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Sgraffito

By MAXIMILIAN F. FRIEDERANG

The Editors, THE AMERICAN ARCHITECT:

At the time of my first visit in January, 1913, you invited me to write a series of articles on my re-discovery of *Sgraffito* and *fresco buono*. I promised at the time, but upon looking over the field of investigation and thought I decided to let the matter rest for at least five years.

This time has expired, and a comparison of other artists' work and my own for the last twenty-five years is full of interest and scientifically very valuable. The experience needed for such serious artistic undertakings must be great, indeed, and only the decorator and artist of superior quality is able to judge of its monumental character. From all the trials and struggles there may be gathered solid and harmonious information, both as to the practical and the artistic sides of the question.

It is only an artist of advanced education and experience who will have courage to step into new fields with any degree of confidence. Another, not so sure of himself,

and less happily balanced, will progress more slowly, will take smaller steps and investigate painstakingly and with diligence. It is true—"Be on your guard; distrust traditions. Tradition is only a guide." Here as elsewhere the element of discrimination must play a large part in one's activities. Go not to the most brilliant, the most surprising and unusual for your traditions, but to the sincerest and simplest, and the most thorough.

In *sgraffito* this matter of discriminating must be the artist's guide to a very large extent. He must learn to discard the lesser truths, and to know that as all art lives by sacrifice, this art also can live only by the sacrifice of certain phases of artistic practice. True simplicity must ever guide the designer and decorator who explores the dignified realms of *sgraffito*. The basic laws of equilibrium, repose and proportion must be maintained, often at the expense of the lesser clevernesses of practice, and often used to conceal defective technique.

MAXIMILIAN F. FRIEDERANG.

THE term *Sgraffito* is derived from the Italian word, *sgraffiato* or *sgraffito*. It signifies a method of scratch work, or hatching, on fresh plaster, black and white work, or any other dark and light color combination, and the *chiaroscuro* of writers of the seventeenth and eighteenth centuries. The system of plastic decoration is that in which we are interested.

Sgraffito, in its simpler forms, constitutes a very elementary sort of artistic expression. Indeed, it is claimed by some writers that *sgraffito* was the earliest form of drawing. Drawing in the sand, on snow, on the bark of a tree, or on stone, are all primitive expressions of this art. The same method of workmanship is also found in early pottery, and was used very extensively in Egypt, India, Persia, China and Japan, as well as in Greece and Rome. On this side of the globe we find excellent *sgraffito* work in Mexico and Peru.

However, little is known at the present time of the methods and scope of its use in the early history of these countries. It first comes into prominence as a type of architectural decoration during the Renaissance. At the time of the exhumations of

the Baths of Titus, in the sixteenth century, *sgraffito* was re-discovered by Pietro Luigo.

Luigo, together with Andrea Feltrini, sought to revive this method of plastic decoration, and finally succeeded in bringing it into considerable prominence. Due largely to the efforts of Feltrini, also called di Cosimo, who profited extensively by the efforts of Luigo, *sgraffito* attained a wide popularity for purposes of external decoration. It is said that a very large percentage of the *sgraffito* to be found in Florence is his work, that of his pupils, or can be traced to his influence clearly.

His method was to apply to the surface to be decorated an *intonaco* of dark plaster, which, while fresh, was covered with a white or light colored stucco. The cartoons were transferred, cut through with a graving iron to expose the dark surface underneath. Finally the whole composition was glazed over with a silicated transparent wash.

Cosimo applied *sgraffito* very successfully to the façades of a number of important Florentine buildings, the first of which was the Palazzo Gondi in the Borgo, followed by the Palazzo Agnissanti, and many other buildings, which still invite our students

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and admiring travelers. At Spoleto, near the cathedral, there is a large palace, covered with designs in *sgraffito*, which is attributed to Julio Romano.

It is in these houses of central Italy, in the fifteenth and sixteenth centuries, that *sgraffito* attained its greatest perfection. The cartoons for the decorations were furnished by artists of distinction, while other craftsmen who helped to execute the work were also artists of ability.

The influence of the Renaissance began to be felt in England during the reign of Henry VII. The Wars of the Roses were practically at an end, and with the consequent time and leisure available the possibilities for intellectual culture were vastly increased. The new learning crossed the channel and gained a firm foothold on British soil.

In the reign of Henry VIII Italian influence became even stronger, in spite of the monarch's constant quarrels with the Church of Rome. The

cultural expression, fostered by Renaissance influence, which was to reach its height during the time of Elizabeth, made good headway. *Sgraffito* is first found to have been used in England at this time. In the king's palace at Hampton Court, as well as in other buildings of that period, its use was successful, technically and artistically.

The modern use of *sgraffito* in England has also been very interesting, and satisfactory from the standpoint of permanence. The dampness of the climate and the other factors which make for the deterioration of the mineral wall have left it unscathed.

In this country, however, this type of plastic art has not met with much favor until comparatively recently. It has been condemned because of adverse atmospheric conditions, although the real cause of the failures is ignorance of the subject and lack of experience on the part of the artists who have attempted its use.

The original worker in *sgraffito* had the advantage of centuries of tradition and years of training in the use of technical processes, now all but lost. The typical American idea of time and its value has probably reacted more strongly against its successful use in this country than any other one thing. Instead of realizing that, in order to achieve satisfactory results in taking up a new and

hitherto comparatively unknown field, a large amount of investigation and experimentation is necessary, the modern worker in *sgraffito* has, as a rule, plunged in boldly, using the first pigments that came to hand, going about the work in a hazy fashion, without any conception of the true nature of the art.

The fact that *sgraffito* is an art must be borne in mind, if one is to make a success of it. It requires much more mastery of drawing than many branches of the fine arts, for two reasons: First, because of the limitations in form and color prescribed by this type of decoration, which bring the actual drawing into unusual prominence; and secondly, because, by reason of the nature of the materials used, a high degree of accuracy and rapid workmanship are essential. Then, too, *sgraffito* demands of the decorator an intimate knowledge of the nature and behavior of the materials used, of the chemistry of

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PALAZZO MONTALVI, FLORENCE
B. AMMANTI, ARCHITECT

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colors and the after-action of caustic lime upon them.

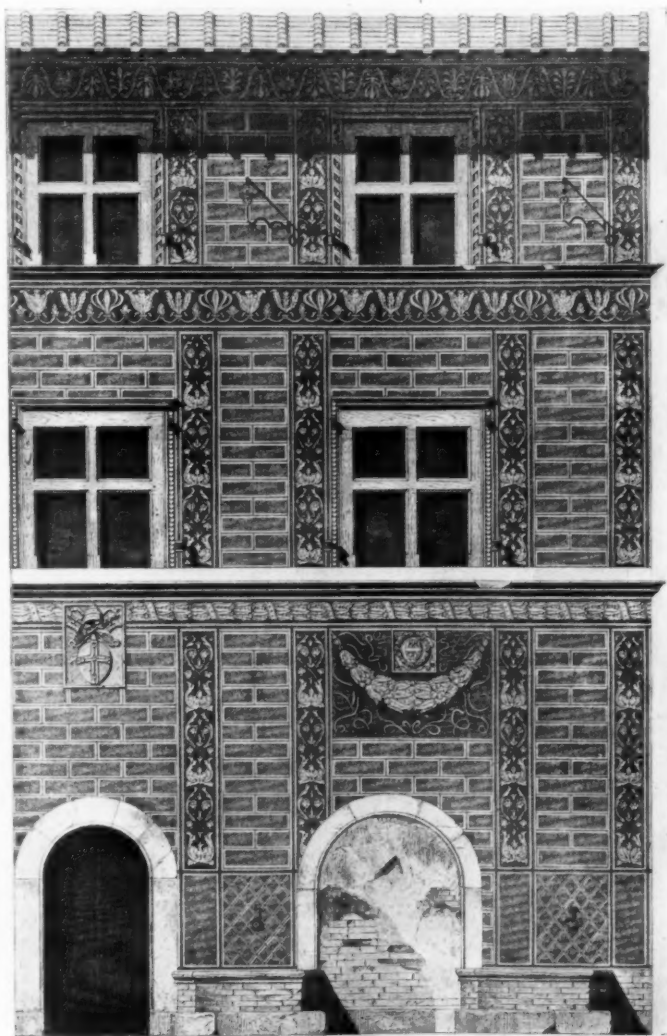
There are certain requirements in the way of workmanship as well which must be fulfilled. Authorities differ on many points of execution in this medium, but there is apparently a unanimity of opinion in regard to the necessity for having a proper sort of surface upon which to apply *sgraffito*. Most important of all is that the surface shall be dry and healthy, free from saline properties. If the walls are damp, external applications of silicate washes, or a coating of stucco, will be found effective.

Given an ordinary brick or stone wall, there should first be applied a priming coat of common plaster, $\frac{5}{8}$ to $\frac{3}{4}$ inches in thickness. A 1:3 mix is considered good for this priming coat, which should be applied several days before the ones used for decorative purposes are needed. It must be thoroughly tapped and sounded to insure its being firm, and it is essential to provide a good key for the second coat.

The second coat may consist of one part Portland cement to one part sifted silver sand and one part distemper. Portland cement used for this purpose must not be fresh from the kilns, as in such new material shrinkage is likely to occur, which will cause cracks. It is well to use a little lime, also, in this coat, to retard the setting, which would otherwise occur in a few hours, and would not permit time for scratching. Plaster applied for this purpose without lime shows a tendency to develop hair cracks, as does plaster of Paris, which also sets very rapidly. There are workers in this medium, however, who have achieved very successful results in the use of cement alone. This color coat may be as thin as $\frac{1}{4}$ to $\frac{1}{8}$ inches and must be very perfectly applied.

The third, and last, coat should be applied as soon as the second is ready to receive it. As soon as it is floated on and troweled over the work of transferring the drawing and scratching on the decoration must be undertaken and carried out as rapidly as possible, before the plaster has time to set.

A silicate binder in the top and second coats is of great value in keeping the plaster soft—sometimes for as long as eight days. This gives an opportunity for more careful workmanship in execution than would ordinarily be possible. In Italy lime was used to the exclusion of cement. This lime, however, was seasoned underground for a year after slaking, with the result that plaster made from it would remain soft for several days, and when it did set was as hard as rock. It has been said that a plaster made from a natural unity of materials, not forced into a connection, will grow in time into a solid mineral wall. The top coat should be merely a "skim," and can be applied with a large brush.



PALAZZO PICCOLOMINI DEL MONTE, PIENZA, ITALY

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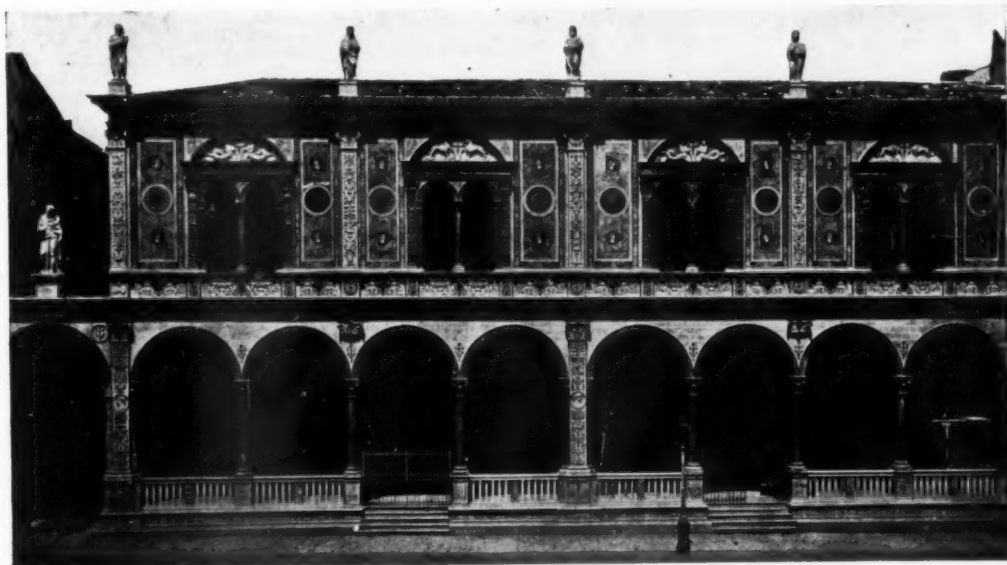
DETAIL OF FAÇADE OF A HOUSE IN VERONA, ITALY

Full size cartoons of the designs to be used are transferred to this top coat, which is usually light in color, as soon as it is applied. The method used is as follows:

The cartoons are drawn, full size, on heavy paper, and the lines pricked through with a pin or a tracing wheel. The reverse side should then be sandpapered, to keep the perforations open when the cartoons are hung against the fresh plaster. When adjusted on the surface to be decorated, the lines are transferred thereto by "pouncing" through with a muslin bag filled with powdered charcoal.

Very often this top coat is applied in its natural silver gray state, or it may be tinted in harmony with the color coat. It is usually kept light, however.

Years of experience have shown that earth pigments give the most satisfactory results in plastic work. The Italians and Spaniards of Renaissance times, who excelled in *sgraffito* and *fresco buono*, used such pigments, knowing that artificial colors, or those secured by chemical reactions, are variable and will not last in the open air and the sunlight.



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The colors preferable for this work, and, in a sense, sanctioned by the best practice, are the ochres and umbers, Turkey red, Indian red, and lime-blue, all of which can be relied upon to be permanent. For a black color coat, or for giving depth to other colors, a charcoal of burned straw or paper is good. Oxide of manganese is also used for black, while any variety of other colors can be obtained by mixing the earth colors mentioned above. Ochre and lime-blue can be used for green, for example, and a very little ochre in lime-blue will regulate its violet

sgraffito it must be borne in mind that this is a flat decoration and needs simple architectural surroundings which allow maximum wall space for decoration. Only enough stone or other trimming should be used to bind the decoration.

It must be conceded that *sgraffito* has certain distinct and unique points of merit, and it could be used to advantage in furthering many of the purposes of modern architectural endeavor. Russell Sturgis, in "The Artist's Way of Working," says: "In good times of architectural art, when straight-



ON THE PIAZZA S. CROCE, FLORENCE, ITALY

tendency. Marble dust has been used to good advantage in plastic color work, and brick dust also, although the latter is said not to be as satisfactory, since it is absorbent and fades eventually.

It will readily be understood that there are certain limitations to the scope of *sgraffito*; the color scheme is limited, the surfaces are flat, or very nearly so, and the materials harden quickly. On the other hand, recognizing these limitations and accepting them, the architect can assuredly find a place in the decorative scheme of things for this practical and beautiful type of ornamentation. In dealing with

forward methods of building were matters of course, these plastic materials were accepted as a covering, nothing else, and were allowed their full share in the work."

There has been a tendency in recent years to introduce more color in exterior architecture. There could be no better medium than *sgraffito* for this purpose, since it is lasting and durable, and lends itself readily to broad architectural surfaces. *Fresco buono* is an excellent medium for an artist's understanding of the science of his materials, but it is not so well fitted for exterior work, and will



ORIGINAL DESIGNS FOR SGRAFFITO DECORATIONS BY MAXIMILIAN F. FRIEDERANG

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not stand up well under exposure to our climatic conditions. It is only with plastic decoration that any wide variation in color effects can be obtained.

In the city house, which in so many respects has followed Renaissance types, and in so many of its phases closely resembles the Florentine Palazzo, it would seem that there might be an interesting development of *sgraffito*, after the fashion in which it was originally used. *Sgraffito* might also play an important part in beautifying vestibules, halls, loggias, vaulted ceilings, patios, courts, many of which are now left bare and desolate.

The Courage of France

When the biggest war in the world's history was launched by the German military machine, to quote the *Improvement Bulletin*, France had embarked upon the preliminaries of one of the greatest engineering feats ever attempted.

On the shores of the Mediterranean is the busy city of Marseilles. It lies near the mouth of the Rhone river, a great inland waterway. In order to dock at Marseilles river barges making the Rhone trip were compelled to venture out into the open Mediterranean, always a dangerous feat for river craft of light draft.

The French had, as far back as Napoleon's day, planned to connect, at some period, the outlet of the Rhone with parallel canals, running to Marseilles. The great engineering obstacle to this plan lay in

the ring of hills which fringe the city of Marseilles.

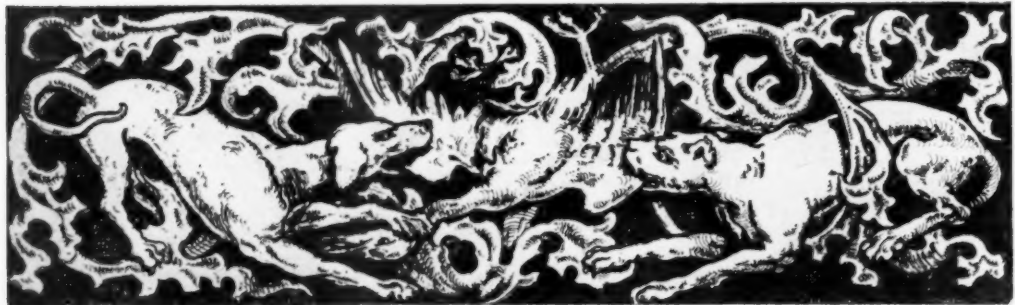
Shortly before the war began, French engineers planned to construct not only the canal, including a canal tunnel through the hills, but an elaborate system of breakwaters and the dredging of a basin for shipping protection at Marseilles.

The city of Marseilles did not permit the stress of war to interfere with this project. Marseilles kept on with the work. The canal tunnel is one of the most remarkable in the world. It is not only seven miles long, but it is the widest tunnel in the world. As the war advanced and the call for man-power increased, Marseilles found it necessary to employ German prisoners upon the work.

It is a startling commentary upon the German viewpoint that the prisoners so employed accepted the situation with equanimity, remarking that it was well to finish the work, because it would be all ready for Germany when she came to seize it and make it efficient.

