

The AMERICAN ARCHITECT



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INTERIOR VIEW—CHURCH OF S. GIORGIO MAGGIORE, VENICE

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Making sure the Stucco Walls will Hold and remain Crackless and Beautiful

Insuring -

Bishopric Stucco Board used on this residence.

F. M. D. Watkins
Binghamton, N. Y.
Owner

Geo. H. Blakeslee
Binghamton, N. Y.
Architect and Contractor

Insured!

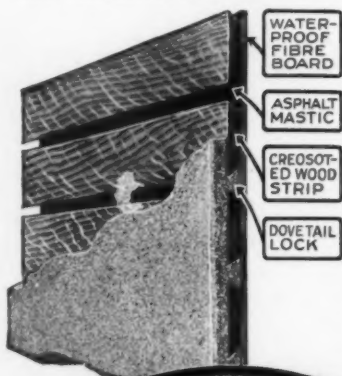
This Binghamton, N. Y., home is shown, in the top picture, ready for Stuccoing. See those spaces between the wood strips of the Bishopric Stucco and Plaster Board? They are the dovetail keys which imprison the Stucco. Once Stucco is applied, it is locked rigid forever by these thousands of keys.

Note how the joints of the Board are broken every few feet. This strengthens the purchase of the keys by distributing the strain of the Stucco. The walls cannot sag or crack anywhere because they are completely unified.

BISHOPRIC BOARD was nailed so securely to this building that the weight of the average Stucco wall—10 to 15 pounds per surface foot, could not possibly budge a single wood strip. Bishopric Board's resistance to deformation in the plane of the wall is extraordinary. No other Stucco base can be nailed so securely.

The beauty of this Binghamton home is insured for its life. The Stucco will always be smooth and fresh looking. Repairs will never be necessary.

Bishopric Board is the background that prevents cracking of Stucco. It insulates perfectly. It also completely sound-deadens the home. It is the most economical Stucco base and gives the Architect and Builder an opportunity to provide special conveniences with the savings made. One-third less plaster is required on account of the dovetail grooves. There is no waste—1,000 sq. ft. covers 1,000 sq. ft. of surface.



Bishopric Board is a combination of materials and principles that have been in constant and successful use for ages. It is protected in every way against the ravages of time and atmospheric change. It keeps the home always dry.

In interior use it saves plaster, time and labor, insulating against heat and cold and deadening sound to a remarkable degree. Bishopric Sheathing, our new product, saves 30 per cent as compared with $\frac{7}{8}$ wood Sheathing and makes a solid, compact wall.



Architects and Builders: Send for Booklet which tells your clients all about Bishopric Board. It contains the perfect stucco mixture; reports of tests; and endorsements by Engineers, Architects and Builders.

THE BISHOPRIC MFG. COMPANY

904 Este Avenue



Cincinnati, Ohio





"ST. MICHAEL ARCHANGEL," FIGURE IN METAL WORK REPOUSSÉ. BASILICA OF
ST. MARK, VENICE

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VOL. CXVI

WEDNESDAY, JULY 2, 1919

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The Life Work of the Late Wallace C. Sabine An Appreciation

By PAUL E. SABINE

THE name and work of Professor Wallace C. Sabine are familiar to all readers of THE AMERICAN ARCHITECT who have ever had to deal with the troublesome problems of Auditorium Acoustics. His death, at the age of fifty, which occurred on January 10, cut short a life of extraordinary activity and usefulness. A recital of the facts of his life and the outline of his work in the field in which he was pre-eminent will be of interest to that large circle of architects in Europe and America with whom his commanding knowledge of acoustical problems brought him into contact.

He was born in Richwood, Ohio, in 1868. He first went to the Public School at the age of eight. At twelve, he entered the preparatory course of the Ohio State University, graduating at the age of eighteen. After two years of graduate study at Harvard, in Physics and Mathematics, he was made an assistant, and shortly after an instructor in Physics. In 1895, he became Assistant Professor of Physics, and ten years later received the full Professorship. Less than another decade later, he succeeded Professor B. O. Peirce as Hollis Professor of Mathematics and Natural Philosophy, a chair which had been filled by a long line of distinguished scholars. In 1916-17, he went as Exchange Professor to France, lecturing on the subject of Architectural Acoustics at the Sorbonne and the École des Beaux Arts, and before the French Society of Architects.

Brown University conferred on him the honorary Doctorate of Science. He was a member of the National Academy of Sciences, a former Vice-President of the American Association for the Advancement of Science, and at the time of his death, Vice-President of the American Physical Society.

This record of scholarly achievement is matched by one of equal worth as an administrator. That masterly director of men and affairs, President Eliot, early marked him as "able and

clear headed." In 1906, President Eliot confirmed this judgment by asking Professor Sabine to become Dean of the New Graduate School of Applied Science, a post demanding not only administrative skill and tact, but also unusual capacity for constructive work. That the foundations for a new and vastly important departure in scientific education were well laid is conceded by all who know the brief history of this department of Harvard University. It was equally this same capacity for broad-minded and far-seeing constructiveness that made him a strong advocate of the movement that ended the existence of the Graduate School of Applied Science in the attempted merger with the Massachusetts Institute of Technology.

The value of his services during the war was recognized by the governments of England, France and America. While in France, he was on the staff of the Bureau of Research of the Air Service of the American Expeditionary Force, a consultant of the French Bureau des Inventions and the British Munition Inventions Bureau. Because of his close acquaintance with the airplane activities of the Allies, after his return to this country in the fall of 1917, his time and services were in constant demand for America's airplane program. After the reorganization of this work in 1918, he became Director of Technical Information of the Board of Aircraft Production. A prominent member of that service remarked regarding him, "he is the one man in the service who claims to know least and who actually knows most about all phases of the aircraft problem."

Writing of his work during these days of the war, Professor T. C. Mendenhall of Ohio State University, his first teacher of physics, says: "His services proved to be of incalculable value and he was constantly traveling back and forth between Cambridge and the Capital.

"During all this time he was suffering from a

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serious malady which came near ending his life in Paris in 1916, and he knew that it could be remedied only by an operation to which his friends had urged him to submit. With a complete forgetfulness of self which was characteristic, he invariably answered, 'Not while the war is on and other lives are in danger.'

Only after his country's crisis was past, did he turn to save himself. He never rallied from the operation performed on January 6, 1919, which, had it been performed earlier, might have saved his life.

Viewed both by the scientist, and the practical man, there are certain outstanding features of Professor Sabine's work in Architectural Acoustics that mark it as of a high order. To the scientist it appeals as being constructive in the highest degree. Definiteness of purpose, directness of attack, simplicity of method, and thoroughness and complete reliability of results distinguish it throughout. To the architect, it appeals strongly, because his results were always presented in a form immediately applicable to concrete and very troublesome problems. He never undertook research simply for the fun of finding out something new, but always to find the answer to a problem that people wanted and needed to have solved. Having done this, he was at pains to state his results in terms that the man who needed them would understand.

To appreciate the value of his contribution to knowledge, we may, for a moment, consider the situation confronting him, when the Corporation of Harvard University asked him in 1895 to undertake the correction of the acoustics of the recently completed lecture room of the Fogg Art Museum. None of the standard text books on sound even mentioned the question of why some rooms are acoustically good and others acoustically bad. At that time no investigations had been published on the subject.

Out of the careful study made for the purpose of solving the particular problem, grew several important results. First of all, the acoustically bad auditorium was made fairly good. At the same time a large amount of valuable data was collected, and, more important, there was evolved a theoretical basis upon which any similar problem could be attacked with some hopes of successful solution. When a year or two later, Messrs. McKim, Mead and White, architects of the new Boston Music Hall, chose to stake their chances of an acoustically successful concert hall on something more substantial than mere luck, Professor Sabine's experience and knowledge were called upon and the acoustical design of the building followed his recommendations. So confident was he of the correctness of his method, that in an article in THE AMERICAN

ARCHITECT, published in 1900, before the completion of the hall, he predicted the period of reverberation of sound in it of standard intensity to within one-hundredth of a second.

This confidence was justified in the altogether satisfactory acoustical properties of the finished hall. The publication in 1900 of *Architectural Acoustics, Part I*, was the product of five years of painstaking labor and formed the first real contribution to the subject.

In the introduction to this paper is given a complete outline of the elements of the acoustical problem. One needs to consider Loudness, Interference and Resonance, Reverberation, Echo and Extraneous Noises, to know completely the acoustic properties of a room. Of acoustical defects, the most common is excessive reverberation, and in this first paper the writer outlines the method of experimental study and the elimination of this defect. He goes on to develop an adequate mathematical theory, and gives sufficient generalized data to make his method of remedying the difficulty applicable in any particular case, and finally as an example of the use of the method, he gives the computation for the new Boston Music Hall and a comparison with the acoustical properties of two similar halls, the Leipsic Gewandthaus, and the old Boston Music Hall. The publication of this paper definitely removed the whole subject of auditorium acoustics from the half-world of chance and guess work. It demonstrated that the architect may plan for the acoustics of a structure with the same degree of certainty that he provides for lighting and ventilation. It gave a solution both theoretical and practical of a problem as old as architecture itself.

It is to be said that in the eighteen years since the publication of his first paper, Professor Sabine followed consistently the program of investigations there outlined. The order in which they were taken up was determined by the demands of the subject itself, and by the actual needs of architects who consulted him.

A word as to the conditions under which all these investigations were performed may be of interest. In its early stage, the method was largely observational. That is to say, it called for the determination of the acoustical properties of rooms already constructed. In certain experiments these properties were altered by the introduction of large quantities of absorbing material, for example, seat cushions in great numbers. Observations had to be taken when complete silence was possible. To appreciate how rare this condition is, one needs only to undertake to secure it. Necessarily the work was done at night and most of it between the hours of one and five in the morning. Buildings presenting the properties desired for study seldom

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had the additional advantage of being isolated and free from noise. The notes of this first five years contain data taken in some forty different rooms, ranging in size from small vestibules to large auditoriums and in location from Bangor to Minneapolis.

In the years immediately following the work on reverberation, the research was extended to include the whole range of musical tones. This, of course, increased many fold the amount of data to be collected. The results of the work of this period were published in part by The American Academy of Arts and Sciences in 1906. In these papers, is described a series of experiments conducted with the aid of some of the faculty of the New England Conservatory, which established the fact that there is a very sharp optimum value of the period of reverberation in a room used for piano music.

The experiments to determine the absorbing power of an audience, and of various wall surfaces, and materials for tones of pitches covering the entire musical range are also described, thus completing the experimental study of Reverberation.

Following the year 1906, the new duties of Dean of the Graduate School of Applied Science would have effectively stopped the research activities of most men. However, Professor Sabine found time, while others slept, to determine the sound-absorbing properties of a great number of materials, for the whole musical range. He also developed a tile whose sound-absorbing properties compare very favorably with those of felt. He gave much time to consultation in this country and in England, both as to buildings in construction and as to methods of improving faulty acoustics. During this period he began the experimental study of the phenomenon of sound interference as applied to interior acoustics. The variation in intensity of sound at points in a room containing a constant source of sound was carefully studied and photographically recorded by means of a telephone receiver and string galvanometer. This study afforded much information on the so-called "dead spots" in auditoriums and demonstrated fully the inadequacy of the "sound ray" method of studying acoustical problems. There was also developed in this period the modification of the Toepler-Boys-Foley method of sound photography, which was applied so successfully to the study of the problems of echo and loudness in large auditoriums. An account of the application of the method appeared in an article on "Theater Acoustics," in *THE AMERICAN ARCHITECT* for December, 1913, with photographs showing the progress of an actual sound wave, in a small model of the auditorium being studied.

In 1914, Professor Sabine began the last of the

problems outlined in his first paper, namely, that of elimination of extraneous noise. This, of course, is the difficult problem of sound insulation which had been brought to his attention by inquiries from many architects. The results of a preliminary study were published in February, 1915. The method there outlined is an adaptation of that developed for the study of reverberation and sound absorption, to the study of sound transmission. The results, though admittedly incomplete, serve to indicate the limitation upon the efficiency of so-called "sound-deadening" material as ordinarily applied. It is shown that for complete insulation the thickness of deadening material is prohibitive, although relatively thin layers produce an appreciable reduction in the intensity of sound transmitted. It is further shown that for complex walls, let us say alternate layers of iron and felt, the simple law that succeeding layers absorb the same proportion of the sound transmitted to them, does not hold and that the transmission of such a complex wall bears no simple relation to that of its separate constituents.

Finally, as in a number of other instances, the preliminary study of the problem revealed that the complete solution demanded a great deal more than its original scope had anticipated. At the end of the paper, the author characteristically says, "At this point, the apparatus was improved, the method recast and the investigation begun anew."

The war prevented the immediate accomplishment of this purpose and not until the autumn of 1918 was it possible to attempt again its realization. In the interval, the new laboratory, to be fully described in a succeeding article, had been built at Riverbank, Geneva, Illinois. Within a month of the signing of the armistice, which freed him in a measure from the press of duty to his country, although mortally ill, he had begun the heavy task of calibrating instruments for the new laboratory.

Without this latest work, done within a month of the time of his death, the continuation of his work by others would have been almost impossible.

This sketch of his scientific work can not be closed more fittingly than by quoting from the records of the Faculty of Harvard University:

"He attacked a problem as old as the institution of public buildings. It had never been solved before in any thorough going manner. He did solve it, and he did this not by virtue of any extraordinary resources of modern science. He did it in such a way as to show that it might have been done by a man like him centuries before.

"Was it then so easy and simple a thing to do? Did he merely happen to find the solution of a difficulty thousands of years old? No, he succeeded by reason of a combination of qualities among which were unending patience and untiring energy."

Notes on An Exhibition of Ornament at the Metropolitan Museum of Art*

By WILLIAM IVINS, JR.

INVENTION in ornamental design, like invention in other fields, such as those of engineering and mechanics, is not so much a question of making something new as of adapting and using existing, well-known things in some combination peculiarly apt to the requirements of the special circumstances. The problem of design really consists of little more than the decorative breaking up of accurately defined surfaces, and it is therefore primarily a question of space distribution. Beautiful handling of spaces rather than discovery of new motifs or development of novel form is what most distinguishes the really great ornamentalists from the ruck. The old half-truth that artistry consists

farthest fetched motifs have been those most frequently combined into the greatest masterpieces.

It is common enough to hear a painter say that he cannot work successfully unless he is given free play, that the limitations or rather the specifications of a "job" always hamper his individuality and his artistry. But, however true or logical such a feeling



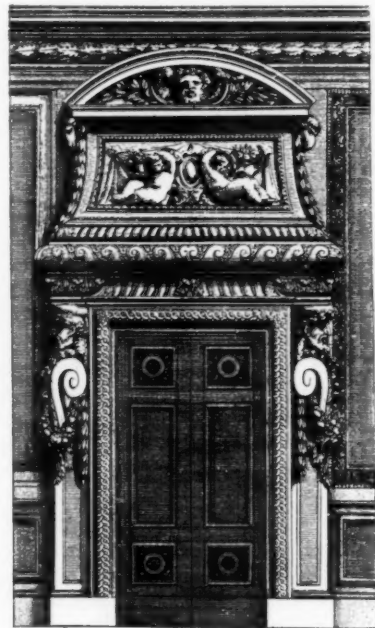
An Inside Door for a Room of State

ENGLISH, XVIII CENTURY

From Batty Langley, *a Sure Guide to Builders*, London, 1729

not in what is said but in how it is said is more nearly true in ornament than in any of the other arts, for the most trivial, the most banal, and the

*Reprinted by permission of the author and the editor of the Bulletin of the Museum.



ORNEMENTS OF PLACARDS

FRENCH, XVII CENTURY, STYLE OF LOUIS XIII

From Guillemard, *les Maitres Ornementistes*

may be in the case of the painter, the ornamentalists have always been supported and aided by the very specific spatial limitations within which, and conditioned on which, they have had to work, so that the greatest of them have been those who, far from breaking down the limitations imposed upon them, have most freely and easily moved within them.

It thus follows, both *a priori* and as matter of fact, that the truest differentiation of the various styles and the several masters within them, certainly from the point of view of the study of the history of ornament and not improbably from that of the

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FRIEZE BY SALEMENTIER, FRENCH, LOUIS XVI

"practical" student of design, lies not so much in motifs as in spatial disposition. The unknown niel-list, Zoan Andrea, Aldegrevier, de Neufforge, Piranesi, Percier, and Adam, all used the same motifs—a *lingua franca* of all times and conditions—and what differentiates them is solely their sense of scale and their ease of movement. Each style has its typical space within which to move, and without complete assimilation, complete comfort within that space and its correct scale, it has always been impossible to produce good work in that style. Now these spaces have never been twice the same in any succeeding periods because of the simple fact that they are based upon different social and economic facts and conventions. Comfort in sitting depends upon such things as military accoutrements, skirts, stays, and many other things, none of which are ever the same for any consecutive score of years—and comfort in sitting is what determines fundamentally the shapes, that is, the spaces, of chairs, which after all are neither more nor less than contrivances for the support of fully clad human bodies. The same thing is true in a more complicated and bigger way of rooms, hallways, and whole buildings, and everything that goes into their furnishing and decoration; for in every case they have been designed to meet certain demands which will never again occur in the same combination.

We all know how unlike and untrue are the figures of the participants in a fancy dress party when seen from a coign of vantage; the men's bodies do not swing properly from their hips, the women's backs and the poise of their heads, the gait of both men and women, belie the most careful archaeological research on the part of their

costumers. We can't be anything other than what we are. And it is just this that underlies the failure of our present-day five-finger exercises in the "styles" of past times. It is a truism that a man of today cannot write like Johnson or like Sterne, and it is just as obvious that a man of today cannot design or live in a house as the contemporaries of those men did. I am

informed by one of our closest students of the history of house planning and decoration, himself a most eminent architect, that if two well-to-do families of the same number and ages, one of the period of Louis XVI and the other of today in New York, were to demand the same amount of space and the same degree of accessibility for their parlors, libraries, living and bed rooms, and

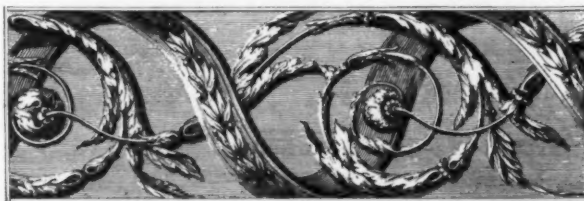
were each to insist upon having the latest and most modern conveniences installed, the house of the family of today would require at least twice the cubic volume that the other did. Twice the cubic volume cannot often be accorded and, naturally, as between "conveniences" and space we elect conveniences, with the result that if both houses are to be decorated in the same style, the spaces of today are diminished, and our scale inevitably thrown out.

And this is merely one of many typical cases.

The same thing is true even in borrowing contemporary foreign styles, for it too has all the impossibility of re-creation—has not some one said that archæology begins at the frontier? The illustrations to this article contain two prime examples of this fact, each showing English borrowing of contemporary or nearly contemporary French work.



DESIGN BY JEAN PILLEMENT, FRENCH, LOUIS XV



ENGLISH, XVIII CENTURY

From Sheraton, *the Cabinet Maker, and Upholsterer's Drawing Book*, London, 1794

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The first "deadly parallel" is that between two doorways, one designed by Marot and the other by Batty Langley, the difference negligible so far as "design" goes, at most but slight simplifications in detail. The second case shows Sheraton playing the most sedulous ape to Salembier, copying as slavishly as he could every slightest incident in his band of ornament. The only difference in either case is one of scale—detail, shape, everything the same, but somehow in each case the French design has a swing, a power, an ease of movement that is native, as of some tongue spoken confidently, idiomatically, and without trace of foreign or provincial accent, while the English designs speak both with ungainly effort and with decided foreign burr.

The exhibition of ornament affords many in-

stances in which the difference in racial and time scale can be felt, and for this alone, if for nothing else, should be of interest to the casual visitor. The most hurried comparison, for instance, of the prints of interior decoration and objects by French artists from LePautre to Percier, all of whom worked within a period of little more than a hundred years, shows how important scale is, for in the work of no two men is it the same. It makes little difference whether the designs compared are as disparate as a LePautre ceiling, a Bérain gunlock, a Blondel mantel and mirror, a Meisssonier snuff box, a Germain candlestick, a Lalonde barometer, and a Percier desk, or a series of wall decorations, the same thing is true in each case—the space proportion of each master, of each period, is unique.

