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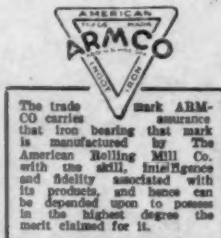
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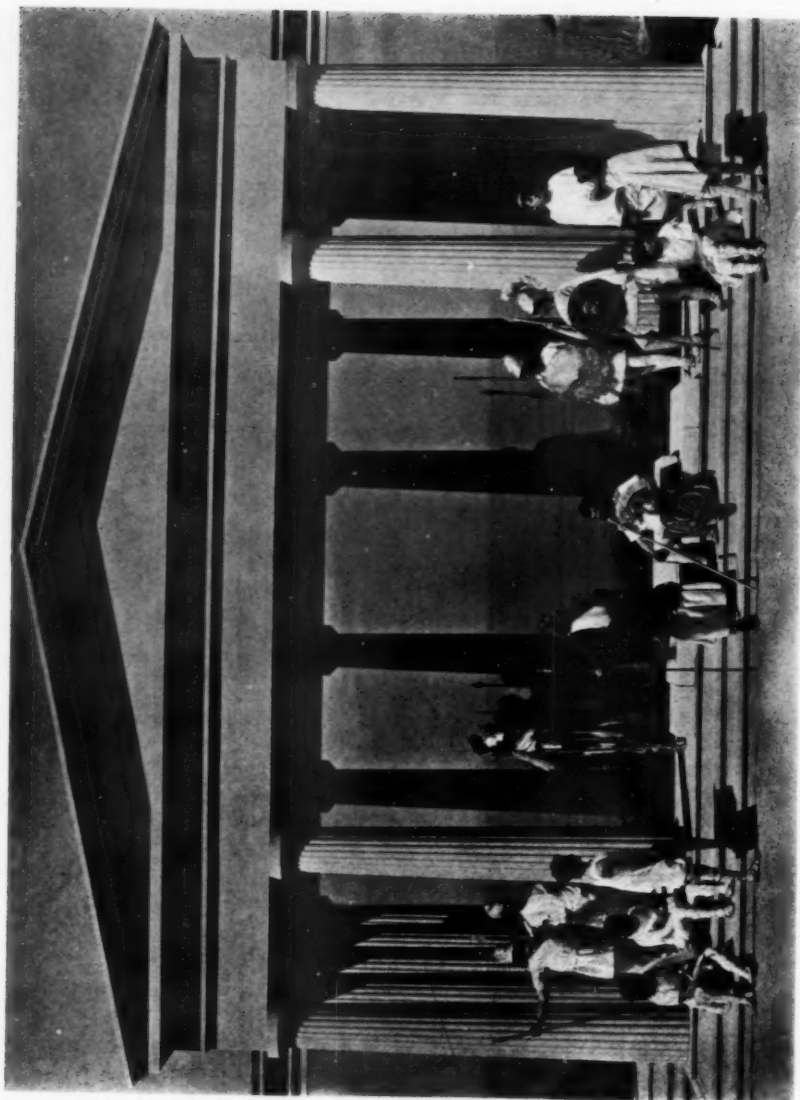
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SCENE FROM PRODUCTION AT THE GREEK THEATRE, POINT LOMA, CAL.
KATHERINE TINGLEY, DESIGNER.

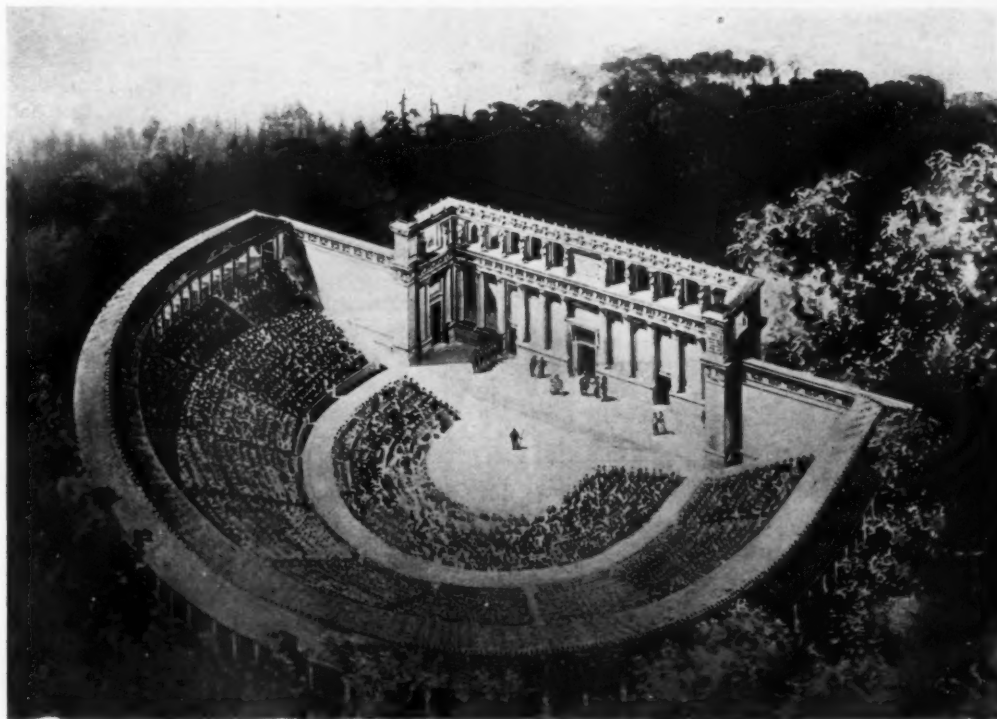
THE AMERICAN ARCHITECT

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VOL. CXVI

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THE GREEK THEATRE, BERKELEY, CAL.
JOHN GALEN HOWARD, ARCHITECT

Designing the Open-Air Theatre

By SHELDON CHENEY

PART I

IN the architectural field there are some subjects, not of wide general interest but of great importance at special times, which are so seldom written about that the architect seeking specialized knowledge must spend weeks in tracing down fugitive articles and pictures. The problem of designing an open-air theatre does not frequently come to the average architect's desk; but doubtless hundreds of architects have upon occasion spent fruitless days in seeking some sort of summary of, and guide to, the scattered information on the subject. It seems well worth while to record, for the pages

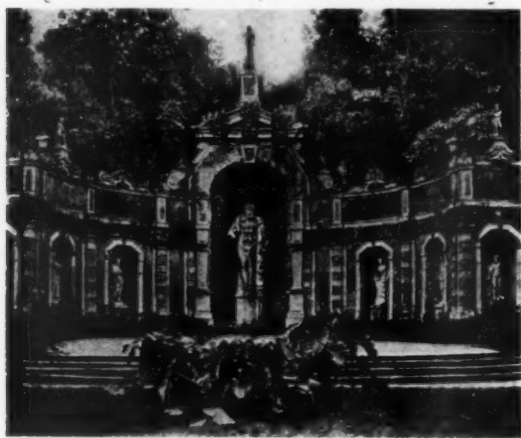
of an architectural magazine, the main principles governing open-air theatre design, and to compile references to some of the most authoritative treatises on individual playhouses.

I am the more anxious to see the material published in a professional magazine, because the architect, while striving to achieve that fullness of beauty which was in the playhouses of the Greeks, is likely to overlook certain principles and features which demand attention if the stage is to be useful for "modern" production; and by stressing constantly the stage producer's practical point of view, as

THE AMERICAN ARCHITECT

against the architect's, I may be helpful in forestalling the type of theatre which is a beautiful anachronism but entirely valueless as a practical working plant.

The insistent call to-day is for playhouses through which can flow the community's life-current: for community drama and *living* theatres. If



THEATRE OF HERCULES AT ISOLA BELLA
FROM H. INIGO TRIGG'S "ART OF DESIGN IN ITALY."

I seem to some too insistent upon this utilitarian and modern point of view, as against the archaeological and æsthetic, it is because I know what the play producer has suffered on existing outdoor stages. And, after all, a theatre may be both beautiful and useful.

It is indeed true that in the past many open-air theatres in this country were first conceived of archaeologically—that is, the novelty and historical inspiration were more of a consideration than dramatic usefulness, and the architect was so advised. But the day for that sort of thing has passed. The remarkable series of productions in the Greek Theatre at Berkeley, Granville Barker's productions in stadiums and improvised playhouses in the East, a new flowering of pageantry throughout the country, and the sudden growth of scores of "little theatre" and semi-professional producing groups, are all symptomatic of a need for outdoor playhouses of a widely useful sort.

In fitting the type of open-air theatre to the particular uses which it is to serve, the architect should insist that the institution, municipality or private owner decide definitely the type of production to be given most often. Only then can he design the general plan and technical details intelligently. There is an erroneous impression current that any open-air stage is adequate for any type of out-

door play or pageant. As a matter of fact the inflexible stage of the Greek playhouse, like the noble one at Berkeley, is in itself a bar to many of the loveliest effects of pageantry; whereas many a garden or nature theatre, in attaining the openness and pastoral beauty appropriate to pageants and masques, is shut away from the possibility of forming an adequate setting for Greek plays or for any drama that demands a more or less intimate atmosphere. The type of theatre should be determined only after a study of existing and probable needs—and not because some traveler has returned from Italy enamored of the *teatro di verdura* at Villa Gori, or because a professor wants a "Greek" theatre.

The point is this: if the theatre is to be used primarily for plays of the ordinary dramatic type, for concerts and for general meetings, it is well to have as great a sense of enclosure as possible. This means almost necessarily a bowl-like auditorium and an architectural stage-wall. In other words, the building to meet these requirements is of the "Greek" or purely architectural type.

On the other hand, if the owners intend to produce chiefly pageants, masques, dance festivals and similarly spectacular and episodic types of play, the sense of enclosure will mean little, and the designer will do well to preserve the maximum of openness, and utilize every bit of natural loveliness to be derived from the site—even to the extent of leaving out the stage-wall entirely, to open a vista through woods or over a lake or stream. Here the added bit of beauty may mean much to the visual effectiveness of a production, whereas in a Greek drama or a modern intensive play it would interrupt the care-



A GARDEN THEATRE IN THE ITALIAN STYLE
ESTATE OF HENRY E. BOTHIN, MONTECITO, CAL.

THE AMERICAN ARCHITECT

fully built-up mood created by dramatist and actor. In the auditorium, too, the bowl-like form may well be discarded for the less expensive flat or shallow type, open at back and sides. (Personally, however—perhaps it is merely an idiosyncrasy—I always like to feel a sense of *backing* when I face a stage, as if everything behind me were facing the one place where the players are.)

Approaching the question of fitness to needs from another point of view, it is safe to say that if the

types, serving widely different needs, is an intermediate one, the semi-architectural or “garden” theatre, which will sometimes prove a happy compromise. In its miniature form the garden theatre is, too, the ideal open-air playhouse for the private estate, where “amateur theatricals” are the only consideration.

In separating the three structural types thus according to usefulness—into nature theatres, garden theatres and architectural theatres—one is dividing



PLAN OF THE GREEK THEATRE AT BERKELEY, CAL.

JOHN GALEN HOWARD, ARCHITECT

theatre is to be built for an institution like a university, or for a “colony,” it usually will serve best if it is of the purely architectural type; for it will then be useful not only for the more usual classes of dramatic production but for lectures, concerts and general assembly purposes. If the playhouse is for the park department of a city, and is to be used chiefly for folk dancing and pageants, or if it is for a woman’s college that desires merely a setting for its annual festivals, then the pure “nature theatre” type, as far removed from the architectural as possible, will be most appropriate. Between these two

the field of the architect from that of the landscape designer. The first type, the nature theatre, the typical pageant theatre, the playhouse in which natural beauty and maximum openness are the first consideration and where architectural features are an unwise intrusion, is clearly outside the field of the usual architect. It is a matter for collaboration on the part of park designers and dramatic experts. We may well leave this phase of the subject with no more than a mention of the places where examples can be found. Some of the best are at Peterborough, N. H., Carmel, Cal., Pottstown, Pa., Monte

THE AMERICAN ARCHITECT

Rio, Cal., Macomb, Illinois, University, N. D., and Forest Park, St. Louis. Nature theatres of a type approaching the more artificial garden theatre may be found at Washington (near the foot of the Washington Monument), at Vassar College, at Montecito, California, and at Huntington, N. Y. In none of these do architectural features enter extensively into the design.

The second type, the garden theatre, in its purest form is also a matter of landscape design rather than building in the ordinary sense. In the Italian prototype as exemplified in the playhouses of the beautiful

There can be no doubt, however, that purity of design is more to be desired in this type of playhouse than elaboration of the decorative elements. Seldom in the history of the theatre has a more satisfactory background for dramatic action been invented than the flat-cut wall of green hedges. It is neutral and does not distract the eye from the players, and yet it has texture-interest and restful coloring. In the hands of an architect, too, such a theatre can have much of the beauty that he brings into his buildings through a careful consideration of scale and line-and-mass composition.



EXTERIOR OF GARDEN THEATRE, BAKERSFIELD, CALIFORNIA

LEWIS P. HOBART, ARCHITECT

villa gardens, the auditorium and stage were designed on formal lines but constructed entirely of clipped hedges, turf and other growing elements. In the later—and perhaps decadent—examples, the hedges lost their simple character as mere backgrounds for the dramatic action and became elaborate compositions in topiary design. This tendency is shown in the illustration of the stage at Villa Sergardi. A second example of variation from the simple hedge-theatre type is the famous "Theatre of Hercules" at Isola Bella.

The illustration shows one of the best American examples of fidelity to the original Italian type. This little playhouse, which is on the estate of Henry E. Bothin at Montecito, Cal., is a miniature copy of the famous Villa Gori Theatre. As is usual with the simple villa theatre type, the stage wings and background are entirely made up of clipped hedges. Ragdale Ring, the garden playhouse on the estate of Howard Van Doren Shaw, the well-known Chicago architect, was likewise modelled originally after the Villa Gori Theatre, al-

THE AMERICAN ARCHITECT

though later the stage was altered to make it more of the "nature theatre" type.

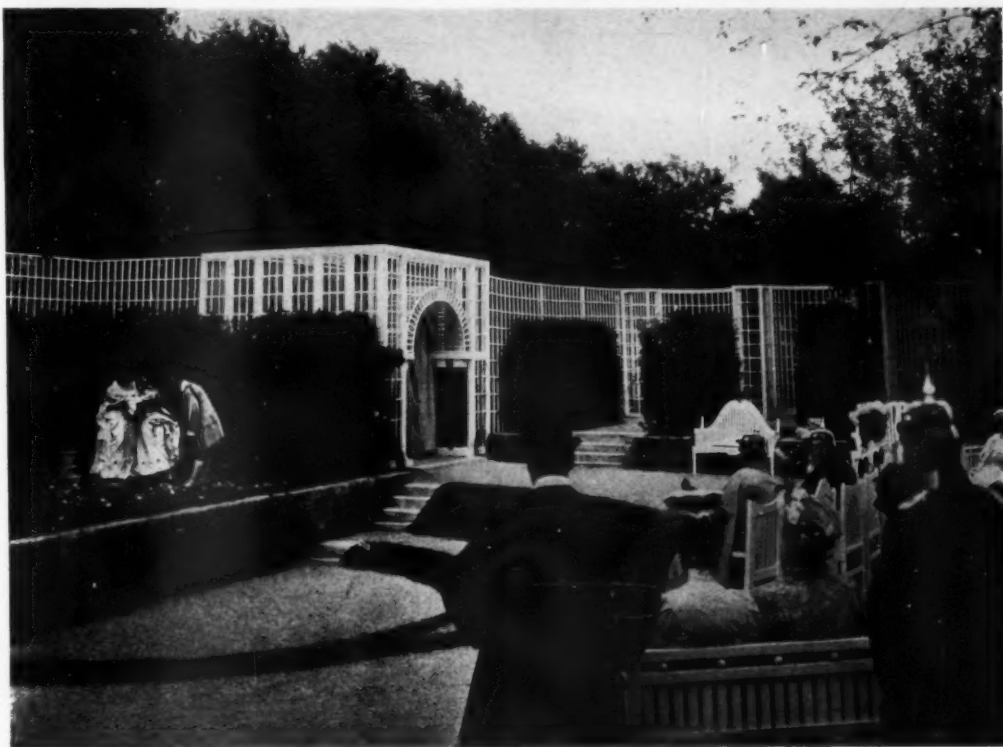
Other distinctive features of the pure garden theatre type (and this may well be made the basis for modern adaptations, even when architectural features are quite extensively added) are as follows: a stage floor of turf, slightly sloping toward the front; stage wings of clipped cypress, yew or ilex; and an auditorium floor that is either entirely flat, or flat in the center with surrounding semi-circular terraces. Quite often, in order to gain intimacy, the theatre is entirely surrounded by tall hedges. At Villa Gori, isolated cypress trees are used for emphasis of design at certain points and this feature has been copied in the Montecito adaptation. A common feature in the Italian garden theatres is a prompter's shelter fashioned of box or other hedging and placed at the center of the front stage wall.

A number of the more important Italian Villa theatres are described and illustrated in an article by Henry Vincent Hubbard in the January, 1914, issue of *Landscape Architecture*. A second illustrated article that is very useful in this connection appeared in *The Harvard Architectural Quarterly*

for March, 1914. There is considerable material about the subject also in H. Inigo Triggs' *The Art of Garden Design in Italy*.

There is, however, a sort of garden theatre which is more legitimately within the field of the architect of general practice. Recent playhouses of the type have shown a tendency to utilize more and more such incidental features as pergolas, treillage-work, arches, stairways, decorative walls, etc. These compositions are sometimes designed independently and sometimes as part of a larger house-and-garden scheme. In the latter case the theatre will, of course, take its style of design from the main building.

In either case there is an unusually interesting problem in working out the method of treatment and the combination of architectural and natural elements. The little treillage-work theatre at Mannheim, Germany, which is illustrated herewith, offers a suggestion of the way in which trellises can be used decoratively. This picture also offers another illustration of the arrangement of a restricted semi-circular auditorium floor on the flat with several terraces rising to the height of the stage or higher,

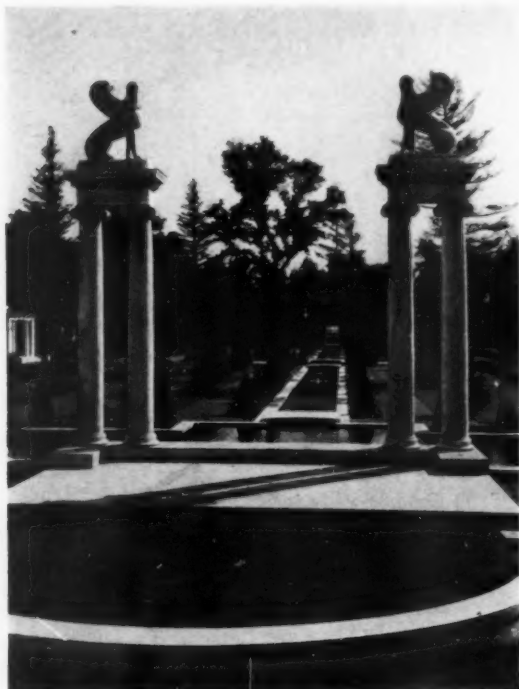


TRELLIS-WORK THEATRE AT MANNHEIM, GERMANY

THE AMERICAN ARCHITECT

and the usual slightly sloping stage lifted about three feet above the lowest auditorium level.

A good example of a playhouse in which pergolas are used decoratively can be seen at Mount Kisco, N. Y., where Martia Leonard has built the Brook-



GARDEN THEATRE
YONKERS, N. Y. ESTATE OF SAMUEL UNTERMEYER
WELLES BOSWORTH, ARCHITECT

side Theatre on her estate. As an example of the architectural garden wall treated decoratively as a stage background, the Garden Terrace Theatre at Yankton, South Dakota, illustrated herewith, is unique and suggestive. Here the architect was asked to realize the romantic Elizabethan spirit in his design, and he has succeeded admirably. The possibilities of creating new theatres of this semi-architectural sort in original design are infinite.

