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A Study of the Architectural and Building Fields

THE year 1917 will long be notable in construction circles for the many conditions that have had to be met and overcome in order to prevent a general failure in all lines of economic effort.

The cost of materials, not only those used in structural work but in every phase of the daily life of our citizens, has increased to such an extent that it has become a vital question as to what will be the final outcome, even though it is undoubtedly true that the earning power of most real estate improvements has increased to a still greater degree. In the trail of this increased cost, and in a measure caused by it, have come problems of transportation. It has become almost impossible to secure the delivery of materials available in one section of the country to another where they are urgently needed. A part of this difficulty arises from the fact that, owing to unwise and in some instances hostile legislation, transportation companies have been compelled, through lack of funds and the inability to float additional securities, to curtail their upkeep outlay. The result has been that when the extraordinary demands of war conditions came they were utterly unable, either in truckage or rolling stock, to meet them successfully, and a period of confusion has ensued which has almost paralyzed all activities involving any but the most vital necessities. It is not necessary to enlarge on the situation which has existed during the past year. The near-impossibility of securing the delivery of materials has become a thing of the past, assuming that the government control of the railroads will be free from small political considerations, and will deal equitably with all phases of this industrial congestion. The trust laws which previously militated against easy movement of transportation are of no force now, and this removal of legal barriers should in itself be of great assistance in relieving the situation.

A second element which has made for increased difficulties is the extreme shortage of labor of all kinds, both skilled and unskilled. Owing to the recall of many aliens to their native lands to serve with their colors, and the further depletion of the labor ranks through the volunteer and draft service in this country, we are confronted, just at a time when it is most needed, with a scarcity of labor that threatens the very continuance of activities in every direction.

The demand for large contributions to patriotic societies and for Government loans of immense

> *"UNEMPLOYMENT and closed factories, brought about through fitful and ill-advised campaigns for public and private economy, will prove a veritable foundation of quicksand for the serious work we have at hand.*
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> *"We need prosperity in war time even more than when we are at peace. Business depressions are always bad, but doubly so when we have a fight on our hands.*
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> *"No radically new conditions confront us. State activities, road building, public works, private industries, all must go on as before. Business must be increased, labor employed and the country kept going strongly ahead as a successful economic machine. We must have successful industries if successful tax levies are to be raised."—Advisory Commission, Council of National Defense.*

proportions have so complicated the financial situation that a readjustment has been necessary, and it is this readjustment which has produced a state of confusion and hesitancy on the part of capital that has, and will for some time yet, require very careful management before it can be overcome.

All of these governing and conflicting elements make the task of analyzing their effects on the construction work of the country a most difficult one and render it almost impossible to prognosticate the future with any degree of certainty. In undertaking to write this review THE AMERICAN ARCHITECT has thoroughly studied conditions as they were found throughout the country by its representatives, and in addition has obtained letters from representative architects, contracting firms and material men.

A study of the building situation during the past year reveals much that is gratifying. While it is generally believed that construction work has been almost entirely stopped, the contrary is true. As estimated in dollars and cents the sum total for the first ten months shows that the net decrease has not exceeded 35 to 40 per cent, the difference being, as noted elsewhere in this issue, that instead of the expenditure being made for monumental works, skyscrapers and speculative projects, it has been transferred to the industrial field. Factories all over the country and in all lines of endeavor have been doubled and tripled in size. Numerous new ones have also been constructed, and many of them are in entirely new localities where there had been no activity previously. Never in the history of the nation has there been such a shifting of the industrial population as has occurred during the past twelve months. As a consequence the demand for housing facilities has far exceeded the supply, although almost a continuous erection of such buildings has been in progress, and there is to-day a housing project under way for one concern in the vicinity of New York which involves 3000 in one undertaking and 1500 in another.

With this brief discussion of the various reasons for the lack of activity in construction work during the past year we can now turn to see what may be in prospect for the coming year. While it would be too much to expect that conditions would return to normal, or even near it at once, there does not seem to be any reason for a pessimistic view of the situation. Already, owing to Government price fixing, steel and cast iron products are beginning to show a decrease in cost. The order books for November of one of the big steel-producing companies are more nearly clear of unfilled orders than they were at the end of last month by about a million tons, and nearly 50 per cent below the same books a year ago. This means that if the reduction continues, and there is no reason to doubt that it will, in a very few months this company and probably others must increase their orders, and, as supply and demand always control prices, a still further reduction may be possible. This is stated with no idea that the prices of any construction material will reach their former low level in many years to come, perhaps never again, but simply to show that the end of the period of readjustment earlier referred to is becoming apparent. This movement in one branch of construction will no doubt be followed more or less by similar ones in other branches, and a normal, basic level will be established of a more stable character, which will hold for some years to come.

The Government is every day entering into large contracts for almost every kind of manufactured material, and this means in many instances increase of factory accommodations, so that industrial building, great as it has been in the past year, must continue to grow during the coming one. These contracts, with others for foodstuffs and farm products, mean the outpouring of immense sums of money. This money obviously will be reinvested, and there is no reason to doubt that a large part of this will flow into building channels. It is not as though this money were to be locked up in vaults and lie idle. It will be put into circulation again at once, and not less than 80 per cent of it will be expended in this country itself. This certainly gives a good basis for the belief that it is not so much the lack of money in the country as it is the unsettled panicky fear that pervades everywhere which has brought about this period of stagnation.

Since this is true, there should be no reason to doubt that there will soon be a revival of construction in all directions. It is the opinion of architects and people in the building trades that it is not so much the actual high cost of materials which retards construction as it is the instability of prices, which prevents an accurate estimate of costs, of necessarily first interest both to the investor and to the contractor.

This is already apparent, for within the past two months or so several projects that have been held in abeyance for the past year are again being put under way. Rents, particularly in the large centers of population, have advanced, and the demand still exceeds the supply, so that with more careful planning and more economical construction methods, with less attention given to frills and ornamentation and more to necessities, building for investment should once more come to the front.

There is one unknown element in the equation which unless wisely handled may upset all calculation. That is Government action as to what shall be designated "essential" and what "non-essential" industries. This may prolong the period of read-

justment. Canada, England and France have already had to meet a similar question to a greater degree than we have, for there the scarcity of man power affected even the output of munitions of war.

A glance at how they relieved the situation may be enlightening and of service to us.

It would be a source of astonishment to anyone not familiar with what has been done to go through the various plants in all of those countries and see what has been done by women. This is true not alone in the lighter tasks in factories, stores, etc., but in the heavier ones which it would never have been thought possible for them to perform. They have taken the places of the men, and are not only doing the work but are doing it most successfully. What they have done we can do. We none of us realize our powers until we are forced by necessity to exercise them to their fullest extent.

Turning now from the material side of the question to the esthetic, we do not find so bright a prospect. But even here pessimism seems out of place. In the foregoing portion of this article it has been endeavored to show, by indications of improvement both in price situation and in the possibilities of obtaining materials, that the coming year should bring at least a healthy revival of construction work and a consequent demand for the services of the architect.

> *"WE have hysterical demands for economy in every line. Some municipalities are stopping road building and other public work. Waste is bad, but indiscriminating economy is worse."*
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> *—Howard E. Coffin.*
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> *"Paris has not suspended public building operations because of the war. Neither has Berlin. Let there be no havoc in the building trade. To put a ban on legitimate public building projects is to sow disorder and unrest."* *—Chicago Tribune.*

Nor can the period of quiet in the architectural field be looked upon as without any redeeming features. As a nation we have been tending every year to increase our speed at the expense of our judgment, not only in situations where haste was required, but also in matters where that quality was not only unnecessary, but even detrimental. It is axiomatic that haste makes for waste, and this has nowhere been more strongly confirmed than in the line of structural effort. Materials and methods of construction have been selected and projects put through which later have been found to be entirely inefficient. The waste which has arisen in the past decade from ill-conceived projects, poor and wasteful construction and use of materials, if analyzed and put into money value would horrify any right-thinking man. Nowhere has this been more noticeable than in the industrial work of the past year. To be sure there has been some valid excuse for it under the prevailing conditions, but even they cannot wholly bear the blame for the larger part of it. It must be laid at the door of lack of foresight. Apparently very little consideration has been given in most of the industrial work to any future use for the buildings or their economical use in the present. Anything having four walls with openings in them for light and a superimposed roof was thought sufficient. This policy has resulted in many sins both in design and in the arrangement of floor areas which it will take years to obliterate, besides creating an annual increase in overhead charges that will continue until such buildings are superseded by others. This annual cost is pure waste.

As this condition becomes more and more evident, as it certainly will when those who erected these structures have undertaken to do business in them, there is no manner of doubt that they will realize in connection with any future projects that it will mean money in their pockets to secure the services of a man trained in the art of planning, arrangement and design.

It is too early as yet to call attention to the specific modifications for the improvement of the industrial plants already erected, except in a general way, inasmuch as most of them are of such recent date that there has not been time to realize their faultiness completely. This comment applies equally to operatives' housing. From an architectural viewpoint the glaring faults are to be found in the general air of unattractiveness of the majority of plants and the lack of efficient planning. These faults go much further than mere architectural expression. They have a much greater effect on the aforementioned pocket than would readily be believed. Experience has already demonstrated that attractive surroundings make for more and better work, for a greater stability of employees and less discontent among them. The man who works in an attractive, well-planned shop and lives in a well-arranged house, even though it be of the simplest and most economical materials, develops a sense of better citizenship, for it is not a far step from interest

in his own domain to that of the city or town in which he lives. Manufacturers, usually the quickest to recognize anything that tends to efficiency, are already taking cognizance of this. Notable instances of what improved surroundings will accomplish are to be found in the plants of the National Cash Register Company of Dayton, Ohio, and the new plant of the General Electric Company, Cleveland, either of which will well repay careful study by prospective builders of manufacturing plants. In both the instances named there will be found an *esprit de corps* among the employees and an emulation in every branch which means actual money value to these companies.

This is not a plea for the use of expensive materials, but for such a study of proportions as will make the simplest building a source of pleasure instead of abhorrence, as many of them are at present. This can be secured by careful study and the knowledge of how to use materials without adding a dollar to the cost, and in some cases actually decreasing their cost.

Turning from industrial work to other branches, we find very few monumental buildings either under way or contemplated. Few if any of the States have proposed any new buildings, but are confining their efforts to such as had been previously authorized and put under way. Nor will there probably be a great amount of such work for some years to come. The National Government still continues its output of post offices and similar buildings, but they fall into this last class, and when those at present authorized are completed there will doubtless be at least a partial cessation of that work.

In domestic work there has been a certain amount of progress, but even that has not reached normal, nor has it shown any developments of an unusual character, except possibly in the direction of simplification and the elimination of elaborate decoration.

As to what may be expected in the future for the architectural progress of this country, conditions are bound to arise which will affect it very materially, and it is an interesting problem to consider in an anticipatory way what they will probably be. Much interest and much encouragement may be drawn from the present situation and that of the problematical future.

Up to the time that the United States entered into this world-wide conflict, the practice of architecture had for years pursued a placid course, the only ripples on its surface being caused by some of the younger members of the profession having heard the call to arms and having gone abroad to take their places in the firing line with those nations who are now our Allies. Those remaining were confronted with problems not so much of architectural design as of the more material, economic features of architectural practice.

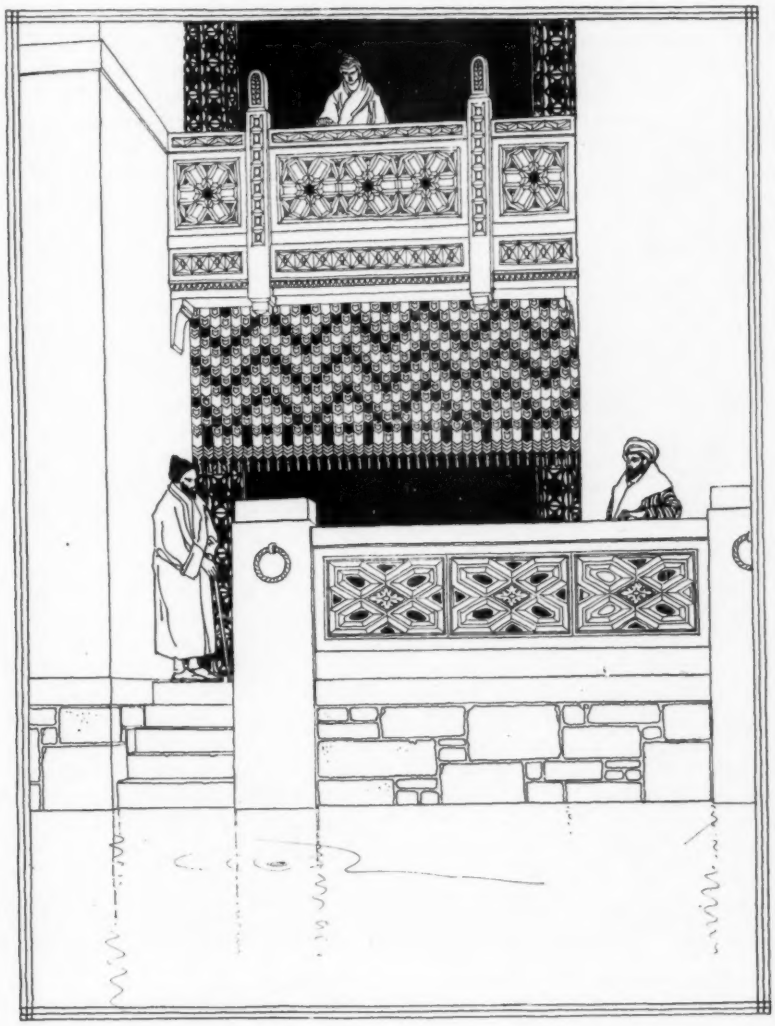
This has strongly developed the thought already present in the minds of some of the prominent architects that in addition to making designs and constructing buildings the architect of the future must include in his equipment the ability to act as the business adviser to his client in such matters, somewhat as the lawyer does. When this is given serious consideration it will be recognized to enlarge greatly the professional field and it will place greatly enhanced responsibilities on the shoulders of the profession. In doing this the architect must add to his already extensive fund of knowledge that of familiarity with real estate values, a closer and more intimate acquaintance with cost of work, of the investment returns that could be hoped for by different courses of procedure, and must exercise great judgment in the selection of the particular one it would be best to recommend. Architects as a class have hitherto given far too little attention to this phase of their profession, and the failure to do so is in some measure responsible for the comparatively subordinate position in which they often find themselves. There can be no better opportunity for making a start toward overcoming this than the present. Many of the profession are already "doing their bit," in the preparatory camps or in the trenches, and should the war continue for any length of time the ranks of the profession will be still further depleted.

These men, many of them yet young, will in a year have gone through experiences that ordinarily would not be crowded into a lifetime. Equipped as they are by education, and possessing keen powers of observation, they will have unparalleled opportunities to see things, to witness great events and to take part in situations of particular importance. All these elements will have a strong influence in molding their future characters. There is no possibility of doubt that every one of them, young or old, by the time of his return to this country and the resumption of his professional work, will have acquired a mental poise, a fund of knowledge, and an ability to read men and meet them on their own ground that will be far in advance of his actual years, and that will have a lasting effect on his subsequent professional career.

It is to be hoped that the hazards of war will not affect the future of these men as seriously as they have those in England and France, and that we shall be able to hail their return to their usual vocations to take their part with renewed vigor in a progress which in the next decade will advance architectural work to a height never before witnessed. For it cannot be doubted that the re-entry into professional work of a body of men having such a fund of ex-

perience with the actualities of life at the front will have a most beneficial effect on the entire practice of architecture in this country.

Finally, while as has already been stated, there does not appear to be any ground for a pessimistic view of affairs, it must be recognized by everyone that the profession is facing a crisis. It all depends on how it is met whether architecture shall go forward and rise to greater heights than ever before, or whether it will supinely accept second place. It is to be hoped that it will advance, but it must be borne in mind that this will mean hard work and initiative on the part of every member of the profession.