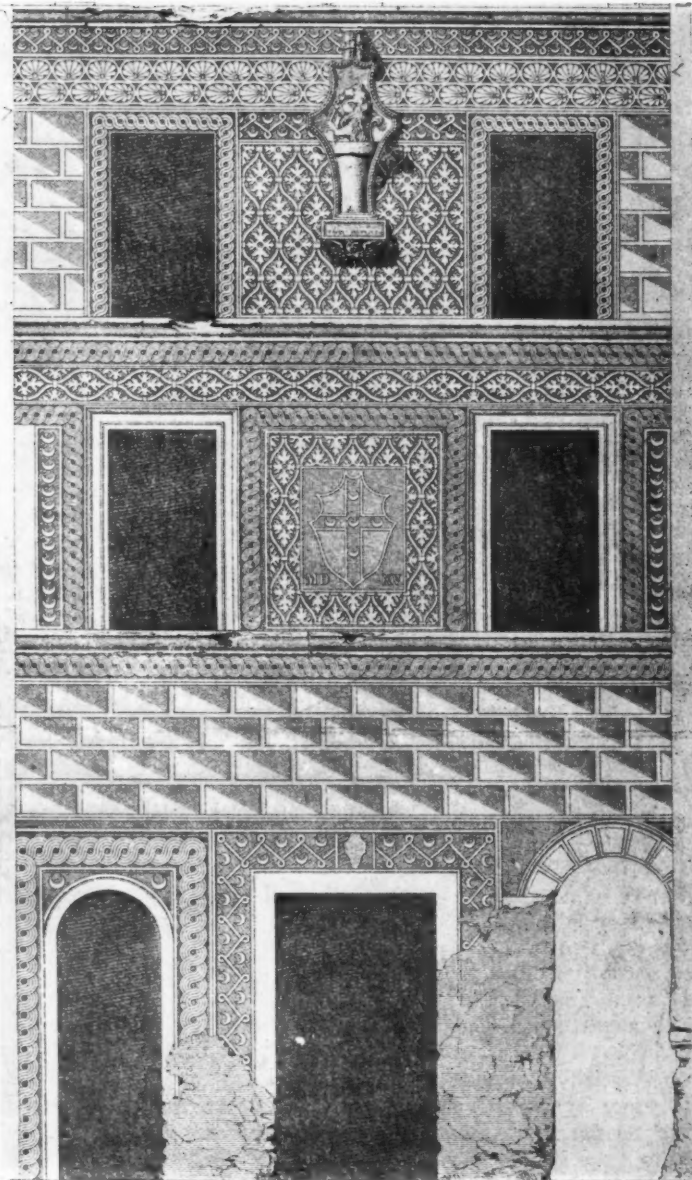
The tunnel has been driven and is ready. The channel will not be dug until after the war.

The remarkable fact, however, is that a nation, so torn and desolated as France, could, in her hour of supreme effort, find time and enterprise to continue this great engineering work. If France, seeing the necessity of such work, could carry it through, how much more important is it that America, with her great man-power, should continue necessary public construction during the period of the war?



ORIGINAL DESIGN FOR SGRAFFITO DECORATION BY MAXIMILIAN F. FRIEDERANG

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FAÇADE OF A HOUSE IN PIENZA, ITALY
BERNARDO ROSSELLINO & FRANCESCO DI GEORGIO, ARCHITECTS

Specification Clauses

By FRANCIS W. GRANT

II—Fire Insurance

IN the absence of a clause in the contract shifting the burden to the owner, a building contract that is entire imposes obligations on the contractor which are not impaired or lessened to any extent by loss or damage the structure may sustain through fire or other casualty, natural or artificial, prior to its acceptance by the owner.

Partial payments made on an entire contract, provided they are made periodically, in estimated approximations only, and not in predetermined or accurately computed amounts as certain defined stages of the work are completed, and are not itemized, and do not carry with them an acceptance of the work accomplished, do not affect the entirety of the contract so as to relieve the contractor of his obligation to finish what he has covenanted to do. He is still bound, regardless of the burden some unforeseen calamity has created for him.

One of the numerous court decisions covering this point expresses the law clearly in the following language: "The contractor having undertaken to do an entire work for a specific sum, can recover nothing unless the work be done, or it can be shown that it was the owner's fault that the work was incomplete, or that there is something to justify the conclusion that the parties have entered into a subsequent agreement."

Payments made on account of the contract, plus the sums retained and the value of the unworked material and the apparatus on the premises, approximately represent what the contractor stands to lose by fire or similar casualty in the case of an entire contract. If he fails to insure against this loss he is certainly most unwise. The owner is insured by having let an entire contract instead of a severable one, and to a contractor who is financially responsible, backed in his enterprise by bondsmen who are also financially responsible. The owner's insurance continues valid so long as his side of the contractual relation remains unaltered.

To hold a contractor to a full performance regardless of destructive agencies operating against him, he must continue to be the sole owner of that which is destroyed, the replacement of which is necessary to complete performance, and he must be solely accountable for it. The untimely taking of possession and the making of payments as though each payment bought and paid for a portion of the building renders the contractor thereafter unac-

countable, and the making of separate contracts for the several branches of work indicates the intention of holding no contractor accountable.

Generally the contract will be held to be not entire and the owner not in a position to demand completion in case of destruction if:

- (a) The contractor does not have undisputed possession and control during building operations.
- (b) The owner furnished a part or the whole of the materials to the contractor free of cost.
- (c) The work is divided among several contractors.
- (d) The payments represent the computed value of certain divisions of the work and are payable when those are completed.
- (e) The accident or casualty causing the loss can be attributed to negligence, or want of reasonable care, skill or expense of the owner.
- (f) The owner asserts ownership or control by acts amounting to a waiver of the contractor's obligation to complete the building.
- (g) The owner accepts insurance benefits in case of loss.

When the contract is not entire, or when undisputed control of the premises and work cannot be given to the contractor, both parties to the contract have insurable interests. Specification writers differ as to which should effect this insurance, while many ignore the matter, leaving each party to look after his own risk. The writer inclines to the plan whereby the contractor is required to attend to all of the fire insurance under specific contract conditions protecting the owner's interests. This seems a reasonable procedure even in the case of alterations and repairs when a portion of the building is necessarily occupied by the owner or his tenants, thus leaving the owner obligated to the performance of one function only—paying the bill—the contractor taking care of everything else and being paid for so doing in the lump sum consideration.

A clause covering the subject of fire insurance substantially as suggested below is recommended in all specifications for work to be performed under contracts that are not entire. It may also be used in specifications for entire contracts without prejudice to any person's rights. Making it a part of an entire contract, though not essential to the owner's interest, may serve as a useful reminder

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to the contractor of his risk and on that account be justifiable.

FIRE INSURANCE

56. The contractor shall effect and maintain fire insurance upon the structure contemplated by this contract and upon all materials therein and thereat, intended for use in the performance of the contract. Said insurance shall be in a sum amply sufficient to fully reimburse the owner, in case of loss by fire, to the amount advanced the contractor as partial payments on the contract and shall be made adjustable and payable on that basis. Insurance policies shall be delivered to the architect and shall be, in form and adequacy, approved by him. Such approval by the architect shall be a condition precedent to the issuance or payment of certificates to the contractor. It is understood and agreed that in case of loss by fire and after adjudication of such loss as hereinabove provided, this contract shall continue in full force and effect as though no such loss had occurred and no partial payments to the contractor had been made.

Article 21 of the Standard Documents of the American Institute of Architects, Second Edition, 1915 (Appendix A), places the expense and the entire burden of responsibility for the placing and maintaining of fire insurance, and the distribution of sums recovered thereunder, on the owner. Under the elaborate system contemplated by this clause the owner becomes the trustee of funds recovered on insurance policies in case of loss and as such must audit the claim of the contractor and the claims of his workmen who may have lost their tools and of his subcontractors whose materials may be involved. He may, on demand of any party claiming an interest in the loss, be required to give bonds for the faithful performance of his duties as such trustee and auditor. He must under no circumstances permit the funds passing through his hands as trustee to come in contact with his own money. The owner must be careful to cover the contractor's interest adequately, and at his own expense; or the contractor may do it and charge the expense to the owner. Failure to cover adequately the interest of the contractor or other interested party would seem to render the owner liable for such amount in excess of insurance money recovered.

As an example of expert document writing giving the subcontracting crafts the maximum of service and protection, the Institute's insurance clause is remarkably good and reflects great credit on the legal talent employed in its preparation. The injection that it contemplates of the subcontractor's affairs into the main contract and the burden of responsibility it imposes on the owner, contrary to all precedent and entirely without compensating advantage, is unreasonable and unjust. The owner has a right to expect his architect to consider his interests first in the preparation of the protective clauses of the contract and not secondary to those of the contractor and the various subcontractors.

There are advanced as arguments in favor of the A. I. A. fire insurance clause the following claims: First, that it is suitable for use in both entire and severable contracts and is therefore standard; second, there is alleged to be an embarrassment incident to the carrying of insurance by several contractors on one job; third, that it is now and hence, *per se*, modern; fourth, it has worked out in practice and has not been complained of to its authors; fifth, that an agreement by a corporation to pay losses occasioned by fire is more reliable than an agreement by a corporation to pay losses occasioned by a contractor's default.

It is submitted in response that the first of these claims is also true of almost any fire insurance clause and is particularly true of the clause above suggested. The second claim, if true, interests the contractors and not the architect's client. The third is obviously illogical. The fourth is not convincing. The fifth is the best claim advanced and reflects a popular prejudice against bonding companies. The writer does not, however, accept it as valid. A bond is perfectly reliable when in proper form and with responsible surety, and it is a simple matter for the architect to see that those conditions obtain.

It should be said in this connection that the authors of the A. I. A. insurance clause have conceded one point and that future editions of the code will probably not require the owner to carry insurance on the tools and appliances of the contractor and his workmen.

Stained Glass of the XIII Century

The following description of the art of stained glass in the thirteenth century, taken in part from a recent issue of the *Bulletin* of the Metropolitan Museum of Art, is of particular interest at this time.

With Rheims and its wonderful glass now but a tragic ruin, and Amiens and Noyon threatened with a similar fate, the stained glass of the most wonderfully perfect development of all times is rapidly passing and will soon be, except for fragments in museum collections, but a memory.

The *Bulletin* states:

In the thirteenth century the art of the glass-maker reached its zenith, and at Chartres, Sens, and Bourges it is the windows of this time which command admiration as artistic achievements of the noblest order. Stained glass of the thirteenth century differs from that of later origin both in conception and in technique. In the first place, the component pieces were cut very small and the finished window was really a transparent mosaic held

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together by lead bands; it was often made up of many patterns on a minute scale, and always treated from the decorative and not the pictorial point of view. Second, the glass used was almost all colored in the melting pot by metallic oxides, while in a fluid state, and for this reason it is referred to as "pot metal," which means that the color is in the glass, not painted upon it. Brownish black paint at first was the only exception to the rule, and was used for the necessary drawing and for details of ornament. It was produced by using finely powdered colored glass as a pigment, subjecting it to the heat of the kiln, and thus melting the paint and affixing it to the sheet. In the early period the drawing was kept subordinate to the mosaic of the design, and the painter played only a secondary part to the glazier in the construction of a window; but as time went on and the demand for pictorial treatment grew greater, the painter rose in importance and the window became more and more nearly a picture. The medallion of the Pascal Lamb shows the first phase of this tendency at work. The deep blue background of the Coronation of the Virgin has given way to a pattern of paint on a clear ground, a method called *grisaille* and sometimes used to fill whole windows where colored glass would have allowed too little light to penetrate.

It was shortly after the period of the *quatrefoils* that another method of painting glass was discovered, and a yellow stain was added to the palette of the glass-maker. The pot metal yellows of the thirteenth century were dark and with a ruddy tinge, but in the next hundred years it was found that a clear, bright, golden hue could be procured by painting the surface with a silver solution. The color when fired was incorporated with the glass, but rested very thinly on the surface and so interfered little with the passage of light. It came to be the distinguishing feature of all later glass, and in this connection it is interesting to note that glass so painted stands the test of time better than any other, as the yellow stain seems to protect the surface from corrosion.

The art of stained glass, as well as the kindred art of mosaic, is, of course, judged by very different standards from those set up for picture-painting. When the later glass workers tried to rival the painters on canvas, it was to the detriment of a great art, and with a complete mastery of pictorial methods, stained glass sank to an insignificant position. The glaziers of the thirteenth century knew their limitations and confined themselves to subjects that could be expressed in two dimensions only, without realistic modeling and relying largely on the use of color for dramatic effect.

High School Building, Park Boulevard, Camden, N. J.

PAUL A. DAVIS, 3RD, *Architect*

This recent and important addition to the educational buildings in Camden, N. J., is located on the edge of Forest Hill Park, a public park of eighty acres lying in large part upon a bluff extending along Cooper River. The building fronts upon the boulevard, which is the main approach to the park and occupies the highest point of Camden within the city.

The treatment of the exterior architecture, as shown in the illustration pages of this issue, is adapted from the domestic architecture of England during the Tudor period.

The building has been planned as a composite type school, with academic, scientific and technical curricula for boys and girls. In nearly all cases a class unit of thirty pupils has been provided for. Forty-six classes may be in recitation or laboratory simultaneously without including those who may be using the library, study hall or auditorium. On this basis, it is possible for 1380 pupils to be in recitation or laboratory at one time.

The auditorium occupies the central portion of the building on the second or main floor immediately in front of the main entrance. The seating capacity is about 1200. The gallery is supported by cantilever trusses so that there are no columns to break the view from any part of the main floor.

The gymnasium is 78 x 48 feet and has a running track gallery reached from the second floor. The locker rooms immediately adjoining it provide space for 1200 lockers equally divided between boys and girls.

The library, 69 x 27 feet, has shelf space for 5000 volumes and has in addition, glass enclosed shelves and cabinets for educational exhibits.

The science laboratories are five in number. There is also a science lecture and demonstration room. In the department of manual training, the shops include two wood shops and machine forge shops and foundry.

The building has no basement. The first floor is at the surface level and the only part of the building below that level is that part of the rear used for the boiler and engine rooms.

The following items with respect to cost, etc., will be found of interest:

Number of class rooms of all kinds, 46.

Cost of building and furnishing, exclusive of ground, \$506,990.88.

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National Housing After the War

THE recently issued report of the Royal Commission on Housing in Scotland states that the new housing accommodations that will be required after the war will amount to no less than 240,000 houses. The reasons set forth in the report that lead to this conclusion appear to be based on the most careful investigation of conditions. If in Scotland alone a quarter of a million of new houses will be required, an estimate of at least 750,000 in all of Great Britain is a conservative one.

Adding to this total the needs of Continental Europe, there undoubtedly will arise a quick demand, when peace comes, for not less than a million and a half of new dwellings. This need will not develop gradually, particularly as to France and Belgium. It will be present as soon as peace is declared. There will be need for the quickest construction of shelters for the many homeless for whom their respective governments are now caring as best they can.

From where will all the enormous quantities of necessary materials come? Does anyone believe that Europe can supply them all? Will not this country be called upon then for aid, as it is being called on now for other vitally necessary support? Will we have to forego our own building that the

homeless in France and Belgium may have a roof over them, in just the same way that we are now asked to economize in every possible way? What is regarded as a patriotic duty in time of war will not be so ungrudgingly performed in time of peace.

Should we not be permitted to make ready to meet a situation that every thinking man knows will arise?

In the setting about of restriction of our present building operations and the curtailment of materials, should not those in charge of these matters give some look ahead to a condition that will undoubtedly exist when this war is over?

Vocational Rehabilitation

IT is gratifying to note that the Government has taken up, in an official way, measures that will result in the rehabilitation of our soldiers and sailors, maimed or otherwise disqualified by active service, from pursuing their usual vocations. The bill now pending in the United States Senate places the entire responsibility for this paternal attitude of the Government toward its crippled men on the Federal Board for Vocational Education. The measure should reach early passage and become a law.

There are many good reasons for urging this, principally that the Government may be saved the enormous expense of the care of a large number of men. There is the further good reason that it will, in many instances, save from pauperization those who, deprived of the ability to pursue former lines of work, will receive a thorough education in others possible even in their crippled states. Thus will the men, who have earned the right of care by a nation for which they have sacrificed so much, be made self-supporting, self-respecting citizens and valuable members of their respective communities.

Specialization in War Time

DURING those quiet periods before the war, many architects gave patient study to specific types of buildings, and as a result of this concentration there have been developed the highest forms of structures to meet certain needs of occupancy.

With our entry into the war there was shown the need on the part of the Government for so many different classes of buildings that the special knowledge to meet certain imperative things was at once required. The architect who had worked as a specialist became at once in great demand, and many large offices have now been practically turned over to work on Government problems.

In addition to the great and absorbing questions

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of industrial housing, there are many complex types of buildings, the planning of which present problems never before necessary to consider hurriedly. May of them might be *projets* for student competition.

It is interesting to glance through a current issue of *THE AMERICAN ARCHITECT* and to make note of these many types of buildings.

Aside from the munition factories, each presenting some special problems, principally as to the routing or handling of materials, from the lightest weight to the heaviest, we have a long list of buildings, each designed for a specific purpose. Coast Defense Stations are to be located at different points; colossal air schools and hangars must be built. There are hospitals, Red Cross and Y. M. C. A. buildings, in large numbers and varying sizes to meet the needs of a single regiment or the requirements of a grand division. Submarine bases, large railway terminals and storehouses must be provided. Nor can these take the slow course of peace times. Speed, and more speed, is the cry. In each instance construction records are made, but before this friendly competition can be commenced, the builders must be fully equipped with plans and specifications. These must be right and they must be ready quickly. Truly, the specialist in designing and planning is a busy architect these days.

Governmental Control of Labor

JUST at this time there are no accurate means of ascertaining what the real attitude of organized labor is, or will be, in the matter of governmental control of supply and demand.