Inaugural Address of Henry K. Holsman, President-Elect Illinois Chapter American Institute of Architects

IF I were to take as a text a great philosophical thought—a thought typical of our individual professional lives, typical of our professional organization, and typical of that age-old professionalism hitherto unorganized, and unconscious of its power, but just now reaching class consciousness; if I were to use a phrase most typical of the value of that great creative, cumulative service of the minds of men for their fellow man, now coming to be known as world professionalism, I would say: "The first shall be last and the last shall be first and servant of all."

My present conception of the policy of this organization lies in that text. The most important goal of our organization, of our profession, of all professions, is class consciousness. The task is one for a class, not for an individual. The President of this Chapter must be conscious of his position as a servant. He may help to awaken the other individuals and guide them to an awareness of their duties, powers and responsibilities; but whatever is done that is true and good, whatever is achieved that is beautiful and therefore cumulative and lasting, must be done by the members of the organization or of the class and not by their servants, the officers. The character of a profession depends upon the character of its individuals. The reputation of a profession depends upon its organization and the participation of all in its welfare.

The architect inherits a profession built upon the oldest instincts of man and handed down from the remotest periods of history. His profession is the one great accumulation of experiences and forces imbued with the spirit of art, and art is a

development of the people as a class for the people as a mass, and cannot be created by an individual. No new form or color invented by an individual (if such a thing is conceivable) can be called art unless it raises to the consciousness of the beholder past pleasures of the mind or familiar instincts of the race. He who would be an artist must serve his people with an emotional understanding of them and their past.

The profession of architecture imposes upon its members the same familiarity with the achievements of structural and social sciences. The architect must work in close co-operation and deep sympathy with other professions than his own. No individual can achieve in this profession by himself. Architecture does not depend upon the inspiration of genius, but upon painstaking culture and talent and the mastery of the principles of the arts and sciences accumulated from all the ages, from men of all professional classes who have worked and thought along social, structural and æsthetic lines. Architecture is a social phenomenon, not an individual phenomenon.

That our profession is the oldest, the broadest and the last to come to consciousness is at once our opportunity and our responsibility. Being in sympathy with so many other professions, it becomes our obligation to wake up and help to prepare for that day of full professional consciousness when men of all classes, from the humblest trade unionist to the exalted statesman, will ask and receive of the treasures laid up in professionalism. Class consciousness is the chief reason for the existence of any professional organization.

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The world is fast becoming aware of the great value of the professional man. He is the man who stands ready to serve other men in their health and happiness, in their organizations and enterprises, in all their conceptions and achievements. What great commercial enterprise or what mighty utilization of forces would have been achieved by the so-called masters of industry had it not been for the professional man who patiently and systematically worked it out, practically for the joy of achieving it; or what one of the great machines of finance or industry, or what government in war or peace could survive and develop, but for the continued devotion of the professional man? His services are not paid for in proportion to their value, and for some things he cannot be bought. He is born of the people, seldom if ever of autocracy. His equipment is inherited from society and he is the safest and most important trustee for the preservation and development of society the world will ever know.

We are now awakening to the dawn of a new era. The age of Kings and Princes is past. The day of Barons and Aristocrats is waning, and the day of professionalism is at hand. Professionalism carries but one banner and written on that banner is but one word—*Service*. The law of its being is freedom restrained by culture, training and unbiased devotion to duty. The remuneration of its members is a known fee in proportion to the cost of preparation and the hazard of the undertaking, coupled with that distinctive mental exhilaration, known to no other calling—the joy of solving a problem that makes life still more worth living.

"And only the Master shall praise us, and
only the Master shall blame;
And no one shall work for money, and no
one shall work for fame,
But each for the joy of the working, and
each in his separate star,
Shall draw the Thing as he sees It for the
God of Things as They Are!"

It is our chief duty to develop our organization, in order to develop our class consciousness. By serving with each other in close contact and fraternity we can develop an awareness of our combined strength and power. To belong is not enough—to participate must be the watchword. When we know each other as individuals, we can make ourselves known to society as a class. We may not have been first in war, but we can be first in peace. Let us stand by the professional ideal, to ourselves be true, and unite in one great body and one great purpose, to serve organized society everywhere within the field of our usefulness, with one great unselfish professional organization, the American Institute of Architects.

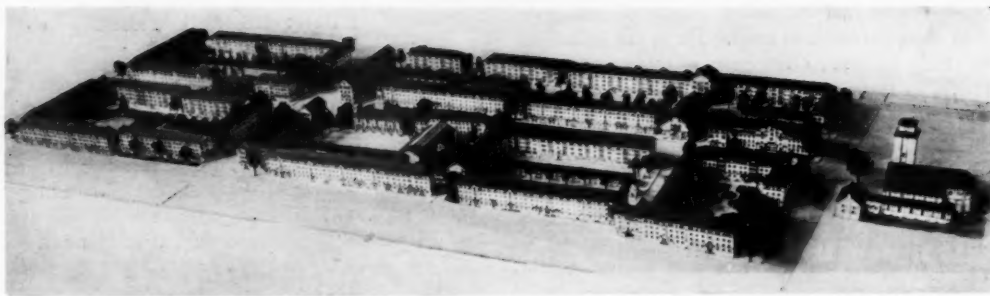
Paint as An Asset

Does it pay to paint farm buildings carefully? Does it add to the selling value of a farm when buildings are properly kept up and regularly painted? A careful inquiry, conducted by the *American Agriculturist*, of a number of leading bankers in the Mississippi valley, including such states as Iowa, Illinois, Michigan, Ohio, Indiana and Missouri, reveals the fact that in nearly every case the bankers did not hesitate to say that they would lend all the way from 5 to 50 per cent more on land where farm buildings were well painted and kept in good condition. They maintain that well kept-up and well painted buildings and fences are an indication of thrift and that the thrifty farmer is a good client, and one to whom money can be safely loaned. An average of the returns from these bankers shows that the increased loan value of a building, due to its well painted condition, is usually somewhere around 22 per cent.

A Michigan bank says "farm buildings out of repair and needing paint indicate that the owner is slow pay." Such farms are rated at about one-third of the assessed value for loans. Where the farm buildings are in good shape the rating is one-half. The president of a Middle Western bank says that when real estate loans are considered, painted buildings are always taken into consideration in making an estimate. The general appearance of the property surrounding the house and barn and also the fields and fences would be carefully observed. He further says that he has no hesitancy in saying that he would absolutely refuse a loan on farms where the buildings were not kept up and well painted. In his judgment, unpainted farm buildings would reduce the loan value at least 25 per cent.

A Minnesota banker says that he is much more willing to loan money where the buildings are well painted. In his particular case he believes that he would loan 20 per cent more than if the buildings were not properly taken care of. A farmer who will keep his buildings painted takes a much deeper interest in his work than one who does not. Another Minnesota bank says that well painted buildings have resulted in securing from his bank sometimes as high as 25 per cent more money than where the buildings are not painted.

All this being true, it is evident that it is a good business proposition to keep the farm buildings well painted. They not only look better and are more pleasing to the owner, but the farm would sell to better advantage, the loan value of the property would be greatly increased and the buildings themselves would last much longer and need less repair than if paint were not applied.



GENERAL VIEW OF MODEL OF GROUP

CONZELMAN-HERDING-BOYD, *Architects and Town Planners*, and HARLAND BARTHOLOMEW, *Engineer*,
City Plan Commission

A Model Housing Plan for Reclaiming a St. Louis District*

IN addition to the demands for better pay and shorter hours upon the part of organized labor in numerous countries during and since the war, there has also come a demand for better living conditions. This means better homes and better home environment. The tenement and the slum are an outgrowth of bad industrial conditions and bad municipal conditions. Present-day civilization demands their elimination. They will be supplanted only when it has been proved that more substantial places of residence can be built in an economical manner. As a result of the lack of building during the war period, there is now a more or less pronounced shortage of housing facilities in most of the large cities in the United States. The character of houses that are apt to be built to supply the increased needs of the community will depend upon the extent of the community's interest in the general housing problem.

Before the war and particularly during and since the war the better housing for working people has been a national issue in England. Previous to the war the movement took the form of what were called "Garden Cities," and certain industrial towns built near large industrial plants. The English Government is committed to the building of at least 500,000 houses for working people following the close of the war. These houses and their environ-

ment will be carefully planned and built in accordance with the best standards of healthful living conditions. This virtually means that housing will practically become a Government function and the building of houses on so great a scale will create a demand for nothing but the best type of low cost houses wherever they may be built, either by public or private enterprise. Already a considerable number of blocks in the congested district of the City of London have been razed, the slums eliminated, and in their place have been erected new homes for the working people very much after the plan herewith suggested.

Housing never became a serious factor in the national life of the United States until the outbreak of the war. The tremendous percentage of labor turnover in the shipyards and the large war industries made it necessary for the Government to undertake the construction of homes so that men working in the shipyards and in the munition plants could find suitable places in which to live and thereby enable them to remain and engage in the very necessary war work. Over fifty towns ranging from a few hundred to several thousand houses each were built through appropriations made to the Department of Labor (later known as the U. S. Housing Corporation) and to the Shipping Board for this purpose. Practically for the first time in the United States the best architectural and engineering talent was concentrated upon the designing of low-cost houses which would furnish the most desirable living conditions. Many of these towns were completed in a very short space of time and, while the unexpected signing of the Armistice

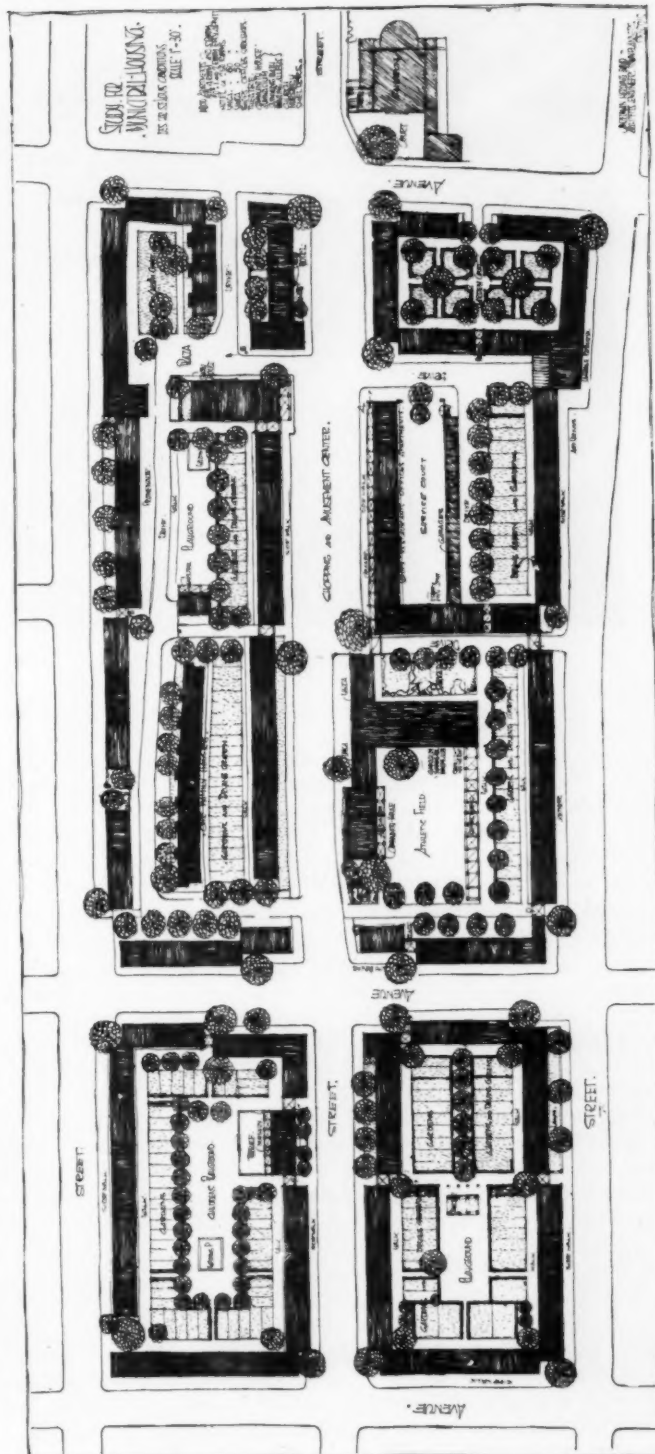
*EDITOR'S NOTE.—While the plan here submitted relates particularly to the district east of Grand Avenue, St. Louis, Mo., the same scheme, with slight modifications, can be made applicable to similar districts which exist in practically every large city. In this connection the work of the London (England) Government Housing Commission is of interest. Existing buildings in the slum sections where new communities are planned will be condemned, the old unsightly and unsanitary structures removed to make way for the more attractive and habitable Government housing project, to the benefit of the city.

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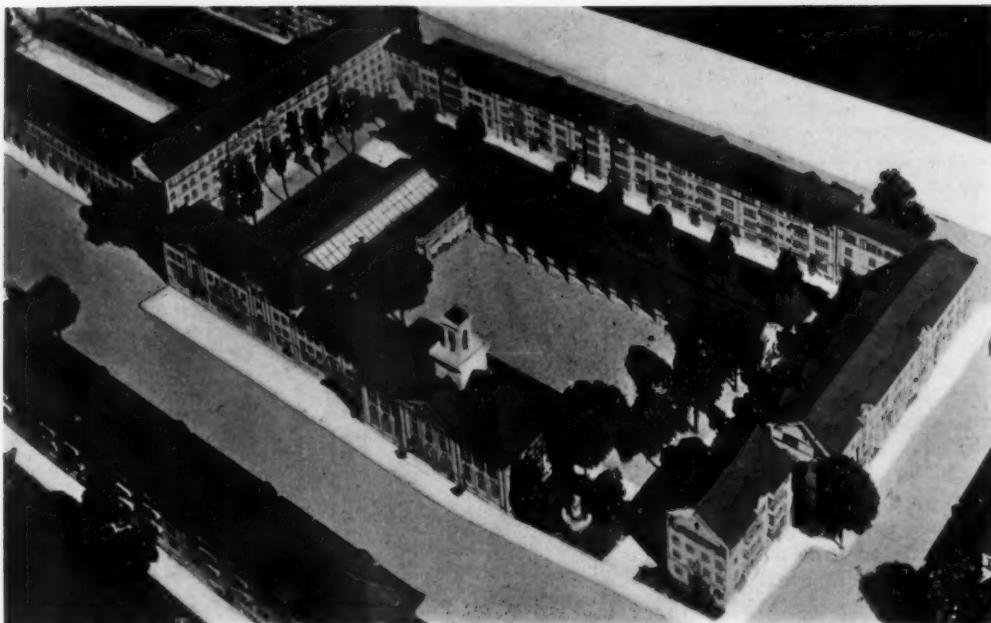
caused a curtailment of much of the work on some of them, a sufficient number of completed houses were built to demonstrate the practicability of low-cost housing in the United States. Unfortunately none of these towns was built near St. Louis to serve as an example for future housing standards here.

For ten years St. Louis has made no advance in the housing field. Many houses have been built but they are of the same types that were built ten and twenty years ago. Perhaps the last statement should be qualified by saying that one new type of dwelling has been developed in the form of a high class tenement or apartment house. In these latter a tremendous overcrowding of the land is developing—in some cases more than 1,000 persons to the acre, or a density of population greater than exists in our present tenement house districts in the eastern part of the city.

St. Louis has probably suffered more from a shifting of large residential districts than any other great American city. Less than 40 years ago the entire city of St. Louis was east of Grand Avenue. Today at least two-thirds of the city's population is to be found west of Grand Avenue. Immediately east of Grand Avenue in the central section of the city was formerly the finest residential district. In that great central residential district today are nothing but boarding houses, vacant property and a large colored residential area. Tremendous losses have occurred in residential values. During the past 5 years less than ten permits have been issued for new residences or substantial repairs to existing dwellings in this central residential district which lies east of Grand Avenue and between Market Street and Cass Avenue. The expansion of commerce and industry cannot begin to absorb all of the residential property that has been abandoned. The question, therefore, is continually asked, "What is to become of this district?" and, "Is it probable that any of this district can be rehabilitated for residential uses?"



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VIEW OF MODEL, SHOWING COMMUNITY HOUSE AND ATHLETIC FIELD

This latter question can most assuredly be answered in the negative if our future housing development is to proceed along the lines of the past. The present monotonous rows of flats and tenements and converted mansions are not merely unattractive places in which to live, but they are not adapted to the present needs of the community so far as living conditions go. Much more desirable and attractive surroundings can be secured for little or no increase in cost in the newer residential districts to the west or to the north and south, so that people do not now care to live in the old district. The only way to rehabilitate the district east of Grand Avenue is to create a thoroughly new environment. This can be done only by tearing down existing buildings and through the reconstruction of a portion of the district with new types of homes having good surroundings. This means large scale operation, the razing and upbuilding of at least four, six or eight blocks as a self-contained community. This in turn raises the question as to whether such a large scale operation is practical and economical. In order to answer this question intelligently the writers of this article have made a careful study of a selected area of six blocks in the district east of Grand Avenue, the results of which are shown herewith.

If such a plan as is herewith presented were to be carried out, a large operating company would be necessary with ample funds at its disposal. Be-

fore attempting to undertake such an operation the company would first have made a careful study of general living conditions in the community to determine the number of families that could be expected to be accommodated; the number of rooms they would require, the rental they could pay, whether the location chosen would be accessible to their various places of work, etc. The operating company should be supported by funds raised by the community at large, being limited to a profit of not more than 6 or 8 per cent over and above operating, depreciation and maintenance cost. Because of the unusually high cost of property, it would not be possible to go into the more desirable forms of detached dwellings that could be built on lower value land. The character of the dwellings built, therefore, would approach more the present form of apartment houses with larger, lighter rooms, more sanitary conveniences, better neighborhood conditions and generally better living environment than it is now possible to obtain in low price living quarters. Under these conditions the operating company would probably be forced to lease rather than sell its properties, maintaining a sufficient control over the entire development to insure the continuance of its operation as a complete, desirable and self-contained neighborhood.

In the plan as shown herewith, covering an area of six blocks, there would be 800 four and five room apartments and 200 two and three room

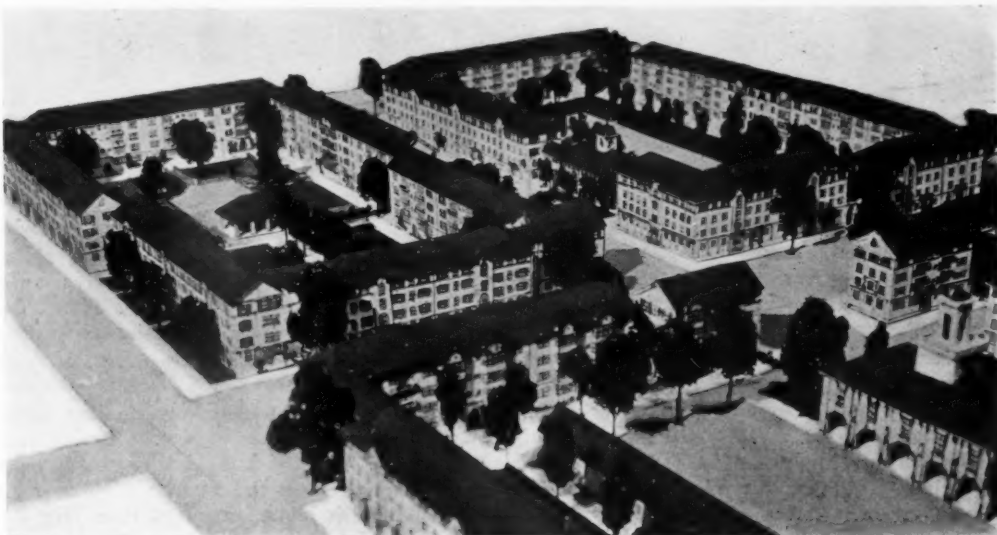
THE AMERICAN ARCHITECT

apartments. Each apartment would contain a well constructed and modernly equipped bathroom, a combined living and dining room of size approximately 12' 3" x 16' 6", a kitchen 18½' x 13½', bedrooms of size 13' x 14' or 11' x 17'. The apartments would be only 2 rooms deep, insuring adequate light and air. They would be so arranged as to have cross-ventilation, which is very desirable. Ample closets would be provided in all of the rooms. One of the most desirable features of the apartments would be their arrangement with kitchen, bath and bedroom facing the street and living-room and another bedroom facing the open interior of the block, which would be so planned as to offer an exceedingly attractive outlook. A balcony or sun parlor overlooking the interior of the block would also be provided. The interiors of the blocks would be free from back yard fences and sheds, being planted with grass and trees and provided with playgrounds and other recreational facilities. The buildings would be of fireproof construction, each apartment having separate entrances upon a thoroughly fireproof hallway. The present plan is nothing more than a suggestion. In this instance, however, it was found desirable to plan 4-story buildings in order to secure the necessary number of apartments. It probably would be found more desirable to build the structures in units of 16 to 24 apartments possibly and arrange these other than in rows in order to overcome what might be considered a somewhat monotonous feature of the row type house in the present plan.

