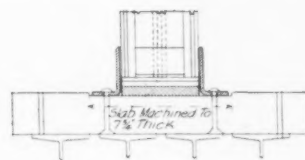


NEW GUARDIAN BUILDING, CLEVELAND

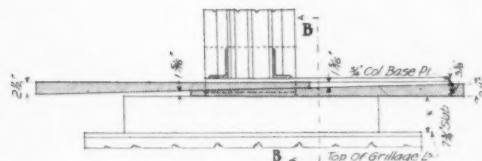
View from Vincent Street

of these undertakings is apt to be under-estimated by many persons because the work is generally so located as not to be easily accessible and is often accomplished without being seen except by those directly interested. The changes recently made in the former New England Building, now incorporated in the New Guardian Building, Cleveland, included some very interesting work of this kind.

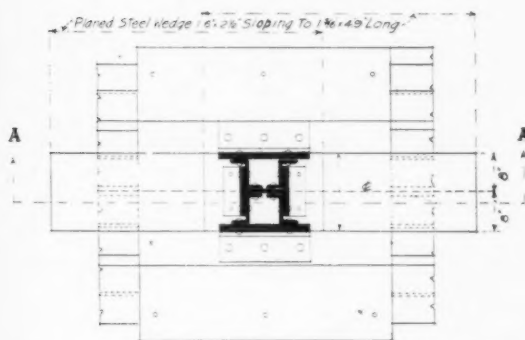
The property acquired by the Guardian Savings and Trust Company has a frontage of 129 ft. 3 in.



Section on line B B



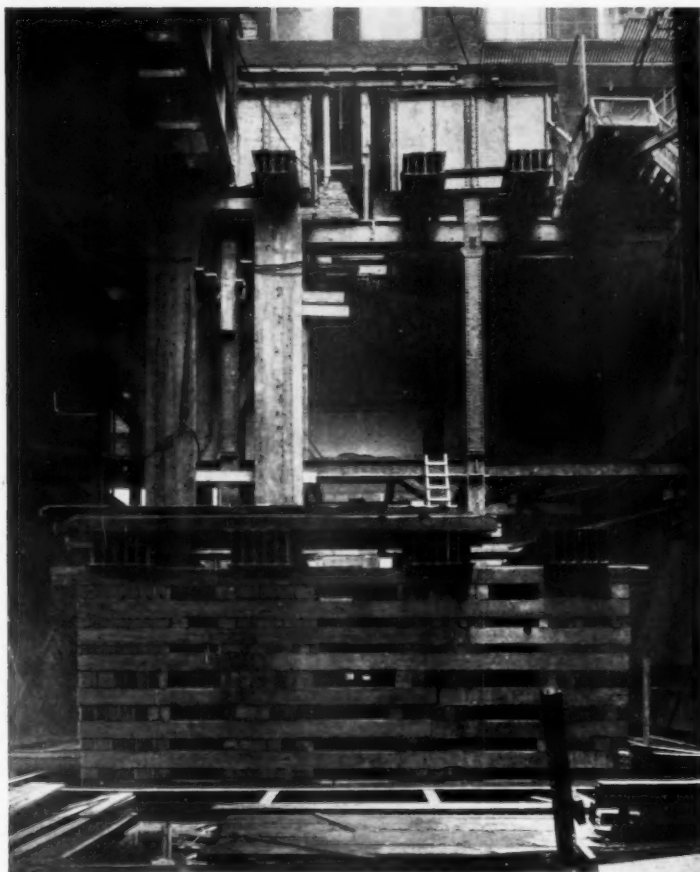
Section on line A A



Plan of column base showing steel wedges in position for driving

DETAIL OF STEEL WEDGES

sive of basement and attic, with a height of coping above the curb of 216 ft. This building was constructed with a steel frame, flat hollow tile arches, stone front and brick end and rear walls. Of the thirty-two columns in the structure, twenty-four (Nos. 5 to 28 inclusive) were 15 in. square cast iron columns from the footings to the second floor, a distance of about 36 ft. From this point to the roof they were of the "Z" bar and plate section. The columns in the side walls (Nos. 1 to 4 inclusive and 29 to 32 inclusive) were steel the full height. The reason for this peculiar combination seems to