For the convenience of the architect who may want to see examples of the garden theatre in its purer form, without architectural features, it is well to mention as examples the Rosemary Theatre at Huntington, Long Island, the Garden Playhouse of the Sleepy Hollow Country Club at Scarborough, New York, and the theatre on the estate of Mrs. William Miller Graham at Montecito, Cal.

Perhaps the best American instance of an architect utilizing the open-air theatre as an incidental feature in an elaborate garden plan is to be seen at

Yonkers, New York, on the estate of Samuel Untermyer. Here Welles Bosworth has developed one of the most successful formal gardens in America, and he has arranged a so-called "Greek Theatre" as a terminal feature of one of the main axes. It will be clear from the illustrations that the stage is dramatically useful only for purely pageant-like effects, as there is no attempt at a built-up background for the players or a sense of enclosure. The dramatic producer is certain to deplore the expenditure of so much money for a stage that might, for the same cost, have been useful for so many more types of production; but in this case a lover of architecture is tempted to justify the whole thing on the one score of decorative beauty. It is evident that the owner and architect conceived the playhouse as a decorative unit in a larger scheme, with little regard to dramatic usefulness, and within the limits of their purpose they have succeeded beyond criticism. The smallness of the "auditorium," too, indicates that the intention was less to provide for a play audience than to offer the garden-lover a secluded place from which to enjoy one of the loveliest vistas of the whole composition.

Leaving now all the variations of the nature and garden theatres, it is safe to say that the architect is most interested in the "Greek" theatre—a name which has come to be used, often erroneously, for any open-air playhouse of a strictly architectural sort. It is true that practically all these structures follow the original Greek model in that they have architectural stage-walls and bowl-like auditoriums; but several of the best known examples in America are Roman or Renaissance rather than Greek in feeling if not in form.

The typical theatre of the ancient Greeks is less useful as a source of suggestion for the modern architect than is the later Greek-Roman transitional type. The Greek drama was such that the audience wanted primarily to see the orchestra rather than the stage, and the auditorium was often carried nearly two-thirds of the way around the orchestra circle. The modern theatre, to offer proper sight lines, must come closer to the Roman system of pushing the stage building in toward the auditorium until the stage front touches the diameter of the orchestra circle, cutting each row of seats into a half-circumference. The most accessible descriptions of the "standard" methods of laying out typical Greek and Roman theatres are to be found in the many translations of Vitruvius' "*Ten Books on Architecture*." Most editions contain diagrams.

Just here it is well to interpolate certain suggestions which the Greeks have handed down to modern theatre builders. It was generally understood that no theatre should face the south. This

THE AMERICAN ARCHITECT

holds good to-day for theatres in countries well north of the equator. The audience is the first consideration, and a southern facing would put a glare directly in its eyes. To save the actors similar annoyance a facing due north should be avoided. Considering that most daytime performances are given in the afternoon the best facing for an open-air theatre in this country is a little to the west of north. A facing to a little east of north would give the audience the maximum of comfort, but would bring a maximum of discomfort to the actors in the late afternoon.

As in Greek times, the architect will find it best ordinarily to utilize a natural hollow for the theatre auditorium. This saves expensive construction, and the effect of walking directly from gardens into the upper rows of seats can be made very attractive.

In designing the stage wall, several principles should be kept in mind. The general decoration of the wall should not be so heavy or so elaborate as to attract the eye away from the actor. For this reason it would be foolish to reconstruct in these days a true Roman theatre with its over-decorated stage wall. If the wall can be so arranged that the space for six or seven feet above the floor is practically unbroken except for the necessary doorways, the actor will have much better opportunity to dominate the scene. The stage of the Greek Theatre at Berkeley is particularly satisfactory in this connection, the figures of the players standing out somewhat as they would on a bas-relief panel.

Open-air producers are almost unanimously agreed that there should be no stage roof. The Roman theatres did not leave their stages open to the sky. But most modern attempts to return to the system have merely developed theatres approaching the indoor standard, with proscenium curtain, painted settings and all the other sophisticated devices that are so alien to the outdoor spirit.

Ordinarily the doors in the stage wall number five, and very few dramatic producers would be willing to grant that fewer would be adequate except in the smallest theatres. Usually three doorways are placed in the wall at the back of the stage, and one in the projecting wall at each end. It is hardly

necessary to add that the arrangement of a straight back wall, with a projecting wall at each end, is the logical one from the producer's point of view. The top of the stage wall was usually, according to the Greek standard, at about the height of the highest tier of seats.

The decoration of the stage wall offers unlimited possibilities to the architect. As in many other types of building, it has seemed easiest to go direct to the Greeks for inspiration, if not for actual forms. Even the most ardent apostle of the modern must admit that there has seldom been a nobler background than the single row of Greek columns; and the success of the Greek Theatre at Berkeley indicates that this arrangement may be admirably adapted for strictly modern use. On the other hand, there are some of us who cannot understand why the architect should concern himself so largely with traditional forms, particularly in connection with a building designed for an art that is developing in directions entirely unexplored by the ancients.

Personally I have in mind a very clear vision of an open-air theatre with a stage background designed somewhat in the spirit of a cathedral reredos, with a general flatness of effect that would leave the actor clearly detached from his background, and yet with a richness which would delight the eye without drawing it forcefully from the stage. Again I can see theatres that are built with practically undecorated stage walls, with an immense central panel unadorned except for the beauty of surface texture and color. Sometimes in looking at a church façade I call to mind those days in which mystery plays were acted on the church steps, and I see in ecclesiastical architecture a very practical suggestion for outdoor theatre building, particularly for that stage which is to have an open-air organ. And yet practically never is an open-air theatre designed in this country without all the earmarks of a laborious study of Greek models. What we should really get from the Greeks is inspiration in regard to beauty of line and mass, and possibly a feeling for dignity. What the architect should supply is the combination of architectural forms to bring out in an original manner these deeper principles.

(To be continued)

The Art Commission of the City of New York

THE Art Commission of the City of New York has attained its majority, having been established twenty-one years; and it may be of interest to your readers to be reminded of its activities.

Recognizing the fact that artists, whether justly or unjustly, are not taken any too seriously by the average citizen, the members of the committee which formulated the Statute creating the Commission felt that they could not hope to have power given to such a Commission if it were composed entirely of artists. They therefore decided to ask for no more than a minority of artist members of the Commission, but to attempt at the same time to arrange that a large majority of the members should be trusted citizens whose interest in art was well recognized by the artistic community, and who could be counted upon to act sympathetically with the artist members.

Accordingly the Commission is constituted of eleven members as follows: the Mayor; the head of the special Department making the submission considered; three ex-officio members; viz., the Presidents of the Metropolitan Museum of Art, of the Brooklyn Institute of Arts and Sciences, and of the New York Public Library; and six other members, viz., an architect, a sculptor, a painter, and three laymen, all six of whom are appointed by the Mayor, but from lists of names presented to him by the Fine Arts Federation of New York, which is what we may call an Art Senate in which all the art societies of New York have representatives.

Twenty-one years of experience has proved the wisdom of this formulation. During that period there has been no serious attack upon the Commission, and no claim has been made that it has acted with prejudice or unworthiness of motive. In the views of some it has occasionally made mistakes; but on the whole its judgments have proved satisfactory, as is shown in the fact that from time to time its powers have been increased.

In the beginning its mandatory powers, involving an absolute right of veto, were limited to paintings, sculpture, monuments, fountains, etc., although it might act on other matters, with similar powers, upon the request of the Mayor. In each subsequent revision of the charter of the greater city, these mandatory powers have been extended, until the jurisdiction of the Commission now covers everything that is constructed by the city, or which is acquired by gift, from a lamp post to a great civic building.

In this connection it may be well to call attention to a fact that is too often overlooked. It is not the function of an Art Commission to constitute itself an arbiter of styles. For instance, its members may be interested in classical art, and may not be sympathetic with romantic sculpture; but if a design as submitted presents a piece of *good* romantic sculpture the Commission is justified in giving it approval, accepting the onus of possible hostile criticism from those who think only in terms of classical art. The same holds true of diverse styles of architecture, mural decoration and other arts.

The Commissioners serve without remuneration, and the performance of their duties involves an amount of work, and a devotion to the interests of the city, which few realize. Up to October, 1919, the Commission had formally acted upon no less than 2,427 submissions. But this number, though large, does not adequately indicate the functioning of the Commission. Each submission, immediately upon its presentation, is referred to a special committee, with one of the artist Commissioners as chairman. These committees consult with the designers where this seems necessary, looking to modifications of design, or to the substitution of new designs where the submission is not satisfactory. They often call for models of sculpture and visit the sculptors' studios to study them.

All this involves a large amount of time and attention that is not in any way evidenced in the published minutes of the Commission's meetings. As an example, I may mention that early in this year three of the Commissioners, who are among the busiest men in our city, met three times within ten days at 42nd Street and Park Avenue to consult with the authorities in relation to the color to be used in the painting of the iron work of the 42nd Street viaduct.

The public sees the results; only the Commission records show what the city has been saved from—what it would have had if no Art Commission had existed. It is now struggling with numerous committees, and designers, contemplating the erection of local war memorials, with the hope that what might have been ugly or inappropriate, may really be dignified even though unpretentious.

Fifteen years have elapsed since I retired as Commissioner, and in returning to an intimate acquaintance with the details of the Commission's activities I see marked evidence of its beneficent influence. In

THE AMERICAN ARCHITECT

the earlier period, disapprovals were relatively very numerous; at the present time they are relatively rare. This is clearly due to the growing appreciation by the heads of Departments of the fact that there rests upon them a responsibility to present to the Commission only worthy designs by skilled ar-

tists. I believe we may look forward to a time when disapprovals will reach a minimum, and when the action of the Commission will look almost entirely to the perfecting of designs in special particulars; action which is very frequent to-day.

Henry Rutgers Marshall.

American Academy in Rome

Its Unique American Educational Work in Italy

NOW that attention is again directed to Italy it will be of interest to Americans to read the story of an outpost of American culture in the Eternal City. The American Academy in Rome has just closed an exhibition at the Century Club of the work of its graduates—architects, painters, sculptors. These men are leaders in American practice and talent in their respective fields; the American Academy in Rome has placed its stamp upon them, giving them the weapons with which careers are carved, knowledge and technical training in constant association with the workmanship and prowess of Renaissance Rome as well as the ancient city of the Cæsars. They have thus been able to make contact with the channels of thought that guided the artistic output of an age the emulation of which is at once our joy and our despair.

The exhibition in question contains examples of the work of the architects; John Russell Pope, Lucian Smith, H. Van Buren Magonigle, Edgar I. Williams, William S. Koyle, Alfred Githens; the sculptors: H. A. MacNeil, Charles Keck, Paulanship, John Gregory, Albin Polasek, Sherry Fry; the painters: F. Tolles Chamberlin, Eugene Savage, Barry Faulkner, Ezra Winter, F. P. Fairbanks, Charles Stickroth, all of whom owe a debt of gratitude for a golden opportunity to the foresight of the founders of the Academy and to the energy and educational policy of its present administrators.

The American Academy in Rome is an established institution with a history beginning in 1894, over a quarter century of yeoman work and unbroken faith so that the best traditions of the arts might prosper on our own soil. It was in the fertile brain of that most distinguished ornament of American architecture, Charles F. McKim, that the idea of such an academy was born; under his fervor and enthusiasm, together with that of Daniel Burnham, it took shape; to their unswerving devotion to this idea, their gifts to it of money and time; to their inspiring example; to the years of Frank Millet's unselfish service, and to the adherence of such

others as La Farge and Saint-Gaudens, now gone, Mowbray, French and Blashfield, happily still active among us, that the seed came to its present fine fruition.

In Rome the American Academy occupies the finest site in the city. Its buildings stand upon the summit of Mount Janiculum, the highest point within the walls. Near its gates lies the ground over which Garibaldi fought in 1849; in one of its buildings he made his headquarters for the last time and the siege left it in ruins. From the Academy windows and terraces one sees the dome of Saint Peters, mother church of them all, and all Rome lies stretched out beneath.

Mr. C. Grant LaFarge, secretary of the Academy, who is devoted to the principles which have been its guide for twenty-five years, writes enthusiastically of its great work: The American Academy in Rome offers opportunities for architects, painters and sculptors in its School of Fine Arts, and for archæologists, historians and students of literature in its School of Classical Studies. The latter was founded in 1895 and a union between the two institutions was effected in 1912. Says Mr. LaFarge: "Although its two co-ordinate branches are called 'schools' they are not schools in any commonly accepted sense. The Academy is not for teaching rudiments; it does not have classes, nor does it even impose a very rigid prescribed course. Its beneficiaries are those who have advanced far beyond the preliminary stages in their various callings. They come to Rome for enlargement and fuller development of their knowledge and talents through first-hand contact with the records of the past. What the Academy offers—its Prize of Rome—is not meant to be benevolent assistance to worthy youth, but the means whereby the best material discoverable may be raised to its highest powers for the elevation of American art and letters." The Academy sends out fellows annually, and offers in addition the privilege of its facilities to the fellowship holders sent out from fifteen American uni-

THE AMERICAN ARCHITECT

versities and other educational institutions. Fellows are chosen in competitions held throughout America.

The American Academy in Rome is a national institution and it is erected upon the underlying conception of the value of and need for collaborative work among artists. Its students come from all parts of the United States, and they are thrown together in working out their problems, "not fellowships only, but fellowship truly." It is most enlightening to note that the Board of Trustees of the Academy is composed of representatives of the provinces of architecture, sculpture, painting, archaeology, literature and history; it is furthermore stipulated that three-fifths of the trustees must at all times be professionally engaged in their respective types of work and that the three major fine arts must always be represented by no less than two-thirds of the professional members of the board. Devoted experts thus control the destiny of the American Academy in Rome.

The exhibition just closed is an index of the Academy's success and usefulness and a sustained test of its policy of educational work. The entire collection of drawings, paintings, photographs, reliefs, figures, etc., are to be sent on tour throughout the country as one of its regular traveling exhibitions by the American Federation of Arts.

Officers of the American Academy in Rome are William Rutherford Mead, president; Breck Trowbridge, vice-president; C. Grant LaFarge, secretary, and William A. Boring, treasurer.

Corrupted Forms of Design

JUDGING by the writing of "Aero," a weekly contributor to *The Architects' Journal* of London, he is a keenly observant student of his profession.

His weekly contribution, printed under the heading "Architectural Causerie," is always instructive, and his references to the practice of architecture in this country absolutely founded on knowledge.

In a recent issue of *The Architects' Journal*, discussing corrupted forms of design, he comments and quotes. In fact this gifted writer often quotes, but in quoting he has the rare gift of aiding his own writing by references that so clearly supplement as to show the thoughtful, retentive and discriminating reader.

Referring to corrupted forms of design, "Aero" has this to say:

It is curious what strange devices have, in the course of years, crept into architectural practice, more especially in the way of corrupted forms of design. The old writers were particularly averse to illegitimate procedure, and one, at least, who

translated Palladio soon after the Restoration, devoted a chapter of his book to the subject: "Of Errours." Two or three lines extracted from this delectable work are given hereunder: "It seems to me not unfit here to acquaint the Reader of many abuses, which being brought about by the barbarous, are yet observed to the end that the studious in this art may avoid them in their Works and understand them in others."

Inigo Jones made curious departures from the first works he had studied in Italy, until experience taught him the value of simplicity. Wren could pile Pelion on Ossa, and both on the lower summits of Olympus, but his work lacks the distinctive mark of his predecessors, because he lived in the age of the full-bottomed wig, and either borrowed his ornament from France or handed it over to the craftsmen following Grinling Gibbons. Neither Kent nor Chambers was free from mistakes in composition. The Adam Brothers refined the life out of their own particular manner by thinning it to suit the Macaroni palate. Soane was obsessed with the idea of tattooing his buildings in order to go one better than the men from Scotia, and not one of the whole band of architects of the eighteenth century turned out a really perfect design, for the simple reason that such a feat is beyond human capability. Yet, with all the faults of the old work, how immeasurably superior it is in tone and quality to the ill-mannered conventions of to-day!

In spite of the low standard of the vernacular, we can at least claim to have made a start toward picking up the old order of things; but too many tricks prevail to please the specialized taste. Why is it that façades are worried with heavy rustications?—that cartouches still creep like snails over the fair face of the stonework?—that designers find it essential to block their columns in an absurd manner?—that mouldings are coarse, pediments broken, ironwork clumsily designed, and ornament resembling the switchy tail of poor Frizzle hangs from the extremities of architectural features for all the world resembling the hairy appendage of the famous equine, "from the nail on the barn door"?

An architect, during a recent conversation with a distinguished lady, endeavored to make out the case for present-day architecture. The lady listened patiently to his impassioned discourse, and then replied: "Architecture will never be the same as it was, because people have no conception of taste, and we are all losing the art of living gracefully." What can we expect when the people who commission architects fail to realize that scholarly architecture is the finest commercial investment? They have a better understanding of such things in America.



In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.

The Mediaeval Guild and the Labor Union

THE mediaeval guilds were associations whose members were pledged to assist each other in the pursuit of common ends. Practically then, the only difference between these old guilds and the modern guild or labor union lies in the interpretation of a "common end." The early classification of guilds were three: ecclesiastical, social-religious and trade. In the modern sense there are no successors to the first two; the trade guild may, however, be considered the progenitor of the labor union.

For centuries the guilds of Europe and particularly in England, controlled their respective fields. Their operations were directed toward the highest development of the crafts, both as to the skill of labor employed and the integrity of its production. Under such wise conduct the guilds were important elements in the economic feature of their times, but a further and perhaps higher element was the moral and social uplift that resulted.

THE decline of the guilds and the underlying reasons for that decline may be easily traced, and the lessons to be learned by modern labor and by those who seek to control or direct it are equally apparent. Commercial progress, the development of easier and quicker means of communication reacted upon the guilds in a most unexpected manner. With a wider market and the encouragement to a greatly increased production, there was indicated an era of great prosperity. But unfortunately then, as it is even more unfortunate now, the guilds or organized labor, were inherently antagonistic to increased production, and contended then, as does labor now, that increased production was not compatible with a high wage scale.

It became at once noticeable that in locations where guilds were able to restrict production,

where custom and tradition stubbornly resisted increased production, they gradually sunk in importance, while in other localities where the influence of the guild was not felt, there arose periods of great commercial activity. It is not difficult to see the analogy between such conditions, conditions that are proven by the actual events of history, and the result of the action of labor unions in specific instances to-day, notably the printing trades. We may, for example, state and conclusively prove that during the almost three months long lockout in the printing trades in New York City, there was a loss to that city of many millions of dollars due to the fact that many publications were compelled to move to other locations where they are now permanently settled.

IF the decline of influence of the guilds was due to a mistaken policy as to restriction or production, it would now appear that history is being repeated and that the persistence of our labor unions in such a policy will ultimately work toward a similar end.

To-day the guilds of Europe have lost their vigor. While they continue in some form or another, they are but the shadow of what was a very considerable substance. Their power for good and their influence on their members for the development of a higher, broader citizenship is gone, and it will never be regained until the objects of organized labor become something more than methods to extract higher wages and shorter hours from employers.

Organized labor, when it has learned the lesson taught by the decline of the mediaeval guilds, when it has become a factor, as it could, for the development of the highest attributes of good citizenship, will attain its proper place, exert a wholesome and important influence, and receive the respect to which it will then be entitled.

THE AMERICAN ARCHITECT

Who Was the Architect?

A STATE bank in Texas has issued a circular asking for a subscription to an issue of \$675,000 of first mortgage bonds, bearing interest at 6 per cent, the proceeds from the bonds to be mainly used in the construction of a large banking building.

The proposed building is minutely described as to the number of stories, the high class of its equipment, its desirable location and many other details. The name of the architect is not stated.

The bank officials under whose direction this circular was undoubtedly prepared have apparently lost sight of the fact that by naming their architect they would, if their selection had been a wise one, have greatly aided the impression of confidence in the value of the bonds they are trying to market.

The value, as a commercial asset, of good architectural design is to-day increasingly realized. No owner of good judgment will ignore this, for he knows there is a pride of tenantry as well as of ownership. Many owners who appreciate this will couple with a reference to their building the fact of its architectural excellence and the name of its architect, with exactly the same feeling of pride of possession as will the picture collector who dwells on the names of the artists.