The establishment, in the Department of Labor, of the United States Employment Service, and the steps taken for Government control of labor, are movements of a most radical nature, all warranted

by our war preparations. The discussion of these acts of the Government by labor leaders may not now be indulged in. It is reasonably sure, however, that in many of its phases the present attitude of the Government may later be criticized roundly by a certain group of men, who in normal times may be relied on to lose no opportunity for public expression of criticism and divergent sentiment.

There is strong probability that many conditions heretofore existing in the field of labor, which have not been regarded with general favor, will be corrected and that on our return to peace there will not also be a return to earlier ways. We are learning many lessons as to Government control of industries that were previously dominated by the interests directly affected. These lessons are of a most useful nature and their application later will serve to present economic problems of unusual importance.

Housing Problems in England

THE United States Consul at Birmingham, England, has advised the State Department that the medical officer of Birmingham estimates that 2000 houses a year should be erected to meet the normal demand caused by the growth of population and at least 5000 a year for the next twenty years. Large numbers of workers, both men and women, are forced to reside outside the city because of the dearth of housing accommodation. The latest estimate puts the house shortage at 14,000.

The cost of building has increased to such an extent that private enterprise will not be able to supply the demand without financial assistance. It has been suggested that this aid might be given by the municipality purchasing suitable land, laying it out, and then leasing it and advancing to the builder funds at a lower rate of interest than he would be able to secure in the open market.

Frank Miles Day

An Appreciation—By Dr. Warren Powers Laird

THE sudden death of Frank Miles Day, under an attack of apoplexy, has removed from the profession of architecture one of its most distinguished members and ended a career of singular usefulness, for Mr. Day combined to a rare degree the qualities of artist and executive, and his influence was potent in the advancement of both the quality of American architecture and the standards of professional practice under which it is wrought into being. To few men is it given thus to aid in moulding both the methods and ideals of a great profession.

When Mr. Day began practice in the late eighties, architecture was in process of being discovered by the American people as a vital, creative art. The public was awakening to an interest in its possibilities through the work of men inspired by foreign travel and study, or their pupils. These pioneers of the new age were men of vigor and originality, but the work of many of them was unhappily marred by an unrestrained individualism. This was a natural reaction from the unimaginative and commonplace character of prevailing architecture, but its excess of freedom developed eccentricity and degenerated, in the hands of less able imitators, into a confusion worse confounded with ignorant vulgarity. In no city was this more evident than in Philadelphia, whose character of staid repression had been swept aside in the movement of revolt, which, starting in healthy reaction against tradition, steadily descended, in a striving for originality, toward chaos through ignorance of the real meaning of architecture—a declaration of independence followed by anarchy rather than an ordered freedom.

At this moment, as though dramatically timed by Fate, there appeared exactly the force needed to turn this vigorous and fundamentally wholesome impulse into the right channels, a force which gave to Philadelphia an architecture so fine and true that it was destined to have national influence. Frank Miles Day and a little group of contemporaries of similar tastes and training here entered upon active practice—Walter Cope, John Stewardson and Wilson Eyre. Each had the genuine sense of architecture and was possessed of rare artistic gifts, and all had traveled abroad and gained that knowledge of the principles and masterpieces of their art which through its discipline and inspiration guides and stimulates the creative impulse of the true architect.

The work done by these men, some of it in co-operation and all in an atmosphere of mutual sympathy and common ideals, was so good that it arrested attention, so fresh and charming, so true to the spirit of architecture and free from its pedantries, that it won the instant approval of thoughtful and discerning people and was accepted as a right standard of performance in architecture.

To this result Mr. Day's contribution was vital. The consistently high level maintained by the work of his office shows always the influence of his qualities: a fine enthusiasm and love to study, a grasp of the essentials of a problem and insight into the essence of style and character; erudition combined with a facility for finding fresh and novel modes of treatment and, perhaps above all, the critical faculty guided by a supremely true taste.

Mr. Day's services to the profession, through his activities in the American Institute of Architects, have been no less notable. Not only as its president for two terms in 1906 and 1907, but before and since as member of its Board of Directors and of various committees, he has rendered unstinted service, a service guided by high ideals of professional conduct, by a mind clear and logical in its processes, and by a habit of painstaking care and thoroughness. In the course of the year many subjects thus engaged his attention, the last of which, well forwarded at the time of his death, was a treatise upon office administration, which when completed will probably rank as one of the most useful undertakings of the Institute.

A life so rich in usefulness should, and doubtless will later, elicit adequate appreciation and complete biographical treatment; but these notes offer at the moment, although in hasty and imperfect form, a record of impressions of the character and attainment of the man and a summary of outstanding facts regarding his career. A mere enumeration of the latter is noteworthy:

Receiving his preparatory education at the Rittenhouse Academy in Philadelphia, he studied architecture at the University of Pennsylvania, graduating as valedictorian of his class in 1883. For the next three years he continued his professional preparation through travel in England, France and Italy, and study at the Royal Academy and South Kensington Museum, and in the office of Basil Champneys, London. In 1888 he began the practice of architecture in Philadelphia, being for a time

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associated with his brother, H. Kent Day, and of late years with Charles Z. Klauder.

Among the more notable of his works in Philadelphia are Horticultural Hall, the Art Club and the Crozer Building, the Museum at the University of Pennsylvania, done in collaboration with Messrs. Cope and Stewardson and Wilson Eyre; the gymnasium of the University of Pennsylvania, the amphitheatre of the Medico-Chirurgical Hospital and a number of churches and private residences. A series of noteworthy college buildings, constructed in other cities, have come from the hand of his firm; buildings for Wellesley, Yale, Cornell and elsewhere, and particularly for Princeton, whose Holder Hall and University Dining Halls have been called by Ralph Adams Cram "one of the most distinguished architectural creations in America."

Mr. Day performed important advisory services in the conduct of competitions and acted as consulting architect for Johns Hopkins, Yale and New York Universities, Wellesley and Pennsylvania State Colleges and other institutions.

His capacity for public service was often demonstrated by a keen interest in civic and educational affairs. In the early years of his practice he was among those members of the Philadelphia Chapter of the Institute who labored effectively for the enlargement of architectural education at the University of Pennsylvania, was a member of the advisory committee during the "cradle days" of the thriving architectural school which grew out of those labors, and had since been an occasional and

always a happy and effective lecturer to its classes.

Apart from his position in the American Institute of Architects, Mr. Day was a Director of the American Academy in Rome, an Honorary Member of the Royal Institute of British Architects, Corresponding Member of the Imperial Society of Russian Architects, Associate of the National Academy of Design and member of the American Philosophical Society and the National Institute of Arts and Letters. He also held membership in the University Club, Philadelphia, the Yale Club and Century Association, New York.

Scholastic recognition was given to Mr. Day in his baccalaureate degree from the University of Pennsylvania upon graduation in 1883, through the degree of Master of Arts, *honoris causa*, granted in 1916 by Yale University, and in 1918 by the honorary degree of Doctor of Science in Architecture, conferred by the University of Pennsylvania. This act, effected and made known to him before his death, was consummated at the commencement ceremonies four days thereafter, when the diploma and hood were delivered to a friend for presentation to his family, in token of the honor in which he was held by his Alma Mater.

As the Provost well said, in the presence of trustees, faculties and graduating class, standing:

"The noblest and most beautiful models of architectural thought and endeavor instantly rise to mind upon mention of his name, and it also recalls profound and meritorious literary contributions worthy of the highest academic recognition."



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The Sacramento Capitol Extension

AWARDS IN FIRST PRELIMINARY COMPETITION.

(By wire from our Special Correspondent)

San Francisco, June 29.—Eight architects successful in the first stage of competition for Supreme Court and Library building and State office building for Sacramento capitol extension are as follows: William Hewitt, Percy Ash and N. C. Curtis, associated, New York; James Gamble Rogers, New York; Dennison & Hiron, New York; Tracy & Swartwout, New York; Adolph Scherrer, Indianapolis; Weeks & Day, Bliss & Faville and Ward & Blohme, San Francisco. The plans to be submitted in second stage to be in by September 15, 1918, for final decision. Architects receiving first choice in final stage will receive commissions; others to receive \$2,500 each. Jury included Gov. William D. Stephens, Supreme Court Justice F. M. Angellotti, Marshall Demotte, chairman of State Board of Control; Wm. Mitchell Kendall, Henry Bacon, Sylvain Schnaittacher. George B. McDougall, State Architect, acted in capacity of adviser. Amount available for construction, \$2,500,000. Work will not be commenced until after conclusion of war.

How the United States Employment Service is Mobilizing Workers

Getting the job and the man together is the chief function of the United States Employment Service, recently established in the Department of Labor under the direction of John B. Densmore, formerly solicitor of the department, as director general. State, municipal and county employment offices have been operated in many States during recent years to take care of demands more or less local, but in the present war emergency, when industries are calling for more labor than can be supplied locally, it is imperative that employment activities on a huge scale should be brought under one coordinating authority in order that the needs of industry may be served adequately and the prosecution of the war forwarded with all possible speed and efficiency. To work in harmony with existing agencies in the various States and to exercise directing authority, as well as to afford a medium through which all demands for labor and requests for positions may be cleared, is the purpose for which the United States Employment Service was organized.

Under its mobilizing and distributing plan the State services are becoming component parts of a national system of labor exchanges, known as the Federal Employment Service under the central supervision of the Department of Labor, but State

services joining the federated system do not lose their identity. In the States thus co-operating, employment directors, subject to general supervision by the director general, through the district superintendents, have been appointed, being generally designated upon recommendation of the council of national defense of each State and after approval by organized capital and labor. In many States the operations of the combined State and United States employment services are directed by a Federal director of employment, appointed by the Department of Labor, with an assistant in management known as the associate director of employment, who is also designated upon the recommendation of the council of national defense of the State.

Proposed Vocational Rehabilitation Act

A bill to provide for the vocational rehabilitation and return to civil employment of disabled soldiers and sailors discharged from our military and naval forces was introduced in the Senate of the United States on April 8, 1918.

The new bill places entire responsibility for the vocational re-education and placement of disabled members of the forces with the Federal Board for Vocational Education and provides that every person who is disabled under circumstances entitling him, after discharge from the military or naval forces, to compensation under Article III of the War Risk Insurance Act, as amended, and who in the opinion of the Federal Board for Vocational Education is unable to resume his former occupation or to enter some other suitable occupation, and who may be vocationally rehabilitated, shall either be ordered by the Bureau of War Risk Insurance to follow such course of vocational rehabilitation as the Federal Board for Vocational Education shall provide, or shall be retained in the forces and detailed to the control of the Federal board until such course of training has been satisfactorily completed. Every person so designated shall receive as monthly compensation a sum equal to the amount of his pay for the last month of active service, or to the amount to which he would be entitled under the War Risk Insurance Act, in the same manner as if he were an enlisted man. Failure to follow the prescribed course of training will result in the withholding by the Bureau of War Risk Insurance, in its discretion, of all or any part of the monthly compensation due him.

The bill proposes to give the Federal Board for Vocational Education power to provide such facilities, instructors and courses of vocational rehabilitation as it deems necessary for the proper training

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of persons concerned, power to provide for the placement of rehabilitated persons, and to use in its placement work, with the approval of the Secretary of Labor, the facilities of the Department of Labor, in so far as it may be practicable. The Federal board is also authorized to make studies, investigations and reports regarding the vocational rehabilitation of disabled persons and their placement in suitable occupations, and to co-operate with such other public or private agencies as it may deem advisable in the performance of the duties imposed upon it by the proposed act.

A problem of more than usual interest to architects, particularly those who have specialized in school buildings, will be the evolution of a structure that will fulfill the requirements of a building wherein the re-education of the adults may successfully be undertaken.

The National Sculpture Society Objects to Design of Medals of Honor

The following letter, addressed to Secretary Baker by Paul Bartlett, president of the National Sculpture Society, is a very proper and dignified protest against the design of the new Medal of Honor which the Government proposes to award our soldiers in the field:

Dear Mr. Secretary:

The National Sculpture Society has instructed me to express to you its sincere regret concerning the commercial designs which are being used for the Medals of Honor and War Merit Crosses that are to be given to our soldiers abroad for heroic deeds in battle.

When we first heard of the proposed medals and crosses we supposed that our best medalists, all of whom are members of the National Society, would naturally be, in due time, asked to make designs, and we are surprised and disappointed that this has not been done.

When one considers how much those medals mean to those upon whom they will be conferred, their national character and future historical value, and the fact that they will also be awarded to heroes in the Allied armies and be worn side by side with the medals and decorations of other nationalities, some of which are pure masterpieces of art, it becomes apparent that the greatest care should be used in the choice of the designs and every effort made to secure for this purpose the best available talent in this country. We still trust, Mr. Secretary, that this can be done; that the first medals may be only used as a matter of expediency,

and that after you have given this question due consideration you will give American artists the opportunity to exercise their talents and strive to create some medals and crosses worthy of this great country, worthy of our great cause, and worthy of the heroes who will wear them and take pride in them, not only for their symbol, but also for their artistic beauty.

May I add that in France all work of this kind which has a far-reaching influence at home as well as abroad and involves the national artistic reputation of the country is treated with real love and reverence and executed and supervised by her greatest artists, the official medalist of the mint being himself a member of the Institute of France, and I can assure you, Mr. Secretary, that if you give our artists a chance you will find that they have the same love and reverence for their work, coupled with a keen sense of patriotism.

Yours very truly,

(Signed) PAUL W. BARTLETT,
President.

Technical Men Unite for War Work

Representing an effort to co-operate effectively and vigorously for war work, an important joint war committee has been formed by representatives of technical societies centered in Chicago. The movement was started by the Military Committee of the Western Society of Engineers, and, at the invitation of that committee, several meetings have been held at the Chicago Engineers' Club. As the result, the "War Committee, Technical Societies of Chicago," to quote the official name, was organized June 4, 1918.

The purpose of this organization is "to enable the technical societies of the Chicago zone to call into play the efforts of the members of the various societies herein represented as occasion may arise, and to co-ordinate their activities in the most effectual manner to help win the war." It is not proposed to attempt any novel "stunts," but rather to place at the disposal of the United States Government, and other authorized agencies, the combined strength and resources of the Chicago technical societies for war work, as need may arise.

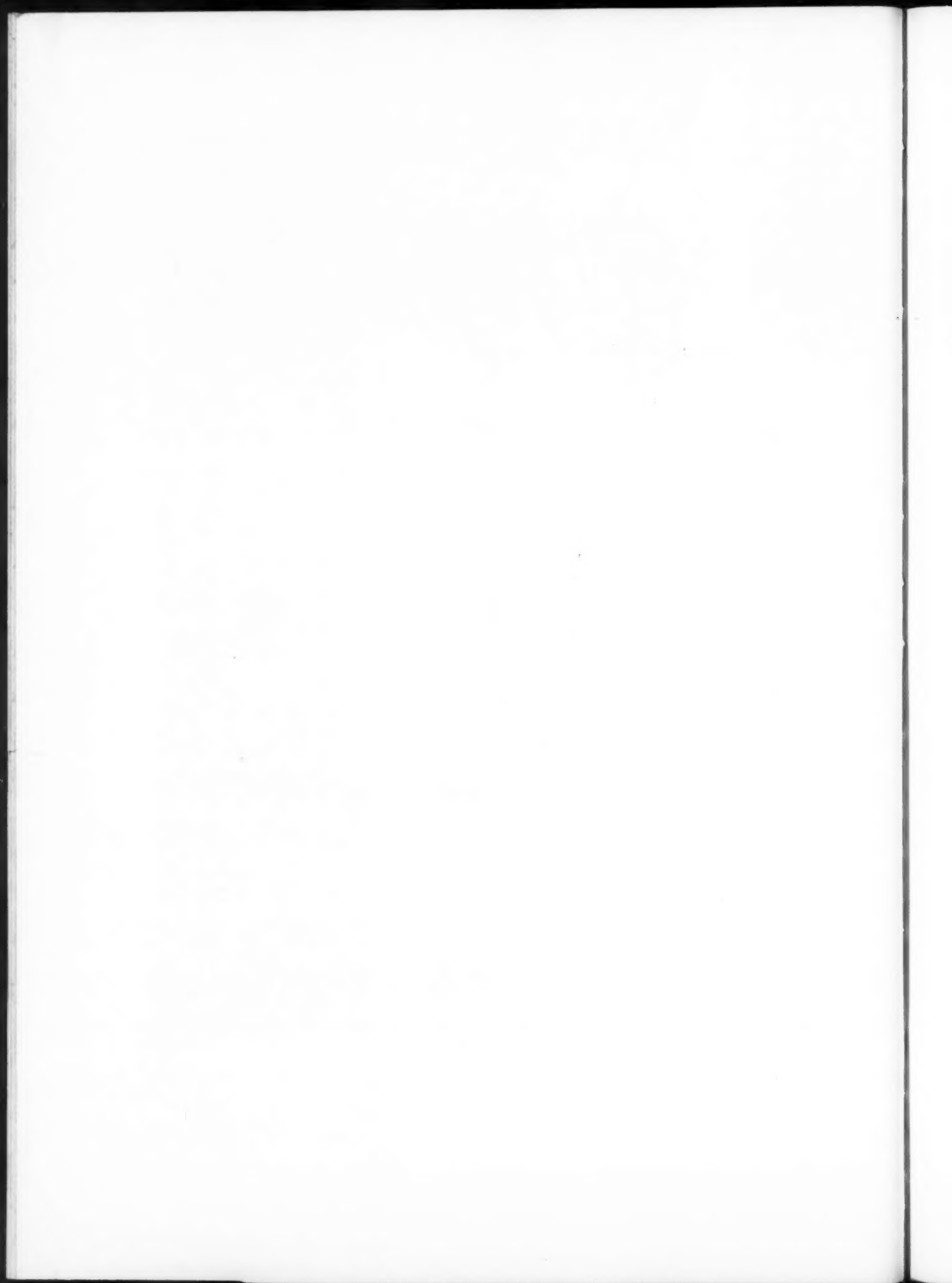
The following member societies are co-operating in the new War Committee: Western Society of Engineers; Structural Engineers Association of Illinois; Society of Industrial Engineers; Illinois Society of Engineers; Illinois Society of Architects; The American Railway Engineering Association; The Swedish Engineers' Society of Chicago; Illinois Chapter, American Institute of Architects; Chicago Section, American Society of Mechanical Engi-



PLATE 1

CAMDEN HIGH SCHOOL, CAMDEN, N. J.