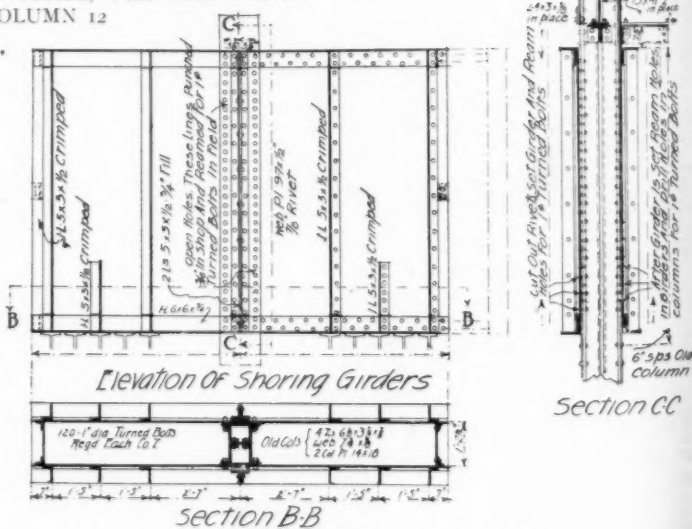
SHORING GIRDERS AND CRIBS IN PLACE, VERTICAL DRUMS
IN PLACE AT COLUMN 12

have been that the designers of the building had greater confidence in cast iron than in steel for carrying the heavier loads.

The plans for the partially remodeled and extended building necessitated the removal of the old second floor at columns No. 8 and No. 12, which would leave them unsupported for a height of 30 ft. above the first floor, with the joint between the steel and the cast iron column coming near the center of the unsupported length. Also column No. 12 receives at the third floor the reaction of a new girder carrying the new adjoining column No. 12A, which supports the corner of the new office build-

ing above. The new basement floor is 4 ft. lower than the old basement, and a portion of the old basement was lowered to provide for an ante-room to the new deposit vaults. This made it necessary to lower the footings of columns No. 8 and No. 12. The problem then was to replace the old foundations with new ones at a lower level; to remove the cast iron columns in the basement and first stories and replace them with new steel columns, the shaft of which would extend from new footings to old steel column at the second floor and with cover plates extending from the footings to the third floor; to remove the old cover plates from the second-story columns to permit the new cover plates to be installed.

The deposit vault was constructed in the new portion of the basement before the alterations and shoring of the existing building were started, and owing to its proximity this vault had to be incorporated into the shoring design. The shoring loads given

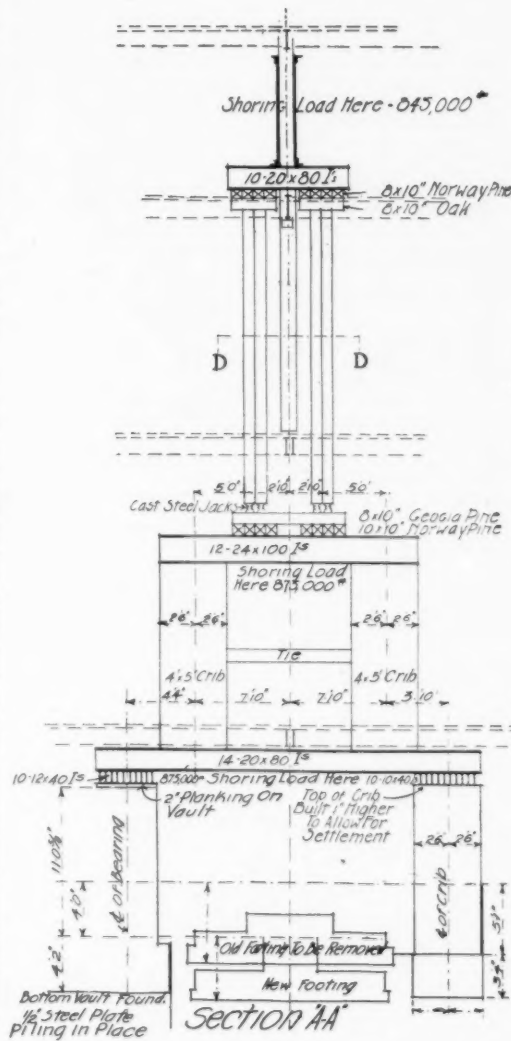
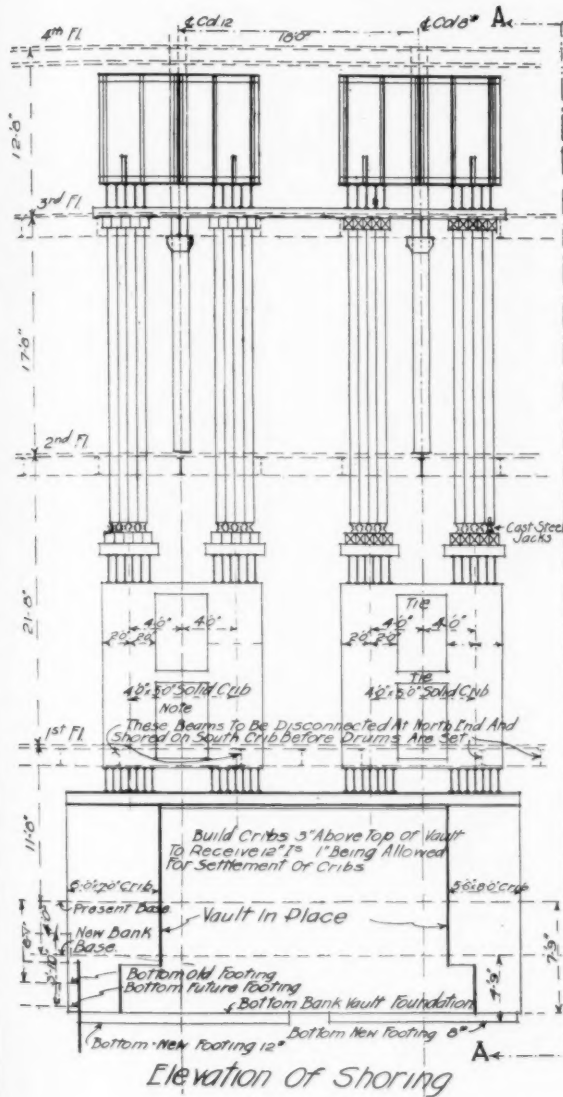


