The AMERICAN ARCHITECT

Founded 1876

VOLUME CXXXVI | SEPTEMBER 1929 | NUMBER 2575

ARCHITECTURE IN THE NORTHWEST SHOWS A TRUE MODERN SPIRIT

By DWIGHT JAMES BAUM, A.I.A.

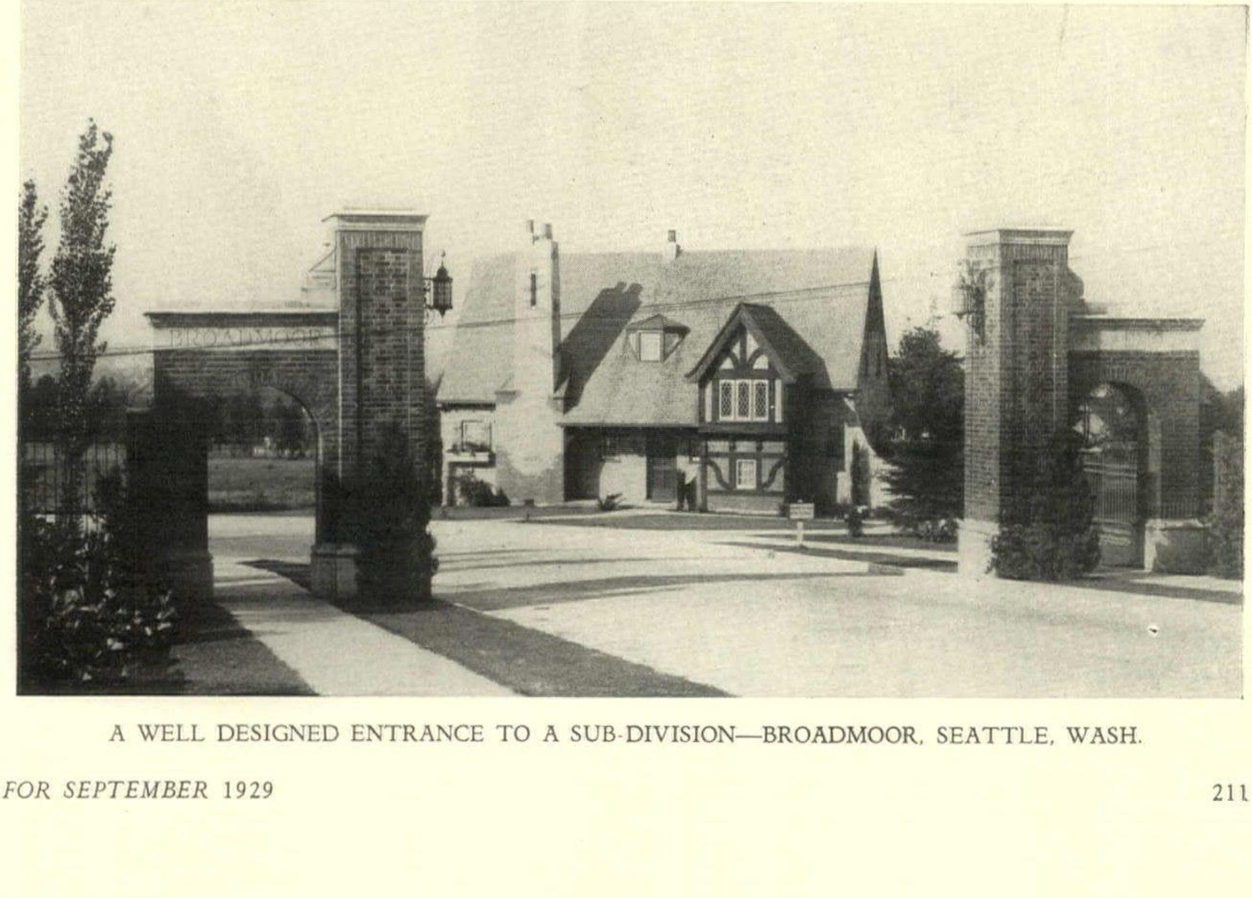
ILLUSTRATIONS ARE REPRODUCED FROM THE ORIGINAL NEGATIVES BY THE AUTHOR

AS the steamer sails up the bay to Seattle, one begins to feel the throb of the Great Northwest, a country that has torn itself out of the wilderness by sheer physical vitality; that now numbers among its buildings some of the finest examples of modern architecture built anywhere in the United States; and that on every hand shows vision in planning and sound originality.

The Northwest is, of course, largely if not entirely made up of Easterners—at least within the past two generations. Therefore the background of the architects practicing there is inevitably that of the East. Yet on this background they have grafted an originality that lends their buildings a distinctive character.

Above all, the architecture of the Northwest might be characterized by the term "common sense." There is none of the labored striving after effect that achieves a startling novelty whose merit is in novelty alone, a novelty that fades in attractiveness and investment value as the years cause a true artistic balance to be struck.

Towns are planned with a sweeping vision that builds for an irridescent future as well as for a pro-



A WELL DESIGNED ENTRANCE TO A SUB-DIVISION—BROADMOOR, SEATTLE, WASH.

gressive present. There are few, if any, buildings erected that as time passes will become a blot upon the landscape—something that can not be said of our Eastern cities.

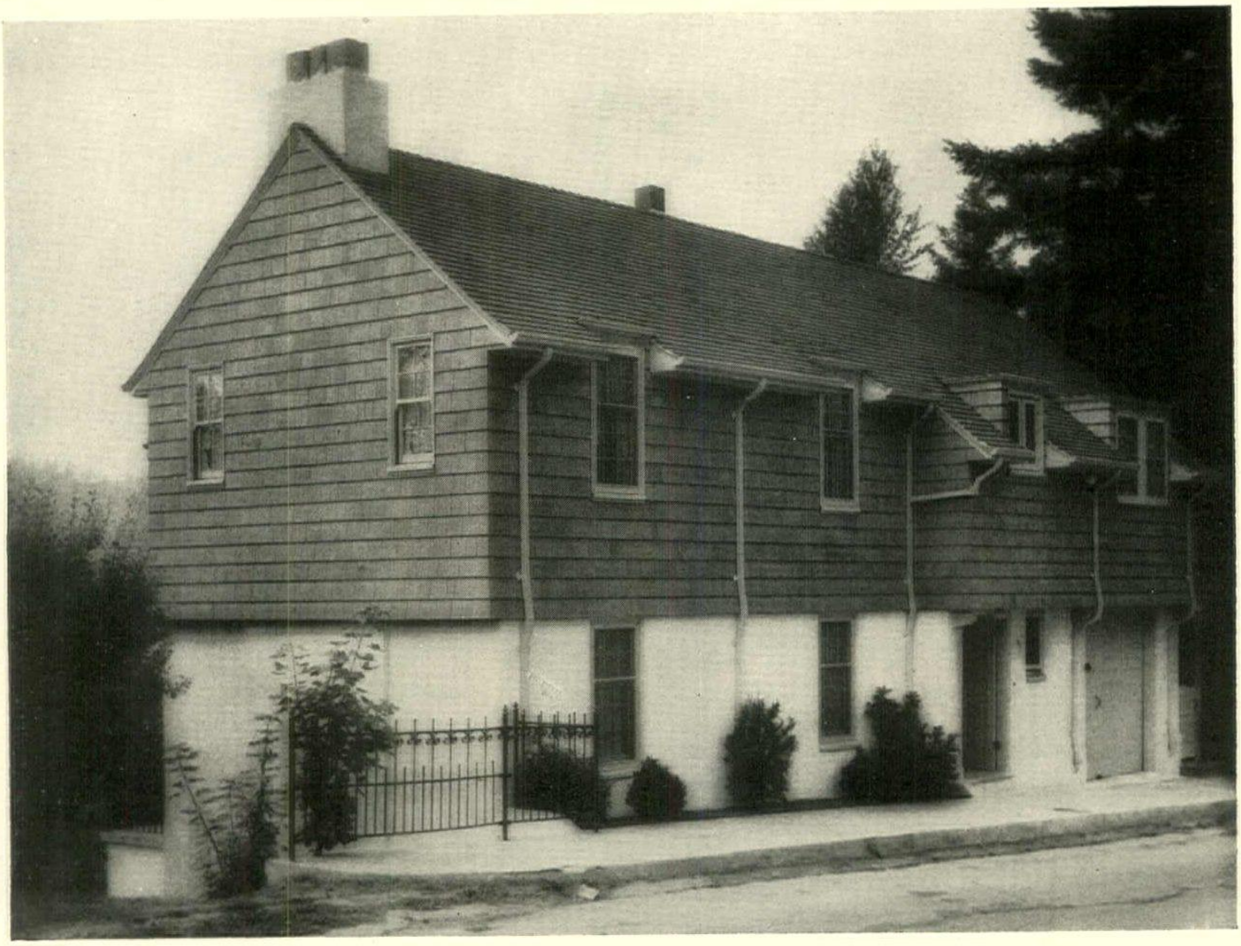
When Gary, Ind., for instance, was planned as a model industrial city, an excellent job was done. Yet Longview, Wash., a city of 12,000 people, surpasses it not only in its general planning but in the attention paid to schools, civic buildings and the general development of the town as a whole. Though the town is only some five years old, the fine group of school buildings and the cultivated beauty of its parkways and lakes give a long-settled appearance to this young community. The library, designed by N. Torbitt, and forming one of the illustrations of this article, is most attractive and is placed in a beautiful setting in the Civic Center. The town itself, which was established by the Long Bell Lumber Company, is laid out on a real city plan about a beautiful boulevard with the Civic Center at one end and the railroad station at the other. Incidentally, it is an excellent illustration of what can be accomplished by adhering to a well thought out plan. Though the planning and work was done just as quickly as that at Gary, Longview is far ahead of Gary.

This seems to be typical of the Northwest, for the people appear to be so full of optimism that their accomplishments are completed in a shorter time than that taken by the Easterners, in spite of the latter's background and superior organization.

As one enters Seattle, the city seems to radiate a freshness that is most interesting. The visitor feels a sense of awe at the great accomplishments of the past few years, notable not only as human accomplishments, but for their architectural excellence. The new Olympic Hotel, designed by George B. Post and Sons, architects of New York, presents one of the finest hotel structures, inside and out, to be seen in this country.

The new shops in Seattle have real distinction. The Woman's Shop of Mangin, in the Fifth Avenue Building, is one of the finest in any community and has a true metropolitan air.

The ten-acre tract owned by the University of Washington in the center of the city has been developed into a smart shop, office and theatrical district, with the simple, new white Skinner Building and the Olympic Hotel as the center. Many other important buildings line the downtown



HOUSE OF MRS. GUY L. WALLACE, PORTLAND, ORE.—A. GLENN STANTON, ARCHITECT

THE NEW POLICY

OF

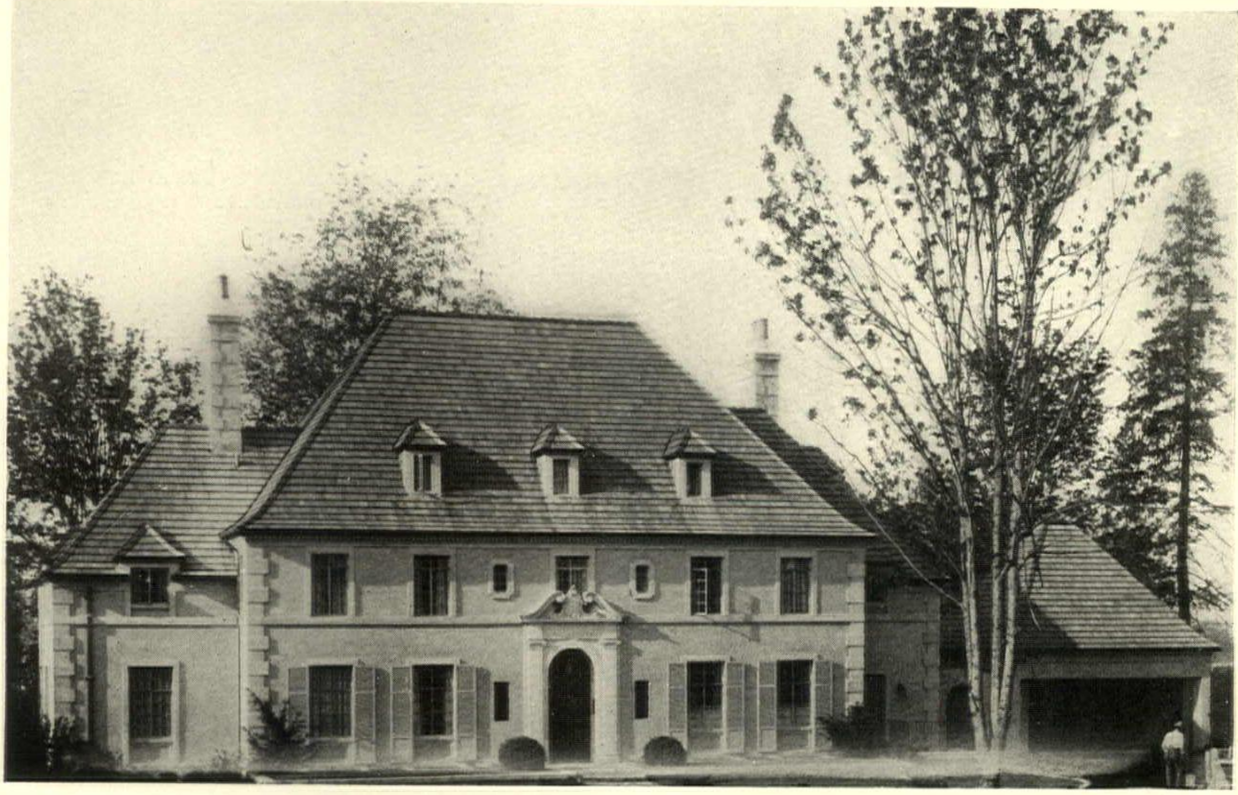
THE AMERICAN ARCHITECT

ARCHITECTURE is as old as human habitation. It has housed mankind and his activities since the first man crawled beneath the shelter of his crude hut, and it has always led the way in the march of civilization, reflecting the changing moods of peoples, making better and more pleasing the handiwork of those who build and leaving its stamp on the pages of the world's history. ¶ High ideals have always been a part of true architecture. Beauty has ever been an aim. Skill has combined attractiveness with the utilitarianism of every day. The architect himself has always been and ever will be an idealist, a seeker of better things, a worshipper of beauty, a lover of the fine, the true. Yet with it all he has today stepped into the front ranks of the world's business men—a combination of characteristics not found elsewhere in modern civilization. ¶ Worshipper of beauty that he is, he is invariably drawn to excellence in design. The work of other men has an attraction for him. He must ever be a student of what others do that he may do better himself. Based upon this premise the field of architecture has developed a group of publications that for execution and contents are not equalled in any other magazine group in any field. ¶ But times change. Architecture has ever been in process of change. And the architect himself today is changing more rapidly than in any other period in the history of architecture. Today the office of many architects is less a studio than a business institution. The work of design has had to be combined with that of management, finance and business method. The architect of today is not the same man he was when The American Architect was founded over a half century ago. ¶ Recognizing this enlarged character of architecture, The American Architect will henceforth endeavor to present a picture broader than has been its custom heretofore. ¶ Foremost in architecture is design, and that phase of the publication's work will never be dropped, but careful selection will be made of those designs that are presented and explanation will be made of the reasons for their presentation. All these old traditional characteristics of the magazine will be retained and improved. Criticism of design will not be uncommon. ¶ The architect, beyond design, has many problems, his relations with his clients, the building of his work into a bigger business, his relations with the erectors of the buildings he plans, the internal operation of his business at lowest cost and best results, the securing of and relations with employees, and countless other detail problems of the everyday world. ¶ All these things in ever broadening scope will become a part of the new American Architect. It will endeavor to paint a current picture of this profession and business with such interest and value that no matter what a man may do, be he proprietor or employee, if that man is a part of architecture he will want to read this magazine.

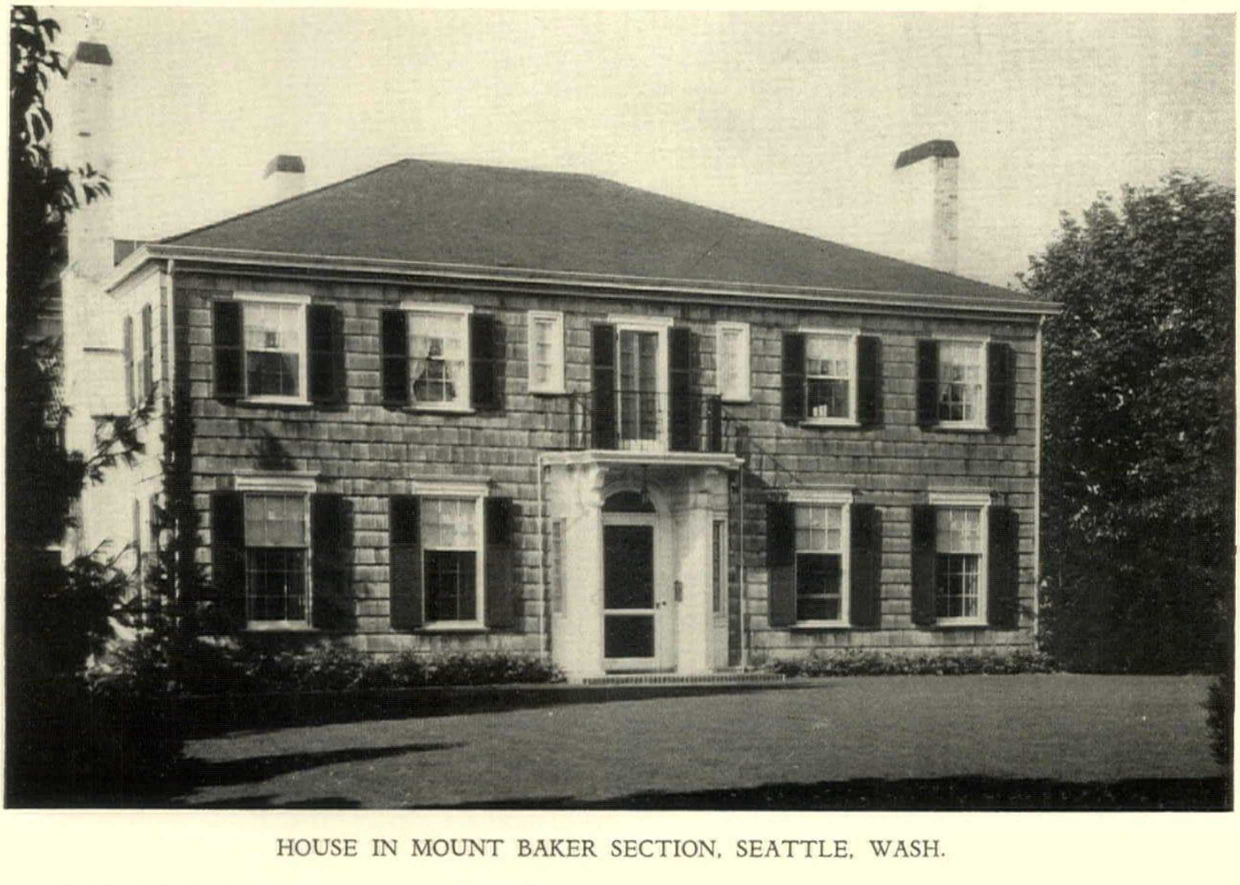
Photo by F. G. Bailey

REPRODUCTION OF THE ANCIENT CAT OF BUBASTIS
ONE OF A PAIR AT THE ENTRANCE TO
CARRERAS TOBACCO FACTORY, LONDON

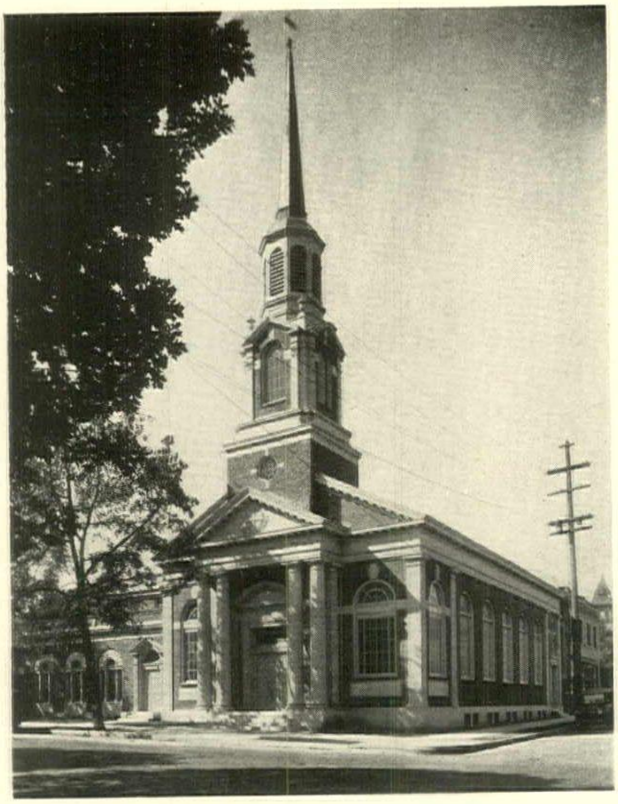
THE AMERICAN ARCHITECT
September 1929



HOUSE IN BROADMOOR, SEATTLE, WASH.
ARTHUR LOVELESS, ARCHITECT



HOUSE IN MOUNT BAKER SECTION, SEATTLE, WASH.