One of the interesting features of the present scheme is that numerous community features have

been provided so as to make of the entire scheme a self-contained community. These features include a hotel of 250 rooms, a Y. M. C. A. containing 50 rooms, Y. W. C. A. containing 50 rooms, numerous stores and offices at the more important street intersections, a theatre, community house, gymnasium, swimming pool and bathhouse, bowling alleys, nursery and shelters. With all of these various features it would be possible in such a large area as is being planned to create an environment sufficiently attractive and self-contained to make it a desirable place of residence. It might even be located near enough to the downtown commercial and industrial districts to permit of walking distance between.

In order to determine whether such a plan as is herewith proposed could actually be carried out, an estimate was made on the probable cost of acquiring all the property within the six blocks considered, tearing down existing buildings and the rebuilding of the area with the new buildings herewith described. A model of the district was prepared, views of which are reproduced herewith, giving something of an idea of how such a building scheme would appear. Careful estimates of cost were made for the building of these houses and various community features. It is estimated that to acquire the property involved would cost approximately \$1,500,000. Other locations than that chosen for the present study might be secured at a lower figure, and would reduce the cost of acquiring the property, which is unusually high in the present instance, but the present location along Olive Street was selected as being one of the most



VIEW OF MODEL, SHOWING PLAY HOUSES AND DRYING GREENS

THE AMERICAN ARCHITECT

difficult places to develop. By choosing a difficult problem, such as is presented by property along Olive Street, it was felt that if the housing development plan could be made a financial success similar developments of less expensive property east of Grand Avenue would be unusually good financial investments. At the present cost of building materials it is estimated that the entire community planned could be built for \$2,660,000, of which sum \$2,100,000 would be for the houses and heating plant and \$560,000 for other buildings. When the prices of building materials decrease as they probably will during the next few years, the cost of the present plan would also be reduced in this respect. Assuming that it would be necessary, therefore, to

estimated annual return is therefore \$219,600 or 5½ per cent upon the total investment. From the above figures it will be seen that a very liberal estimate for the cost of acquiring the property has been made. In proportion to the amount of money to be expended for actual housing development, the cost of site should be materially reduced and, as previously stated at locations other than upon Olive Street, this figure could be reduced considerably. If the cost of acquiring the site could be reduced from \$1,500,000 to \$750,000 a net return of 6.1 would be possible, based upon the figures above.

The estimate of annual income from the stores, theatre and other buildings is believed to be con-



VIEW OF MODEL, SHOWING CHURCH WITH END GROUPS AND GARDEN COURTS

earn 10 per cent gross annually on this investment of \$4,160,000, there should be an annual income of \$416,000. Assuming that the 4 and 5 room apartments would rent for \$25 and \$30 per month and the 2 room apartments for \$16 and \$20 per month, there would be a yearly rental return from houses of \$295,200. It is estimated that there would be an additional rental return of \$86,000 per annum from the stores and other buildings. This makes a total gross income of \$381,200 per annum or slightly over 9 per cent. Assuming the estimated annual expense would be \$161,600—which would include 1 per cent for fixed charges (taxes, etc.); 0.3 per cent for management; 0.3 per cent for rent collection; 2 per cent for amortization; 6 per cent for vacancies and 0.5 per cent for coal. The

servative, for the excellent location of many of the stores and offices should produce an annual income in excess of the amount estimated; the other community features of the plan, such as the playgrounds, shelter houses, nursery and community center, should be operated free of charge except for special privileges, being thereby special inducements offered by this community form of development.

Should such an undertaking as that herewith suggested or one similar thereto be carried out and prove successful, it should serve to greatly improve housing conditions in the community through establishing a much higher standard than now exists. If successful, additional areas could be planned and built, owners of present poorly designed and ill-

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kept property would be forced to bring it to a more desirable state for occupancy in order to rent it. The present plan would afford housing accommodations for about 3500 to 4000 persons and would produce a density of population of 150 persons per acre, or considerably less than is now occurring in the better apartment house districts of the city.

The present plan was devised merely to answer the question whether it is practicable to develop good homes which would rent for comparatively low prices in the present high value districts of the city which have constantly been depreciating in value. A much more desirable plan might be devised than the one here presented. In undertaking the present studies we set ourselves a task of solving the most difficult problem possible. We even restricted ourselves by choosing a location at

a point where the east and west streets carry a considerable traffic and for this reason could not be closed or changed substantially in alignment. In the plan prepared only one minor north and south street was closed. From the views of the model that are reproduced herewith it will be seen that a variety of pleasing views would be presented in the different locations of the community. The arrangement of buildings with numerous offsets, arcades and grouping to relieve the monotony of the row type of house produces a result that is believed to be interesting and attractive. If the conclusions that are to be drawn from the studies made prove of any value in the consideration of the rather complicated problem of producing improved housing conditions in St. Louis, we will feel that our labors have been justified.



CARVED REREDOS—TUDOR PERIOD

Astronomy and the Architect

FOR centuries past, men have been used to accepting the sunlight as part of the day's blessings. Its benefits have been realized, but no particular thought has been given to increasing its power indoors by an application of astronomical facts to the problem.

In planning a town, buildings should be so placed as to receive the maximum of sunlight. The custom now is to square buildings with the points of the compass, and in northern latitudes this means that one side will practically never get the sun from one end of the year to the other.

H. L. Seymour, town-planning adviser to the Dominion Housing Commission, states in a recent discussion that on the shortest day in the year the Equitable Building in New York casts a shadow of nearly eight acres. This results in placing adjacent structures almost entirely in the shade. The interplay of similar shadows from other tall buildings creates quite a problem. In developing the discussion, Mr. Seymour says:

As the condition at the winter solstice is evidently the most unfavorable for sunlight-planning, and because, as shown, such condition obtains to a great extent from about the middle of October to late in February, this condition should be the one to receive the greatest study. If ample sunlight can be provided for this period of four months, our problems, with few exceptions, are solved.

How should a detached building be constructed and oriented so that not only the exterior wall surfaces, but also the surface of the ground around them shall have the direct rays of the sun for as long a time as possible on December 21?

For our investigations let us first take the case of a cube with sides of, say, twenty-five feet, this being fairly typical of a small dwelling-house, and consider its condition as to sunlight at noon, December 21, if it be located in latitude 42 degrees north. As we build our house further north, the conditions, of course, become more unfavorable.

By orienting our cube, or building, with sides northeast, southwest, etc., every side receives sunlight; there is no area of perpetual shadow—and shadow curves indicate that more sunlight is received in the vicinity of the building. It would appear that for a detached building the latter position is preferable.

By adding extensions to our cube or square building, we get another typical building, the 'L.'

The axes of the building would still be at an angle of 45 degrees with the cardinal points, and the interior angle formed by the extension should face the south.

Having established the best orientation for an isolated detached building, the next matter is to determine the effect of the grouping of buildings.

Until the shadows cast by adjoining buildings are such that all sunlight is cut off from some surface of the building under consideration, or until there results a ground area or areas of perpetual shadow, there would appear to be no advantage in changing the orientation of buildings considered favorable for isolated conditions.

Buildings on a north-south street must be much further apart than on northwest-southeast and northeast-southwest streets, if minimum standards of two hours or less of completely lighted walls are enforced for southern exposures.

It would appear, then, that streets in an open rural or residential development, and where no important factor dictates otherwise, should preferably be placed so that buildings thereon and with faces parallel thereto, have their sides at an angle of 45 degrees with the cardinal points.

This means that streets in such a development should run northeast-southwest and northwest-southeast, and not north-south and east-west as is the general custom.

The plan of the town site of Kipawa, P. Q., shows an actual case in course of development. The development is so open that each house and even every building in the business section can be treated as a separate unit, so far as sunlight and shadow are concerned.

The streets are not square with the cardinal points, but run in directions that permit a desirable orientation of buildings. It is only fair to add that frequently there may be other factors that make it desirable to face buildings in other directions. In such cases, having provided for sufficient open spaces between buildings to avoid objectionable shadows, the important thing is to design the disposition of rooms to suit the particular orientation. But it may be admitted that a building with its sides angling somewhat with the cardinal points will receive sunlight, as a rule, on all its faces, and if square with the cardinal points is sure to have one unlighted wall, a condition to be avoided where possible.

Editorial Comment

An Appreciation of the Late Wallace C. Sabine

PROBABLY in no branch of the higher technical research in which the profession of architecture is directly interested, has greater progress been made than in that of acoustics. Professor Wallace C. Sabine, at the time of his death, had reduced to an exact science the theory of the acoustic properties of auditoriums.

At the outset, his work was largely in the direction of the improvement of acoustically bad auditoriums. In the progress of this work he succeeded in establishing certain well sustained laws that insured the acoustic perfection of new buildings.

To have accomplished so much in the span of a relatively short life, demonstrates the great mental force of the man and the sheer grit and indomitable will that enabled him to continue despite a malady which daily sapped his physical powers.

Professor Sabine was actively engaged in his work up to within a month of his death. To the very last he attacked with a mentality nothing short of the marvelous, those abstruse and difficult problems which were the basis of his research, and he brought to completion the plans for an experimental laboratory the completeness of which stands today as a monument to the man.

Qualities of enduring patience and untiring energy enabled Professor Sabine to complete a research so valuable that its transference to other and competent hands will insure the most satisfactory progress in a work in which every architect will take the utmost interest.

In his life and death Wallace C. Sabine showed so unselfish an attitude toward his work that after his master mind was withdrawn from participation the path was so free from obstacles as to insure progress to a successful finality.

President Holsman's Address

IN his inaugural address, printed in this issue, Henry K. Holsman, president-elect of the Illinois Chapter of Architects, condenses in a few pithy paragraphs an exact conception of the modern practice of architecture.

In pointing out that professional practice should carry but one banner, bearing the single word *Service*, he raises to the proper emphasis the vital thing that every architect must today consider.

Service as described by Mr. Holsman comprises a wide field of professional obligation. It will not only mean personal attention to a client's interests, but it will and should include all those finer phases of service that any professional man gives, not alone to his own professional brethren, but to every other professional rank. The goal of class consciousness is pointed out very properly as one of the duties of every professional man. In reaching this goal many duties will be found that conscientious men cannot ignore. First of these will be the assumption of just such duties as Mr. Holsman has so auspiciously assumed. Well directed individual effort will raise the average of every profession and increase its respect, but it is in the organization of well directed endeavor that the best results will be reached. There exists in certain men too much apathy in their attitude toward organized bodies of the profession. This aloofness greatly retards the unselfish efforts of those who at considerable expenditure of time and money bring a great measure of help to all in their profession. These groups of men should receive the strongest support.

Nothing in any division of professional life so truly upholds its ideals as do its organized bodies. They can either make or break the success of professionalism. It is therefore encouraging to be able to learn from the reading of President Holsman's address not only how thoroughly he appreciates the great responsibility that devolves upon him as president of a representative chapter of the Institute, but also how clear are his views as to the attitude of architects toward their professional field.

Reversing the Point of View

THE composite national mind in its summation of the havoc the war has wrought, dwells almost exclusively on the enormous fatality, the immense property loss as represented in dollars, grouped in sums too large for human conception, and political readjustments. Few but the most serious-minded give thought to the widespread shattering of ideas, the great changes in our mental attitude toward the important things of life, the entire reversal of view point that the war has brought to pass.

So greatly have the minds of men been stirred that one is not surprised to hear from a man so clear of vision as Lloyd George the counsel that we should endeavor not to get back to the point we

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were before the war, but to acquire an entirely new world.

This is just exactly what we shall have to do. Every preconceived idea, while not always shattered, has become so affected by the rapidity of passing events that to endeavor to retrace our steps and find a basis for our future plans on pre-war conceptions will be to become distanced in our progress toward our desired ends.

The practice of architecture will be strongly affected by this new thought, this mental quickening, and it is the mentally alert man or the equally keenly perceptive organized body that grasps this fact and puts it into prompt execution that will have the greatest measure of success.

To Remove War Emergency Buildings in Washington

NOW that the war is over and the necessity for many of the emergency departmental buildings that sprawled so disfiguringly all over Washington has passed, there is a commendable effort on the part of Congress to hasten their removal and substitute permanent structures of architectural distinction.

Senator Smoot of Utah has directed attention to the enormous annual outlay, amounting to hundreds of thousands of dollars, for offices to accommodate

the departments and bureaus of the Government. He urges that a well considered plan for a group of buildings that will provide a proper lodgment in one defined area for all these now widely scattered offices be devised and promptly brought to completion.

Naturally every architect will endorse a scheme that he knows is so absolutely desirable, and if he is inclined to become reminiscent he will recall that he has at one time and another in the past given similar endorsement to similarly well conceived plans. At the door of politics may be laid the blame for the failure of these plans, and if the present admirable proposition lags and finally dies it will probably be due to the same cause.

The symmetry of L'Enfant's plan, the architectural integrity of the Capital City has only been conserved by the most watchful attitude of those who have these things at heart. While we need all the additional buildings that Senator Smoot so stoutly champions, we shall also need to watch carefully every plan evolved in order that no mistakes shall be made. It is not always easy to protect Washington from enthusiastic but poorly advised advocates of new buildings, and it is sometimes futile to look for assistance from those in high office, as witness the matter of the power house on the Mall and other equally undesirable so-called improvements.



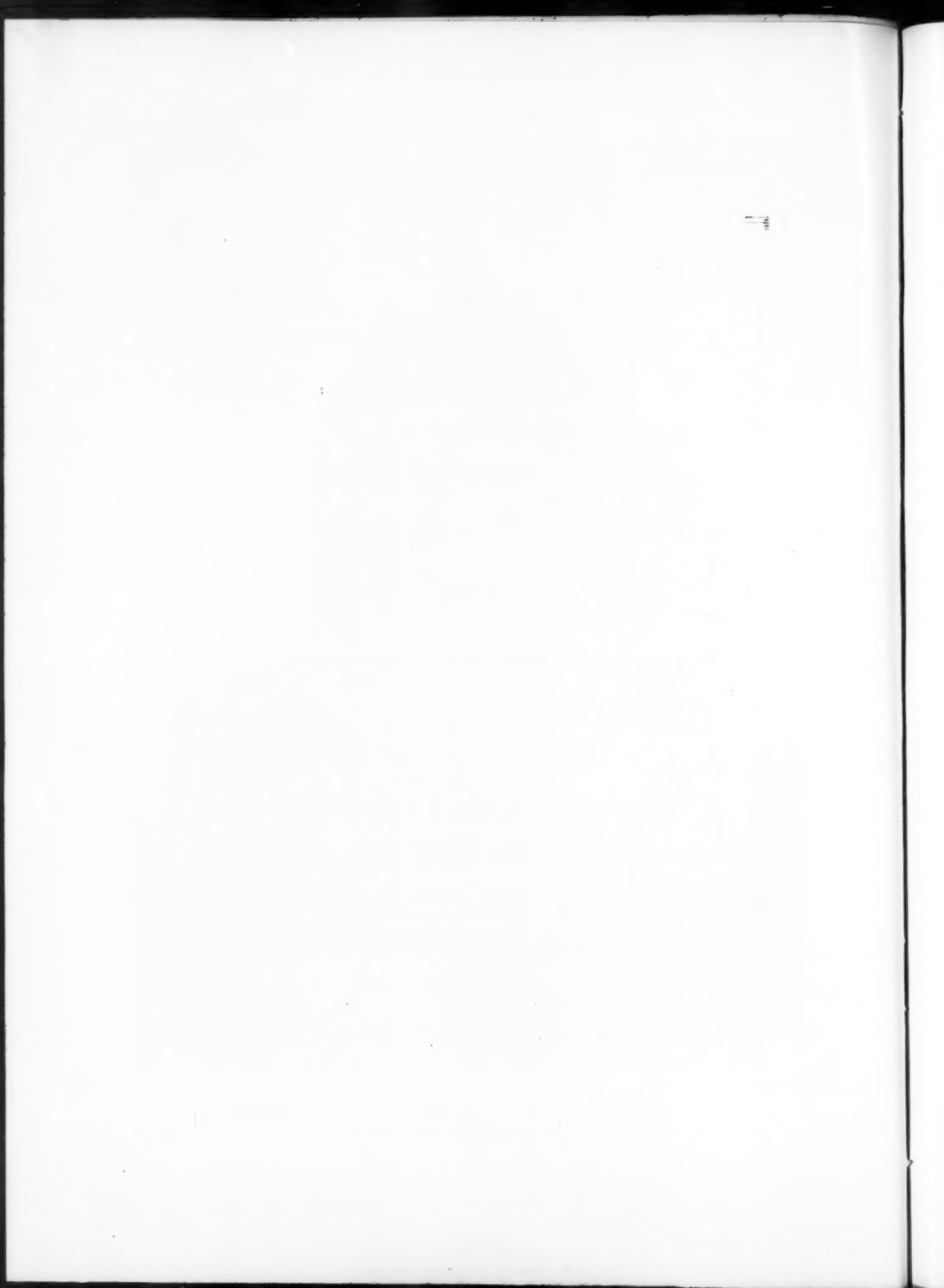
NORTH FRONT, GREAT CHATFIELD MANOR HOUSE

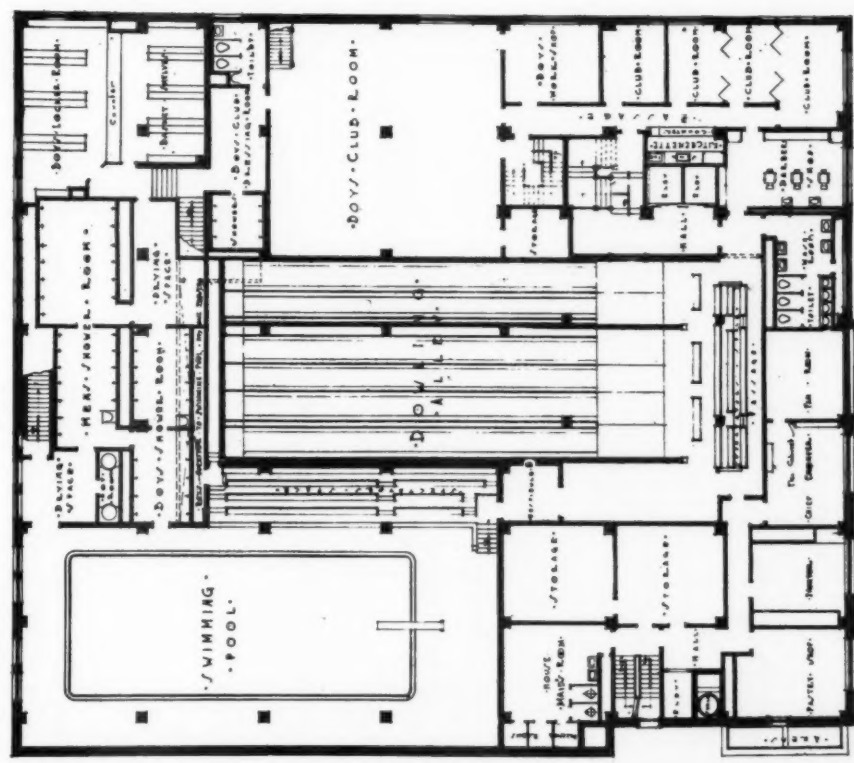


PLATE 1

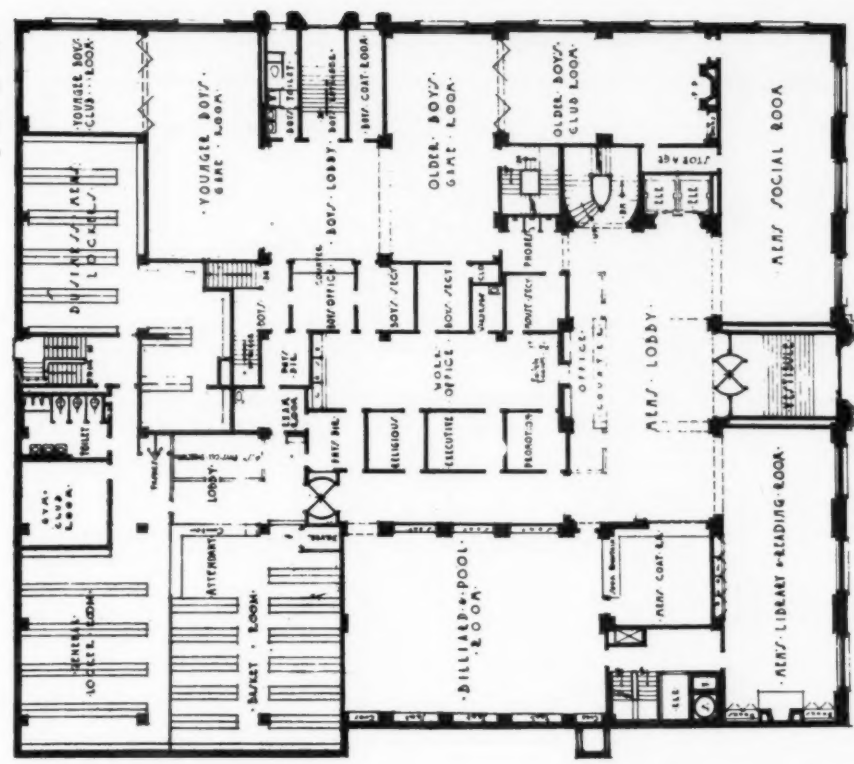
MINNEAPOLIS, MINN., CENTRAL Y. M. C. A. BUILDING