FROM A DRAWING BY CLAUDE BRAGDON

Looking Forward

The Building Prospects for 1918

IT is only the pessimist who will endeavor to convince his hearers that the building prospects for the coming year are not of a hopeful character. The close student of events will have learned from a careful consideration of all the many factors controlling building operations that there is little uncertainty as regards the future of the building industry in 1918. He will not have failed to note that conditions have arisen that will make the construction of buildings of essential character an imperative necessity, and that their progress cannot with safety be longer delayed. That the general public broadly interested in these matters is getting this point of view is an encouraging sign at this time, but what is perhaps of greater importance is the fact that the shrewd, calculating element, the men who control the money with which building operations are financed, are again willing to enter upon negotiations for the financing of building operations. This fact, and the fact is established by actual transaction, will speak to the practical mind in a much more emphatic way, in a manner that will carry the weight of conviction, than any mere expression of opinion, even if it is based on long, practical experience.

The tendency of the loaning or investment element in the building field has always been considered the barometer by whose indications we can with a reasonable surety look into the future and map out our plans. The consensus of opinion, as expressed by officers connected with large loaning companies that have been interviewed on this subject, leads to the most optimistic view as to the future in the building industry. In view of the present very friendly attitude of capital toward building, there appears evidence of a present activity that may be regarded as the forerunner of a normal, healthy state of building operations.

Building projects considered two years or less ago, and abandoned because of high prices, scarcity of labor, and the difficulty experienced in securing materials, are now being revived in every section. Some contracts have been already let, and the remainder are under serious consideration. With higher prices ruling for materials are the also higher income possibilities, and these offset each other in such a way that the value of the investment is not impaired, and in fact it has sometimes been found to be enhanced. Bills of quantities on these projects, figured two years ago, and figured to-day by the same bidders, have disclosed that the enhanced costs range in an excess of but from 20 to 30 per cent. With the demand for these structures, either from tenants, as in the case of loft and office buildings, or manufacturers who have large contracts to fill and who are in keen search of plants, the consideration offered in rentals or purchase price is in excess of the advance in construction costs, hence it does not, as a matter of fact, exist. There is no abnormality when an increase of income keeps pace with an increase in cost.

Information has been received from one architect's office of three projects whose history is similar to the example cited above, and it is learned that all these erstwhile abandoned projects were started toward quick completion last December. Many other instances of single examples are at hand, and it would appear that architects who have taken the trouble to keep in close touch with actual conditions, and have ignored the ill-advised utterances of a group of alarmists, have had no difficulty in impressing on clients the real truths that now affect the building situation.

Owners, too, are studying these questions for themselves, and when they have reached the correct conclusion and find it confirmed by the advice of their architects, are willing to proceed with these projects. They realize that it may be years before prices react, and do not hope for a return to a scale of costs such as existed, for example, during 1913 and 1914. They also realize that if prices should decline they will only do so as affected by a general decline in every other field, and as this would affect rentals and selling values sympathetically, a long-term rental contract to-day becomes in a sense an insurance policy against future depreciation.

Further, these advances in rentals affect buildings already constructed in the same way that they do the ones now in course of completion, so that a general tone of confidence and stability is being formed in spite of the many conditions that during more normal times might appear to be conducive to stagnation.

With these facts before us, it is highly probable that the amount of building that will be undertaken during 1918 will exceed that of any year since 1913.

With the present demand for housing accommodations, for office space, and for the types of buildings necessary to afford shelter for all the varied branches of our industries now being pushed to their utmost producing capacity exceeding the supply, it is difficult to understand an argument that

seeks to prove that the course of the building industry during the coming year will be other than one of steady and prosperous growth.

The questions of transportation are daily becoming of less serious nature. The lessons that have been learned since the outbreak of the war have shown that in the loading and routing of cars the general handling of our transportation problems have, in spite of the loudly acclaimed efficiency, been wasteful to prodigality. With these things corrected and waste and inefficiency eliminated, our transportation problems are gradually being solved. And while to-day there is yet much to be accomplished, the question of transportation has ceased to be of sufficient severity to menace the conduct of building operations.

Normal building requirements alone would afford a healthy volume of business. To these must be added the enormous demands of the Government. Combining the two, we have as a result the prospect of an activity in the building-construction field unequaled since 1912.

Patriotism and Building

An Editorial

TO a greater extent than any other country engaged in the great conflict, the United States is compelled to recognize the existence of a vociferous patriotism that speaks with a Potsdam accent and somewhere conceals the "Made in Germany" brand. "Don't do this, and don't do that, because by refraining you will help win the war," urge its exponents; and the astounding feature about the situation is that almost any one can issue a set of soap-box don'ts, and, if they are even slightly camouflaged with some of this pseudo devotion to national aims, they are swallowed whole by a very large part of the population, even including many men of prominence in the professional and business worlds—men who ought to be able to do their own thinking—but apparently lack the time.

It is probably true that a lot of the attempts to shut off industrial activity, to curtail trade and cripple commerce, are merely the result of silly sentimentality, but some of them unquestionably are Prussian propaganda.

In one of these classes or the other—and it does not matter much which—belongs the effort that has been made in recent months to curtail the legitimate building activities of the nation.

War necessarily shuts off purely speculative building operations. In fact, it renders them quite impossible without any prohibitory legislation, and this is as it should be. But the American people to-day stand in actual need of many millions of dollars' worth of building improvements that are in abeyance largely because a few people who pose as economists, but who in reality are either empty-headed or pro-German, have hinted that it is unpatriotic to proceed with such projects under present conditions.

No building project ought to be undertaken during the war if its prosecution will hinder the Government by taking either materials or labor needed in war work. That is axiomatic Americanism. But no legitimate building project should be deferred if it can be carried into execution without interference with the country's war work.

Many paper-shelled analysts have jumped to the conclusion that because England was forced to curtail building early in the war the United States must do likewise. They have overlooked the fact that England's situation and ours are in nowise alike. How do they differ?

Before the war, England imported building materials to meet her requirements—steel from the United States, France, Belgium and Germany; cement from the same sources; timber from the Baltic and from North America, etc. A continuance of building after the exhaustion of the stocks on hand at the beginning of the war would have meant the continuance of imports of materials. Every foot of cargo space obtainable was needed for imports of foodstuffs and munitions. Obviously, under such conditions building must yield.

Again, the white population of the entire British Empire is in numbers about half the white population of the United States and possessions. This is a white man's war. The problem with England was one of defense against sudden and violent onslaught for which the nation was almost wholly unprepared, and the obvious thing was to draw into active service every able-bodied man who could be induced or forced to serve, barring only those needed to maintain war industries. With imports and exports minimized by the submarine war, other industries had to curtail or cease operation altogether, so their interests were not greatly affected by the drive for a great army that absorbed at random the skilled mechanic and the country gentleman, the laborer and the financier. All were needed in the trenches and the fleet. But with the United States the problem is altogether different. The need, with us, is for an army of experts. England's need was numbers; ours is numbers, too, but in less degree. In much greater degree it is an army of super-efficiency, so fitted for the fight that it will make every blow a staggering blow. It must not be so large that we cannot maintain it, furnish it supplies, munitions, equipment and financial backing; and this army, assuming that the war may last another three years, will not constitute any such draft on our male population as England had to face at the outset.

The building industries and trades of the United States furnish a living to hundreds of thousands of men and women who are not now needed for war service, but whose ability to provide for themselves and to help carry the financial burdens of the war is of the highest consequence.

The fabrication of materials used in building, in the aggregate, represents an industry capable of paying in taxation the cost of maintaining a great army. But a dead or dormant industry is not taxable.

If the industries and labor dependent on building are to stagnate until peace comes, the country thereby must lose one of its great war resources—

the ability of those industries and that labor to produce revenue for the furtherance of the war.

No one but an admirer of the German theory of internal financing can afford to indorse any propaganda tending to depress the earning power of the American people at a time like this. Unless we, as the Prussians have done, are to adopt the dog-chasing-his-tail monetary system, the system that utilizes debts as the security for bond issues, we must earn as we go. This is very largely a pay-as-you-enter war, as far as we are concerned, and to pay we must earn.

Not long since an important financial house announced that it would no longer advertise its facilities for lending money for building improvements, because it believed that such advertising would be unpatriotic.

Not long since the Governor of a State and the Mayor of a great city loudly proclaimed their belief that public improvements should stop during the war.

Not long since a banker of national prominence said that there is no danger that curtailment of industries will impair the people's ability to foot the war bills.

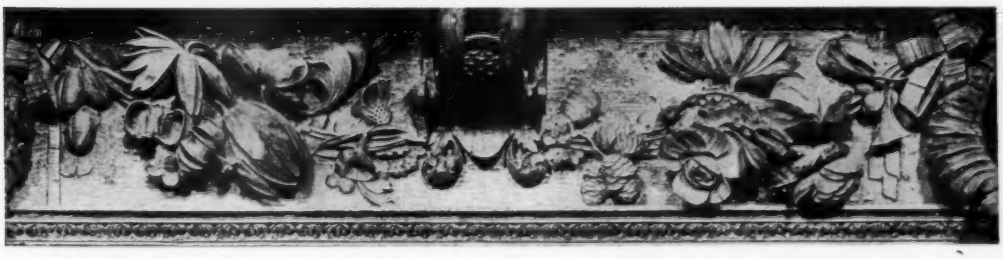
But how would industries devoid of income pay taxes? How will that financial house continue to contribute to the war cause if it ceases doing business? How will earnings based on public improvements be levied against if there are no earnings?

No loyal citizen will advocate the doing of an hour's labor or the sale of a dollar's worth of merchandise if thereby the welfare of the American people is to be impaired. Prosecution of the war to an absolutely successful conclusion is the first consideration before us, and nothing must be permitted to stand in the way. If we bear in mind the obvious fact that the industrial stagnation that some people are so actively endeavoring to bring about is one of the very things that would most effectively stand in the way of attaining that foremost object, it will be possible to judge a little more accurately the merit of some of the anti-building propaganda that is prevalent.

The demands on American industries after the war are going to exceed the utmost possibilities of production. If we carry out every plan involving expansion of manufacturing facilities, better and more efficient housing of labor, betterment of transportation facilities, addition to resources for storage and distribution of American products, the American business machine will find itself overwhelmed, nevertheless. What greater commercial victory could Germany hope for than the success of a propaganda that would bring us into the peace councils as unprepared to meet the demands of international business as we were unprepared in 1914 to meet the exigencies of international politics?

The test of any building project is twofold, but very simple. Is it going to meet an actual need? Will it enable a farmer to produce more or better food? Will it enable a manufacturer to turn out in greater quantity something for which there is a legitimate demand? Will it enable a railroad to give better or greater transportation service? Will it enable a municipality or a State to take better care of its people, to give them the governmental service to which they are entitled? Will it enable a producer so to live that his productive capacity will be increased? Will it afford the business interests of a great city or a small community facilities that they need to maintain their earning power? If it will do any of these things, then the other test is, will it interfere in any way with the conduct of the war, by taking materials, transportation or labor needed for war purposes?

The American people have altogether too much hard sense to be long misled by dishonest or incompetent advice on a problem as great as this. Building is going on, just as all legitimate industries are going on, with every honest man endeavoring to conduct his affairs so as to render the Government every bit of loyal assistance in his power. We are going to remember that if the cost of this war is not to be saddled on posterity we must keep business going, not as usual, but as never before. We must regard the cost of the war as an added overhead that every business must help to pay; and we must remember, too, that only a *going* business can contribute.



The Value of Permanent Building

Extract from a letter from J. P. H. Perry, Manager Turner Construction Co.

I BELIEVE that at this time the prospects for industrial building operations are very satisfactory. With the tremendous appropriations for supplies for both arms of our military service and the stupendous demands of these services, it is hard to see how the industries of the country can help expanding. This will, of course, mean new buildings. With incendiarism in the air and money plentiful, it would seem likely most improvements would be of a permanent and substantial nature. We look for a large number of reinforced concrete industrial building contracts in the coming year.

Of course, it is obvious that there will be a great number of Government building operations. Any knowledge of the plans now on foot in Washington will almost stagger one with the magnitude of building improvements they entail. To be sure at present it seems as though most of the Government improvements, excepting possibly work for the Navy Department, will be of a temporary nature. It is to be hoped, though, that we will learn our lesson more quickly than Great Britain did and waste but little time and money on temporary buildings, turning rather to a slightly more expensive type of structure which will have a commercial value after peace is declared. This is especially to be desired in connection with the great embarkation stations and terminal developments projected for both seaboards.

It would seem probable that the majority of industrial building improvements would be more largely built with reinforced concrete than in the past. While steel is not as expensive as it has been, and may go lower yet, the difference in favor of structural concrete instead of structural steel is still and will be for some time sufficiently attractive to overcome unfounded prejudice and conservatism.

It seems almost certain that the contracting organizations of the country, will have more than they can take care of during 1918.

"SOMEWHERE IN FRANCE"

War and Building

By S. M. Fechheimer of Trussed Concrete Steel Co.

IN times of war the duty of the citizen is primarily to his country. This is fundamental to national life and security. The entire resources of the country must be at the disposal of our Government irrespective of personal gains or individual hardships.

The first duty of the building world is therefore to help unstintingly in securing the earliest possible victory. That the building world has appreciated this is evidenced by what has already been done in feats of rapid construction. Working under discouraging conditions, in many cases far from shipping connections and hampered by labor difficulties, camps representing cities in themselves have sprung up over night.

Leading builders, including contractors, architects and engineers, have enlisted their services without thought of reward or praise, and at actual personal loss to themselves. Only those who have been in close touch with these important building projects realize the difficulties that have had to be overcome —not only the normal building problems, but also the studied plots to hamper progress. When the final story of the war will have been written, the construction and engineering world will be known to have played a vital part in securing success.

But the realization that the first duty of the building world is to our Government does not mean that we should cease all other activities. It is certain that our Government's needs cannot possibly make use of all the building resources of the country. More than this, the construction of buildings of many types is essential for continued national progress.

Besides our strictly Government buildings, factories and additions of many kinds must be built in order to provide the increased production necessary to our national needs. In many sections residential buildings must be built to house the employees of expanding industries. Public buildings of a number of types should unquestionably be built, such as hospitals and schools. Warehouses without number must be built to store large quantities of raw materials and finished products resulting from enlarged production, as well as for food supplies and merchandise generally.

Persons who build must recognize that they should at once adjust themselves to war conditions. Very many new buildings will be required in the near future, and it is the part of wisdom to provide for these as far in advance as possible. Delays which need not be considered in normal times are sure to occur because of shortage of materials, transportation difficulties and lack of competent labor.

There is no prospect for lower building costs, as markets of all kinds are sold out far in advance. In fact, building costs at the present time have not increased in the same proportion as most lines of merchandise and supplies. The comparatively quiet winter season in advance of spring activity is a particularly favorable time to let contracts, as contractors will figure more closely than they will later on when they are busy with actual contracts on hand.

Building cannot halt any more than any other industrial activity. Success on the battle front is dependent upon the greatest possible production at home, whether it is raising wheat, making guns or erecting buildings. There should be no grounds for discouragement among builders, but rather a steadfast determination to promote building on the broad lines of national service.