PAUL A. DAVIS, 3RD, ARCHITECT



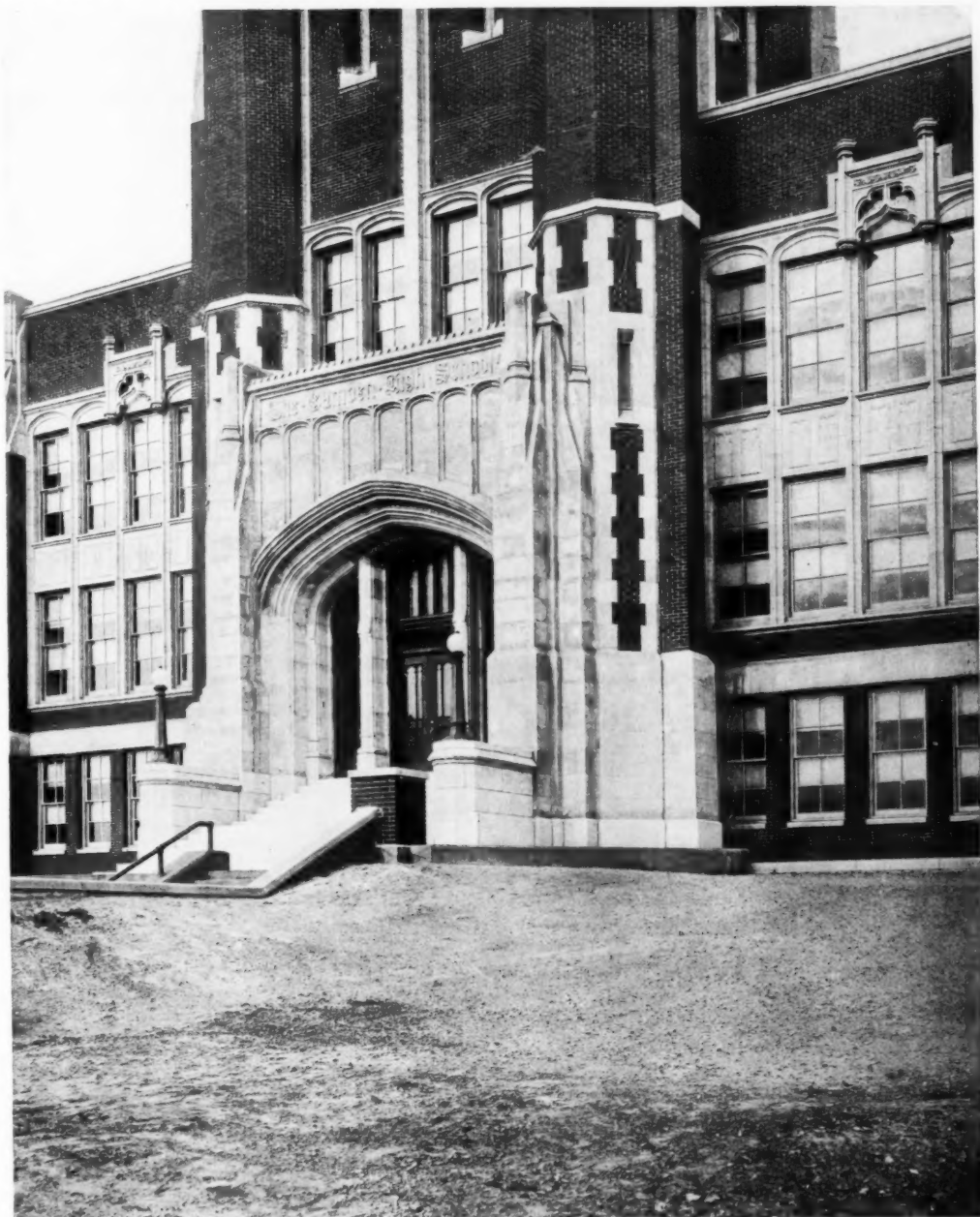
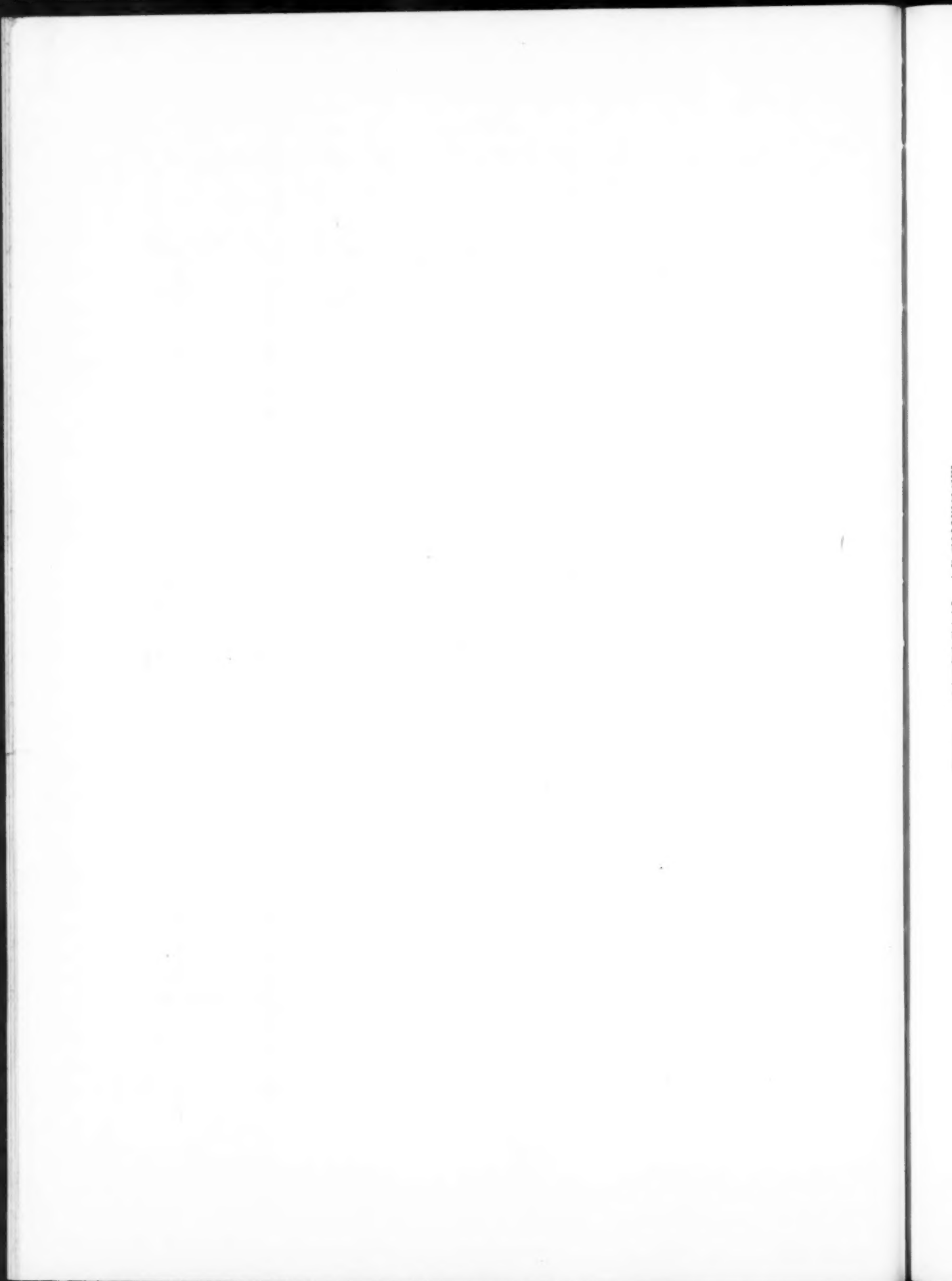


PLATE 2

CAMDEN HIGH SCHOOL, CAMDEN, N. J.

PAUL A. DAVIS, 3RD, ARCHITECT



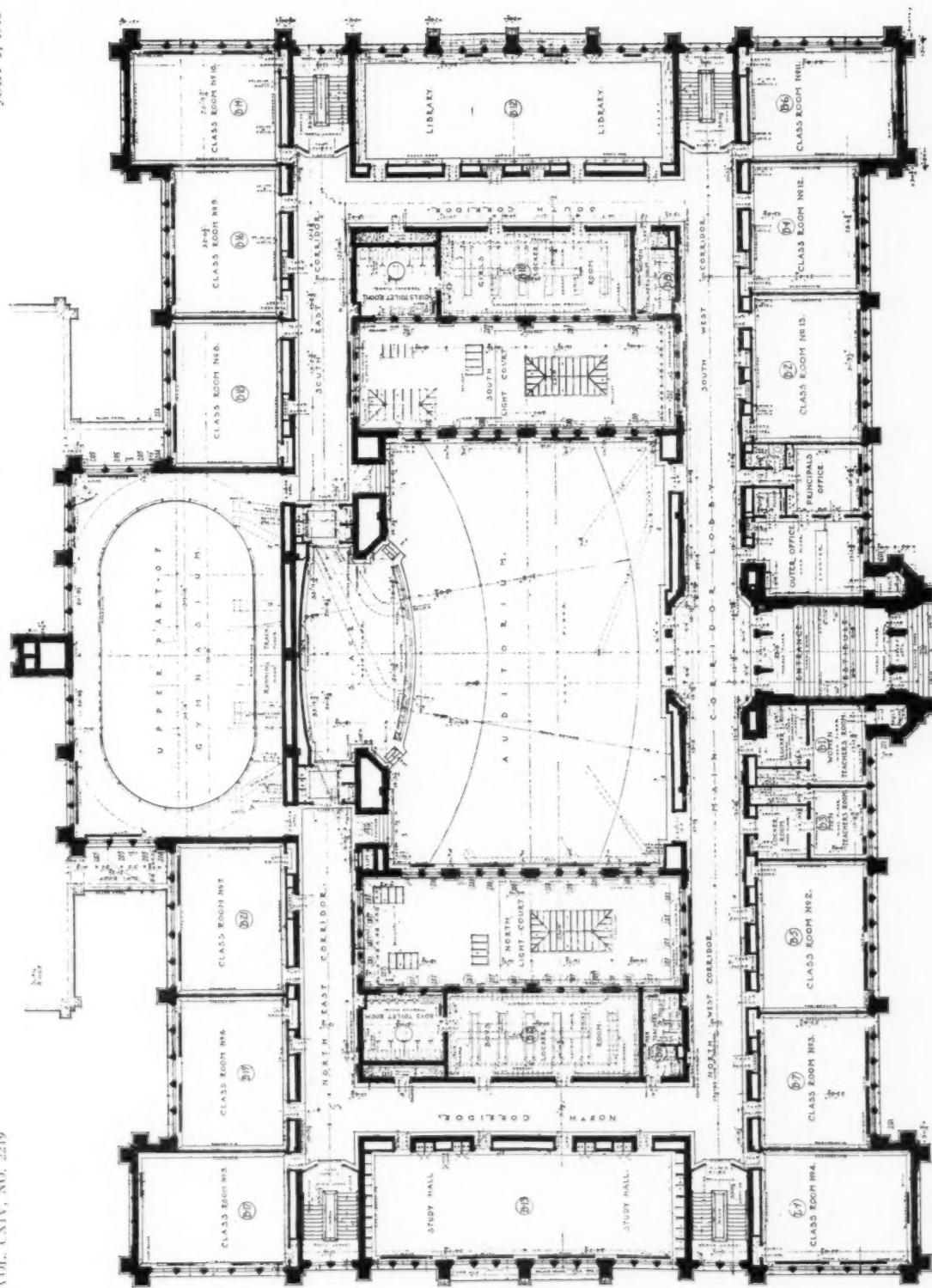
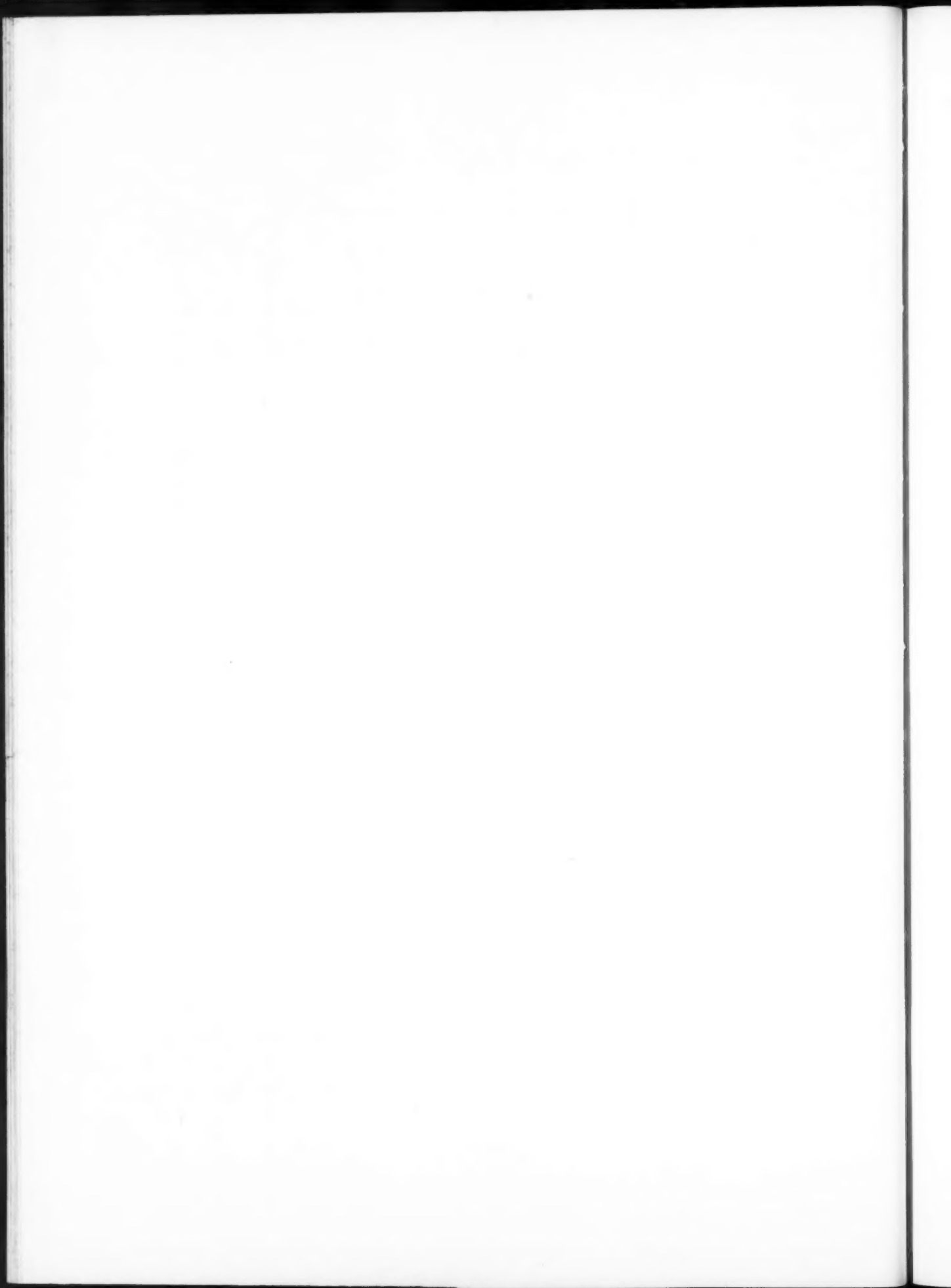
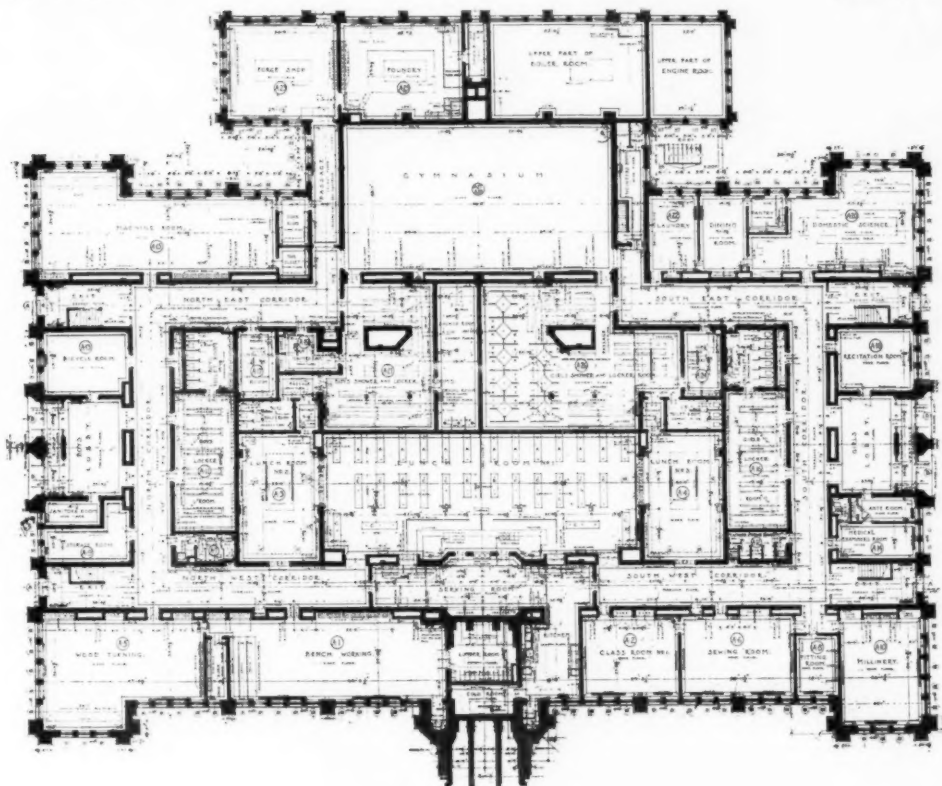