THE UNITARIAN CHURCH OF OUR FATHER AT PORTLAND, ORE., DESIGNED BY JAMIESON PARKER, IS AN EXAMPLE OF A WELL DETAILED BUILDING BASED UPON EARLY AMERICAN PRECEDENT

THE MOUNT BAKER SECTION OF SEATTLE, WASH., CONTAINS MANY FINE RESIDENCES. THE HOUSE SHOWN BELOW IS A PARTICULARLY GOOD EXAMPLE OF THE PICTURESQUE YET SIMPLE AND DIGNIFIED TYPES TO BE FOUND IN THIS DEVELOPMENT

IN THE HOUSE OF J. R. BOWLES, PORTLAND HEIGHTS, A. E. DOYLE HAS SELECTED A FEW MATERIALS AND USED THEM TO GOOD ADVANTAGE IN A HOUSE WHOSE SIMPLICITY IN DESIGN MAKES IT DEPENDENT UPON MATERIALS AND PROPORTION

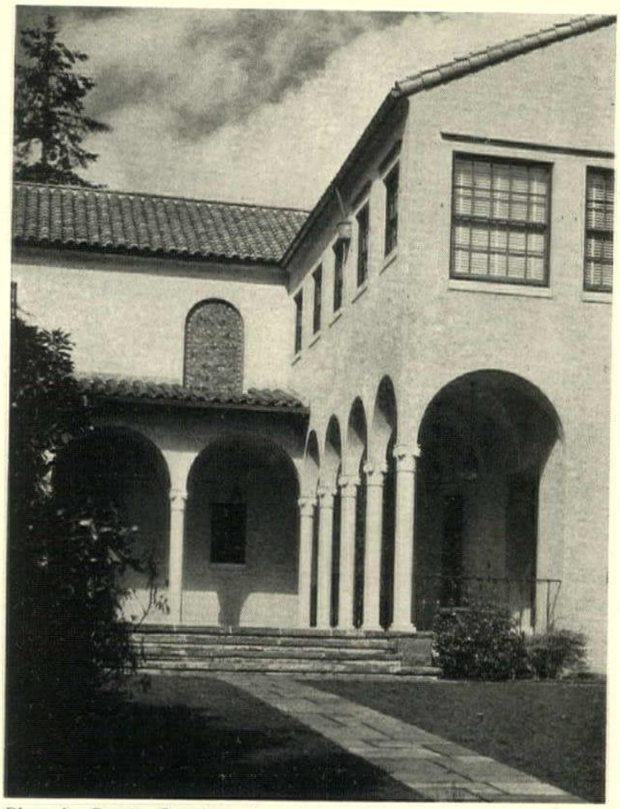


Photo by Peasley-Jourdan

THE HOUSE SHOWN BELOW IS AN EXAMPLE OF A TREATMENT IN WOOD THAT IS PARTICULARLY INTERESTING AND APPROPRIATE IN A DISTRICT WHERE LUMBER IS A GREAT INDUSTRY. HAROLD W. DOTY WAS THE ARCHITECT FOR THIS HOUSE, WHICH IS AT DUNTHORPE, PORTLAND, ORE.

streets, buildings that would be noticed anywhere.

The recently completed Northern Life Tower, which is of purely modern architecture in which vertical lines are accented, is done in far more successful manner than some New York office buildings contemporaneous with it.

The University campus is beginning to take on a character all its own, partly through the new buildings designed by Bebb and Gould. The library, although only partly completed at the time of the writer's visit, shows both distinction and a restraint that is refreshing.

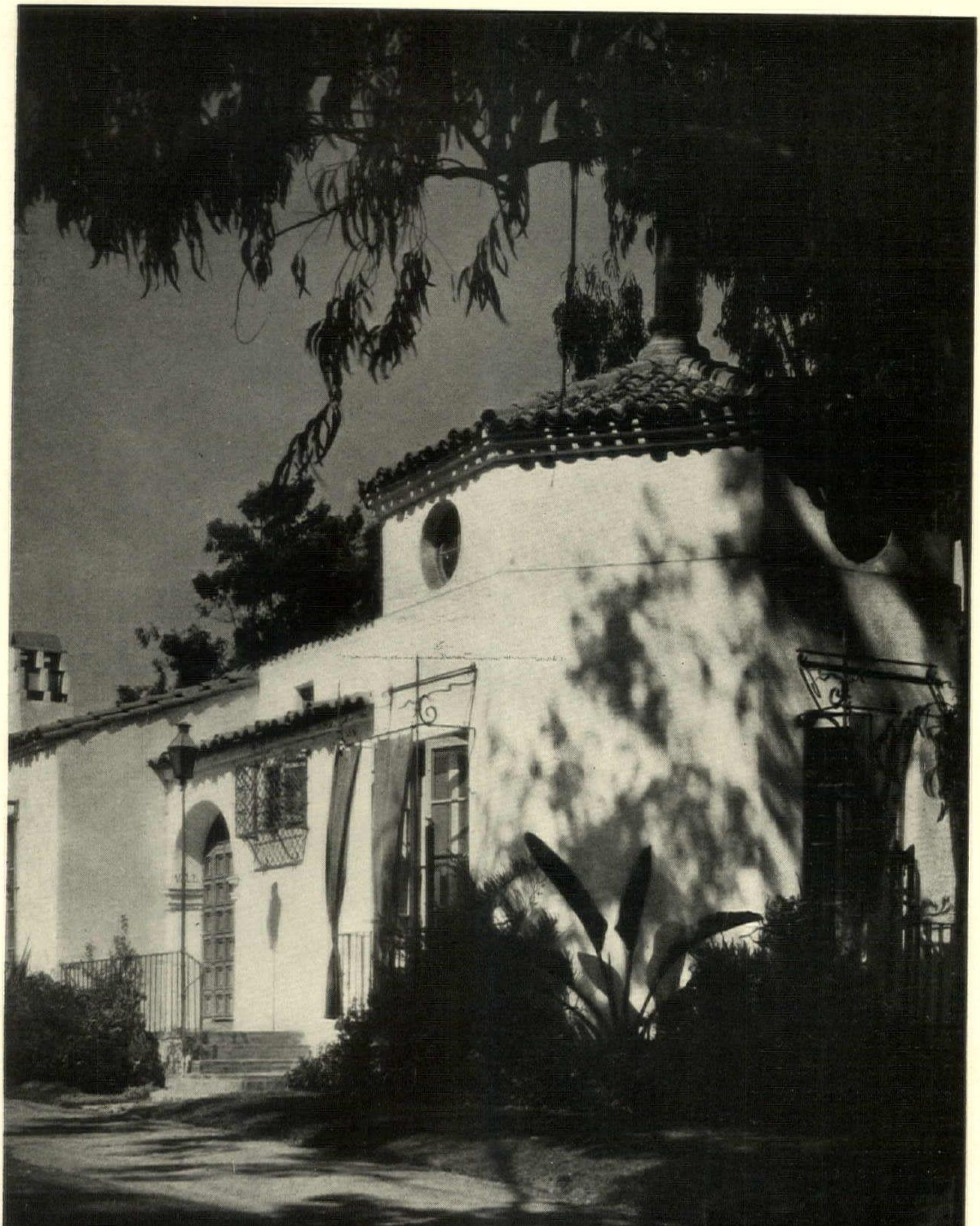
The new suburb "Broadmoor," as well as the Mount Baker district, have many attractive homes. Unfortunately, the writer was not able to photograph many buildings in Tacoma. In Point Defiance Park is a well studied Tudor residence of importance. The National Bank of Tacoma, the First Presbyterian Church, a brick building in the Romanesque style with good detail, the Scottish Rite Cathedral of conservative modernism, and the Wright Seminary for Women in brick Tudor style are all notable buildings.

Motoring down the famous Columbia River highway to Portland, one is somewhat prepared by its beauty to expect a fine residential city—and there is no disappointment. Much of the architecture here is of a so-called modern type which would be criticised by many modernists, though to the writer's mind it expresses a true, modern conception. Though its forms are based on the past, its handling is done in a new manner which reveals a soundly conservative originality that is thoroughly impressive because of its common sense handling of the problems involved. Perhaps the word "rational" expresses its character as well as any word can.

In the commercial section, besides the buildings illustrated, the Bank of California and the Security Savings and Trust Company are buildings of merit. At the University of Oregan, Lawrence and Holford have done several interesting buildings, while their little church at Tillomook has a quaint charm all its own. The Floyd Frank residence, by Herman Brookman, is, the writer believes, one of the most interesting houses in the Northwest.

While in the Northwest, the writer had the pleasure of attending a meeting and dinner in Seattle of the Washington Chapter and, in Portland, of the Oregon Chapter of the American Institute of Architects. The number present, their interest and enthusiasm, showed that the architectural future of our great Northwest is in good hands.

ARCHITECTURE OF SPANISH INSPIRATION IS APPROPRIATE TO THE NATURAL SURROUNDINGS AND CLIMATIC CONDITIONS OF BEVERLY HILLS, CALIF.



HOUSE AT BEVERLY HILLS, CALIF.
FROM A PHOTOGRAPH BY DWIGHT JAMES BAUM

MILTON B. MEDARY, F.A.I.A.

1874—1929

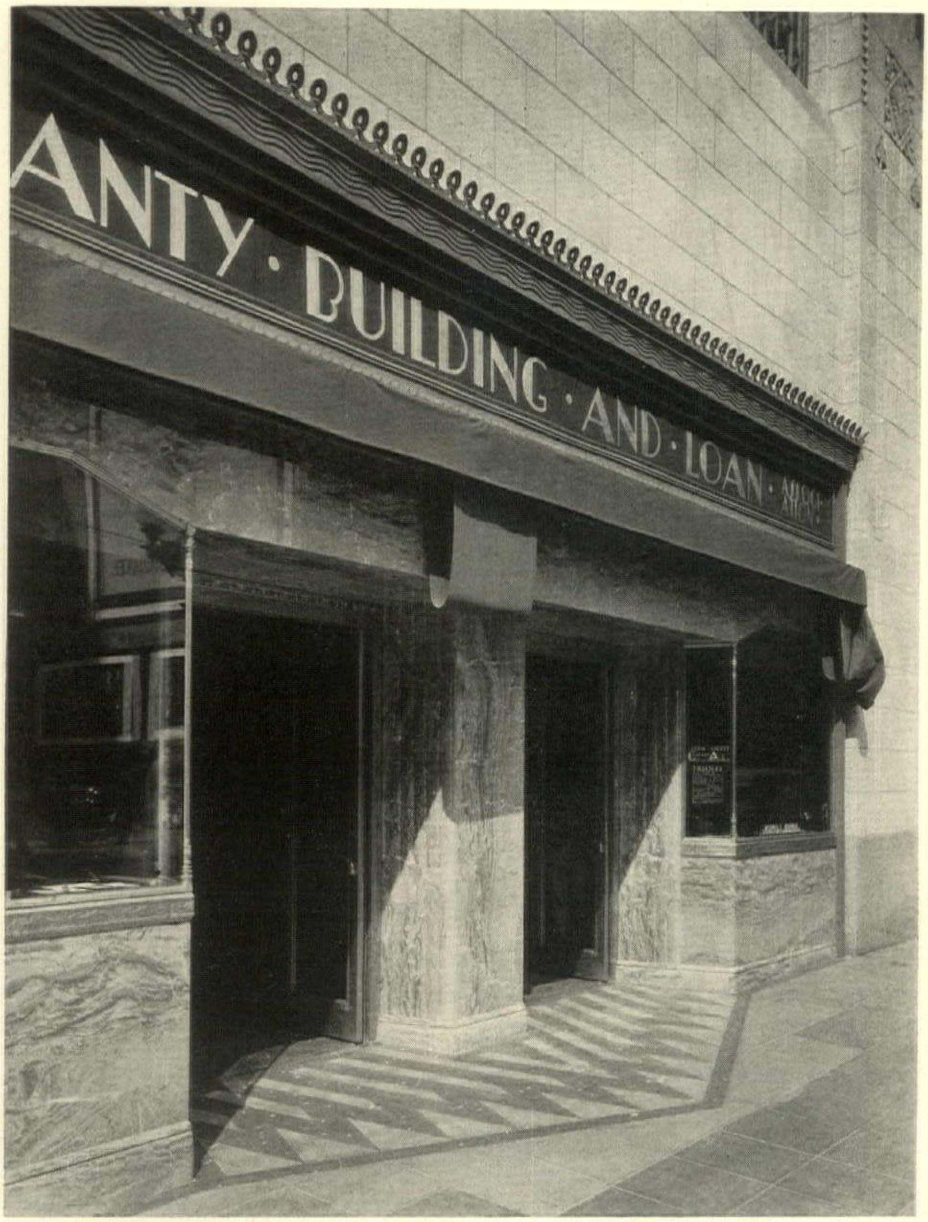
IN THE death of Milton B. Medary, the profession has had removed from its ranks a member who was internationally well known, beloved by all who knew him, a man who had accomplished much good in the advancement of architecture in the United States. Mr. Medary, a member of the firm of Zantzinger, Borie and Medary, of Philadelphia, Pa., died of heart disease at his home in Bala, Pa., on August 7th, 1929.

Milton B. Medary was born in Philadelphia on February 6th, 1874, the son of Milton Bennett Medary and Mary Emma Cregar Medary. At the age of sixteen he began the study of architecture at the University of Pennsylvania. A few years after leaving the University he joined the firm of Field and Medary. In 1905 the partnership was dissolved and Mr. Medary continued to practice alone. The firm of Zantzinger, Borie and Medary was formed in 1910. In 1899 Mr. Medary became an associate member of the American Institute of Architects. The Institute conferred upon him the degree of Fellow in 1910 and awarded him the Gold Medal of the Institute in 1928. He served as President of the Institute from 1926 to 1928. In 1927 he became a life member of this body.

Mr. Medary was always active and keenly interested in public affairs and especially those affecting the development of good architecture in this country. In 1918 he served as chairman of the Housing Corporation of the Department of Labor to design workmen's villages at Neville Island, Pittsburgh and Bethlehem, Pa. In 1922 President Harding appointed him a member of the National Commission of Fine Arts. President Coolidge appointed him a member of the National Capital Park and Planning Commission in 1926. Secretary Mellon named him for a seat on the Board of Architectural Consultants of the Treasury Department in 1927. In this same year the University of Pennsylvania conferred upon him the degree of Doctor of Fine Arts, and the Art Club of Philadelphia awarded him the Gold Medal of this institution.

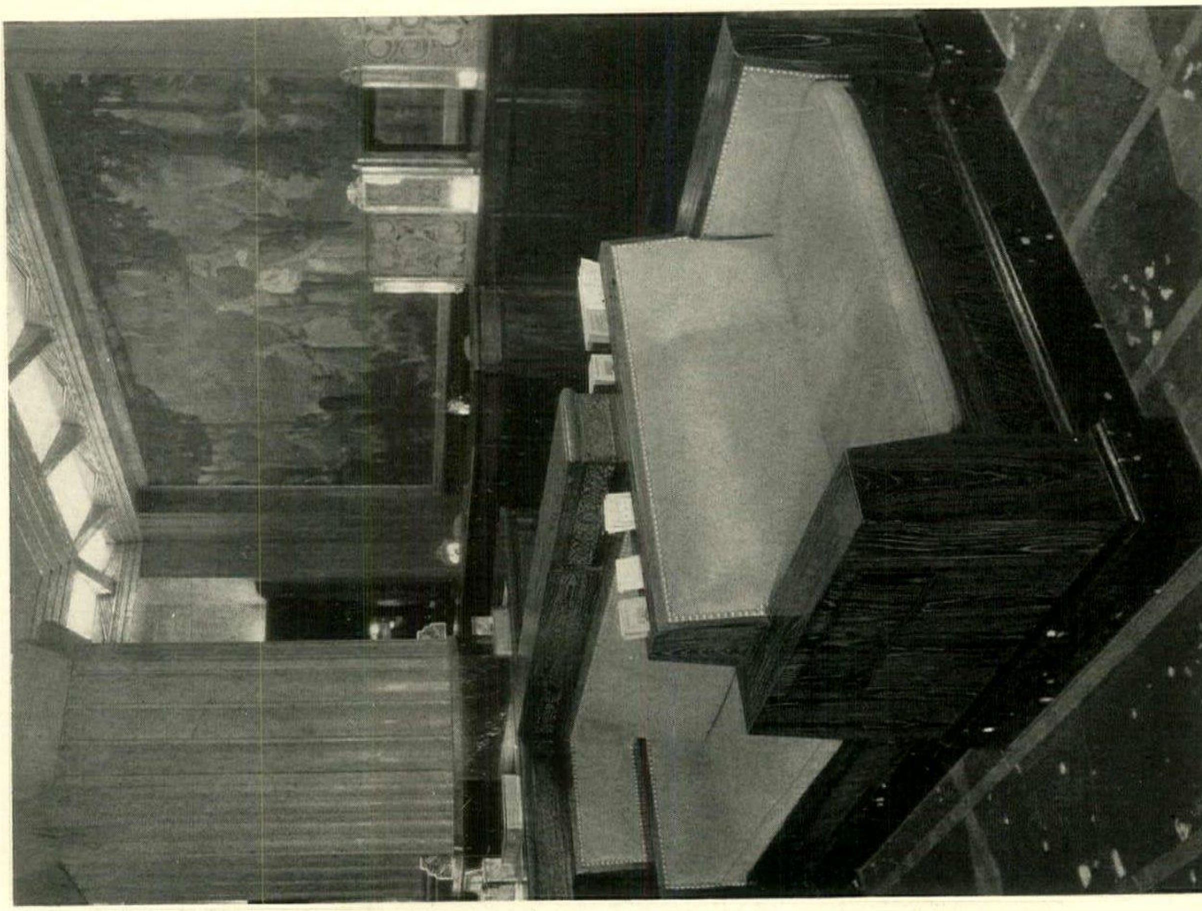
Among the many positions held by Mr. Medary were those of consulting architect to Cornell University; director of the Foundation for Architecture and Landscape Architecture of Lake Forest, Ill.; President of the Philadelphia Chapter of the A. I. A., T-Square Club, and the Architectural Alumni of the University of Pennsylvania; honorary corresponding member of the Royal Institute of British Architects; and honorary member of the American Society of Landscape Architects. Mr. Medary was a member of many architectural societies; the Philadelphia Zoölogical Society; the Art, Philobibion, Wilderness, Rittenhouse Clubs of Philadelphia, Century Club of New York and the Cosmos Club of Washington.

Among the structures of which he or his firm were the designers are the Bok Carillon, or Singing Tower, at Mountain Lake, Fla., the Valley Forge Chapel, the Penn Athletic Club, and Fidelity-Mutual Life Building in Philadelphia.



GUARANTY BUILDING AND LOAN ASSOCIATION
LOS ANGELES, CALIF.