DETAILS OF SHORING GIRDERS

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include all dead loads and the full live loads, for which the original building was designed, from the fourth floor and above. The shoring load on column No. 12 was 845,000 pounds and for No.

for shear in turned bolts, and 280 for crushing yellow pine blocking perpendicular to the grain. The maximum load on each vertical drum was 9000 pounds, and these were arranged as shown, so that



DETAILS OF SHORING, NEW GUARDIAN BUILDING, CLEVELAND

8 it was 820,000 pounds, and the final foundation loads were 1,450,000 and 1,033,000 pounds respectively.

The working stresses, in pounds per square inch, used in designing this shoring were 12,000 for extreme fiber stress in steel girders and beams, 9000

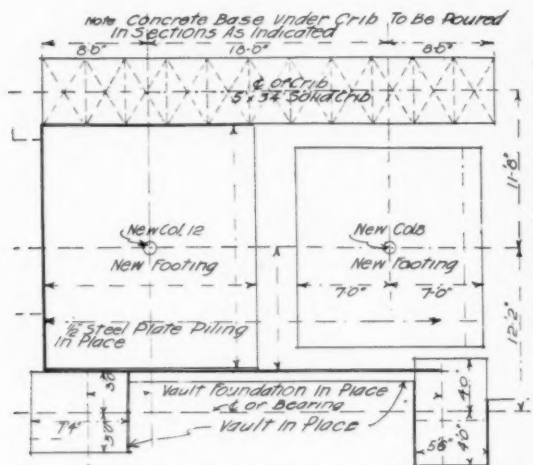
the steel jack screw in the base of each could be easily turned. The temporary concrete footings under the cribs were designed for a maximum load on the soil of 5000 pounds per square foot.

The column load was transferred to the shoring by attaching to each column two shoring girders.

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These girders were 12 ft. long and 8 ft. high with a $97 \times \frac{1}{2}$ in. web, single $6 \times 6 \times \frac{3}{4}$ flange angles and $5 \times 3 \times \frac{1}{2}$ crimped stiffener angles disposed as shown.

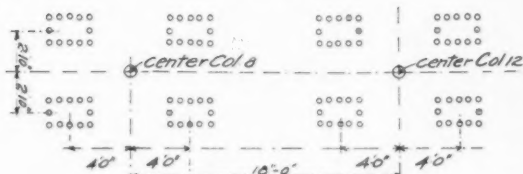
The open holes in the girders, sixty in each, were punched with $\frac{13}{16}$ -in. holes and when in place reamed through the column flange for 1-in. turned bolts at column 8 and for 1-in. rivets at column 12. One girder was set and connected complete before the rivets in the opposite column cover plate were cut out.