"SOMEWHERE IN FRANCE"

The Present Cost of Building

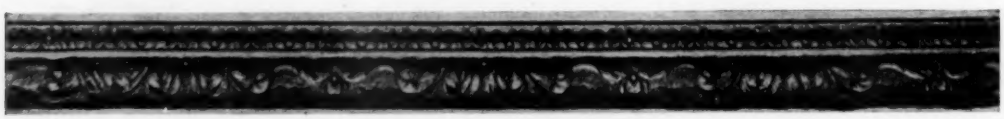
By Willis Polk

THE immutable God-made laws of competition always control the economic world, and no end of man-made laws ever results in more than a temporary ripple on the placid surface of things as they are. For example, Is the present cost of building prohibitive? Would it be wise upon the part of investors to defer improvement at this time with any certainty that they will, during the ensuing conditions, profit rather than lose by such deferment? A safe estimate of future conditions may always be wisely prognosticated by a careful analysis of the past; for example, vain hopes often encourage the anticipation of things unattainable, as the farmer's son said to the butcher, "Pop told me to ask forty dollars for this here heifer, but if I couldn't get forty to take thirty." Now, shall we encourage ourselves in a penny-wise-pound-foolish policy of waiting, or shall we be bold and courageous, improve our properties, post up our net income upon capital investment at 6 per cent net on the money, or shall we let the property remain idle at minus zero? Personally I do not feel either qualified or competent to set myself up as a prophet in this very serious question. I can do nothing more than to express my personal opinions and beliefs. I remember the day when Thanksgiving turkeys sold at 7½c. and 8c. per pound; only yesterday I cheerfully paid my local retailer 38c. per pound for a turkey. I remember the day when the honest laborer, worthy of his hire, contentedly worked and slaved industriously ten, eleven and twelve hours a day for a dollar and a quarter. I remember when, in 1891, the Mills Building in San Francisco, celebrated as one of the pioneer modern office buildings of the world, and to-day is still one of the best, cost at that time, when labor for ten hours received the average wage of a dollar and a quarter and mechanics for nine hours received the average wage of three dollars, cost 49c. per cubic foot; in the reconstruction and addition to this same building, following the earthquake and fire which destroyed our beautiful city and during a period of apparently excessive costs and high wages, was reconstructed with labor working eight hours per day at an average wage of $2.50 and mechanics working eight hours a day at an average wage of $6, cost owing to improved methods but 33c. per cubic foot. Of course there are always fluctuations in local values, but I seriously believe that the big man can exact compensation from the morrow for his losses of to-day. It is only the small man, in the hope that he can make some gain by delay, who permits valuable property to remain idle one moment. There are many notable instances within the confines of our fair city illustrating the point in question, to wit: many of our vacant lots. Of course these casual observations of mine should be taken with a grain of salt. I am in the building business. It is to my interest to encourge building.

But in any event as a last resource, doubting Thomases, who desire to ignore the adage that "He who hesitates is lost," might find consolation in this note on preparedness: Would it not now be advisable for such persons to proceed with the development of any plans that might be required for prospective improvements, and by this method be prepared at a moment's notice to take advantage of any favorable market conditions that might ensue, rather than be forced to participate with hastily made and immature plans in the rush to be first on the market when the hoped-for time arrives. In other words, why not have complete plans on file in a safe deposit vault along with deeds to the property? If you must be a coward be ready to follow when a brave leader gives the command—Forward, march!

Therefore, while labor worked ten hours a day thirty years ago for $1.25 and building cost was at least as high as to-day, I do not believe that ten years from now it would be surprising to find labor working but seven hours a day and receiving $10, with materials proportionate, and likewise find building costs still within economic bounds for safe investment. I do not believe that there will be more than a slight reaction; costs will steadily advance, as they have during the period under discussion. In the meantime taxes will go on forever. An idle lot is no better than an idle mechanic.

Hooverize natural resources, but conscript available units in the army of progress. Drill, don't slack. Make the idle lot productive; make the idle dollar work.



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VOL. CXIII JANUARY 2, 1918 No. 2193

Mr. Young's Letter

IN the admirable communication by Mr. Thomas Crane Young printed elsewhere in this issue, he lays stress on the fact "that in the recent building emergency caused by our entry into the war, the Government has turned for help to the engineer and contractor and not to the architect."

Mr. Young has lucidly reviewed the field of architectural practice and with the skill of a practical diagnostician has clearly indicated where he believes the trouble lies. It is easy to agree with conclusions so lucidly reached. Let us hope that his logical statements may arouse the whole profession to serious consideration of the subject with a view to remedying present conditions.

While he modestly disclaims any ability to prescribe a remedy, he outlines in his concluding paragraph a course that there can be no doubt would go far toward a satisfactory solution.

For the past decade it has been patent to those in touch with architectural affairs that there has been a growing hostility to architects on the part of many influential members in our National legislative body and in the Executive Department of the Government, caused very largely by the extremely unwise, and almost arbitrary, course of action taken by members of the profession. This action culminated just prior to the outbreak of the war in a campaign of sharp criticism, in some instances actual abuse of Congress with reference to their conduct by that body, of Federal building operations, and in the heat of that campaign statements were made that could be and were so easily shown to be inaccurate that their effect was entirely lost. This unsupported criticism only served to widen the breach already existing between the profession and the Government. Fortunately those in charge of this campaign, no doubt influenced by cooler and wiser heads in council, caused these attacks to cease. The mischief had been done and false impressions created that it will take years of conscientious effort to overcome.

While this campaign may have produced an effect on individual members of the governmental bodies (man is but human and it is not to be supposed that all of those who are high in office are broad enough to altogether overlook what to them would be regarded as an unwarranted and unproved criticism), it is not logical to believe that any large proportion of either our legislators or executive officers would be seriously affected thereby. It is felt that we must look deeper than the purely personal idea of revenge for the fundamental causes of the feeling. This is borne out by the fact that there exists a similar antagonism among those outside of governmental service, which surely cannot be laid at the door of spite.

Mr. Young has struck the key note of the difficulty when he declares it to be lack of efficiency and absence of preparedness on the part of the bulk of the profession. These conditions are largely of our own creating. The profession of architecture is now reaping the whirlwind of their own sowing. That "we have inherited a set of false gods or fetishes which we have set up for public worship but which we despise" is so true in fact that nothing remains but the demolition of them and the building up of higher ideals and broader standards.

The setting up of ideals based on purely esthetic premises, with the knowledge and conviction beforehand that no man in any profession could realize their performance, is to waste time in their promulgation and to invite ridicule for lack of performance.

The engineer can boast of advantages of academic training equal to that of architects, but his course in practice is always based on lines of hard practical common sense modified by his knowledge of esthetics. These esthetics he uses as a flavor. He does not lay them in with every stone. He does not deride art nor does he deny its value to mankind, but it is given a subordinate place both in his training and practice.

Professor Lethaby, R.I.B.A., in a recent address, discussing the present condition of professional practice in Great Britain, stated: "There is really no op-

position between art and science. Show me your art, as St. Paul might have said, and I will show you your science."

"Art is the active side of things, science the contemplative. The most of art is science in operation, and a large part of science is reflection upon art." Again:

"Individuals unfortunately may make their way by claiming to be the priests of mystery architecture and talking tall art to Mrs. Jones, but to do so is a grave injury to the whole body, which must stand on reasonable service. It has, in fact, betrayed us to the caricature of Mr. Pecksniff."

It would appear that Professor Lethaby detects in the body of the profession in Great Britain the same weaknesses that are so forcibly set forth by Mr. Young in his communication. That this is true, the following further quotation will serve to prove:

"There has been remarkable agreement in the view that this Institute should take up questions of public welfare in matters relating to building more definitely and constantly, that it is called upon to enter on a large constructive policy, and even to engage in earnest propaganda work. In working in the public interest this Institute would incidentally find a worthy place for itself, but, unless we awake, the new cottages, national housing, and town improvements will be done in the main without us."

It is not possible too strongly to recommend to the careful consideration of every man who practices the profession of architecture the truths so logically set forth by Mr. Young.

Now is the time to do the thinking, to set our house in order, and to act. The material for a great and powerful organization is at hand. It needs the wise and prudent men in the profession to take this material and erect a structure that will command the respect of everyone, and conserve all the rights and dignities of practice based on a common sense attitude towards the work we do.

Announcement

DEPARTMENT ARCHITECTURAL ENGINEERING

The scope of the Department of Architectural Engineering of THE AMERICAN ARCHITECT will not be confined to structural engineering exclusively. It will comprehend the broad policy of considering every-day construction problems confronting architects and engineers in the use of all the materials of construction, and of structural design.

This department will be in editorial charge of Mr. Arthur T. North. Mr. North is a member of the American Society of Civil Engineers, the American Railway Engineering Association and a licensed Structural Engineer (Illinois). Aside from his technical training as an architect and engineer, he has had an extensive practical experience in connection with structural and ornamental iron and steel work, fireproofing and a wide range of general contracting.

MEANWHILE, if these hours be dark, as, indeed, in many ways they are, at least do not let us sit deedless, like fools and fine gentlemen, thinking the common toil not good enough for us, and beaten by the muddle; but rather let us work like good fellows, trying by some dim candle-light to set our workshop ready against to-morrow's daylight—that to-morrow, when the civilized world, no longer greedy, strifeful, and destructive, shall have a new art, a glorious art, made by the people and for the people, as a happiness to the maker and the user.—William Morris.

Criticism and Comment

Fetishes and Fallacies

The Editors, THE AMERICAN ARCHITECT:

It may be that there are those among us who believe all is as it should be in the profession and that architects are really the super-builders, all-around technical experts, artists and captains of business they have fondly imagined themselves to be. To such it must have come as a distinct shock to realize that in the recent building emergency caused by our entry into the war, the Government turned for help to the engineer and the contractor and not to the architect. In Government circles it is well known that the architect, as such, has no very good standing. In recent Government construction he has been silent and invisible. At least so far as the public is concerned only the former two professions have been conspicuously evident. If he has taken any hand in these great affairs, he has had to abandon his own profession and do his work in the guise of an engineer. Are we then a useless profession and merely a collection of parasites on the industrial body? Or have we failed to keep pace with others in the development of modern life? Do we measure up to a standard of achievement comparable to the other professions?

All over this country of ours may be heard in our professional ranks the low grumble of discontent, which now and then breaks out in open accusations, that our professional leaders and teachers do not always practice as they preach. I do not know that this is so, but I am forced to believe that for quite a number of years our beloved profession has been steadily losing in the public estimation of our business ability, and lack of respect for our so-called "principles" is indicated by the increasing reluctance of the younger men to join the Institute ranks. If this be true, the fault is ours, but if endowed with the qualifications necessary to really make us captains of the building industry, the remedy should be easily found, though now concealed from view.

If the war has passed us up as useless, it has also given us leisure which we might improve by looking ourselves squarely in the face and if what we find is not to our liking, we might exercise on ourselves the newly discovered art of camouflage and reappear in another form—perhaps as engineer or contractor-architects.

It seems to me that we have inherited a set of false gods or fetishes which we set up for public worship, but privately despise. I refer to some of the laws of conduct set forth in our ridiculous Code of Ethics. Why should it be a crime to advertise? Advertising is now a profession in itself, much more highly paid than ours, and, therefore, of course, more useful in the business world. The motto of the advertiser is "Truth." An engineer may, without losing caste, insert a modest business card in a public print. He may, without danger to his professional soul, contract to perform a certain work, and if successful acquire a substantial profit commensurate with the brains and capital employed. And he does it. In fact, we do advertise every time we publish the picture of a work of which we claim the authorship.

Again, what other body of sane men would for a moment tolerate so utterly wasteful, inefficient and economically foolish a practice as that of public competition as a means of securing commissions? Our code admits that it is very, very bad, but says in effect: "If you do this evil thing according to the prescribed ritual, you will not be damned and may still remain in the ranks of the elect." If the practice is evil, why not cut it out?

Another fetish is the fixed percentage system of charging for professional service. This method is illogical, often unjust, not easily explained and therefore productive of much ill feeling among clients and trouble for the Architect. An owner seldom objects to paying his contractor a clean profit of 8 per cent, 10 per cent, or even a larger percentage, over and above all costs and expenses quite as a matter of course, while almost invariably he considers the more modest fee for architectural services as an unnecessary expense and pure waste, simply because of the manner in which the matter is presented to him. Why should we adhere to this practice—also an inheritance from the dead?

In fact, our whole method of conducting business as prescribed in our code is at least a century out of date. It might have been good business in the time of Louis the Something, but it is wholly out of touch with our own time. To this I attribute much of the apparent loss of prestige to the architect and the corresponding gain to the contractor and engineer. Why should not the contractor have a better standing in the financial world than the architect? He invariably carries a larger balance in the bank, usually has a much more imposing place of business, and a larger, better organized and more highly trained office force. But, most of all, when a business man asks what a certain improvement will cost, he can give a positive and direct reply. He

can say, "I know what it will cost, for I will contract to do the work for so much money and am financially responsible." But if the same question is asked of the Architect the answer must be, if according to code, something like this: "I don't know, sir. I can only say approximately or guess at the cost. But I can get the information. I will go to the Smith, Jones Contracting Co. and find out exactly."

In the field of industrial work the engineer has very largely superseded the architect. The engineer often builds substantially if not with much idea of beauty and the client is convinced that an additional fee for architectural service is not at all necessary. But, unfortunately, neither does the architect always build well or beautifully, or with due exercise of economy. Even the small builder has made serious inroads in the province of architecture. Millions of dollars are spent every year in minor building operations without benefit to the architect. The speculative builder understands construction well enough to suit his purpose, and he hires a draughtsman for a few dollars to "fix up" an elevation. But he acquires wealth and so in time becomes a valuable and respected citizen notwithstanding his esthetic shortcomings.

No one likes to brave unpopularity by stating unpleasant facts. I am merely trying to show that the authorized method of conducting the business of the architect is defective and not in accord with the modern spirit of efficiency in business or professional work, and to state my belief that a chief cause of this condition is the adherence to a code of ethics which is positively unmoral and serves chiefly as an obstruction to thought and progress. It is in the hope of provoking a discussion which may lead to some possible betterment in present conditions that I have been induced to commit this rank bit of heresy. I have no remedy to offer here. Where so many highly technical professions or occupations are so intimately related as in the building industry, it is not meet or desirable for an individual or any body of architects by themselves to arbitrarily determine upon a business policy necessarily affecting all the others.

Every thinking man believes that this war will cause vast changes in all phases of work and life, and when peace comes should we not, along with others, prepare ourselves to meet the new conditions effectively and not again be caught unawares? I believe that under the new conditions there will be no more use for the autocrat in building than in government. There will no doubt be ample scope and use for all the technical professions, including the architect, and, to my mind, the road to greater efficiency and service lies in a closer mutual relationship and co-operation. Democracy and co-operation must, with us also, take the place of the old relationship of Master and Man. Sooner or later I trust the leaders in all scientific, technical and professional societies whose interests touch on the building industry may get together for the purpose of a better mutual understanding, and to help in the solution of the grave social or economic problems confronting us as well as in the minor troubles where interests which should be mutual seem to conflict. Either by ourselves or in co-operation with others, we should eliminate old practices which should be obsolete and, if possible, establish a new professional creed in which we all may believe.

St. Louis, Mo. THOMAS CRANE YOUNG.

The Editors, THE AMERICAN ARCHITECT:

I have carefully read the editorial in your issue of Dec. 14. I am not particularly well informed in the matters of architectural politics, and I was unaware that so large a majority of architects throughout the country are not Institute members.

Your suggestion that a national organization be formed, similar in scope to the Bar Association, seems to possess many admirable points. Of course, the architectural profession encounters two difficulties which do not encumber the legal profession. One is the dual nature of the architect's work, combining as it does the practical with the artistic, and the other is the tendency to rate an architect's capacity by competitive paper drawings rather than by his success in actually planning and constructing useful and beautiful buildings. Both of these make the operation of penalizing offenses against the profession a very difficult one, as the architect of distinctly artistic temperament resents the hampering effect of codified regulations while the more practical members realize the necessity of such restraint.

While not pertaining particularly to the subject, it seems to me that the present code of ethics might be considerably amended so as to allow a closer control of contracts by the architect, perhaps to the extent of even allowing him to take contracts and construct the building. Many well-designed buildings are spoiled by the inability of the architect to control, under the present system, the actual artistic construction of the work except through a series of contractors and sub-contractors.

The present code of ethics is based on the idea of preventing the architect from actually handling any of the money involved in his building operations, but it must be conceded that unless the architect is held by his client to be like Cæsar's wife—above suspicion—his usefulness is seriously impaired.

WALTER H. KILHAM.

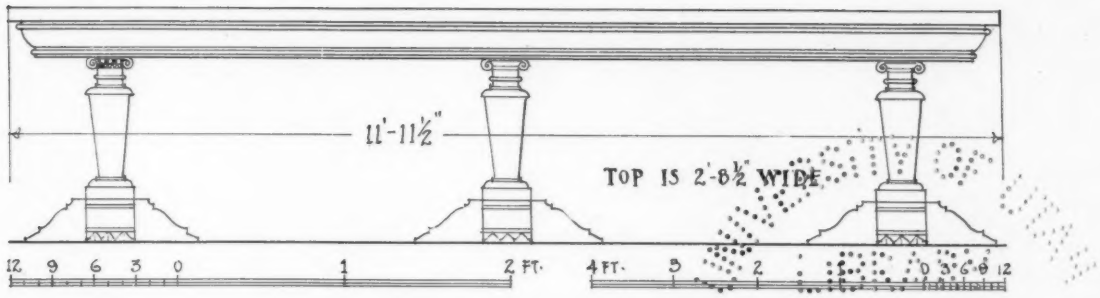
Boston, Mass.