Feil & Paradise, Architects



Photos by Mott Studios

GUARANTY BUILDING AND LOAN ASSOCIATION, LOS ANGELES, CALIF.—FEIL & PARADISE, ARCHITECTS

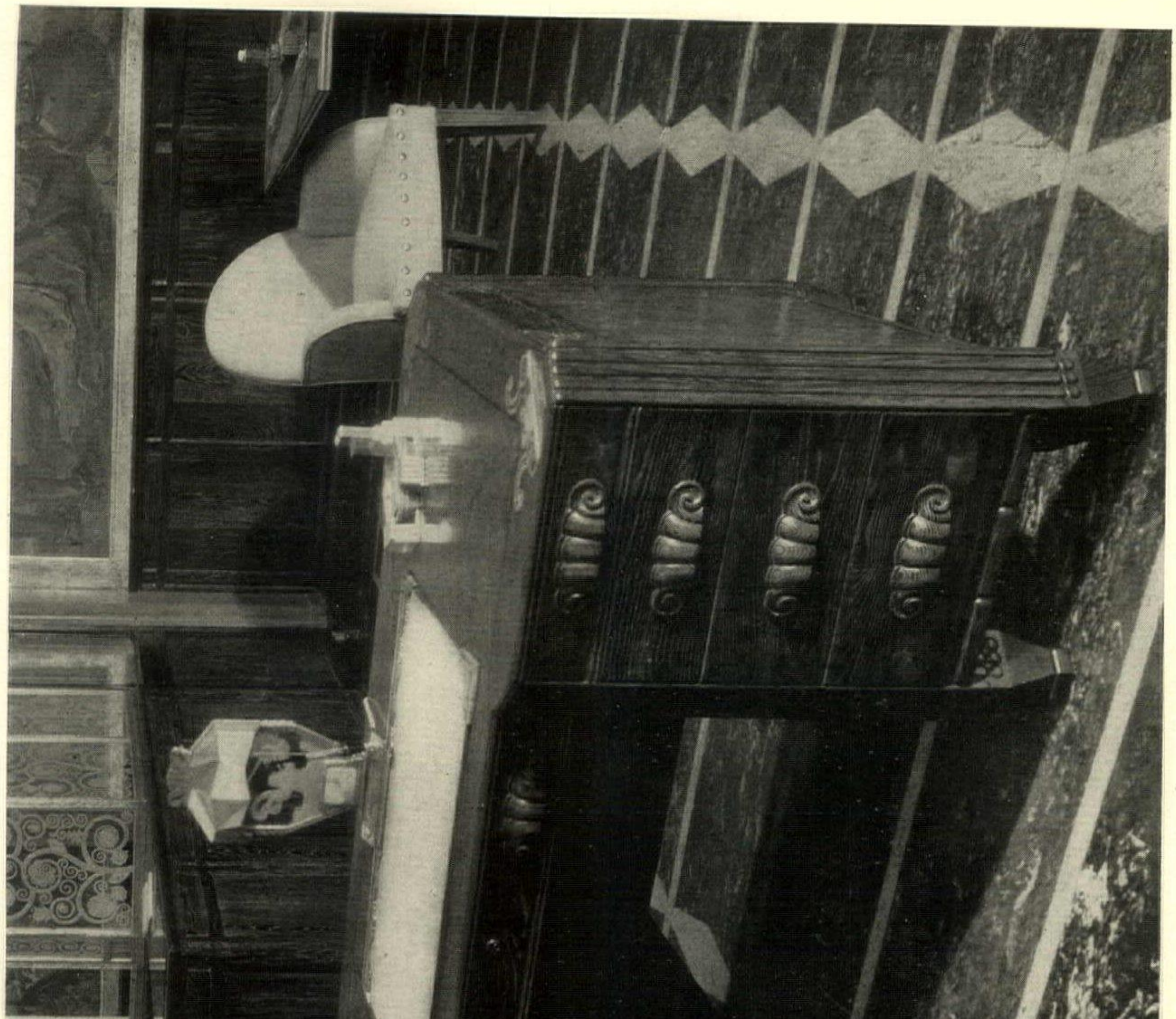


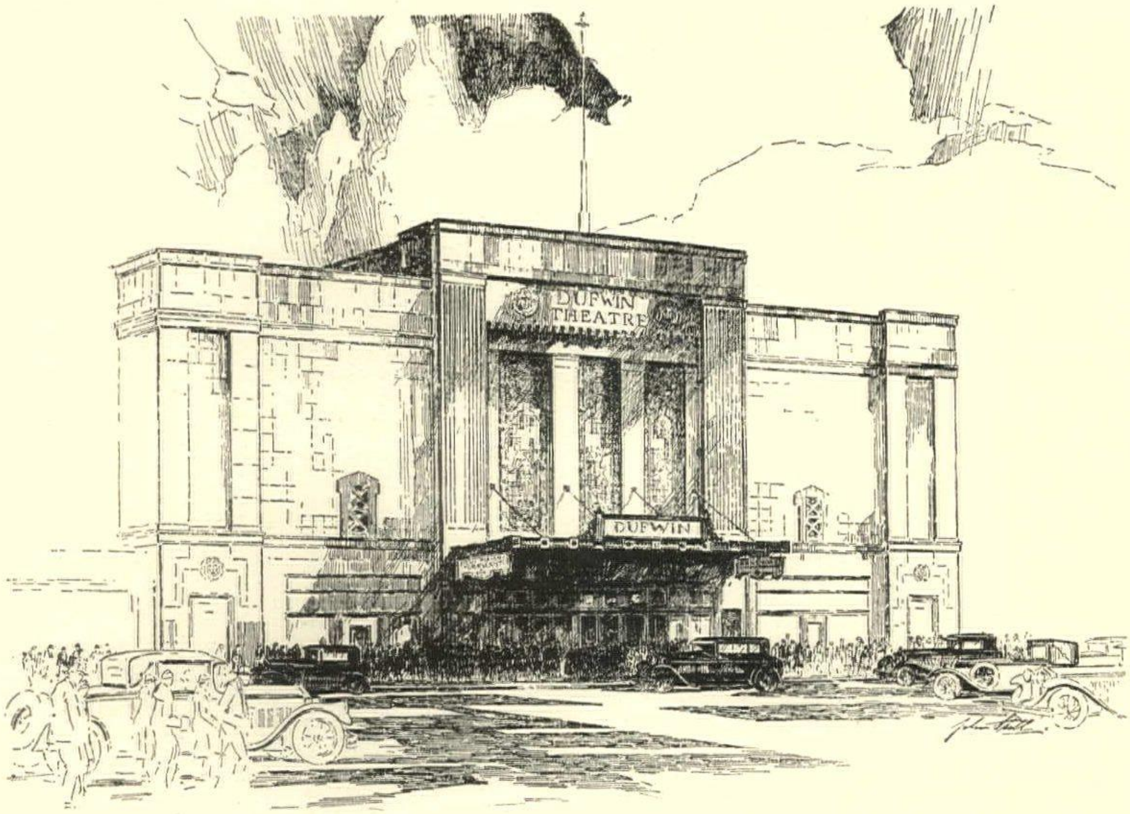
Photo by Mott Studios

GUARANTY BUILDING AND LOAN ASSOCIATION, LOS ANGELES, CALIF.—FEIL & PARADISE, ARCHITECTS

Photos by Mott Studios

GUARANTY BUILDING AND LOAN ASSOCIATION, LOS ANGELES, CALIF.

FEIL & PARADISE, ARCHITECTS



DUFWIN THEATRE, OAKLAND, CALIF.

Weeks & Day, Architects

THE recent developments and changes in the world of architecture and decorative art, with varied reactions, all of them finally submerged in a growing faith in the future, lead to the modern architectural treatment of the new Dufwin Theatre.

Due to the small size of the property and in order to obtain the required number of seats, the rear of the balcony necessarily extended to the street, which produced a solid main facade wall, presenting a difficult exterior surface to design. It was decided to use a modern form of Greek art and architecture, with a certain amount of color and luster to obtain an interesting effect of theatrical character. Since there was no opportunity for openings on the exterior facade, three large colorful tile panels were designed to obtain a note of interest and color, needed to relieve the severity of the plain wall. The frames of all three panels are rich in color, of Greek origin and similar in design, with a group of figures in each representing Tragedy, Music and Drama. The upper part is in green, red, blue and gold, with the figures silhouetted against a deep blue background. The pedestals supporting them sparkle with colors of vermillion, umber, yellow and gold, and accents of black. The wall surfaces surrounding the panels are executed in a soft tone of amber pink.

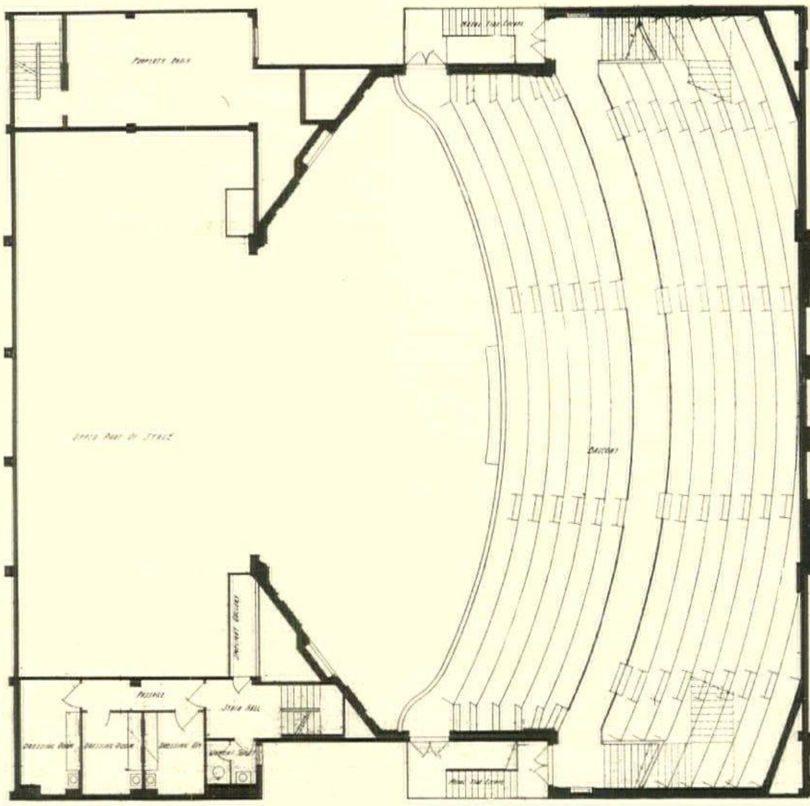
Under the group of panels the marquise, severe in treatment, was designed as a part of the exterior composition and structure.

The vestibule has a Pompeian vaulted ceiling, decorated with free ornament of brown, green, gold and black, laid carefully over a rich red background. The walls are light Caen stone, relieved with marble trimmed openings.

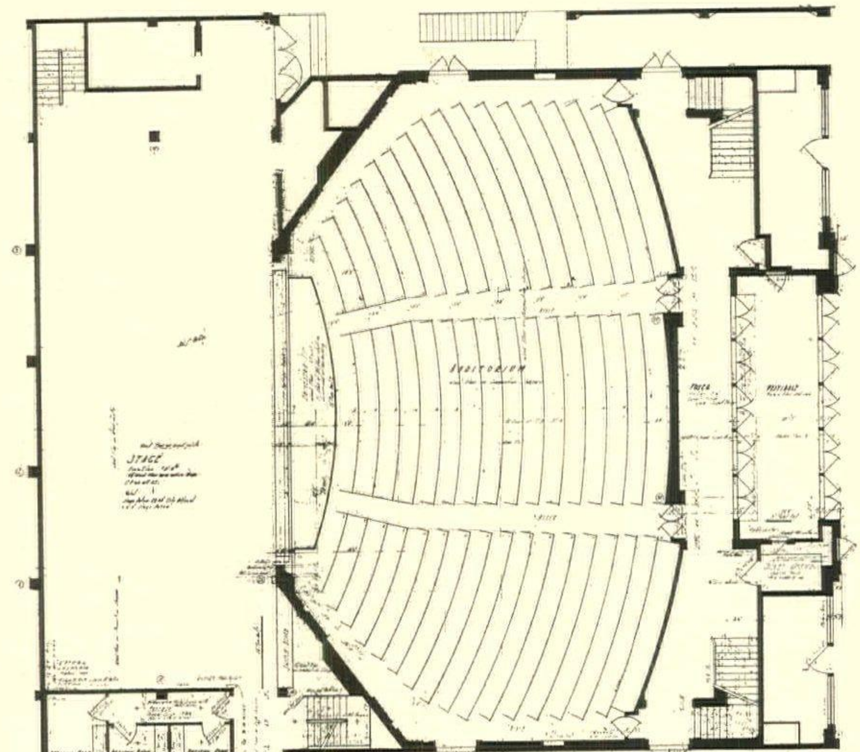
Upon entering the auditorium, the impression is one of simplicity in design, with the same Greek influence as that of the exterior. A wood wainscot encircles the lower part of the auditorium, blending with the soft mellow tones of the walls and ceiling. The proscenium opening is dignified in character, with two gold figures in relief, at the sides near the top, against a glazed blue background. The corners adjacent to the proscenium are treated with pilasters, enclosing recessed mirror panels, over the top of which are decorative panels of figures in gold, on a background of dull blue.

The draperies and furniture are warm in color tone. The proscenium is draped in soft crimson and trimmed with gold, which picks up the warm soft tones of the lighting fixtures.

The theatre has a seating capacity of 1206.

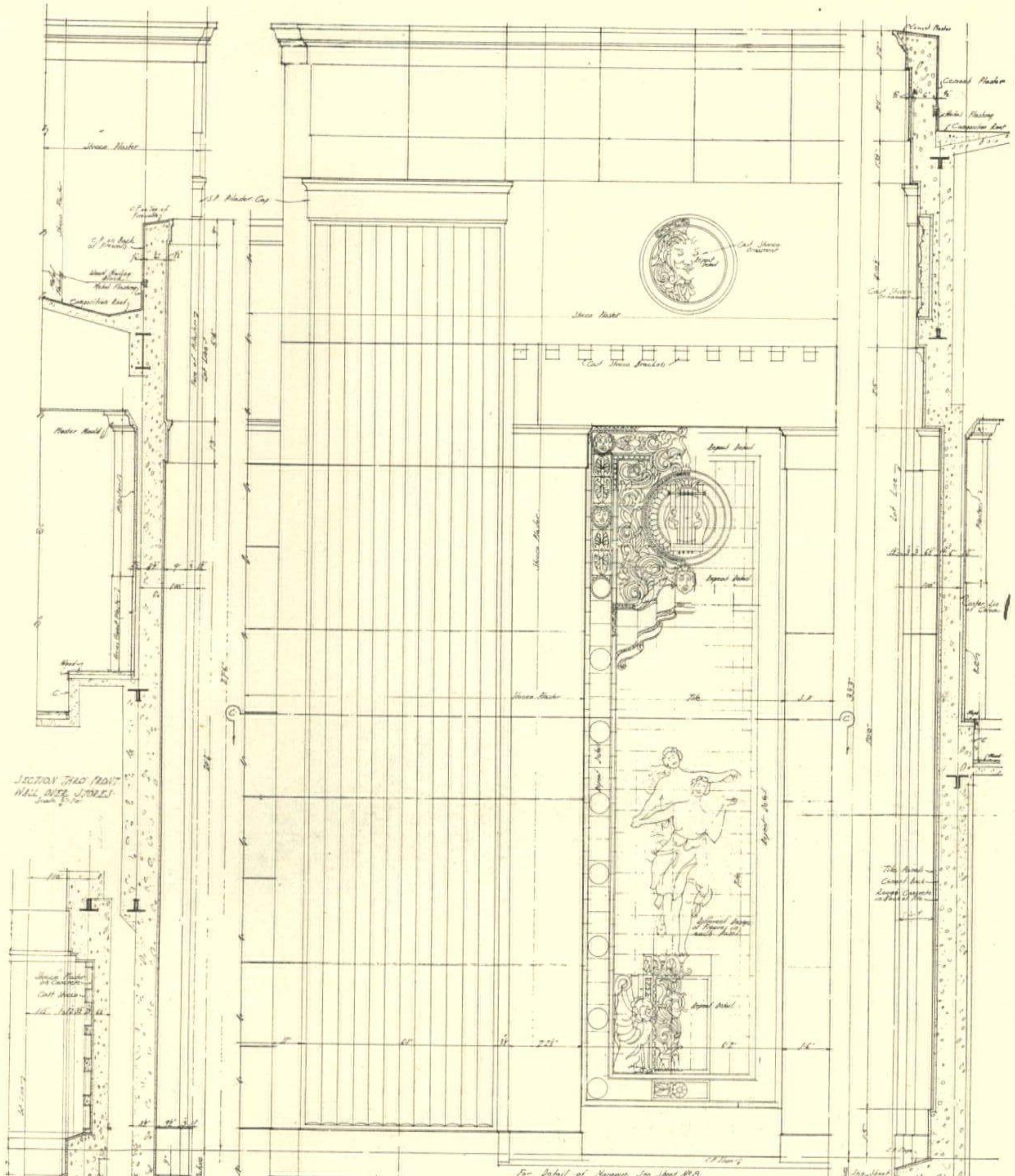


BALCONY FLOOR



ORCHESTRA FLOOR

DUFWIN THEATRE—OAKLAND, CALIF.—WEEKS & DAY, ARCHITECTS



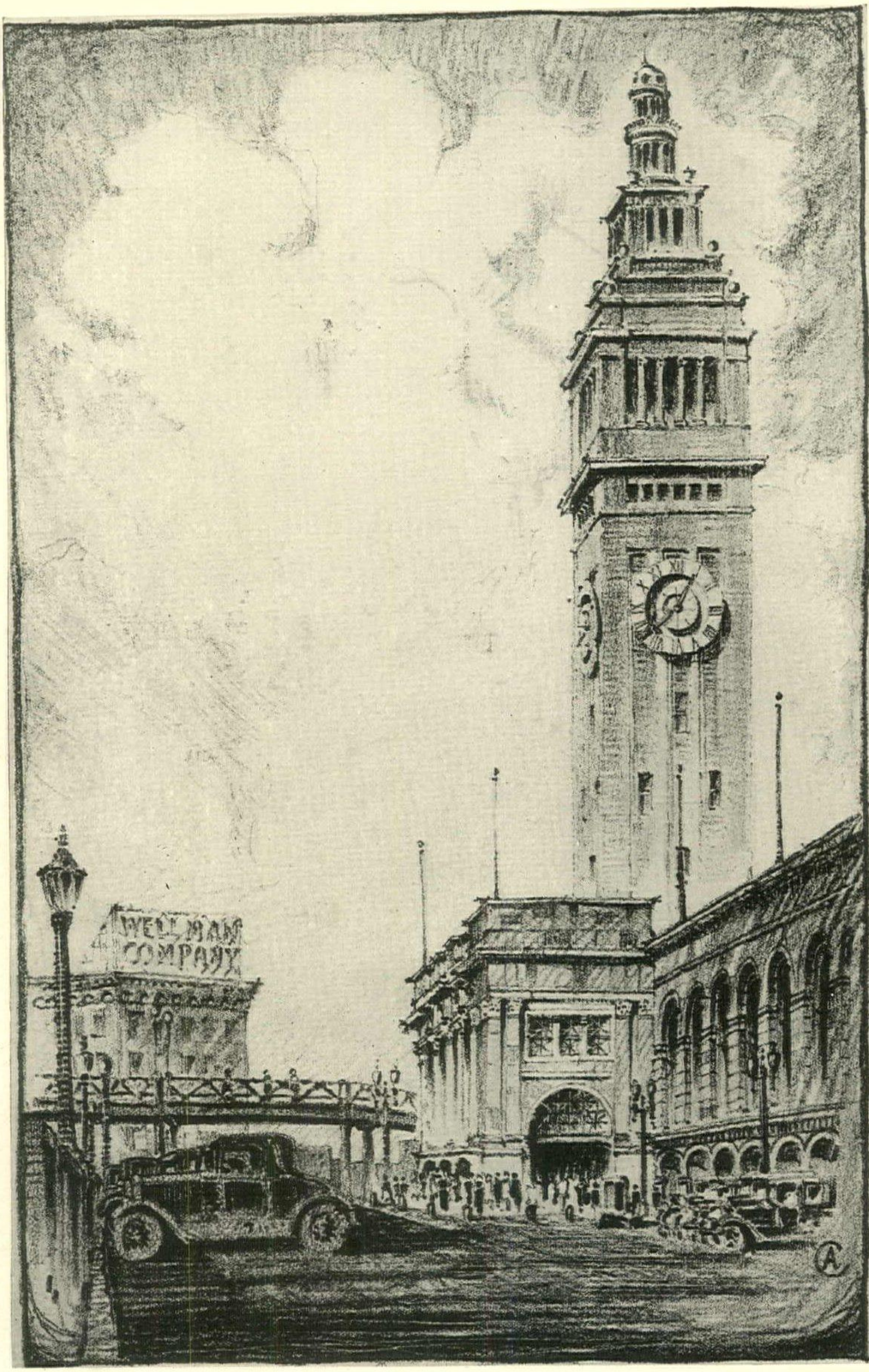
DETAILS OF FRONT ELEVATION

DUFWIN THEATRE, OAKLAND, CALIF.