We feel that the Texas bank could very materially have strengthened its appeal to the bond buying public if they had incorporated in their circular a picture of the proposed building carrying the name of the architect who was to be entrusted with the expenditure of so large a sum of money.

"Cost-Plus" Contracting Methods and Production

THE "cost-plus" system, put in operation by the Government during the war to speed production, and which developed to be one of the main causes of the social unrest that has marked post-war activities in this country, has been abandoned by the Belgian Government. It is interesting to know that this method, still in use by certain contractors and manufacturers in this country to guarantee against loss and insure a stipulated profit, has proved so costly and generally unsatisfactory as to make its abolishment necessary. It is stated that the profits accruing to concerns in the Netherlands ranged from 10 to 20 per cent, and even more, according to the nature of the work and according to whether they could utilize material already in their possession.

There has recently been considerable discussion in this country as to the "cost-plus" method of contracting and its relationship to workmen's present

inefficiency. Much light has been thrown on the topic by J. J. McEntee, "business agent" in New York of the International Association of Machinists, who admits that the system "spoiled" the workmen during the war. He states that he has seen the effects of the "cost-plus" system among his associates in the shipyards "where it now takes three men to work at a winch that previously one could handle," and admits that similar conditions run through all the trades.

IT seems decidedly difficult to get an honest day's work for an honest wage under these conditions, for it is decidedly difficult to get men to change their methods and increase their output. However, they must be made to realize that the jobs that they hold depend upon their efforts and it is a question of their very existence being governed by their efficiency. To quote from Mr. McEntee:

"On the other jobs I have seen so many men that they were actually in each other's way—all this at a time when the nation needed men for its army. As a matter of fact, everyone knows that a great many of these 'mechanics' were working at their jobs merely to escape the draft.

"The 'cost-plus' contracts changed the whole order of things. There was no one in any way responsible for keeping expenses down; on the contrary, there was every incentive to run them up."

There is a decidedly good explanation of statistics which show that, taking the average of a large number of industries, production is only 60 per cent of normal. With this decrease in production can be added an increase in the wage level of from 65 to 100 per cent, which make for a decidedly serious situation in view of the fact that the only hope for a decrease in the cost of living can come from increased production. Even without profiteering there must come constantly rising prices as long as there is a decrease in the volume of products, especially of the necessities.

Stocks in all lines are being depleted, with an increase in the demand for all kinds of goods. There must be prompt action in cementing a closer relationship between the vital industrial factors, capital and labor, if a still further curtailment of production is to be avoided. The country's excellent prospects must not be allowed to go asunder because a few of the leaders of organized labor are still impressed with the conviction that it is incumbent upon them not only to regulate, but to curtail production, as being of benefit to the wage earner. How will the workingman be benefited if prices of what he has to buy are continually rising? Many commodities have already advanced beyond that increase he had already won in the way of wages.

Now, as never before, the greatest need in industry is increased production. Belgium's action in abandoning the "cost-plus" system, because it made for costly waste, should be a lesson.



PLATE 211

CORNER OF STAGE, SHOWING DETAIL.
THE GREEK THEATRE, BERKELEY, CAL.
JOHN GALEN HOWARD, ARCHITECT.

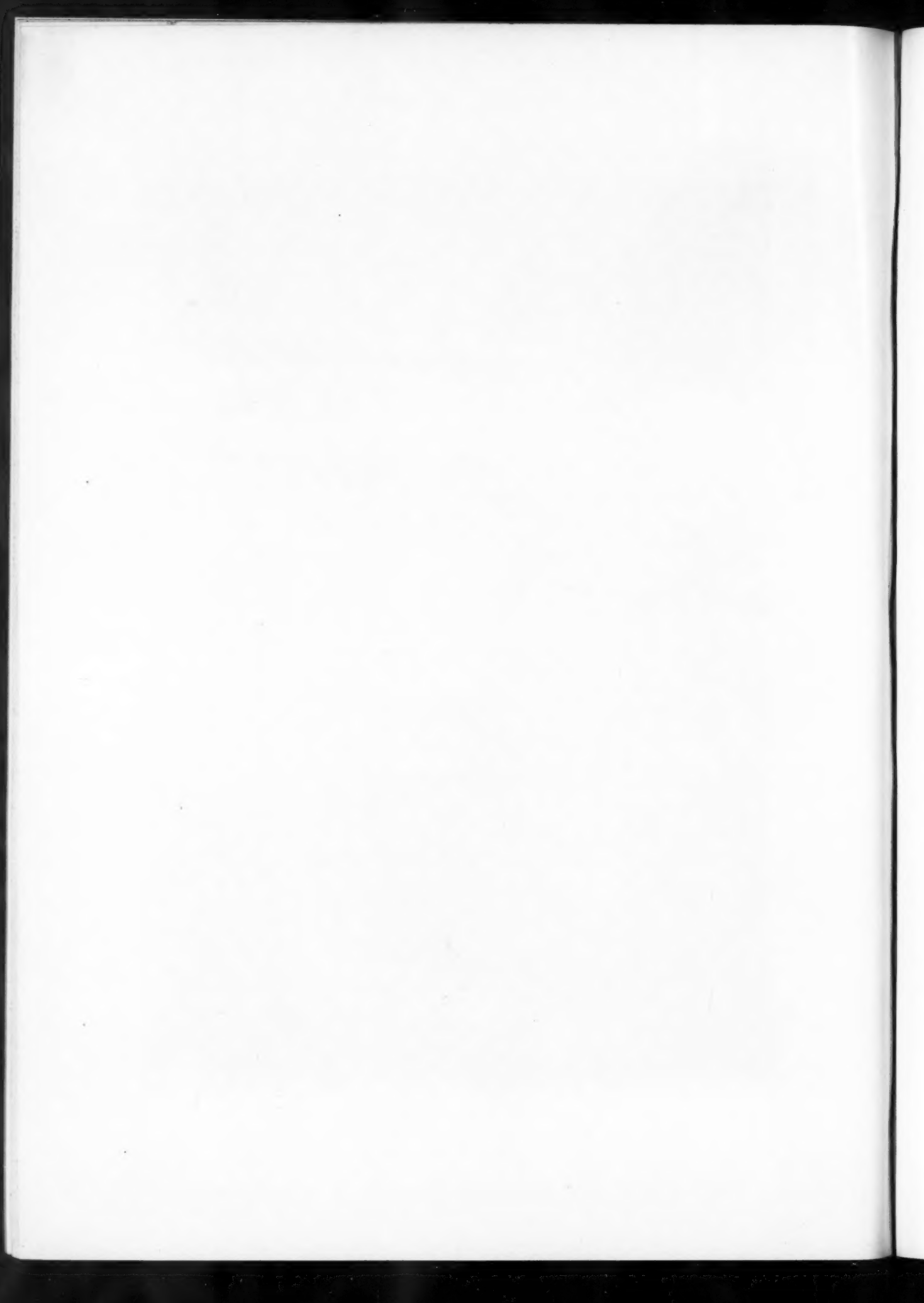




PLATE 212

THE GREEK THEATRE, BERKELEY, CAL.
AS SET FOR ONE OF MARGARET ANGLIN'S GREEK PLAYS. THE STAIRS ON THE STAGE AND THOSE IN THE ORCHESTRA ARE TEMPORARY
JOHN GALEN HOWARD, ARCHITECT.



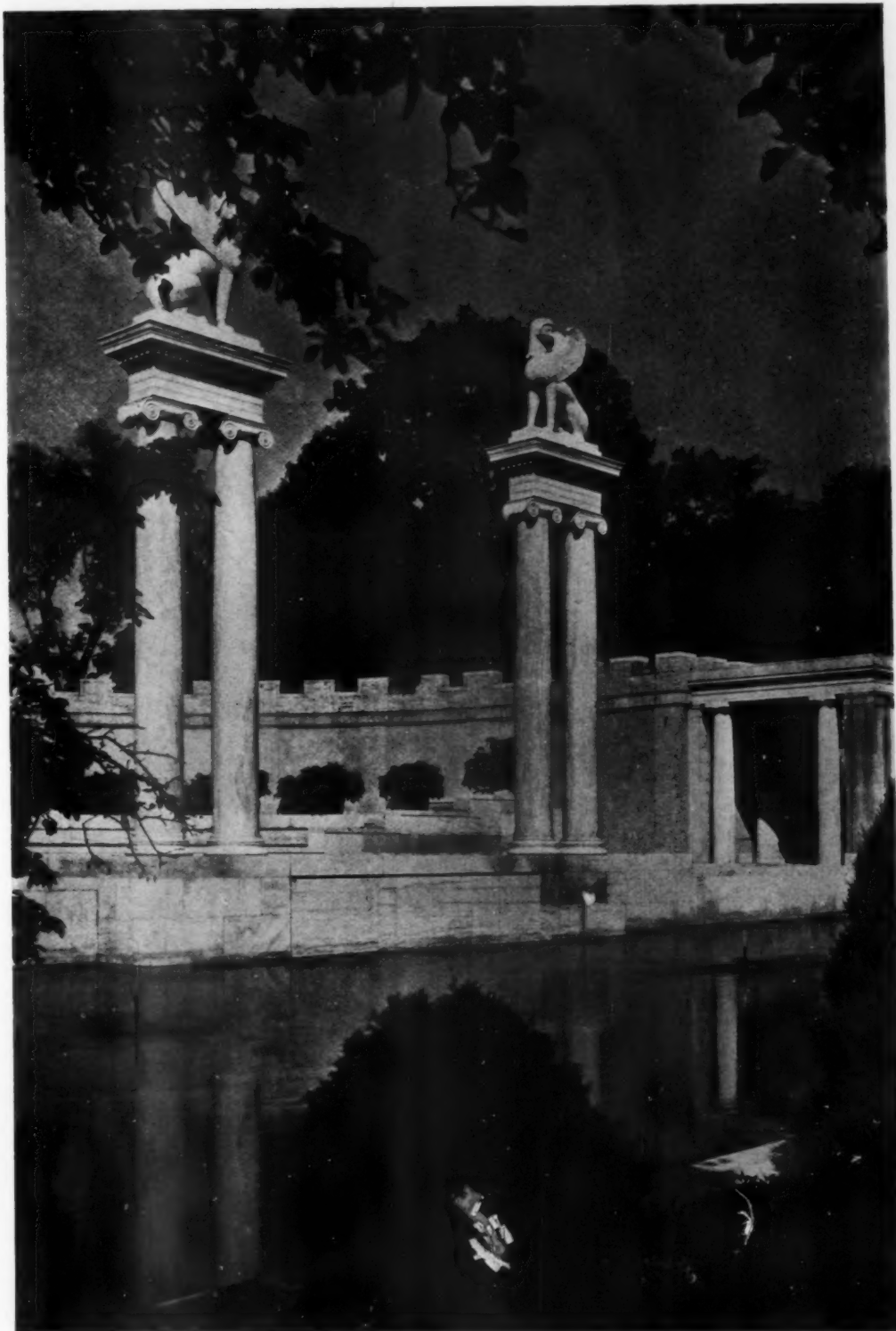


PLATE 213
GARDEN THEATRE ON THE ESTATE OF SAMUEL UNTERMEYER, YONKERS, N. Y.
WELLES BOSWORTH, ARCHITECT.



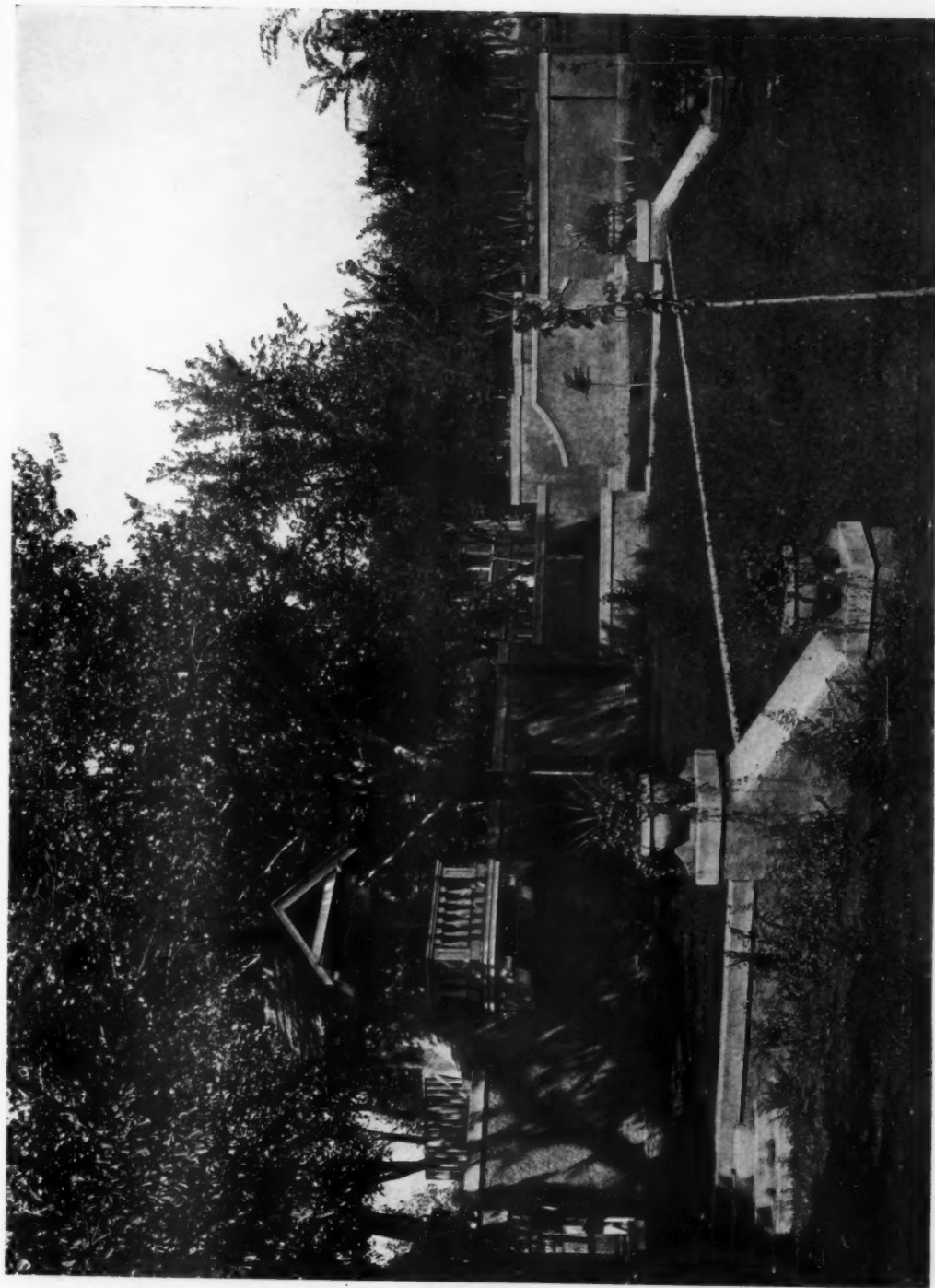


PLATE 214

STAGE OF THE GARDEN TERRACE THEATRE, YANKTON, SOUTH DAKOTA
A. R. VAN DYKE, ARCHITECT. PHELPS WYMAN, LANDSCAPE ARCHITECT.