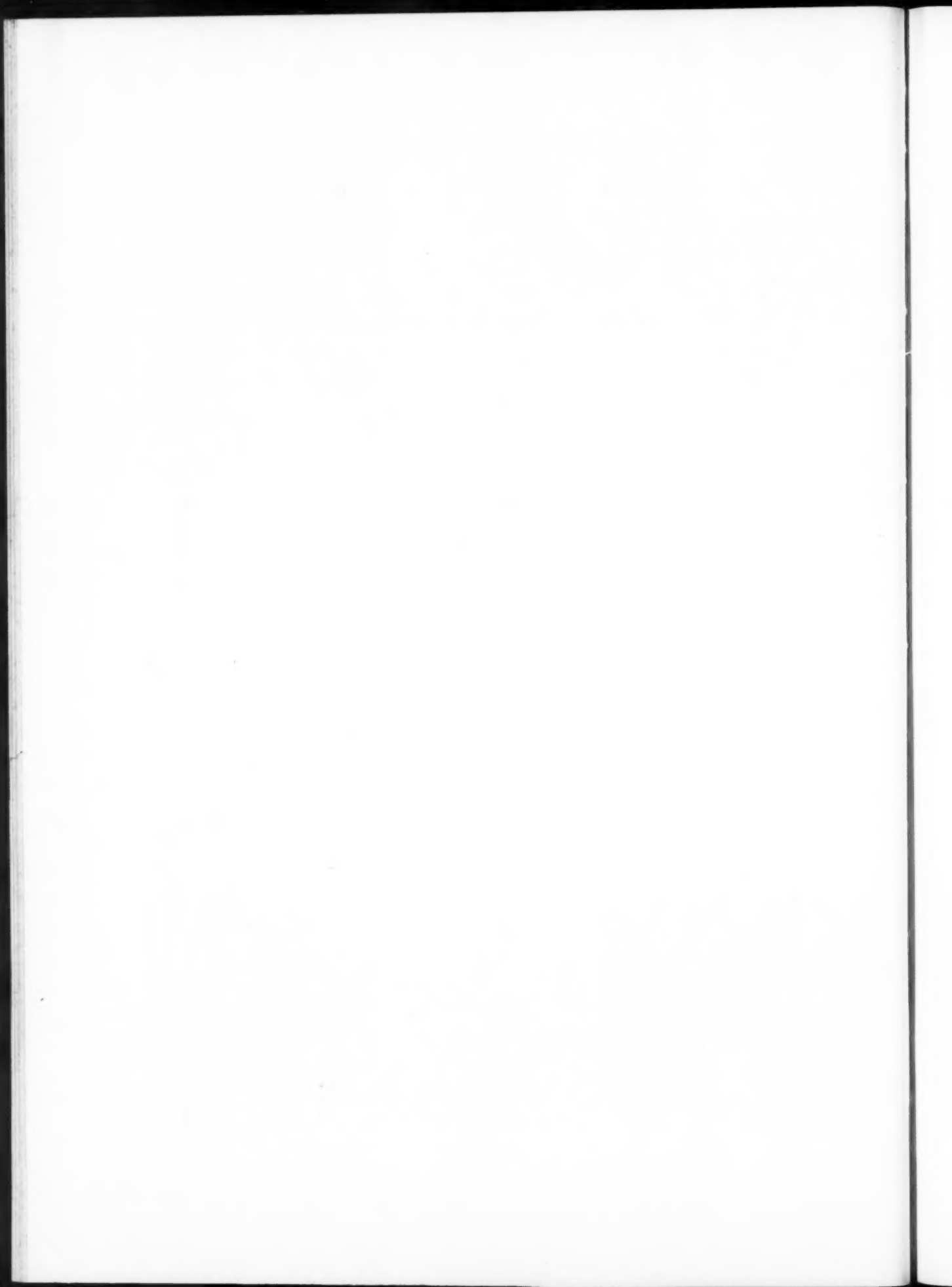
PLATE 3

CAMDEN HIGH SCHOOL, CAMDEN, N. J.

PAUL A. DAVIS, 3RD, ARCHITECT







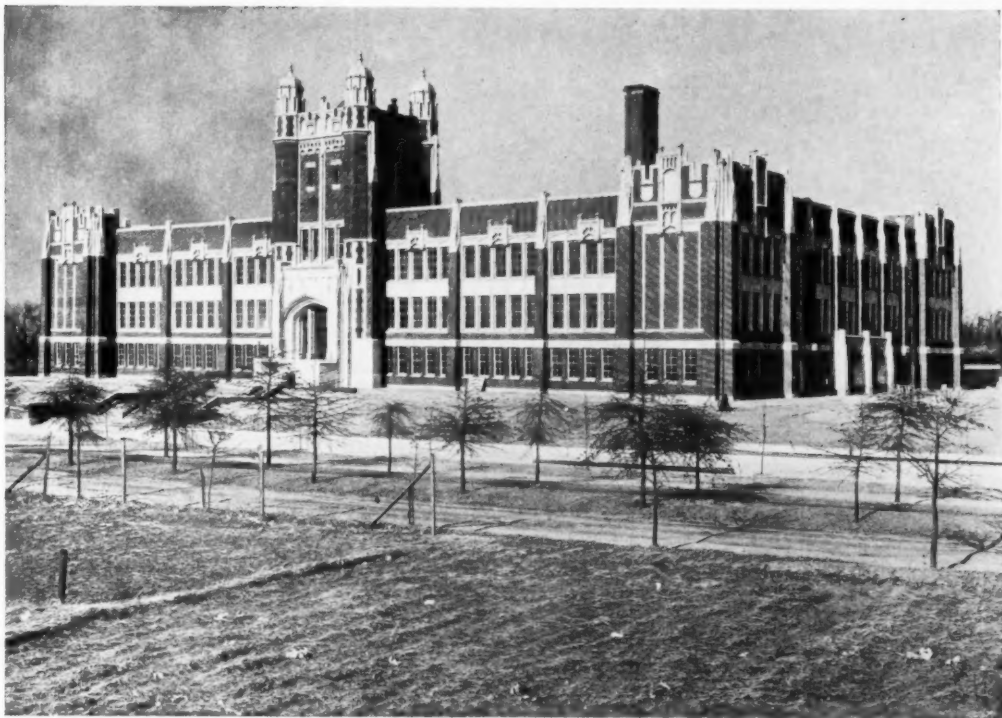


PLATE 5

CAMDEN HIGH SCHOOL, CAMDEN, N. J.

PAUL A. DAVIS, 3RD, ARCHITECT

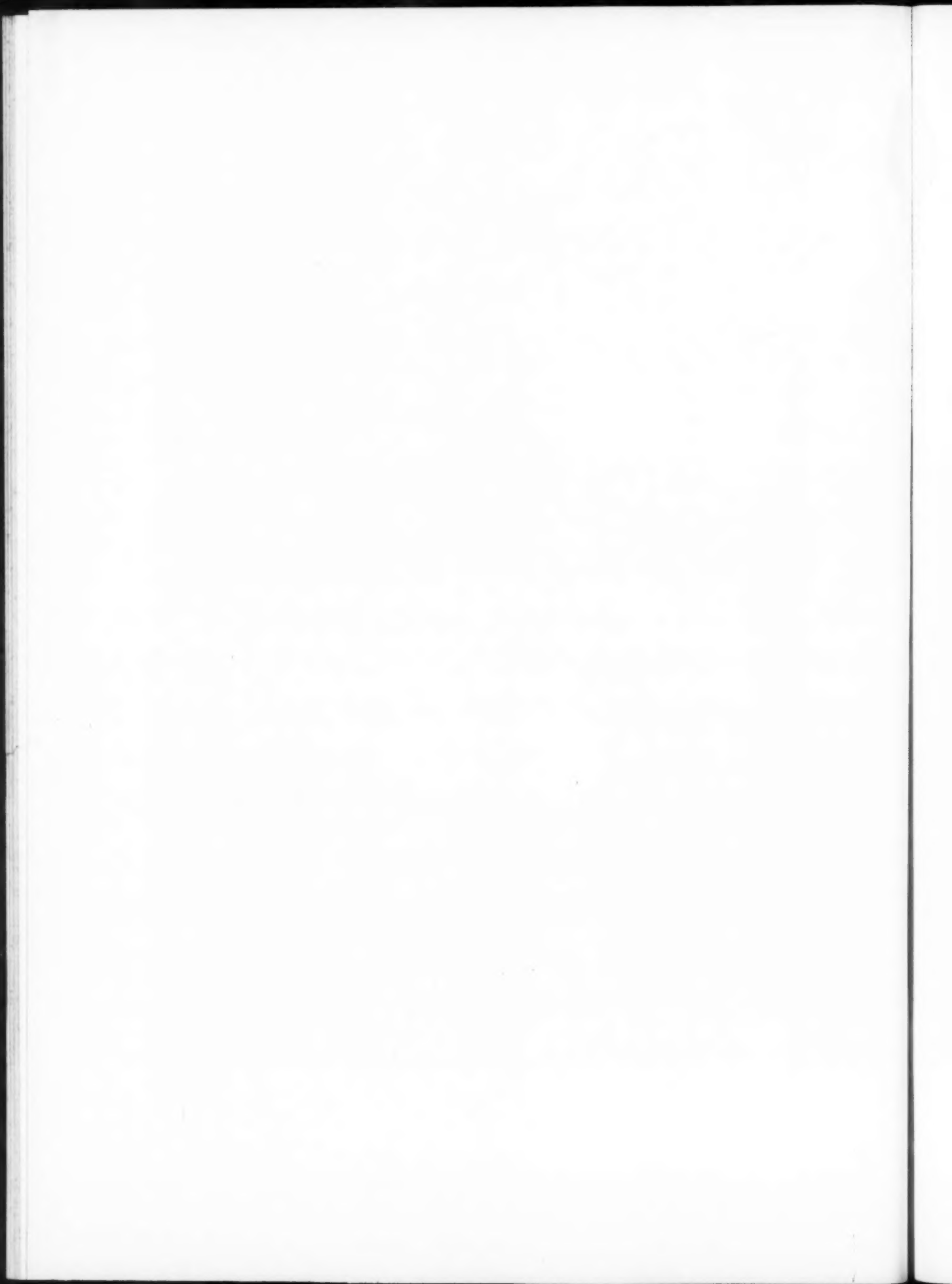




PLATE 6

FERNWOOD SCHOOL, PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS



PLATE 7

EXTERIOR DETAIL

FERNWOOD SCHOOL, PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS

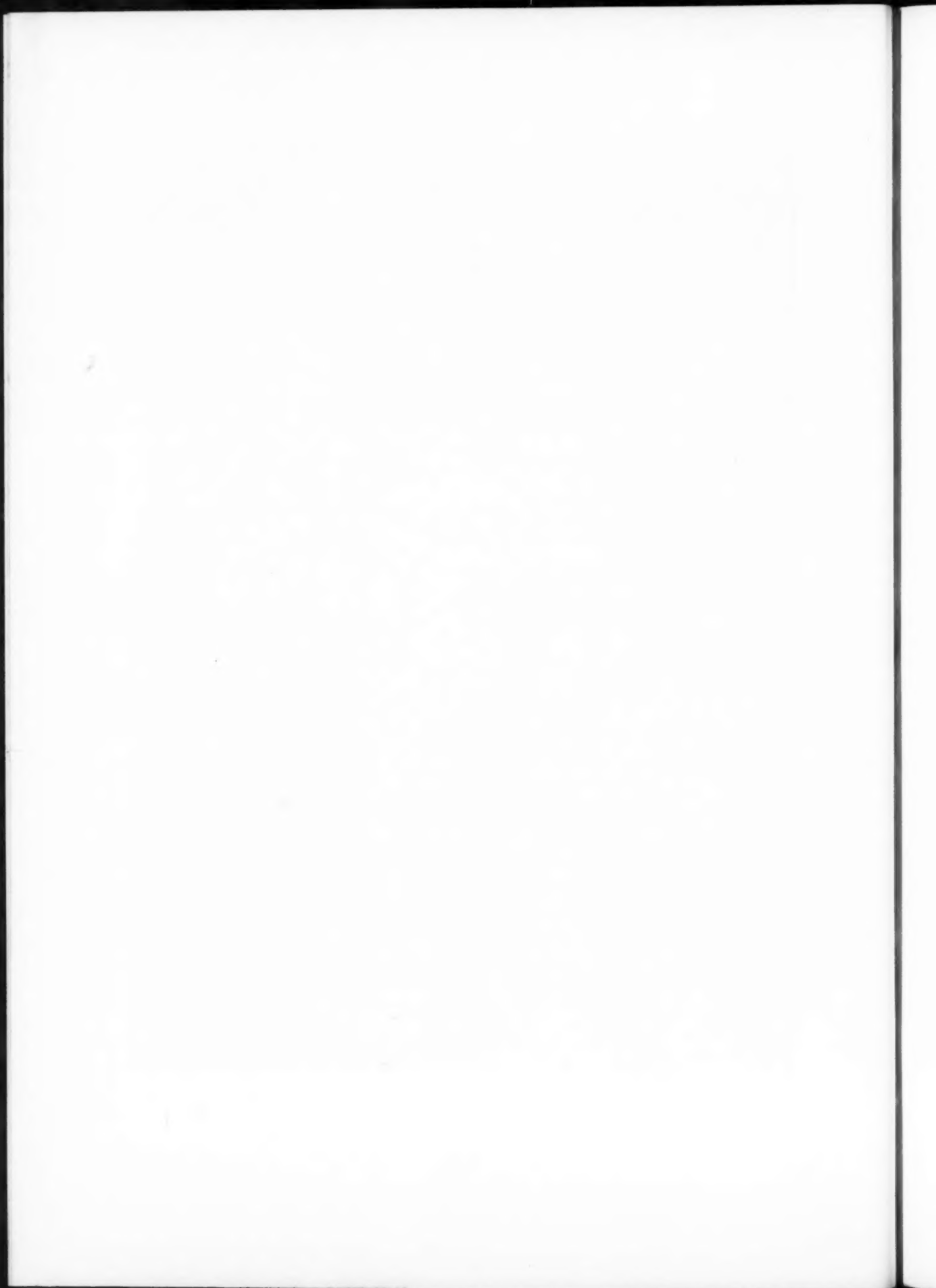


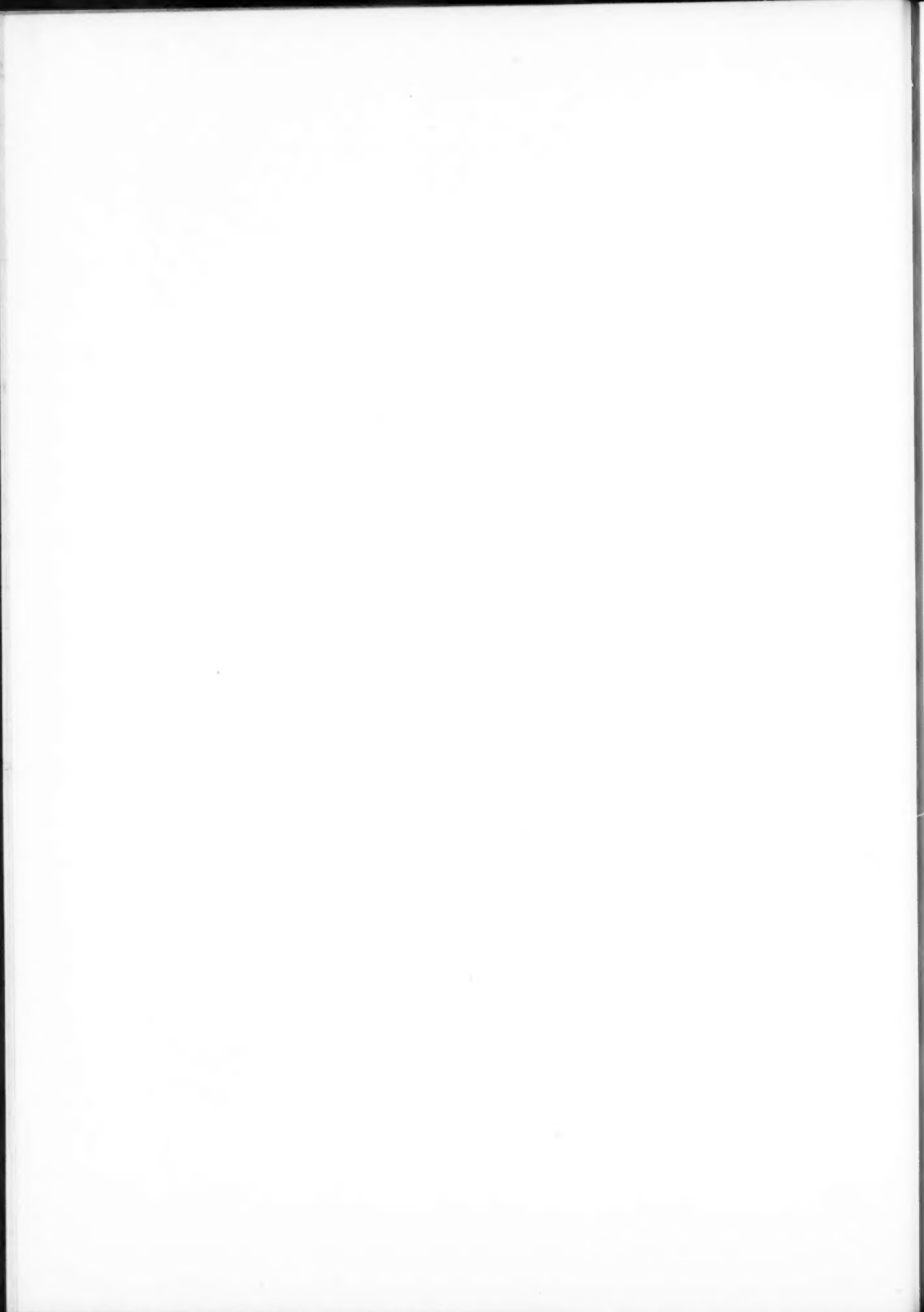


PLATE 8

ENTRANCE DETAIL

FERNWOOD SCHOOL, PORTLAND, ORE.