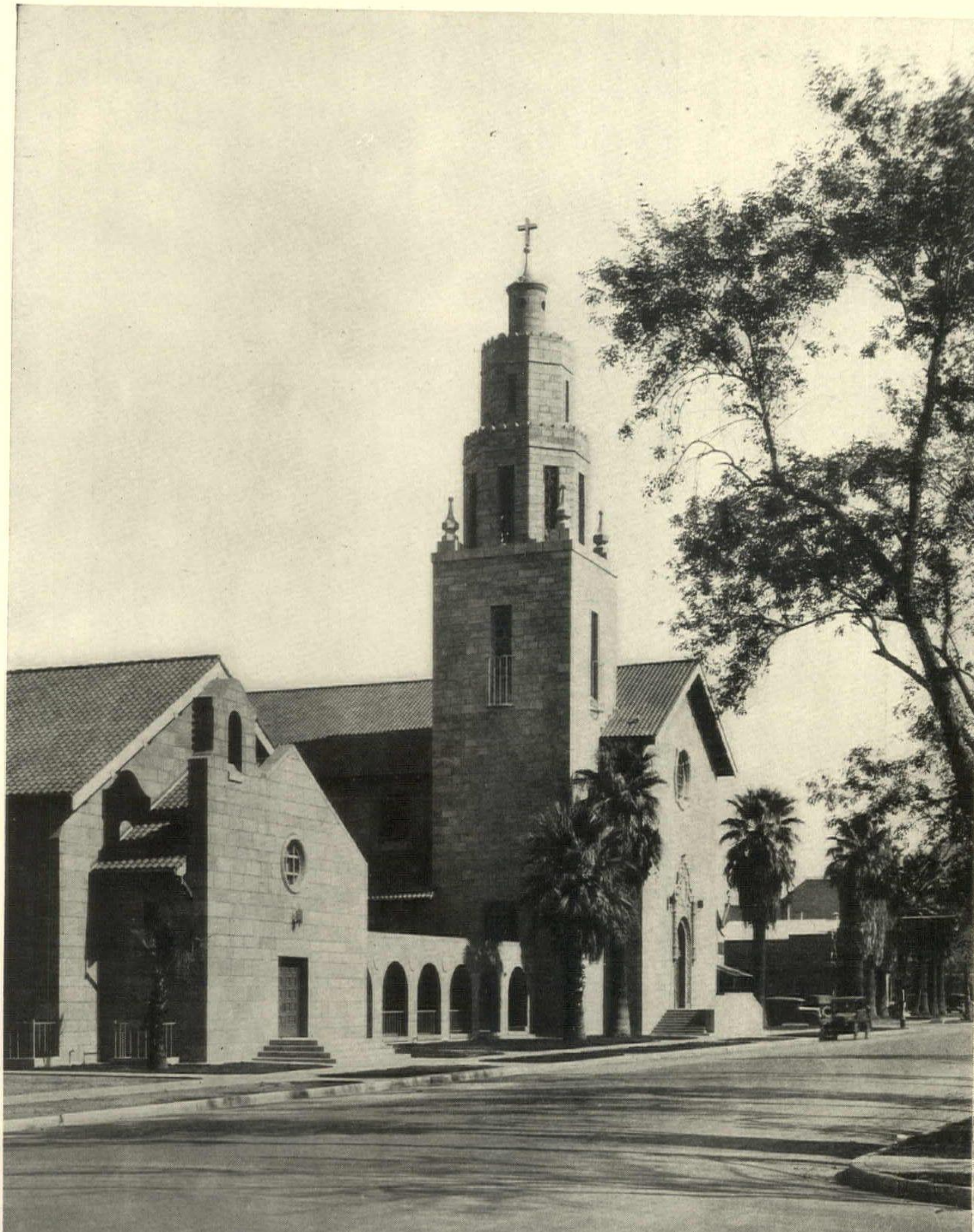
WEEKS & DAY, ARCHITECTS

DUFWIN THEATRE, OAKLAND, CALIF.
WEEKS & DAY, ARCHITECTS

AUDITORIUM, DUFWIN THEATRE, OAKLAND, CALIF.
WEEKS & DAY, ARCHITECTS



FERRY BUILDING, SAN FRANCISCO, CALIF.
FROM A LITHOGRAPH BY ARMAND CARROLL



FIRST PRESBYTERIAN CHURCH, PHOENIX, ARIZ.
NORMAN F. MARSH & CO., ARCHITECTS

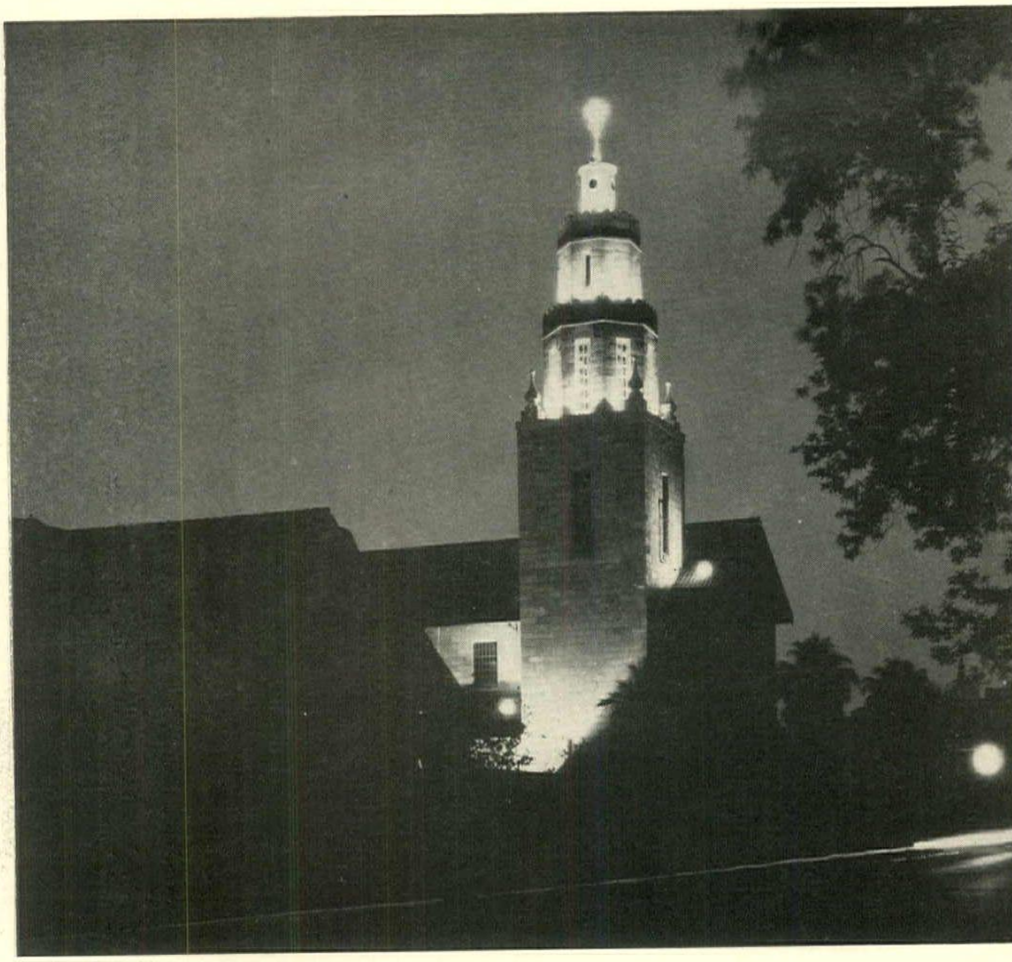
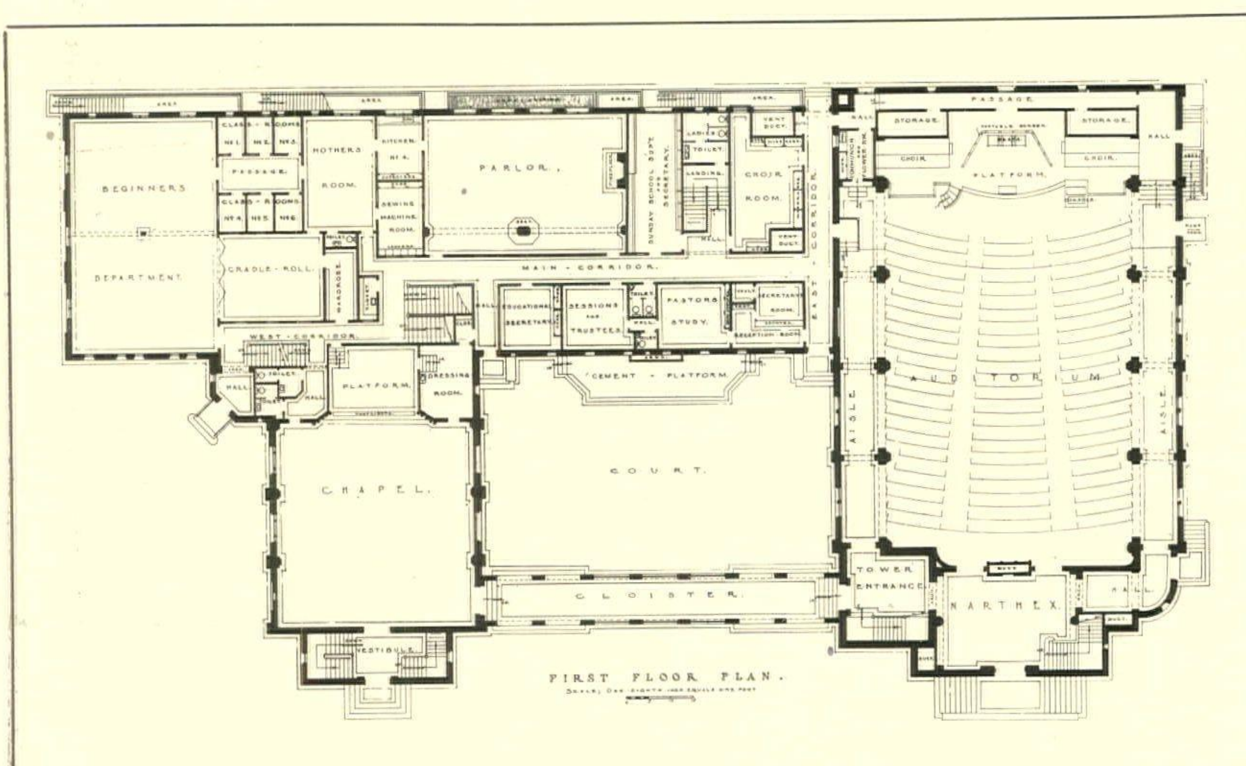
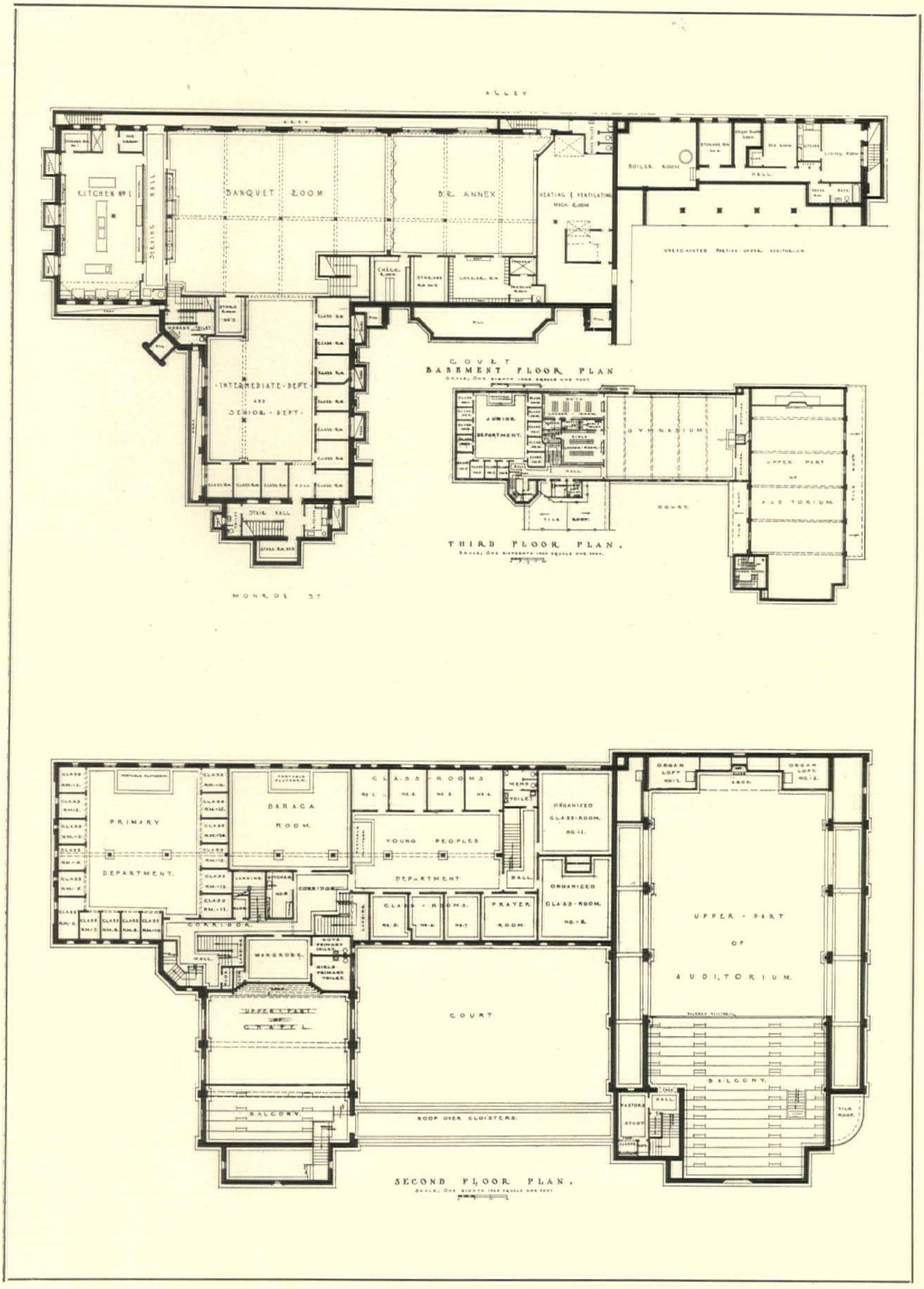


Photo copyright by McCulloch Bros.



FIRST PRESBYTERIAN CHURCH, PHOENIX, ARIZ.

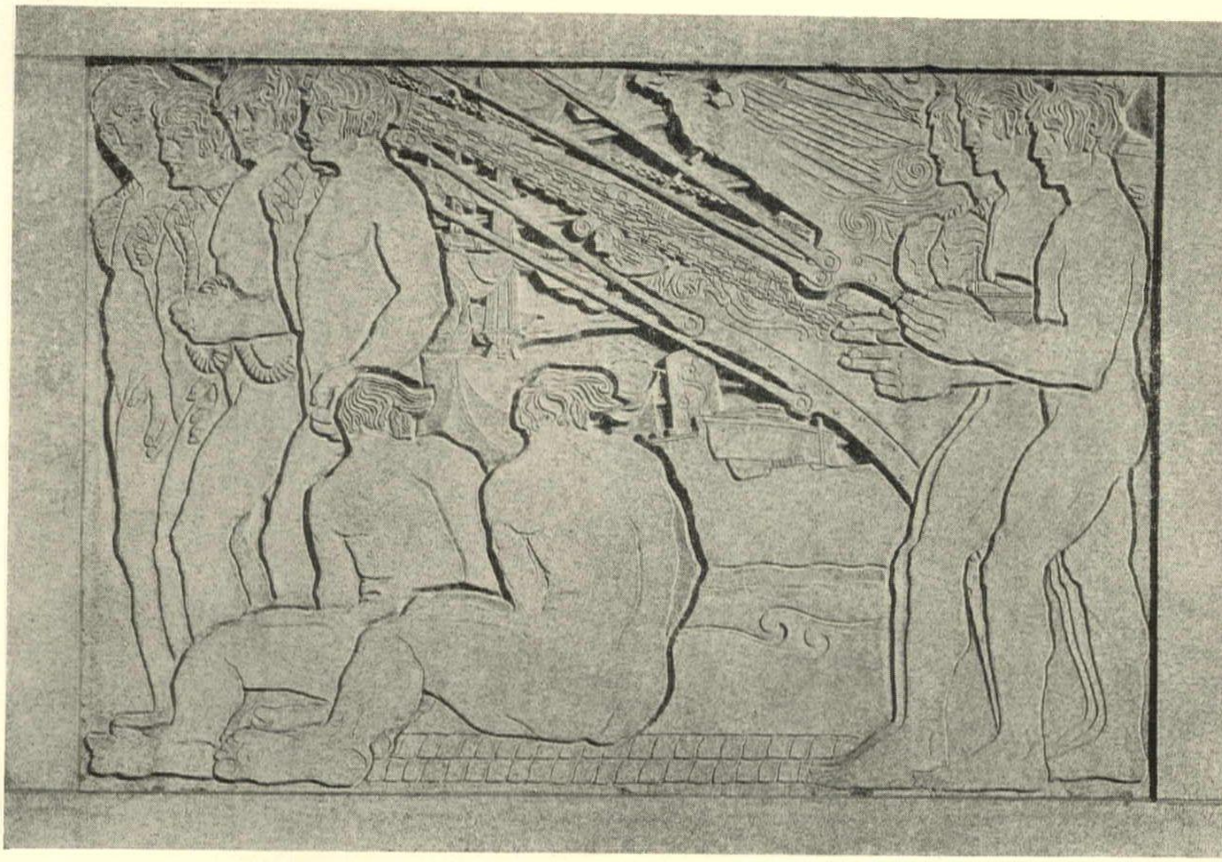
NORMAN F. MARSH & COMPANY, ARCHITECTS



FIRST PRESBYTERIAN CHURCH, PHOENIX, ARIZ.

NORMAN F. MARSH & COMPANY, ARCHITECTS

FIRST PRESBYTERIAN CHURCH, PHOENIX, ARIZ.
NORMAN F. MARSH & COMPANY, ARCHITECTS



INCOME SECURITIES BUILDING, OAKLAND, CALIF.

FRED H. REIMERS, Architect

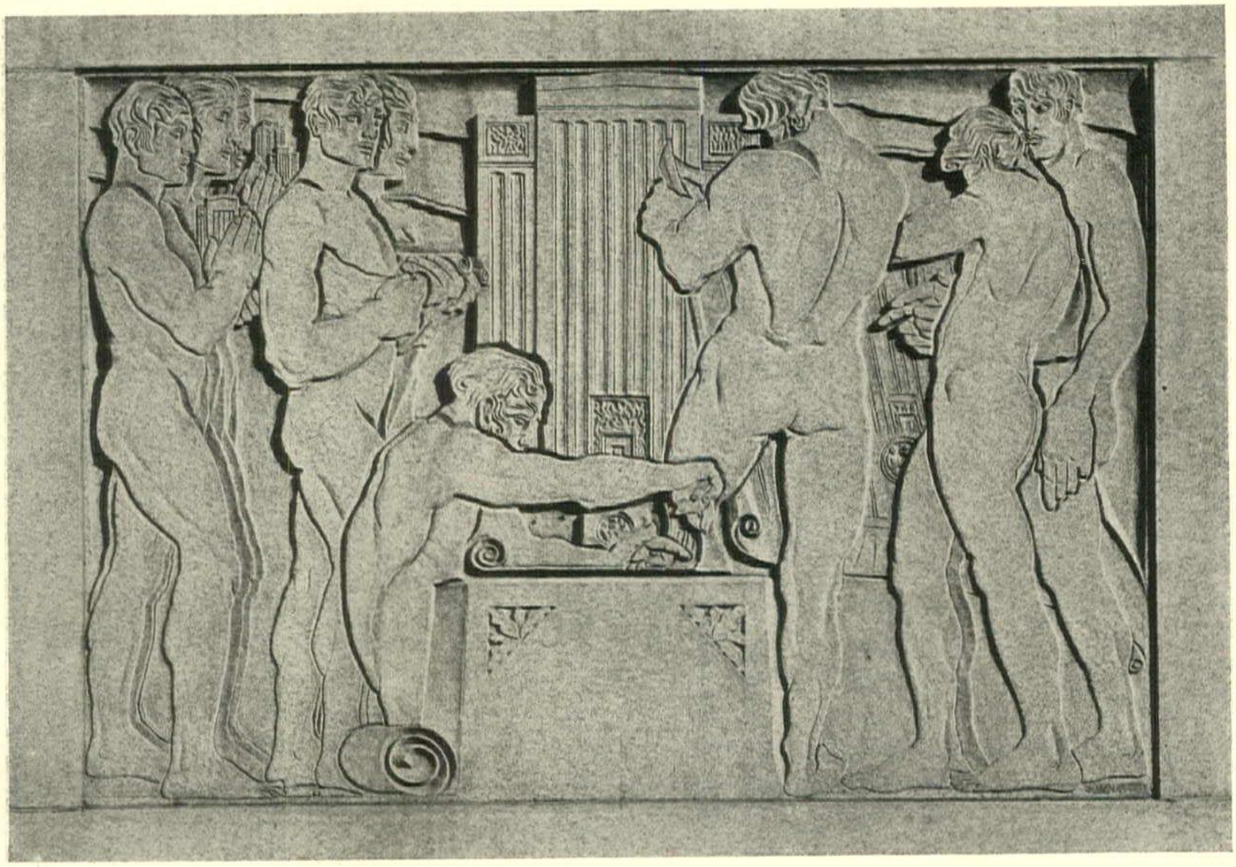
Sculptural Decoration Designed by John Stoll

THE design of the Income Securities Building, at Oakland, California, is unique due to the fact, no doubt, that the structure is largely sculptural in conception. It is a six-story building, covering a lot fifty by one hundred feet. While an effort was made to create a design of simple, dignified proportions, void of the monotonous embellishments of orthodox ornament purchased by the yard, the design features certain decorative motives which give it peculiar interest.

The facade is buttressed at four points. These buttresses, triangular in shape, terminate in a boldly outlined sculptural eagle. The slope at the terminal of the buttress corresponds with the slope of the parapet wall. The pinions of the eagle fall or continue into the flanking flutings of the buttresses. The two entrance doors and window between are set in deep splayed reveals. The eagles form a simple, powerful and interpretative finish. Other lines carry the eye to the main motif of the low relief panels above the doors. These are cut to conform with the spirit of the conception as a whole. Repeating the feeling of the slope of the parapet wall, the heads of the figures are cut V-shaped and approximately two inches deep, tapering to a half inch or less toward the feet. The anatomy of the figures is big and powerful. The accentuation of decoration on the building has a logical appeal to mind and eye at the points at which it appears.

The panel illustrated above is symbolical of commerce and shipping. Two powerful figures seated on the hawser are envisioning commerce carriers of the future. Other figures are interpretative of united coöperation and aim. The rope they carry is symbolical of unbroken bond. The eagle and Indian figureheads express the thought of dominion and nationality.

One panel illustrated on the following page symbolizes general activities. It is purposeful in spirit and action, and interprets justice in dealings, youth and confidence and aspiration. The other panel is a symbolical representation of architecture and the progressive spirit of the art.