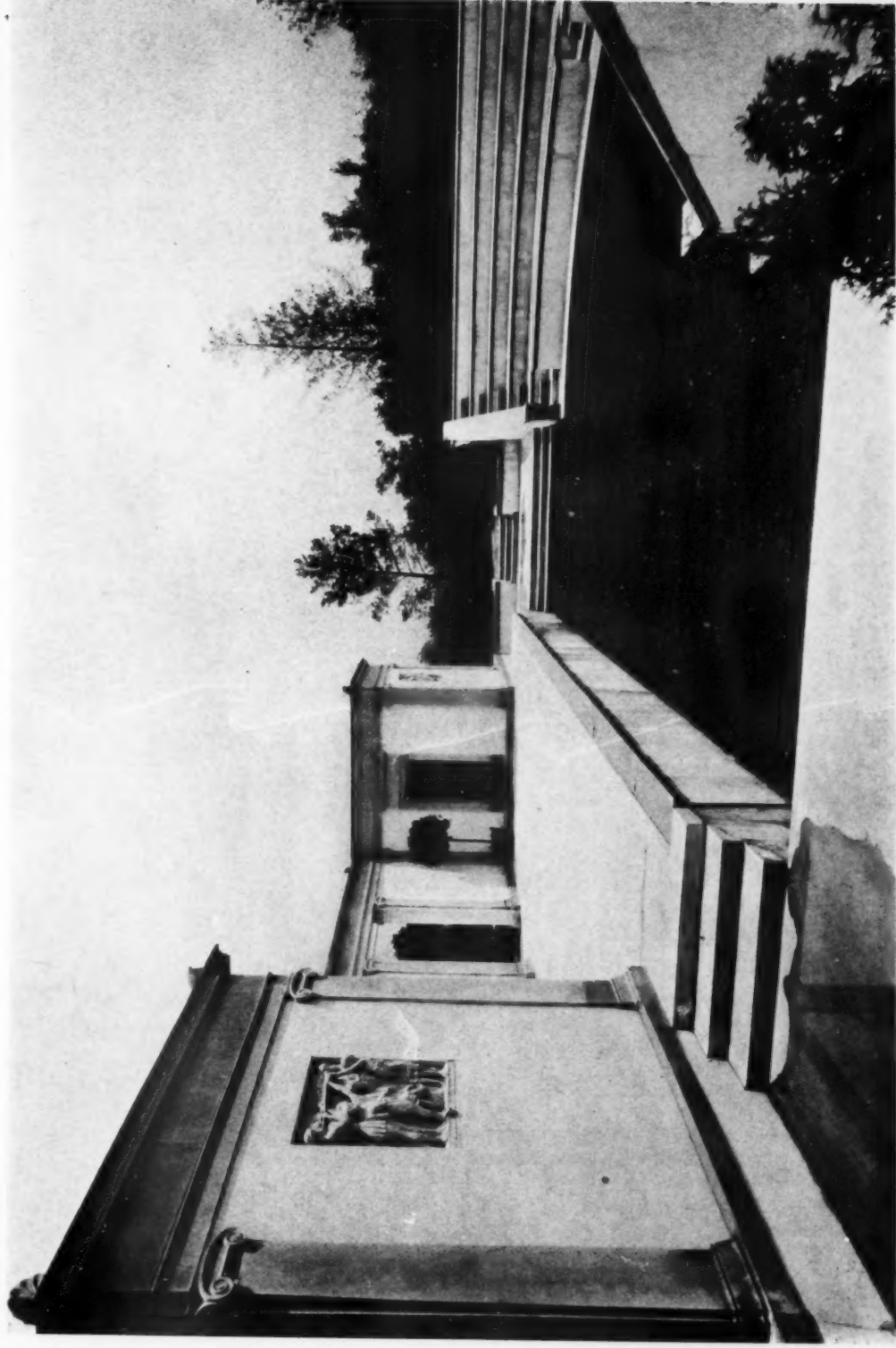


PLATE 215

CRANBROOK GREEK THEATRE, CRANBROOK, MICH.
MARCUS R. BURROWES, ARCHITECT



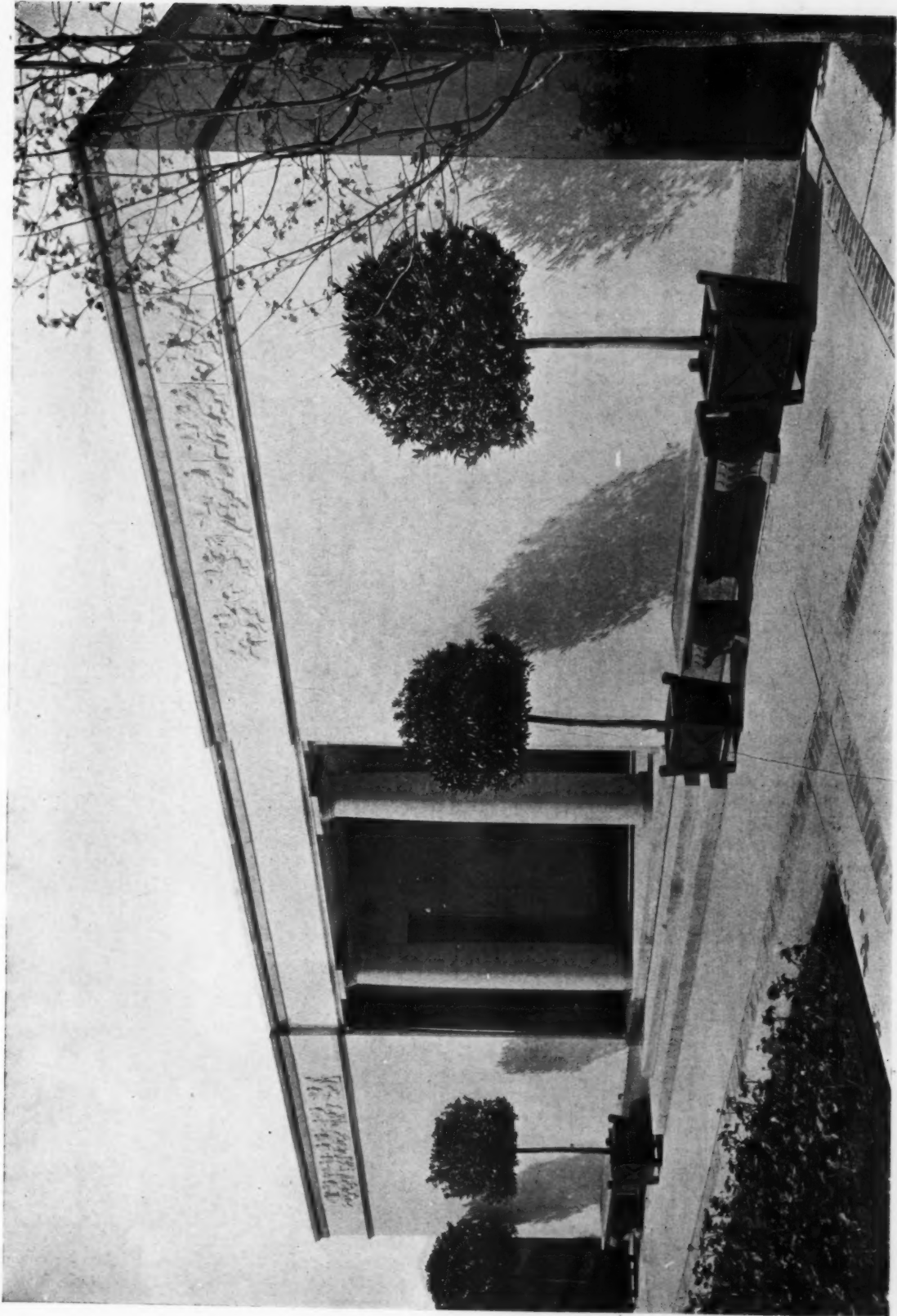


PLATE 216

SECOND STAGE BUILDING—CRANBROOK GREEK THEATRE, CRANBROOK, MICH.

MARCUS R. BURROWES, ARCHITECT



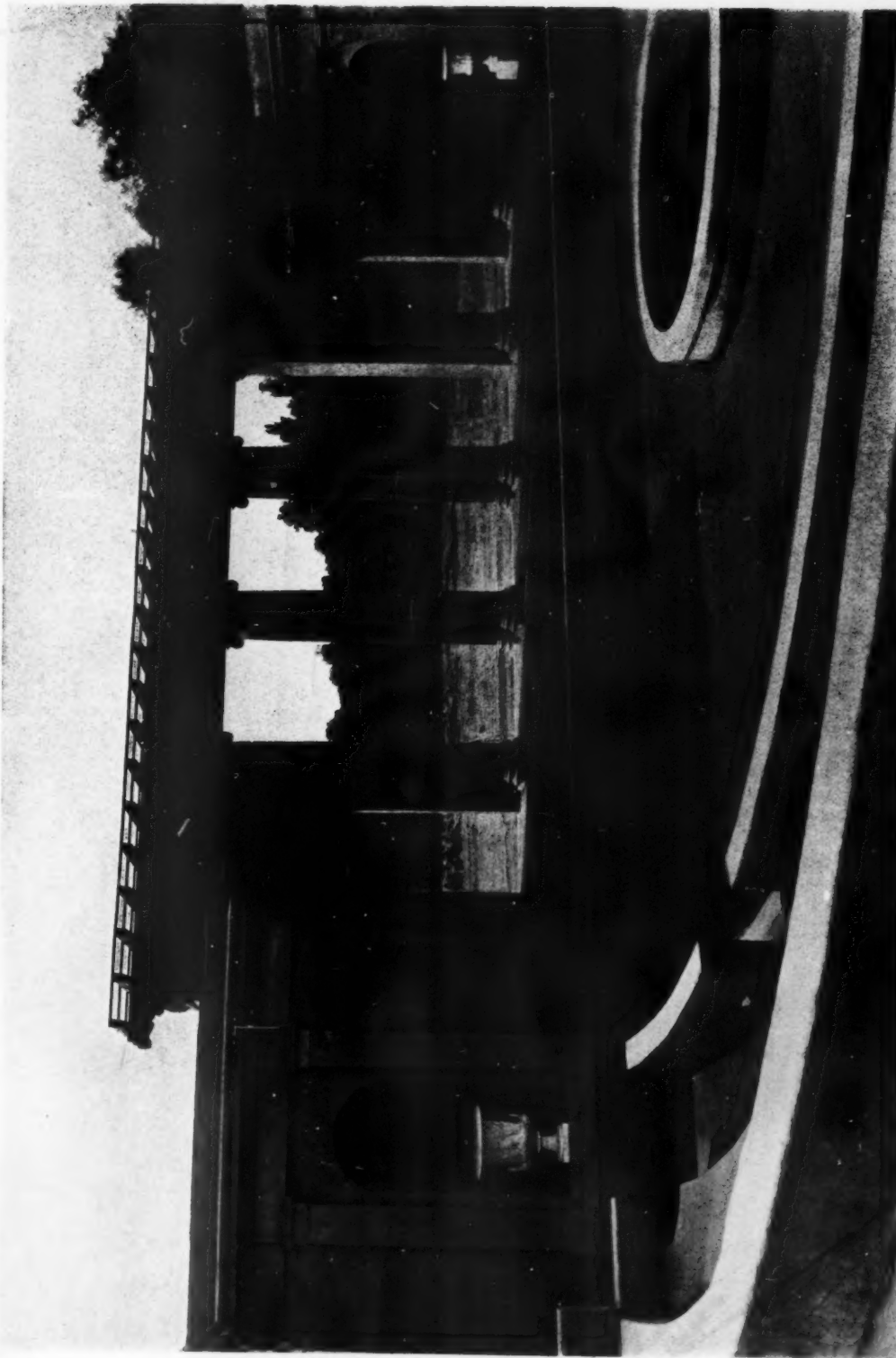
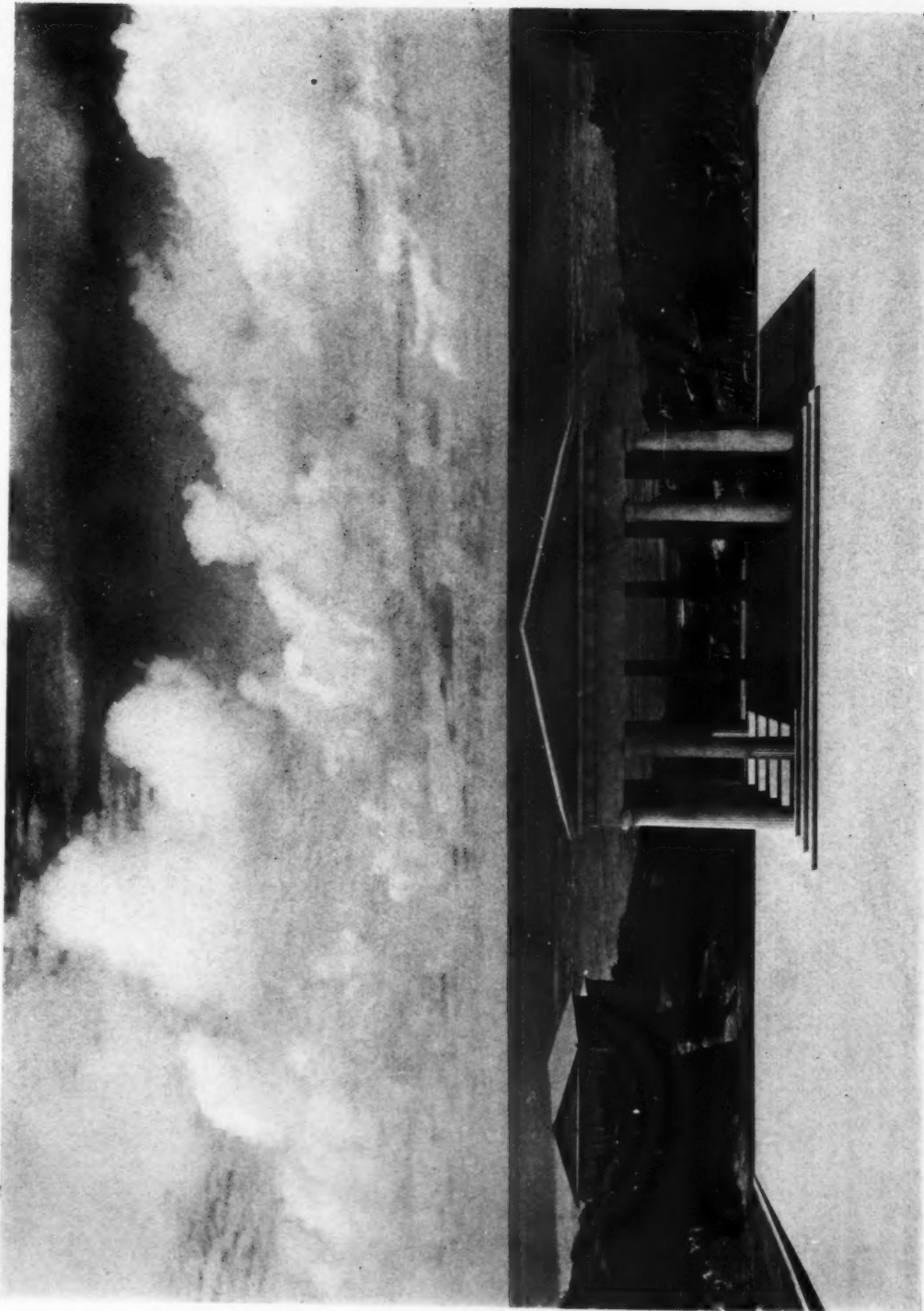


PLATE 217

STAGE OF THE GREEK THEATRE, BAKERSFIELD, CAL.
LEWIS P. HOBART, ARCHITECT.





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STAGE OF THE GREEK THEATRE, POINT LOMA, CAL.
KATHERINE TINGLEY, DESIGNER.

Current News

Happenings and Comment in the Fields of Architecture and the Allied Arts

In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.

A National Architect Whom Time Almost Erased

In all professions there have been pioneers who accomplished great things which stood as monuments of their labors while their names were practically forgotten. In architecture in the United States this is as true as in other professions.

The Kansas City *Star* calls attention to one important example in the following quotation:

"For sixty-three years he has lain in an unmarked grave, No. 111, in an obscure cemetery in the capital of the nation he served, utterly forgotten, even by the men of his own profession. He has been almost completely ignored in American history, and his name scarcely appears in American reference works."

The quotation concerns Robert Mills, "the first native American who entered on the study of architecture and engineering in the United States," and is from a recent bulletin issued by the University of South Carolina. The bulletin says further: "While Mills's early work placed him in the front rank of the architects of his day—it was not until he was past fifty that he developed his full talents and earned his pre-eminent position in American architecture. The patent office, the treasury building, the old post-office and the Washington monument are four structures upon which his fame must finally rest."

"Fortunately foreign recognition has not been wholly lacking, and at least two important works on architecture give him very extended notice, more extended, in fact, than that given to all other American architects combined."

Mills was a native of Charleston, N. C., his life spanning the years 1781 to 1855. He was educated at Charleston College and when 19 years old entered the office of James Hoban in Washington, a Charleston architect who was just finishing the White House. He early met Thomas Jefferson, who was greatly attached to him. In 1802 he made a tour of the country with letters of introduction from Jefferson. On his return to Washington Mr. Jefferson gave him the run of his library, lent him architectural works and entertained him on his estate at Monticello. This visit is said to have lasted two years, in the course of which he made the general drawing for the Jefferson mansion.

"It is probable," the bulletin states, "that on his visits to Monticello, Mills met Miss Eliza Barnwell Smith, daughter of General Smith of Hackwood Park, Frederick County, Va., whom he married soon after."

"It was from South Carolina," it continues, "that Mills won the award in competition for the design for the Bunker Hill monument, the cornerstone of which was laid by Lafayette in 1825. Mills' first independent practice was in Philadelphia, about 1810, where he had charge

of the restoration of Independence Hall and designed two fireproof wings. While in Philadelphia, Mills, in a competition, won a \$500 prize and the design for the first monument erected to Washington, that at Baltimore."

From Philadelphia Mills returned to Charleston, where he remained ten years as a member of the South Carolina board of public works. In 1830 he went to Washington at the invitation of President Andrew Jackson, who appointed him architect of public buildings in 1836. That office he held until 1851, when he retired from the office and from practice, at the age of 70.

The works of Mills most familiar, perhaps, to Americans, is the Washington monument in Washington. Mills' design was accepted by the national society fostering the project in 1833, but it was not until 1878 that the final appropriation for its completion was made.

"Personally," the article says, "Mills was extremely modest and retiring and did not seek public attention. He never signed his buildings, which, by the way, is quite a recent custom, and often failed to sign his plans."

We learn from one quarter that he had "studious habits and was a man of unusual dignity and reserve, yet affable and kindly, with the humor of 'Bobby' Burns. He was a regular attendant at the Presbyterian church, where he and his friend, President Pierce, seldom missed a service. He had one redeeming vice, the intemperate use of snuff."

Although his fame rests upon his architectural works he was also a constructive reformer and had bold plans for the development of his state and country. Old files of the *Scientific American* show that he was the first to propose a transcontinental railway to the Pacific. He advocated sane temperance measures and declared that "pauperism may be traced most generally from the dram-shop."

Prado Museum to Be Doubled in Size

The centenary of the Prado Museum at Madrid fell a short while ago and the event was celebrated in a most ambitious manner. For months past, Don Aureliano de Bernete, the director of the museum, in collaboration with Don Amos Salvador, Jr., the well-known Spanish architect, had been overseeing the building of an addition to the museum, doubling the space formerly available.

The collections which will be housed in the new galleries include the chief masterpieces of Velasquez, notably "Las Meniñas" and "The Crucifixion," works by El Greco, Titian, Rubens, Poussin, Claude Lorrain and Goya.

The museum authorities and Don Salvador are to be congratulated on their success in obtaining a maximum increase of accommodation for the collections with a minimum alteration of the exterior appearance of the building.

THE AMERICAN ARCHITECT

State's Movies Start

In line with suggestions made by THE AMERICAN ARCHITECT to utilize the medium of the motion picture in developing artistic appreciation of objects in daily use, it is now learned from the New York State Reconstruction Commission that the statewide educational film campaign, to present pictorially to the people the reconstruction problems which it now is facing, has just begun. At one exhibition Governor Smith will speak from the platform of a traveling motion-picture theatre, a specially built auto truck, carrying a portable screen, light plant, and projection machine.

The pictures will be shown in city streets and parks, at town centers, and at country crossroads on a tour which will start from Albany next week.

In addition to the moving-picture apparatus, the "movie house" is equipped with a talking machine with sufficient power to be heard over a radius of 200 yards. A record of a speech by the Governor has been made, which will be delivered from the machine while a film of the Governor on the platform is thrown on the screen. All the films have been designed to conform to the Reconstruction Commission's idea that the solution of reconstruction problems can come only from a thorough understanding of them by the people.

One film will show apples rotting in orchards of this State while oranges are being shipped from Florida and California, the inference being that intra-state traffic does not receive favorable consideration in railroad rates. Another film suggests dealing with the public health problem by establishing a health center in each community.

Proposals to be placed before the public include the retrenchment program through which it is planned to consolidate 187 state departments into 19; the suggestion for dealing with housing, as indicated by the work of other states; the request for money to carry out an Americanization campaign, and the proposal that the state free employment bureaus be continued indefinitely.

Mrs. Henry Moskowitz is secretary of the commission.

Highway Council Takes Work of Transport Committee

This important step was decided upon following information to the effect that the Highways Transport Committee, of the Council of National Defense, was to be disbanded.

It was the consensus of opinion in several conferences that the Federal Highway Council would be the logical organization to carry on many of its activities and to co-ordinate the work of highway and transport interests.

The importance of this work to the entire country has been so universally recognized as to emphasize the need for its continuance. Also the great road building program of the country is so closely allied with the transportation over the highways that it is absolutely necessary to consider one with the other.

The work will be under the supervision of Charles W. Reid as manager of the Transportation Bureau, of the Federal Highway Council.

In undertaking this work the Federal Highway Council is assured of the co-operation of the various governmental departments that have heretofore been co-operating in the work of the Highways Transport Committee.

The following policy has been adopted as representing the aims and objects:

To assist in co-ordinating the highways with the other transportation agencies of the country; to encourage the development of highways that will advance the economic life of the nation; stimulate their use in such a manner as to facilitate and cheapen the transportation of food, raw materials and finished products, and to co-operate with Government agencies, both state and national, to the end that our highways may be of maximum service in the transportation system of the country.

In announcing this platform it will be the aim of the Transportation Bureau to seek: To recognize the problems of the road builder; to realize the needs of the road user, and to visualize future highway transport requirements; to co-operate with the railroads and waterways to the end that the public may have in full that form of transportation which is most efficient, economical and practical; to study the problems attending the entrance of the motor truck into our commercial life in order that we may assist the industry which is industrially great and financially strong in its efforts to be economically right; to promote uniform legislation and encourage every movement for the safety of life and limb on the highway; to encourage the establishment of motor express lines where such lines will insure a fair return to the investor and serve a useful purpose in the community; to gather such information and statistics as will be of value to those interested in determining the economic field for highway transport, and act as a clearing house for the dissemination of the same.

Ceramic Industry Well Distributed Over the Netherlands

United States Trade Commissioner Arthur H. Redfield, writing from The Hague, states that in the matter of location the ceramic industries are well scattered over the Netherlands. Not merely the historic centers of the industry, but the two score towns less well known are contributing to the country's output of fine and coarse earthenware. There were 69 establishments listed in 1918 as manufacturing earthenware and tiles. Of these, 9 were located at Gouda, 6 at Utrecht, 3 at Delft, 3 at Arnhem, 3 at Bergen op Zoom, 3 at Maastricht, 3 at Nijmegen, 2 at Deventer, 2 at Hazerswoude, 2 at Jutfaas, 2 at Leiderdorp, and 2 at Sneek.

The largest of these factories, situated at Maastricht, employed 2000 workers. The combined number of employees in six other establishments was 755. Two of the principal factories, each employing 200 workers, used 90 horsepower each.

The most celebrated product of the Dutch ceramic industry is the blue-and-white delftware. Its origin goes back to the beginning of the seventeenth century and resulted from an effort to imitate the Chinese blue-and-white jars and plates which were just being introduced from the Orient. The industry flourished in the seventeenth century and well into the eighteenth. It extended from its original home at Delft to Arnhem, Amsterdam, Haarlem, The Hague, Nieuwer-Amstel, Oud-Loosdrecht, and Weesp. Delft alone boasted 30 earthenware factories in the palmy days of the industry. Vases, plates, tiles, and ornaments of all descriptions were produced in profusion and went to adorn the houses of the period. From the original blue-and-white the makers launched into a variety of colors and designs, finding their inspiration for the latter in the familiar scenes of Dutch daily life.