LAWRENCE & HOLFORD, ARCHITECTS



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neers; Chicago Section, American Institute of Electrical Engineers; Chicago Section, American Chemical Society; Chicago Section, American Institute of Mining Engineers; Mid-West Section, Society of Automotive Engineers; Illinois Association of American Society of Civil Engineers; Chicago Section, American Society of Heating and Ventilating Engineers; Chicago Section, American Society of Refrigerating Engineers; Chicago Section, Steel Treating Research Society; Chicago Section, Illuminating Engineering Society; Chicago Chapter, American Association of Engineers.

Officers of the War Committee have been elected as follows: Chairman, F. K. Copeland; vice-chairman, W. L. Abbott; secretary, Edgar S. Nethercut; treasurer, William A. Fox.

Army Construction Work Totals Expenditure of \$1,170,619,000

Building construction for the army, at home and abroad, completed, commenced and projected, involves a total expenditure of \$1,170,619,000, according to a summary authorized by Secretary Baker. Besides cantonments and camps, the department has provided emergency housing for civilian employees, expanded existing warehouse and manufacturing plants and built new ones.

Up to June 10 the construction division has completed fifty-three jobs, thirty-six being cantonments and camps, at a cost of \$202,250,000. It has now under way 244 operations which will cost \$270,000,000. Preparations are being made to start 117 more, to cost \$700,000,000.

The existing form of construction contract will be continued, under which profits are confined to a percentage on the cost, with an established maximum fee, which cannot be higher than \$250,000. A board of experts was called in recently to go over the contract system, and unanimously approved it.

Fine Arts and High Prices

The high prices which have been paid in the auction room this season for paintings, old books, autographs, and choice art objects present a striking object lesson that the lure of collecting has not lost either its charm or its power, despite the war, with its manifold demands for service and financial aid. When a collection as large and varied as that of the late George A. Hearn, the most important individual sale of the year, brings over three-quarters of a million dollars at auction, it evidently shows a well sustained interest in the fine arts. Many of the

paintings in the Hearn sale brought record prices for works of certain artists, another illustration of the fact revealed in so many ways within recent years that our collectors of discriminating tastes are growing in number and that competition for the best things is naturally becoming keener.—N. Y. *Times*.

The Question of War Medals

Among the resolutions adopted by the American Federation of Arts at the recent convention is one relating to the design of medals of honor and crosses to be given for distinguished service in our army. It was resolved that as these medals and crosses will be compared with those of other countries and will be considered now and in the future as examples of our development in art at this time, the designs for them should in all cases be approved by the Federal Commission of Fine Arts before being authorized by Congress.

The idea is one that should receive encouragement. It is not probable that our soldiers will look critically at the decorations bestowed upon them by a grateful country in return for the free offer of priceless life; but the fact that an ugly bit of stamped metal would carry with it a thrill as potent as the loveliest bas-relief of the Renaissance is no argument in favor of unnecessary ugliness. Our sculptors will jump at the chance to do their best for the men at the front, and we certainly should not consider their best too good. There is no danger of prettiness in the result. The temper of the artists is that of the country at large and their effort would be to combine simplicity, boldness, and precision in their designs.—N. Y. *Evening Post*.

What Will Win the War?

The New York *Tribune* recently said editorially that "Victory is a question of means," and then it went on to list the means. These are:

First, the raw materials.

Second, the plants where raw materials are converted by industrial processes into sinews of war.

Third, the labor to act upon the raw materials.

Fourth, the fighting man power in uniform.

Fifth, transportation.

Labor and materials, in other words, are what are necessary to win the war. What, then, is the duty of all of us? Obviously what we must do is to produce all that is possible and consume as little as necessary and give the Government our utmost financial support.

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The Task Before Us

In the United States there has been, so far, no organized undertaking on the part of the Government looking to the solution of the problems of reconstruction. The future political and military relations of this country to the rest of the world have been set forth by the President, but neither he nor Congress has approached the question of financial, industrial and social reconstruction as a whole. Here and there in war measures or in the proposals of department heads may be discerned evidences of individual investigation and thinking, but thus far there has been no co-operative and avowed effort along this line as in other countries. No special body to enter upon this work has been organized here, and while it may be fairly assumed that such departments as those of the Treasury, the Interior, Agriculture, Commerce and Labor are devoting much of their time to reconstruction measures there is as yet no agency for the co-ordination of their findings and the suggestion of general policies unless it be Congress itself, a purely political body.—*Illinois Society Bulletin*.

Coast Defense Stations

Secretary of War Baker has asked provision in the new fortification bill for sixteen coastal aerial defense stations to guard against submarine and airplane attacks.

The estimated cost is \$1,000,000 each. Thirteen of them will be on the Atlantic coast. Sites for the stations have already been selected. They can be built within six weeks after appropriations are available, Secretary Baker informed the subcommittee of the House Appropriations Committee, which is framing the \$7,000,000,000 fortification bill.

Use for Germanic Museum

HARVARD MAGAZINE SUGGESTS THAT IT BE MADE
A WAR MUSEUM

The *Harvard Illustrated Magazine* suggests that Harvard convert the \$2,000,000 Germanic Museum into a war museum where trophies, the roll of honor, and the proposed memorial album could be placed.

The museum, which has not yet been dedicated, was built with funds given by Adolphus Busch of St. Louis. The Kaiser, several years before the Busch gift, gave \$25,000 toward the maintenance of the old museum, and this yields an annual income of \$1,300.

"The Germanic Museum now fulfills no purpose," says the magazine. "A beautiful building of late construction, it stands as a loss to the university unless utilized. We, therefore, suggest that it be converted into a war museum and that a university war collection be continued on some lines and begun on others. With a couple of 75s from the French and a discarded tank from the British we can make our start. Our war letters, our honor rolls and portraits of fallen heroes can be here consecrated in a new Harvard hall of glory."

State Assistance for Housing

The Royal Commission on Housing in Scotland, whose report was published last fall, estimated the existing shortage of houses, on the basis of not more than three persons to a room (an excess of that number being regarded as overcrowding), at 121,000 houses, writes Consul Rufus Fleming, from Edinburgh. A subsequent inquiry carried out by the Local Government Board for Scotland through the local authorities—municipal corporations—shows a deficiency of at least 109,000 houses. It appears, therefore, that there is practical agreement that the actual shortage is very great, exceeding 100,000 houses. If, as held by the Royal Commission, overcrowding should be estimated not at over three persons to a room, but at over two persons, and if this higher standard be adopted in providing houses, the new accommodation required will represent between 225,000 and 240,000 houses.

The local authorities that have in the past taken up the task of endeavoring to house the industrial population have found, almost without exception, that their schemes involved a loss, small or great, which fell upon the taxpayers; and as building costs are at present from 70 to 100 per cent higher than they were in pre-war years and will doubtless remain high for some years to come, the housing problem is considered to be too difficult for either private enterprise or the local authorities to solve. State assistance in the provision of houses being regarded as absolutely necessary, the Scottish Local Government Board, after consultation with the Cabinet and the Treasury, has come forward with a proposal for financially assisting local authorities during the period immediately following the war.

The State guaranty takes the form of at least 75 per cent of the loss, if any, incurred by local authorities. Assistance will be given in two ways, the one succeeding the other. For a period of years, not less than seven, following the initiating of local programs, the Treasury undertakes to pay 75 per cent of any approved annual deficit. At the end of that period a valuation of the property is to

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be made, and the State will then assume responsibility for 75 per cent of any excess in the amount of the outstanding capital charges over the then value of the property. The local authorities must hold themselves responsible for the remaining 25 per cent of any loss; but in exceptional cases, where the ratable value of the local authority is low, the Treasury may extend its assistance beyond the three-quarters which will be the normal subsidy.

Railway Nationalization

By the action of the Government in assuming control of the railroads of the country, the United States joins Great Britain, France, Russia, and Italy, all of which took over the operation of their railroads as a war measure. Of these countries, all but Great Britain already owned and operated a part of the railroad lines before the war. Aside from state operation of railways purely as a war measure, the tendency toward Government ownership of this public utility has been marked. France has owned and operated the State Railway since 1878, and in 1908 purchased the Western Railway. The other lines were operated, until the outbreak of war, under private management. Before the war Russia was gradually acquiring the private lines of that country. Italy has owned the majority of her railroads since 1884 and has operated them since 1905. Switzerland and Japan have also definitely committed themselves to Government ownership of railways, the former in 1898 and the latter in 1906.

The Rebuilding of Salonika

Mr. Thomas H. Mawson, the expert in town planning, has just returned from Salonika, states *Building News* of London, where he has been acting, at M. Venizelos's request, as senior member of the commission appointed by the Greek government to work out the scheme for rebuilding the city. The commission, which is composed of Greek and French architects and engineers, has completed its plans for taking advantage of the biggest opportunity for town planning since the San Francisco fire. The central area of about one and a half miles long and three-quarters of a mile wide, covering two-thirds of the city, was completely gutted, and Mr. Mawson was instructed by M. Venizelos to regard the whole area as if it were vacant land, and to prepare plans so as to secure the utmost economic and esthetic advantages to the city, which will be in the future one of the greatest of shipping and industrial centers. The plans provide for a future

population of 320,000. It will take ten years to complete the scheme. The site is an ideal one, rising from the water's edge up to the city walls and citadel on the hills behind the town. The scheme includes the reorganization and extension of the docks, the provision of two new railway stations, and an underground electric line. There will be separate roads for fast motor traffic and for slow traffic. There will be a big central building—government and municipal center, law courts, and a generous provision of parks and public gardens. There are to be two wide areas of park land running through the city from the sea to the hills and dividing Salonika into three business and residential areas. These wedges of park are continued as belts of forests beyond the city walls, and will be laid out on ground previously occupied by old Turkish cemeteries. In one will be built a university, chiefly for scientific and industrial teaching. The style of the architecture will be partly Byzantine—the French are planning a series of bazaars in the Eastern manner—while the business and official buildings will be classical Greek. At one end of the city there will be an aviation ground, and at Mecra Point, now the site of the British base hospital, the holiday resort of the place, a recreational center is planned, including a casino, yacht club, and hotels.

To Pool War Resources

Pooling of all economic resources of America and the nations allied against the Central Powers is a step nearer.

One of the moves planned in the project for welding into a vast mobile machine the entire economic power of the United States and the Allies behind the military forces is the creation of a Munitions Council with headquarters at one of the Entente capitals.

This phase of the question has been under consideration by the War Industries Board for some months.

Under a tentative plan outlined, the Munitions Council would be divided into two parts, food and war material.

The control, purchase and distribution of food, raw material, and finished products needed by the Allies would be centered in the Munitions Council.

Any question as to the needs of the various allies, their armies, and those of the United States would come before the council. Orders for material would be allocated or reallocated in conformity with varying needs and the ability of plants in the allied nations to deliver.

Every industry, both in Europe and the United States, would be the object of special study with

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regard to its ability to turn out material needed, and duplication of manufacture would be prevented.

While the plan outlined is now tentative, such progress has been made that Assistant Secretary Stettinius, Food Administrator Hoover, and other officials of the war-making agencies are arranging to go to Europe within a few weeks to make preparations for setting up the organization.

Extending Red Cross Canteen Service Back of U. S. Lines

According to a recent report of the Red Cross Department of Military Affairs in France, a large development is taking place back of the American lines. A network of 30 canteens for our troops has been established in the rear of the front-line trenches. Besides supplying hot drinks and other refreshments to the soldiers, they also are undertaking the distribution of such articles as pencils, paper and envelopes, safety pins, playing cards, bandages, iodine, canes for wounded, sewing kits, etc.

Four rest stations on the American lines of communication supply food and hot drinks to American troops en route to their camps from the various ports of debarkation. No charge is made for the drinks or any of the articles that are distributed.

The report also shows that a new hospital for American Army and Navy officers has been opened by the American Red Cross on the French coast, and that another hospital with 370 beds has been opened for enlisted men. The bureau of farms now is operating 10 farms, varying from 3 to 100 acres in size. All of these farms are under intensive cultivation, and the hospitals to which they are attached are getting their vegetables from them. The Red Cross now has 17 moving-picture machines in operation at base hospitals, with an average attendance at each performance of 500 men.

Colossal Air Schools Abroad

A correspondent of the *New York Times*, describing a recent visit to the American Air School in France, comments on its enormous size and the efficiency of its training methods. Referring to the many large buildings erected or in course of construction, he writes:

"At another point, I went over great railway yards, to see rows upon rows of steel structure warehouses which are being built to hold supplies for an army of 1,000,000 men for thirty days, an immense refrigerating plant, a gas plant, an oil storage plant, and countless other features, all on

the same prodigious scale. Calm, quiet men are supervising it, all watching it grow before their eyes.

"There is everywhere an air of suppressed energy rather than exuberance or bustle. It is orderly progress, firmly guided by strong minds, by capable men. America has put her best executives into this work, and they are rapidly making good, as events of the very near future are certain to prove.

"Further along the line I saw much the same evidence of orderliness combined with strength. In army bakeries, in the big central camouflage plant, at various advanced centers from which army supplies are rearranged for shifting to the various railroads and thence to the soldiers at the front, it all spells complete knowledge on the part of every principal engaged of what America set out to do when she entered this war and a full determination to see that job through to the finish. This foundation work is sound and thorough; so also will be the work of the Americans when they emerge in strength into the larger field of operations."

"Never Again"

Civilization and savagery are still locked in a death struggle. We are not through with the big job yet. As sure as the sparks fly upward, right will conquer and democracy will be safe. Till then let us concentrate every thought, every action, every dollar in the accomplishment of that end. Then we can take thought for the morrow.

At the dawn of the great day of victorious peace, a sick world, weak from the blows of this greatest and cruelest of wars, will cry aloud "Never again!" Civilization, faint at heart, yet cheered by hope, will echo the refrain, "Never again!" And the authoritative voice of American Business will ring throughout the land, "*It must not happen again!*"

Our national existence depends upon Business, and on its healthy growth hangs our prosperity. It is vitally interested in devising some practical plan which will make future wars impossible, and which will stabilize its own course.

How can this be accomplished?

"Blocking New Wars" is the title of a series of articles just penned by Herbert S. Houston, member of the Chamber of Commerce of the United States on Economic Results of the War. It is a work which advances such a plan—sanely and logically. It shows how commerce can strike down the mailed fist, tells how economic pressure may avert the future calamity of war.

The Chamber of Commerce of the United States has twice supported this view in a referendum. President Wilson, in his memorable statement of

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America's war aims, declared that even the free seas should be closed "by international action for the enforcement of international covenants," a powerful agency on exerting economic pressure.

This is a question of supreme and universal interest. It is a question of to-day.

The Classic Style in Theater Design

As a matter of personal preference, I like a theater to have a classical front, which gives the right savor of the fathers of the drama. Not that I am oblivious of the open-air amphitheatres of Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, or that "awnings were a late invention of Roman luxury." That theaters should suggest the Greek spirit, it is now generally conceded had become fairly evident before the war; several new theaters showing the right purity and restraint; so that the classicism of sedate St. James's, regarded for a generation as being hopelessly out of date, had come into fashion again.—Diogenes, in *Architects' and Builders' Journal*.

The Colleoni Statue at Venice

Verrocchio's statue of Bartolommeo Colleoni in Venice is now hidden from view by a covering placed to protect what is probably the finest equestrian statue ever modeled, from damage by aerial bombs. *The Architects and Builders Journal* of London prints in a recent issue an interesting account of this statue, and presents a series of well taken views. The article states:

This great memorial of war belonging to the Italian Renaissance is a magnificent monument to General Colleoni in the centre of the Campo Santi Giovanni e Paolo at Venice, where it was unveiled on March 12, 1496. This statue was modelled by Andrea Verrocchio, a pupil of Donatello and cast in bronze after his death by Allesandro Leopardi, who also designed the splendid pedestal on which the statue is set. A considerable controversy circled around this monument. Bartolommeo Colleoni, who entered the service of the Venetian Republic in 1448 after having fought against it, left the State a large sum of money for the erection of a statue to his memory. Verrocchio was given the work, but when it appeared that the commission was to be divided he threw up his task and left Venice for Florence. Eventually, however, by persuasion and threat, he again set to work, and at the time of his death, in 1488, the model was complete. Hence the artistic affront on the part of Leopardi, who, on the strength of having reproduced the model in bronze, inscribed his own name as author on the belly-band of the horse—ALEXANDER LEOPARDUS V. F. OPUS. Mr. Symonds, however, in his "Renaissance in Italy," makes a strong claim for Leopardi. He acknowledges that the general conception must be attributed to Verrocchio, "but the breath of life that animates both horse and rider, the richness of detail that enhances the massive grandeur of the group, and the fiery spirit of its style of execution, were due to the Venetian genius of Leopardi. Verrocchio alone

produced nothing so magnificent." Much has been written in appraisement of the Colleoni monument, and as representative of the great esteem in which it is held two extracts are here given. Professor Middleton says: "This is perhaps the noblest equestrian statue in the world, being in some respects superior to the antique bronze of Marcus Aurelius in Rome, and to that of Gattamelata at Padua by Donatello. The horse is designed with wonderful nobility and spirit, and the easy pose of the great General, combining perfect balance with absolute ease and security, is a marvel of sculptural ability. Most remarkable skill is shown by the way in which Verrocchio has exaggerated the strongly marked features of the General, so that nothing of its powerful effect is lost by the lofty position of the head." An even finer estimate is given by Professor Baldwin Brown. "The pedestal," he says, "so important an element in the monumental effect of statuary, is justly proportioned to the effigy, which is placed upon it so far to the front that there is a sense of forward movement without any hint of insecurity. Man and horse are as one; the embodiment of irresistible force held severely in reserve. The horse, the noblest representative of his own ponderous type in art, was studied by Dürer for his Knight and Death, and the suggestion of the measured earth-shaking tread of the creature is not less impressive than the gaze of the impassioned rider as he glares from under the shadow of his helm."