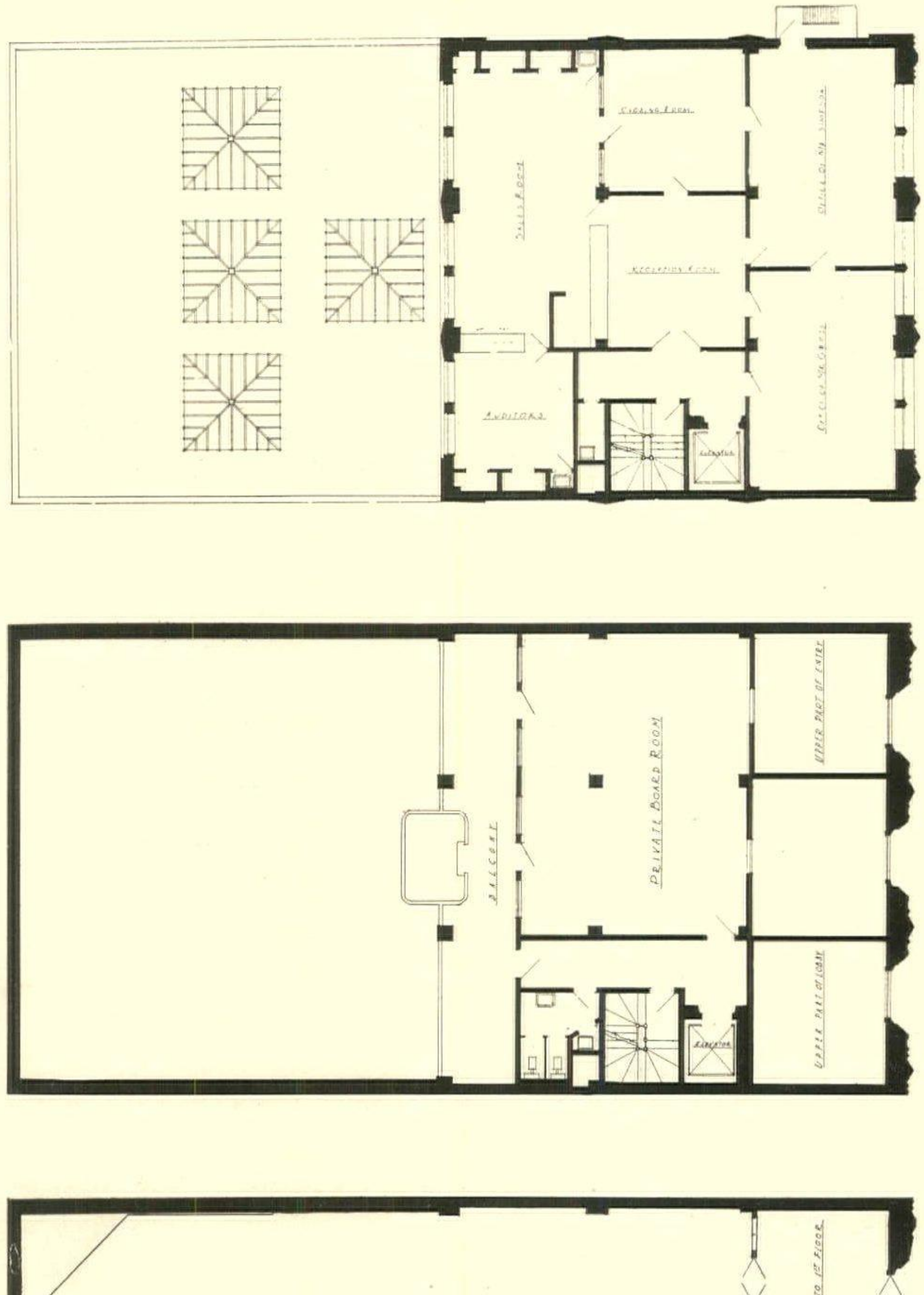


SCULPTURED PANELS, INCOME SECURITIES BUILDING, OAKLAND, CALIF.
DESIGNED BY JOHN STOLL

Photo by Cohen Co.

INCOME SECURITIES BUILDING, OAKLAND, CALIF.

FRED REIMERS, ARCHITECT; FACADE DESIGNED BY JOHN STOLL



MEZZANINE FLOOR

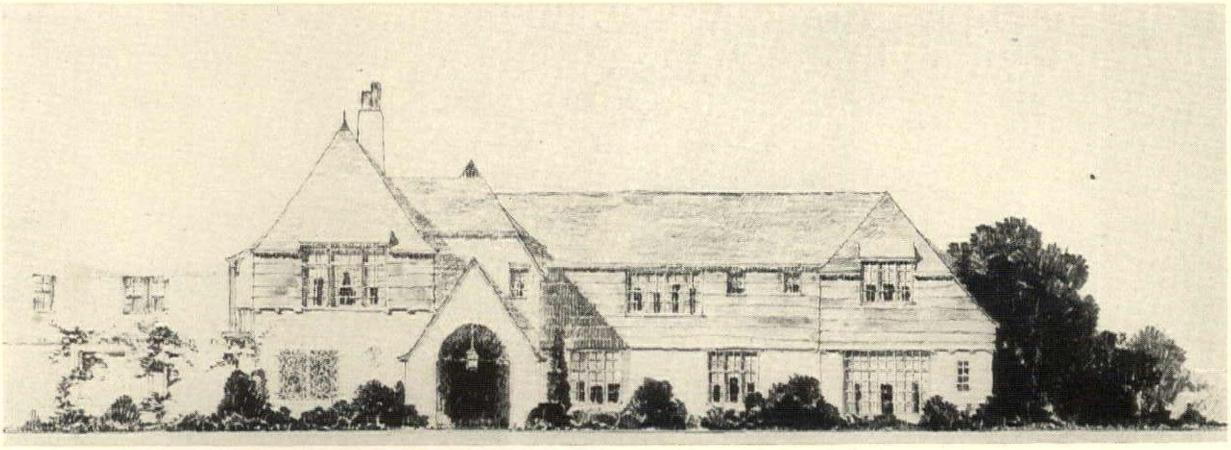
SECOND FLOOR

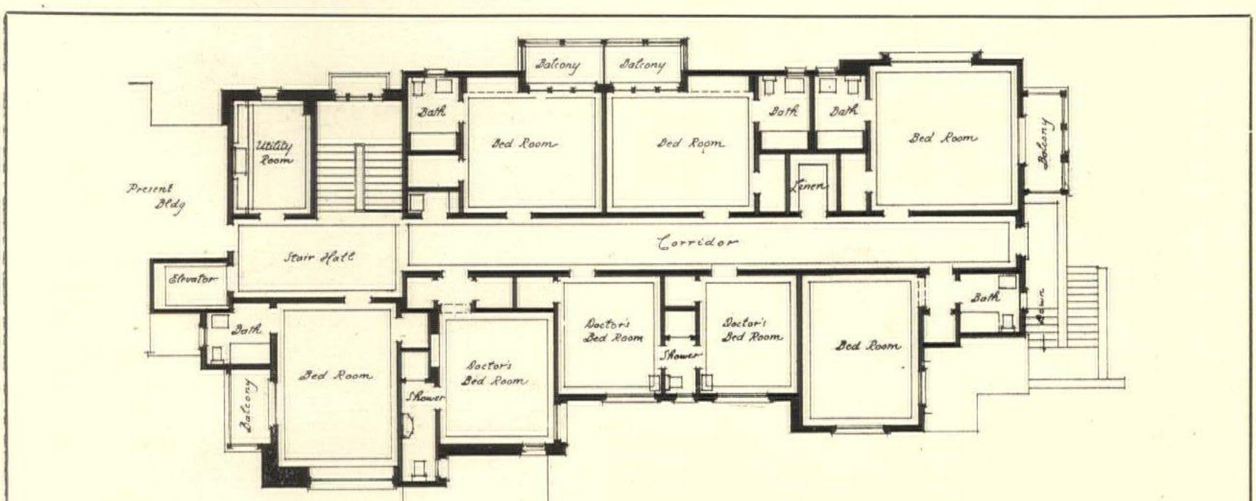
FIRST FLOOR

INCOME SECURITIES BUILDING, OAKLAND, CALIF.—FRED H. REIMERS, ARCHITECT

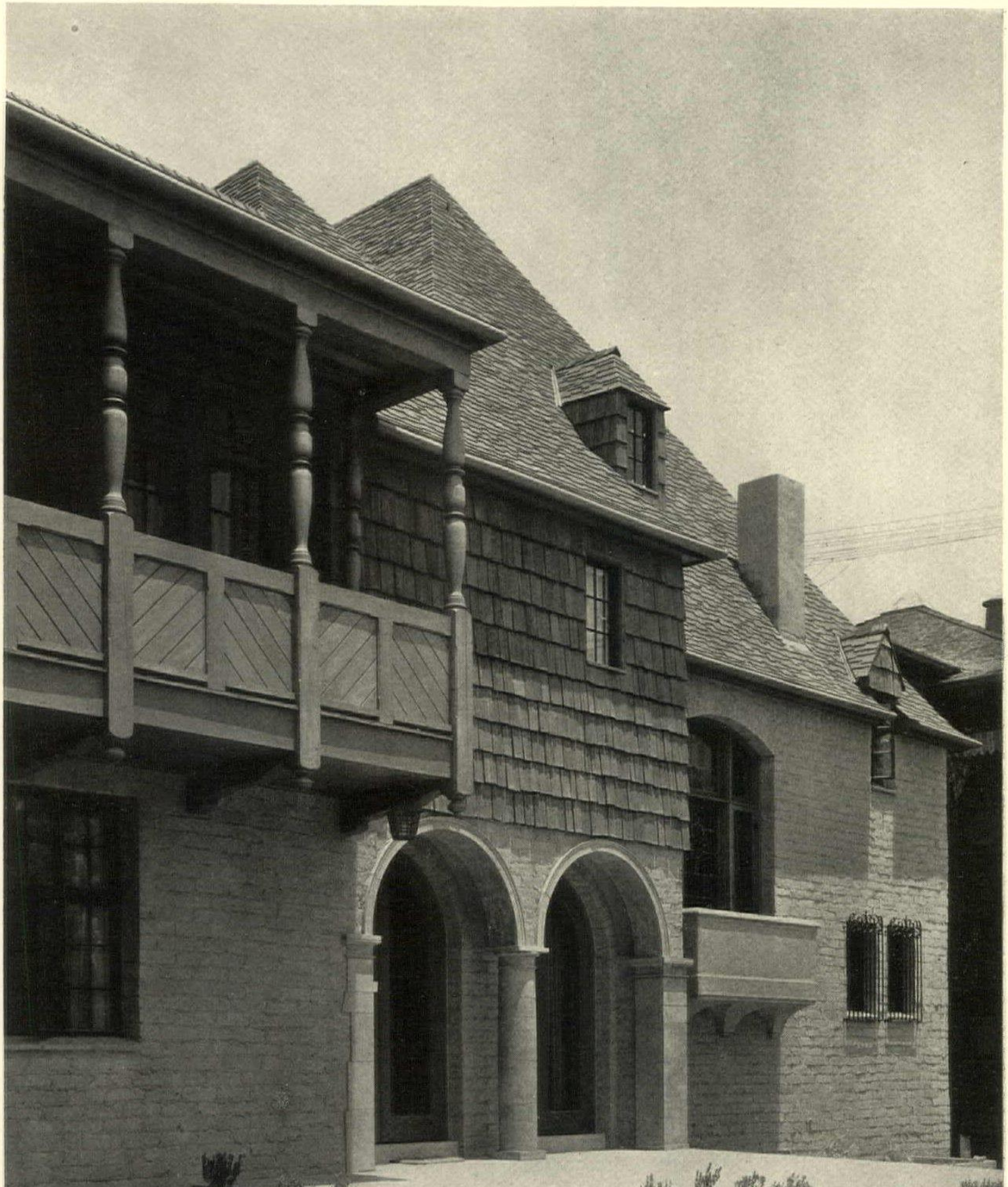
LAS ENCINAS SANITARIUM, PASADENA, CALIF.

Clarence L. Jay, Architect

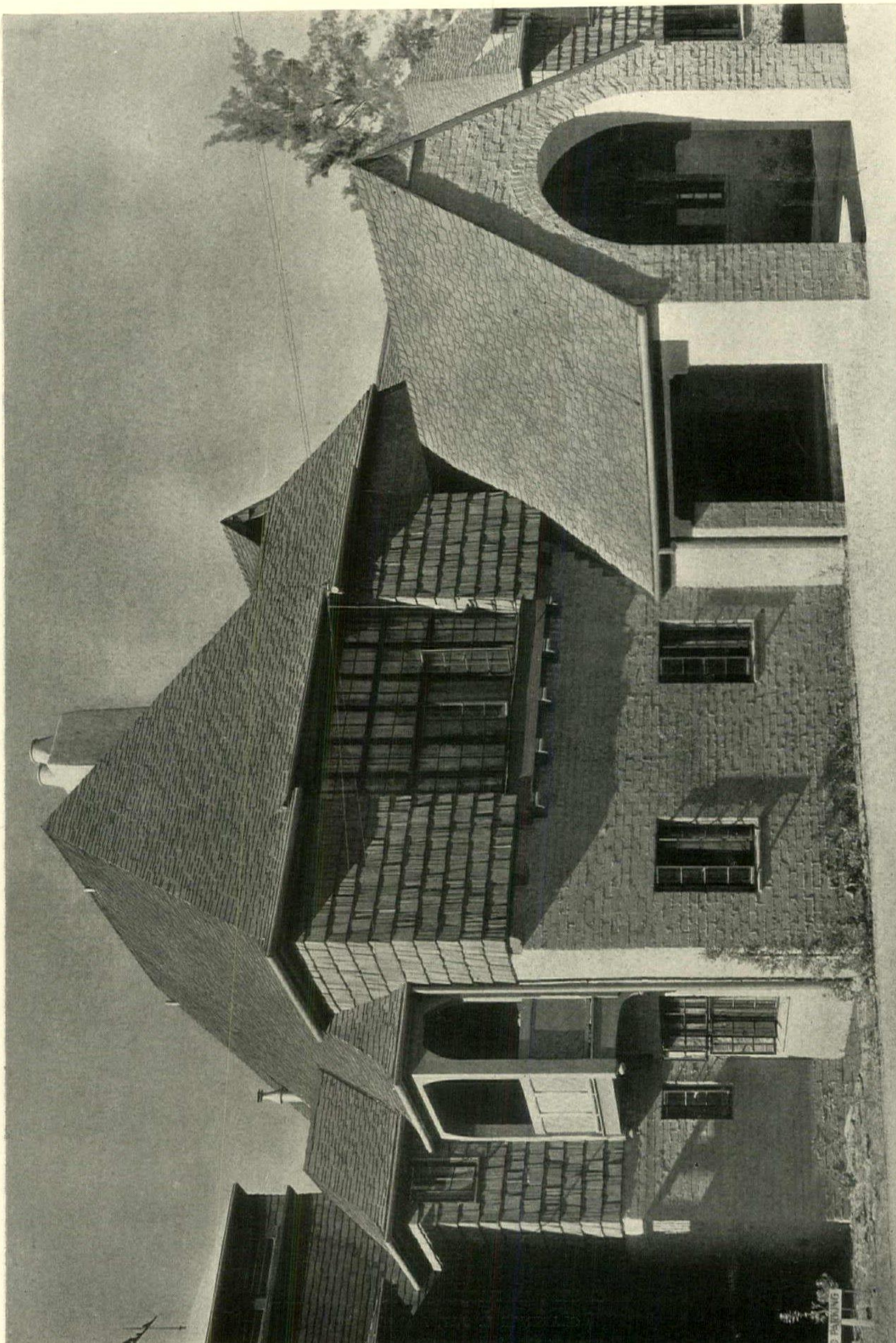




LAS ENCINAS SANITARIUM, PASADENA, CALIF.
CLARENCE L. JAY, ARCHITECT



LAS ENCINAS SANITARIUM, PASADENA, CALIF.
CLARENCE L. JAY, ARCHITECT



LAS ENCINAS SANITARIUM, PASADENA, CALIF.—CLARENCE L. JAY, ARCHITECT

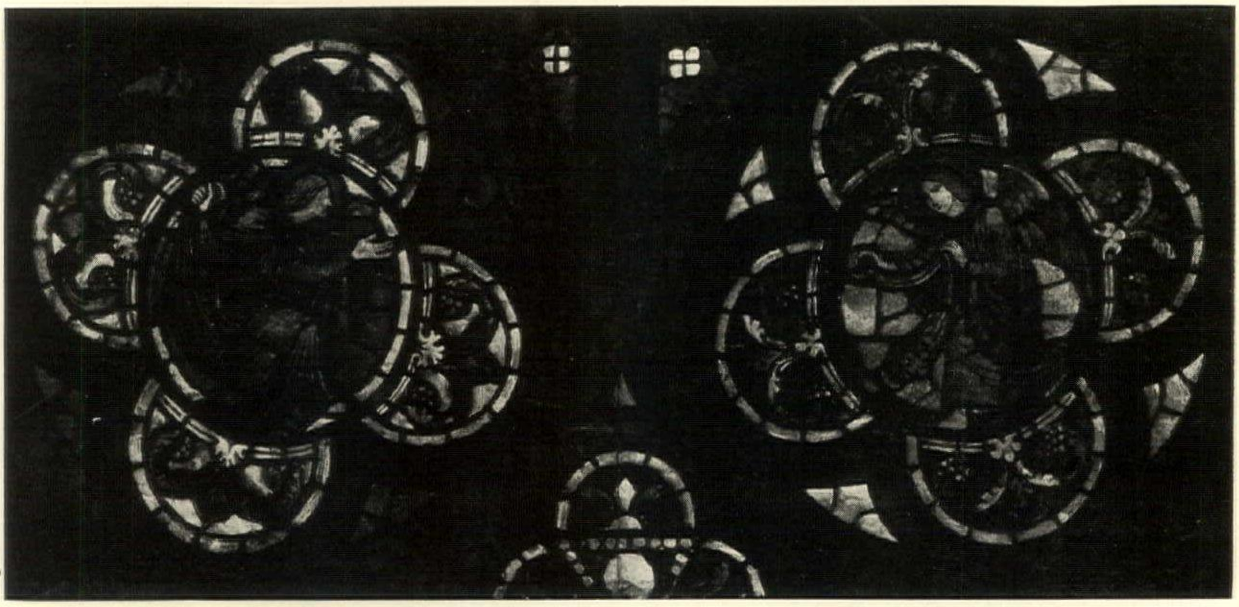
INTERIOR ARCHITECTURE

NOTES ON STAINED GLASS AND THE ART OF CLEMENT HEATON

By C. HOWARD WALKER, F.A.I.A.

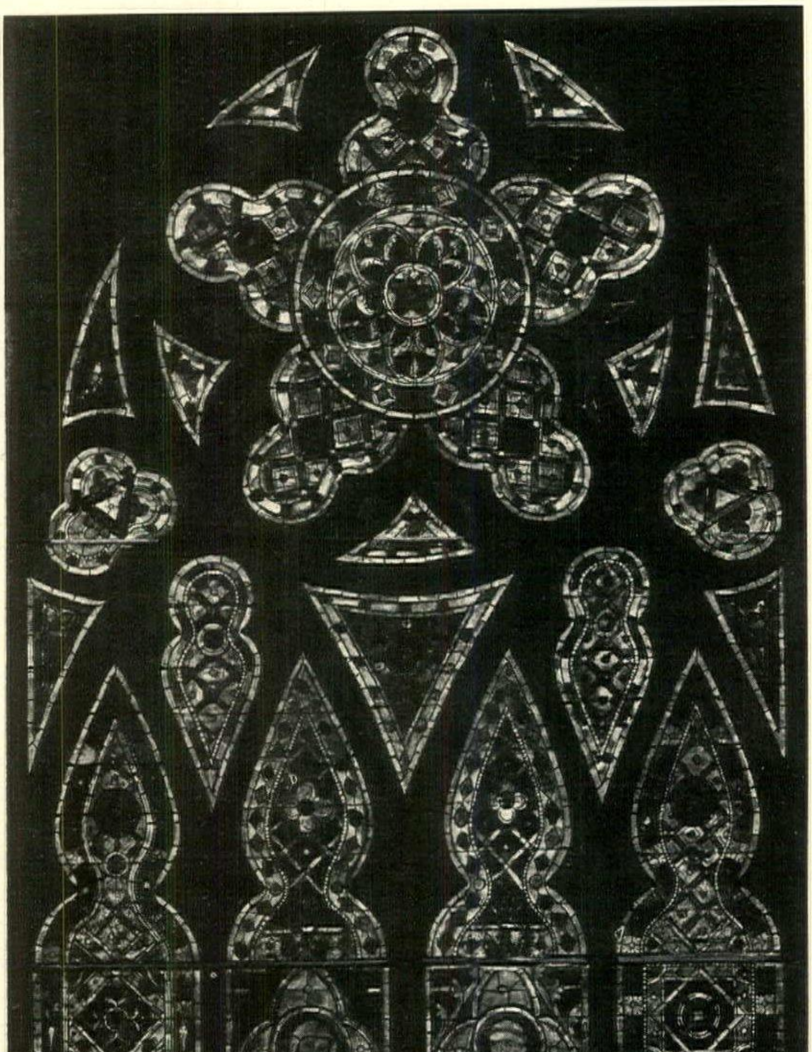
CLEMENT HEATON, in his windows in the Church of the Blessed Sacrament, in New York, has been very successful in the use of a type of stained glass windows best suited for churches which have not the rich and deep shadows of mediaeval cathedrals, and which therefore do not harmonize with the type of windows used in Chartres Cathedral. The mediaevalists of the later XIIIth century desired to introduce light and to give lightness and delicacy to the building, so they intentionally introduced parts in grisaille, designed and executed with great care by the same masters who dealt with the figure and full color windows, yet enough colored glass was introduced to give an appreciable color effect. They were considered in both French and English cathedrals as an integral part of the architecture. Mr. Heaton has reinstituted this *modus operandi* in use in the 13th century, but since largely neglected, in the Church of the Blessed Sacrament. The clerestory windows each have, on a field of grisaille, two figures on colored grounds, under canopies. Rich borders surround each opening, so the series of windows forms a vast field of color which decorates the entire church. The effect of brilliancy is also partly due to the technique adopted.