Miniature Model to Be Made of Proposed State Buildings

The state officials in Albany, New York, are not convinced that the present plans for the erection of the new State Office Building west of the Capitol are the best and that the proposed new building would not keep obscured the beauty of the Capitol and the State Education Building. In order that they might look before they leap, the trustees of public buildings, it has been made known, appropriated \$1,000 for the making of a miniature model of the Capitol and State Education Building with the proposed new office building according to the present plans for its location. The entire model will be encased and will be viewed through a peep hole, which will give the same view as though the three buildings were viewed from State street.

It has been argued that the erection of the tall office building, 10 stories being planned, would interfere with the beauty of the architecture of the Capitol and Education Building which have been favorably commented upon since the buildings west of the Capitol have been razed. Even with those low buildings the beauty of the two state structures was not appreciated and it is the opinion that the tall office building would obscure the view of the other two buildings much more than did the buildings that stood west of the Capitol on State street and Washington avenue.

The model will be made on a scale to conform with the dimensions of the Capitol and the Education Building and those of the proposed office building called for in the plans. With the completion of the model the state officials will be able to get a correct view of the group of buildings and it will then be determined whether or not to change the plans for the office building.

Old Hindu Shrine to Be Erected in Philadelphia

There is a Hindu temple in America now, the only one ever brought to the United States from its picturesque surroundings, and two experts on Oriental architecture, assisting in transplanting the structure, have found they have a real task on their hands.

They are working under a great handicap. They have sixty-four architectural units which go to make up the whole, weighing more than 100 tons. They have no plans, specifications, drawings or models. No one in America ever saw the temple as it stood. The architects must study the parts, determine to what age the temple belonged and its style of architecture, write its history and erect it in the massive rotunda of the Pennsylvania Museum and School of Industrial Art in Philadelphia.

The problem of rebuilding the shrine was taken up by Langdon Warner, director of the museum, who called upon Dr. A. K. Coomaraswamy of the Oriental Department, Museum of Fine Arts, Boston, foremost authority on Hindu architecture in this country, for aid.

Work of cleaning and polishing the stones was started at once. Photographs of the various pieces were taken and mounted on wooden blocks as a means of studying the shrine in miniature to determine the location of each piece in the original.

Doctor Coomaraswamy has carefully studied the various pieces in the collection. The condition of the stone and the manner in which they were cut are his only means of determining the age of the temple. Here he finds a discrepancy, for the shrine units suggest a building about 3000 years old while the architecture is identified as

Dravidian, which style flourished subsequent to the tenth century. Some Dravidian monuments extend even to the seventh century. The stones are remarkably clean cut and little weather beaten. But the remarkable South Indian climate may account for the good state of preservation.

Carved figures on many of the massive columns show suggestions of Egypt. There is the Egyptian fondness for giving a direct front view of some monster with no attempt at toning down the lines. The friezes of the Indian shrine are well filled with characters in action, much after the style of Doric temples.

It is thought the building had a wooden roof, like many buildings of that period, which, with the passing of time had rotted away, leaving the interior exposed. According to Doctor Coomaraswamy the building was apparently octagonal in shape and surrounded by columns, each carrying a highly ornate capital. In temples of that period the sanctuary itself was often low and insignificant, bordered by imposing porches and hypostyle halls, and Director Warner believes it is to a porch of this sort that the many columns in this collection belong.

Brooklyn Museum Receives Chinese Art Treasures

The Brooklyn Museum has recently received from Samuel P. Avery an added gift of Chinese cloisonne enamels and bronzes. The entire collection, which is believed to be the largest and finest in the world, has been rearranged to its best advantage from the exhibition point of view. The Museum has placed upon the wall panels describing the process of cloisonne enamel and giving general information regarding the various classes and periods of enamels and bronzes.

One case shows bronzes varying in color from almost black to a beautiful golden color, depending upon the amalgam used. Here, also, are gold and silver inlays on bronze and the "sun-spot" pieces, with the pure gold hammered into the bronze. One case contains human figures in both cloisonne and bronze, covering the various periods of Chinese art. One case holds odd pieces of unusual shape, animals, shells and other curious examples. The new pieces have not been placed together, but wherever they will show to the best advantage, and include 73 cloisonne and 37 bronzes. The large pieces include incense burners, vases, a large plant jar of wonderful design and color, a Peking enamel table of the Eighteenth Century, temple bells and lanterns. Although less showy, the smaller pieces, boxes, candlesticks, hat-stands, plates, bowls and the tiny snuff bottles are of equally beautiful workmanship and color.

The recent acquisition to the Avery collection brings the total number of pieces of cloisonne and enamels in the museum to 360, the collection including not only a greater number of pieces than any other in the world, but a greater variety of shapes and a greater degree of excellence in workmanship. Every piece exhibited is labeled, giving period and date, and with the larger pieces, a more detailed description.

President Monroe's Old Home Is Sold

Oak Hill estate, near Leesburg, Va., former home of President Monroe, containing 1500 acres and including an old orchard from which Queen Victoria of England was supplied with Albemarle Pippin apples, has been sold by Mrs. Henry Fairfax to Frank C. Littleton of New York. The price is said to have exceeded \$260,000.

THE AMERICAN ARCHITECT

May Recover Works of Art

An ancient story of the greed of kings has been resurrected by an erudite member of the Institute of France, Mr. Adrien Blanchet. The fact is there is some prospective work on hand for the utilization of the Rhone water power. Thus do ancient history and modern enterprise come to hobnob in the revue des études anciennes. The story tells how the King of France, Charles IX, coming one day to Arles, saw the Roman sarcophagi and wished them his. He did not covet long, for the next act in this kingly episode was the shipping of the most perfect of Rome's monuments en route for the capital city. This may have furnished a later king of France, namely, Louis XIV, with the precedent for the removal of the statue of Messalina from Bordeaux; not that that monarch ever needed either precedent or encouragement for his actions. The sarcophagi started on their journey. It was in the year 1565. They had unfortunately not gone beyond the famous Pont-Saint-Esprit, before the boats sank beneath so unusual and weighty a load. Now, the congress for the development of water power, which sat a short while ago, discussed among other schemes the transformation of the Pont-Saint-Esprit. The question is—and it will be admitted to be an absorbing one—during the excavations in the bed of the Rhone will these sarcophagi, lost nearly four centuries ago, be recovered?

Old House to Be Museum

A movement is on at Riverside, Cal., for the preservation of a number of the old landmarks of the vicinity buildings and spots intimately connected with the early history of southern California. The plan is being fostered by the local chapter of the Daughters of the Revolution and the Pioneer Society.

The first project to be undertaken is the restoration of the old Rubidoux home, an adobe structure, which was built by Indian labor three-quarters of a century ago. The Rubidoux family was one of the most prominent of the early Spanish residents, and the home was a social center for the interior section. Many of the notable events of history of the period just previous to the forty-niners are more or less intimately connected with this old building which in recent years has been abandoned and has begun to crumble away.

After the work of restoration is completed the building will serve as a nucleus for a pioneer museum for the housing of many relics of the early days.

Preserve Old Buildings with Wax

They are preparing to cover the old City Hall in New York with wax to preserve it. This ancient pile, of which New York is so proud, is to be armored against time and weather by the application of this compound. Contracts have been signed to that effect and the city has gone on record to the extent of \$12,000 as being in favor of preserving this finest of its old buildings. Wax, as candles, was used in the days of its youth, to light the City Hall. Now it will guard it in its age.

The preserving process is unique and interesting. Disintegration is prevented by dissolvings and recrystallizing the stone surface. The surface is raised above the melting point of the wax compound, which is 140 degrees Fahr. Then hot melted paraffin, containing creosote dissolved in turpentine, is brushed across the stone and per-

mitted to penetrate to a point of saturation. In marble the penetration may reach a half inch. Bricks can be completely pierced without destroying the adhesive properties. As the wall cools, the wax congeals, and if some of the liquid remains on the surface it demonstrates that the pores of the stone or brick are filled completely to the depth reached. Then a reheating causes the absorption of this excess and leaves the surface clear.

The paraffin combination is not affected by weather, alkali or acid. The use of creosote prevents organic growth upon the surface. Evidence of the preserving value of the process is available in the obelisk case. This monument was set up in Central Park in 1881. In four years 780 pounds of stone chips fell to the ground, by reason of the new climate. It was in 1885 that the paraffin process was applied and, although the work carries a guarantee of only ten years, there is still no indication of weathering.

The Confederate monument in the park extension was preserved in the same way and it is withstanding the elements fully as well as expected.

London Proposes Garden Cities

Millions of pounds are to be spent in the creation of a system of industrial garden cities which ultimately will rim metropolitan London. The scheme, just outlined, is the most elaborate city-building project ever undertaken in England and is an adaptation of the model industrial town idea originated some years ago in the United States.

Building on the first of these "flower garden" suburb cities is to begin next year north of London, according to newspaper announcements. The town will be self-supporting and will cover several thousands acres. Within its precincts will be an agricultural area. Its populace will be supported by several engineering industries to be located there.

The project is an attempt not only to solve London's housing problem, which has become a grievous one, but to prevent an overwhelming congestion of the city's industries and other commercial activities.

The Fall of a Chimney

The Vigo chimney, at Northampton, England, for nearly fifty years the most prominent county landmark, 250 feet above the surrounding landscape, is reported to have disappeared in a crash of falling bricks and a cloud of dust, by the *Building News* of London. It took two years to build and about two seconds to demolish. Three men were killed during its construction, but its destruction was happily attended by no unforeseen incident. The chimney was dated 1871, and is said to have contained two million bricks and to have weighed about 2,000 tons. The work of felling was entrusted to Mr. Joe Ingram, a son of the well-known "Parachute Joe", who occupied two days in preparing the base of the chimney before "blowing" it with two pounds of gelignite. For a moment after the shot was fired nothing happened. Then the chimney swayed slightly and suddenly it fell, not sideways, as had been expected, but straight down as if the earth had opened up to receive it. It simply collapsed on its base, "sat down," as someone said, and all was over. The bricks, which lie in a huge pile, are good, and said to be worth at least £1,000, and there are sufficient to build a large number of cottages.

THE AMERICAN ARCHITECT

English Housing Plan

The Swansea Corporation of Wales has received official sanction for the first part of its housing scheme, and construction will commence without delay. The scheme provides for the erection of 3000 houses at a cost of about £800 each, as compared with the pre-war cost of £270. This will mean a total expenditure for housing of £2,400,000.

Most of the dwellings will be erected on Town Hill, which is part of the corporation's own estate. Swansea's municipal estate is valued at £2,000,000 (\$9,733,000), and is said to be the second richest in the country. The corporation recently purchased from Lord Swansea the so-called Singleton estate, which is about 250 acres in extent. The purchase price was £90,000 (\$437,985), but that sum does not include the timber and minerals.

Rebuilding Devastated Belgium

One of the questions which the Belgians discussed passionately during the German occupation was the rebuilding of their destroyed towns. We can foresee, to a certain extent, the main lines on which this huge work of reconstruction is going to be run. A sharp distinction must be established between towns which have been completely destroyed, like Dixmude and Nieuport, and others which have been partly preserved, like Louvain and Dinant. The first can be rebuilt according to any rational plan which meets with the approval of the state and of the local authorities, without taking any account of the past. It is, however, doubtful whether any violent departure from the old traditions—like that proposed by the promoters of "garden cities"—will be made, since this would mean a complete change in property assessments—a rather difficult task when we remember that most of the houses were owned by their occupants. So writes Emile Cammaerto in the October *Yale Review*.

When it comes to the partly destroyed towns, two schools of thought are in conflict. There are the modernists who are ready to sacrifice the half-ruined remains of a beautiful past to the exigencies of modern life, and the conservatives who would like to rebuild the town solely to emphasize the importance of the few historic monuments which have been more or less preserved. The latter attitude of mind is not necessarily more artistic than the first. The restorers do not content themselves with re-establishing things as they were in 1914; they would like to use this opportunity to do away with all modern buildings in order to obtain what they call a "perfect architectural ensemble," dating from a single period, and ignoring the important fact that towns have a life of their own, like human beings, and that such reconstructions, besides being impossible (since the stone carvers and master masons of the past cannot be brought to life again), could only produce an utterly artificial result. These dogmatic restorers have already done sufficient harm in the past and it is to be hoped that no fresh chance for mischief will be given to them in the future.

The prevalent opinion, however, championed in the press by those who enjoy the greatest moral authority, strikes a middle course between the two extreme views. And for once this middle course presents also the most artistic solution of the problem. It would be foolish, they urge, not to take this opportunity to broaden the main streets for the convenience of future motor traffic, but at the same time if the old buildings are to be preserved, their immediate surroundings must not be altered to the

extent of spoiling the perspective. Suppose, for instance, that the Grand Place of Louvain should be made the center of a number of broad streets so that the Town Hall could be seen from afar; this monument, whose effect of greatness was partly due to the narrowness of the adjoining streets, and to one's surprise in seeing it suddenly on debouching from them, would lose a great deal of its charm and beauty. The principle advocated would be to preserve the center of such cities as Louvain and Dinant more or less in their original state, without attempting any artificial remodeling, and to lead the main traffic through wide roads which would surround them.

A Historic Mansion and an Early Strike

Oatlands Lodge, Weybridge, which is up for sale, is presumably the Oatlands to which Charles Greville makes so many references in his voluminous memoirs. The *Architects' Journal* of London quotes from an amusing entry in his diary, under date August 30, 1819, which relates to something very like a strike: "I am just returned from Oatlands; we had an immense party, the most numerous ever known there. The Duchess wished it to have been prolonged, but there were no funds. The distress they were in is inconceivable. When the Duchess came down there was no water in the house. She asked the reason and was informed that the water came by pipes from St. George's Hill, which were stopped up with sand; and as the workmen were never paid they would not clear them out. She ordered the pipes to be cleared and the bills brought to her, which was done. On Thursday there was a great distress, as the steward had no money to pay the tradespeople, and the Duke was prevailed on with great difficulty to produce a small sum for the purpose." Oh, "gallant" Duke of York! In matters of disbursement he was (to use an eighteenth century idiom) "monstrous gouty-handed." But the British workman changeth not; except, perhaps, that nowadays, having become more sensitive and quite super-sympathetic, he will down tools with much less provocation, and what would happen if he did not get his wages down on the nail is ghastly in the conjecturing.

Aluminum Substitute for Copper and Brass

A new invention called conducting aluminum M. 277, which is said to be creating a profound impression, has been made by Dr. Georges Giulini, the most famous expert in the aluminum trade, reports Consul Philip Holland of Basel, Switzerland. This new metal is produced by putting the ordinary aluminum through a special patented process, by which it acquires the same mechanical qualities and capacities as bronze, copper, and brass without changing its specific weight.

It is said that the price of the new metal can be kept within very low limits; so that, even at the pre-war prices of other metals, it will be able, by reason of its smaller specific weight, to compete with copper and brass very favorably. The fact that the new metal is a conductor will make it especially in demand in the electrical trade. The inventor anticipates for it also a good market among the builders of motor cars, aeroplanes, ships and railway carriages. Leading men, to whom the invention is already known, are said to be much impressed with its possibilities.

News From Various Sources

Authoritative denial of rumors that the Canadian Government contemplated an embargo on the export of newsprint paper has been received by the Bureau of Commerce.

The long-pending wage dispute between the British Government and the railway unions seems to have been settled. The victory apparently is on the side of the railway men.

The *Survey* announces that Kentucky has organized a co-operative council as a clearing house for plans of State welfare. Functions will include preparation of program for unified action on social legislation.

Cable to New York *Sun* states that British Government will introduce 5 shilling notes, owing to present high price of silver, new note being equivalent to American dollar bill at present rate of exchange.

A widespread campaign for the disposal of all the passenger ships held by the United States Shipping Board is to be immediately undertaken, it is stated by Chairman Payne of the board.

An annotated list of references on war memorials, arranged under the following heads: General Works, Monuments—Sculpture, Community Houses, Trees, and Miscellaneous. Prepared and issued by the New York Public Library, 476 Fifth Avenue, New York.

The British Government is planning a great overseas trade offensive, declared Sir Hamar Greenwood, head of the Department of Overseas Trade, in the course of an interview in which he outlined the scheme. It includes sending of touring trade exhibitions to South Africa.

Associated Press reports from Chicago that, with closing of thousands of less essential industries throwing 200,000 men out of work and the adoption of a six-and-one-half-hour business day for stores and office buildings, Chicago felt first practical effects of coal shortage.

Chief of Construction Division announces that during war Construction Division of Army has contributed something new and epoch-making to terminal engineering and commercial warehouse operation in securing maximum elevator efficiency. At Army Supply Base in Brooklyn there are 96 elevators now in use following this system.

Elimination of profiteering in sugar, with the consequence that present prices will be reduced and hoarded supplies placed on the market, has been promised by the Food Administration Division of the Department of Justice. This will be accomplished through exercising the war-time act as extended during 1920 by the McNary bill, it was said.

The American Library Association has voted in favor of a \$2,000,000 fund to be expended among other things for "education in citizenship and American ideals." The programme also includes provision for books for the blind, library branches in communities without free library service and circulation of books in army posts and in other Government and civic centers.

A pamphlet compiled by the State Highway Commission of Maine contains a large map of Maine's improved and unimproved State highways, tables of statistics, a general statement of results already accomplished, and a discussion of the need for the proposed road bond issue amendment now before the Legislature. Apply to the State Highway Commission, Augusta, Me.

A study by Frank Backus Williams, of the New York Bar, of the legal powers of the city authorities of Akron with regard to the establishment of a city plan, in such matters as the acquisition of land for public use, the relocation of public and semi-public buildings, building regulation and zoning, and city planning finance was published by the Akron Chamber of Commerce.

Rumors have been flying about the studios for some time that all of the paintings of ultra-modern tendencies that were part of the American art exhibition sent to France had been rejected by the authorities of the Luxembourg Museum. The news was confirmed at a recent meeting of the jury that chose the paintings. Even a work by Max Weber, a member of the jury, was rejected.

A collection of facts in support of a proposed amendment to the State constitution providing for the condemnation of more land and property than is needed for the acquiring, opening and widening of parks, boulevards, public places, streets and alleys by municipalities within and beyond their boundaries was published under head of "Excess Condemnation" by the City Plan Commission, Detroit, Mich.

Net earnings of the railroads of the United States for the month of November were the lowest in thirty years, according to preliminary figures on revenues and expenses of the larger systems made public to-night. As a result in the drop in November earnings, due almost entirely to the coal strike and its effect upon transportation, the Government is facing a net deficit for the month's operation of the roads of approximately \$64,500,000.

Registration fees for pleasure automobiles will be higher this year with the introduction of the new method of computing the tax according to the horsepower, list price and age. The more expensive cars will be most heavily taxed. Heretofore cars have been taxed on their horsepower alone. Since the rates differ according to three variables instead of one, schedules have been prepared and sent to automobile owners for assistance in computing the 1920 fees.

Refuting charges made by the Asphalt Association and Edwin Duffey, former Highway Commissioner, that New York State is preparing to build a system of concrete roads costing \$40,000 a mile, Frederick Stuart Greene, Highway Commissioner, sent a letter to-day to the fifty Senators and 151 Assemblymen and members of the boards of supervisors in fifty-seven counties, in which he presents a table, prepared by the nine division engineers, showing that the average cost a mile of a reinforced pavement is \$28,544.12.

THE AMERICAN ARCHITECT

Personals

Orlando Van Gunten, architect, recently discharged from the army, has reopened his office at 64 East Van Buren Street, Room 512, Chicago, Ill.

Robert O. Scholz, architect, has opened an office at Room 700, Davidson Building, 921 Fifteenth Street, N. W., Washington.

The firm of Van Horn & Loven, architects, Bismarck, N. D., dissolved partnership and K. A. Loven, architect, located in the Webb Block, desires catalogs and samples.

K. Lee Hyder, at present and during the last year with the American Appraisal Co. of Milwaukee, is to reopen his office in the David Whitney Building, Detroit, Mich., which he was compelled to close during the war.

Herbert S. Crocker, M. Am. Soc. C. E., and Francis S. Crowell, Assoc. M. Am. Soc. C. E., announce their association as consulting civil engineers under the firm name of Crocker & Crowell, with offices at 101 Park Avenue, New York.