Germany's Iron Industry

According to a trade correspondent, the iron industry in Germany is experiencing serious difficulties. Lack of transportation, the unusual shortage of labor, and the difficulty of procuring both food and clothing for even the comparatively small amount of labor available is seriously hampering the iron industry. This correspondent states:

"There is no use of iron or steel for private purposes. The whole product goes directly to war industries or indirectly through railroad building and repairs. The whole iron industry is driven to the utmost limit of production, as has been the case since the beginning of the war.

"All help, whether of men or women, young or old, so long as it is productive, is called upon to supply the direct and indirect needs of the army. For private uses there is still no material, and the building industry, for example, is at a standstill. With the great consumption everywhere, which is due to the lowered quality of the goods, a falling off in the need of iron, even in the early times after peace, is not to be expected."

Streamline Buildings Next?

The movement of the present day toward elimination of waste in building design—or, better said, the prevention of waste in planning and construction—follows the same tendency that is to be noted as the outcome of conditions in the past. Wars or other forces have called upon man for sacrifices which led ultimately to a mental exertion that pro-

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duced great economies combined with greater efficiency.

"Befo' th' wah" between the North and South, in the olden golden gracious and spacious days, everything was free and easy, liberal and hospitable. After that war things tightened up, and the buildings to-day are no more like those of the days of graciousness and spaciousness than buildings of the coming decades will be like those that were built in the last decade in the matter of method, manner, quantities, bulk or detail. Prevention of waste—that is, consistent practice of the principle—should ultimately lead to undreamt of changes in forms of architectural design. Like all efforts to produce maximum effectiveness at minimum expenditure, this should in turn lead to the production of an art transcending all previous architectural efforts insofar as sheer cleanliness of line, perfect adaptation of means to end and logical development of the problem is concerned.

The streamline building is the next outcome.—*Building Review.*

Exhibition of Architectural Drawings

At the recent convention of the American Institute of Architects held in Philadelphia, a special exhibit was shown, of drawings by Wilson Eyre, a well-known architect. Practically the entire collection is now hung in the Alumni Memorial Building, Ann Arbor. It constitutes an unusually interesting set of drawings. There are more than one hundred of these, all of which were made by Mr. Eyre himself over a period of thirty years. They show the entire range of this versatile artist; pen and ink, pencil, black and colored crayon, water color, and a combination of these mediums are used, as well as papers of all colors ranging from a white Whatman to the tinted papers which Mr. Eyre knows so well how to use advantageously.

The subjects include cottages, houses of all sizes, gardens, studies in charcoal of full-size details for stone carving, faience and terra cotta. There are elevations and perspectives of exteriors and interiors, drawings from the figure, and a number of splendid foreign sketches primarily from Italy and England. There are also some photographs of the executive work. It is altogether one of the most interesting collections ever brought together.

From Philadelphia the collection went to New York before going to the University of Michigan, from where it will probably go to Cleveland on its way back to Philadelphia.

To Form a School of Archæology at Jerusalem

It is stated in English papers that there is being organized in London by a group of prominent English scientists a School of Archæology that will undertake a scientific study of Palestine and Mesopotamia after the war. A large proportion of the fund necessary to carry forward this project successfully has been subscribed.

Developing an American Style in Architecture

The Architects and Builders Journal of London comments in a recent issue, and at some length, on an address by H. Van Buren Magonigle, in which he stated: "We whisper or shout in the accents of England or of France or Italy or of Greece, hoping to be understood. When we learn to speak in the new tongue that shall be American, showing its origin as a word contains its root, but this will take time."

To this the *Journal* replies:

It will be noted that the demand for a distinctively American style of architecture is qualified by an admission that it must be given time to grow. That is surely the way of it. And it must be spontaneous rather than the result of a conscious and deliberate endeavor to break away from tradition. Yet it must spring from knowledge as from a cultivated soil. One of our American friends talks with some scorn of "period" architecture and decoration. He refers, no doubt, to the abuse of these things by weak and subservient minds, which dare not deviate by a hair's breadth from an established convention in structure or ornamentation, and, with fatuous fidelity, will reproduce all the faults of the model; for not even the Parthenon is faultless, much less any scheme in any of the "periods." Scholarship, refined taste, and the immediate object to be served, will guide and govern the modifications. We have always felt that the Americans show in their adaptations more freedom and grace than the architects of any other country save France, but probably we have seen only the best examples; and we are rather at a loss to understand the yearning of our cousins for "a new language" when they speak the old languages with so charming an accent, and when their vernacular (which at the moment we are specially proud to recognize as an offshoot of our own) is so incomparably rich in racy idiom; and it is better to lisp in Latin than to yell in Esperanto.

Department of Architectural Engineering

An Important Departure in Building Codes

THE new Building Code, now in process of construction for the City of Detroit, evidences an awakened appreciation of the influence and importance of such regulations. Until the past few years such regulations have not shown any indication of being based on correct fundamental principles and logically developed therefrom. As a rule they have been simply compilations of existing codes, altered to conform to some local condition or interest. The result has been the enactment of regulations that are complex in their makeup, contradictory and often imposing unwarranted restrictions. From a zealous effort to safeguard the interests of the public effectively some regulations have been enacted which are so drastic in their requirements that their unreasonable exactions distinctly retard the growth of the community. A building code committee recently recommended the building of parapet walls on strictly fireproof buildings, presumably to retard the spread of fire. This requirement was an inheritance from codes written before the days of fireproof buildings and while it is a necessity with some kinds of construction, it is a wilful waste when applied to a fireproof building. Logical reasoning can be applied to the formulation of such regulations with as much propriety as it is applied to ordinary business procedures. The best results will probably be obtained through a committee composed of competent architects, engineers, contractors, fire prevention and sanitary experts, who will discard all written laws and attack the problem with the intention to accomplish a reasonable and desirable resultant through the logical development of a few simple basic facts.

In THE AMERICAN ARCHITECT of February 20, 1918, mention is made of an amendment to the Chicago Building Code concerning the construction of stairs in buildings used solely for warehouse and storage purposes, which amendment evidenced the

realization that the character of the occupancy of a building should have some bearing on the stairway facilities required. The capable committee for Revision of Building Code for Detroit has gone much further in this particular item and proposes to regulate the construction of stairways on a basis new to such ordinances. Through its secretary, Mr. E. L. Sanderson, the committee invites suggestions on the subject.

The proposed article XXII, entitled stairways and exits, is a radical departure from the stereotyped requirements common to such laws. The basic idea is that a stairway should be provided to serve the needs of the structure as determined by the type of the construction of the building and the character of its occupancy.

The proposed article defines its purpose "to provide adequate means of exit from each portion of each story of any building erected or to be erected in the city of Detroit. Such exit or exits shall be placed and maintained so as to serve all occupants in the building with all the protection from fire panic or other hazard which can be reasonably required under the present known provisions for safeguarding human life." Very properly the purpose of a stairway is considered from the aspect of safety to human life and it follows that if this is accomplished there will be also a measure of prevention of fire loss to property. The whole subject is considered by analyzing the factors involved and classifying them as "hazard" and "safety" conditions, their influence being indicated by numerical values. It follows that if the total numerical value of the hazard conditions is equaled or exceeded by the total numerical value of the safety conditions, an adequate means of egress is provided.

The numerical values proposed are given and the items identified by a modified notation in which "H" indicates a hazard point and "S" a safety point.

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Table of Requirements

HAZARD VALUE FOR GENERAL INITIAL REQUIREMENTS.

	Hazard Points
H1. For general stair requirement for any buildings	100

HAZARD VALUE FOR NUMBER AND AREA OF STORIES.

H2. For each story above the first.....	3
H3. For each 1000 sq. ft. of area or fraction thereof over the first 1500 sq. ft.....	5

A story or floor shall be any complete floor of a building regardless of area or any balcony, gallery or mezzanine floor which shall be more than five hundred (500) sq. ft. in gross area.

The floor area of a story shall be considered as the area between building lines or to the outside of walls whether they be enclosing walls or firewalls dividing a floor in parts.

No deduction shall be made for elevator and stair shafts, vaults, or other similar spaces within the building walls.

HAZARD VALUES FOR OCCUPANCY.

	Hazard Points
H4. For more than 20 and less than 100 persons per floor.....	15
H5. For each 100 persons or fraction thereof over the first 100.....	20
H6. For the presence of any inflammable liquid or material.....	50
H7. For the presence of more than 20 and less than 50 sleeping rooms on any floor	30
H8. For each 25 sleeping rooms or fraction thereof over the first 50.....	30

In figuring Hazard Values for occupancy the maximum number of people on any floor is to be calculated and used in general but if the occupancy is less on all floors above the floor having the maximum occupancy the safety values need only equal the less hazard value for that part of the building and stair provisions reduced accordingly.

A similar reduction may be made if a lower floor only has inflammable liquids or sleeping rooms on it and stair provisions for stories above reduced accordingly.

The number of persons occupying any floor shall be determined by the following table:

KIND OR USE OF BUILDING.

Dance Halls	} 15 sq. ft. per person
Lodge Rooms	
Exhibition Rooms	
Skating Rinks	
Printing Establishments	
Armories	
Convention Hall	
Club Houses	} 30 sq. ft. per person
Bath Houses	
Public Buildings	
Commercial Stores	
Department Stores	
Markets	
Lodging Houses	
Reading Rooms	
Restaurants	
Churches	} 50 sq. ft. per person
Bowling and Billiard Rooms	
Work Rooms	
Manufacturing Buildings	
Factory Buildings	
Loft Buildings	
Packing Houses	
Office Buildings	} 150 sq. ft. per person
Hotels	
Hospitals	
Asylums	
Sanitariums	
Garages	
Depots	
Studios	} 300 sq. ft. per person
Warehouses	
Storage Houses	
Freight Houses	

In building of occupancy other than those listed in the foregoing table, the nearest similar occupancy given may be used with the approval of the Commissioner.

The Commissioner shall, however, have the right to reduce the number of square feet allowed per person in any building or on any floor of a building where actual conditions justify, and hazard values shall be figured accordingly.

The area of a floor for the purpose of computing the number of occupants shall be the net inside area not including stair and elevator shafts, toilets, vaults, or other partitioned areas not occupied by people using the floor.

In the case of a floor having mixed occupancy the different parts shall be calculated in accordance with the above table.

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SAFETY VALUE OF CONSTRUCTION OF BUILDING.

	Safety Points
S1. For fireproof type.....	60
S2. For mill or slow burning type.....	20
S3. For ordinary type.....	15
S4. For frame type.....	10
S5. For skeleton type.....	25
S6. For complete approval standard sprinkler system	30

Buildings of more than one type of construction shall be given credit for the lesser type only, unless the different types are entirely separated by fire walls.

SAFETY VALUES OF STAIR LOCATION.

	Safety Points
S7. For locating at least one stairway in each half of a building whose floor area has been divided in half by a straight line drawn in any direction and so any point on the floor is not more than 100 feet from a stairway..	30
S8. For locating same as in S7, except so that a point on the floor may be over 100 feet but not more than 150 feet from a stairway.....	20
S9. For locating stairways other than required in S7, but so no point on the floor is more than 40 feet from stairway	20
S10. For locating stairway other than required in S7, but so no point on the floor is more than 75 feet from stairway	10

LOCATION.—In all buildings of more than 6000 sq. ft. of ground area (including courts) or having any building line dimensions of over one hundred ten (110) feet, at least one stairway shall be located in each half of the building when the ground area is divided in half in any direction by a straight line, drawn from corner to corner or from the center to center of opposite sides.

In the case of a ground area having more than four (4) sides the circumscribed rectangle shall be considered as the area to be divided but such reduction of ground area shall not be added in calculating the 6000 sq. ft. above required.

A stair shaft located on a dividing line shall be considered satisfactorily located and for the purpose of establishing distances as given in above Safety Values the location of a stairway shall mean the door to any enclosed stair shaft, smoke tower, or fire tower, or to the first riser of a down run of an open stair or the door leading to a fire escape

or into a fireproof passageway leading to a smoke tower, fire tower, enclosed stair or fire escape.

No building or floor shall be so planned that the distance from any point in the building or floor to a stairway or entrance to passageway leading to a stairway or to a horizontal exit shall be greater than 150 feet in line of travel, except in factory, manufacturing, storage and warehouse buildings of fireproof type construction having incombustible material only in them when this distance and all the distances given above may be increased 50% and same safety value taken.

No floor of a building on which there are more than twenty (20) sleeping rooms, or on which explosive or inflammable liquids or materials are stored, manufactured or used, shall be so planned that the distance from any point in the building to a stairway shall be greater than 75 feet.

For the purpose of this section all distances given shall be taken to mean the distances a person must travel from any point to the stairway measured along the shortest line.

SAFETY VALUES FOR STAIRS.

	Safety Points
S11. Smoke tower	75
S12. Fire tower, fireproof throughout.....	60
S13. Fire tower, except with stairs of combustible material. This type not allowed in new buildings over four (4) stories high.	30
S14. Fire tower, except with stair and enclosure of combustible material. This type not allowed in new buildings over three (3) stories high.....	20
S15. Enclosed interior stairway, fireproof throughout	45
S16. Enclosed interior stairway, except with stair of combustible material. This type not allowed in new buildings over four (4) stories high.....	20
S17. Enclosed interior stair, except stair and enclosure be of combustible materials. This type not allowed in new buildings over three (3) stories high.....	10
S18. Open stairs of fireproof construction. This type not allowed in new buildings over three (3) stories high.....	10
S19. Open stairs of non-fireproof construction. This type not allowed in new buildings over two (2) stories high..	5
S20. Horizontal exits provided with a clear passageway at least five (5) feet wide from such horizontal exit to an enclosed stairway	75
S21. Fire escape	20

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A smoke tower is defined as having enclosing walls at least 12 in. thick and extending from the street, alley or open court to and above the roof forming a bulkhead with fire door on roof. Fixed or automatic fire windows sufficient for lighting purposes may be installed in these walls provided they are not subject to fire exposure hazard from the same or nearby buildings. There shall be no openings in any wall separating the stairway from the building, but access to the smoke tower shall be had by means of incombustible outside balconies or by means of vestibules within the walls of the building which shall be open on at least one side. Such balconies or vestibules shall have an unobstructed width of at least 42 in., incombustible railings not less than 4 ft. high and shall be provided with solid incombustible floors. The balconies or vestibules shall open upon or extend into an open space not less than 100 sq. ft. in area with a least dimension of 10 ft. Access to the balconies, vestibules and the smoke tower shall be provided by means of approved self-closing fire doors not less than 40 in. wide and 78 in. high. A wire glass panel may be provided in the door opening into the smoke tower of not less than one-third the area of the door.

A fire tower is defined as consisting of a fireproof enclosure extending from a street, alley or open court to and above the roof, forming a bulkhead with a fire door on the roof. They may be connected at street grade to street, alley or court by a fireproof passageway having a clear width at least as wide as the stairs and 7 ft. high, if direct exit cannot be arranged. Direct entrance may be made to the shaft from the building on any floor, provided such openings are equipped with self-closing fire doors not less than 40 in. wide. Fire doors may be omitted in non-fireproof enclosing walls.

Enclosed interior stairs conform in every way to the requirements of fire towers except that they are not required to lead directly or through a passageway to a street, alley or open court at first floor, but may open directly onto the ground floor provided there is an exit to a street, alley, or court within 40 ft. from the bottom riser and provided the width of the exit doors equal twice the width of the stairs.

Enclosure on the first story of fireproof enclosed interior stairs may be omitted in fireproof constructed buildings provided there is a complete fire stop at second floor line with fire doors equaling the width of the stairs.

Open stairways constructed of fireproof or non-fireproof materials may be used as permitted by the table of requirements (items S18-S19) provided they land on the ground floor within 50 ft. of an exit to street, alley or court and the width of the exit doors is equal to the width of the stairs.

Horizontal exits are understood to mean one or more openings which are more than 42 in. wide, through or around a fire wall, fire exit partition or any fireproof wall separating two buildings, or an exit made by an exterior bridge or balcony connecting two buildings or two floor areas of the same building. Where there is a difference in level between connected buildings or floor areas, a ramp may be provided with a pitch not exceeding 2 in. rise to one foot run. The bridges or balconies shall be not less than 42 in. wide and constructed of incombustible material and enclosed on all sides at least 4 ft. high. All exterior openings in connected buildings or areas within 10 ft. of such bridge or balcony shall be protected by fire doors or fire windows with fixed or automatic closing sash. The available floor area on each side of a horizontal exit shall be sufficient for the joint occupancy on the basis of not less than 3 sq. ft. of unobstructed space per person and shall be provided with at least one stairway of value equaling that of item S15.

All types of stairs shall be at least 42 in. wide between stringers or face of walls or 40 in. wide between face of wall and open balustrades, or between two open balustrades. They shall be free from all obstructions except that handrails attached to walls may project not more than 3½ in. from the walls. If newels project above the top of handrails there shall be a clear distance of 42 in. between the newel and the wall or newel opposite. Handrails shall be provided on both sides of stairs.