Ancient glass is not more brilliant than it is harmonious in general tone; this is due somewhat to decay of the glass surfaces. To obtain this harmony requires artistic knowledge and skill in the use of painting and patinas. Interest from variety of design accompanies the general harmony of tone and color, but there is no haphazard assemblage of unrelated units. In the present case



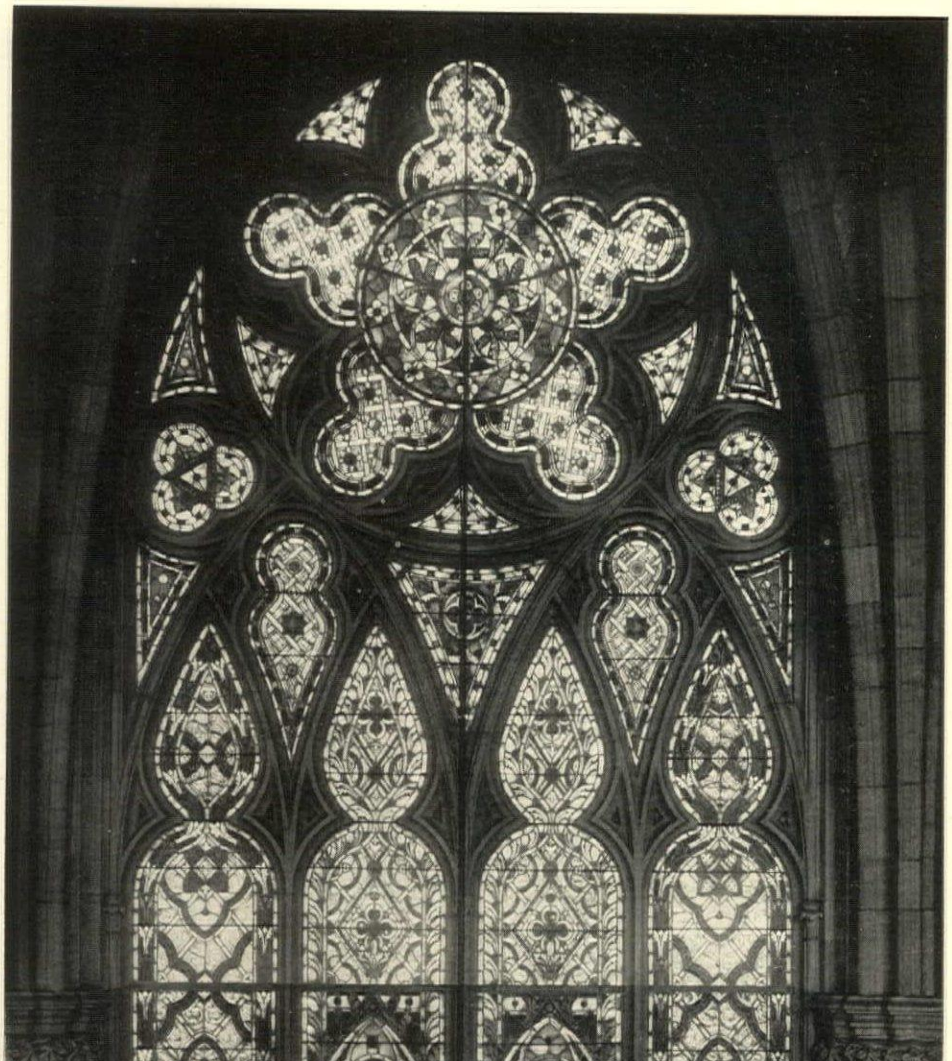
PORTION OF THE ORIGINAL COLOR STUDY BY CLEMENT HEATON FOR THE GREAT ROSE WINDOW. BLUE, RUBY AND WHITE PREDOMINATE WITH SECONDARY COLORS OF YELLOW, GREEN, PURPLE AND LIGHT BLUE

CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT



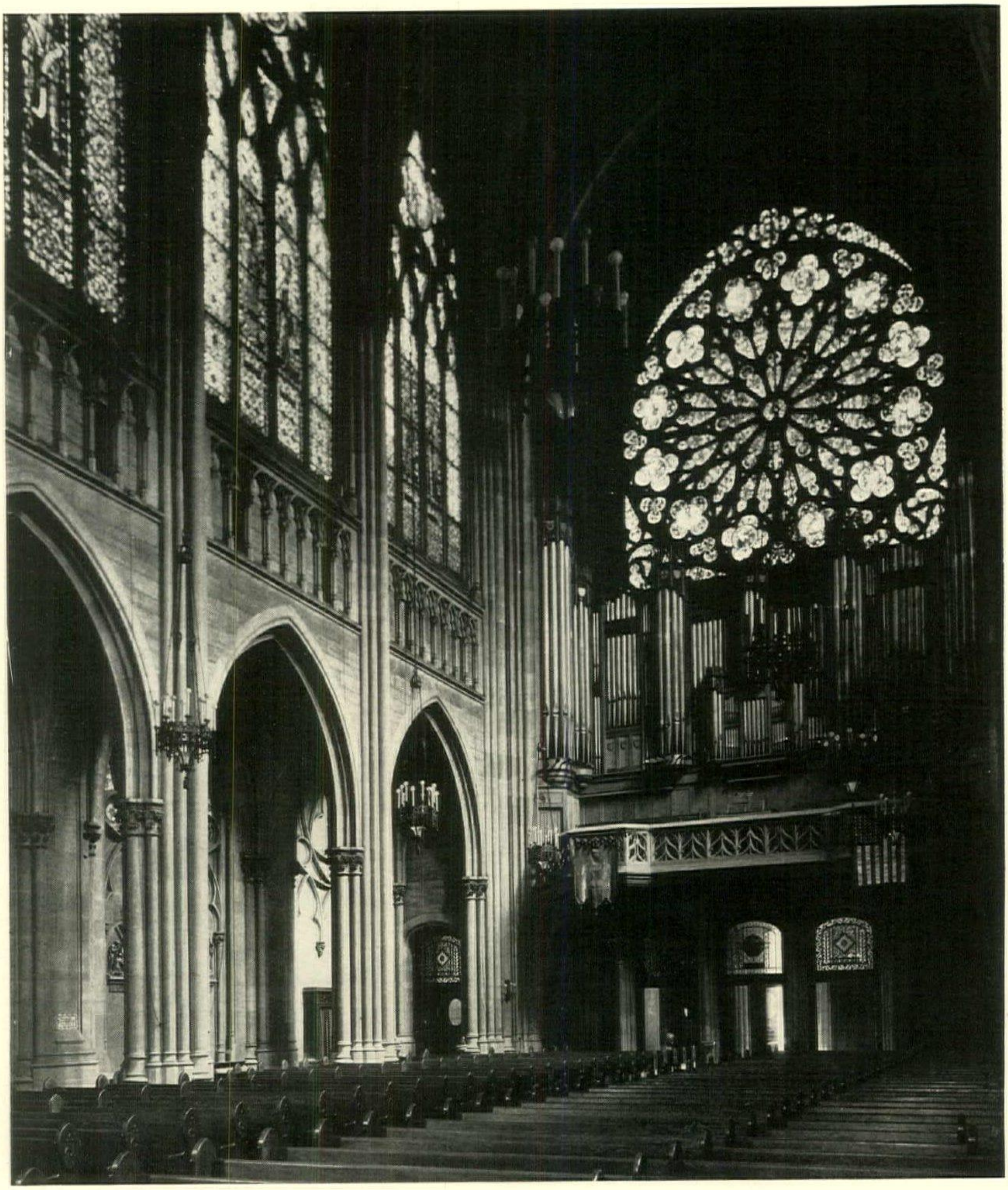
ORIGINAL SKETCH IN COLOR OF CLERESTORY WINDOW BY CLEMENT HEATON. COMPARE WITH THE REPRODUCTION FROM A PHOTOGRAPH OF AN ACTUAL WINDOW ON PAGE 243

CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT



THE GRISAILLE BACKGROUND OF THE CLERESTORY WINDOWS HAVE SUFFICIENT COLOR TO GIVE AN IMPRESSION OF RICH COLOR ON A TRANSLUCENT WHITE BACKGROUND

CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT



THE ROSE WINDOW, THIRTY-SIX FEET IN DIAMETER, IS ONE OF THE LARGEST IN THE UNITED STATES
CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT

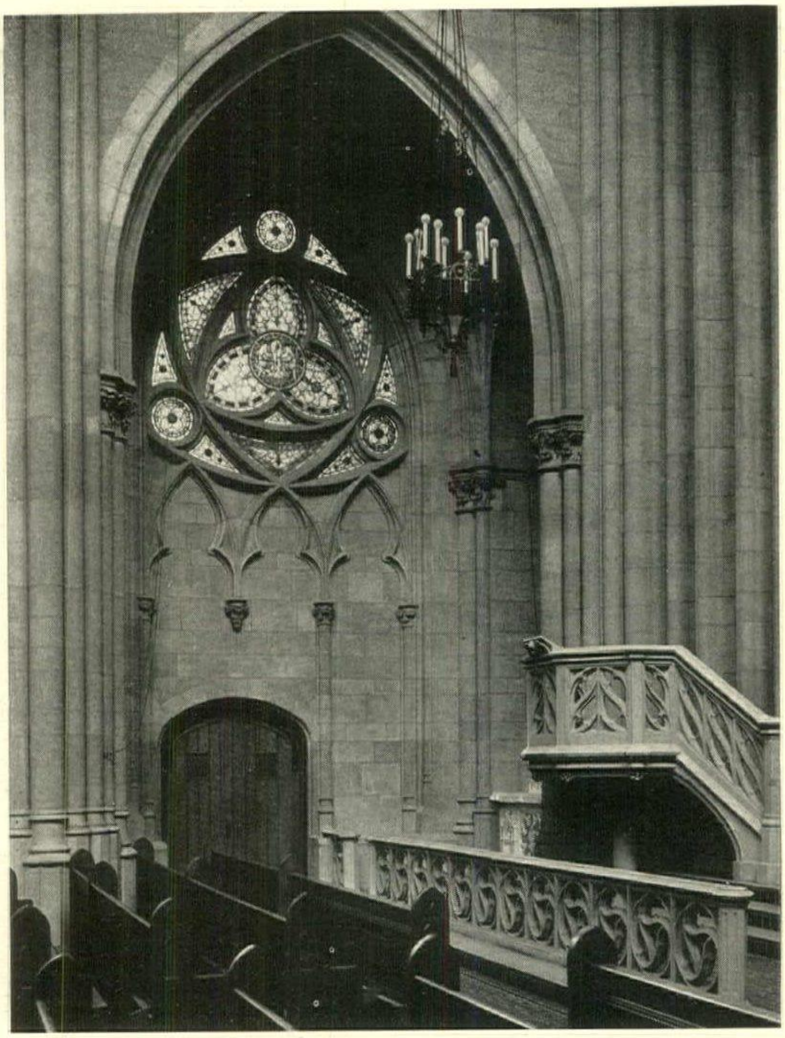
the whole vista constitutes a color symphony in design in which the score of figures provide historical material for study and receive close attention to detail. These figures are the twelve apostles, Saints Thomas Aquinas, Clara, Barbara, Bonaventura and others. Realistic representation has been so popular that the deep lying principles on which ancient stained glass depends for its beauty have not generally been perceived. Stained glass is preëminently design, not literal pictorial representation, and if it is to some extent an artificial expression, it is therefore the more consistent and harmonious, and architectonic with the architecture it embellishes, exemplifying a practical application of aesthetic principles.

The glory of ecclesiastical shrines is the lineal

FIVE CLERESTORY WINDOWS ON EACH SIDE OF THE NAVE FORM A "WALL OF GLASS"
CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT

descendant of the mosaics of St. Sophia, St. Marks and the apses and naves of Ravenna. It brings to its aid a penetration of light, not the reflection of it, and becomes a rich design of jewels through which the light passes. It is therefore color decoration pitched in the highest possible key; but it requires the added quality of tone or it overwhelms its environment. The early French glass of Le Mans and Chartres, enshrined amidst the deep shadows of cathedrals, which depended more upon the candles upon the altars for their illumination than they did upon the light of the day, was rich in intense blues and rubies and greens, glowing high under the vaulting as supreme color decoration. The drawing of the leading was extremely simple, and what painting there was upon the glass to indicate feature and other detail was elemental and strong, so that it would hold its own with the intense color. As the years went by, more light through the windows was found necessary and the 14th century work is characterized by the introduction of more white glass fields with decorative patterns. Especially was this the case in England, where this style of stained glass came from France. The English glass became silvery in character, which had white fields with glowing color in their midst and around their borders. The use of background texture patterns increased, and the so-called grisaille, made as delicate as lace, became an admirable foil for the figures, as did the elaborate architectural canopies; rich color was maintained on the borders and in the figures. In addition to the painting, which was delineative drawing in black or brown, a delicate yellow stain appeared. Whether the gray of the English climate induced lighter windows in tone or if they were felt to be in harmony with the architecture, or both, is merely speculative analysis. At all events, England is famous for her silver windows—York comes to mind—which were also well adapted to the Great Halls of the universities, and of the Inns of Court.

Glass, however, at all periods remained thoroughly architectonic, as were mosaics and mediaeval sculpture, as in the porches of Chartres; and, as the mediaeval framework of structural forms was narrow and vertical, the figures partook of that character. The grouped traceried windows, forced by wind pressure to be narrow, especially demanded this type, and when these traceries accommodated themselves to the arches at the top they created geometric openings, subject to geometric patterns. Stained glass was also the exponent of religious history. It depicted the lives of Christ and of Mary the Mother, of the Prophets, the Saints, and the heads of the Church hierarchy, of whom severity, nobility, and power were the attributes. These attributes were expressed by symbolism, with dignity, creating a classical conventionalism devoid of agitation and of eccentrictiy. It is interesting to note that the great periods of Greek sculpture, of Byzantine mosaics, of early Italian painting and of Japanese prints acknowledged the same characteristics in design.



THE AISLE WINDOWS ARE NOT DEPENDED UPON FOR LIGHT. PRACTICALLY THE ONLY ONE NOT OBSCURED BY SURROUNDING BUILDINGS IS SHOWN ABOVE

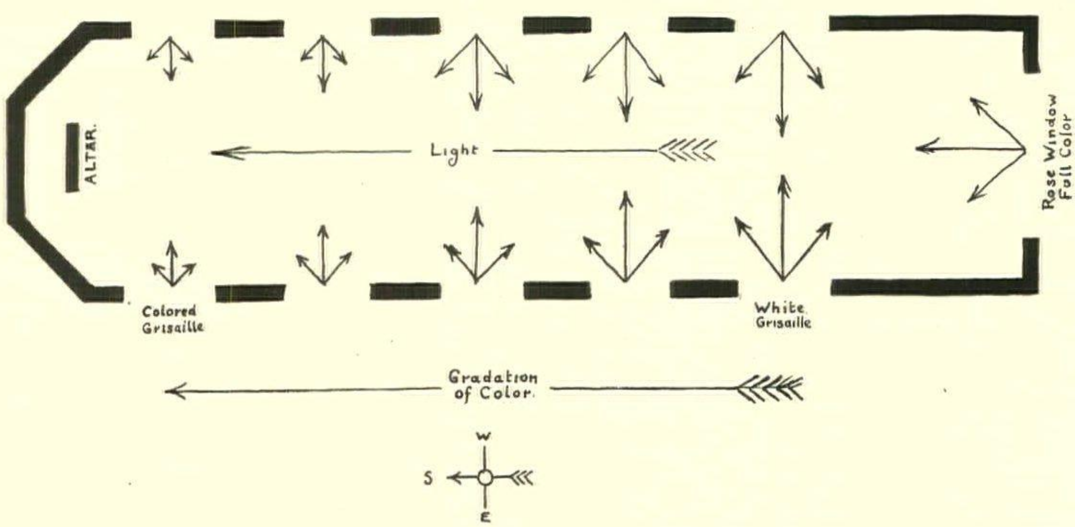
CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY

GUSTAVE STEINBACK, ARCHITECT

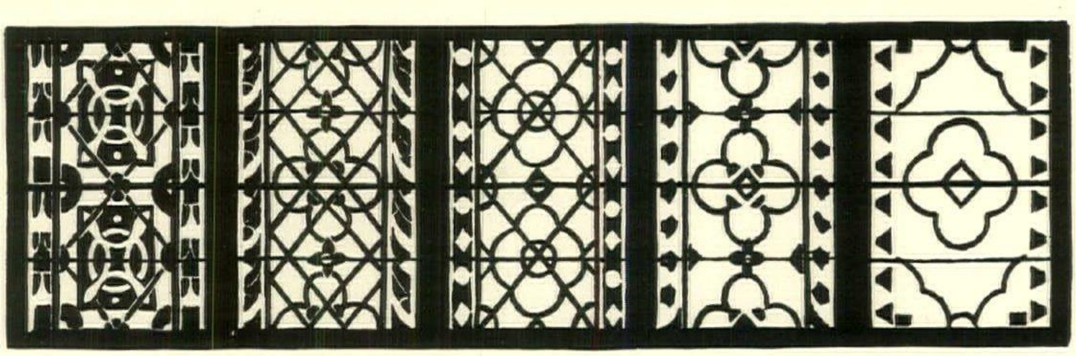
The work of Clement Heaton shows his thorough knowledge of glass power, purpose and limitations. Having lived and worked at glass and mosaics in Central Europe, he is thoroughly conversant with the continental glass, as well as with the English type which he studied in earlier days. He consequently has a rich choice of types which he uses according to the needs of each building. He especially appreciates the value of the drawing of the leading, a design in itself, which

LEADING FORMS THE BASIS OF THE DESIGN RELIEVED BY DELICACY OF TONE AND VARIETY OF LINE

CHURCH OF THE BLESSED SACRAMET NEW YORK CITY—GUSTAVE STEINBACK, ARCHITECT he keeps in admirable scale. In the windows of the Church of the Blessed Sacrament, the tracery openings required skilful treatment in the design, especially in the opening of the rose windows. The architectural details of canopies, cusps, crockets, and capitals are executed with knowledge, and the borders which surround the lights are interesting and varied, as are the diaper patterns in the field. The draperies of the saints, simply painted, have the firm parallelism and radiation of folds that harmonize tapestry drawings of the 16th century. The ornamental windows without figures, which so frequently appear mannered, have a rich variation of texture, and the distribution of color is excellent. This type of work is in accordance with the architecture of which it is a part, richly decorating it but not overwhelming it, and embodies not only the traditions but the beauty of many of the admired stained glass windows of the best period of the glass art of the past.



PLAN SHOWING GRADATION OF COLOR IN WINDOWS TO SECURE GRADATION OF DAYLIGHT



PANEL OF EACH OF FIVE CLERESTORY WINDOWS SHOWING IN BLACK THE AMOUNT OF COLOR USED IN THE GRISAILLE AS WELL AS THE DESIGN

CHURCH OF THE BLESSED SACRAMENT, NEW YORK CITY
GUSTAVE STEINBACK, ARCHITECT

✧ ENGINEERING AND CONSTRUCTION ✧

TECHNICAL CONSIDERATIONS IN THE PLANNING OF HOSPITAL X-RAY DEPARTMENTS

By C. B. BRAESTRUP, B.Sc., A.I.E.E.

CONSULTING X-RAY ENGINEER, PHYSICIST AT MT. SINAI AND BELLEVUE HOSPITALS, NEW YORK CITY

IN the design of a modern hospital probably no other division requires as much special knowledge as that of the X-ray department for in addition to the usual hospital requirements numerous problems of a technical nature must also be considered. Among these are the protection against penetrating radiation and high tension currents; the accommodation of equipment which is still in the development stage; the vital question of film storage; electrical power requirements; and the arrangement of the auxiliary circuits to which the usual rules governing ordinary electrical equipment cannot be applied.

While certain general rules, together with a few fundamental physical laws which are necessary in the designing of a safe and efficient roentgenological department, may be stated, it should be borne in mind that every X-ray department presents individual problems requiring the fullest coöperation of the architect, roentgenologist and hospital authorities. The necessary technical and physical advice should be obtained from a physicist or electrical engineer experienced in this field, rather than from haphazard sources.

TABLE 1: RELATION BETWEEN BED CAPACITY AND FLOOR SPACE OF X-RAY DEPARTMENT OF VARIOUS AMERICAN HOSPITALS

Hospital	Location	Beds	X-Ray Floor Space Sq. Ft.	Ratio Sq. Ft. Bed Capacity
A.	New York	175	1660	9.5
B.	Michigan	302	3200	10.6
C.	Florida	125	1000	8.0
D.	New York	650	7200	11.0
E.	New York	420	4000	9.5
F.	New York	129	1150	8.9

LOCATION AND SPACE REQUIRED

In general, the diagnostic and therapeutic application of X-rays is done under the same supervision, with the two subdivisions located together and forming the X-ray department. The department should be centrally located with ready access for hospitalized and out-patients. The rooms must be dry and airy, inasmuch as humidity and heat reduce the insulation of the high tension equipment, causing variation in radiation output or even complete breakdown of the generators. The practice of placing the X-ray department in basements and often on top of or close to the boiler room is so objectionable that it is hard to believe that this arrangement can still be found in modern hospitals. To insure ample distance from the floor to the overhead high tension conductors, the ceiling height should be at least 11 feet with a clearance to beams and pipes of not less than 10 feet. Outside walls are desirable not only for the air and light they afford, but also because they do not require ray proof covering. Similarly, a one-story building used exclusively for radiological purposes means a great saving in protective materials and offers, in addition, a degree of safety to the rest of the hospital. However, with proper ray proofing and the use of the so-called safety films any location meeting the above mentioned requirements should be satisfactory. Table No. 1 indicates the relation between bed capacity and space occupied by the X-ray department for several hospitals. It will be noted that the variation in this ratio is surprisingly small, considering that factors such as the number of out-patients, and amount of teaching and research all have a bearing on this relationship of bed capacity, to X-ray department area. As a preliminary estimate, the X-ray department, including halls, may be considered to require 10 square feet per bed. Teaching institutions generally require somewhat more, while general hospitals probably can get along with a little less.