On Dec. 1, 1919, C. F. J. Barnes, architect, will remove and combine his offices with Jos. E. Mills & Son, architects, 1305 Kresge Building, Detroit, Mich., where he will continue a general architectural and structural engineering practice.

H. H. St. Clair, architect and engineer, will reopen office shortly in Charleston, W. Va., and will appreciate catalogs on following: Ice machines and refrigerators for country homes, etc.; gas machines for country homes, etc.;

plumbing fixtures; hardware for closets; wardrobes; sash balances; roofing tile.

Joseph Della Valle and Toby Vece, architects, announce the opening of their offices at 865 Chapel Street, New Haven, Conn. Manufacturers' catalogues and samples are requested.

William Lyon Somerville, architect, formerly partner in the firm of Murphy & Dana, of New York City, wishes to announce the opening of his office in the Imperial Bank Building, corner of Yonge and Bloor streets, Toronto.

Richard M. Bates, Jr., of Huntington, W. Va., now has rooms in the Citizens National Bank Building for the practice of architecture.

Prof. Newton A. Wells, for twenty years on the architectural faculty of the University of Illinois and head of that department, has resigned to go into a construction business.

M. T. Hardin, architect, of Muskogee, Oklahoma, has been appointed State Architect by the Board of Affairs, succeeding Jewel H. Hicks, architect, of Ardmore.

Architects Dittoe, Fahnestock and Garber of Cincinnati, Ohio, have opened new offices in the Conrad Building in that city.

Lawrence W. George and William H. MacLucas have formed a partnership for the practice of architecture under the firm name of George & MacLucas, with offices at 934 Lemcke Building, Indianapolis, Indiana.

Frederick Meisler has opened an office in Washington Avenue, Little Ferry, New Jersey, to practice architecture, and desires samples and catalogues.

Financial and Commercial Digest

As Affecting the Practice of Architecture

Trade Activity and Living Costs

The American people are continuing to make enormous expenditures for the sort of luxuries which are in demand only at times when people are well supplied with money, states the *New York Sun*. Charles M. Schwab has said that there never was such "a riot of luxurious expenditure," and the other day the president of the Equitable Life Assurance Society declared that unless the American people checked their present habits of extravagance a panic ultimately would be encountered. He added that although the nation's wealth had increased as measured in dollars, that gain was largely because evidences of wealth had increased at a greater rate than the wealth that it represented, which means that the country is suffering from the inflation which inevitably results from the effort to finance the prodigious expenditures of the war period. That inflation has reached a point at which, according to Prof. Irving Fisher of Yale University, our dollar represents in purchasing power just about what 33 cents stood for in 1895. Advices from various sections of the country show that absorption of high-priced merchandise was never as general as now and indications are that the country's holiday trade

this year will break all records. There is no telling how much further that craze will go nor just what will have to happen before it be checked. But the great need of the hour is to get the people to cultivate thrift habits and enlarge the nation's rainy day fund. Bankers and business men should encourage all savings campaigns, for it is apparent that much money being spent does its spenders very little good.

To a certain extent it can be said that our burdensome living expenses result from "high living," as the late James J. Hill pointed out at the time of the 1903 panic. Although the life insurance companies this year sold about \$7,000,000,000 more insurance than was written in 1918, the proportionate increase was probably not greater than it was in many years when increased facilities for purchasing insurance are taken into account.

One of the most urgent problems of the new year will be the task of making the average American increase his savings account and reduce that proportion of his expenditure for wasteful extravagance. That problem is world-wide and, although its solution is not clear at the moment, the average American has sufficient common sense to make him realize that the golden flow will not continue indefinitely.

Milwaukee Gains 50 Per Cent in Building

MILWAUKEE, Jan. 5.—In the history of Milwaukee county there has been no year approaching 1919 in volume of building operations. The aggregate value of new construction and improvements is placed at \$30,000,000, an increase of 50 per cent over the record for any previous year. Nor has this increase been due chiefly to the increase in the price of building materials and labor. More permits have been issued by at least 30 per cent, and the increase in factory facilities has been unprecedented.

Last year witnessed an immense growth in the building and loan associations of Milwaukee, larger than in any previous year.

At the opening of the new year the thirty-six associations in the city, not including those in the suburbs, had invested in loans to members, mainly on residence properties, a little more than \$22,500,000, an increase of 70 per cent over the preceding year.

Expect Chicago Building Records To Be Broken in 1920

CHICAGO, ILL., Jan. 7.—With the prospect that all building records in Chicago will be broken during 1920, as predicted by Building Commissioner Charles Bostrom, this city has started the new year with construction work which has extended to every part of the community and includes manufacturing plants, homes and hotels, the value of which runs into the millions.

Chicago has been harder hit during the last few months, due to the building strikes and other causes, than almost any large city of the country and at a time when the demand for homes and commercial facilities was the greatest. Now, construction has taken on an impetus which nothing can stop outside a complete tieup of transportation. Demand for cars for building material is insistent and the railroads are doing everything to meet the demand.

While this unusual increase in building expansion has caused prices of materials to advance, it apparently is having little effect on the demand, as money seems to be plentiful and builders are asking for the best in material and artistic design. It should be mentioned that the campaign carried on in Chicago in recent years by the City Plan Commission for planning in city building, which also includes the zoning system, is having a decided effect upon the trend of building not only as to structures but as regards thoroughfares and parking as well. The announced purpose of the commission to have the "best planned city in America" has been reflected in the actions of individual property owners and builders.

Some idea of the growth of building in Chicago in recent months is revealed in the fact that permits for buildings during November and December of the year just closed aggregated approximately \$22,000,000, represented by about 1000 permits.

In the Calumet steel district, conditions are rapidly nearing normal. In fact, the mills there only recently acquired orders for future delivery to railroads which will keep them busy for some months—the orders depending, of course, on the result of railway financing now before Congress.

Righting the Industrial Situation

THERE has been a decided tendency with the coming of the new year to take a firmer stand against imposing burdens on private enterprise and to make investment in industry and commerce, particularly in building operations, more attractive. It is strongly felt that the time has arrived, due to more stable labor conditions, when freer loans on mortgages must result.

While it is true that there remains a great shortage of materials, there was a rapid gain in construction during December. An increase of 20 per cent was scored for the month over November, and it is expected that building operations will go forward from now on at a greater rate than during the past four years. The volume of contemplated building operations for December approximated \$90,000,000 a week.

Manufacturers of building materials state that the present shortage of commodities will not be overcome for an indefinite period. Until all energies are marshalled for better production it is clear that prices cannot recede, unless by business reaction which would be seriously felt by all. The situation will remain desperate if workers refuse to work their hardest for increased production. Further, it is certain that the high cost of living will not be reduced until production reaches normal.

The executive council of the National Association of Credit Men has issued a pronouncement to the effect that the advancing prices that marked the year have brought another danger to our credit structure. The council states that soaring prices have induced an orgy of speculation, not only in stocks but merchandise and all other things

having value, and this has imposed a strain on credit that few men sufficiently appreciate. Already the result has been to draw credit from legitimate commerce to satisfy the demand for credit to be used in speculation, which pays higher rates than commerce can.

The council declares that the only way to safety lies in direction by leaders of clear vision. They must be able to distinguish clearly between speculative and legitimate demands, for the line separating the two is not always easily determined.

At a recent meeting to consider the trend of commercial credits and the underlying factors of the situation, full recognition was given the fact that the readjustment to peace conditions is a matter of time. The unsettled conditions induced by the war have given rise to radicalism and a demand for ill-advised experiment.

To aid the speedy return to normal conditions, we must first restore the sound business principles which have aided this country in its progress and given encouragement to its free institutions. The initiative which has peculiarly characterized the American people must not be restrained. There must not be added restrictions or burdens that add to the cost of distribution from manufacturer to consumer. The expansion of the country rests on the conservation and intelligent use of the profits of industry, and it is as bad for business men to divert their profits into fixed assets as for the individual to waste his surplus earnings. A corporation's assets must be kept in liquid condition and the worker must save in these days of high wages for less productive days that may come.

Department of Architectural Engineering

Scientific Methods Applied to Home Lighting*

PART I

By A. L. POWELL and R. E. HARRINGTON.

EDITOR'S NOTES It is believed that the subject here presented is of sufficient importance to the architectural profession to merit careful consideration. The architect should take a leading part in the movement towards better illumination. He should become thoroughly familiar with the subject so that he may capably advise his client and make adequate provision in the wiring system for all necessary features. The result of his knowledge, experience and advice will result in a thoroughly satisfied client.

THE question of proper lighting in the home is one of fascination. While all of us have rather fixed ideas as to what is best adapted to our own needs and to our own conception of the artistic, there is usually one "best" way of accomplishing this purpose.

We see on every hand examples of the misuse of modern light sources due to a lack of knowledge of their possibilities.

Artificial light is a wonderfully flexible medium. No element of the decorative scheme offers as many possibilities or has as distinct a psychological effect. The possibilities are so great that a life-long search would not reveal all of them and the opportunities for the display of individual tastes are unlimited.

A properly lighted room at once gives the impression of a pleasing picture and a feeling of comfort. An interior inappropriately illuminated is always repellent although sometimes the casual observer does not realize that the light is at fault. No matter how skillfully a room may be planned and furnished as to harmony of fittings and balance of color, if the lighting equipment does not function properly, complete success has not been achieved.

There are certain fundamentals which must be observed: *First*, the light must be comfortable. It must not be glaring or excessively brilliant. This produces eye strain and irritates the entire system. Extreme contrasts in light are objectionable. In other words, very bright areas adjacent to rather dark ones are not pleasing. *Second*, the fixture or glassware should be artistic and appropriate. Arti-

ficial lighting in the home should not be simply utilitarian in character. The fixture should not be crude and have as its sole excuse for existence the supplying of light. It should be as much part of the room decoration as the draperies, carpet, or furniture. Anything which is truly artistic is useful. As a rule the simpler designs are the more pleasing. In spite of this generally accepted law, we constantly see fixtures which serve no really useful purpose and which are most complicated and cumbersome in their make-up. *Third*, advantage should be taken of the adaptability of modern light sources to color modification and the light toned to suit the decorative scheme. Light is now produced so efficiently that color effects can be secured at a very reasonable cost.

There can be no hard and fast rules laid down as to what represents the best practice in lighting the various rooms in the home. There are many methods which might justly be applied to any one room. Even one's own ideas suffer modification from time to time. Not only does this change of viewpoint occur but there is a great variation between individual preferences.

In view of the above, it is most essential that the home be so wired that flexibility of lighting is practical and can be obtained with minimum expense. A slight increase in the initial investment when a residence is being built will yield large future returns in comfort and satisfaction. An attempt should not be made to minimize the initial wiring expense by sacrificing adaptability. This course of action usually proves to be false economy.

The lighting equipment itself need not be expensive, but on the other hand, one should not attempt to spend the absolute minimum, for the best in any class of merchandise is not cheap. A lighting unit by day and especially by night, is extremely prominent, in fact, it is often the first thing that strikes

*Abstract from a paper presented before the Illuminating Engineering Society.

THE AMERICAN ARCHITECT



FIGURE 1

NIGHT VIEW OF ENCLOSED PORCH OR SUN-PARLOR
LIGHTED BY TWO 40-WATT MAZDA LAMPS IN INDIRECT
BRACKET UNITS RESEMBLING FLOWER BASKETS.

the eye. On account of this very prominence, it is important that it be well chosen. It should not force itself on one, but should blend with the general picture. This can be readily accomplished by suitable selection and placement.

Electric lighting possesses qualities presented by no other means of lighting. It is extremely flexible. Base board and floor outlets permit one to place a light anywhere in the room. It is thoroughly safe and adaptable to any kind of a shade; silk, parchment, paper, glass, or metal. An endless variety of combinations of material can be called into play. Electric bulbs are so convenient that they can be placed anywhere; behind a cornice, in a vase, or wherever fancy dictates. Electric lamps are standard in a wide range of sizes, from the little 10-watt, giving just a very small amount of light, to huge bulbs which are limited in power only by the commercial demand. Thus the lighting for a room does not have to originate from one spot. It can be split up so that there are just a few touches of light here and there where desired.

There is no longer any legitimate excuse for illuminating the residence throughout with the "raw" or unmodified light. One would not think of leaving all the walls, for example, in their original plaster finish. Warm color tones are easily produced either with colored lamps or through the use of tinted gelatines or fabrics.

While it is almost impossible to completely cover the subject of residence lighting in so brief a time, yet, it is believed the essential features can best be

pointed out by discussing in more or less detail the requirements of each room, having in mind the following seven points: Arrangement of outlets; type of fixtures ordinarily used; their advantages and disadvantages; where unsatisfactory how they can be modified to be most suitable; style of glassware or reflector; type and size of lamp; and finally the possibilities in connection with each room.

PORCH.

In taking up the rooms of a house in their logical order, the porch is naturally the first to receive attention. This is the part of the home most readily visible from the street, and if well illuminated is an indication that the owner is doing his share in one respect at least toward the general attractiveness of the town; proper porch lighting in addition

has an element of protection, for burglars and sneak thieves are likely to pass by the house with a porch light burning.

Porches which merely serve as an entrance require only a low intensity of general illumination, designed to light the steps thus minimizing the danger of accident. The wattage or size of lamp used here should be very small for it is desirable to have this light burning all evening.

The unit most commonly employed for this service is a close fitting ceiling ring with a diffusing enclosing globe. Its advantages are that it is inexpensive and neat. A somewhat decorative type globe of opalescent or white glass is preferable to the round frosted glass ball ordinarily employed, since it gives better diffusion.

One of the greatest inconveniences, when calling at night in an unfamiliar locality, is to locate the desired number. A house number porch light is therefore a great source of satisfaction to both the owner and his friends. A number of types on the market show the numbers luminous against a dark background, at the same time transmitting light, through a portion of the fixture, which serves to illuminate the porch itself. Civic pride as well as personal convenience demands the installation of more illuminated house numbers.

In the more pretentious home, the porch is often fitted as a room and used for reading or other purposes at night. In such cases, it should be lighted in the same manner as a room and here an opportunity is presented for harmony of lighting.

THE AMERICAN ARCHITECT

The use of cretonne shaded portable lamps which blend with the furniture decorations is excellent practise. Weatherproof flush receptacles at convenient points offer means of attaching such units.

The idea of outdoors can often be carried out on the porch and the sun-parlor or solarium presents opportunities for originality in lighting. Totally indirect fixtures are available provided the ceiling is of the proper light tone, and artificial vines hanging over the edge of the indirect unit give it an appearance of simply another group of foliage. Simple forms of direct lighting angle reflectors can often be used inverted as indirect wall bracket units. The night view in Fig. 1 is typical of such units. Here they appear to be baskets of flowers, but in reality are angle type steel reflectors with 40-watt Mazda lamps pointing upward. The problem was to find some method of hiding the mechanism or working parts of the unit. The light showing through the orange black-eyed susans and red geraniums renders them luminous and full of life. This is an excellent example of making the lighting striking and yet so subtle that the result is accomplished without a thought arising in one's mind as to the means to the end.

HALL.

We pass from the porch to the front hall and find this room so varied in character from the mere vestibule to the luxurious reception room that it is difficult to make any general treatment. If it serves merely as an entrance passage, a single low wattage lamp enclosed in a diffusing glass globe is quite appropriate. Either the lantern type or fixture resembling a hanging urn is suitable. Three-way switches controlling this light are of considerable service. One should be located near the entrance door and the other at the head of the stair or in the upper hall.

Where the room serves for purposes similar to a living-room, the methods of lighting described in connection with this are applicable. An additional outlet, however, in such cases is desirable. This consists of a bracket fixture with a low wattage lamp and diffusing shade at one side of the stairway. The 10-watt lamp for example is so economical that it may be burned all night forming an extremely effective burglar insurance as well as a convenience.

LIVING-ROOM.

The next part of the house to receive our consideration is commonly known as the living-room, parlor, library, or den, depending on local conditions. Here is the part of the home where perhaps the greatest opportunity is presented for artistic effects and originality. The widely diversified uses of this room give rise to different lighting requirements, and provision should be made for meeting these. When the family only is gathered or when a few friends drop in for a social evening, the maximum degree of comfort is attained by having a comparatively low value of general illumination supplemented by points of rather higher intensity. Every precaution must of course be taken to insure thorough diffusion of the light and elimination of brilliant light sources. When the room is used for a large gathering, it is desirable to have a relatively high intensity of evenly distributed general illumination. When the room is used by only one or two persons, it is often preferable to have practically no general lighting and merely a certain area illuminated.

One of the simplest methods of meeting the above requirements is by the installation of a central unit of either the indirect or semi-indirect type so wired that two degrees (low and high) of illumination are produced.

The indirect units should be hung at such a height that the cut-off, or edge of the circle of bright illumination, comes at the junction of the ceiling and walls or at the picture-moulding. Often when gas



FIGURE 2

NIGHT VIEW OF A LIVING-ROOM LIGHTED BY INDIRECT TABLE AND FLOOR LAMPS SUPPLEMENTED BY WALL BRACKETS WITH SILK SCONCES

THE AMERICAN ARCHITECT

filled lamps are used their rather concentrated filament causes sharp shadows of the supporting chains or hanger. In such instances, it is well to use lamps all frosted or where 50-watts per socket is adequate, the latest development in incandescent lamps, the white Mazda, is especially well suited.

This general illumination should be supplemented by local or portable lamps served from base-board outlets at various points about the room. Such portable lamps may be in the form of the standard reading lamp, the small art glass decorative lamp,



A SMALL DEN AS IT APPEARS BY NIGHT ILLUMINATED BY A 50-WATT WHITE MAZDA LAMP IN AN IVORY TONE SEMI-INDIRECT UNIT. A HIGH INTENSITY IS PROVIDED AT THE DESK BY A SUITABLE LOCAL LAMP.

and the like. Color modification may be introduced by using superficially colored lamps in the main lighting unit or with properly selected gelatine screens.

The art glass and silk shaded lamps offer other opportunities for the introduction of a touch of color.

Instead of the central or ceiling unit, the general illumination is often supplied by wall brackets with suitably toned diffusing glass shades, silk shades or sconces, the design of the bracket of course being in harmony with the decorative period of the room. These also should be supplemented by the portable or table units. If gas filled lamps are employed in open top silk shaded portable lamps, a circle of very bright illumination as well as shadows of the support is cast on the ceiling. To prevent this effect, the top should be covered with thin silk, or other fabric, or diffusing bulb lamps installed.

The portable, table or floor, silk shaded indirect and direct lighting unit offers another solution of the problem of supplying general as well as local lighting. An example of such an installation is shown in Fig. 2. The most commonly used form

employs an inverted mirrored reflector with a relatively large lamp pointing upward and a group of frosted smaller lamps for supplying the direct light. The general lighting may be toned by placing a sheet of colored gelatine across the mouth of the indirect reflector. The operation of a pull chain switch enables either the general illumination or the local lighting to be available at will. A similar effect can be produced by using a prismatic or dense opal bowl shaped reflector inverted within a silk or parchment shade.

Where a central unit takes the form of direct lighting, the silk shaded multi-arm candlestick fixture harmonizing with the wall brackets is often employed with splendid results. In the Colonial type of interior, the Georgian style chandelier with etched crystal shades and lamps burning upright is perfectly good taste, but not as thoroughly comfortable on account of the relatively high brilliancy of the units as some of the other schemes which have been discussed.

The necessity for a generous number of base-board and floor receptacles cannot be too strongly emphasized as these make possible the display of individuality so much to be desired.

(To be continued)

Interesting Features of the Report of the Commission on Building Districts and Restrictions of the City of Newark, New Jersey

THE report of the Commissioners appointed to investigate and report on the advisability of dividing the city of Newark, N. J., into zones in which the use of buildings shall be restricted as well as the height and area has been recently issued and contains several very interesting features.

In connection with the work of zoning various cities it must be remembered that while many cities in Europe have been familiar with zoning and city planning for years, this work is of comparatively recent origin in the United States. For this reason the various ordinances already adopted for this purpose should be carefully studied in order to note the changes and improvements resulting from further study and also from investigation of the practical workings of such ordinances as have been in operation for a period of several years.