PLATE 1

FURNITURE, COMMON HALL, ABBOTT'S HOSPITAL, GUILDFORD

PHOTOGRAPHED AND DRAWN
BY WALTER G. THOMAS

ENGLISH DETAILS



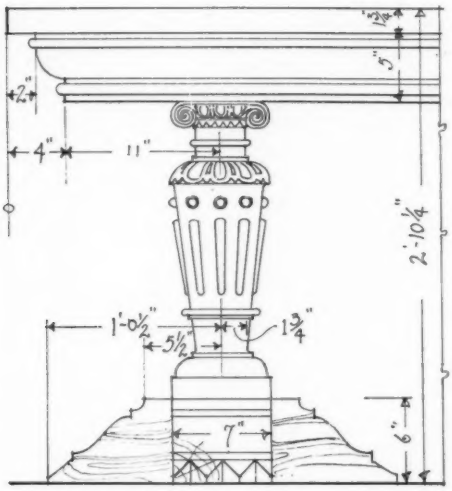
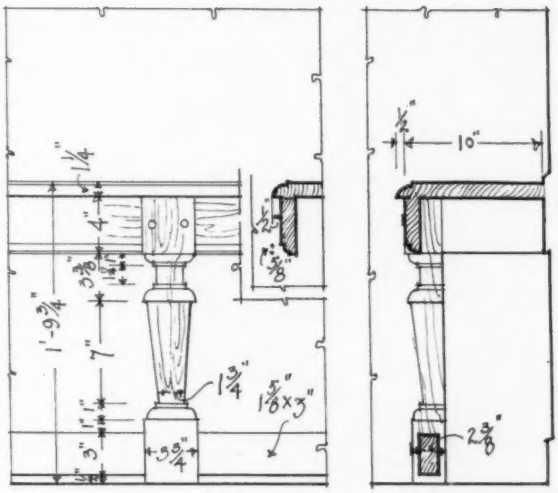
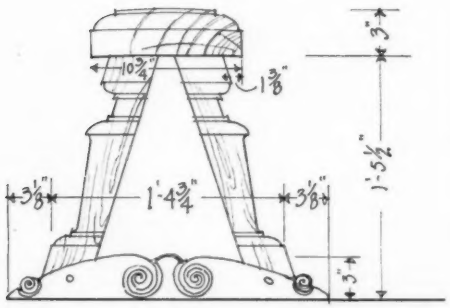
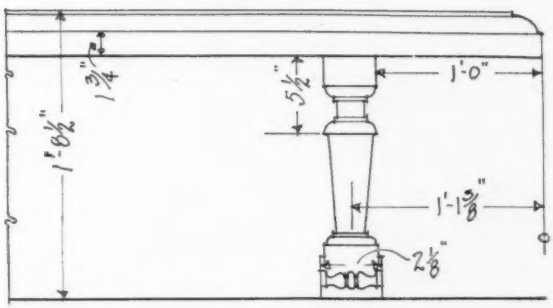


TABLE LEG



WALL BENCH





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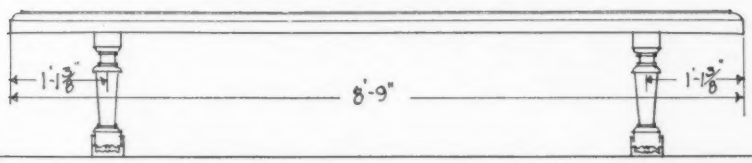


PLATE 2

FURNITURE, COMMON HALL, ABBOTT'S HOSPITAL, WORCESTER

PHOTOGRAPHED AND DRAWN BY WALTER G. THOMAS

ENGLISH DETAILS

PLATE 3

ALPHA TAU OMEGA FRATERNITY HOUSE, BERKELEY, CAL.

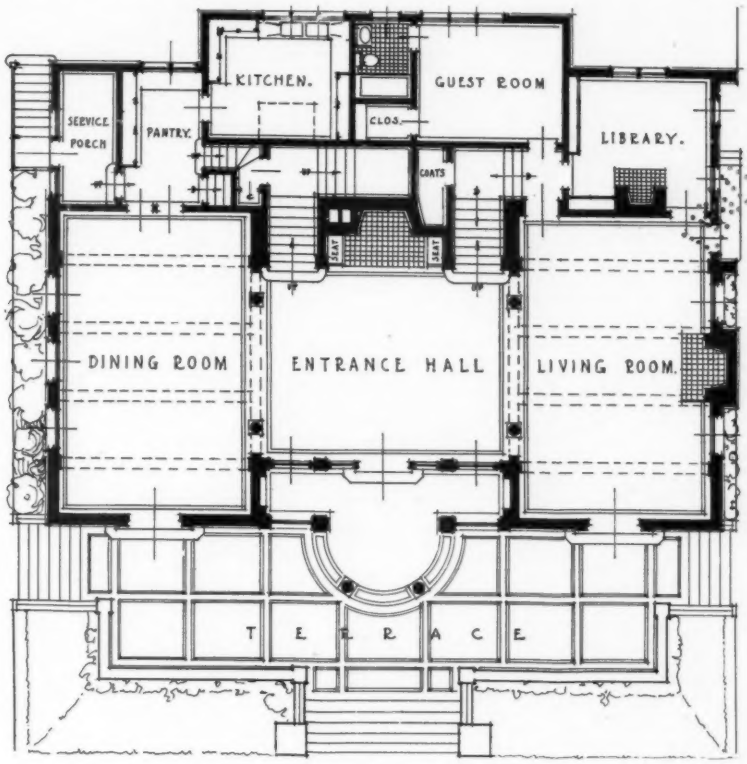
WILLIAM C. HAYS, *ARCHITECT*, NORMAN W. SHAW, *ASSOCIATE*

PLATE 4

ALPHA TAU OMEGA FRATERNITY HOUSE, BERKELEY, CAL.

WILLIAM C. HAYS, *ARCHITECT*, NORMAN W. SHAW, *ASSOCIATE*

VOL. CXIII, NO. 2193 JANUARY 2, 1918



FIRST FLOOR PLAN

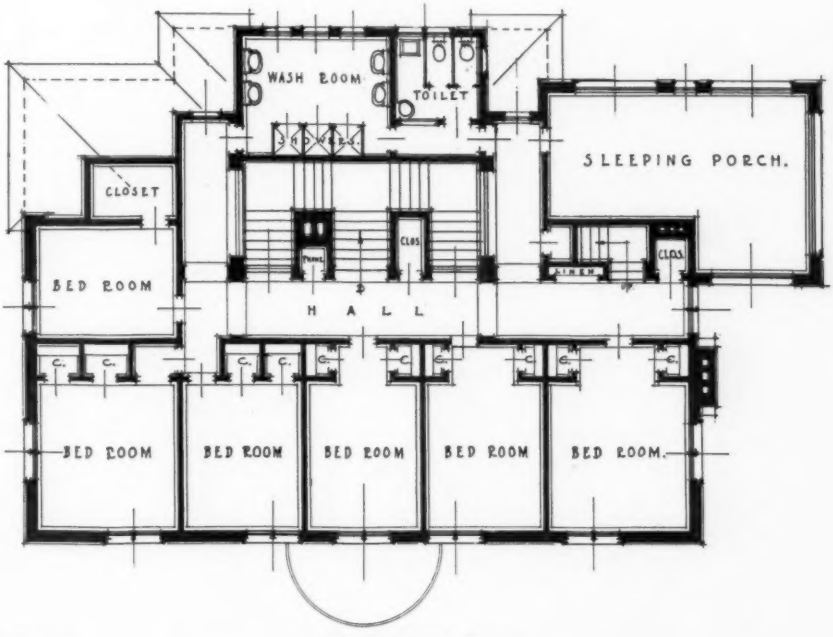


PLATE 5 SECOND FLOOR PLAN

ALPHA TAU OMEGA FRATERNITY HOUSE, BERKELEY, CAL.

WILLIAM C. HAYS, *ARCHITECT*, NORMAN W. SHAW, *ASSOCIATE*

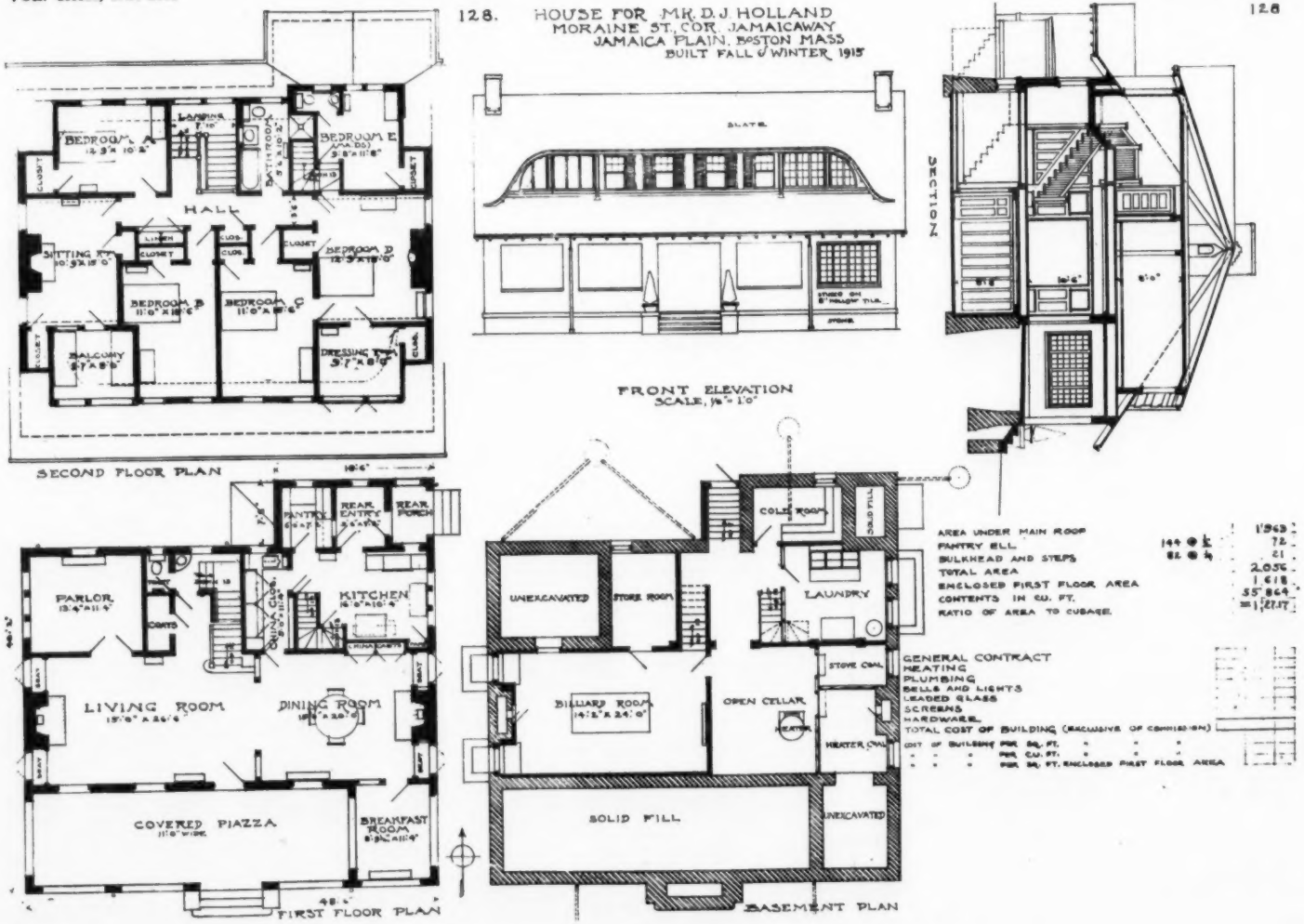
PLATE 6

HOUSE OF D. J. HOLLAND, JAMAICA PLAIN, MASS.

WILLARD D. BROWN, *ARCHITECT*

128. HOUSE FOR MR. D. J. HOLLAND
MORAINE ST., COR. JAMAICAWAY
JAMAICA PLAIN, BOSTON MASS.
BUILT FALL & WINTER, 1915

128



AREA UNDER MAIN ROOF		1'969
PANTRY ELL	144 @ ½	72
BULKHEAD AND STEPS	82 @ ¼	21
TOTAL AREA		2.056
ENCLOSED FIRST FLOOR AREA		1 618
CONTENTS IN CU. FT.		55' 864
RATIO OF AREA TO CUBAGE		= 1 : 27.17

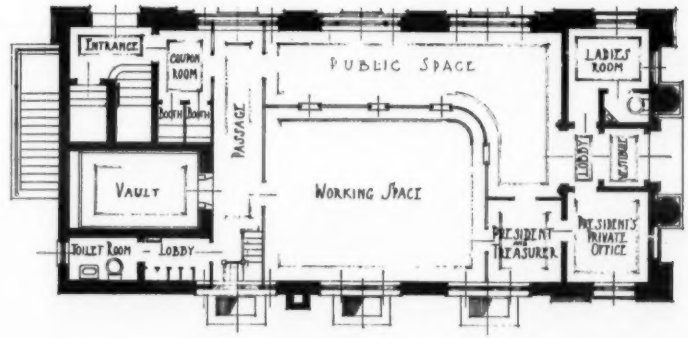
GENERAL CONTRACT	
HEATING	
PLUMBING	
BELLS AND LIGHTS	
LEADED GLASS	
SCREENS	
HARDWARE	
TOTAL COST OF BUILDING (EXCLUSIVE OF COMMISSION)	
COST OF BUILDING PER SQ. FT.	
" " " PER CU. FT.	
" " " PER SQ. FT. ENCLOSED FIRST FLOOR AREA	

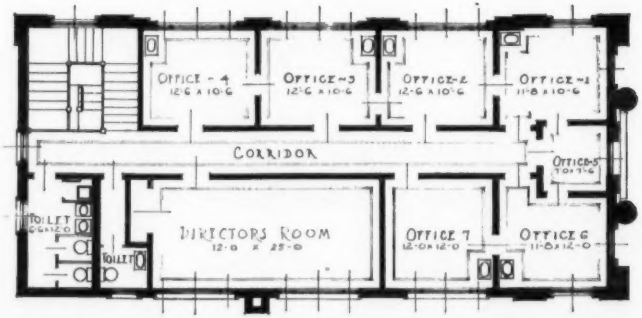
PLATE 7

HOUSE OF D. J. HOLLAND, JAMAICA PLAIN, MASS.

WILLARD D. BROWN, *ARCHITECT*

PLATE 8





BUILDING OF
AMERICAN BANK & TRUST CO.,
NEW HAVEN, CONN.

□ □

BROWN & VON BEREN, *ARCHITECTS*

PLATE 9

BUILDING FOR INTERNATIONAL TAILORING CO., CHICAGO, ILL.

MUNDIE & JENSEN, *ARCHITECTS*

UPPER STORIES

BUILDING FOR INTERNATIONAL TAILORING CO.
CHICAGO, ILL.