LONG, LAMOREAUX & LONG, ARCHITECTS



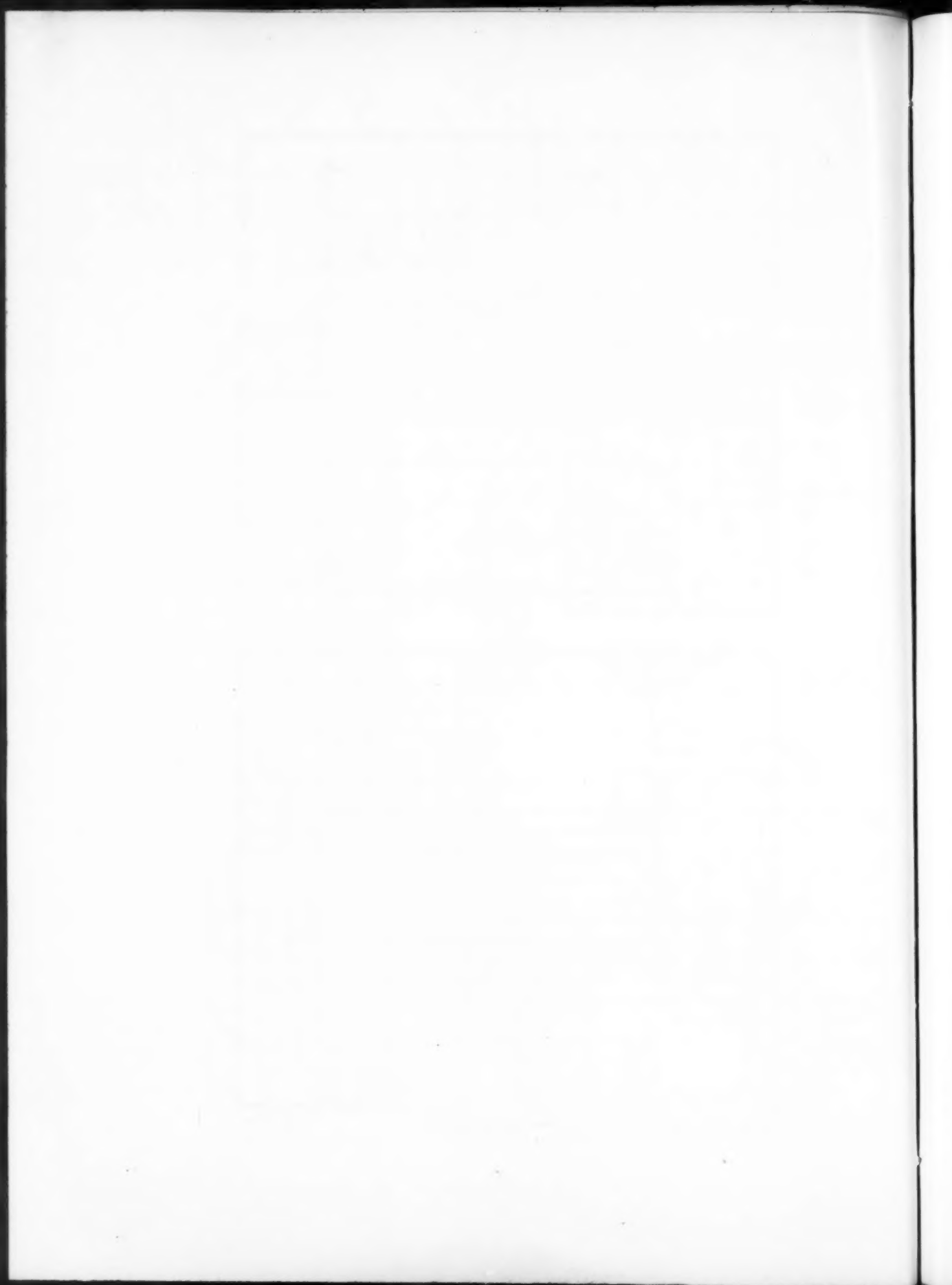


BASEMENT PLAN



FIRST FLOOR PLAN

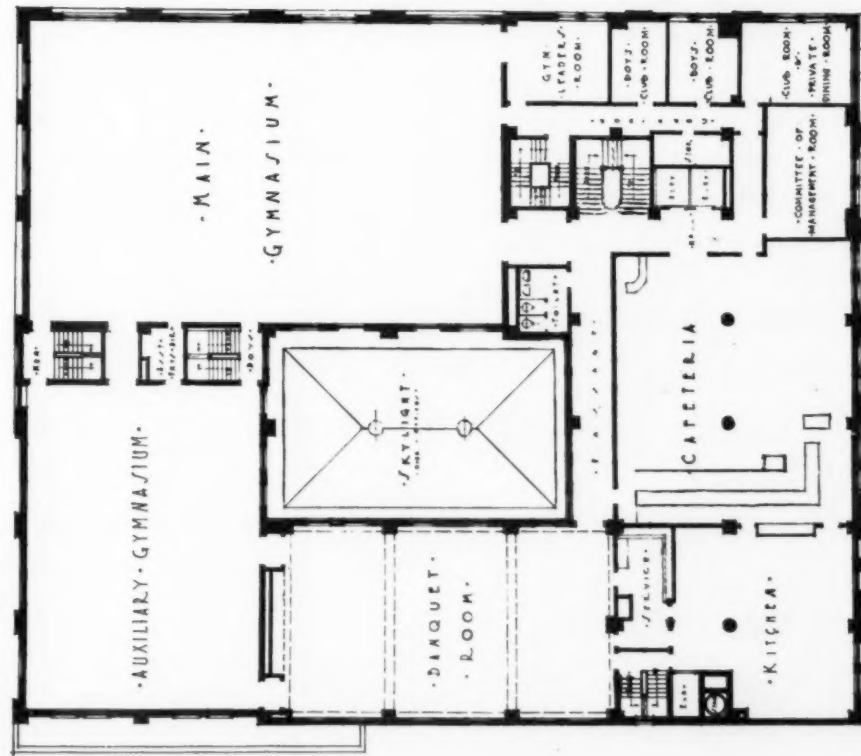
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LONG, LAMOREAUX & LONG, ARCHITECTS