Plan of Footing & Cribbs

NEW GUARDIAN BUILDING, CLEVELAND

Details of shoring



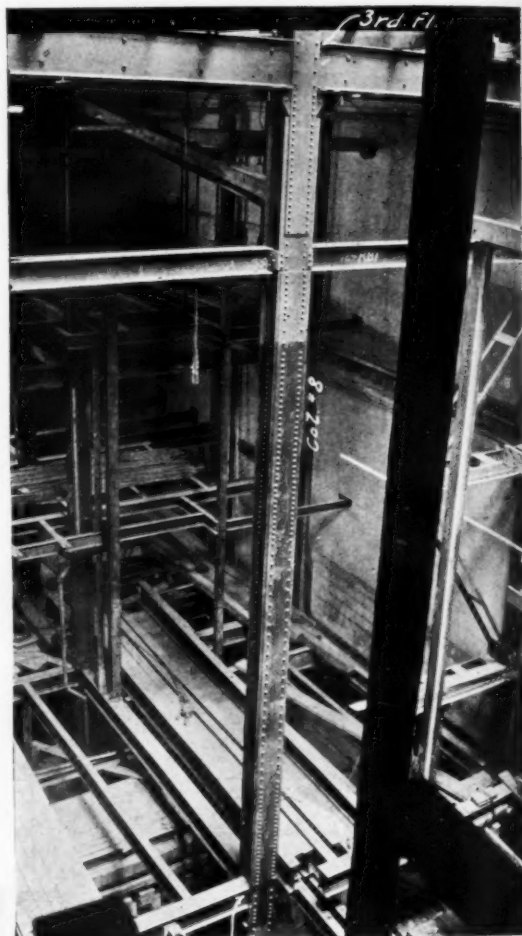
SECTION ON LINE D D

Arrangement of vertical drums

These girders were left attached to column No. 12 and the portions extending beyond the column cut off by an acetylene torch. When the shoring was completed, the girders at column No. 8 were removed and rivets driven in all holes in the column. These shoring girders were supported on a structure consisting of steel beams, wood blocking, vertical drums and temporary concrete foundations as shown.

When the load was transferred to the shoring by raising the column $\frac{3}{32}$ inch, the cribbing, blocking

and soil under the temporary footings compressed all told about 3 in., which was continuously taken up by the steel jacks until no movement occurred. The old cast-iron columns were removed and the new footings and columns installed and fixed in place. When the foundation was in condition to take the load, planed steel wedges were set as detailed and the load transferred from the shoring to the columns by lowering the jacks. The total



VIEW OF COLUMN 8 FROM FIRST TO THIRD FLOORS AS RECONSTRUCTED

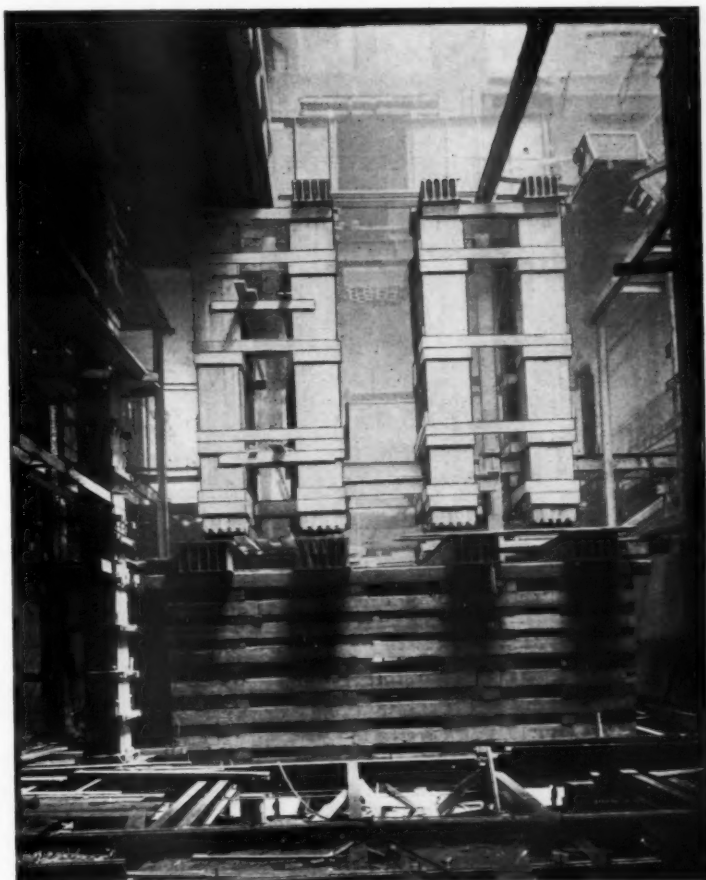
settlement of the foundations was $\frac{5}{8}$ in., which was taken up by driving the wedges home with steel jack screws, the main shoring jacks being temporarily raised when the wedge jacks were being operated. When a condition of stability was secured the shoring was removed.