MUNDIE & JENSEN, *ARCHITECTS*

PLATE 10

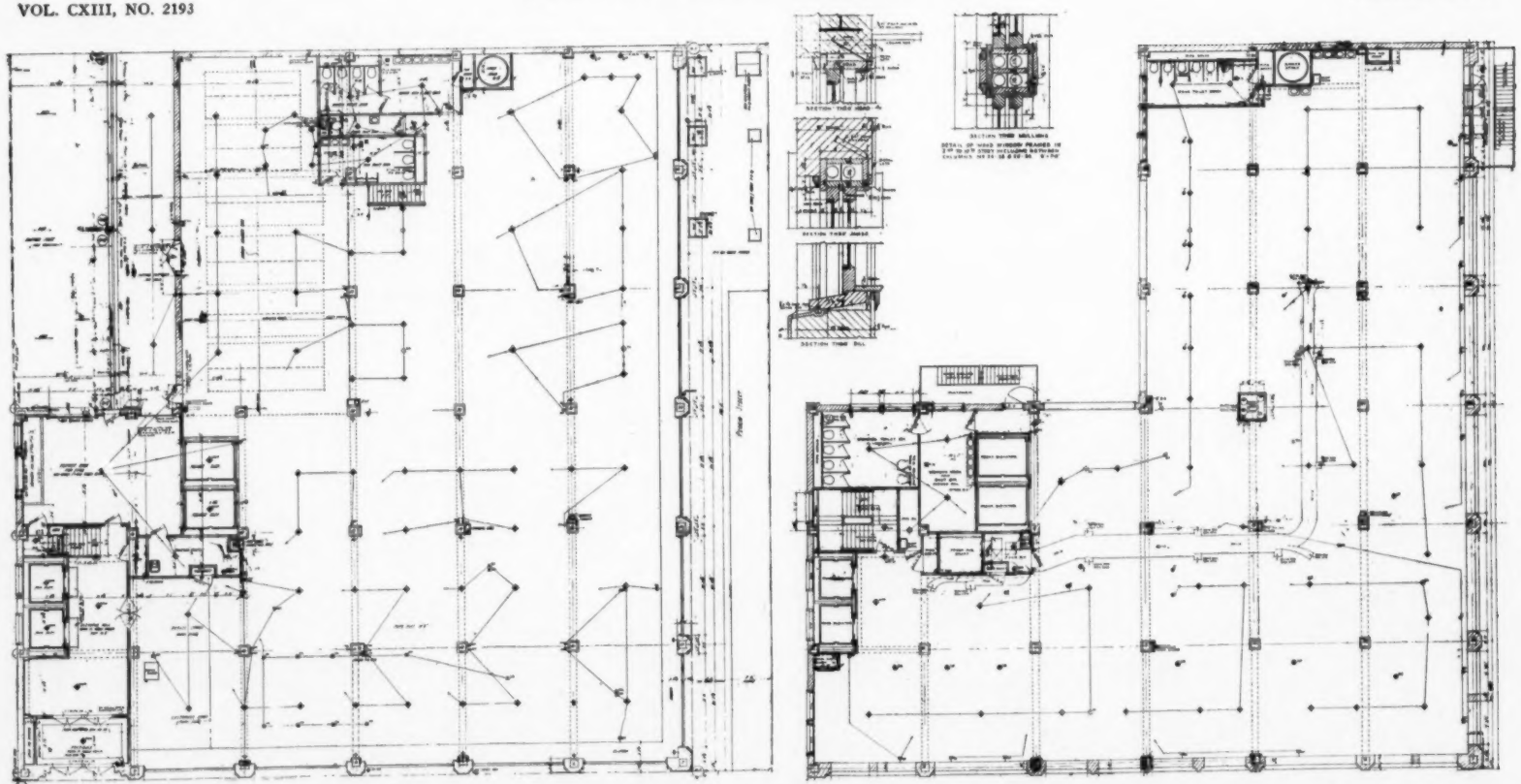


PLATE II

BUILDING FOR INTERNATIONAL TAILORING CO., CHICAGO, ILL.

MUNDIE & JENSEN, *ARCHITECTS*

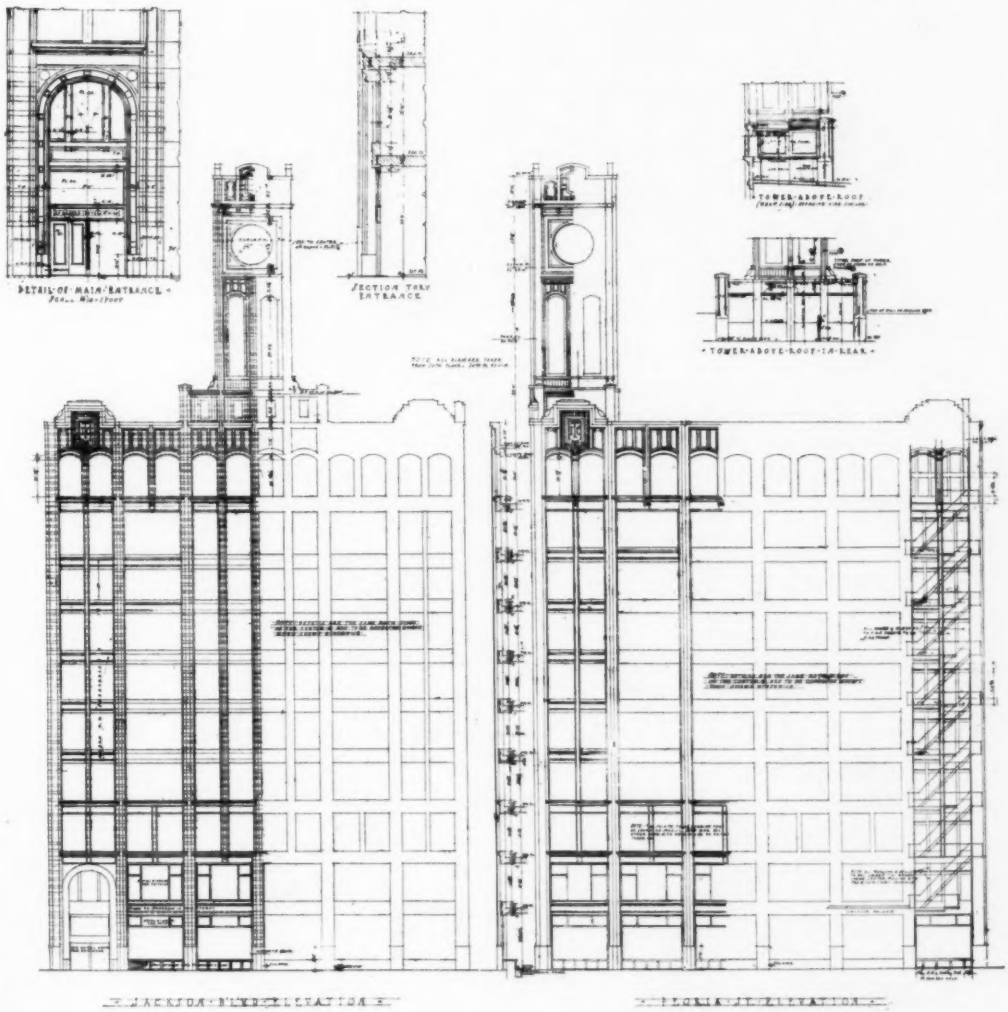


PLATE 12

BUILDING FOR INTERNATIONAL TAILORING CO., CHICAGO, ILL.

MUNDIE & JENSEN, *ARCHITECTS*

PLATE 13

LACASSION LABORATORIES BUILDING, ST. LOUIS, MO.

P. J. BRADSHAW, *ARCHITECT.* W. J. KNIGHT, *ENGINEER*

PLATE 14

BUILDING FOR BALTIMORE OIL ENGINE CO., BALTIMORE, MD.

WALTER M. GIESKE, *ARCHITECT*

PLATE 15 DETAIL MAIN ENTRANCE

BUILDING FOR BALTIMORE OIL ENGINE CO., BALTIMORE, MD.

WALTER M. GIESKE, *ARCHITECT*

PLATE 16

BUILDING FOR BALTIMORE OIL ENGINE CO., BALTIMORE, MD.

WALTER M. GIESKE, *ARCHITECT*

The Business Outlook

A LOGICAL consideration of the elements affecting building operations for the coming year results in the conclusion that business should be good and that the volume will very considerably exceed the amount of the past year. The retardation during 1917 was due principally to three causes: first, a belief that the prices of building material were fictitiously high; second, a great uncertainty regarding the money market, and third, but not the least important, the circulation of rumors by enemy aliens and pessimistic pacifists that lead to all sorts of fears on the part of owners, architects, contractors and producers.

The first and most essential element to the success of the building industry in 1918 is the refusal of all interested to believe or credit pessimistic statements, whether by word of mouth or the columns of the daily press, until their authority has been conclusively determined.

The second element to success is a careful study of the economic questions involved so that architects, contractors and producers will be able to intelligently advise owners and investors.

One of the questions that has caused much speculation is whether or not building operations would be considered one of the non-essential industries and alarmists have pointed out that it is so classed in England, where no building can be done except by special permission. In England one of the most important reasons for this ruling lay in the fact that practically all building material was imported and consequently required ships for transportation that were urgently needed for food and supplies directly necessary to the conduct of the war.

In this country practically nothing entering into building construction need be imported. Furthermore, a great deal of it does not require any long rail transportation.

As a matter of fact, not one single industry or product has yet been classed as non-essential and the disposition of those in authority seems to be to make no such classification. Transportation problems have, and will for a little time to come, make it necessary to give priority to food, coal and war supplies, but these problems are rapidly being met and should cause no bar to the industry after the next two or three months.

The *lumber* and *steel* industries, producing the two commodities used in largest volume in building construction, are regarded by the Government as essential.

Transportation has somewhat affected building due to priority requirements and the lack of equipment, both locomotives and cars, by the railroads. The position of the railroads is especially trying during the winter months of every year, and the extra demands this year are taxing them almost beyond their limits. United operation, and the ignoring of restrictive legislation, together with the cooperation of government officals, have made it possible for our railway management to meet the burdens. Within the next few months thousands of new cars and hundreds of new locomotives, together with the passing of the winter season, to say nothing of the completion of many of the government building projects, will greatly relieve the distress of the railroads and make possible much freer transportation.

It is true that the cost of building has risen considerably during the past two years, but this increase is not so great as has been frequently reported. A specific job figured two years ago and held in abeyance has just been let at an increase of slightly less than 20 per cent. This is more than compensated by the increased earning capacity of the building, for rents have advanced 22 per cent.

The increase in building costs generally have been due to several causes among which was the urgent demand of the government during the past year for the necessary materials to build its cantonments. This need was so great in some instances that whole plants were commandeered for a period of several months, and their product taken out of the general market. This need is now nearly past, and these manufacturers will again be able to furnish supplies which will mean a restoration of competitive conditions with some lowering of prices on specific products.

The greatest cause, probably, for the increases in costs has been the unprecedented advance in wages. This advance has affected both the cost of the material for construction and the cost of its erection. Even if there were no probable shortage of labor due to the demands of both our armed forces and the industries necessary to their supply, no immediate or great reduction in labor costs could be looked for. All history shows that reductions in wage come about very slowly, and no pronounced reduction can be expected for many years after the war.

For this reason it behooves architects to carefully study all jobs so that the materials selected and methods of construction will reduce the labor of erection to the lowest possible point. In many cases they can also study contracting methods and suggest changes that will reduce labor requirements.

While on some specific products and some general lines there may be an easing of the price, it is certain that no great reduction is likely to take place throughout the duration of the war and for many years after. If it were not for the great demands which Europe is going to make for building material from this country after the close of the war, we might well expect a drop in prices at that time. But these demands will so far exceed our ordinary peace-time requirements, in building materials, as well as other products, that prices will be maintained at their present levels or higher.

Building operations, no matter how small or how large, are, like other major business propositions, based on credit and borrowing capacity. It is, therefore, advantageous to study the credit situation of this country as it may affect the building situation.

We have raised between five and six billion dollars in two Liberty Loans since the first of June and have something more than that to raise during the next few months. More than half of that already raised has been loaned to our allies and probably an equal portion of future loans will be used in the same way. On these loans the allies pay interest to our government so that on this portion there is no present or future tax demands for principal or interest. As showing the ability of this country to care for these loans it is only necessary to point out that all of the first loan and something above 85 per cent of the second loan have been paid.

These loans, and the taxes which our government will raise, are simply a form of credit, for there is of course no such vast sum of money in the world. *And practically all of this credit is for purchases in this country,* for it is a stipulation of the loans to our allies that the proceeds shall be expended here. This means both potentially and actually that this country is enjoying a period of prosperity never before experienced in its history.

Both the wage earner and the farmer have a larger margin between income and necessary expense than ever before, and that surplus is largely going into investment channels. And one of the first investments in these days of thrift is the ownership or improvement of homes. Preceding or following comes the saving by deposits in banks.

Manufacturers generally, while possibly making the same margin of profit on the products, are making a considerably greater return on investment.

Both the increased deposits of wage earners and farmers and the increased earning of capital help to swell the loaning capacity of banks and other loaning agencies.

All classes of the people have responded promptly to the government's call for loans and Liberty bonds are widely distributed. These bonds themselves are considered by most contractors and manufacturers equally as good as currency in payment. Therefore the owner of Liberty bonds is an in excellent position to turn his investment from bonds into buildings.

While for a time there was hesitancy on the part of the larger loaning institutions to accept commitments on building operations, practically any of them are now willing to make such loans when surrounded by the usual safeguards.

It is probably true that rates of interest on building loans are not quite so favorable as formerly, but neither are they as favorable in other lines. This is naturally to be expected when the government is now paying four per cent, whereas it formerly paid less than three per cent.

Many architects who have closely followed conditions have independently arrived at the same conclusions which our broader investigations have developed and are advising clients to proceed with projects which had been temporarily held up. Within the past month many specific instances have come to our attention where this advice has been followed.

If all architects will exercise their prerogative as business advisers, as well as professional advisers, to their clients and clearly explain the situation, 1918 will see much more work in architects' offices.

F. C. B.

Digest of Commercial and Financial News

Affecting the Practice of Architecture

Our Personal Responsibility

"The same national unity which we must develop to win the war will be required to meet the international trade struggle which will follow in the wake of peace," said Mr. Francis H. Sissons, Vice-President of the Guaranty Trust Co., New York, in a recent address.

"Every American, therefore, must govern his life and direct his activities as though the fate of the country depended upon him alone. Then there will be no confusion of purposes, no uncertain motives, but, instead, a clarified atmosphere for the most effective use of our tremendous nervous energy, inventive resourcefulness, undeniable courage, and superb moral initiative.

"If we fail now to give the full measure of devotion to our country, the time will inevitably come when we shall have to pay many times over the price of that which we selfishly withhold at present.

"We must recognize that each and every one of us, and not merely our Government, is at war. Thus only can we win the glorious victory, which will be ours if we combine to exert *all* our power for the achievement of that supreme objective. There lies the line of business advantage for us all, to speed the day of victorious peace, of democracy triumphant, of a nation prosperous and united, facing its manifest destiny of world leadership."

The New Income Tax Law

In the October *Bulletin* we called attention to the unjust discrimination made by the war revenue bill in the taxing of the incomes of professional men and corporations. The bill as enacted into law unquestionably contains a joker which is most serious to the individual professional man. By section 200 of the new law a general tax is made on individuals or professional men of 8 per cent on all of their business or professional earnings over $6,000.

To illustrate, if an architect is a single man and has an income of $10,000 he must first pay 8 per cent on the difference between $6,000 and $10,000, or $320, but in computing his tax under the two regular individual income tax provisions of the old law and the new, this tax of $320 would be deducted from the income of $10,000, leaving $9,680, from which must be subtracted the exempted amount of $3,000 provided in the old law on which he would pay the 2 per cent normal income tax. This tax of 2 per cent on $6,680 would amount to $133.60. Then under the new income tax law the professional man with the $10,000 income would have to pay another 2 per cent on his income over the limit of $1,000 set in the new law or 2 per cent on $8,680, which would amount to $172.60. His total income tax will therefore be $627.20. A corporation having a net income of $10,000 will be taxed as follows: Normal tax, 2 per cent on $6,000 or $120, plus an additional 2 per cent on $8,000 as per the terms of the new revenue law; in addition to these direct taxes an additional surtax will be levied of 1 per cent on $2,500 and 2 per cent on $2,500, making the total income tax for the corporation equal to $335.

Thus by the plain provisions of the income tax laws a corporation having an income of $10,000 must pay an income tax of 3.55 per cent, while a professional man or individual having identically the same income will be compelled to pay an income tax of 6.272 per cent. Can any member of Congress justify this manifest unfairness to the individual?—*Bulletin* of the Illinois Society of Architects.

Prices of Building Materials as Compared with Other Commodities

Buildings needed now will earn a rental proportionate to their cost. This fact is so apparent as to need no long argument to impress it.