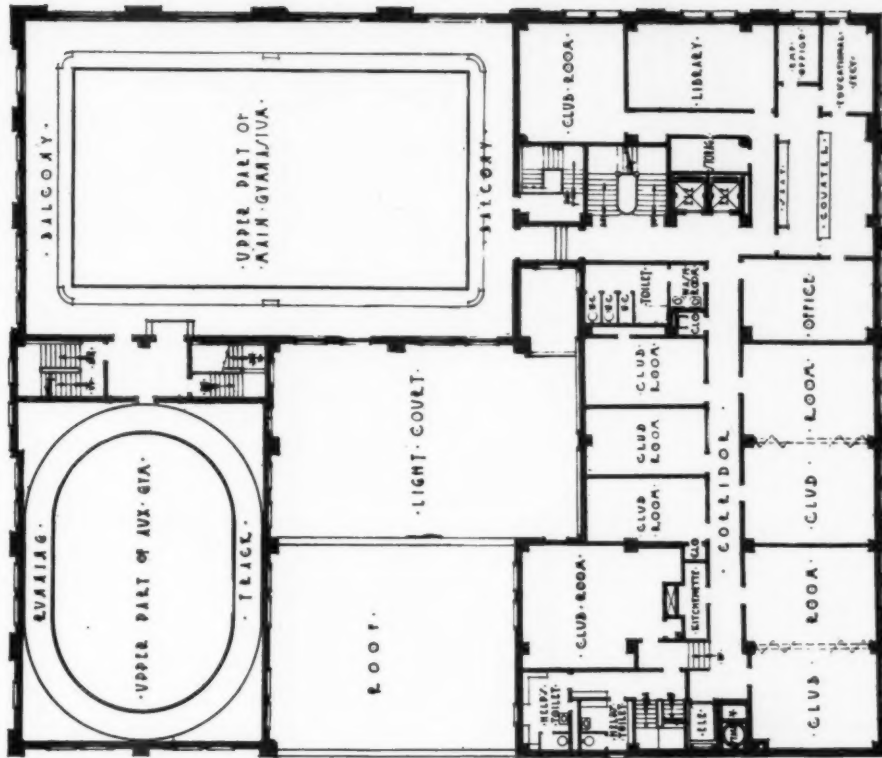
THE AMERICAN ARCHITECT

VOL. CXVI, NO. 2271

JULY 2, 1919



SECOND FLOOR PLAN



THIRD FLOOR PLAN

MINNEAPOLIS, MINN., CENTRAL Y. M. C. A. BUILDING
LONG, LAMOREAUX & LONG, ARCHITECTS



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PLATE 4

FIFTH FLOOR PLAN

SHOWING TYPICAL DORMITORY ARRANGEMENT

SIXTH FLOOR PLAN,

MINNEAPOLIS, MINN., CENTRAL Y. M. C. A. BUILDING

LONG, LAMOREAUX & LONG, ARCHITECTS





MEN'S LOBBY



PLATE 5

MEN'S LIBRARY AND READING ROOM

MINNEAPOLIS, MINN., CENTRAL Y. M. C. A. BUILDING

LONG, LAMOREAUX & LONG, ARCHITECTS





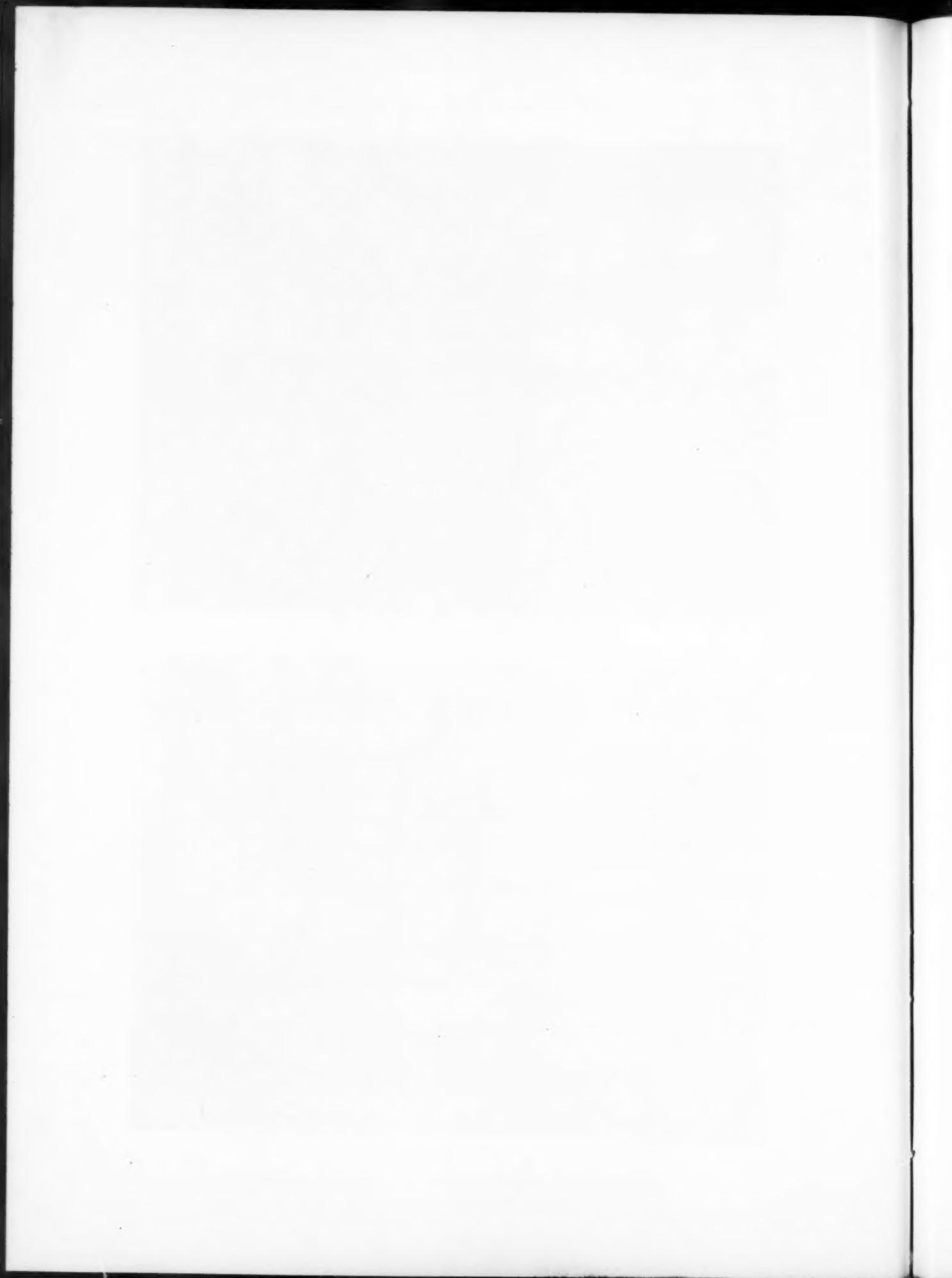
AUXILIARY GYMNASIUM

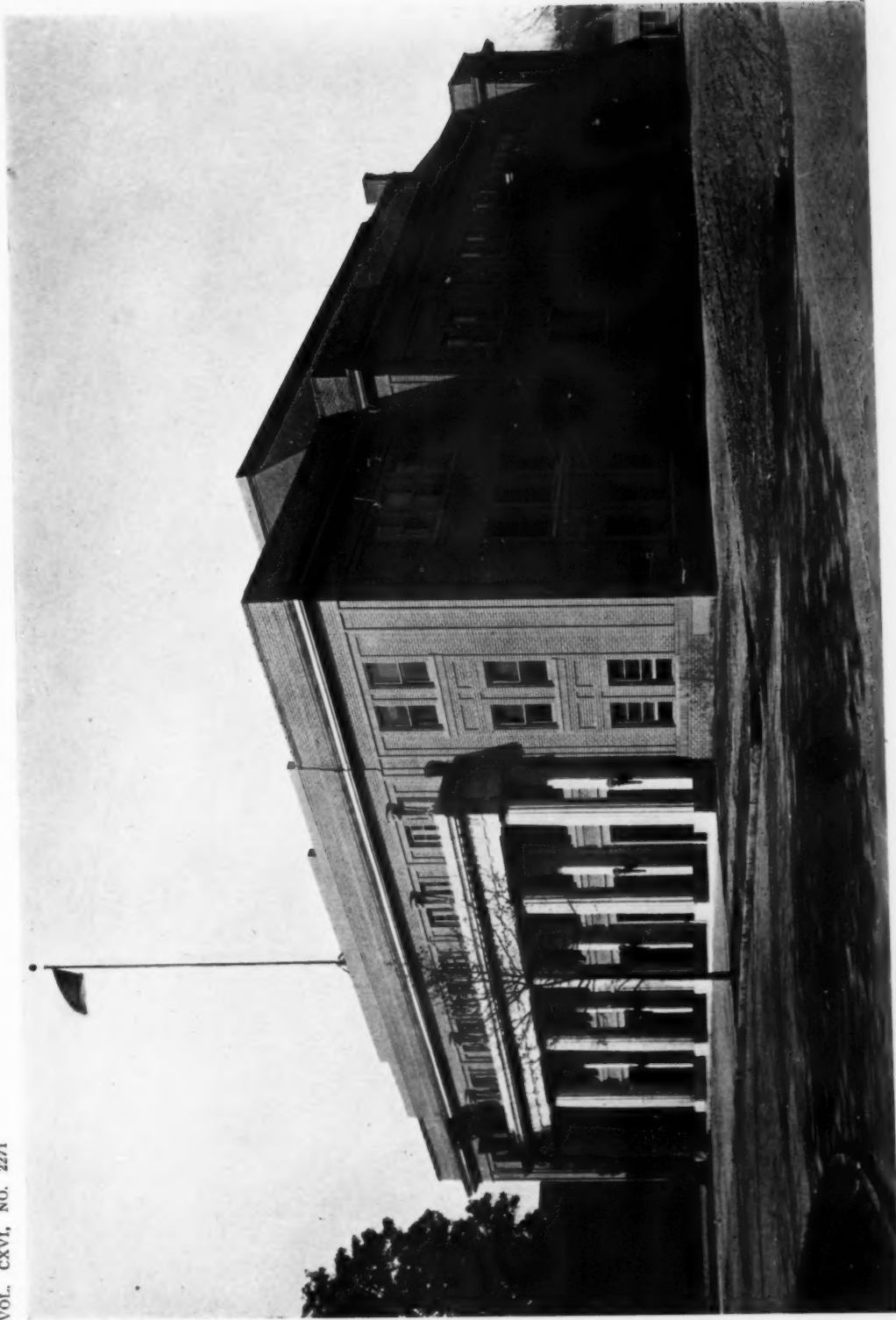


PLATE 6

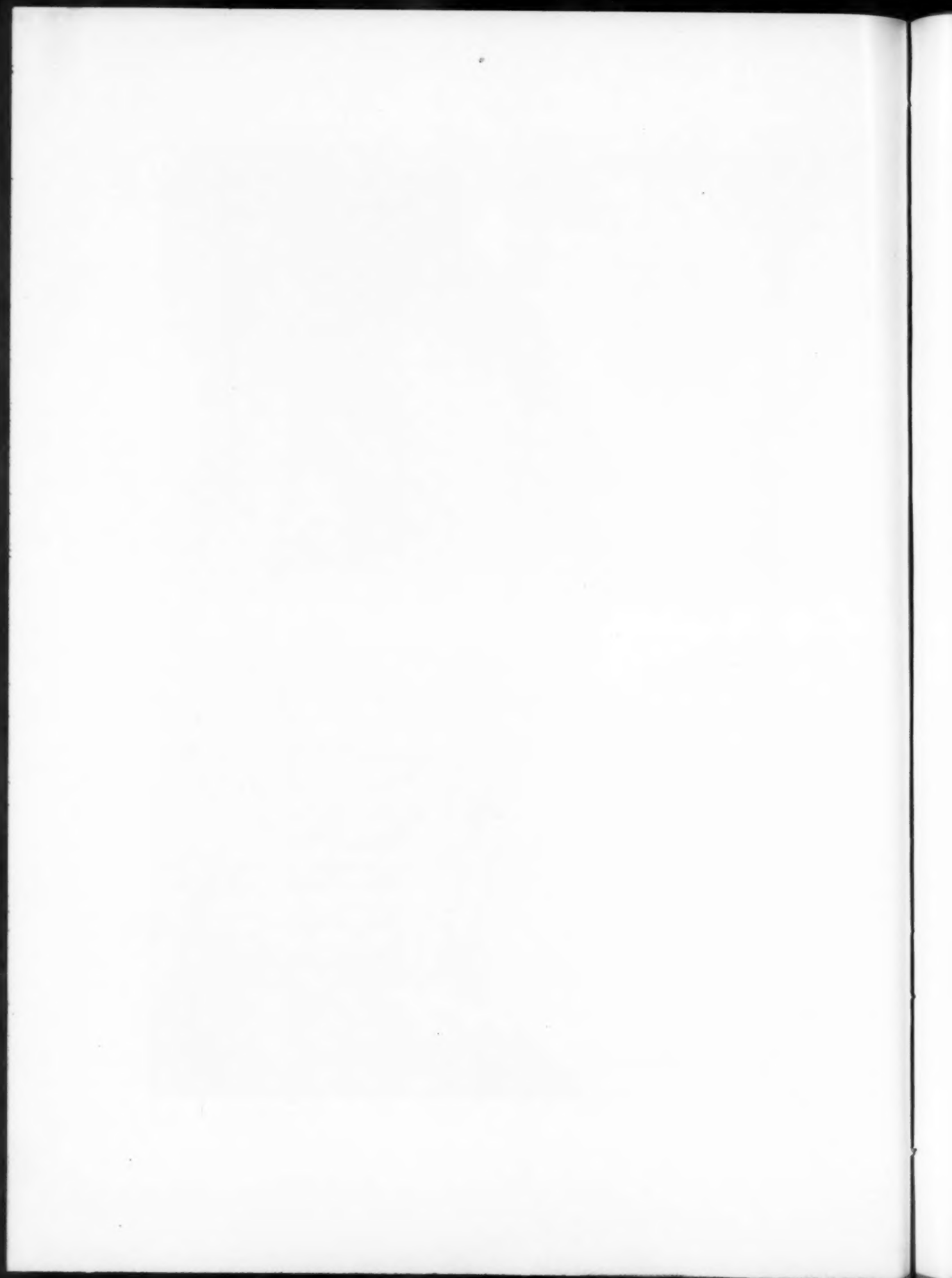
MAIN GYMNASIUM

MINNEAPOLIS, MINN., CENTRAL Y. M. C. A. BUILDING
LONG, LAMOREAUX & LONG, ARCHITECTS



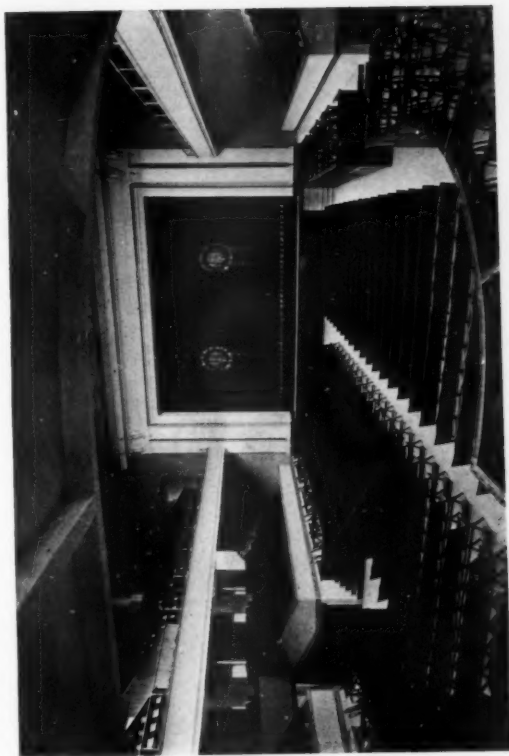


MUNICIPAL AUDITORIUM, SAVANNAH, GA.
HENRIK WALLIN, ARCHITECT

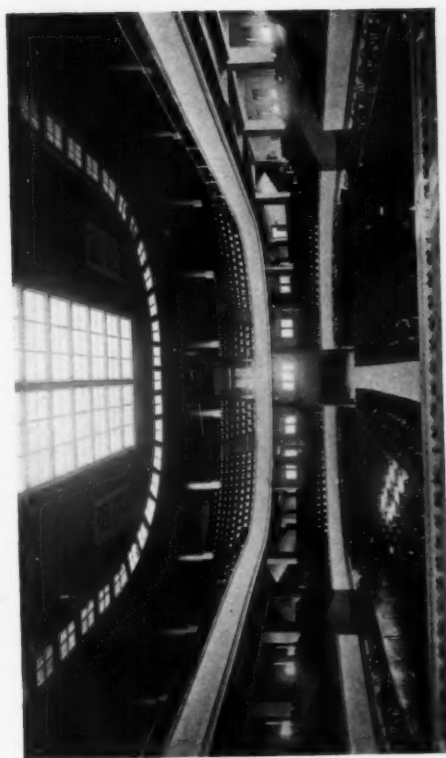




DETAIL, MAIN ENTRANCE



VIEW TOWARD STAGE



VIEW FROM STAGE

MUNICIPAL AUDITORIUM, SAVANNAH, GA.

HENRIK WALLIN, ARCHITECT



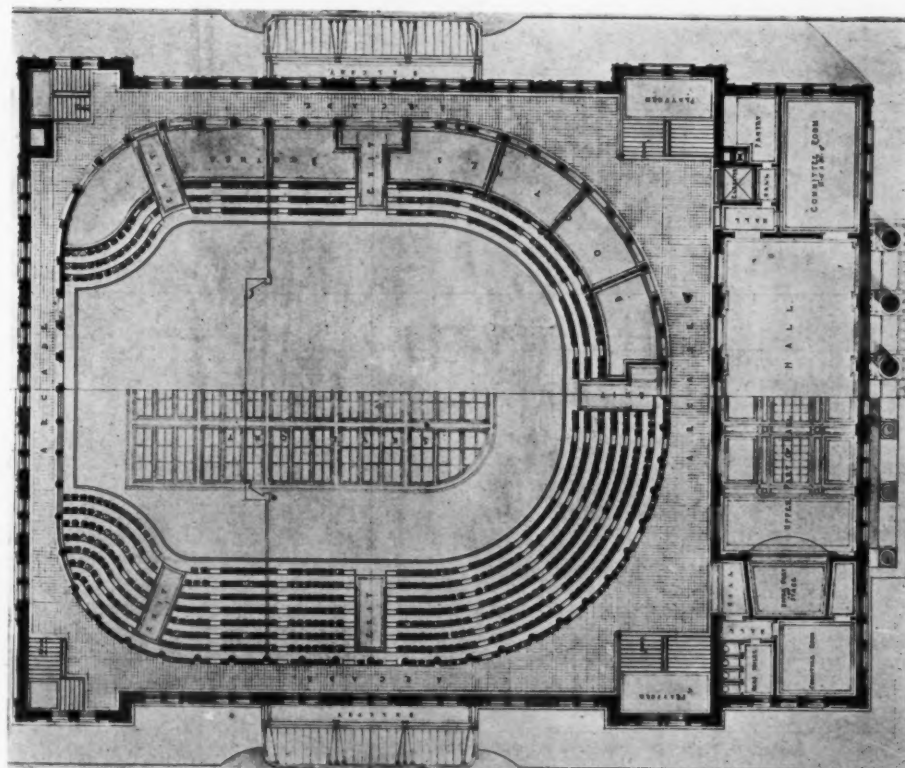
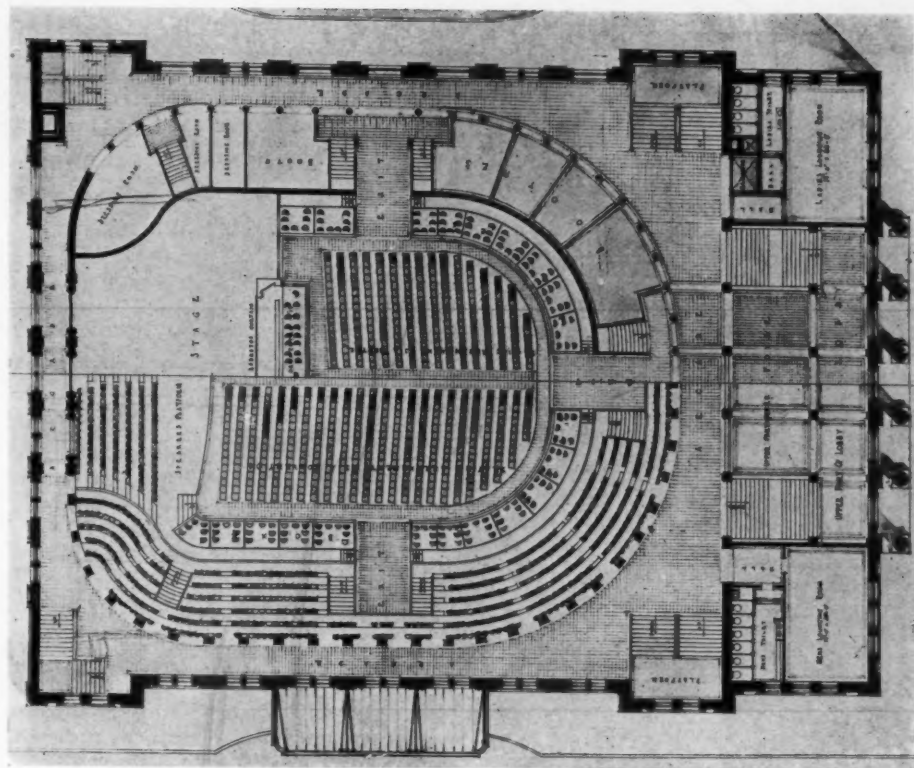


PLATE 9 ONE-HALF PLAN GALLERY FLOOR—ONE-HALF PLAN SECOND FLOOR



ONE-HALF PLAN PARQUET CIRCLE—ONE-HALF PLAN ARENA FLOOR

MUNICIPAL AUDITORIUM, SAVANNAH, GA.

HENRIK WALLIN, ARCHITECT



Current News

Illinois Chapter A. I. A.

At the meeting of the Illinois Chapter of the American Institute of Architects, June 10, 1919, the following officers were elected:

President, Henry K. Holsman.
First Vice-president, Thomas E. Tallmadge.
Second Vice-president, Francis W. Puckey.
Secretary, Albert M. Saxe.
Treasurer, Richard E. Schmidt.
Director (one year), George W. Maher.
Director (two years), Charles H. Hammond.
Director (two years), William J. Smith.

The feature of the meeting was Henry K. Holsman's inaugural address reported elsewhere in *THE AMERICAN ARCHITECT* and speeches by members who have returned from service. The Illinois Chapter had 39 men in active service.

Profit in Old Buildings

From different parts of the country come reports of profits made by utilizing the materials made available by the wrecking of old buildings in the construction of new houses and barns. Before the war no money was to be saved by utilizing second-hand lumber; now prices are so high that it pays to save old boards and timbers and haul them long distances to be incorporated in new work. From this time on it is not probable that any dismantled building will be used only for kindling wood.

There are chances in every growing and progressive community for cutting down the cost of new buildings by the purchase of the old structures that are to be superseded by modern residences or business blocks. In many cases the old lumber, if protected from the weather, may be as serviceable as any just from the sawmill. The attention now being given to the salvage of old buildings indicates that Americans are getting away from their old habits of wastefulness.

Domestic Needs Come First

There has been much talk of late of America striving for a great export trade in lumber. The first of a series of regional conferences to consider forestry problems, recently held in Washington, indicates that this would be an unwise effort and against public economy, explains the *New York Herald*. Statements were made by experts concerning the lumber outlook that may well arrest the attention of the country at large. We are told that we are fast using up our sources of domestic supply and are not growing forests to replenish them. According to Colonel Henry S. Graves, Chief of the Federal Forest Service, the local supplies of lumber in hundreds of communities throughout the United States are being exhausted. Wood-using factories, often the chief industry of populous localities, are closing. The timber of the East is practically exhausted. We are using up our southern and western forests so rapidly that their

depletion, not lack of labor or cost of transportation, is causing high prices in the home markets. This will increase as demand and supply draw away from each other.

The only way suggested to provide for future public needs for forests is better to protect those owned by the Government, the States and municipalities, adding to these when possible, and to bring about timber growing on private lands through governmental co-operation. Forestry questions are national questions. They are State and local questions as well. For this reason the representatives of several States having timber interests to guard are demanding that the national government resume leadership in this matter. They want to go ahead with reforestation devastated regions in some such manner as the States have gone ahead in highway construction in partnership with the Government in the expenditure of equal appropriations under co-operative supervision. This would seem to be a project that Congress might well consider.

It is still possible to grow forests at a rate to enable the country to cut maturing trees to continue its domestic industries, but steps to that end should be taken without further delay. If the war emergency had come a few years later we would have had great difficulty in meeting our requirements for wood products. It is clearly appropriate for the Department of Agriculture, having charge of the Federal Forest Service, to turn public attention to forest perpetuation rather than have it attracted to an attempt to build up a big foreign business on rapidly diminishing resources.

Lithuania's Art Inspires Modern World

Lithuania, the living sister of the Greeks, has in her veins the same blood that gave to the world the works of the greatest Grecian sculptors, writes a Virginia paper. Her works have been buried in obscurity just as Greek sculpture was buried in the earth. Greek art was uncovered. Lithuanian sculpture has been discovered.

This sister race of the Hellenes, whose democracy is older than the Greeks, preserved not only her ancient flair for the plastic art; it has kept alive through centuries of oppression the same ineradicable aspiration for political freedom. And it is this national hope and love of the soil of their motherland that has made modern Lithuanian sculpture what it is. The French have called Lithuanian sculpture the threshold of art. Their own artists are going to Lithuania for inspiration. For while other nations and schools may have technique and methods and ideas, the French have been quick to recognize the supreme idea of all. And that idea is a subject so powerful that it leads to expression in art. Art too often seeks an idea to express.

Rimsa, perhaps the greatest of Lithuanian sculptors, gives to the world "the Lithuanian school," a group which symbolizes the grand subject and cause of Lithuanian art. The old woman sitting by her spinning wheel and teaching a child to spin is a national symbol. It is the symbol and portrait of a secretly preserved nationalism.

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Board of National Advisers

The National Federation of Construction Industries in its fifth news bulletin announces the creation of a Board of National Advisers, to be composed of Directors of the Federation, representatives of member associations, and other men selected because of their prominence in the business world. It has been decided that for the remainder of the current year the presidents of association members shall be requested to serve as representatives of their several associations and that the determination of how association members shall thereafter be selected shall be left to the next annual meeting of the Federation.

Domestic Architecture in England

England has started upon an extensive house-building project, to solve the problem of proper housing for her millions of laboring people. To insure that these houses are practical for living purposes women have been asked to design them.

For generations men have planned houses with doors that open against the stove, sinks that are too low, inadequate closet space and a thousand other inconveniences. It is only of late years that it is being recognized that the woman who must run the home and probably do the actual work in it is a better judge of inside arrangement than the man who pays for it. Even now the services of the woman architect are seldom sought for public building projects like this one in London.

The chances are that these workingmen's cottages will possess a charm combined with a convenience of detail which will make them a delight to the families who come to occupy them. Woman, who has been the home-maker since the world began, by virtue of inheritance and experience, must know best how to design a home.

The New World

Much thought and discussion have been given to the material aspects and results of the world war, writes an Indianapolis paper. We have heard and read a great deal about the loss of life, the destruction of property, the financial burdens, the political readjustments, the new economic relations which the war has occasioned. But the most important change wrought by the great conflict seemingly has been accorded scant consideration, namely, that the world of ideas has been shattered even more ruthlessly and completely than the world of material things. If Mars has been the breaker of material pre-war idols he has also been the iconoclast of pre-war ideas. And, in a larger sense, the world cannot be reconstructed; it must be built anew, and not upon old foundations but upon new bases.

With prophetic vision, Lloyd George has grasped the import of the psychological reactions of the great cataclysm, and has expressed it in these simple words: "Don't think of getting back to where you were before the war. Get a really new world."

An economist of international reputation has stated that "as a result of the war the economic development of the world has been impelled forward by at least two generations."

New aspirations and ambitions, in fact, inspire this nation and are leading it to a broader vision and a greater service for all humanity.

In that one word "service" is epitomized all that we learned and accomplished by the co-ordination, the co-operation, and the unification necessitated by the crisis through which we have just passed. It will henceforth be a national shibboleth; it will constitute both the basis and the measure of our relations to other peoples and to each other.

Soldier-Artists Dominate "Salon"

That modern Temple of Art, the Grand Palais, must be rubbing its eyes with amazement after five years of hibernation so far as art exhibitions are concerned, to find itself once more harboring within its walls a Salon, the first to be held there since the untroubled spring of 1914.

Ever since mid-winter, when it was made known that there was to be a spring Salon, not only the artist colony but the Parisian world of art-lovers has been on the qui vive for the day of opening, the "Vernissage" or varnishing day as it is always called.

This is a soldier-artist Salon. For the martial painter all bars of restriction were let down. He was subjected to no stern, flinty-hearted jury's decision of acceptance or refusal, and there was a generous limit allowed for works sent. Thus the art-fledgling, mobilized or demobilized, sees his canvases placed side by side with those of the mighty painters of France. Thanks to this liberty, many paintings that it would be flattering to call mediocre naturally are encountered, but one seems to look through the canvas to the heart of the creator, the hero who faced the enemy. Thus comes a vision that checks possible mirth.

Yet if this is virtually a soldier-artist Salon, the backbone of the exhibition lies in the works of such great French masters as Menard, Simon, Aman-Jean, Bosnard, Roll, Cottet, Henri Martin, Bourdelle and our own celebrated painter of Paris street scenes, Edwin Scott, who has three beautiful pictures at the exhibition. One of Scott's paintings has just been bought for the Luxembourg Gallery.

Geneva Lacks Building for the League of Nations

Switzerland's government is beginning to regret the strenuous efforts which it made to induce the great powers of the entente to establish the headquarters of the League of Nations at Geneva rather than at Brussels, where the city had already offered to place at the league's disposal the magnificent and historic Egmont palace, with its beautiful gardens, shaded by trees many centuries old.

Brussels, easy of access to all the nations comprised in the league, seemed to be especially well qualified to serve as its headquarters, not only because of the material advantages which the city offered, but likewise because of the great sacrifices of life and treasure which Belgium made in the autumn of 1914.

Even The Hague would have been preferable to Geneva. There, too, a huge building was available for the housing of the league, namely, Andrew Carnegie's Palace of Peace, which, as long as it remains empty, constitutes a sort of mockery of the very objects which it is the professed desire of the league to obtain. At Geneva there is no building available for the use of the league.

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"Praise from Sir Hubert"

The Architect of London, in its monthly review and illustration of the current architectural press, reproduces a number of examples of memorials from recent issues of *THE AMERICAN ARCHITECT* and comments as follows:

"From *THE AMERICAN ARCHITECT* we give some illustrations of memorial schemes, which show American design in its best phase. They are clean, well-proportioned and dignified studies, such as we too rarely see in this country outside the studio work of the Architectural Association and some of the exceptional work of our other schools of architecture. The American commercial building is often a little dull and monotonous, too conscious of mere size; the American country house seldom comes into its own; but in more purely architectural design that of America often surpasses all other countries."

Notice of Competition

The board of trustees of the Fullerton Union High School and Junior College, Fullerton, Cal., announces that it has prepared a program for a competition for the best scheme for enlarging and embellishing the present school group.

The competition is for the four prizes of \$2,000, \$500, \$300 and \$200 respectively, the successful drawings to become the property of the board.

Registration of competitors may be made until Aug. 1, inquiries may be made at any time until Aug. 20, and the competition closes Aug. 28.

The board has appointed Carleton M. Winslow, Los Angeles, as professional advisor.

Prospective competitors desiring programs and the present layout of the grounds are requested to send their names and addresses, together with a deposit of two dollars, to the principal of the Fullerton Union High School and Junior College, Fullerton, Cal. The deposits will be returned to all competitors at the termination of the competition.

Sprucing Up Municipal Bridges

Only one thing is more important just now than the protection of the country's natural resources, writes the Department of Labor.

That is the protection of the country's fabricated resources.

Production is so costly that economy lies in preservation. Preservation in the long run is constructive.

During the war makeshifts were used to save repair, since labor was scarce. But now labor is not scarce. There are thousands of soldiers for whom the War Department Bureau, headed by Col. Arthur Woods, Assistant to the Secretary of War, is seeking work that will tide them over the initial period of readjustment.

Small repairs now will obviate larger repairs later and will give returned soldiers a job for which they are eager and for which they are suited.

The necessity of keeping bridges in repair is obvious. Worn off paint on a girder means decay of the valuable metal. And it is in no sense economical to save paint when its use will save manufactured material of great cost. It is extremely bad policy to replace steel that might have been saved at a small expenditure of money and labor.

City budgets that are not to be accused of extravagance should make provision for sprucing up public bridges.

It is just as if the owner of an automobile or a motorcycle would be accused of wastefulness if he allowed his machinery to corrode merely for the lack of oil which he considered too expensive.

There are three ways of spending money on manufactured property. One can spend it on operation, on construction and on maintenance. Maintenance is the important thing now, since the costs of the other two are so great. Maintenance is that ounce of prevention which saves many pounds of cure.

Putting oil on the bearings of an engine saves wear, saves the metal lining, saves repair. Care that costs one dollar saves \$5 in repair. Neglected repair that causes the breaking down of machinery and replacement of part may result in an expenditure of \$500. It is a house-that-Jack-built progression of avoidable costs.

Spruce up machinery, bridges, and vehicles today, and avoid tomorrow's overwhelming replacement costs.