No extra credit shall be given for stairs having more than this width unless such stair be 7 ft. wide with a well secured center handrail. When stairs are built with this width, double safety values in table of requirements will be allowed and if stairs are built 10 ft. 6 in. wide, with center rails, triple value may be taken. All smoke towers, fire towers and interior enclosed stairways shall be continuous from top of stairs to grade, but may be offset when such offset is made by means of a horizontal enclosed fireproof passageway from one stairway to another, thus providing a full enclosure to pass through at all times.

All stairs shall be of fireproof construction, except as rated in items S13, S14, S16, S17 and S19. The structural details of stairs, platforms and fire escapes are of the usual kind with the usual restrictions as to the use of winders and the dimensions of treads and risers, the artificial lighting and other common requirements are included. In existing buildings the unit width of stairs may be considered as 36 in. when applying to existing stairs, but when new stairs are required to be built, they shall be 42 in. wide.

All fireproof enclosures, except for the smoke towers, shall be at least 6 in. thick in all cases above

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the first floor and 8 in. thick below the first floor, if supported at each floor. If not so supported, the enclosures shall be as thick as the enclosing walls of the building.

The use of any material classed and approved by this code as fireproof material shall be permitted for stair enclosure construction. Wired glass and metal (not less than No. 20 gage) enclosures will be allowed as fireproof enclosures above the first floor in Type I buildings.

Referring to the tables of numerical values classed as hazard points, it will be noted that to H1 is given a value of 100 points. As the use of a stairway must represent a hazard it is entirely proper to assume some value as a general hazard, in the same manner that fire insurance rates are estimated by charges and credits from a basic amount, this basic amount varying with the classification of the fire fighting ability of and class of buildings in the town or city. Assuming that H1 equaling 100 points is correct, all other values must be comparative to it.

Unless the areas allowed per person are based on a large number of actual surveys made in the city of Detroit, some of the classifications may be discussed with possible advantage. The best manner of securing such surveys would be by having them made by state and city factory and fire prevention inspectors. This has proven to be impossible in some instances through the failure of the heads of such bureaus to realize the great value of such data or their lack of authority to make such a survey. However, such a survey would result in much needed information of real value.

The 15 sq. ft. classification means that every section of a floor 4 ft. by 4 ft. in size would be occupied by a person. It is hardly probable that that condition would obtain in printing establishments, where the linotype machines, makeup cases, presses, bindery tables and passageways would preclude the possibility of such a condition. This occupancy would belong rather to the workroom class. Club houses and bath houses might well be classed with the hotels in the 150 sq. ft. class.

The 30 sq. ft. class is apparently well considered. It may be questioned that every unit area of a department store would represent a person, but it is true that congestion does occur in some places that is far in excess of the unit suggested. Considering also that the majority of the persons to be cared for in department stores are women and children present in the capacity of purchasers, it is true that they are not as self-reliant as the employees, and therefore the hazard due to that fact is increased. It is conceded that women who are employed are better able to care for themselves in emergencies than those who have a limited and intermittent contact

with conditions outside of their homes. The characteristics of the persons to be protected should be fully considered when the hazards are evaluated. It scarcely seems reasonable to place bowling and billiard rooms in this class, as the very nature of the equipment precludes the presence of persons in the proportion indicated.

The 50 sq. ft. class could well be better classified. To group work rooms, manufacturing, factory and loft buildings without specifying the particular operation carried on therein seems to be incomplete, as there will naturally be more persons per square foot of floor area in a factory, where the operators work at sewing machines on small articles, than in a weave shop, where the looms occupy much floor space. There will be a distinct difference between some portions of a shoe factory and a cigar factory. For these reasons it might be better to divide a manufacturing occupancy into several classes.

The safety points are really influenced very little by the type of construction for the reason that the casualties resulting from fires are caused by smoke and gases and lack of means of egress, rather than from actual contact with the fire or from the collapse of the structure. The structural parts of a mill constructed building cannot begin to burn before the combustion of the contents would cause the occupants to perish from the gases generated. For this reason the safety points with reference to the type of construction should not have a very large range, and it might be correct to class the mill constructed building with the fireproof building. One has only to recall the terrible toll of lives in the Triangle fire in New York in 1911 to realize that the fireproof construction of the building afforded no protection whatever to the occupants. In fact, the heated gases can spread more quickly in such a building than in a mill constructed building, for in the latter the structure absorbs the heat very quickly and to a measurable degree. With certain light inflammable contents a fire spreads more quickly in a fireproof building for this reason. As stated editorially in *THE AMERICAN ARCHITECT*, April 5, 1911, and April 22, 1914, the safety to life is better conserved by a sprinkler equipment than by any possible type of construction. Item S5 is a type of construction "in which all internal loads and strains and both internal and external strains are transmitted to the foundation by a skeleton or framework of iron or steel, such structural members not being fireproofed. Such buildings may have fireproof or mill construction floors conforming to the requirements of this code." Owing to the lack of fire-resisting ability of exposed steel parts it would appear that S5 should have less credit than S2. In fact, a construction such as S5

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is not permitted in many cities in buildings more than two stories in height. It is suggested that the points range as follows:

	Safety Points
S1 Fireproof type	30
S2 Mill or slow-burning type.....	30
S3 Ordinary type	15
S4 Frame type	10
S5 Skeleton type	25
S6 Complete approved standard sprinkler system	60

In considering this subject it must be kept constantly in mind that the quickness of emptying the building of its occupants is the prime object, and that this must be accomplished in a very few minutes. It is a lamentable fact that there exists a

false sense of security prevalent among many persons which is engendered by the fact that a certain type of construction is called fireproof. Persons can and do perish, as the result of fires, in fireproof buildings as easily as in any other class of buildings, the occupancy and factors other than structural being similar.

The location and arrangement of the means of egress appear to be very carefully and consistently measured.

On the whole, this mode of considering the question of stairways is basically correct, and with the suggestions and criticisms invited by the Code Committee carefully weighed and digested, Detroit should, and probably will, lead other cities in the adequacy of its regulation of this very important factor in a building code.



EXTERIOR VIEW OF FORGE SHOP, PACKARD MOTOR CAR COMPANY, DETROIT

Forge Shop of the Packard Motor Car Company, Detroit

ALBERT KAHN, *Architect*

THE departure from a usual construction is always of interest and well worth consideration. The crane girders that support the track of a traveling crane which spans the entire width of a building, are supported on the exterior wall columns or masonry pilasters. When the crane covers a section of the interior of a building these girders are supported on isolated columns, dividing the floor space into longitudinal bays. The presence of these columns is often objectionable and their elimination is an accomplishment well worth mention.

The forge shop of the Packard Motor Car Company is a building 72 ft. wide and is equipped with a 10-ton electric traveling crane having a 38-ft. span, which travels longitudinally throughout the center of the building. There are no columns in this shop, which has a clear floor space except for the machinery installed therein. The trusses supporting the roof have horizontal lower chords, and at the second panel points the vertical web members extend below these chords, supporting the track girders and engaging with supplementary trusses as shown in the cross section. On the hori-

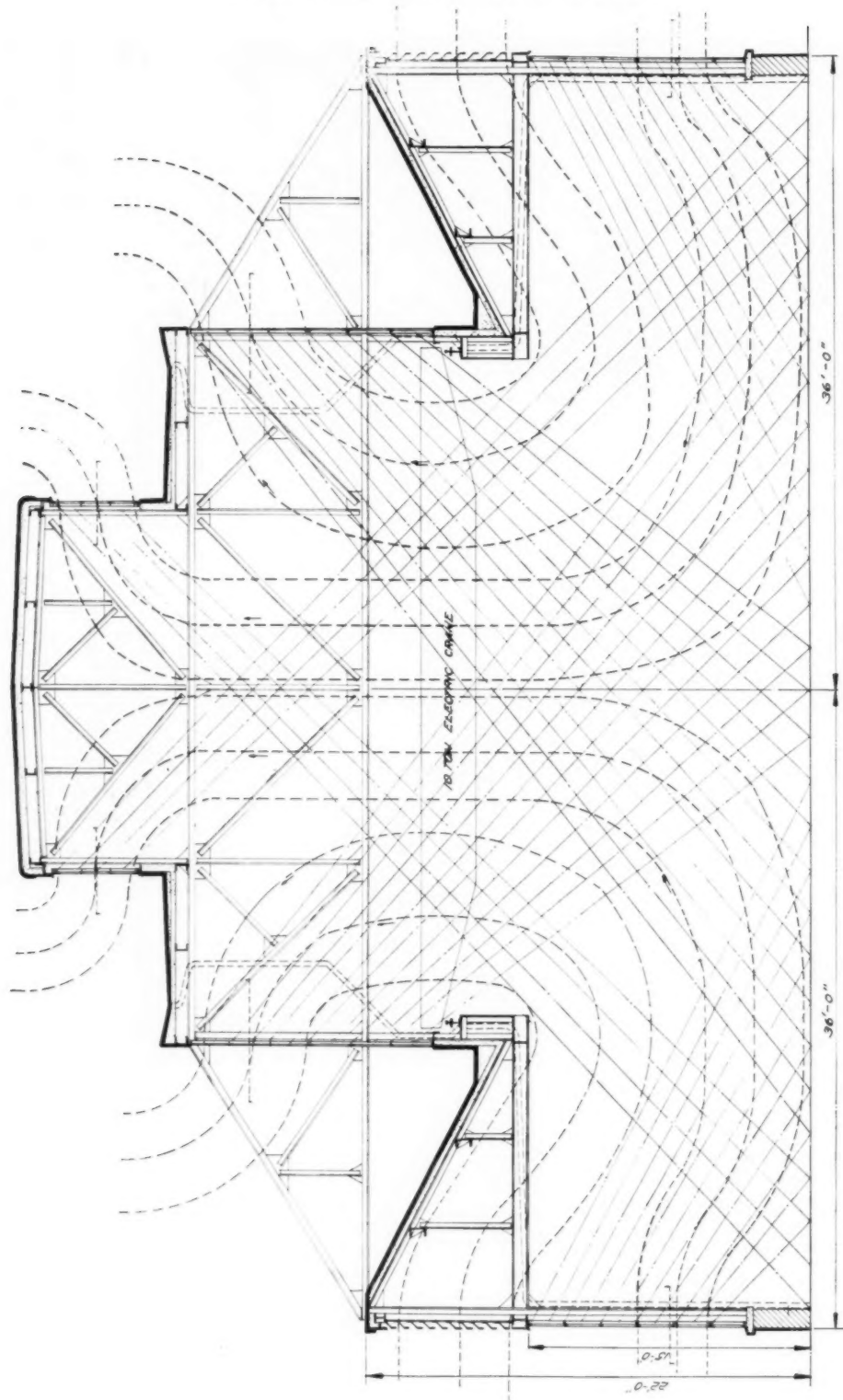
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INTERIOR VIEW OF FORGE SHOP, PACKARD MOTOR CAR COMPANY, DETROIT
ALBERT KAHN, *ARCHITECT*



INTERIOR VIEW OF FORGE SHOP, PACKARD MOTOR CAR COMPANY, DETROIT
ALBERT KAHN, *ARCHITECT*



CROSS SECTION FORGE SHOP, PACKARD MOTOR CAR COMPANY, DETROIT
ALBERT KAHN, ARCHITECT

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zontal upper chord is supported a monitor of the usual kind. The arrangement of the truss is such that the track supports are rigidly held in place and any stresses developed by the moving of the crane are properly cared for. Sway bracing is introduced in the plane of the inclined chord at two places and more frequently in the plane of the horizontal chords.

In order to secure a maximum amount of light and ventilation vertical windows are introduced within the truss area of the cross section at the second panel points. These windows extend below the lower chord and the contour of the roof and window surfaces leaves a portion of the trustees unenclosed by the building. This is unusual and involves only the ordinary maintenance of proper protection by painting. An analysis of the design shows that of the total height of the building one side has 70 per cent of glass surface, 15.5 per cent of louvre surface and 85 per cent of combined louvre and glass surface, 36.6 per cent of open window surface which with the louvre surface amounts to 52 per cent of open surface for ventilation.

As indicated on the cross section the air for ventilation is admitted through the lower section of the windows in the side walls and also through the louvres immediately above these windows. The heated air escapes through the lower and upper monitors. The windows used are made of steel sash, with center pivoted continuous sash for the movable part required for ventilation. The distribution of daylight is also indicated in the cross section and its uniform diffusion is well shown by the interior views presented.

The water from the roof of the monitor is discharged onto the flat roof portion from which it is conducted by down spouts within the building to the underground drains. At the level of the crane girders the water from the lower roof is admitted to these down spouts.

All of the features in this building show careful study and calculation and the unusual conditions have been successfully provided for, resulting in a structure housing a maximum production.

An Important Circular

ANTICIPATING the coming winter, the subject of fuel production and conservation is of importance. Increased production means a possibility of increased consumption and a relief from the hardships of last winter. But conservation of fuel means a saving and the overcoming of waste. With properly designed and equipped power and heating plants, the maintenance of equal horsepower energy with the consumption of less fuel is possible.

It is true that the waste of fuel among domestic users is a very large percentage of the total fuel production and that waste is the most difficult to overcome for very apparent reasons. But among the users of fuel for power purposes, the saving should be more easily effected. Perhaps the most potent argument to the majority of these is the greatly enhanced cost of fuel. This factor would more forcibly affect those selfishly inclined than any consideration for the welfare of others.

This subject is being freely discussed at this time, but the greater part of the discussions are confined to proclaiming the *necessity* rather than the *how*. Circular No. 7 entitled "Fuel Economy in the Operation of Hand Fired Power Plants," issued by the Engineering Experiment Station of the University of Illinois (Urbana, Illinois), is a very comprehensive review of the situation, and while it is written more especially for the coal users supplied by the Illinois, Indiana and Western Kentucky coal fields, it is of value to all coal consumers operating the kind of plants described.

The present high rate of production is still insufficient to supply all needs and there seems to be no possibility of an increase in the output of the mines sufficient to satisfy every demand. There are two possible results of this fuel shortage; either certain industries must close down or more work must be done with the coal available. This circular shows that the average small power plant can save 15 per cent of its fuel by the exercise of greater care in equipment and operation. This means a saving of twelve or thirteen million tons per annum if applied throughout the country.

The purpose of the publication is to present to owners, managers, superintendents, engineers, and firemen certain suggestions which will help them in effecting greater fuel economy, and in determining the properties and characteristics of the coal purchased.

The publication was prepared by a special committee of the research staff of the Engineering Experiment Station, assisted by an advisory committee consisting of Joseph Harrington, Advisory Engineer on Power Plant Design and Operation, Chicago; Arthur L. Rice, Editor *Power Plant Engineering*, Chicago; John C. White, Chairman Educational Committee, National Association of Stationary Engineers, Madison, Wis.; O. P. Hood, Chief Mechanical Engineer, Bureau of Mines, Washington, D. C.; D. M. Myers, Advisory Engineer on Fuel Conservation, United States Fuel Administration, Washington, D. C., and C. R. Richards, Dean of the College of Engineering and Director of the Engineering Experiment Station of the University of Illinois.

Industrial Information

Pendant Switches

The Hart Manufacturing Company, Hartford, Connecticut, has issued a four-page folder descriptive of its pendant switches. These switches are adaptable to many uses, such as controlling small electric heating devices, vacuum cleaners and the like. The quick snap make and break, it is stated, guarantees absolute safety. Cuts show the simple, sturdy mechanism of this "Diamond H" pendant and feed through switch. There is no porcelain used in the construction of this switch, and it is said that the device is radically different in construction from other switches serving the same purpose.

Portable Signal Batteries

Two types of portable batteries, specially designed and developed for railway signal service, are advertised by the Electric Storage Battery Company, Allegheny Avenue and Nineteenth Street, Philadelphia, Pa., in their Bulletin No. 170, issued in March, 1918. These batteries are fully described and illustrated in this bulletin, which is but one of a large series issued by this company. Another, Bulletin No. 169, also published in March, 1918, deals with oil switch batteries. Any of these pamphlets may be had upon request to the manufacturers.

A Non-Corrosive Trap Chamber Cover

Murdock Damper & Bronze Company, 127 Federal Street, Boston, Mass., manufactures a trap chamber cover which is easily removable, inconspicuous in that it harmonizes with the surrounding portion of the floor, is provided with a lift whereby it may be removed and replaced. This cover, it is claimed, is absolutely non-corrosive, being made of the same metal throughout. For use in the floors of bathrooms and other such apartments where it is sometimes desirable to have access to trap chambers, this device should fill a very practical need.

Rubber Necessities

W. H. Salisbury & Company, 105 South Wabash Avenue, Chicago, Illinois, have issued an attractive booklet, illustrative of their different sorts of rubber products. This company has specialized on the rubber needs of the building industry for the past sixty years, and has many products of interest to the architect and builder. Rubber tile floor covering, for all its different purposes; fire protection equipment, including "Kantfail" fire hose racks, "Salisbury" approved fire extinguisher, "Salisbury" fire pumps, hose valves, outside wall plates, watchmen's clocks; rubber mats and mattings in a variety of designs, and plumbing fixtures in rubber and rubber hose, complete a summary of the products of this company.

Super-Standard Heaters

This is the time of year when the far-sighted man gives heed to his furnace and heating needs. The sixteenth catalog of the Spencer Heater Company, Scranton, Pa., is very enlightening in this respect. The qualities embodied in the Spencer heater are fully set forth, there is a large amount of testimony from successful owners of Spencer heaters and there is a series of cuts showing this heater in various types and sizes. Facts about Coal, Importance of Right Chimney Conditions and Factors Determining Boiler Capacities are also discussed in this catalog.

"The Concrete Builder"

The bi-monthly bulletin of the Portland Cement Association, offices in all principal cities, is published in the interests of concrete for farm and home. In the second issue for May there is agitation for a banner silo year, urging a general campaign to equal the activities which are taking place in Indiana. Much general information about good silo construction, and discussions of poultry house design, concrete storage cellars for perishable crops, corncribs built of cement staves and like interesting subjects are also to be found in this bulletin.

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