Mr. Ralph P. Stoddard, Secretary of the Ohio Builders' Supply Association, in a recent talk on "Present and Prospective Cost of Building Material," said: "You know that from 1914 to the present time there has been an increase of 133 per cent on coal; 115 per cent on copper, 107 per cent on nearly all other metals; 350 per cent on steel products, 100 per cent on canned goods, 34 per cent on all labor, 100 per cent on woolens, 68 per cent on machinery, 61 per cent on horses, 83 per cent on feed, 100 per cent on lard and as much on butter and eggs, 93 per cent on wheat.

"You now get for a dime a loaf of bread you can put in your vest pocket. The principal crops are 187 per cent up. The paper the merchant wraps his groceries in has advanced 82 per cent since 1914. Beans—always standing on the cheap

lunch counter—now are 'way up amongst the luxuries and 75 per cent higher than you ever heard of them being before. A well-known 'beverage' is 200 per cent up and the glass you drink it out of has been raised 80 per cent. The gasoline for your flivver costs you 70 per cent to 100 per cent more than it did when common brick was $7 per thousand. Corn is up 186 per cent, pork chops 100 per cent, coffee 36 per cent. Still there is a panic because builders' supplies average an increase of about 30 per cent.

"Will prices be lower—can they be reduced unless the manufacturing and handling costs are reduced? In my opinion, nothing less than a general panic will bring them back to old levels. The law of supply and demand unquestionably is at work as usual. If the demand falls off so sharply that there is an oversupply, there will be a reduction. The same has been the condition and is to-day. Plants that have an output of hundreds of carloads per day have been able to ship only one or two cars a day on account of the car shortage. The plants have their books covered with orders. They are under the same overhead in operating costs that there would be if they were shipping their capacity. Do you think they will reduce prices under these conditions? With a million men going to war will labor be cheaper? What ground have we to look for lower prices on anything? Even government regulation doesn't seem to make living cheaper.

"Let us face conditions as they exist. The world is at war—every condition is unusual—wages never were so high before in the history of the country—there are no idlers.

"Bank resources are at the highest figure known—16 billion dollars in the June report. Deposits in national banks are 16 billion dollars—an increase of 2 billions in a year. All along the line there are new records in every department of banking and the cities are prospering as never before. This is exceptionally true wherever there is manufacturing.

"And the farms! They are prospering beyond their expectation, with big crops to cash in at the highest prices they ever drew.

"These conditions will last while the war lasts and then think of the rebuilding and the enormous demand abroad for all materials!

"Don't waste time thinking about high prices. Compared with all other things, building prices are not high!"

The cautious man would want to analyze these things that he may be able to form a judgment based on his own knowledge. Let him consider this résumé:

(a) The present saving. A 30 per cent increase of building material as compared with 50 to 300 per cent increase in nearly all other commodities, or, as above stated, more building per dollar.

(b) The certainty based on present economic conditions that present price levels will continue for a long period after the war.

(c) The likelihood of a further rise in prices. A good argument in favor of building now.

(d) The country's unusual prosperity and the soundness of its finances.

(e) The immediate benefits to be derived from a policy of quick action, and

(f) Last, but by no means least, the patriotic duty of going ahead with needed construction—taking a chance for the sake of "doing our bit."

It is a fact that any man can easily verify, that after the civil war a period of almost twenty years elapsed before prices had reacted to antebellum days. Further, it is also proven that prices have maintained a high level during from ten to twenty years after every war in modern history.

Another factor in the maintenance of present high prices is that there are in none of the essential industries large stocks of raw material on hand. The unprecedented demand is consuming these stocks as fast as they can be accumulated. There are now practically no reserve stocks, and the production of raw material and its distribution at the points of consumption all tend toward higher prices, thus creating the "hand to mouth" operation of many industries that are at present of the first importance.

Public Improvements in Time of War

In an address delivered before the League of Kansas Municipalities, Mr. James L. Begg, Commissioner of Public Improvements in Kansas City, stated, in part, as follows:

"Personally, I believe it would be a national calamity to cease public improvements and throw hundreds of thousands of workmen out of employment. But an idea growing popular is to cease any business not assisting the direct prosecution of the war, for the reason that such work deprives the country of the necessary men, funds and material. On the surface, this argument rings with patriotism, but look sanely below the surface of the situation of closed business activities and tell me where the people are to get this money to subscribe to the war reliefs and to purchase the Liberty Bonds. How are the unemployed to be even self-sustaining?

"The continuance of public improvements during the war is also being criticized, arguing that the country needs the men, money and material. The argument in favor of the continuance of usual business activities holds fast in favor of public improvements being continued wherever possible.

"If the material used and the class of labor employed were needed by the Government, were the taxes appropriated for the payment for such work transferable to the War Department, the Red Cross, the Navy League or the Allies, then I would agree that it would be retarding the war to continue through this crisis the usual public improvement.

"The Government has control of the materials necessary to the preparation and prosecution of the war. Cement, rock, gravel, sand, tile, brick and asphalt, the materials mostly employed in the development of public work, are not thus controlled but could be when necessary. The man who makes ready these materials is not skilled in any other line of work, and if he were, and of draft age, could be utilized by the War Department at any time. Neither is the laborer employed in the development of public work skilled in other work and he could not be turned to use in the direct activities. But to keep this man employed at his usual occupation as in normal times enables him to feed, clothe and care for his family. In short, it keeps the money in circulation. A portion of it goes to the grocer and to the shoe and dry goods merchant. The business man has more funds with which to buy Liberty Bonds and to subscribe to the war reliefs.

"The laborer thus provided with work is in an independent position, able to care for his family and giving the country a wiser form of economy than having a line of women and children applying to the city and county for aid. Taxes are required to feed the needy. Then why not take the taxes to make improvements whereby an honest laborer willing to work may acquire the funds for a livelihood and not be humbled to beg?

"Why demoralize our citizenship at a time when the country is demanding the efforts of our best men? I believe that during this war all are demanding the efforts of our best men. I believe that during this war all public and private work should be carried on at as nearly a normal level as possible. And if the time comes when the Government shall call upon these laborers for army duty in the fight for the democracy of the world the response will be made by strong, patriotic citizens and not by charity seekers made weaklings by a false economy program."

No Industry To Be Classed As Non-Essential

Walter S. Gifford, director of the Council of National Defense, states *Engineering News-Record*, has allowed it to become known in Washington that plans which were said to be on foot to make public a list of 525 industries in the United States in the relative order of their importance for the conduct of the war will not be carried out. The same information was obtained by the Washington correspondents at the office of Dr. Garfield, fuel administrator, where information in regard to the proposed order has been sought on the ground that if any industry was deemed unessential by the Government, its supply of coal would be shut off, and its name placed toward the end of the proposed list of 525 industries.

Instead of tabulating industry in classes to be known as essential and non-essential, the Council of National Defense is organizing what is to be known as a Bureau of Manufacturing Resources. The new bureau will afford a point of contact between all manufacturers and the Government, and the new bureau, as well as the Commercial Economy Board of the Council, will point out to manufacturers of what have heretofore been considered as luxuries the fact that they must expect some curtailment of their business during the war, thus opening the way for their coal and their labor to reach munition plants, etc. The plan will also give manufacturers of so-called luxuries an opportunity to convert their factories and forces wherever possible to the production of articles greatly needed for the war—the War Industries Board assisting by finding out for such manufacturers Government contracts suited to their plants.

The question of imports and exports has played

the principal part in the decision not to make public a list of non-essential industries, and Washington has been guided by the experience of England, when Spain refused to furnish pyrites unless Great Britain took also citrus fruits, as well as by other instances, in other countries. The Chamber of Commerce of the United States recently sent to business men all over the United States statements that it might be necessary to furnish Chile with jewelry and limousines if the United States wants nitrates and copper.

These subjects have been under consideration in Paris at the Allied conference, and it is understood that an international board, to deal with the subject of imports and exports, under which lies the question of what industries are essential or non-essential, will be created, with Oscar T. Crosby, assistant secretary of the treasury, now in Paris as a member of Colonel House's mission, as the representative on the board of the United States. It is understood that the board will continue its work during the period of the war, with headquarters in either London or Paris.

Whither Are We Going?

Unless we take time occasionally to detach ourselves from the details of our war preparations and view events as political phenomena, says *Engineering News-Record,* we lose sight of the tremendous changes which have occurred since April in our economic and political structure. We are in a new era. Economically considered, last March is of a different age. The war has brought changes that generations of peace would not have witnessed. A Washington item of last week, that made hardly a ripple, will serve to show how accustomed we have become to radical proposals and how readily we accept doctrines, extreme as measured by the standards of last year, so long as they are "necessary for the war." Washington dispatches had it that plans were being formulated for the establishment of a credit board for the purpose of attending "to the credit needs of manufacturers and contractors who are filling war orders for the United States Government." The report went on to say that among other things the board "will arrange for the financing either by having the Government make them (the manufacturers and contractors) cash advances or by other means."

While we readily assent to the proposal of Government financing, under present conditions, we should not blind ourselves to the magnitude of the step. We are extending public credit to private enterprises. That the products are for the Government does not change the fact. The significance of this course appears when we recall that through practically all time the credit power has been in private hands, not in those of the Government. It has been the bulwark of privilege and the undoing of those who had the vision, the organizing ability, the inventive genius, but were unable to tap credit sources.

But another thought suggests itself in this connection, how much of this war-time co-operation will be allowed to remain after the war? Will the railroads be allowed to continue their co-operative operation, involving pooling and all manner of practices formerly interdicted? (Some will answer by saying that these are steps toward Government ownership.) Will the advisory committees in the various industries be permitted to exist? Will the nation, heretofore against ship subsidies, continue to be an owner, or at least a lessor, of shipping? Will the Government continue to exercise control over essentials, such as iron and fuel and food? In fine, are the national industrial economies which the war has occasioned a permanent acquisition, or will the new structure be swept away when peace comes?

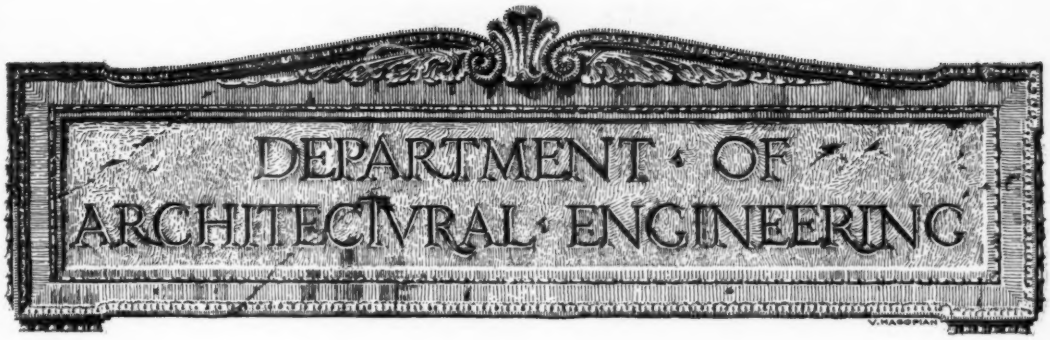
These are not only interesting, but extremely important questions. We do not presume to answer them. We doubt whether they can be answered now. We raise them because they must be answered before long and because engineers should have a part in the answering.

City Plan Report

Robert H. Whitten, Secretary of the Committee on City Plan, New York, has prepared his report. He states in part:

"The importance of planning a comprehensive system for an entire borough and not leaving the development of such system to chance or to the whim or selfish interest of the individual land developer or builder cannot be overestimated. But plans are futile unless they can be enforced. This is the great weakness of present methods. It is not easy, however, to suggest practical remedies. The city is not in position actually to condemn and acquire the ownership of land within the boundaries of proposed streets long in advance of their actual requirement for building purposes, and yet unless this is done there is nothing to prevent an individual owner from so improving his property as practically to block the eventual carrying out of the city's street plan."

"Legislation should be enacted that would permit the city to withhold for a period of from six months to one year the granting of a permit for a building within the lines of a street shown on the final map of the city."



The Philosophy of Physiologic Lighting

By F. Laurent Godinez

THE question "what is glare?" has been propounded thousands of times, but the answers do not illuminate the problem with intelligible intensity. Of all the definitions, "Glare is light out of place" comes a trifle nearer the mark, but not near enough to make a palpable hit. In discussing the problem of glare, or unphysiological lighting, from an architectural viewpoint, we are confronted with the fundamental hypothesis that "light is a *revealing* agent." Consequently, lighting which does not reveal is opposed in definition, action and *effect* to its function as a *cause*. Obviously, architecture to be appreciated must be seen, but if glare is present the function of sight is so restricted that appreciation is handicapped through imperception by depression of visual function.

Glare is so prevalent a factor in modern architecture that the building which is lighted at night in conformity with the laws of ocular hygiene is the exception and not the rule. Lighting fixtures which are in sympathy with their environment when unlighted become indistinguishable, meaningless blotches of glare at night, devastating to one's sight and to the expression of the surroundings (Fig. I). If the reader questions this sweeping denunciation, let him verify it by personal observation at night. In the over-intensity and dazzling glare of modern lighting there is no relief for the sufferers from its insidious physical reactions, which include many forms of inorganic lesions generally and incorrectly attributed to other causes.

The over-lighting of the reading page is responsible for that dull, intermittent pain about the eyes which often accompanies reading, and occasionally exhibits itself by symptomatic disturbances after a period of from twelve to twenty-four hours has elapsed. While eye-strain from this cause is slight, compared with the injury to eyesight wrought by more pronounced glare phenomena, it is interesting to analyze each of the factors responsible for glare to expose for serious consideration many influences which have been persistently suppressed. Physiology teaches that the character and adaptability of all human organs are shaped by usage, and its cumulative influence transmitted through centuries to the present generation. The human eye, as an organ, is no exception to this rule, and its adaptability as a medium for translating the vibratory phenomena of light radiation into the physical sensation or illusion of vision is prescribed within limitations which have been imposed by usage since the beginning when the source of light—then as now a substitute for darkness—was a flame, ignited by the primitive friction of flint and derived from leaves impregnated with the oil of a fish, symbolizing the birth of that historic emblem of architecture, the lamp. Physiologists agree that the structural peculiarities of the optic organ rendered it from the beginning more sensitive to the influence of a flickering flame source of light than to Nature's perfect illumination, which from daybreak to sunset affords an ideal so replete with subtle psychological intimations and discriminations concerning the periods allotted to work and rest that man's crude efforts to improve upon the Creator's plan have proved futile.

Before the day of the printed page astigmatism was an unrecognized factor, though it unquestionably existed, since misshapen eyeballs have been traced to other causes having a tendency to disfigure the perfectly spherical contour of the eye, which is the fundamental symbol of its ability to function focused rays of light correctly. Astigmatism existed in the days of the savage, but the long range of vision failed to disclose those painful symptoms which invariably reveal themselves when astigmatic eyes are subjected to the strain of close vision and the reading page.

Two very important phases of artificial light have

moulded the eye to its present state of degeneracy: first, the influence of yellow light, extending through a period of centuries, and second, the influence of "white light" inaugurated with the introduction of the tungsten or mazda electric lamp in its first form, less than ten years ago. Naturally, an organ which had thrived for centuries upon a color diet of yellow light could not adjust itself to a quality of light which, on account of its whiteness, was extremely irritating. Like the stomach, the eye can stand a

Fig. 1.—At night the lighting fixture becomes expressionless—an object of torture to over-taxed eyes, and utterly meaningless as a decorative symbol. By all means render the fixture harmonious with its environment but do not permit it to become an offensive, dangerous menace to ocular comfort. How inconsequential becomes the agitation of the fixture maker under the critical censure of the architect bestowed upon his beautifully rendered *esquisse*, when we realize that these objectionable discrepancies would not and could not be visible to the human eye even with the aid of a powerful telescope through the dense fog-like glare which annihilates all but the desire on the part of the beholder to look in some other direction.

certain amount of abuse. The stomach can never accustom itself to a diet of carbolic acid; nor can the eye assimilate a diet of light which in color, intensity and brilliancy exceeds the danger mark established by usage. The sensibility curve of the eye (Fig. 2) shows a maximum perception in the yellow region of the spectrum and a minimum at the red and violet extremes. Ultra violet radiation beyond the visibility range of the spectrum is extremely irritating to the retina, owing to the dissimilative action which decomposes the visual purpose more rapidly than it can be restored by natural assimilation.