State to Confirm Building Plans

The latest development in New York State is that the State Department of Labor will examine all plans for constructing factories, and if they conform to the labor law and industrial code they will be approved. This approval will be accepted by local authorities throughout the state and will save the owners trouble later on because of defects or violations. For this reason the Labor Department asks that this notice be published widely so that those who intend building to meet the coming expansion of business will be saved from needless expense, annoyance and delay.

Part of the notice of the Labor Department reads:

"Efficiency is greatly hindered when a building is unsuited to its use, defects discovered after completion are not only annoying, but usually expensive to remedy."

"A business man who does not assure himself he is right before he starts a building project is not progressive."

"Efficiency and economy in building construction can be obtained by conferring with or submitting your plans and specifications in duplicate to the Engineering Division, Department of Labor, Capitol, Albany, N. Y., for examination and approval."

"This service is rendered without charge by the State Industrial Commission."

Fire Destroys Famous Yildiz Kiosk

The palace of the Yildiz Kiosk, inhabited by the Sultan, has been destroyed by fire.

The Yildiz Kiosk, in the reign of Abdul Hamid II became the symbol of Turkish power. Its destruction literally means the wiping out of a commonplace group of buildings amid gloomy barracks and high walls, on the road beyond Pera with its colony of foreign diplomats, but figuratively, on account of its traditions of intrigue, mystery, and death, it means the disappearance of all that the Ottoman Turk has stood for in European history since 1453.

Within its inclosed walls was the Tchitli Kiosk; a long, one-storied building decorated with Japanese curios—presents from the late Mikado. At right angles to it and joined by a secret door was the harem proper, while within thirty feet of this was the Little Harem, where the Sultan ordinarily lived.

Late News from Architectural Fields

Special Correspondence to THE AMERICAN ARCHITECT

National Importance of Architecturally Good Government Buildings

WASHINGTON, D. C., June 27.—Congress is gradually awakening to the fact that the national importance of government bureaus dictates that they be housed in buildings of architectural distinction. Legislation designed to preserve the grandeur and dignity of Washington will shortly be presented to Congress for consideration. Indication of the new sentiment developing among congressmen is given in the proposals of Senator Smoot of Utah, for the removal of unsightly and temporary war buildings and the adequate housing of all government departments.

Senator Smoot's comments on government buildings is destined to bring about a realization that a building program of a permanent character will be required by the Federal government. The Utah senator is a powerful figure with the Republican majority and his opinions on the architectural reforms for Washington will bear considerable weight with his colleagues now in control of legislation.

It is regarded as a certainty that many of the so-called "temporary" buildings erected for war purposes will be occupied for many years. There has been no sign of abandonment of these structures with the diminution of wartime activities. These structures, erected in an emergency, are bound to deteriorate within a few years. It is a well known fact that many government employees find it impossible to work in these buildings during the summer season because of the oppressive heat and poor ventilation.

Washington architects are wondering what attitude Congress will take toward the movement now under way the removal of the straggling groups of emergency buildings. Assured of strong support in the Senate and House, an effort will be made to win congressional approval to a policy of building permanent office buildings. The rapid expansion of the executive departments requires an adjustment of housing conditions on a peace time program.

Senator Smoot has pointed out that the government pays out hundreds of thousands in rents in Washington every year. These offices are scattered throughout the city. The expiration of leases on many buildings this spring left the various bureaus in a quandary. For instance, the Federal Trade Commission was forced out into the street May first and for several days sought in vain for adequate accommodations. The Department of Justice occupies a building, privately financed when legislation for a permanent Federal building failed after several years of effort.

The War Department outgrew its quarters during the war and even the post-war activities are so extensive that the temporary structures will be occupied for several years. The Treasury, Commerce and Labor Departments have all expanded. Even the erection of an addition to the Treasury and the rental of a building intended for a large hotel failed to solve the problem of housing for this department. The creation of new bureaus in all departments makes a new building program a necessity.

Representative Clark of Florida, chairman of the House Committee on Public Buildings and Grounds, has promised

to push legislation for the removal of the disorderly aggregation of war structures in Potomac Park.

The location of these proposed new buildings for the permanent use of the government will directly affect the work of Washington architects. Whatever large buildings will be erected will undoubtedly be passed upon by the Commission of Fine Arts. This commission has long held the opinion that the precedents established by the chief structures of the earliest days should determine the architectural styles for new buildings. This body believes that the present style permits variety in treatment of individual buildings without producing any harmful effects on the harmonious development of the city.

Architects visiting Washington have generally commented on the heterogeneous nature of the architecture, especially the private buildings on the main thoroughfares. It is for this reason that the adoption of a fixed style for Federal buildings is favored—the character of the government structures would be impressive.

A Bill to Create a Federal Home Loan Board

WASHINGTON, D. C., June 27.—Representative Slep of Virginia has introduced a bill in the House to create a Federal Home Loan Board and home loan banks for the purpose of aiding in financing the construction of homes. The bill is essentially the same as presented to the Senate by Senator Calder of New York.

It provides for the appointment of four members of a Federal Home Loan Board, the fifth member being the Secretary of the Treasury, who shall be chairman ex-officio. The bill fixes the salary of the board members at \$10,000, the terms of service ranging from two years to eight years. The executive officer of the board will be designated as a home loan commissioner. The board will have the power to appoint a home loan registrar in each home loan bank district to receive applications for the issue of home loan bonds. Home loan bank examiners are to be appointed on condition they shall have no official connection with banking interests.

The bill authorizes the creation of eleven Federal home loan bank districts. Banks may be organized whenever ten or more building associations located within the district and having aggregate assets of not less than \$5,000,000 shall associate themselves together for that purpose. Each bank must have a paid-in capital of not less than \$100,000 in shares of \$1,000 each. The proposed bill gives the bank wide powers, the restrictions and limitations being merely ordinary precautionary measures.

Under the terms of the bill, bonds will be issued in denominations of \$20, \$40, \$100, \$500 and \$1,000. They will run for a specified maximum period, not exceeding twenty years, subject to payment at the option of the home loan bank, before maturity, at any time after five years from date of issue. A provision is made which limits the interest to not more than 5 per cent. An item of the bill calls for heavy penalties for false statements in the application of such loans.

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Mr. Slep's bill has been referred to the House Committee on Banking and Currency. Senator Calder, formerly a New York real estate man, is bringing pressure to bear on his colleagues in order to expedite a favorable report from the Senate committee. The passage of the Slep bill, with its essential features intact, is expected.

Art Exhibitions for the Season of 1919-20

WASHINGTON, D. C., June 28.—The American Federation of Arts has compiled a tentative list of exhibitions for the season of 1919-1920. These exhibitions have been carefully selected from the museums, artists, collectors and other sources.

Many works of interest to architects have been listed. These include 132 studies for mural paintings by Violet Oakley, made for the Pennsylvania State Capitol and other public and private buildings; Exhibition of Industrial Design, assembled through the co-operation of the Art Alliance, comprising textiles, wall papers, designs for silver, jewelry and art objects, with photographs of executed work; Textiles by American manufacturers (actual materials) showing art of exemplary merit in design; Sculpture Exhibition, photographs of executed works and small bronzes and medals by American sculptors; Arts and Crafts of foreign population, examples of handicrafts of foreign-born citizens.

The Architectural League of New York has assembled photographs, plans, etc., of small homes for town and country, of special interest to the home builder, which will also be sent on exhibition tour. In co-operation with architects and planners, the American Federation of Arts will exhibit plans and photographs of work done in other

countries and America, to develop industrial residential centers, garden cities, etc. Various other exhibitions will be prepared during the summer.

To Encourage Home Building

WASHINGTON, D. C., June 28.—Senator Calder of New York has introduced a bill to encourage the building of homes by providing for exemption from taxation of the income mortgages on real estate.

The bill calls for an amendment to paragraph (b) of Section 213 of the Revenue Act of 1918, the subdivision reading as follows: "The amount received by an individual as interest on an aggregate principal not to exceed \$40,000 of loans secured, under a mortgage or otherwise, solely by real estate."

The bill has been referred to the Committee on Finance of the Senate. A favorable report is expected.

An Appropriation by Congress for Pool at Lincoln Memorial

WASHINGTON, D. C., June 28.—The House of Representatives has approved of an appropriation of \$200,000 to begin work on the reflecting pool at the Lincoln Memorial. Considerable opposition developed from Southern members, but their efforts to defeat the measure were voted down.

Representative Buchanan of Texas raised a point of order in an effort to strike out the appropriation. Representative Sisson offered a motion to limit the cost of the pool to \$200,000. It was defeated with the second proposal of Mr. Buchanan to have the District of Columbia pay half the cost of the memorial.

Building the Business of the Future*

THE war has literally scattered American products all over the world. During the last four years our goods have been introduced in markets where they had never before sought admittance or where they never before had entry. And they were introduced at no cost whatsoever to the manufacturer. They were distributed on a scale which would have been impossible under normal conditions. There was no competition. The world desperately needed food, fuel, clothing, materials, and machinery. Ours was the only nation which could supply the demand. And we shall be kept busy filling the empty shelves over the earth for a considerable time during the reconstruction period. But we cannot expect the demand to continue indefinitely.

Burdened with war debts, the European belligerents are bending every effort to speed up their industrial machinery to a more productive scale than ever. They are endeavoring to curtail imports and promote exports. It is noteworthy that Great Britain has made rapid strides since the signing of the armistice in regaining some of the trade she lost temporarily during the war. In view of these efforts, we would indeed be blind were we not able to see that from now on we must prepare to meet the keenest rivalry in international trade.

Our products will no longer sell themselves abroad, as

they did during the war. The demand for them which dire necessity created will not sustain itself; it must be stimulated and kept active by effective advertising. Otherwise the unprecedented advantage which chance has bestowed upon us will gradually, but inevitably, be lost.

* * *

This is absolutely essential, not only to maintain and to foster our foreign trade but also to preserve our present prosperity. The cessation of hostilities found us with a tremendously expanded industrial capacity which the war had made imperative. But Mars has withdrawn from the world markets, and we are confronted with the problem of adjusting our industrial machinery to the demands of peace and of keeping it busy. We cannot lessen our productiveness without impairing business and prosperity. Consequently, we must encourage as never before the consumption of American goods in foreign lands. In helping to accomplish this result, therefore, advertising will assume an economic importance that can scarcely be exaggerated.

* * *

Lack of appreciation of this vital, psychological condition is largely responsible for the existing hesitancy and uncertainty of business in this country. For the last six months we have been handicapped by a feeling of doubt, by a tendency to indulge in "watchful waiting," to mark time until the peace treaty shall be signed. Prevailing high prices and wage schedules have been factors,

*Excerpts from an address by Francis H. Sisson, vice-president of the Guaranty Trust Co. of New York, before the Advertising Council of the Chicago Association of Commerce.

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of course, in superinducing this state of uncertainty. But we are fast perceiving that the coming of peace will not mark a return to pre-war prices, and we are gradually realizing that we are jeopardizing prosperity by inaction. Business interests are only now awakening to an adequate conception of the immense purchasing power of the American people.

The floating of colossal government loans, the paying of the heaviest taxes ever self-imposed by a people, and the generous and repeated responses to unparalleled war charities by this nation have not lessened its purchasing power, for we have been wonderfully productive and prosperous. In a remarkably brief period we have changed from a debtor to a creditor nation, and the world owes us in excess of \$10,000,000,000; our interest charges on this vast sum will yield us an annual income of approximately \$500,000,000. We have bought back from Europe more than \$2,500,000,000 worth of our securities, and henceforth will pay to ourselves the dividends which accrue from these holdings and which formerly were sent abroad. Our trade balance is the largest in history and our exports will undoubtedly total \$6,500,000,000 by the end of the current fiscal year, which ends on the thirtieth of June.

All that we need to do is to buy now, build now—and advertising can do more than any other one element to impress that fact upon the American public and to stir it to action. The Department of Labor is co-operating with business in promoting a "buy now" campaign. That Department is advocating advertising "because it saves money and reduces prices to the consumer; it prevents profiteering; it insures honest profits and makes them permanent."

* * *

But there are other and bigger problems for advertising to help solve through dispelling ignorance. Consider for a moment what we may expect in default of proper understanding of the vital economic questions pending before this nation to-day. Recall how near we came to authorizing by popular vote a debased currency during the free silver campaign; how long we temporized with our critical banking problem; how foolishly we have hampered and shackled our large industrial institutions in their legitimate expansion and beneficial economic functions; how we have over-regulated and strangled our railroads; how we have blundered in our taxation. Realize how we permitted the menace of government ownership, and its proved inefficiencies and political and financial tragedies to continue; how the organized might of labor and other class interests works its way at public expense.

Lessen Building Costs

The average builder doing competitive work will often estimate on ten jobs in order to secure one. Each one of these estimates may cost on the average at least \$75. Thus an outlay of at least \$750 must be made before a contract is secured, \$675 of which is waste pure and simple.

This \$675 goes into the builder's overhead. It is charged up against the one job in ten secured, adding just that much to the cost.

Many an architect's expenses also goes into useless overhead. In a recent competition, 75 architects submitted plans for an expensive structure. Each set of plans prepared on the chance of securing this job averaged \$1,000, wasted \$74,000. And the owners paid for this in the form of the architect's overhead.

That condition is deplorable. If owners who desired competitive plans or a choice of estimates paid for just as

many as desired, then less waste effort would be required and overhead would be lowered. That means an appreciable reduction in costs.

Of course when a builder goes after a job, having no competition, it is good business for him to give an estimate on cost. The owner naturally desires to know the cost of the work before proceeding. If it is too high, the builder does not secure the job, but neither does anybody else.

Too often, however, in localities where many contractors are willing to bid, ten or twelve will be asked to submit estimates—free. All bids may be rejected. At best only one will win out; the others will have had their trouble for nothing.

That is not fair, but unfortunately the trade has educated the public to expect this sort of indiscriminate service.

Now that costs have advanced so considerably, it is time that such wholesale free estimates on competitive business be eliminated. Let owners pay for just those estimates required; they will find their costs lower.

Elimination of the free estimate will do much to lower the cost of building.

In the Building Material Market

With but two exceptions—in the case of lumber and brick—there is now no great advance in prices over the pre-war level of 1913.

True, there have been wide fluctuations in the interim, but now that prices are again holding firm in all markets, with but few exceptions, it can be clearly shown that building material production rose and fell with the swing of the business pendulum, it having dropped to low points in 1914 and 1915 and risen to high levels in 1916.

Common brick and lumber were the two commodities that have more rapidly advanced than other materials and have held their advance. The increased cost of lumber and brick is due largely to the fact that the chief cost of production is labor. When the demand is not sufficient, especially in the case of brick, to cover the rising cost, the manufacturers close their plants and thereby curtail production and prevent overstocking the market. Today brick in New York City is \$15.00 per thousand, as compared with from \$5.00 to \$7.00 per thousand seven years ago, an increase of more than 100 per cent. But brick is the exception on the list, even lumber failing to show such a startling rise, excluding perhaps yellow pine, oak and maple flooring.

In listing commodities for their representative character and their relation to fundamental building conditions a summary of copper, iron and steel, lead and spelter has been made for the period from 1913 to date, showing the wide fluctuations that have occurred and how there has been a gradual return to pre-war figures. In January, 1913, copper was selling at 17 cents per pound. By July of that year it had receded to 14.12½. In July, 1914, it further eased to 13.50, the low level. April, 1917, found copper at 32, from which point there has been a gradual decline to the present level of 16.

The rise and decline of steel billets is even more spectacular. In January, 1913, open-hearth billets at Pittsburgh, wholesale, sold for \$29.00 per gross ton. \$19.00 was the low mark touched in July, 1914. From that month on there came a steady rise with the entry of the United States into the war until three years later a ton brought \$100. This abnormal price was entirely due to the fact that during the war Government necessi-

(Continued on page 30-A)

Department of Architectural Engineering

Shall We Militarize Our National Public Works?

THE long expected response of the Corps of Engineers, U. S. A., to the activities of the engineers, architects and constructors of the country looking toward the establishment of a National Department of Public Works has been made. It is in the form of a bill designated S. 1376, 66th Congress, 1st Session, introduced into the Senate June 5th, 1919, by Senator Ransdell of Louisiana. It may be inferred that this Senator is not prepared to father the measure, for the customary legend at the head of the bill contains the additional words "by request," after Senator Ransdell's name.

The bill is 35 pages long and contains 29 sections. It proposes to create an "Auxiliary Engineer Corps" in the United States Army for duty on works of public improvement—a non-combative corps of engineers which shall be "under the command and direction of the Chief of Engineers, U. S. A. . . .

Its personnel shall be assigned by the Chief of Engineers to duties under his charge; specifically on river and harbor improvements, inland waterways, locks and canals, fortifications, embankments, levees, dykes, breakwaters, piers and in the supervision and in the construction of national highways and bridges and to any other public work that shall be now or hereafter assigned to the Chief of Engineers under the War Department. This organization shall also perform the duty of guarding and protecting all national public works."

Whether or not the foregoing language places the construction of national highways and bridges under the Chief of Engineers and thereby increases the authority of the Engineer Corps beyond that now conferred upon it, is a question for the lawyers to determine. It may be observed, however, that, even if such authority is not specifically conferred, the language creates an "open sesame" and one is reminded of the ancient legend concerning the camel who received permission to place his nose in the tent. The bill is too long and comprehensive to be reviewed adequately here, but those who read it will have no question that it is the first step in an attempt to militarize the public works functions

of the Federal Government, which seems inadvisable.

The Engineers', Architects' and Constructors' Conference on National Public Works took action at the recent Chicago meeting directly opposite in spirit and purport to that set forth under this proposed measure. Therefore the officers of this federation are in duty bound to oppose this bill. In order that the engineers, architects and constructors of the country may be informed concerning the first steps taken in opposition, the letter to the Chairman of the Senate Committee on Commerce, to which the bill has been referred, is reproduced below.

"Honorable Wesley L. Jones, Chairman,
Committee on Commerce,
The U. S. Senate,
Washington, D. C.

My dear Senator Jones:

On June 5, Senator Ransdell introduced into the Senate, "by request," a bill to create an Auxiliary Engineer Corps in the United States Army for duty on works of public improvement. It is numbered S. 1376 and has been referred to the Committee on Commerce.

I have the honor to be chairman of a federation of societies with an aggregate membership of 105,000 engineers, architects and constructors. This federation, which is known as the "Engineers', Architects' and Constructors' Conference on National Public Works," is opposed to the provisions of the bill above named, and at its convention in Chicago, April 23 to 25, adopted a program contrary thereto in all respects.

On behalf of the federation aforesaid, I respectfully request that when the Committee on Commerce designates S. 1376 for hearing, said federation be given an opportunity to prepare and present its views.

For more than forty years, the engineers, architects and constructors of the United States have almost unanimously been advocating the consolida-

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tion of the engineering and construction work of the government into a Department of Public Works. The United States stands practically alone among the great and small nations of the world in that it has no such department. The matter has been considered and acted upon from time to time by various engineering societies throughout the country, but all efforts have heretofore been futile for two reasons: (a) the engineers, architects and constructors of the country have given local and sporadic, rather than united and continuous, support; (b) the Corps of Engineers of the United States Army has always been able to defeat any proposal that has thus far been advanced to Congress. The engineers, architects and constructors of the country are now united and they propose to present to Congress in the near future a well considered plan for a Department of Public Works that will correct the present chaos in our national construction matters and achieve economy and efficiency.

I will not burden you now with a detailed statement of the reasons which, after more than forty years of mature consideration by well balanced men, prompt the forthcoming recommendations. With respect to S. 1376, we shall in due time endeavor to substantiate our belief that there is no more sure, certain and insidious way of accomplishing militarism in the United States than through the militarization of our public works. Heretofore this militarization has extended principally to the rivers and harbors operations, with results that have repeatedly been characterized in a way not at all favorable to the Corps of Engineers. The Bill S. 1376 extends army control to public roads, bridges "and any other public work that be now or hereafter assigned." This bill is merely a part of a very ambitious plan to place the Army in the saddle over all engineering operations of the Government.

The genesis of S. 1376 is well known. You will find attached hereto a sample of propaganda circulated among the civilian force of the Corps of Engineers through the district office in New Orleans. It is hardly necessary to remind one as familiar with official army procedure as yourself that no civilian attached to the Corps of Engineers would be so venturesome as to distribute this amazing circular without "knowledge and consent" of headquarters at Washington.

It is a very long way from the War Department to the Capitol if one goes via New Orleans. The engineers, architects and constructors of this country are coming to the doors of Congress very soon, with a respectful petition which will be the result of forty years of the best engineering thought.

But in so doing, we shall remember the fundamental engineering axiom that a straight line is the shortest distance between two points.

With best wishes, I remain,

Yours very truly,

(Signed) M. O. LEIGHTON,
Chairman,
Engineers', Architects'
and Constructors' Conference
on National Public Works."