Newark's Commissioners in their report refer to the work of zoning the city of New York, which became effective in July, 1916, and state:

As it is the theft of the horse that teaches one to lock the barn door, it is the dire consequences of unregulated

THE AMERICAN ARCHITECT

building which are the most effective in impressing the value of zoning upon a city.

Evidently the Commission considered several features of the New York law which are capable of improvement. Among these is the limitation to but three distinct use districts, namely, residence, business and unrestricted. There is no doubt that there are many businesses which are barred under the New York law in a business district and only permitted in an unrestricted district which could well be permitted in many of the districts now designated as business. This has led to the belief that there should be at least four distinct use districts, one in which the building of residences alone is permitted, one in which the higher type of business or a combination of business and residence building is permitted, one in which light industry may be permitted and one in which the heavier and objectionable type of industry can be carried on.

The Newark Commissioners in their report take this view, and the city has been laid out into four use districts, known as (1) residence, (2) business, (3) industrial and (4) heavy industrial.

The third classification is the one of interest, and the report states with respect thereto:

In an industrial district buildings may, as in a business district, be erected for any use that is not categorically excluded. The trades and industries banned are all of a noxious or offensive character by reason of the emission of noise, odor, dust or gas, embracing among others boiler works, acid plants, garbage incinerators, foundries, smelters, slaughter houses, stone crushers and canneries.

It would seem that this is a wise provision, and by many it is believed that the New York zoning resolution could advantageously be amended to provide for a light industrial district.

A further step taken by the Newark Commission is worthy of note. In zoning ordinances thus far adopted restrictions have been placed against the offensive uses; in other words, in a residence district business was excluded; in a business district factories were excluded, but residences were permitted; in an unrestricted district all kinds of manufacturing plants were permitted, and both high class business and residence buildings also were permitted.

In the report referred to, the Newark Commissioners state that inasmuch as it is unhealthy and not to the best interest of the public to permit any industries to exist in residential districts, therefore neither should residences be permitted to be erected in those districts specifically set apart for heavy industrial use, and to this end the erection of residences is prohibited in heavy industrial districts.

The logic of this seems conclusive, and anyone who is familiar with the slum section or with the very poor residential section will realize the advisability of prohibiting the erection of additional residences in sections which, due to the character of

existing buildings and the general environment are unsuitable for residential purposes.

With respect to the limitation of building heights and differing from the New York regulations (in which the height is limited entirely by the width of the street), flat height limits have been recommended. Whether this will work out to the advantage of the city or not, remains to be seen. In support of the inclusion of this provision the Commission has this to say:

In working out the height regulations it was deemed better to establish a flat height limit than to vary the heights in each particular case according to the street widths.

The only exception to this rule is in the case of the narrow street in the downtown business section where the application of the height limit generally applicable to buildings in the district will permit the erection of too high buildings. These streets, which in many instances have a width of only 30 and 40 feet, are, moreover, so disbursed between wider streets that it is impracticable to segregate them in a separate district with a lower height limit than that applied to the wide streets. In this part of the city, therefore, a multiple of the street width is used to supplement the flat height limit suggested for the district as a whole.

A height limit based exclusively upon a multiple of a street width is objectionable in that it does not promote a uniform type of development throughout a district. Being based upon the street width it allows higher buildings upon the wider streets, and thus actually invites the location of buildings that will not comport with the general character of a neighborhood.

High apartments in a high class private house district are only a little less objectionable than stores. The fact that they happen to be located on a wide street hardly mitigates the injury, as the blight suffered by the adjoining houses is identically the same, no matter how wide or narrow the street on which the apartment fronts.

The report contains a provision for the creation of a Board of Appeals similar to that of the city of New York, having discretionary powers so that in specific and unusual circumstances a strict provision of the law may be varied and substantial justice done to all parties concerned.

It is felt by those who have had experience with zoning work that such a board is absolutely essential to the successful operation of laws of this character which are enacted under the police power of the State. There is no doubt that peculiar and extraordinary cases not within the scope of the provisions of the zoning ordinance will from time to time arise. Also peculiar circumstances may affect one plot of ground which are entirely absent in the case of others, and for this reason it is necessary that such cases be acted upon individually so that in all cases the spirit, if not the exact letter, of the law shall be carried out.

The Board of Appeals of the city of New York has conclusively demonstrated the wisdom and practical working of such a provision. It is to be hoped that the report of the Newark Commissioners will be adopted at an early date.

The Future of the Corps of Engineers of the United States Army

WE are accustomed to hear it said that the present advocacy of a Department of Public Works is but a pretext for an attack on the Corps of Engineers, U. S. Army, and an attempt on the part of civilian engineers, prompted by jealousy or revenge, to reduce that corps to an ineffective condition. It is not to be denied that the great body of engineers holds opinions derogatory to the Engineer Corps and believes itself justified in contending that it is not a highly competent engineering organization. This, however, is altogether irrelevant. It makes little difference whether the sentiments entertained by the majority of engineers are friendly to the corps or otherwise. That which is of real importance is the provision of the bill relative to the Corps of Engineers which has been introduced into Congress to establish a Department of Public Works. If that provision be constructive the opinions which engineers hold with respect to this particular group of men are without significance.

The Jones-Reavis bill to create a Department of Public Works seeks to bestow on the Corps of Engineers greater benefits than any legislation that has been before Congress in the last quarter century. Many members of that corps will naturally and undoubtedly denounce this statement. Many others will recognize it as true, and as time goes on such recognition will be unanimous within that organization. It is believed worth while to explain the reasons.

The Corps of Engineers is first of all a military organization created as such and so maintained from the beginning. The civil work on rivers and harbors was given to it in an emergency many years ago, and inasmuch as there is very little military engineering practiced in peace times, the assignment of the Engineer Corps to such work has undoubtedly been of benefit in keeping the members usefully employed. Although this civil work has constituted the greater part of the occupation of military engineers, it has always been in the nature of a stop gap. The recent war created obsolescence in many lines of military practice and therefore it will be helpful to consider what it has done to military engineering and how it has changed the status of the Corps of Engineers.

The military engineering of to-day is not the science which brought renown to the military engineers of old. In those days military engineering was an essential part of military strategy. The

great permanent fortifications of the world constituted the bulk of military engineering and they brought deserved credit upon their creators. Wars are not fought as they used to be. Mobile armies are, and undoubtedly will, in the future, be the instruments of war. Nothing better illustrates the fact that the old military engineering is obsolete than the first advance of the German Army to the Marne. It was not the engineering masterpieces of defense that turned back the divisions of Von Kluck. Beginning at Liège those fortifications were either destroyed or enveloped in a short space of time. Von Kluck's defeat was the result of military strategy made possible by the quick transfer of forces in motor vehicles.

By all of this we do not mean that there is no more military engineering. Some remains, but its requirements are relatively easy of accomplishment even by line officers or by men of intelligence in many lines of work. The writer was impressed not long since by the statement of an engineer officer who served throughout the war as an instructor of officers and troops. He said: "Give me a young engineer graduate of average intelligence and I will teach him all that remains of purely military engineering in a period of thirty days."

Engineering lies at the base of war operations but it is not military engineering. The trenches which formed the nucleus of defensive warfare in the late war were temporary expedients, to be used only as long as the progress in action made them useful and then abandoned for other trenches. They are not engineering works. Their location was generally fixed by line officers and their excavation was a matter of pick and shovel work. The real engineering of the war was the civil, mechanical, mining and electrical engineering with which civilian engineers have long been familiar. It consisted of transportation by highway, railway, and air. This was not military engineering, nor was the officer in charge of railway transportation a military engineer. Prior to the war General Atterbury, who gained such fame in France, was operating vice-president of the Pennsylvania Railroad. Other engineering work of the war was bridge-building, waterworks construction, drainage, and numerous other features of familiar character. Automotive power was a tremendous factor, but everyone will agree that that is not military engineering.

The most conclusive observation that can be made in this respect is that of the assignments of some

THE AMERICAN ARCHITECT

TABLE SHOWING THE DIFFERENT KINDS OF ENGINEERING WORK WHICH VARIOUS FEDERAL BUREAUS DO OR MAY DO. THIS ILLUSTRATES THE NECESSITY FOR CONSOLIDATING THEIR ACTIVITIES INSOFAR AS THESE ARE RELATED TO PUBLIC WORKS UNDER ONE CENTRAL DEPARTMENT

	Hydr. Construction	Road Construction	Building Construction	Railroad Construction	Misc. Construction	Surveying and Mapping	Engineering Research	Chemistry	Coast Fleets	Navigation, Irrigation and Drainage	Types of Construction
DEPT. OF AGRICULTURE											
Soils.....	..	..	..	..	x	x	..	x	..	..	Fertilizer plant, \$75,000.
Chemistry.....	..	..	x	..	..	..	..	x	..	..	Building at Arlington, alterations, \$50,000.
Forest Service.....	x	x	x	..	x	x	x	x	..	x	Roads, trails, tel. lines, buildings.
Roads.....	..	x	..	..	..	x	x	x	..	..	Roads, \$200,000,000 a year.
Weather Bureau.....	..	..	..	..	..	..	..	..	..	..	Local stations, observatories.
Animal Industry.....	..	..	x	..	..	..	..	..	..	..	Barns, cattle pens.
Plant Industry.....	..	..	x	..	..	..	..	..	..	..	Greenhouses.
DEPT. OF COMMERCE											
Fisheries.....	x	x	x	..	x	..	..	..	x	..	Roads, dams, hatcheries, buildings.
Standards.....	..	x	x	..	x	..	x	x	..	..	Buildings, roads for own use—small.
Coast and Geodetic.....	..	..	..	..	x	x	x	..	x	x	Observation towers, survey vessels.
Lighthouses.....	x	x	x	..	x	..	..	..	x	x	Vessels, lighthouses, walls, docks, buildings, shops.
DEPT. OF THE TREASURY											
Public Health Service.....	x	..	x	..	x	x	x	x	..	..	Hospitals, quarantine stations, docks sea walls, barracks and quarters.
Supervising Architect.....	..	..	x	..	x	..	..	..	..	..	Post offices, custom houses, etc.
Coast Guard.....	..	..	x	..	x	..	..	..	x	..	Vessels, boats, stations, tel. lines.
DEPT. OF WAR (Civil Constr.)											
Panama Canal.....	x	x	x	x	x	x	x	..	x	..	Under Secretary of War but not under War Department.
Alaskan Road Commission.....	..	x	..	..	..	x	..	..	..	..	Alaskan roads and trails.
California Debris Commission.....	x	..	..	..	x	x	..	..	..	..	Dams.
Mississippi River Commission.....	x	..	..	..	x	x	..	..	..	x	Levees.
Corps of Engineers, Civil Functions.....	x	x	x	..	x	x	x	..	x	x	Dams, revetments, canals, dredging, Cantonments, storehouses, depots, utilities.
Construction Division.....	..	x	x	x	x	x	..	..	..	x	
DEPT. OF THE INTERIOR											
Bureau of Mines.....	..	..	..	..	..	x	x	x	..	..	Buildings
Geological Survey.....	x	..	..	..	..	x	x	x	..	..	Gauging stations.
Reclamation Service.....	x	x	x	..	x	x	x	x	..	x	Irrigation projects.
Land Office.....	..	..	x	..	x	x	..	..	..	..	Buildings, telephones, etc.
National Parks.....	x	x	x	..	..	x	..	..	..	..	Roads, trails, dams, buildings.
Alaskan Railway Commission.....	x	x	x	x	x	x	x	x	..	x	Railroads and all things necessary thereto.

of the most prominent members of the Corps of Engineers during the war. Surely if military engineering had been a prominent factor every one of these highly qualified military engineers would have been assigned to such duties. Yet General Kuhn was placed in the line. General Seibert was first assigned, and it is said much against his own inclination, to duty in the line and was subsequently transferred to duty at the head of the Chemical Warfare Service in Washington. Similarly, we find General Newcomer, a highly accomplished military engineer, was assigned to duty as assistant to General Seibert. General Harts was provost-marshal

of Paris. General Biddle, after serving for a time as assistant chief of staff, was sent to London in command of American troops in England. General Taylor was relieved from duty in France during the war and returned to this country to take charge of rivers and harbors. General Kutz was similarly relieved from duty and placed in charge of Camp Humphreys and subsequently re-assigned to his old position as Engineer Commissioner of the District of Columbia. General Rose, a man of astonishing ability and capacity who was successively promoted from captain to brigadier-general during the war was in charge of the General Engineer Depot—a

THE AMERICAN ARCHITECT

business man's job. Many other instances might be cited. In other words, some of the most prominent and supposedly accomplished military engineers in the Regular Army gave no military engineering service during the war. Of course we do not know the reasons, but it is quite apparent that their superiors thought they could be spared. Had military engineering been so important, how could all this have taken place?

The great engineering functions of the war were those which civilian engineers are accustomed to handle. Naturally, therefore, they were performed by engineers temporarily brought into the army who had given their lives to those specialties. We cannot doubt that the reason why so many engineer officers were assigned to non-engineering positions during the war was because their particular engineering fitness was not essential to the great emergency. Their capabilities fitted in better elsewhere. Why were they not fitted for the war's engineering?

The Corps of Engineers had, save in notable exceptions, been deprived of the training along the necessary lines. Their experience outside of purely military engineering had been with the rivers and harbors of the country. They knew hydraulics, levees, dams, dredging and revetment. Such experience may have been exceedingly useful at ports of entry, but levees and dams, dredging and revetments were not a part of the requirements between the ports of entry and the fighting front. There were very good reasons therefore why they were not experienced in bridge-building, highway and railroad-building, water supply engineering, etc., and why these positions had to be filled in the main by engineers from civil life. Just here lies the weakness in the present system of training of the Corps of Engineers. The members of that corps cannot be blamed for not having had the experience required by the war.

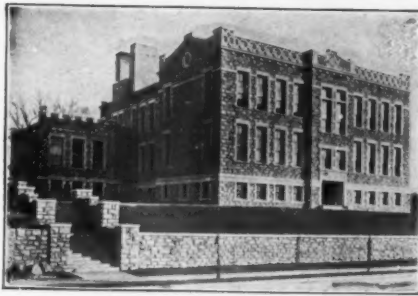
The Jones-Reavis bill proposes to correct all this. It does not destroy the Engineer Corps. It relieves it from highly specialized duties along lines which will be of little or no value in war emergency, but gives the engineer officers opportunities to become thoroughly familiar with engineering in all lines which will be demanded of them in military service. All of this points to a lesson. The more we con-

sider the engineering work of the late war the better prepared we must become to defend the Jones-Reavis bill. In peace time the military engineers should, as provided by that bill, be detailed to work under the Department of Public Works which gives them the specific training that they should have, so that when another great war comes along they can be utilized along war engineering lines rather than on such things as chemical warfare, provost-marshalships and military administration. The people of the country who have, during long years, paid to equip these men for a particular service should find it possible to realize on that investment when the crisis comes.

The table on preceding page showing the kinds of engineering work which various Federal bureaus do or may do illustrates the necessity for consolidating their work as related to public works under one central department.

This table shows the various classes of engineering work in which Government bureaus engage. The bureaus which are starred are the bureaus which it is proposed to include in the Department of Public Works. Not all of these bureaus which are indicated as doing construction work are now so engaged, but all have engaged and all may engage again. The amounts vary from \$75,000, which is the last construction expenditure of the Bureau of Chemistry, to \$200,000,000, which is the amount of Federal aid authorized yearly to be expended under the direction of the Bureau of Roads. The chief civil construction bureaus of the Federal Government are the Bureau of Roads, River and Harbor Improvement, Supervising Architect's Office, Reclamation Service, Alaskan Railway Commission, Mississippi River Commission, Forest Service and Public Health Service. They vary in importance practically in the order named.

Not all of these bureaus listed on this chart have permanent construction personnel. When such bureaus build they must therefore use emergency organizations and take the loss and waste which the use of emergency organizations always entails. The Public Works Department would be in a position to serve as contractor or agent for the bureaus doing this intermittent construction and would place at their disposal the services of a skilled and permanent organization.



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Late Quotations in Building Material Markets

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

(The following prices are current of January 21.)

BRICK		New York	Chicago
Common (Delivered at job in Borough of Manhattan only), per thousand.....		\$22.50	\$16.50†
Face brick (delivered on job):			
Rough red		37.00	40.00
Smooth red		38.00	40.00
Rough buff		42.00	40.00
Smooth buff		42.00	40.00
Rough gray		45.00	40.00†
Smooth gray		47.00	40.00†
Colonials		26.00	30.00

BROKEN STONE		New York	Chicago
1½ in. per cu. yd.....		\$3.25	\$2.75
¾ in. per cu. yd.....		3.50	2.75

BUILDING PAPER		New York	Chicago
Rosin sized sheathing, 500 sq. ft. rolls, 36 in. wide:			
25 lbs. to roll.....		\$0.85	\$0.88
30 lbs. to roll.....		1.00	1.05
40 lbs. to roll.....		1.35	1.40
Deadening felt, 50 sq. yd. rolls, 36 in. wide:			
Per ton		85.00	105.00

BUILDING STONE		New York	Chicago
Indiana limestone, per cu. ft.....		\$1.23	\$0.83
Kentucky limestone, per cu. ft.....		1.35	....
Brier Hill sandstone, per cu. ft.....		1.50	....
Gray Canyon sandstone, per cu. ft.....		.95	....
Buff Wakenan, per cu. ft.....		1.50	....
Buff Mountain, per cu. ft.....		1.50	....
North River bluestone, per cu. ft.....		1.05	....
Seam-face granite, per sq. ft.....		1.00	....
South Dover marble (promiscuous mill block), per cu. ft.....		2.25	....
White Vermont marble (sawed), New York, per cu. ft.....		3.00	....

BURNED CLAY		New York	Chicago
(Delivered on job.)			
Block partition:			
3 in., per sq. ft.....		\$0.13	\$0.10
4 in., per sq. ft.....		.15	.11
Chimney tops:			
12 x 12 for 8 x 8 flues.....		3.50	2.25
Flue lining:			
4½ ft. x 13 ft., per lin. ft.....		.24	.12
4½ x 8½, per lin. ft.....		.18	.16
8½ x 8½, per ft.....		.24	.10
8½ x 13, per ft.....		.35	.20
13 x 13, per ft.....		.60	.45
8½ x 18, per ft.....		.60	.50
13 x 18, per ft.....		.95	.75
18 x 18, per ft.....		1.25	.85
Wall coping (double slant):			
8 in., per lin. ft.....		.18	.18
12 in., per ft.....		.33	.26
18 in., per ft.....		.54	.30
Wall coping (single slant):			
8 in., per lin. ft.....		.16	.14
12 in., per ft.....		.26½	.22
18 in., per ft.....		.54	.36
(Corners and angles four times the price of one foot of coping the same size.)			

HOLLOW TILE		New York	Chicago
(Delivered at job, in New York below 72nd St.)			
2 x 8 x 12 partitions, per 1,000 sq. ft.....		\$102.00	\$102.70
3 x 12 x 12 partitions, per 1,000 sq. ft.....		102.00	102.70
4 x 12 x 12 partitions, per 1,000 sq. ft.....		114.75	106.60†
6 x 12 x 12 partitions, per 1,000 sq. ft.....		153.00	150.60
8 x 12 x 12 partitions, per 1,000 sq. ft.....		205.30	205.30
10 x 12 x 12 partitions, per 1,000 sq. ft.....		253.20	253.20
12 x 12 x 12 partitions, per 1,000 sq. ft.....		230.00	230.00
2 x 12 x 12 split furring, per 1,000 sq. ft.....		163.75	294.80*

CHIMNEY TOPS		New York	Chicago
Revolving		40%	40%

CEMENT		New York	Chicago
Per bbl. in 15-cent bags (Rebate 60c. per bbl. for bags in New York), 15-cent bags in Chicago (Rebate 60c. per bbl.)		\$3.40	\$3.10

CONDUCTOR PIPE		New York	Chicago
Galvanized steel		5 & 10 & 5%	....
Galvanized charcoal iron.....		44½%	....
Copper		40%	....
Elbows (all sizes to 6-in.) .....		....	....
Galvanized steel		70%	70%
Squares		60%	60%
Copper		30%	30%

COPPER SHEETS		New York	Chicago
At the mill, hot rolled, 16 oz., base-price, per lb.....		.29½c.	28½c.
(From jobbers' warehouse add 2 to 3 cents.)			