It is not appropriate to digress from the general discussion for a detailed technical presentation of the physiological action of light in causing secretion and wandering of retinal pigmentation. Everyone knows by effect if not by name the symptoms of dissimilative action whereby the visual purple is bleached and photographically altered by the action of light, being transformed into a new chemical substance which, in turn, stimulates the light-perceiving organs, reactively conveying the stimulus to the centers of light and color perception, where an analysis of the sensation as regards color and intensity takes place in the brain cells. The symptoms of this retinal disturbance (from white light) manifest themselves by a deep-seated burning sensation of pain which seems to be near the base of the eyeball and which is prolonged in some cases for several days following the interval of exposure. Eye strain from this cause is prevalent wherever white light is used without modification and is reflected into the eye from the white surface of the reading page. Beneath a yellow light the white page becomes yellow and the contrast of the type against the yellow background is agreeable, accounting in a measure for the popularity of the oil lamp as a student and reading lamp. With our modern electric illuminants the color of the page is a dazzling white, and against this glaring background the perception of small black type is difficult and painful. The area occupied by the blank white paper is greater than

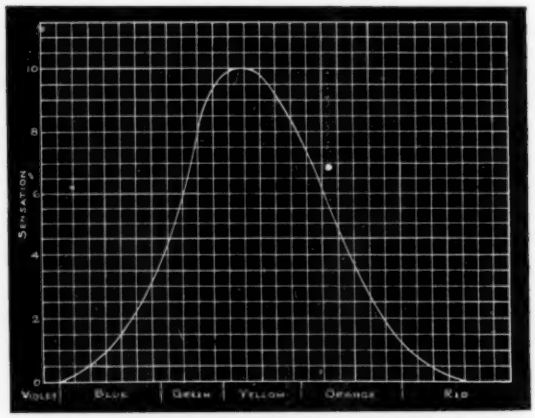


Fig. 2.—The sensibility of the human eye for color has been determined by the cumulative influence of centuries of usage. Physiologists agree that the color adaptivity of our visual organs has been shaped hereditarily by artificial light, which in its concentrated form exercised a more injurious effect than the diffused stimuli of Nature's illuminants, the Sun and Moon. The term "maximum sensation" implies maximum *comfort* rather than activity, although it is plausible to associate visual acuity and comfortable lighting—hence the popularity of the oil lamp.

is necessary as a reflecting surface, even with yellow light; so when a white light of high intensity is substituted, an excess quantity of light floods the retina, retarding perception.

The reversal of contrast backgrounds has been suggested as a means of correcting eye strain from this cause, but the change from black characters on a white ground to white characters on a black ground is too radical a transformation and one which could not be accomplished except by mutual agreement on the part of all publishers. Further-

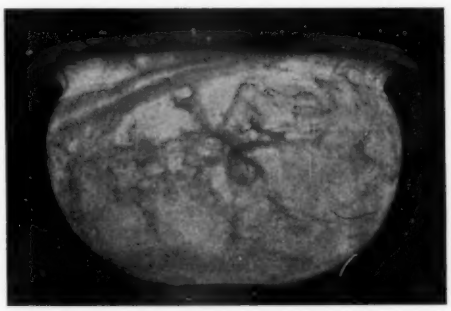
more, the area occupied by the white characters against the black ground requires too great an intensity of light for perception, and the abrupt reversal of contrast is psychologically as well as physiologically disturbing to the mind.

All professional men should try the experiment of conducting a personal diagnosis regarding their visual color accommodation. The change from a white to yellow light for all close work will accomplish the most extraordinary results in dispelling aggravating symptoms falsely attributed to organic troubles. Strange to relate, the process of transforming white to yellow light is not attended by any appreciable quantitative loss of light. The greatest brightness of the latest type of electric illuminants occurs in the yellow region of the spectrum, and this color is freely transmitted by yellow glass, which only absorbs the blue and green rays, which are lacking in useful brightness. Yellow film, silk or glass used as a transforming color medium in this way will not absorb more than 15 per cent of the useful light, but were the absorption loss over 100 per cent it would be thoroughly justifiable from the physiologic standard alone. Modern gas lighting equipment automatically effects this compensation.

Fig. 3.—Aside from the depression of visual function to over-stimulation of the retina, and the associated disintegration of the visual purple, there is an attendant reflex, nervous lesion due to the unnatural and prolonged contraction of the ciliary muscle, in its vain effort to exclude "glare" from the retina by contraction of the pupillary aperture. Reading under bad lighting after dining causes indigestion, on account of this extra and unnatural muscular burden coupled with its affiliated nerve tension.

Every architect has been confronted with the annoyance caused by the distortive influence of white light on architectural expression, evidenced by the cold, repellant atmosphere which it imparts, and the fixture maker has apparently failed to consider the subject of color, aside from the conformity of external fixture finishes with their surroundings. There is no condition of lighting in any interior, regardless of the type of fixture or the system of illumination used, which is not amenable to color modification without external changes. All direct lighting fixtures with enclosing glassware may be transposed by inserting yellow color cylinders over the enclosed lamps. Where direct lighting fixtures are encountered with exposed bulbs, the lamps themselves can be color "dipped" or new bulbs with colored glass substituted. The electric lamp is not an ornament, and even in the round bulb form it affords neither beauty nor utility as a fixture "ornament." It signifies a lack of ingenuity and inappreciation of modern possibilities on the part of the designer who allows himself to adopt such antiquated and worthless practices. All fixtures which conceal the illuminants from view are very easily adapted to color modifications by enclosing the lamps in color tubes, or, where possible, covering the open, light-radiating surfaces of the fixture with glass of the desired color density. If these applications are visible the color medium can be placed behind the regular enclosing glassware, providing that it does not possess any conflicting color. In such cases it becomes necessary to reconstruct the fixture, using new glassware throughout.

These considerations illustrate one phase of unphysiologic lighting due to the substitution of white for yellow light; and while the efforts of the engineer to "improve upon daylight" in the attainment



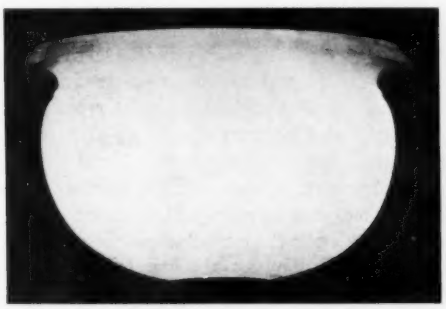


Fig. 5.—The bowl of genuine Italian Alabaster (left) is illuminated so that its pictorial beauty is delicately emphasized. Opposite, the same bowl is shown as it appears with several others, in a very attractive interior—with the exception of the lighting which conveys the exact impression of ordinary ground glass of the cheapest kind. By placing a dense reflector of opal glass within the stone bowl of Alabaster, the volume of transmitted light is reduced to the requisite degree of emphasis, and the reflected light from the inner portion of the reflector is permitted to diffuse throughout the room after becoming modified by the influence of the ceiling and its color.

of a white light may be of value to industrial occupations which, for commercial reasons, desire to turn night into day, architects and others who are opposed to a violation of esthetic ideals will continue to advocate lighting which is established on the proper foundation of color.

Glare from exposed lighting is more noticeable to-day than at any time in the history of lighting development, and it is this exposure of glaring bulbs which is causing so much ocular discomfort. Fortunately, each successive lamp improvement is attended by such a tremendous increase in brilliancy that within a short time no one will be able to regard an exposed bulb for the briefest interval without intense suffering. Possibly at that time the drastic legislation which has been so long delayed may be forthcoming—after the damage has been done.

To appreciate the overload which the human eye has been subjected to, it is only necessary to compart the relative brightness of light sources which shaped the accommodation of that organ since the beginning. This brightness is best expressed in candle-power-per-square-inch, because it has nothing to do with the quantity of light emitted by each illuminant, but is merely a measure of intrinsic brilliancy expressed in candlepower measured on one square inch of surface. On this basis the eye was exposed to a brightness of not more than eight candlepower from the oil flame and the candle; nor was this exceeded by the open gas flame many years later. With the introduction of the Welsbach mantle there came an increase of from eight to twenty candlepower, but the uniform luminosity of the mantle overcame in a measure the increase in brightness by compensating for the "flicker" which the eye had suffered from oil flame sources. True, the first gas mantles did not burn with an absolute steadiness, but their surging was of no significance when compared with the constant agitation of the flame. The mantle offered the first color change, but it was more toward the greenish-yellow than white.

When the electric lamp made its appearance in 1879, the eye was exposed to an increase of over 200 candlepower and the abrupt change from a flame and mantle source to that of a hair-pin filament, or line of light, bent in the form of a loop. These first electric lamps were not free from flicker owing to difficulties which were encountered in generating electric current at a constant voltage; so the eye had to contend with the accustomed disturbance or flicker, accompanied by an abnormal increase in brilliancy. Fortunately, the color of the first electric light was yellow, and this enabled the eye to assimilate the other irregularities.

With each successive improvement of the electric lamp there was a slight tendency toward a whiter light, but not sufficiently decisive to cause any damage until the exploitation of the Tungsten lamp. Tungsten is a chemical element which, when pressed or drawn in the form of a lamp filament, produces a light of intense brilliancy exceeding the limit of ocular safety two hundred times, as first manufactured. Physiologists agree that the eye should not be exposed to a brightness greater than eight candlepower per square inch, obtaining this figure from tests based upon the maxima and minima of intrinsic brilliancy standards ranging from the oil lamp to the electric lamp. The intrinsic brilliancy of the Tungsten filament was quoted at 1200 c.p., and later improvements soon caused increases which have culminated to-day (with the introduction of the gas-filled bulb) in extremes exceeding 6000 c.p. per square inch!

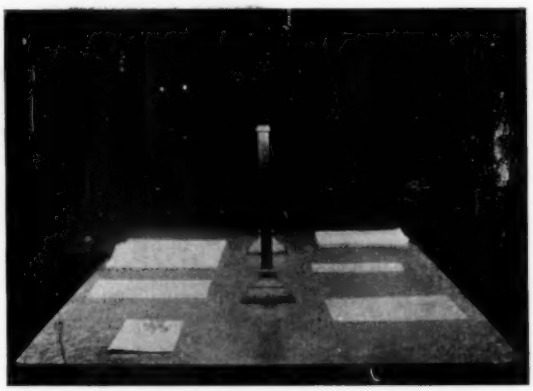


Fig. 4.—The desk light is one of the most difficult mediums to control for glare avoidance. If the lamp itself is concealed within a shade or reflector, the white surface of the working page will reflect light up into the eye with the same painful abruptness as the snow covered sidewalk. By placing desk lamps at the right height, and carefully calculating their light emission, the reflected light from the working page will strike the worker far below the level of his eyes, thereby insuring ocular comfort. Such a rare example is illustrated.

If the reader questions the danger of such illuminants, let him regard one for less than one second and then attempt to focus his eyes on any object near or far. The dazed sensation which follows such exposure sometimes lasts for hours, and in the case of weak eyes often entirely paralyzes the optical function for days at a time (Fig. 3).

There is great danger in promiscuous lamp replacements. In several hospitals in the East the management desired to avail themselves of the saving in electric current effected by gas-filled bulbs of the latest type. The fixtures were of the sort that always get specified where politics rules, and consisted of the inevitable "stem with crossarms" and pendent sockets. These had been filled with carbon lamps, and while directly in the line of vision, their yellow light and lower intrinsic brilliancy made their

glare endurable. The substitution of the nitrogen bulbs had caused great complaint among the hospital patients who must lie with their eyes directly facing the blinding glare. The significance of this sort of thing—which is common alike to hospitals and all buildings where the lighting problem has been neglected—is that these high brilliancy illuminants must be handled with extreme care or else the resultant illumination will be unphysiologic and utterly demoralizing to architectural expression.

Another phase of bad lighting is caused by misdirected light rays which are reflected from ceilings and side walls at such abrupt angles that it is impossible for the eyebrow to exert its protective function (Fig. 4). In the well-lighted interior occupants are free from eye strain in any portion of the room, and the lighting equipment can be regarded fixedly without the slightest ocular discomfort. Apply this test to lighting in your vicinity and you will find it applies in eighty-five out of every one hundred cases.

Architectural considerations demand a great deal more from lighting than glare elimination. For example, an urn of Italian alabaster might illuminate an interior with just the requisite degree of emphasis and without the slightest glare (Fig. 1), yet the pictorial value of the urn itself might be destroyed by excessive brightness.

It is conditions like this which afford an infinite variety of difficult individual problems, each deserving of special treatment as a part of the general lighting problem.

Progress and Prospects in Architectural Engineering

OUTSTANDING events that mark the progress of architectural engineering are of infrequent occurrence. They are so few, in fact, that we readily give such a place to the introduction of rolled wrought iron structural shapes, the use of which changed the character of building construction in a radical manner. The production of rolled steel structural shapes in the latter '80's gave a great impetus to the building industry by providing a much stronger material than any previously in use, of practically equal weight. Another such event was the introduction of reinforced concrete construction about ten years later. This latter form of construction was immediately investigated through the medium of scientific tests and has now become a standardized form of construction.

During the past year the design and construction of buildings has been affected by the abnormal increase in the cost and scarcity of materials of construction. If this condition continues it may affect our methods of design in such a way that its influence will become an event of importance. Coupled with the abnormal demand for the construction of industrial buildings, this condition may not only influence our methods of structural design, but also the practice of architecture and architectural engineering.

The architect and the engineer are confronted with the necessity of making a very close and comprehensive study of the characteristics of all of the materials of construction and their cost and availability. The uses to which these materials have been put, as a matter of routine, cannot in all cases be followed at the present time, and our methods of design must be altered to suit the situation. To successfully design a building today with a view to economy and speed of erection it is often necessary to use a combination of structural steel, reinforced concrete and structural timber. Methods based on normal conditions can be safely and intelligently dispensed with along with some other precedents that have been unquestioned heretofore.

This can well be illustrated by the construction of a warehouse in Chicago, in which the columns and girders were made of reinforced concrete in combination with a heavy laminated wood floor. The building is a success in every way, economically and structurally, but this combination would not have been used a few years ago.

It is then apparent that the architect and engineer is confronted with the necessity of being in closer touch with all materials, their uses, abuses and availability. In order to do this it is essential that he have an intimate contact with the sources of supply in the persons of the producer and dealer. These latter sources of information are really the only legitimate ones at hand and their importance is well known to the successful architect and engineer of today. Structural value and money cost must be carefully considered and the decision made regardless of what was done yesterday or the day before that.

Another element is becoming apparent, and it is one which tends to eliminate the architect and en-

gineer in independent practice. Reference is made to the contractor-engineer, who advertises his thirty, forty or fifty-day factory, made while you wait. This competition is apparent in some localities, but as yet is not a very important factor. At the same time, it must be admitted that the display advertising made by these organizations may make a strong appeal to the purchaser.

As a rule most persons are susceptible to the effect of a pleasing design, and the owner, like others of limited experience in building, is very seldom an intelligent purchaser. Low cost and speed often appeal to him to the exclusion of the elements of appearance, convenience, permanence and stability. The contractor-engineer is probably capable of delivering a ready-made structure consisting of four walls and a roof, but he is limited to just those things. Instances are common where these organizations have not given the speedy construction so loudly proclaimed and really they are subject to the same human limitations that affect the architect of equal intelligence and energy.

Admit the possibility of an appreciable loss of business on the part of the architect and engineer due to the advertising campaign and selling methods of these contractor-engineers. This competition can be met in a legitimate and sensible way. In order to do this the architect and engineer must readjust their methods in many respects. The elements involved are the preparation of the plans and the kind of building contract.

The plan is determined in these times largely by cost and availability of material and labor. This fact necessitates a close contact with the source of supply and the contractor, and in this way the style of construction is decided by making preliminary estimates on the structural portions of typical bays and sections. The factors common to any type can be considered later, as it is the structural bulk of the building that governs the necessary costs.