ARRANGEMENT OF THE RADIOGRAPHIC ROOMS

A survey of X-ray departments shows but little uniformity as to the layout of the rooms in relation to each other. The explanation for this is perhaps that roentgenology is still young and developing too rapidly to allow standardization. Likewise, the arrangements of many of the older departments were arrived at by fitting, as far as possible, the radiological needs to the space available. The results thus arrived at were often far from ideal and cannot well be used as a guide for future X-ray departments. The accompanying plan of a typical X-ray department of a 500 to 600-bed hospital illustrates a good arrangement of the various radiological rooms. The usual oblong hospital wing has been assumed rather than a square area, although the latter may adapt itself better to the needs of the X-ray department. While this plan incorporates some of the best features of several recently completed radiological divisions, it indicates, of course, but one solution to the problem. As illustrated, the waiting-room should be near the entrance of the department and close to the office and reception desk. From there the patients are directed to the various dressing rooms. An ample number of these rooms, provided with direct access to corridor and X-ray rooms, will materially increase the number of patients that can be handled. The dressing rooms in connection with the fluoroscopic rooms may also be used as light locks enabling the patients and doctors to enter without disturbing the accommodation of the examining radiologist's eyes. This requires that the dressing room partitions, usually only 7 to 8 feet high, extend to the ceiling and that the dressing rooms be illuminated by colored lights or white lights shut off automatically when the door to the fluoroscopic room is opened. The *fluoroscopic room* connects directly with a toilet, barium preparation sink, and a radiographic room. To exclude light during fluoroscopic examinations, the windows are provided with light proof shutters of a type that can easily be opened and closed. Sliding or folding shutters are used in preference to rolling shades. The doors must be light proof because even a small amount of light interferes with good fluoroscopy. Ordinarily a special room is not needed for the fluoroscopic generator. It requires but little space, about 2 feet by 3 feet by 5 feet, and can be placed on a false ceiling above a dressing room or closet.

The *dark room* is logically located between the two main radiographic rooms and opposite the viewing room where the finished films are examined. Various methods are used in entering the dark room without admitting light. The maze, the revolving door or the light lock are the most common. Where sufficient space is available the maze allows passage with the least amount of effort, but may require a door in addition to accommodate the moving of large objects. The revolving door requires the minimum amount of space. The light lock with its two doors is only fool-proof when controlled electrically or mechanically. Pass boxes are provided for passing the loaded films between dark room and X-ray rooms and hall. Usually there are two together, one for the unexposed and one for the exposed films. Each of these boxes, like the light lock, has two doors of which only one can be open at a time, thus preventing light from entering the dark room. This room is divided into two sections, one for loading and unloading films, and one for developing, fixing, washing and drying the films. A modified arrangement of the dark room is shown in the accompanying plan. In this plan each of the main radiographic rooms has its own loading cubicle. With this arrangement the cassettes with their sensitive intensifying screens are kept out of the dark room and the possibility of moisture damaging the screens is consequently much smaller. This lay-out is particularly well adapted to a very busy hospital where the development alone is usually enough to keep one man busy all day. It is highly desirable to have a window in the dark room and preferably in the section used for the developing. Light proof shutters should be provided as in the fluoroscopic room. Most hospitals use forced pre-heated air for drying the films. Some institutions have even gone a step further, using air from which the moisture has been removed by refrigeration before heating. In this way the drying of the films requires minimum time even on very humid days. As the exhaust air from the dryer is highly humid due to the moisture from the films, it is desirable to have it pass directly to the outside. A vent with automatic louvers is therefore provided to fit the dryer selected.

In developing the films it is desirable to have the solution at a constant temperature (65 degrees Fahrenheit). This may be accomplished by thermostatic control of the circulating water for the purpose of which hot or cold water connections are provided. Depending on the temperature of the cold water, it may be necessary, in the summer time, to cool it by means of a special refrigerator.

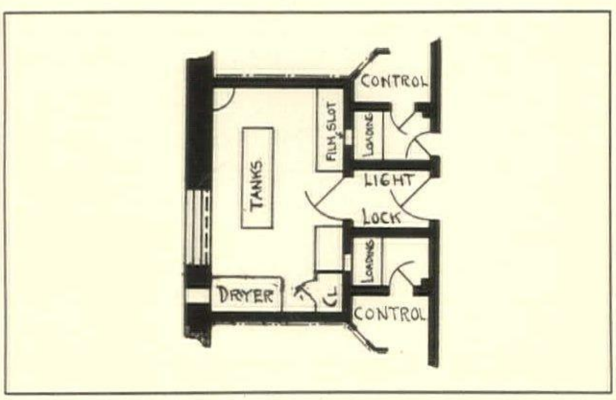
The location of the two *main radiographic rooms* between the dressing rooms and dark room permits efficient handling of patients as well as of the films. The control booth is situated so that the operator has ample vision of patient, tube and high tension generator, and at the same time may save himself unnecessary steps. The generators placed above the closets in the dark room, of course, means a saving in space, but necessitates a fairly high ceiling as most radiographic generators require a height including clearance of 5 to 7 feet. Under any circumstances it is advisable to have separate rooms for the high tension generators as a safeguard against electrical shocks.

The *cystoscopic and fracture room* is located at a greater distance from the dark room because the amount of radiography done here is limited and the handling of films is therefore of less importance.

The *viewing room* is opposite the dark room and next to the director's office and near the general office where the reports on the films are typed. Space is provided in the hall for stretcher cases awaiting attention.

ARRANGEMENT OF THERAPY ROOMS

The length of exposure and the penetrating

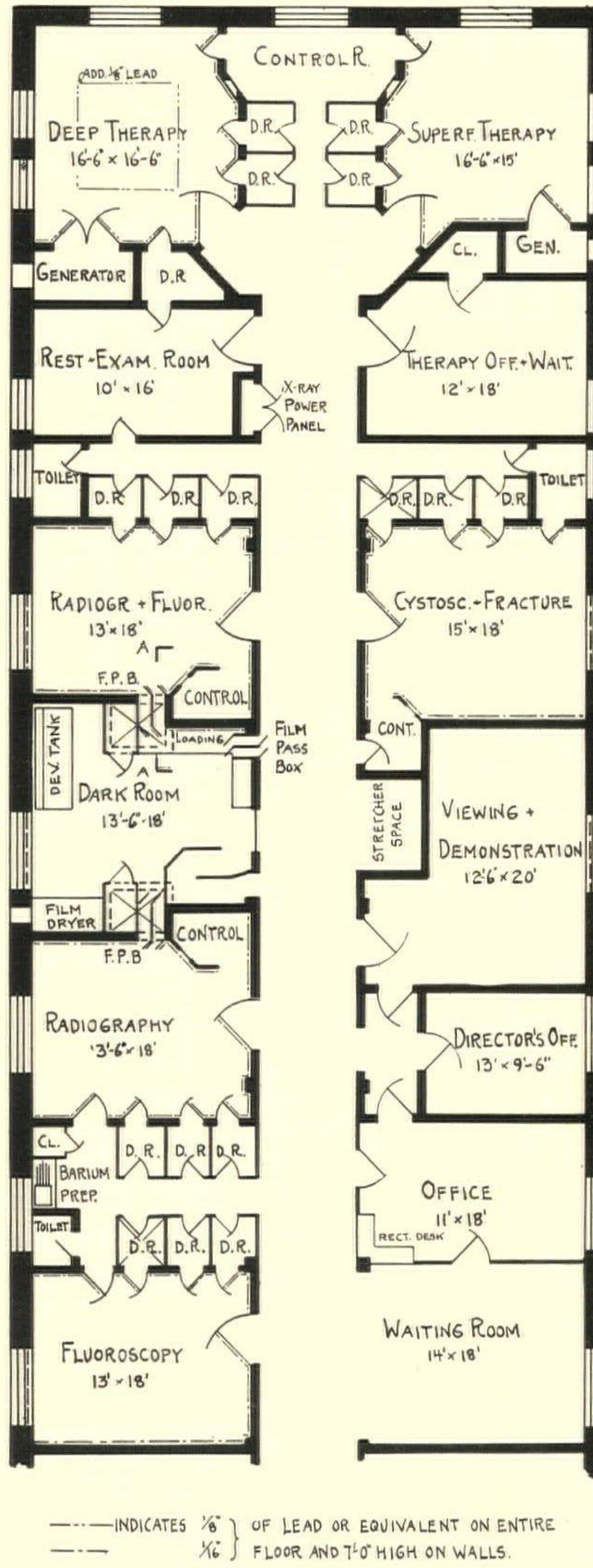


ALTERNATE PLAN OF DARK ROOM WITH SEPARATE LOADING CUBICLES

power of the rays used in therapy render the question of protection as well as of comfort to the patient and to the operator of great importance. The typical layout shows an arrangement of the therapy rooms suggested by the writer and now being successfully used at several hospitals. It will be noted that the high voltage treatment rooms are corner rooms offering maximum light and ventilation with minimum cost of protection. The location of the controls gives the operators good vision of patient, tube and apparatus. Contrary to the usual arrangement, the operators here have plenty of air and light. The passage between the dressing rooms allows communication with the rest of the department. Separate machine rooms are provided, thus permitting inspection and repair of one machine without shutting down the other.

ELECTRICAL POWER SUPPLY AND WIRING

Wherever possible, alternating current should be used in preference to direct current as power



PLAN OF TYPICAL X-RAY DEPARTMENT FOR 500 TO 600 BED GENERAL HOSPITAL AREA APPROXIMATELY 5,000 SQUARE FEET

D. R. INDICATES DRESSING ROOMS FEWER BUT LARGER ROOMS MAY BE PREFERRED IN PRIVATE INSTITUTIONS supply for the X-ray machines. Practically all types of X-ray machines use alternating current for their primary supply. In the case of direct current supply this necessitates the addition of a rotary converter with its inherent limitations.

The constancy of radiation output, and therefore also the diagnostic and therapeutic result, depends in no small degree upon a steady incoming line voltage. Due to the characteristics of the X-ray tube even a small fluctuation in the line voltage may cause a great variation in the radiation intensity. While there are several makes of stabilizers which will keep the tube current constant, independent of line fluctuations, these do not take care of the other important factor, the high tension voltage across the tube. The voltage regulator used on ordinary power circuits acts too slowly to be of real benefit, especially in fast radiography. To minimize the voltage fluctuations, the X-ray department should have its own separate line and wherever possible also a separate transformer. No other power load should be connected to this line and transformer. For a large department it may be advisable to use a three-phase system and distribute the X-ray load, usually single phase, as evenly as possible between the phases. This arrangement has also the advantage that it will readily take care of any future three-phase generator, a type which now is not unusual in Europe.

As the voltage drop in the feeder is a function of its resistance, the selection of the proper size wire is important. Table No. 2 gives the current drawn by the average single-phase 220-V. machine at various tube loads. Where several generators are used at the same time, the maximum current will be the geometrical sum of currents of the machines operating simultaneously under peak load conditions. The wiring chart indicates the size of wire for various currents and distances assuming an allowable drop of 1% between incoming service and X-ray machine.

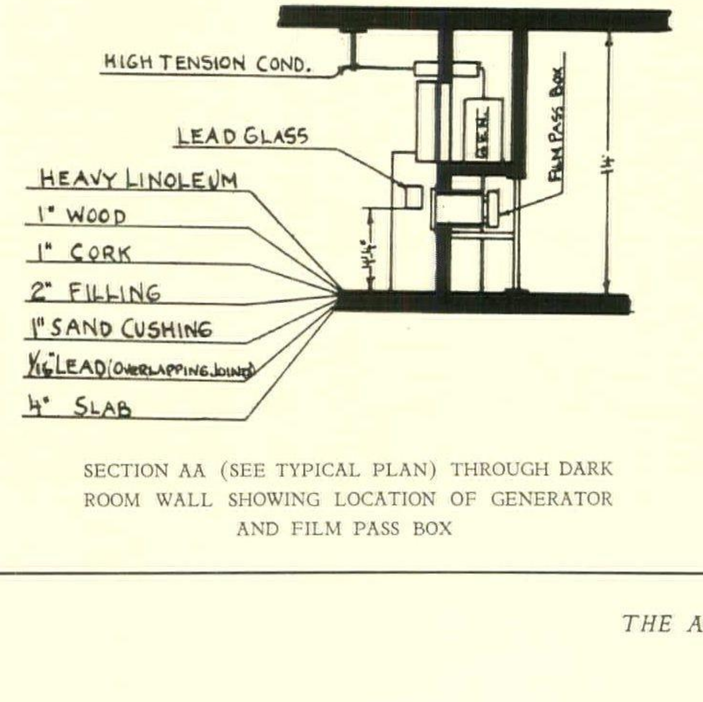
For a large department it is good practice to have a common X-ray power panel provided with pilot light and voltmeter, also a main switch and individual switches for each generator. The main switch permits the shutting off of all power at the same time. The individual switches are used to cut out equipment undergoing repair or inspection. In addition, externally operated safety switches are located at the control stand of each generator.

TABLE 2: APPROXIMATE CURRENT CONSUMPTION BY AVERAGE SINGLE PHASE 220-VOLT X-RAY GENERATOR

Type of Work	Tube Load	Line Current
Fluoroscopy	90 K.V. Peak, 5 M.A.	5 Amperes
Radiography	90 K.V. Peak, 25 M.A.	15 Amperes
	90 K.V. Peak, 50 M.A.	28 Amperes
	90 K.V. Peak, 75 M.A.	40 Amperes
	90 K.V. Peak, 100 M.A.	50 Amperes
	90 K.V. Peak, 200 M.A.	90 Amperes
	90 K.V. Peak, 400 M.A.	160 Amperes
Therapy	150 K.V. Peak, 5 M.A.	10 Amperes
	200 K.V. Peak, 5 M.A.	15 Amperes
	200 K.V. Peak, 30 M.A.	55 Amperes

In practically all modern hospitals provisions are made for the use throughout the hospital of a small mobile X-ray machine at the bedside of the patient. As this machine requires more current than it is possible to obtain from standard outlets, special wiring is necessary. Three-pole receptacles, one pole grounded, should be located on each floor and within 40 to 50 feet of any point where it is desired to operate the bedside unit. By using 220 volts in preference to 110 volts the diameter of the wire can be smaller. The actual size can be determined by the previously mentioned tables knowing the kind of work required by the mobile generator and the distance to the incoming service.

To eliminate loose wiring across the floors of the X-ray rooms concealed conduits of ample diameter should be provided for various auxiliary circuits between the control stand and the different equipment in the X-ray room. For the protection of the operator and patients against



SECTION AA (SEE TYPICAL PLAN) THROUGH DARK ROOM WALL SHOWING LOCATION OF GENERATOR AND FILM PASS BOX high-tension shocks the metal fluoroscopes and tube stands should be grounded. For this purpose small brass plates with connecting screw should be provided flush with the floor at convenient places and connected to a suitable ground such as a water pipe.

The lighting of the X-ray department should be given careful consideration. Due to the high-tension conductors suspended from the ceiling in the X-ray rooms, care should be taken to insure ample clearance to the electrical fixtures. Wall brackets or flush ceiling units should be used where conditions permit them to be satisfactorily located.

The dark room should have an ample number of wall outlets at the tank and loading table. Provision should also be made for a double circuit ceiling fixture giving indirect white or colored illumination. The white light should be controlled by a switch located out of reach of the casual visitor.

A similar fixture, but with direct illumination, should be provided in the fluoroscopic and fracture rooms. Arrangement should here be made whereby the red light can be controlled by a foot switch.

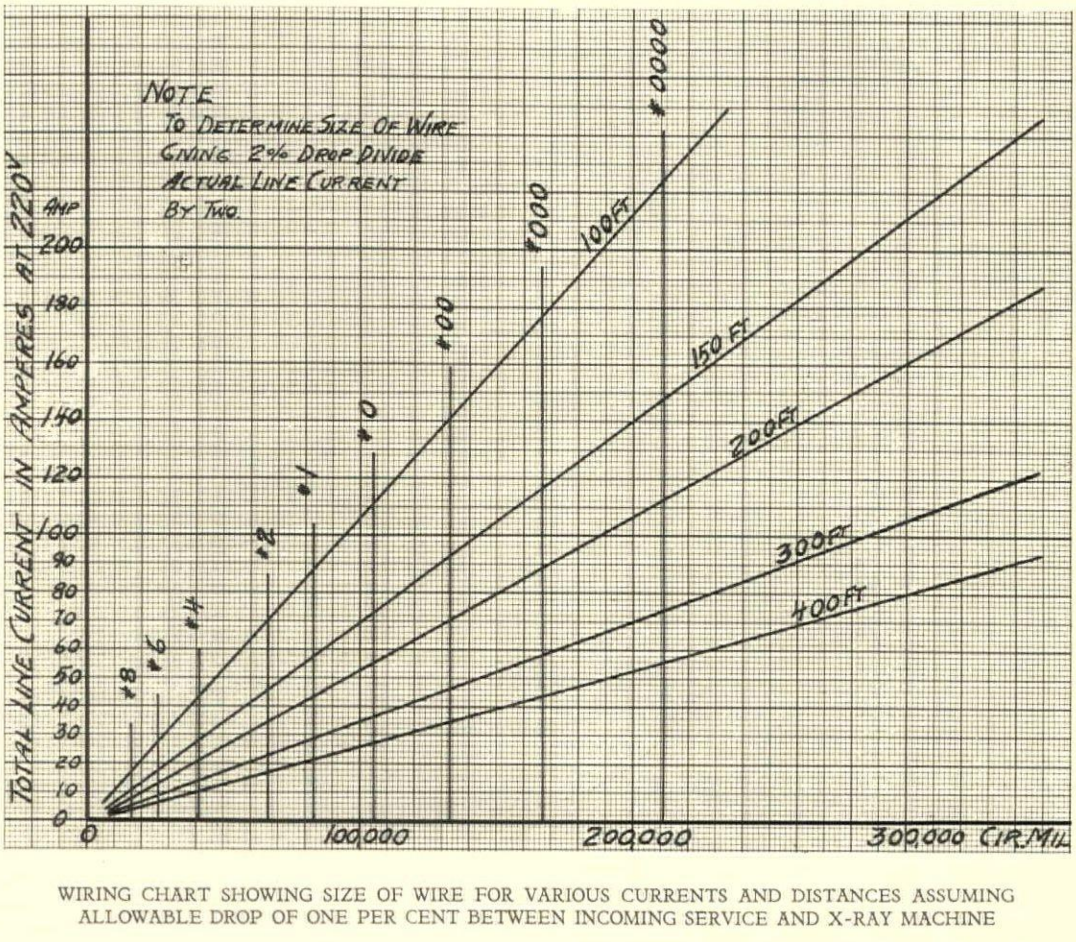
It is important that the meters hanging from the ceiling in the X-ray rooms are properly illuminated. Lights with special reflectors mounted above the operator's window will usually be found to serve this purpose admirably.

All machine rooms should have an outlet for a trouble lamp and in the viewing room special 30 ampere outlets should be provided for the viewing boxes.

PROTECTION AGAINST RADIATION

Within a few years after Roentgen's discovery of X-rays several of the pioneers in this field suffered from certain harmful effects due to prolonged exposure to the rays. The radiation used today has the same dangerous properties, but we are better able to guard against them because of our improved knowledge of its nature. When properly applied, in carefully designed laboratories, radiology today does not present greater hazards than many other professions.

The main purpose of protection is to absorb the unwanted part of the radiation. As the absorption depends upon the density of the absorbing medium, heavy materials like lead and its compounds, or barium plaster and the so-called ray proof rubber, are those most generally used. The protective material is placed most economically at the source of radiation, the X-ray tube. The present tendency is, therefore, also toward enclosed



WIRING CHART SHOWING SIZE OF WIRE FOR VARIOUS CURRENTS AND DISTANCES ASSUMING ALLOWABLE DROP OF ONE PER CENT BETWEEN INCOMING SERVICE AND X-RAY MACHINE

Material	Density	100 K.V.	150 K.V.	200 K.V. Peak	Lead
		Thickness giving same protection as lead at various tube voltages.			
Aluminum	2.7	60 mm.	60 mm.	70 mm.	1 mm.
		120 mm.	130 mm.	140 mm.	2 mm.
Brass	8.4	4 mm.	6 mm.	6.5 mm.	1 mm.
		9 mm.	13.5 mm.	16 mm.	2 mm.
		14 mm.	21.5 mm.	27 mm.	3 mm.
Steel	7.8	6.5 mm.	9 mm.	11.5 mm.	1 mm.
		15 mm.	21.5 mm.	27 mm.	2 mm.
		23.5 mm.	34 mm.	39 mm.	3 mm.
Lead Glass	3.4-4.6		4 to 7.5 mm.		1 mm.
			8 to 15 mm.		2 mm.
			12 to 22 mm.		3 mm.
Lead Rubber	3.3-5.8		2 to 5 mm.		1 mm.
			8 to 15 mm.		2 mm.
			12 to 22 mm.		3 mm.
*Barium Plaster	3.5	4 mm.	7.5 mm.	9 mm.	1 mm.
		9 mm.	18 mm.	25 mm.	2 mm.
		14.5 mm.	29 mm.	43 mm.	3 mm.
		20 mm.	41 mm.	65 mm.	4 mm.
†Concrete	21	100 mm.	105 mm.	110 mm.	1 mm.
		200 mm.	210 mm.	220 mm.	2 mm.
Red Brick	1.9	100 mm.	110 mm.	120 mm.	1 mm.
		200 mm.	220 mm.	250 mm.	2 mm.