Reference in the foregoing letter to organized propaganda will be made clear by the following reproduction of the circular sent out from the district office of the Engineer Corps at New Orleans:

Strictly Personal—

1. The purpose of this letter is to enlist all Chief Clerks in the U. S. Engineer Service in a "push" to shove a bill through Congress for mobilizing an Auxiliary Engineer Corps. A bill for this purpose was recently placed in the hands of Senator Joseph E. Ransdell with a view to having it introduced by request at the coming session of Congress. This bill provides for a complete organization from top to bottom—non-combative with a military status, and under the direction of the Chief of Engineers, U. S. Army, with the rank he now has—Major-General—and the Division Engineers with the rank of Brig.-General, and the District Engineers with the rank of Colonel; with provision for ranks for assistants below the District Engineer. The Corps is to be mobilized from the experienced men of all classes in the office and field now in the service. Its duties are as now—construction, care and maintenance of public works; and National highways and bridges to be added. Let us talk about National good roads; absolutely necessary for the welfare and prosperity of the Nation.

2. The foundation of this organization rests solely upon merit in which the lowest paid man, if he is made of the right stuff, has a chance to make something of himself. It is not a salary grab—nor does it provide any fat jobs.

3. It provides for a three-year practical training period for all who enter the service and who have had no previous engineer experience before a man can get into the permanent corps, unless he qualifies for a commission before that time.

4. It provides graded pay in the various classes of the personnel—and also longevity pay of 5% increase for every three years' service, for eight three-year periods; besides the opportunity, if classifications justify it, for promotion from class to class with higher pay in such class. It provides also for an Efficiency Board that shall pass upon the qualifications of the personnel—so that justice

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is done to all men; with reference to duties performed and rank and compensation, which any member of the corps is justly entitled to. I may perform the same duties as Junior Engineer, which you perform as Inspector. The inequality of grade and pay is apparent.

5. As the honor men of West Point furnish the personnel for the Army Engineers so shall the honor men of our schools and colleges furnish the personnel of all departments of office and field service for the Auxiliary Engineer Corps, through the three year training period.

6. The District Engineer is the commanding officer of the District and the contracting officer, with division of duties under several departments, each in charge of experienced assistants under him.

7. The duties of custodian of property and disbursing officer will be divorced from the duties of District Engineer, leaving the hands of the latter untied for strictly engineering duties. No corporation would think of merging the duties of Chief Engineer with that of Treasurer or Paymaster.

8. Now then—it is essential to watch progress at Washington. Essential to have the bill introduced in the coming session, and essential to keep it going till passed.

9. When you hear that the bill is introduced, call on your Congressman or Senator for printed copy.

10. Talk for such legislation—be enthusiastic over it—get your business friends to write letters requesting the passage of the bill. Keep at it and don't let it rest. It will take time to get the bill through.

11. It may be necessary to keep a man in Washington under pay to "mark time" and keep a sharp lookout. All the Engineering Districts, I feel sure, will rally to the necessary financial assistance.

12. If you are really interested, send a self-addressed envelope $3\frac{1}{8}$ " x 9", with 3-cent postage stamp affixed, for copy of "Reasons why an Auxiliary Engineer Corps should be mobilized at this time." Any further "dope" desired will be furnished, but always send self-addressed stamped envelope.

13. Later on, if you desire it, we will have the bill cyclostyled. This work with a copy of the brief mailed flat will cost about 15 cents for postage and paper.

14. It is desired to work and talk quietly among the employees and our friends in each district—though the New Orleans *Times-Picayune* recently published something about the proposed legislation. I feel sure the District Engineers do not care to have anything to do with this legislation one way or another. They are trained to do their duty and not to be relieved from it. If

things have got into a deep rut—any relief needed must come through the people and Congress; so it is up to us to take the initiative. Strong influence is working to turn public works over to the Quartermaster Corps because they have already so many of our men in the service—and there is talk of a Waterways Commission and a Construction Engineer branch in the Quartermaster service; but it is not believed that either the people or Congress are ready for a change of engineers. The Auxiliary Engineer Corps will meet any public necessity, if there is one, for a Waterways Commission. There is a chance for any engineer that knows anything about river and harbor work to get in—as it calls for men having this special qualification, and where he will have every opportunity to make use of it. Let us work for it. Personal work among ourselves and friends, and before Congress, will be of much value.

ADDRESS: John D. Schmidt, 519 Canal Street, New Orleans, La.

Progress often spells conflict. We have just given of our best in men and money to defeat militarism, and prevent the forcing upon a world of enlightened civilization the doctrine that Might makes Right, and to uphold the ideals of democracy for which the blood of our forefathers was spilled to make sacred and free from the tyranny of autocracy the land in which we dwell. Let us maintain at home that which we won abroad.

Duly appointed representatives of the engineers, architects and constructors of the entire country recently met in Chicago and came to one common conclusion, namely, that a National Department of Public Works was essential to the economical and efficient operation of that phase of our government relating to the construction of governmental works, and to that end, by suitable resolutions, decided that it would be wise to divorce from each of the many branches of the government now dealing with such works, their jurisdiction over such construction and place it under one central department.

A proper bill as a means to bring about this desirable end is in the course of preparation, and will shortly be presented to Congress, but already we see a fight ahead. Those very forces of militarism which we defeated abroad seek to grasp power in our own government. Let the profession do its part to defeat any such insidious legislation as that now pending, whether it confers "fat jobs" upon some or only grants additional authority to those whom wisdom would dictate should deal with other matters.

Fire-Resistive Construction Cheaper in First Cost

A GOOD deal is said today about the high cost of building and the following information would indicate the possibilities of a scientifically planned, economical and at the same time fire-resistive type of construction.

Some six years ago the owner of the Junius Apartments, Chicago, here illustrated, had a building erected along the same lines as this more recent structure. The earlier building was the same length, three stories and low basement, instead of four stories in height, finished on two sides instead of three sides, and built in the ordinary manner with brick exterior walls, wood joists, wood studs, etc. The units in the old building were practically the same as those of the new and were designed for the same purpose namely, apartments.

The new building is fire-resistive throughout, except that the roof is of frame construction built over fire-resistive slab, forming the ceiling of the top story. The new building is composed of better material throughout, and yet its cost per cubic foot was nearly four cents less than the cost of the old building.

This was done in spite of the fact that the market price of steel was at its highest point, namely, \$72.00 a ton at the mill. Reinforced concrete frame construction was used, the exterior walls being curtain walls of hollow building tile faced on the outside with shale brick. Stairs were built of iron with concrete treads and wood rails.

The floor construction in the newer fire-resistive

building is of the concrete beam type, with removable steel dome. The building under construction is shown in one of the illustrations.

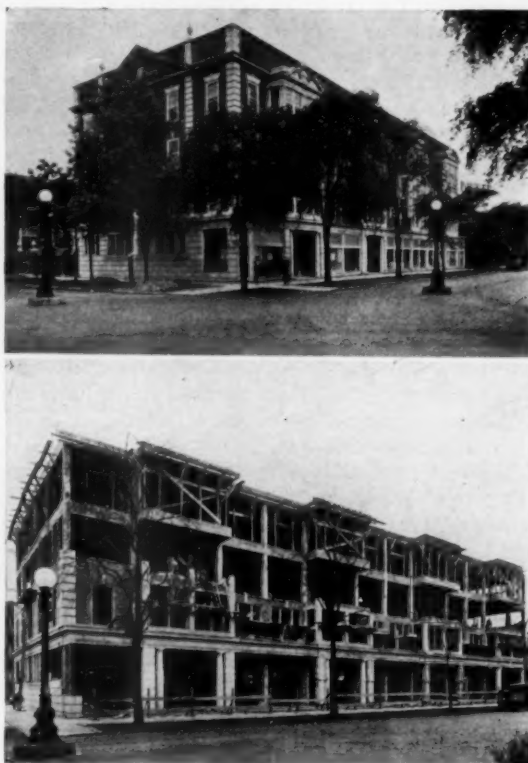
Another interesting feature is that the building contains 43 concrete mantels made of a portland cement, sand and color mixture, of a composition to give a Caen stone appearance. The mantels were made in one piece and by having 43 of them made on one order, in one factory, it was possible to get them installed at a price of \$17.50 each. They are better than wood mantels and are, of course, much more economical, both as to first cost and also in up-keep.

The lobby of the building has a concrete mantel of somewhat more elaborate design.

The remarkable difference in the cost of the two buildings could easily be accounted for, and this difference would have been much greater had the two buildings been built at the same time. In the fire-resistive building there was no wood trim whatever used around any of the windows, and the wood finish and trim throughout the building was reduced to a minimum. Where heavy brick walls were required between the units in the

building of ordinary construction, three-inch tile was used in the fire-resistive building. Of course, the floor construction in the fire-resistive building was more expensive than the floor construction in the ordinary building, but almost every other feature of the building was much less expensive in the fire-resistive building.

My experience in changing plans from ordinary construction to fire-resistive construction, after taking bids on the ordinary construction, leads me to say that if the designer will give due consideration



Junius Apartments and Shops, Chicago. Lower view shows building under construction.

*In a letter to *Concrete*, in which he comments on the relatively low cost of fire-resistive building construction in these times, as compared with non-fire-resistive construction, Henry K. Holsman, architect, Chicago, refers to the Junius apartments and shops shown in the accompanying illustrations.

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to the points of difference between the two types of construction he will find that, as the markets now are for buildings of this type, fire-resistive construction will cost no more than ordinary construction. I think the reason this is not more generally understood is due to the fact that when an architect usually designs a fire-resistive building he uses all of the features of ordinary construction and adds to them the fire-resistive construction. This is not necessary, and, in fact, not desirable.

A careful study of the special types of construction now available for fire-resistive buildings should be made, and new features introduced wherever they are desirable, along the lines suggested.

Book Review

CONCRETE—STEEL CONSTRUCTION, PART I—BUILDINGS. By Henry T. Eddy, C.E., Ph.D., Sc.D., LL.D., and C. A. P. Turner, C.E. Second edition, rewritten and embodying the most advanced theoretical developments. 477 pages, illustrated. Cloth.

This work, consisting of fifteen chapters, deals largely with the development and design of the flat slab type of reinforced concrete construction. The extended use of calculus in the derivation of formulas usually found in connection with the design of structures into which indeterminate stresses enter so extensively, is largely avoided, thereby adding considerably to a clearer comprehension of the line of reasoning employed. The authors seek to set forth a rational, safe and economical basis for the design of such buildings, and to this end point out the peculiar action occurring in such a type of construction, as well as the necessity of differentiating between it, and the simpler beam, girder and slab type, in arriving at a rational design. Two chapters are devoted to reinforced concrete columns and foundations.

As flat slab construction is finding a constantly enlarging field, the book should prove a valuable acquisition to the technically trained architect as well as the engineer dealing with this class of work.

Correct Moisture Content of Lumber

Shrinking and swelling of wood, as well as warping and twisting, are caused by changes in moisture content. Such changes always take place when the wood is not in equilibrium with the surrounding atmosphere. This state of equilibrium depends mainly upon the humidity of the air and to some extent upon its temperature.

Knowing the average temperature and humidity of any given region, as given by the Weather Bureau records, it is possible to determine the moisture content of wood corresponding to these conditions. Wood dried to this moisture content will undergo the least possible amount of working in that particular region.

The following table, compiled from data secured by the Forest Products Laboratory of the U. S. Forest Service at Madison, Wisconsin, shows the moisture content in wood corresponding to various temperatures and humidities:

When Relative Humidity of Air is, per Cent	THE MOISTURE CONTENT OF "DRY" WOOD IS		
	At Temperature of 70 Deg. F., per Cent	At Temperature of 140 Deg. F., per Cent	At Temperature of 212 Deg. F., per Cent
20	4.5	3.3	2.2
30	6.0	4.5	2.9
40	7.7	5.9	3.9
50	9.3	7.1	4.9
60	11.2	8.8	6.2
70	13.5	10.7	8.0
80	17.0	14.0	10.5
90	22.2	18.2	14.0
100	32.0	26.2	21.0

All wooden products in which swelling, shrinking, warping, checking, and opening of glue joints are troublesome should be manufactured at the moisture content and under atmospheric conditions corresponding to the average for the region in which they are to be used.

Peculiar Workings of the Zoning Resolution

THE building zone resolution of New York City became effective July 25, 1916, and since that date many interesting appeals have been decided by the Board of Appeals to whom was given power to modify, under certain conditions, the strict letter of the resolution. An interesting case, decided on June 10, 1919, was one in which an owner sought permission to convert an existing 5-story stable located at 117-118 West 46th St., Manhattan (which is a business district), into a garage. Both a stable for more than 5 horses, and a garage for more than 5 cars are prohibited in a business district, this prohibition, however, not applying to buildings and uses existing at the time of the adoption of the resolution.

The appeal was filed December 1, 1916, at which time the building zone resolution contained a clause relating to existing buildings and uses which permitted the conversion of one prohibited use into another prohibited use provided the cost of the structural alterations accompanying such change did not exceed 50 per cent of the value of the building, exclusive of the foundations. It was also the practice in the Building and Fire Departments at that time to permit such conversions under these conditions and require in the case of wood joisted construction a protection of fire retarding material covering existing wooden floors and ceilings, usually 3 inches of concrete over the floor and a plaster board and metal ceiling, although the law required fireproof construction in the case of new buildings. It appears that the cost of such alterations as were necessary for a conversion of this sort could be kept just within the 50 per cent limitation of the building zone resolution. It is therefore evident that had the owner of this structure retained a competent architect, familiar with the laws, in the first instance, no appeal would have been necessary, as the work proposed was entirely in accordance with the then existing practice in both the Building and Fire Departments.

Unfortunately for the owner, however, an application for modification of the zoning resolution was made and before the case was set for hearing the Board of Appeals, in acting on another matter, decided that the conversion of non-fireproof stables into garages could not be permitted, unless such buildings be reconstructed fireproof as required for new buildings. In other words, the owner of this stable while waiting for his case to be heard lost a privilege he formerly had, but of which he was ignorant.

For some reason, apparently the owner's lack of completing his papers, the case never came to trial, and on April 3, 1917, was withdrawn by him. To all intents and purposes this would have been the end of the matter. Over a year later, however,* we find the owner again possessed with an ambition to have the stable converted into a garage, and also to add another story to the structure, thus making it six stories high.

Plans were filed (by a new architect) with and disapproved by the Superintendent of Buildings, and thereafter a new appeal filed with the Board of Appeals. Strong protest against the proposed change was voiced by surrounding property owners at the public hearing on the case, the objectors, including representatives of the Board of Education, as there is a large school directly opposite the stable, and a church in the same block. As a result, the Board denied the appeal, and again it appeared that the matter was ended. The new applicant for the owner later discovered the record of the previous appeal which had been withdrawn, and the existence of which he was apparently ignorant of at the time his case was argued.

On September 17, 1918, a formal request was made to the Board of Appeals that this 1916 case be restored to the calendar and reheard under the law as of December, 1916. The Board, after receiving an opinion from the Corporation Counsel (its legal adviser), and acting upon his suggestion restored the original case to the calendar on December 17, 1918, but refused to act on it under the 1916 law, the appeal to be heard on its merits under the law as amended. For various reasons the case was laid over until April 29, 1919, at which time the Board was advised of the pendency in the Board of Estimate and Apportionment (a superior body) of a resolution to prohibit the erection or conversion of buildings for public garage use, if located within 200 ft. of a school. This resolution if adopted as proposed would have settled the matter. It was later adopted but made not to apply to cases pending before the Board of Appeals. On June 10th, 1919, the restored application was finally disposed of, the Board denying the appeal by a vote of 2 to 5, some 2½ years after it was filed. It seems probable that a writ of certiorari will be allowed, and the case finally disposed of in the courts.

*In the interim the building code had been amended so as to permit the type of fire retarding construction previously approved, for a garage of this kind, but the building zone resolution had also been amended prohibiting such conversion (in a business district) if structural alterations of any nature were made.

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A Substitute for Linseed Oil in Paint Manufacture

LEGITIMIZATION OF SOYA BEAN OIL

By HENRY A. GARDNER*

The rapidly growing production of soya bean oil in the United States is to a very great extent due to the early work of the Educational Bureau. During the past year there has been produced in North America over five million gallons of this oil, and an additional large quantity has been imported.

Exposure tests have shown that 20% of soya bean oil may be mixed with 80% of raw linseed oil to produce a paint liquid that will wear quite as well as pure linseed oil. The above mixture will show an iodine number (index of drying value) of approximately 170 when North American linseed oil is used as the base. In the writer's opinion, the above mixture (with an iodine value not less than 170) may be used with successful results in high grade paints. The adoption of this mixture for at least many types of paint in which it is customary to use linseed oil wholly, would be suggested. There should be no hesitation in disclosing, where analysis labels are now used, the actual composition of this liquid, as it is a thoroughly legitimate product which has proved satisfactory in scientific and practical tests.

Soya bean oil mixtures are excellent for the grinding of certain paste tinting colors. The raw oil is of lighter color than raw linseed oil, and may be made even lighter by refining. Soya oil grinds easily with pigments and produces pastes that remain soft and less liable to stiffening in the package than those made with pure linseed oil. The amount of soya oil introduced into a house paint, for instance, through the use of painter's paste tinting colors made on the above basis would be extremely small and would not have any substantial influence upon the drying of the paint. Because of the above properties of soya oil, it would appear that it is an oil that is even more desirable than straight linseed oil for color grinding, and that colors produced with this oil should really have a higher sales value than those ground wholly in raw linseed oil.

Soya oil requires a higher percentage of drier than linseed oil. Cobalt driers have been found

very satisfactory and even more efficient than lead or manganese driers. Cobalt linoleate is probably the most desirable, since it has a high degree of solubility in the oil and may be brought into solution at comparatively low temperatures. Cobalt acetate has sometimes been used in soya oil by the varnish maker, being introduced at high temperatures. The development of acetic acid vapors by this process, it should be noted, sometimes results.

Soya oil has a higher flash point than any other vegetable oil used in the paint industry. It may be heat treated and blown to a viscous form. Its value in varnish making has already been indicated and it is probable that it will soon be established firmly in the industry. Its further use is suggested.

Flat Slab Patent Held Invalid by Court

In a suit brought by the Condron Company, Chicago, for infringement of the Sinks patent on "2-way" flat slab construction, an opinion was handed down on April 16, 1919, in the U. S. District Court, Northern District of Illinois, Eastern Division, by Judge A. L. Sanborn, which concludes as follows:

"The patentee may have made a better flat slab or shallow beam construction than prior inventors, but the patent itself, apart from simplifying computation, simply proceeded along lines suggested by engineering skill. I think the patent is invalid, and that the bill should be dismissed."

Pending a decision on this case in the U. S. Court of Appeals, the Condron Company announces that they will make no royalty charges to their patent licensees or to those who accept licenses from them for the use of the Sinks invention in flat slab buildings erected or contracted for between April 30, 1919, and the date of such decision, regardless of whether the decision, on appeal, sustains the Sinks patent or not.

The Norcross patent, which was the original patent granted for the flat slab type of reinforced concrete floor, expired on April 29th of this year.

Under these conditions, and unless the lower court is reversed on appeal, no royalty charges can be made on any type of flat slab construction. This will decrease to a slight extent the cost of this type of reinforced concrete construction.

*Director of Scientific Section Educational Bureau, Paint Manufacturers' Association of the U. S.