A contract based on the cost-plus percentage or unit price scheme is almost necessary where speed is essential. A contract of this kind, based on a typical sketch and a synopsis of specification, permits the contractor to organize men and equipment for the work; permits the purchase of the essential materials from sketch plans, and permits of the grading, excavations and other such activities going on while the plans and specifications are being made.

It is a simple matter of co-operation, the elements of which are the well equipped organization of the architect and engineer on one side, working in close relation with producers and dealers in materials, the contractor, sometimes representative of organized labor, and the owner, on the other.

To meet the situation forced by the display advertising and selling methods referred to is quite a problem and must of necessity force the architect to modify some of his ideas and practices in this respect. This matter is now under consideration by some architectural and engineering organizations and doubtless they will find a proper solution. That the condition under which the architect and engineer disposes of his services may become irksome is possible and is as worthy of united thought and action as any factor affecting those professions.

The heavy inroads made in the available engineering talent by governmental activities is another factor which confronts the architect. It makes it more necessary than ever to make satisfactory working arrangements with that essential element of building construction. The relations of these two necessary factors will undoubtedly undergo some changes, and by mere force of circumstances a more satisfactory and equitable adjustment will eventuate. This can be accomplished by means of an honest measuring of the human limitations of each profession and according each its due.

The allied interests of the building industry should be active in considering the present aspect of affairs. United action, national in scope, will be necessary to preserve it. It is logical that in the presentation of this matter for general consideration the architect and engineer should assume an important position. It is not a time to await invitation, but to act with initiative, demanding, as an essential factor in the industry, a share of the responsibility.

The organizations of these professions generally meet at stated intervals, and a number of them, owing to war conditions, have foregone meeting at all, thus making united action on their part an exceedingly difficult thing, and giving the impression that they are willing to allow the profession to rest supinely on precedent and die of sheer inertia.

There will never be a more opportune time for the professional element in this industry to throw these precedents and other such useless impedimenta to the winds, and to take a definite stand as business men toward the preservation of their interests. Unless radical steps are taken the present distressing state of affairs will go from bad to worse, and those who do not get in line with practical efforts toward the solution of this problem will find themselves eliminated.

That there is a necessity for building construction is apparent, and now is the time to present a united effort, antagonistic to pessimism, wild rumors and fear of things that never happen. If other industries can make business, there is no reason for the professional man not doing the same, by perfectly legitimate and proper means.

The engineering features of building construction are governed by regulations that are constantly being changed. The architect and engineer are

steadily increasing their influence in these matters. Cleveland is about to adopt a new "flat slab" reinforced concrete ordinance. This type of construction has almost become standard in the central and western states and the laws governing its design are of general interest. Pittsburgh will soon consider an entirely new and complete building code which has been in preparation for a considerable time. New York and St. Louis are working under new regulations; Chicago has eliminated the ordinance conflicts between the Building Department and the Bureau of Fire Prevention and Public Safety and other revisions affecting structural design are under consideration. These regulations and their effect on building construction will be discussed as they become effective.

There is every indication that building construction of some kinds and in large volume will be executed during the coming year. There is no doubt but that the architect and engineer is becoming alive to the changing conditions of affairs and is preparing to cope with them. It is to be hoped that his endeavors will be met successfully and with profit.

Structural Features
International Tailoring Co. Building

MUNDIE & JENSEN, *Architects*

THE structural framework is of steel columns and girders, fireproofed with concrete and carrying reinforced-concrete floors and roof.

Foundation is of 50-ft. cypress piles, loaded to 25 tons each, driven to hardpan with tops cut off 1′ 0″ below datum and covered with reinforced-concrete capping. Property line on one side and street lines on two sides made it necessary to use cantilever foundation construction at three sides of building. Reinforced-concrete was used for these cantilevers.

Building is divided into rectangular panels 19′ 1″ x 20′ 6⅝″ with rolled steel columns at panel intersections, 20″ steel beams spanning the 20′ 6⅝″ direction and 6″ steel tie beams between columns in the 19′ 1″ direction.

Steel beams were used in framing around stairs, elevators, shafts, etc. The stairs, elevators, etc., were grouped as far as possible to limit the number of typical panels broken into by special framing.

Structural floors between steel girders are of 2½″ reinforced-concrete slabs with 4″ wide by 10″ deep ribs or joists on 24″ centers, the slabs and ribs being poured together, forming tee beams between the steel girders. The end 3′ 0″ of ribs was beveled to 8″ wide at supports to provide for shearing and negative bending stresses. Finished floors are of wood on beveled wood strips with cinder concrete fill between strips; ceilings were formed by wiring ¼″-diameter steel rods to undersides of floor ribs and covering with wire lath and plaster.

The specification for floor construction was drawn to allow the use of either metal or gypsum tiles for forming the concrete slabs and ribs.

At the time of letting contracts, a system of wood forms, beveled so as to be easily removed and reused, and in which the ordinary form joists were used to form the sides of the concrete ribs, was suggested by the architects. This system was adopted and a saving of about 12 per cent of the cost of form work made to the owners.

The live floor load for the building is 100 lb. per square foot. The structural designs were made by the architects, all being in conformity to Chicago Building Code.

The Present and the Future in the Building Field, as Shown in Correspondence with Various Building Materials Interests

The Northwestern Expanded Metal Co., in their house organ, *Expanded Metal Construction,* review future conditions in the following lucid manner:

"What is to be the condition of the industry next year? The answer to this depends upon the attitude taken by the individual architect, contractor, dealer and manufacturer. Each of these can help to materially stabilize building conditions by publishing the facts. In comparison with other commodities, building material prices are not unreasonably high. There is very little difficulty in obtaining the materials required. The condition of business in general is sound, there is an abundance of money and more is to be spent for war supplies. The need for buildings in nearly every locality is a very pressing one. The keeping of the building industry in a prosperous condition is important to the welfare of the country. Without a prosperous country the satisfactory and early conclusion of the war cannot be brought about. Not only is there a pressing demand for buildings in many localities, but there is a line of building which is frequently overlooked when conditions are normal. Every locality presents great possibilities for the remodeling and reconstruction of old buildings. What is needed right now in the building industry is for every man who has the interest of the industry at heart to stop howling about conditions and get out and see what can be done to improve them. A careful study and investigation will convince the most pessimistic that this great branch of industry is far from becoming extinct and that next year may be made a busy and profitable one for every one interested in any way in building construction."

* * *

In a letter received from Henry W. Dakin, president of Crittall Casement Window Co., there is presented an excellent example as to how the cessation of certain lines of manufacture in Europe has served to stimulate production in the United States. While every European country has suffered to a greater or less extent from the interference with production, it is logical to assume that a strong effort will be made when peace is declared to regain this lost business. Manufacturers in the United States will no doubt face strong competition and they will equally without doubt strive in every way to overcome it. Mr. Dakin writes:

"While we now feel the effects of general business readjustment made necessary by war conditions, this company is just completing the most successful year of its history. These conditions are attributed largely to the more general use of metal casements, in keeping with the tendency toward the building of more substantial structure.

"English-made steel casements have formerly been much used in this country, but now, because of the difficulty in importing them, some of our increased business is explained by this condition."

* * *

The Indiana Limestone Quarrymen's Association has been using much of its advertising space in a broad propaganda to stimulate legitimate building operations and to allay by well-directed arguments a tendency toward a pessimistic view of the building field in the present and in the future.

In response to a letter addressed to this association, there has been received the following reply:

"It is a fact that in many more cases than is popularly imagined, first-class building stone like Indiana Limestone may be employed and detailed so as to obviate the necessity of using expensive slow delivered steel. It will be clear to anyone who gives the subject a moment's thought that there are great possibilities in reverting to standard masonry construction, at least in buildings of moderate height."

* * *

The substitution for materials heretofore employed of others whose merits have perhaps been overlooked is revising the character of the raw material used in many industries.

The following extract from a letter received from The Birch Manufacturers' Association illustrates a case in point:

"Owing to our active Birch Campaign this year, shipments of Birch lumber have not fallen off. We have investigated other markets and have secured the specifying

of Birch for aeroplane propellers as a suitable alternative for mahogany or walnut. In the same way it has been used in the manufacture of gun stocks for some of the Allies and further large purchases are contemplated. Increasingly better grades are being called for by the manufacturers of particularly fine boxes for the shipment of expensive munitions. This wood has worked into these channels on account of its hardness and strength which is much the same as Rock Maple.

"Rotary cut Birch Veneers are also finding an increasing market along new lines, particularly in aeroplane work where their extreme strength and hardness is making them a desirable material."

* * *

Old "saws" survive because their teachings are along the lines of truth. "Necessity is the mother of invention" is a time-worn adage, and its truth is being shown in the fact that many manufacturers have been compelled to invent new processes or to adopt new materials and methods in order to overcome the obstacles presented in the non-availability of usual materials.

The following extract from a letter from the Wisconsin Iron and Wire Works illustrates this point:

"The general opinion is that ornamental iron and bronze are considerably higher in cost than before the war, but we have found that by using the wrought construction, and the improved methods of making connections which are now available to us on account of the improvement in welding apparatus, that we are in a position to turn out ornamental iron work with considerable economy, as long as the lines are kept plain and the design is such that wrought shapes and moldings can be used.

"As you doubtless understand, in the wrought construction there is a considerable economy in labor, due to the fact that patterns are eliminated, and further, owing to the fact that metal shapes can be obtained in the market at a much lower price per pound than high grade gray iron castings can now be secured.

"We mention this information, thinking that it might be of interest to your readers, and also to assist anyone interested in securing values in ornamental iron and bronze at this time."

* * *

That we "cut our coats according to our cloth," or that we avail ourselves of standardized labor-saving materials, is urged in a letter received from the Trussed Concrete Steel Co. of Detroit, Mich.

This argument in favor of a wider use of materials that will serve our purpose is along right lines. We are paying a high price for this war, and we are getting some returns, even now, in the light of new experiences, new and valuable lessons in economy, and the stimulation of our powers of invention in these matters of alternatives that will have good effect long after the present necessity has passed.

The letter from the Trussed Concrete Steel Co., referred to, says in part:

"Conservation is the keynote of the present day. America is engaged in the gigantic task of supplying the world. In the face of this, many of our skilled mechanics are on the firing line, and there is a distinct shortage of labor in all industries. Those who are at home must learn to do with less and to use what they have more efficiently.

"In the building world, any materials that economize in labor in the field should be encouraged, as well as those that economize materials. Use the shop-fabricated materials in place of those that require large organizations in the field and which delay construction progress. In reinforcing steel, use the shop-fabricated reinforcing bars which combine in one member the horizontal reinforcement and hundreds of loose stirrups. They save labor of forming, handling and placing hundreds of loose members in the field, besides actually economizing in the quantity of steel.

"Another material which is particularly economical at this time is pressed steel hoists and studs. A fireproof floor can be built of this material very quickly, using the minimum amount of labor in the field and very little material. The pressed steel joists are completely fabricated in the factory. When they reach the job, all that is necessary is to set them in place. Prongs are already punched in the top and bottom members, so that the reinforcing material is readily attached. No cutting, no punching, no fitting of any kind is required on the job. All this work has been done in the factory.

"Standardization is essential in economizing labor and increasing production. The use of special materials in building should be avoided wherever possible. Special materials require extra work in handling, preparing drawings, shop manufacture and in erection. Use the stock standards of steel sash. These stock sizes will fit practically any size of window opening, and meet all requirements of daylighting and ventilation. Further, stock sizes insure speed in delivery of material as well as economy in the cost of the building.

"In fact, architects will often find it advantageous, particularly as auxiliary structures in industrial buildings, to use standard buildings in place of special designs. Such buildings are of a one-story type, and stock panels and units for them are kept continually in the warehouse. Sizes of buildings run in a variety of widths up to 60 feet, and in lengths in any multiple of 4 feet. An additional feature of these buildings is that they can be readily taken down at any time and re-erected in another location without loss. The buildings are fireproof, as every part of them is of steel, including windows, doors and roofs."

Industrial Notes

The American Steel & Wire Company of 208 S. La Salle Street, Chicago, manufacture concrete reinforcement, electrical wires and cables and wire rope. In connection with the latter product, it is interesting to note that a very large portion of the output of wire rope for the past year has been used to fill the tremendous need for wire nets to protect our harbors from enemy submarines. It is pointed out that there is no substitute for this material.

One of the most significant arguments in favor of the use of hollow building tile is its healthful growth as an important building product. The marked increase in the number and kind of buildings in which this form of construction is used speaks better for it

than any other form of advertising could. The Hollow Building Tile Association, 111 West Washington Street, Chicago, Ill., claims that under present conditions buildings can be erected almost, if not quite, as cheaply of this construction as frame. It seems logical, therefore, that the building public should now turn more and more to the use of clay materials, and of hollow building tile in particular.

The William Bayley Company of Springfield, Ohio, have developed the solid rolled steel sash to a very high point of efficiency and economy. These windows are used very extensively in every type of building, and are especially practicable for use in industrial buildings, inasmuch as they insure economy and rapidity of erection.

Another novelty in the construction line is that offered by the Keppler Glass Constructions, Inc., who call attention to the specialty they are making of glass walls. The most important features of these walls are that they give a great deal of light, need no upkeep as there are no exposed metal parts, are not transparent, and are a much better protection against heat and cold than ordinary windows. This type of wall construction finds particular use in industrial and railroad buildings, in the place of curtain walls, and for partitions of inside offices that might otherwise be dark. The walls are built of 6 in. x 6 in. units, which are also used in skylight construction. The materials used in their erection can generally be secured locally without difficulty.

Fiske & Company, Inc., of 40 West Thirty-second Street, New York, which developed the Fisklock Tapestry Brick about three years ago, advises that it has been used for approximately 700 buildings. This brick, which takes the place of both face and backing brick, can be erected almost as cheaply as frame, and the manufacturers state that it is considerably cheaper than other types of masonry construction. This material is being used very extensively for housing projects developed by manufacturing firms, and may well become of still greater service in solving one of the greatest industrial problems of the day.

During the past year the Stanley Works of New Britain, Conn., have developed the Stanley Sherardized finish. This finish is applied principally to steel butts and hinges, and practically makes them rust-proof. Over this "sherardizing" standard plated finishes are applied, and a very practical substitute is thereby secured for solid bronze and brass, at considerably less cost.

The Mitchell-Tappen Company of 15-17 John Street, New York, manufacturers of Standardized Metal Caging, are advertising their ability to take care of orders for this product on forty-eight hours' notice. They have provided sufficient material and manufacturing facilities to make this possible, and are to be congratulated on their foresight.

The Tirrill Gas Machine Lighting Company of 103 Park Avenue, New York City, manufacture a machine in which gasoline is used from which gas is generated for use either in lighting or heating. This apparatus finds particular use in places where there is shortage of coal or gas. It has also been extensively used to meet cooking needs of country residences where it is not desired to use coal, and where isolated electric plants are installed for lighting purposes.

The scarcity of cork and other insulating materials has brought to the front the insulating and sound deadening quilt manufactured by Samuel Cabot, Inc., of 141 Milk Street, Boston. This is not a new product, but its uses are constantly becoming broader, and it ranks among the best for the purpose indicated, as shown by tests of the U. S. Government Bureau of Standards.

The Hughes Electric Heating Company, 5660 Taylor Street, Chicago, are manufacturers of electric heating appliances which might well be of general interest in these times of coal and gas shortage. Their electric ranges are installed very successfully in large apartment buildings in various parts of the country, and are also very popular for use in the Domestic Science Departments of our public schools. From the standpoint of cleanliness, comfort and economy the electric burner is said to surpass any other form of heat. Each burner has three degrees of heat, and the precision with which the heat can be regulated is another strong factor in its favor, from the standpoints of efficiency, comfort and economy.

The Flintkote Company, 88 Pearl Street, Boston, manufacture an asphalt shingle which is unique in color, being a mottled effect acquired through the use of the popular gray-green and dark red slate. This effect is very attractive in appearance, and is also said to be absolutely permanent in color. The economy of the asphalt shingle is unquestioned, due partly to its permanence and also to the fact, according to the manufacturers, that the use of asphalt shingles entitles the owners to a reduction of at least 7½ per cent in insurance rates over that on unapproved material.

DETAIL OF THE CUPOLA, THE VATICAN, ROME