During the progress of this work the basement.

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first and second stories, and the rooms adjoining columns Nos. 8 and 12 in the third story, were vacated; otherwise, the entrance to the elevators and the balance of the building was operated and occupied as usual. The adding to and transforming of

this building into the New Guardian Building was done by Walker & Weeks, architects, and the shoring was designed and supervised by Mr. T. J. Bryson, engineer for the architects. This work was directed and done by Mr. Andrew T. Knudson.



SHORING GIRDERS, CRIBS AND VERTICAL DRUMS IN PLACE.
LOWER PART OF COLUMN 12 REMOVED

Industrial Information

Zinc in Paint

A constructive booklet, pointing out the uses of zinc in paint, is published by the New Jersey Zinc Company, 55 Wall Street, New York. The properties of paint, of zinc, of zinc in paint, are all discussed. There is a section of helpful painting suggestions, covering, among other things the painting of exterior and interior woodwork, seaside buildings, farm buildings, metal, concrete, boats, etc. "Where and How to Get Zinc Paints" is the last topic discussed. The bulletin states that the company has compiled and will send on request a list of the manufacturers using adequate zinc in their plants. A list of the manufacturers selling pure zinc in form for painters' use is also available.

Vitrolite

Vitrolite is a manufactured material that is particularly well adapted for use for toilet partitions, wainscoting, and wall surfacing, and for table tops and counters as well. It is an impervious structural material, meeting the most exacting demands for sanitation and being easily available for construction in units of desired sizes. It is manufactured by The Vitrolite Company, Chamber of Commerce Building, Chicago, Ill.

Technically speaking, Vitrolite is the product of the fusion at 3000° Fahrenheit, of Sand, Feldspar, Fluorspar, Kyrolith, Silica, and several other natural ingredients, which, in passing from a fluid state to that of a solid, become homogeneous in substance, impermeable to the absorption of foreign matter and acid-resisting. It is manufactured in the form of large slabs of various thicknesses which are subjected to a thorough process of annealing, making them tough, with great tensile strength and surface wearing qualities. Vitrolite may be had in slabs up to 50 in. in width and 10 ft. in length and in thicknesses of 5/16 in., 7/16 in., 1/2 in., 9/16 in., 5/8 in., 3/4 in., 7/8 in. and 1 in.

The Vitrolite Company is so organized that it has operating construction shops in the principal cities of the country, with crews of trained specialists who are thoroughly experienced in the handling and installation of Vitrolite. Vitrolite is attached

to walls and ceilings with Vitro cement, which is plastic, and although holding the Vitrolite securely allows for readjustments due to settling.

New Enclosed Motor Starter

The Cutler-Hammer Mfg. Company, Milwaukee, Wis., manufacturers of electric controlling devices, has recently issued a bulletin—No. 9116—describing their new starter for A. C. Squirrel Cage motors. This device, which is entirely enclosed, protects man power and machinery. The operating lever is outside of the enclosing case. The company states, in connection with the safety features of this instrument: "It will be noted that the fuses are not in circuit during the 'starting' period, but are inserted automatically during the running of the motors. This makes unnecessary the dangerous practice of using fuses so large that they will not blow when starting, but which unfortunately are too large to protect the windings of the motors during their running. This practice often results in burning out of a motor, due to inadequate fuse protection or to the blowing of one fuse and allowing the motor to carry its full load on one phase. The fuses provided with the 9116 Starter are of such a size as to prevent single phase operation of a polyphase motor under loaded conditions.

"This new 9116 enclosed starter, therefore, provides not only a safety feature in the factory where many workmen are employed, but also prevents damage to the motor."

"Building More Comfort Into the Farm Home"

The Beaver Board Company, Buffalo, N. Y., has published a booklet showing how advantageously Beaver Board can be used in the country home. It is pointed out that a man can easily transform his home by his own efforts, through the use of this material. Its value in the new home and for various particular usages is also shown. Some details of construction are presented in this booklet, and it is stated that free plans and descriptive matter will be sent upon request.