		New York	Chicago
Cold Rolled, per lb.....		31c. to 33c.	30c.
From stock in 100 lb. lots and over.....		.32c.	32c.
For less than 100 lb. lots 2c. per lb. advance.			
Polished, 20 in. wide and under, 1c. per sq. ft. extra; over 20 in. wide, 2c. per sq. ft. extra. Planished, 1c. per sq. ft. more than polished.			
Bottom, pits and flats, 1 oz. and heavier, per lb.....		.43c.	.42c.
Tinning one side, per sq. ft.....		.06c.	.06c.

CORNER BEAD		New York	Chicago
Per foot		.05	.05

EAVES TROUGH		New York	Chicago
(Discounts from list):			
Galvanized steel		60%	60 & 10%
Galvanized charcoal iron.....		50%	55½%
Copper		20%	40%
(Also note Conductor Pipe.)			

FIBER		New York	Chicago
Per bushel		.36	.30

FINISHED IRON AND STEEL		New York	Chicago
(Mill shipments.)			
Bar iron, refined grade.....		2.77c.	2.62c.
Bar iron, double refined.....		3.77c.	....
Soft steel bars		2.62c.	2.62c.
Shapes		2.72c.	....
Plates		2.77c.	2.65c.

GALVANIZED SHEETS		New York	Chicago
Nos. 12 and 14 gauge, per lb.....		7.60c. to 8.10c.	....
No. 16		7.75c. to 8.25c.	....
Nos. 18 and 20		7.90c. to 8.40c.	....
Nos. 22 and 24		8.05c. to 8.55c.	....
No. 26		8.20c. to 8.70c.	....
No. 27		8.35c. to 8.85c.	....
No. 28		8.50c. to 9.00c.	....
No. 30		9.00c. to 9.50c.	....
(No. 28 and lighter, 36 in. wide, 20c. higher.)			
Corrugated Roofing, Galvanized:			
2½ in. corrugations, per 100 lbs., over flat sheets.....		30.00c.	....

GLASS		New York	Chicago
(Discounts from manufacturers' price lists)			
Single strength, A quality, first three brackets.....		79%	77%
Single strength, B quality.....		79%	77%
Double strength, A quality.....		79%	79%
Double strength, B quality.....		81%	81%
Plate—up to 5 sq. ft.....		81%	80%
Plate—over 5 sq. ft.....		83%	80%
Plate—up to 10 sq. ft.....		....	80%
Plate—over 10 sq. ft.....		....	80%
Polished plate glass (commercial run of thickness and quality) sizes to 5 sq. ft., inclusive.....		.78%	....
Sizes over 5 sq. ft.....		.78%	....

GRAVEL		New York	Chicago
1½ in. (Borough of Manhattan only), per cu. yd.....		\$2.75	\$2.75
¾ in. (Borough of Manhattan), per cu. yd.....		2.75	3.00

GRIT		New York	Chicago
Delivered at job in Borough of Manhattan.....		\$2.25	\$2.00
Delivered in the Bronx.....		2.50	2.25

GYPSUM		New York	Chicago
Plaster Board:			
Delivered at job, Boroughs of Manhattan and Bronx:			
27 x 28 x 1.....		37c.	....
27 x 48 x ½.....		34c.	....
32 x 36 x ¼.....		23c.	20c.
32 x 36 x ¾.....		24c.	21½c.
32 x 36 x ½.....		26c.	....

Plaster Blocks:		New York	Chicago
Delivered at job, Boroughs of Manhattan and Bronx:			
2 in. hollow, 12 x 30, per sq. ft.....		.09c.	....
2 in. solid, 12 x 30, per sq. ft.....		12c.	11c.
3 in. hollow, 12 x 30, per sq. ft.....		12c.	11c.
3 in. solid, 12 x 30, per sq. ft.....		15c.	15c.
4 in. hollow, 12 x 30, per sq. ft.....		13c.	12c.
5 in. hollow, 12 x 30, per sq. ft.....		14½c.	....
6 in. hollow, 12 x 30, per sq. ft.....		18c.	14c.
8 in. hollow, 12 x 30, per sq. ft.....		22½c.	....

LATH		New York	Chicago
Eastern spruce, per thousand.....		\$10.50	\$16.00 to \$18.00*
No. 1 hemlock, per thousand.....		8.25	16.00 to 18.00*
No. 1 yellow pine, per thousand.....		9.00	16.00 to 18.00*

LEAD		New York	Chicago
American pig, per lb.....		10 to 11c.*	6½ to 6¼c.
Bar, per lb.....		10½c. to 12c.*	6½ to 6¼c.

LIME		New York	Chicago
Common, 300 lb. bbls., per bbl.....		\$3.50	\$1.50
Finishing, 300 lb. bbls., per bbl.....		3.70	....
Common hydrated, in paper bags, per ton.....		18.50	18.00
Common hydrated, in cloth bags, per ton (rebate per bag, 20c.)		26.50	24.00
Hydrated finishing lime, cloth bags (rebate for bags 20c.)		24.60	....
Hydrated finishing lime, in paper bags, per ton.....		24.60	....

LUMBER		New York	Chicago
(Retail prices per M., delivered.)			
Yellow pine, 2 x 4.....		\$72.50	\$65.00
Yellow pine, 2 x 6.....		72.50	55.00
Yellow pine, 4 x 4.....		77.50	56.00
Yellow pine, 8 x 8.....		75.00	56.00
Yellow pine, 12 x 12.....		83.00	65.00
Yellow pine, No. 1 boards, 1 x 6.....		100.00	75.00*
Yellow pine, No. 1 boards, 1 x 12.....		110.00	80.00
Yellow pine, B and better flooring (plain).....		115.00	125.00*
Yellow pine, B and better flooring (quartered).....		150.00	117.00
North Carolina pine, flat flooring, No. 2 and better		115.00	90.00
North Carolina pine, flat flooring, No. 3.....		100.00	95.00
North Carolina pine, rift flooring.....		137.50	110.00
Norway pine, 2 x 4.....		75.00	77.50
Norway pine, 2 x 12.....		90.00	79.00

(Continued on page 830-B.)

Barrett Specification Roofs

20 Years of Service Guaranteed—

IN the old days buying a roof very often proved to be something of a gamble.

Maybe you got just what you specified, and maybe not.

The cost per square foot was too often taken as the only standard of value—frequently to the owner's subsequent sorrow.

Today all this is changed.

It was the Barrett Specification which first made it possible for building owners everywhere to obtain, through their local contractors, a *standardized* roof, worked out by roofing engineers and based on scientific principles of modern roof construction.

Today we offer to *guarantee* Barrett Specification Roofs for a period of 20 years!

This guaranty is obtainable on any roof of 50 squares or more, in any

town of 25,000 population or over, and in smaller places where our Inspection Service is available.

It is a Surety Bond, issued by the U. S. Fidelity & Guaranty Company, of Baltimore.

To obtain this Surety Bond you have only to insert in your building Specifications the following:

"The roof shall be laid according to The Barrett Specification dated May 1, 1916, and the roofing contractor shall secure for me (or us) the 20-Year Guaranty Bond therein mentioned."

The guaranty costs you nothing. We merely require that the roofing contractor be approved by us and that we be given an opportunity to inspect the construction.

We shall be glad to send you a copy of *The Barrett Specification*, with diagrams ready for insertion in your building plans.

New York
Boston
Cleveland
Birmingham
Seattle
Youngstown
Nashville

THE BARRETT COMPANY, Limited:
John, N. B.

Chicago
St. Louis
Cincinnati
Kansas City
Peoria
Toledo
Washington

Duluth
Richmond
Elizabeth

Halifax, N. S.

The **Barrett** Company



Milwaukee
Latrobe
New Orleans
Montreal
Dallas
Bangor
Bethlehem
Salt Lake City
Toronto
Sydney, N. S.
Atlanta
Columbus
Detroit
Johnstown
Winnipeg
Vancouver

Philadelphia
Pittsburgh
Minneapolis
Baltimore
Lebanon
Buffalo



The 20-Year Bond

We illustrate above the 20-Year Surety Bond that will be given on all roofs of 50 squares or over in towns of 25,000 population or more and in other places where our Inspection Service is available.



Laying a 20-Year Barrett Specification Roof on Building No. 20 of the National Cash Register Co., of Dayton, Ohio.

THE AMERICAN ARCHITECT

Late Building Material Prices

(Continued from page 830-A.)

	New York	Chicago
Douglas fir, 6 x 6 to 12 x 12.....	\$75.00	\$71.00*
Douglas fir, 12 x 12 to 14 x 14.....	85.00	78.00
Hemlock, 2 x 4.....	63.00	55.00
Hemlock, 2 x 12.....	65.00	58.00
Oak, quartered, 1 in., F. A. S.....	275.00	285.00
Oak plain, 1 in., F. A. S.....	210.00	210.00†
Oak flooring, 13/16, quartered (white).....	280.00	295.00*
Oak flooring, 13/16, quartered (red).....	275.00	225.00
Oak flooring, 13 x 16, plain (white).....	205.00	175.00
Oak flooring, 13 x 16, plain (red).....	210.00	185.00
Maple, 1 in., F. A. S.....	135.00	185.00*
Maple flooring, 13/16, clear.....	160.00	150.00
Maple flooring, 13/16, select.....	145.00	135.00
Maple flooring 13/16 No. 1 factory.....	120.00	100.00
Basswood, 1 in., F. A. S.....	120.00	100.00
Mahogany, 1 in., F. A. S.....	320.00	350.00*
Sap gum, 1 in., F. A. S.....	87.50	75.00
Red gum, 1 in., F. A. S.....	125.00	115.00
Chestnut, 1 in., F. A. S.....	110.00	105.00
Poplar, 1 in., F. A. S.....	150.00	130.00
Birch, 1 in., F. A. S.....	125.00	100.00
Spruce, random, 2 in.....	70.00	65.00
Spruce, wide, 8 in.....	75.00	70.00
Spruce, 12 in.....	80.00	75.00
Spruce, 12 in.....	90.00	75.00
Cypress, 1 in., F. A. S.....	140.00	130.00

METAL LATH

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

Red, per lb.....	.05	.05
Brown, per lb.....	.05	.05
Buff, per lb.....	.05	.05
Chocolate, per lb.....	.05	.05
Black, per lb.....	.06	.05
Pompeian buff, per lb.....	.07	.07
Moss green, per lb.....	.07	.07
Colonial drab, per lb.....	.07	.07
French gray, per lb.....	.07	.07
Royal purple, per lb.....	.07	.07
Yellow, per lb.....	.07	.07

(These prices are for mortar colors in bbls. or kegs of more than 200 lbs. each. In kegs of less than 200 lbs. each add 1c. per lb. In 25 lb. cans add 2c. and 12 1/2 lb. cans add 2 1/2 c. per lb.)

WIRE NAILS

Wire nails and brass, miscellaneous.....	75%	75%
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OILS

Linseed (7 1/2 lbs.) city, raw.....	\$1.80	\$1.95
Over 5-gal. lots.....	1.79	
Linseed, boiled, advance, per gal.....	.01	.02
Out of town, American seed, at.....	1.80	2.05
Calcutta.....	2.00	.....

PAINTS

Leads:		
American white, in oil, kegs; lots over 100 lbs.....	13c.	13c.
White, in oil, 25-lb. tin pails; add to keg price.....	1/4 c.	1/4 c.
Red, bbl., 1/2 bbl., and kegs; lots over 100 lbs.....	13c.	14 1/2 c.
Dry Colors:		
Red Venetian, American, per 100 lbs.....	\$2.00 to \$4.50	\$2.00 to \$4.00
Metallic Paints:		
Brown, per ton.....	\$32.00 to \$36.00	\$32.00 to \$36.00
Red, per ton.....	35.00 to 40.00	35.00 to 40.00

PIPE

Cast Iron:		
6 in. and heavier.....	\$54.30	\$61.80
4 in.....	57.30	64.80
3 in.....	62.30	71.80

(and \$2.00* additional for Class A and gas pipe.)
(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.)

Wrought:	Butt Weld	F.O.B. Pittsburgh	F.O.B. Chicago
Steel:			
Black, 1/2 to 3 in.....	50 1/2 to 57 1/2 %	42.6 to 49.6 %	
Galv., 1/2 to 3 in.....	24 to 44 %	14.6 to 34.6 %	
Iron:			
Black, 1/2 to 1 1/2 in.....	29 1/2 to 34 1/2 %	19.6 to 29.6 %	
Galv., 1/2 to 1 1/2 in.....	2 1/2 to 23 1/2 %	9.4 to 11.6 %	
Steel:			
Black, 2 1/2 to 6 in.....	53 1/2 %	45.6 %	
Galv., 2 1/2 to 6 in.....	41 %	31.6 %	
Iron:			
Black, 2 1/2 to 6 in.....	34 1/2 %	24.6 %	
Galv., 2 1/2 to 6 in.....	21 1/2 %	9.6 %	
Steel:			
Black, 1/2 to 3 in.....	46 1/2 to 56 1/2 %	33 to 43 %	
Galv., 1/2 to 3 in.....	29 to 44 %	10.6 to 18 %	
Iron:			
Black, 1/2 to 1 1/2 in.....	28 1/2 to 39 1/2 %	.....	
Galv., 1/2 to 1 1/2 in.....	11 1/2 to 24 1/2 %	.....	
Steel:			
Black, 2 to 6 in.....	48 1/2 to 50 1/2 %	35 to 37 %	
Galv., 2 to 6 in.....	37 to 39 %	10 to 12 %	
Iron:			
Black, 1 1/2 to 6 in.....	25 1/2 to 34 1/2 %	.....	
Galv., 1 1/2 to 6 in.....	10 1/2 to 22 1/2 %	.....	

PIPE-VITRIFIED SEWER

(Standard pipe and fittings, F.O.B., carloads):		
3 to 24 in.....	67%	67%
27 to 30 in.....	66%	66%

PLASTER

(Rebate for bags, 15c.)		
Neat wall cement in 15-cent bags, per ton.....	\$22.30	\$19.00†
Finishing plaster.....	25.00	19.50
Lath mortar, in cloth bags, per ton.....	16.00	14.00

	New York	Chicago
Brown mortar, in bags.....	16.00	14.00
Finishing plaster, per bbl. (250 lbs.).....	3.80	3.00
Finishing plaster, per bbl. (320 lb. bbl.).....	4.75	5.00

PURTY

In bladders, per 100 lb.....	\$6.25	\$6.25
In 1-lb. tins, per 100 lb.....	6.75	6.75
In 5-lb. tins, per 100 lb.....	6.25	6.25

RADIATION

New York reports a 45% discount on standard heights.
Chicago reports F. O. B. Plant with actual rate of freight allowed not exceeding 40c. per c.w.t. a 45.9% discount on standard heights steam and 44.3% on water.

REGISTERS

Cast iron semi-steel or steel, in black or white japan or electroplate and small faces and borders.....	30%	30%
Large faced, 14 x 14 in. and larger.....	30%	30%
Base board registers.....	30%	30%
Base board intakes.....	30%	30%
White enameled goods.....	5%	5%
Solid brass or bronze goods, except grilles.....	net	net
Grilles in black and white japan or electroplate in cast iron, plain lattice design—smaller than 14 x 14 in.....	30%	30%
—Larger than 14 x 14 in.....	50%	50%

REINFORCING BARS

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

ROOFING MATERIAL

Tarred Felt Paper:		
No. 1—25 lbs. to 100 sq. ft., per ton.....	\$62.00	\$75.00
No. 2—16 lbs. to 100 sq. ft., per ton.....	63.00	75.00
No. 3—12 lbs. to 100 sq. ft., per ton.....	64.00	75.00
Rosin sized sheathing, per ton.....	75.00	70.00
Corrugated roofing, galvanized, 2 1/2 in. corrugation, over flat sheets, 30c. per 100 lbs.		
Rubber, 108 sq. ft. rolls, 32 in. wide, per roll:		
First Quality:		
1 ply—35 lb. rolls.....	\$1.90	\$2.00
2 ply—45 lb. rolls.....	2.30	2.40
3 ply—55 lb. rolls.....	2.85	2.80
Second Quality:		
1 ply—35 lb. rolls.....	1.45	1.60
2 ply—45 lb. rolls.....	1.75	1.90
3 ply—55 lb. rolls.....	2.20	2.20

ROSIN

Common to good, strained (wholesale), 80 lb. per gal.....	\$17.50	
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SAND

Mason, per cu. yd.....	\$1.85 to \$2.25	\$2.75
Torpedo, per cu. yd.....	1.85 to 2.25	2.75
White sand, per cu. yd.....	4.50	

SHINGLES

Red cedar, 6 to 2, clear, per thousand.....	\$10.00	\$6.50
Red cedar, 5 to 2, clear, per thousand.....	12.00	7.50
White cedar, extra star, per thousand.....	11.00	7.00
Cypress, 6 x 18, No. 1 hearts per M.....	17.00	14.00
Cypress, 6 x 18, No. 1 prime per M.....	15.00	12.00

SLATE ROOFING

	F.O.B. cars, Quarry Station	F.O.B. Chicago
Pennsylvania:		
Best Bangor.....	\$7.75 to \$9.00	\$10.20 to \$11.45
No. 1 Bangor Ribbon.....	6.75 to 7.00	9.20 to 9.70
Pen Argyl.....	6.50 to 7.25	9.70 to 10.45
Peach Bottom.....	10.50 to 12.50	12.45 to 14.45
No. 1 Chapman.....	6.25 to 7.25	8.70 to 9.95
Vermont:		
No. 1 Sea Green.....	4.25 to 6.75	5.95 to 9.00
Unfading Green.....	9.00 to 10.50	9.40 to 12.50
Mottled Green Purple.....	9.00 to 10.50	.....
Red.....	12.00 to 20.00	14.80 to 22.80
Maine:		
Brownsville, U'f'g Black, No. 1.....	12.00	14.10 to 15.10
Slates felt, 30 lb. roll.....	.92	.....
Slates felt, 40 lb. roll.....	1.22	.....

SPIRITS TURPENTINE

	New York	Chicago
Per gal. in machine bbl.....	\$1.74	\$1.73

STONE SCREENINGS

Lime, per cu. yd.....	\$2.35	\$2.75
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STRUCTURAL STEEL

Beams and channel, 3 to 15 in., per lb.....	2.45c.	3.47c.
Beams and channels, over 15 in., per lb.....	2.45c.	3.57c.
Angles.....	2.45c.	3.47c.
Zees.....	2.45c.	3.47c.
Tees.....	2.45c.	3.52c.
Steel bars, half extras, from mill.....	2.35c. to 2.75c.	3.37c.

STUCCO

In cloth, per ton (white, mixed).....	\$22.50	\$19.50
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STUCCO BOARD

Medium weight stucco board, plain, per M sq. ft.....	\$42.50	\$45.00
Medium weight stucco board, creosoted, per M sq. ft.....	50.00	50.00
Heavy weight stucco board, plain, per M sq. ft.....	55.00	55.00
Heavy weight stucco board, creosoted, per M sq. ft.....	60.00	60.00
Medium weight stucco board, plain, narrow key, per M sq. ft.....	50.00	50.00
Medium weight stucco board, narrow key, creosoted, per M sq. ft.....	55.00	55.00
Insulating board, heavy felt background, per M sq. ft.....	50.00	50.00

SHEATHING BOARD

Heavy weight sheathing board, per M sq. ft.....	\$50.00	\$50.00
Medium weight sheathing board, per M sq. ft.....	46.00	45.00
Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.)		

WALL BOARD

Wall board, shipped any length, 4 ft. wide, per M.....	\$45.00	\$40.00
Packed flat in cars if ordered in less than car lots. Add \$5.00 per M ft. for crating.		

ZINC SHEETS

Western slabs.....	10 1/2 c. to 11 1/2 c.	.....
Sheets, No. 9, base casks.....	13 1/2 c.	.....
Open, per lb.....	14c.	.....