Some Recent Engineering Articles of Interest

- Flexible Distribution for Industrial Plants. L. F. Leurey, Elec. World. April 26.
- Concrete Consistency Measured by New Device. Herbert A. Davis. Eng. News-Record. March 27.
- History and Properties of Light-Weight Aggregates (for Concrete Ships). Eng. News-Record. April 24.
- United States Nitrate Plant, No. 2 at Muscle Shoals, Ala.: The Boiler Room. Charles H. Bromley. Power. Serial beginning March 25.
- Refrigerating Plant Data. Power. March 25.
- The New Pittsburgh Station of the Bureau of Mines. George W. Harris. Coal Age. Serial beginning April 17.
- The Corrosion of Non-Ferrous Metals. Guy D. Bengough and O. F. Hudson. (Abstract of Report to Corrosion Comm of Inst of Metals.) Engineering (London). Serial beginning March 21.
- The Activities of the American Society of Civil Engineers During the Past Twenty-Five Years. Chas. Warren Hunt. Transactions, A. S. C. E. Vol. 82, 1918.
- How to Make Isometric Working Drawings to Scale. George Paaswell. Eng. News-Record. April 3.
- Engineering Civic Federation. W. L. Saunders. Eng. News-Record. April 17.
- Labor Efficiency Good on Percentage Contracts. Henry C. Turner. Eng. News-Record. April 24.
- Town Planning includes "Sunlight Engineering". H. L. Seymour. (Paper read before Royal Astronomical Soc.) Canadian Engineer. April 10.
- Report of the Seventh National Conference on Housing in America. Joseph C. Wagner. Journal Engrs. Club of Phila. April 24.
- New Passenger Station in Richmond, Va. Railway Review. February 15.
- New Cleveland Passenger Terminal Project. Railway Review. March 29.
- A Rectangular Reinforced Concrete Enginehouse. Railway Age. April 4.
- Philadelphia City Hall Subway Station. Harry Gardner. Engineering World. April 1.
- The Disposal of Sewage by Treatment With Acid. Edgar S. Dorr and Robert Spurr Weston. Journal Boston Soc. C. E. April.
- Design Features of Sewage Disposal Plant at Industrial Housing Development of the Alan Wood, Iron and Steel Co., at Swedeland, Pa. George L. Robinson. Municipal & County Eng. April.
- Sewage Disposal by Dilution, Including Chlorination of Sewage Effluent and Treatment of Sludge. W. C. Easdale. (From the Surveyor), Eng. & Cont. April 30.
- Specifications and Methods of Tests for Portland Cement. Transactions A. S. C. E. Vol. 82, 1918.
- Final Report of the Special Committee on Concrete and Reinforced Concrete. Transactions A. S. C. E. Vol. 82, 1918.
- The Reconstruction of the Slum Property. John G. Mitchell. Gas Age. Nov., 1918.
- Heat Transfer Tests of Building Materials. L. M. Arkley. Journal Eng. Inst. of Canada. Dec., 1918.
- Doubly Reinforced Beams. E. G. W. Montgomery. Journal Eng. Inst. of Canada. January.
- Structural Work in the Gas Works. Gas Journal (London). March 11.
- The National Housing Scheme. Oswald A. Bridges. Journal Inst. of Municipal & County Engrs. March 15.
- Methods, Economies and Standardization in Preparation of Plans for School Buildings. Clarence E. Dobbin. (From a paper read before Municipal Engrs. of the City of New York.) Engineering & Contracting. March 26.
- Cinder Concrete in Structural Work. Harry Gardner. Eng. World. April 15.
- Bituminous Roofing Materials and Construction. George Landis Wilson. Chemical and Metallurgical Engineering. Serial beginning April 15.
- Sewer Complicates Foundation Plans. Eng. News-Record. April 17.
- Labor-Saving Machinery Used in Building Houses. Samuel H. Lea. Eng. News-Record. April 17.
- A Simple Method for Designing Concrete Beams Reinforced for Compression. Arthur Raymond. Engineering and Contracting. April 23.
- Results of Flat Slab Floor Tests at Western Newspaper Union Building, Chicago. Arthur N. Talbot and Harrison F. Gonnerman. (Paper issued by Univ. of Illinois.) Engineering and Contracting. April 23.
- Strength of Hollow Building Tile. (Paper issued by U. S. Bureau of Standards.) Engineering and Contracting. April 23.
- Empirical Column Formulas for Brick Piers. W. W. Pearce. (Paper read before Bldg. Officials' Conference of the U. S. and Canada, and National Brick Mfrs. Assoc. of the U. S.) Engineering & Contracting. April 23.
- Strength of Hollow Building Tile. (Paper issued by U. S. Bureau of Standards.) Engineering and Contracting. April 23.
- Effect on Structures of Recent Porto Rico Earthquakes. M. L. Vicente and C. F. Joslin. Eng. News-Record. April 24.
- Why Building Materials Should Be Tested. Emmanuel Mavaut. Canadian Engineer. April 24.
- The Francois and Portier Grouting Processes. A. H. Krynauw. (From Transactions, Chemical, Metal and Min. Soc. of South Africa.) Eng. & Cont. April 30.
- San Francisco's High-Pressure Water Supply. Charles W. Geiger. Eng. World. April 15.
- Water Softening Plant on Construction Job Pays for Itself in Two Months. Engineering and Contracting. April 16.
- New Orleans Army Base Improves Facilities of the Port. George H. Davis. Eng. News-Record. April 24.



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Harland A. Perkins, Architect, Boston

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THE AMERICAN ARCHITECT

(Continued from page 22)

ties resulted in what might properly be called commandeering of every available stock of steel in this country. In October, 1917, the price had dropped to \$47.50. To-day steel billets are strong at \$38.50, less than \$10 over the price of six years ago.

Lead, delivered in New York, also has returned to approximately a pre-war level. Selling at \$4.35 per pound in January, 1913, there followed a period in which there was a slow but gradual decline to \$3.50 in October, 1914. July, 1917, found pig lead at \$10.75 per pound, only \$1.50 increase over pre-war levels.

Spelter sold for \$7.10 per pound in January, 1913. By October, 1914, it had eased to \$4.60. From that date it increased until it had reached \$21.00 by July, 1916. Following a sudden drop from this level to \$13.00 that Fall, a quick jump to \$19.00 the next Spring, there came a steady decline to the present price of \$6.00, but \$1.50 more per pound than in 1914.

The return to practically the levels of 1914 on these four basic commodities is conclusive evidence that reports circulated to the effect that it is the high cost of building materials that is holding up construction are groundless when actual conditions are studied. What increase there has been in construction costs is clearly traceable to three main causes: (1) an increased labor wage scale; (2) lack of increased production, and (3) higher transportation charges.

(From our special correspondent.)

CHICAGO, ILL., June 18.—It is becoming more and more evident that the views of such financial and industrial leaders as J. Ogden Armour, Charles H. Wacker, George M. Reynolds, and many others, that it is unwise to delay construction in the belief that costs will fall, and that right now is the best time to build, were based upon a

thorough knowledge of conditions and have resulted in the actual starting of many big building projects in this city.

J. Ogden Armour, should he so desire, might take credit for much of the present activities. In a recent public statement Mr. Armour said: "It behooves Chicagoans of vision to make provision for the future. There is need for more factories of all kinds; there is need for more stores; especially is there need for more houses and dwelling places for the thousands who are already within our gates looking for them and for the tens of thousands more who will be coming here as soon as the opportunity which lies here becomes apparent. It is unwise to delay construction in the belief that costs will fall. Wages and the other factors that determine costs are on permanently higher levels. Right now is the best time to build."

Chicago seemed to be halting—waiting for some just such advice. Mr. Armour expressed his views at a most opportune time. It seems as though his words "fanned the smoldering embers of a mass of plans for great activity into flame." Chicago is going ahead. Chicago has great plans for the immediate future, and Chicago's most progressive men are behind a movement to make this city the most wonderful place in the country.

It started with the building of small homes and bungalows. But a review of the permits issued during the last week give evidence of a much greater activity which presages a building boom in the near future. It might be well for the more skeptical to take note of the remarkable number of big apartment hotel projects announced during the present year, most of them during the last three months, which reach the total cost of over \$14,000,000.

The most important include the Drake, costing \$3,500,000; Webster, \$2,500,000; New Beach, \$2,000,000; American Cities, \$1,250,000; Ritz, \$1,000,000, and four Streetwork projects, \$3,000,000. Some lesser projects will carry the total well above \$15,000,000.

Late Quotations in Building Material Markets

(Price quotations now current on building materials and supplies as quoted by dealers and jobbers for delivery in New York and Chicago follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted, but will also present a basis to judge conditions as affecting correlating materials. Items marked (*) indicate an advance over last week, while those marked (†) record a decline. Other prices did not fluctuate during the week.)

BRICK		New York	Chicago
Face brick (delivered on job):			
Common (Delivered at job in Borough of Manhattan only), per thousand.....			
Rough red	\$17.85	\$12.00	
Smooth red	29.00	40.00	
Smooth buff	26.00	40.00	
Smooth gray	32.00	40.00	
Colonials	32.00	40.00	
	38.00	42.00	
	40.00	42.00	
	24.00	30.00	

BROKEN STONE		New York	Chicago
(Delivered on job):			
1½ in. per cu. yd.....	\$2.75	\$2.25†	
¾ in. per cu. yd.....	2.75	2.25†	

BURNED CLAY		New York	Chicago
(Delivered on job):			
Block partition:			
3 in., per sq. ft.....	.13	.10	
4 in., per sq. ft.....	.15	.11	
Chimney tops:			
12 x 12 for 8 x 8 flues.....	\$3.50	\$2.25	
Flue lining:			
4½ ft. x 13 ft., per lin. ft.....	.24	.12	
4½ x 8½, per lin. ft.....	.18	.16	
8½ x 8½, per ft.....	.24	.16	
8½ x 13, per ft.....	.54	.20	

	New York	Chicago
13 x 13, per ft.....	.46	.28
8½ x 18, per ft.....	.54	.32
13½ x 18, per ft.....	.70	.42
18 x 18, per ft.....	.90	.55
Wall coping (double slant):		
8 in., per lin. ft.....	.16	.14
12 in., per ft.....	.26	.18
18 in., per ft.....	.54	.30
Wall coping (single slant):		
8 in., per lin. ft.....	.16	.14
12 in., per ft.....	.26½	.30
18 in., per ft.....	.54	.30
(Corners and angles four times the price of one foot of coping the same size.)		

Hollow Tile		New York	Chicago
(Delivered at job, in New York below 72nd St.):			
2 x 8 x 12 partitions, per 1,000 sq. ft.....	\$70.15		
3 x 12 x 12 partitions, per 1,000 sq. ft.....	102.00	\$67.90	
4 x 12 x 12 partitions, per 1,000 sq. ft.....	114.75	72.50	
6 x 12 x 12 partitions, per 1,000 sq. ft.....	153.00	99.60	
8 x 12 x 12 partitions, per 1,000 sq. ft.....		135.80	
10 x 12 x 12 partitions, per 1,000 sq. ft.....		167.50	
12 x 12 x 12 partitions, per 1,000 sq. ft.....		194.60	
2 x 12 x 12 split furring, per 1,000 sq. ft.....	63.75		

CEMENT		New York	Chicago
Per bbl. in 15 cent bags (Rebate 60c. per bbl. for bags)	\$2.90†	\$2.90†	

COPPER SHEETS		New York	Chicago
At the mill, hot rolled, 16 oz. base-price, per lb.....			
(From jobber's warehouse add 2 to 3 cents. Cold rolled add 1c. per lb. to hot rolled.)	25½c.*	25½c.*	

CORNER BEAD		New York	Chicago
Per foot	.05	.05	
FIBRE		New York	Chicago
Per bushel	.36*	.30	

(Continued on page 30-B)



Flush Switches

NEXT to sockets, switches—means of controlling current elsewhere than at the point of use—are perhaps the most important part of an electrical installation. They are subjected to almost constant usage and must, therefore, be mechanically and electrically able to withstand heavy service.

G-E Flush Switches are carefully designed and thoroughly tested and they will stand a surprising amount of abuse. A few of the many types are shown here.

G-E RELIABLE WIRING DEVICES

Can be furnished by any reputable electrical contractor

The name General Electric Company on an electrical device is a guarantee of quality backed by over a quarter-century's experience in the generation, transmission, distribution and application of electricity.



Flush tumbler switch (metal covered handle)



Flush tumbler switch (composition handle)



Flush type locking switch



Flush push button switch

General Electric Company
 General Office Schenectady, N.Y.

THE AMERICAN ARCHITECT

Late Building Material Prices

(Continued from page 30-A)

GALVANIZED SHEETS

	New York	Chicago
Nos. 18 and 20 gauge, per lb.	\$6.12	\$6.12
No. 26	6.42	6.42
No. 27	6.57	6.57

GLASS

(Discounts from manufacturer's price lists)

Single strength, A quality, first three brackets.	77%	77%
Single strength, B quality.	77%	77%
Double strength, A quality.	79%	79%
Double strength, B quality.	81%	81%
Plate—up to 5 sq. ft.	82%	80%
Plate—over 5 sq. ft.	84%	80%
Plate—up to 10 sq. ft.	80%†	80%
Plate—over 10 sq. ft.	80%†	80%†

GRAVEL

1½ in. (Borough of Manhattan only), per cu. yd.	\$2.75	\$2.35
¾ in. (Borough of Manhattan only), per cu. yd.	2.75	2.35

GYPSUM

Plaster Blocks:

Delivered at job, Boroughs of Manhattan and Bronx.		
27 x 28 x 1.	35c.	
27 x 48 x ½.	30c.	
32 x 36 x ¼.	21c.	25c.
32 x 36 x ¾.	21c.	26c.
32 x 36 x ¾.	21c.	

Plaster Blocks:

Delivered at job, Boroughs of Manhattan and Bronx.		
2 in. solid, per sq. ft.	7½c.	
3 in. solid, 12 x 30, per sq. ft.	10½c.	
3 in. hollow	10½c.	10c.
4 in. hollow	12½c.	11c.
6 in. hollow	17½c.	

LATH

Eastern spruce, per thousand.	\$6.75*	
No. 1 white pine, per thousand.	\$7.50*	
No. 1 hemlock, per thousand.	6.50*	
No. 1 yellow pine, per thousand.	6.75*	

LEAD

America pig, per lb.	6 to 6½*	6¼ to 6¾*
Bar, per lb.	7½ to 8½*	5½ to 6¼*

LIME

Common, 300 lb. bbls., per bbl.	\$2.50	\$1.40
Finishing, 300 lb. bbls., per bbl.	3.70	
Hydrated, in paper bags, per ton.	18.50*	18.25*

LUMBER

(Retail prices per M, delivered.)

Yellow pine, 2 x 4.	\$65.00*	\$47.00
Yellow pine, 2 x 6.	65.00*	45.00
Yellow pine, 4 x 4.	65.00*	52.00
Yellow pine, 8 x 8.	67.50*	52.00
Yellow pine, 12 x 12.	75.00*	57.00
Yellow pine, No. 1 boards, 1 x 6.	75.00*	53.00
Yellow pine, No. 1 boards, 1 x 12.	80.00*	56.00
Yellow pine, B and better flooring (plain).	70.00*	62.00*
Yellow pine, B and better flooring (quartered).	82.50*	75.00*
Douglas fir, 6 x 6 to 12 x 12.	67.50*	65.00*
Douglas fir, 12 x 14 to 14 x 14.	75.00	64.00
Norway pine, 2 x 4.	60.00	50.00
Norway pine, 2 x 12.		57.00
Hemlock, 2 x 4.	55.00*	46.00
Hemlock, 2 x 12.	53.00*	48.00
Oak flooring, 13/16 quartered white.	200.00*	150.00*
Oak flooring, 13/16 quartered red.	190.00*	143.00*
Oak flooring, 13/16 plain white.	125.00*	100.00*
Oak flooring, 13/16 plain red.	90.00*	100.00*
Maple flooring, 13/16 clear.	89.50*	89.00
Maple flooring, 13/16 select.	85.00*	75.00
Maple flooring, 13/16 No. 1 factory.	75.00*	62.00
Mahogany, 1" F. A. S.	300.00	300.00
Quartered oak, 1" F. A. S.	180.00	150.00
Plain oak, 1" F. A. S.	120.00	110.00*
Red gum, 1" F. A. S.	90.00*	80.00*
Sap gum, 1" F. A. S.	65.00*	61.00*
Chestnut, 1" F. A. S.	90.00*	81.00*
Poplar, 1" F. A. S.	135.00*	125.00*
Birch, 1" F. A. S.	71.00*	69.00*
Spruce, random 2"	55.00*	50.00
Spruce, wide 8"	65.00*	60.00

METAL LATH

Under 100 sq. yd., per sq. yd.	40c.*	35c.†
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MORTAR COLORS

Red, per lb.	.05	.05
Brown, per lb.	.05	.05
Chocolate, per lb.	.05	.05
Black, per lb.	.05	.05

OILS

Linseed, city, raw.	\$1.88 to \$1.90*	\$2.11*
Linseed, boiled, advance, per gal.	.01	.02*
Out of town, American seed at.	1.88 to 1.90*	2.11*

Leads:

American white, in oil, kegs; lots over 100 lbs.	13c.†	13c.†
White, in oil, 25-lb. tin pails; add to keg price.	¼c.	¼c.
Red, bbl., ½ bbl. and kegs; lots over 100 lbs.	13c.†	14c.†

Dry Colors:

Red Venetian, American, per 100 lbs.	\$2.00 to \$4.50	\$4.10
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Metallic Paints:		New York	Chicago
Brown, per ton.	\$32.00 to \$36.00*	\$24.00	\$32.00
Red, per ton.	35.00 to 40.00*	24.00	32.00

PIPE

Cast Iron:		\$52.70	\$51.80
6 in. and heavier.		55.70	54.80
4 in.		62.70	61.80
3 in.			

(and \$1 additional for Class A and gas pipe.)
(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c.)

Wrought:

Steel:			
Black, ½ to 3 in.	Butt Weld	50½ to 57½%	57½%
Galv., ½ to 3 in.		24 to 44 %	41 %
Iron:			
Black, ½ to 1½ in.		29½ to 39 %	39½%
Galv., ½ to 1½ in.		2½ to 23½%	23½%

Steel:

Black, 2½ to 6 in.	Lap Weld	53½%	53½%
Galv., 2½ to 6 in.		41 %	41 %
Iron:			
Black, 2½ to 6 in.		34½%	34½%
Galv., 2½ to 6 in.		21½%	21 %

PLASTER

Neat wall cement in 15 cent bags, per ton.	\$20.30	\$18.50
Finishing plaster	24.00	21.00

PUTTY

In bladders, per 100 lb.		\$4.25†
In 1-lb. to 5-lb. tins, per 100 lb.	6.75	6.50†

RADIATION

(A further discount, effective April 4, of 15% on direct radiators, 12½% on wall radiators, and 10% on steam and hot water boilers is announced. This approximates a drop of 36% on radiators and 33% on boilers from prices in effect before the 1st of January, 1919.) Chicago reports a 57% discount on standard heights.

REGISTERS

Cast iron semi-steel or steel, in black or white japan		40%	40%
or electro plate and small faces and borders.		40%	40%
Wall frames		40%	40%
Large faced, 14 x 14 in. and larger.		60%	60%
Base board registers		40%	40%
Base board intakes		40%	40%
White enameled goods		15%	15%
Solid brass or bronze goods, except grilles.		net	net
Grilles in black and white japan or electroplate in cast iron, plain lattice design—smaller than 14 x 14 in.		40%	40%
—Less than 14 x 14 in.		60%	60%

REINFORCING BARS

High carbon steel from mill.	\$48.50	\$49.50
Medium steel from mill.	48.50	49.50

ROOFING MATERIAL

Tarred Paper:		
1-Ply, per ton.	\$62.00*	\$65.00
2-Ply	1.05*	1.00*
3-Ply	1.40*	1.40*
Rosin sized sheathing, per ton.	60.00	60.00
Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, 30c. per 100 lbs.		

SAND

Mason per cu. yd.	\$1.80	\$2.25
Torpedo, per cu. yd.	1.80	2.25*

SHINGLES

Red cedar, 5 to 2, clear, per thousand.	\$10.75*	\$7.00*
White cedar, extra star, A star, per thousand.	10.00*	6.50*

SLATE ROOFING

	F.O.B. cars.	F.O.B. Chicago
Pennsylvania:		
Best Bangor	\$6.50 to \$9.00	\$10.20 to \$11.45
No. 1 Bangor Ribbon	6.75 to 7.25	9.20 to 9.70
Pen Argyl	7.25 to 9.00*	9.70 to 10.45
Peach Bottom	10.00 to 12.50	12.45 to 14.45
No. 1 Chapman	7.25 to 8.25	8.70 to 9.95
Vermont:		
No. 1 Sea Green	3.50 to 6.75	5.95 to 9.20
Unfading Green	5.50 to 9.00	8.30 to 11.05
Red	13.00 to 16.00	14.80 to 22.80
Maine:		
Brownsville, U'f'g Black, No. 1	10.00 to 12.50*	14.10 to 15.10
Slates felt, 30 lb. roll	.92†	
Slates felt, 40 lb. roll	1.22†	

SPIRITS TURPENTINE

Per bbl.	.66½	.66½
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STONE SCREENINGS

Lime, per cu. yd.	\$2.35	\$2.35
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STRUCTURAL STEEL

Beams and channel, 3 to 15 in., per lb.	2.72c.*	3.47c.
Beams and channel, over 15 in., per lb.	2.72c.*	3.57c.
Angles, 3 to 6 in.	2.72c.*	3.47c.
Zees and tees.	2.72c.*	3.47c.
Steel bars, half extras, from mill.	2.35c.	3.47c.

STUCCO

In cloth, per ton (white, mixed)	\$21.50	
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