1/16" equal to 1.59 mm. approx. 1/8" equal to 3.18 mm. approx.
*2 parts course $BaSo_4$; 1 part fine $BaSo_4$; 1 part Portland Cement
†Average mix used in building construction

TABLE 3: PROTECTIVE VALUE OF VARIOUS MATERIALS

tube holders or tubes with ray proof walls. In either case, a small aperture allows only the wanted fractional part of the total radiation to pass out. With this arrangement we have only to protect against the primary rays passing through the aperture and the secondary or deflected radiation given off by the patients, the walls, the floor or by any other object which the rays may strike.

The amount of protection needed will depend upon a number of conditions, the most important of these being:

Tube Voltage
Tube Current
Distance to the Tube
Accumulative Length of Exposure
Type of Tube
Type of Tube Holder

Type of Person to Be Protected (casual visitor or person continuously in the proximity of the X-rays).

Depending upon the above factors, the protection will, for radiography and fluoroscopy, vary from 1/16" to 3/32" of lead or equivalent thickness of other protective material. For therapy, 1/8" to 1/4" of lead or equivalent is generally used. The higher values mentioned are needed completely to absorb the direct beam of primary radiation, while the lower values are considered ample where enclosed tube stands are used except to stop the rays passing through the aperture of the tube holder.

X-rays, like ordinary light, pass in straight lines, so that protective covering is not needed above seven feet from the floor. The only radiation that possibly could come through would be secondary radiation which by that time would have a negligible intensity.

Wherever vision is required lead glass windows of sufficient thickness should be used. The protective value of the window should be equal to that of the wall in which it is mounted. The edges of the window should be bevelled off to insure maximum vision, with a small size window; 10" by 12" is usually sufficient.

The relation between the protective values of various materials is shown in Table No. 3. Barium plaster and ray proof rubber are used to some extent, in place of lead. Barium plaster means a considerable saving in cost, but must be very carefully applied in thin layers to avoid cracks and the protection should be tested after it is in place. Special rubber has the advantage that it does not need any surfacing and also acts as an insulator against high tension shocks; its price, however, is comparatively high. In any case where materials other than lead are used, samples of these should be tested beforehand at the voltage at which they will be used.

The practical application of ray proof materials is illustrated in the typical plan. It will be observed that all the diagnostic X-ray rooms have 1/16 inch of lead or equivalent in floors and walls 7 feet high. If tubes completely surrounded by protective materials are used, ray proof covering is only needed in the floor, control booth and the wall next to the dark room. Both therapy rooms have 1/8 inch of lead in the floors and walls, as it is assumed that an enclosed tube holder is to be used for the deep therapy tube. An additional sheet of 1/8 inch lead 8 feet by 8 feet is placed under the deep therapy tube holder, making a total of 1/4 inch of lead to absorb the primary beam. No ray-proofing is provided in the ceiling as only secondary radiation will travel in that direction and a 6-inch concrete floor is ample to stop the small intensity diminished by the great distance.

STRUCTURAL CONSIDERATION

In order to minimize the effect of possible electrical shocks the floors in the X-ray rooms should have insulating covering such as heavy linoleum or rubber placed on wood or cork to give additional insulation. If lead is used, it should be placed furthest away from the surface.

No special recommendation has been made as to the storage of films, as practically all hospitals today use the acetate base, non-explosive type. If, however, it is desired to make provisions for the use of nitrate base films, a vault completely isolated from the main hospital buildings is recommended. This building should be constructed in accordance with the National Fire Underwriters Code and also in conformity with local building ordinances.

The fluoroscopic and dark rooms must, naturally, function with the windows closed to prevent light entering. Artificial ventilation is therefore necessary. Generally, louvers to the hall and outside together with forced ventilation are used. Provision should also be made for ventilating the machine rooms where the electrostatic fields break down the air, producing an undesirable amount of ozone. Where it is necessary to have the dressing room partitions go to the ceiling these rooms should have light proof ventilators.

Contrary to tradition, the X-ray rooms can have light and cheerful coloring. Light blue or green are the preferred shades. In rooms where there are overhead high tension conductors, the ceilings should be the same color as the walls to hide the accumulation of dust on the parts nearest to the high tension conductors.

A review of radiological developments during the last decade clearly indicates that still further progress may be expected within the next few years. While it is not possible to prophesy what will be the exact future demands from the X-ray department, there is no doubt that a spacious and flexible layout is essential to maintain a high degree of efficiency for years to come. This idea should be paramount in the mind of the architect planning a new roentgenological department.

The writer wishes to express his sincere appreciation to the several prominent roentgenologists who readily have given their valued counsel in the preparation of this article.

References:

"Methods and Problems of Medical Education (Twelfth Series)." The Rockefeller Foundation, 1929.

"The American Hospital of the Twentieth Century," by Edward F. Stevens, 1928.

"Roentgenology," by G. W. C. Kaye, 1928.

"Roentgen-Ray Protection," by L. S. Taylor. American Journal of Roentgenology, July, 1929.

EDITORIAL COMMENT

ACHIEVEMENT

THE June-July, 1929, issue of the New York Building Congress News contains a short article entitled "R. D. Kohn as Seen by Himself." Mr. Kohn, president of the Building Congress, wrote the article in response to a request for biographical information about himself. Mr. Kohn does not hesitate to say that he was born in New York City on May 12th, 1870. After briefly outlining his early education and later his student days in architecture and work with the Housing Division of the Emergency Fleet during the war, he outlines the organization of his office which consists of a group of associated architects. In closing, Mr. Kohn states: "Among the achievements I still look forward to there is one above all others. It is that I may some day do a really beautiful piece of work; one that, at its completion, will satisfy me aesthetically." We suppose that this is the underlying principle which, if admitted, stimulates the majority of architects to go on whether "jobs" are many or few, interesting or distasteful, large or small, or cheap or costly. One cannot help wondering whether many architects achieve this ambition, for the most difficult person to satisfy in this matter is the creator.

Richard Upjohn, Stanford White, Charles McKim, Willis Polk and Bertram Goodhue, among others, must have realized or come very close to realizing this ambition. It can well be imagined that the late Milton Medary achieved something that satisfied him aesthetically in the Bok Singing Tower at Mountain Lake, Florida. After all, the number of architects who realize this lifelong dream are comparatively few. To many, and their name is legion, it remains only a dream, often for want of opportunity or the combination of factors that makes a vision of an ideal a reality. That these men keep on day in and day out speaks well for their steadfastness of purpose, courage and—backbone. A few fall by the wayside, but the majority keep their dream of achieving a really fine monument constantly before them.

TALL BUILDINGS

Most of us can recall when "tall" buildings were eight, nine or perhaps ten stories high. Buildings of thirteen, fourteen or fifteen stories were skyscrapers, until the Woolworth Building was erected. Thereafter we became very much accustomed to twenty-story buildings, and even thirty-story buildings ceased to cause much comment and are now relegated to the real estate news pages in the back of the newspaper among the advertisements. In New York City the proposed Larkin Building of over one hundred stories, announced about two years ago, was sufficiently daring to gain space in the second, third or fourth pages of a daily or a column in the Sunday feature section. If one continues to hear rumors that the project is still being considered, that is the nearest that it seems to realization for the present. The Chanin Building of fifty-eight stories became a reality, and its sixty-eight story neighbor, the Chrysler Building, is rapidly rising heavenward, a spire of steel followed by a mass of brick and stone. The flag does not yet fly from the topmost steel column, but we read that a building eighty stories high is proposed for the corner opposite the Chanin and the Chrysler Buildings. A recent morning newspaper devoted a third of a column to the announcement, which would indicate that buildings fifty to eighty stories in height still have an element of news. This tower would be twenty-three stories higher than the Woolworth Building and five stories higher than the proposed Crane Tower in Chicago. The Eiffel Tower in Paris would, however, still remain the tallest man-made structure. Oh, yes, the cost of the eighty-story tower is mentioned in round figures as $25,000,000.

HOUSE FOR W. T. BISHOP

BEL-AIR, CALIFORNIA

GORDON B. KAUFMAN
Architect

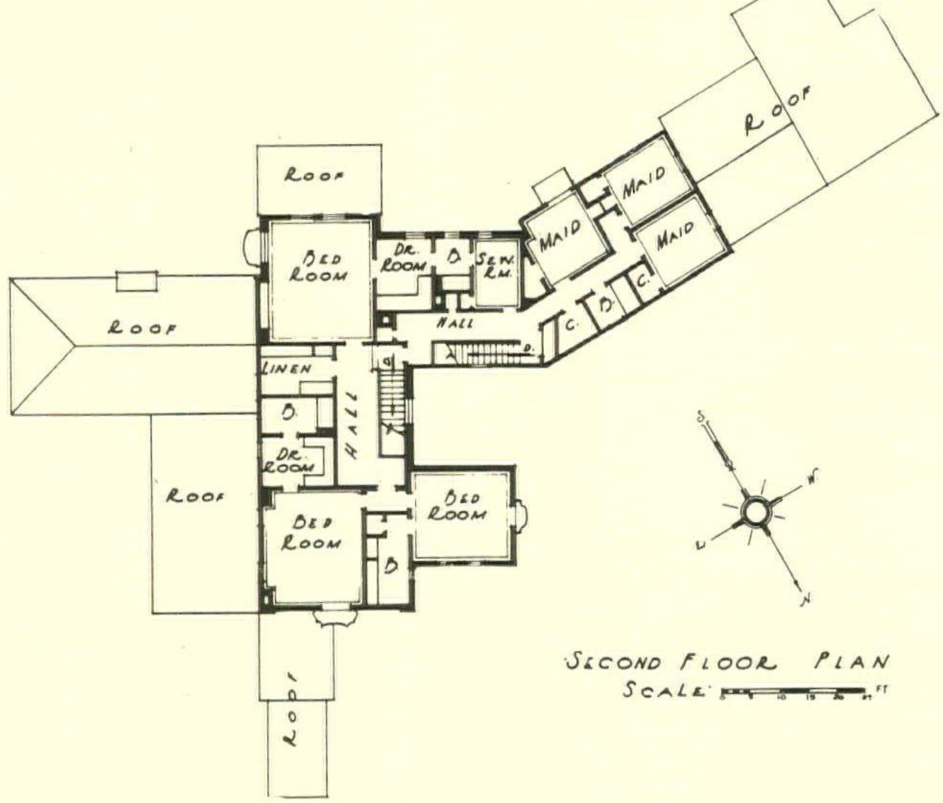
Photo by W. M. Clarke

Photo by W. M. Clarke

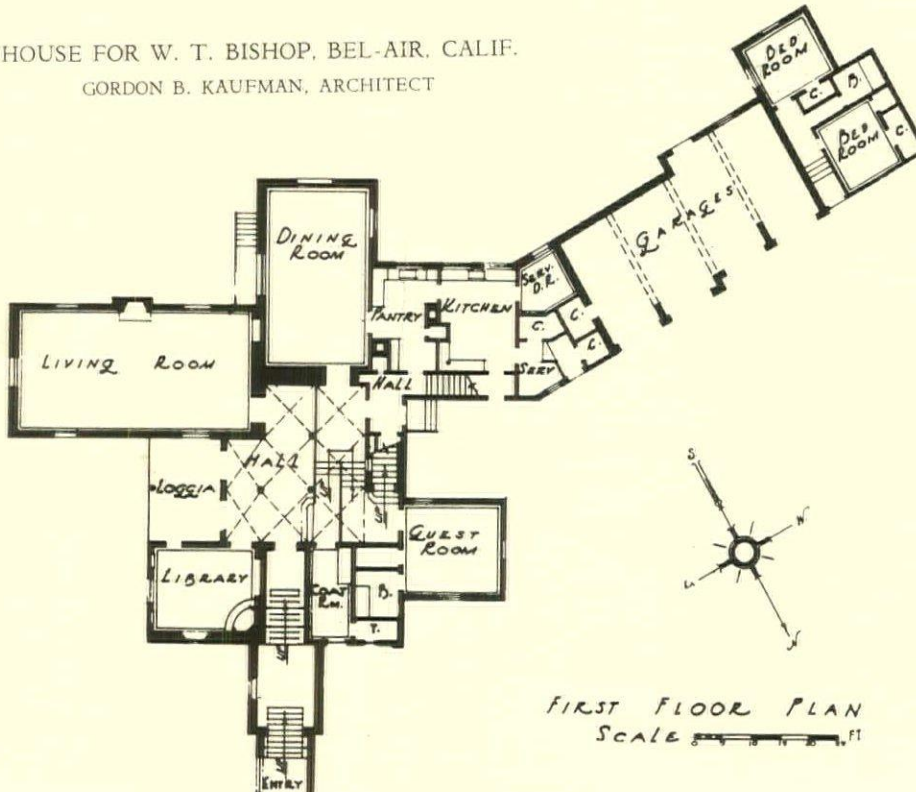
HOUSE FOR W. T. BISHOP, BEL-AIR, CALIF.
GORDON B. KAUFMAN, ARCHITECT

Photo by W. M. Clarke

HOUSE FOR W. T. BISHOP, BEL-AIR, CALIF.
GORDON B. KAUFMAN, ARCHITECT



HOUSE FOR W. T. BISHOP, BEL-AIR, CALIF.
GORDON B. KAUFMAN, ARCHITECT



HOUSE FOR T. FENTON KNIGHT

LA CANADA, CALIF.

HENRY C. NEWTON AND ROBERT D. DENNIS

Architects

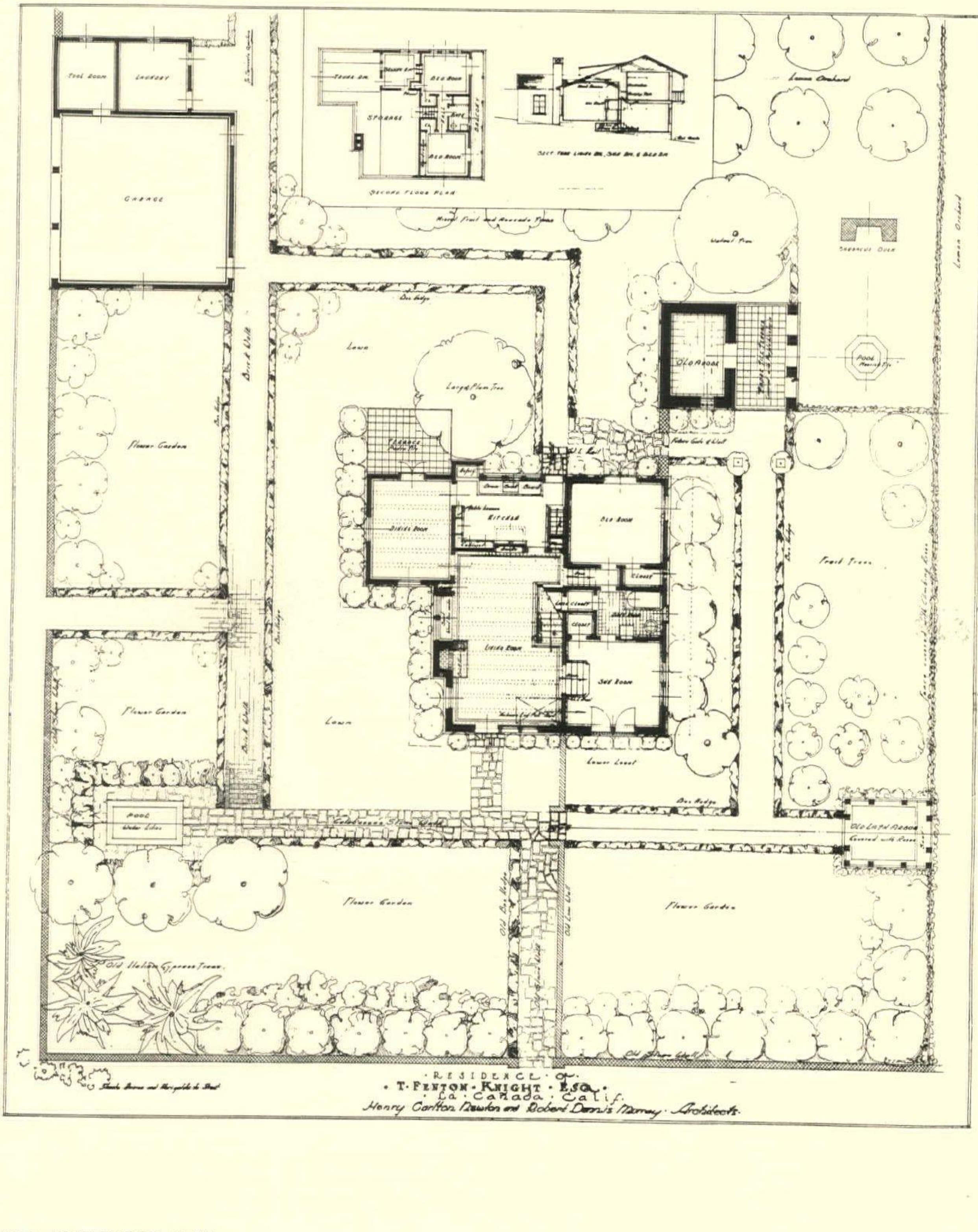


Photo by Miles Berne

HOUSE FOR T. FENTON KNIGHT, LA CANADA, CALIF.
HENRY C. NEWTON AND ROBERT D. DENNIS, ARCHITECTS

Photo by Miles Berne

HOUSE FOR T. FENTON KNIGHT, LA CANADA, CALIF.
HENRY C. NEWTON AND ROBERT D. DENNIS, ARCHITECTS

Photo by Miles Berne

HOUSE FOR T. FENTON KNIGHT, LA CANADA, CALIF.—HENRY C. NEWTON AND ROBERT D. DENNIS, ARCHITECTS

SPECIFICATIONS

Communications relative to specifications addressed to THE AMERICAN ARCHITECT *will be answered, in the pages of this department, by H. R. Dowswell, of the office of Shreve, Lamb & Harmon, Architects.*

THE New York Building Congress Standard Specifications for Carpentry have had the benefit of criticisms and suggestions by both the Master Carpenters' Association of New York and the Lumber Association. The Standards Committee therefore feels that these specifications should help to clear up many of the misunderstandings which have heretofore arisen in this division of the work. These specifications, as others previously published, require that the Architect, in Part A, make decisions on items which vary for different buildings. The specification writer should particularly note Paragraph 7 regarding "nominal dimensions" and Paragraph 17. These paragraphs definitely accept "trade sizes" unless large scale or full size details are issued for bidding.

The remaining paragraphs need no special comment except perhaps Paragraphs 100 to 106. Paragraph 102 is important. If the Architect desires to inspect millwork, such inspection, to be of value, must be made before priming or back painting.

The Standards Committee do not at the present time propose to issue a standard specification for Finishing Hardware. The selection of hardware for any building depends upon the sum which can be appropriated and the personal likes of the Architect and Owner. Paragraph No. 100 therefore assumes that the finishing hardware will be delivered to the sub-contractor applying same.

A.I.A. DIVISION 19.

New York Building Congress Standard Specifications for

CARPENTRY

PART B.

General Conditions.

1. GENERAL CONDITIONS OF THE CONTRACT of the American Institute of Architects, current edition, shall form a part of this Division, together with the Special Conditions to which this Contractor is referred. **General Conditions**

Arbitration Clause.

2. Any dispute or claim arising out of or relating to this Contract, or for the breach thereof, shall be settled by arbitration. Arbitration shall proceed under the requirements specified in the General Conditions, current edition, of the American Institute of Architects; or under the Rules of the Arbitration Court of the New York Building Congress, or of the American Arbitration Association, and judgment upon an award may be entered in the court having jurisdiction. One of these methods of arbitration shall be chosen at the time of the signing of the Contract, or, if not then determined, the choice of these methods shall beat the option of the party asking for arbitration. **Arbitration Clause**

Scope.

3. The following requirements in regard to materials and workmanship specify the required standards for furnishing of all labor, material and appliances necessary for the execution of all Carpentry, Framing, Millwork and Rough Hardware. **Scope**

Relations with Other Trades.

4. These requirements, however, form a part of the Contract only insofar as they describe items mentioned in Part A of this specification or as indicated on the Contract drawings. **Relations with Other Trades**

Temporary Enclosures.

5. This Contractor shall coöperate with contractors for other trades with which his work comes in contact. Where anchors, nailing pieces, frames or other carpentry work is to be built into masonry, the material shall be furnished by this Contractor in ample time to avoid delays. Subsequent cutting or alterations required through failure in this regard shall be executed at this Contractor's expense. **Temporary Enclosures**

Recommended for use by the New York Chapter, A.I.A. Approved by the Master Carpenters' Association of New York

Materials.

6. Where temporary enclosures for openings or other portions of the work are specified to be furnished under this Division, they shall be of the extent and be constructed as noted under Part A. **Materials**
7. All rough carpentry, framing lumber and timbers such as girders, beams, sills, plates, joists, rafters, studs, sleepers, grounds, bucks, sheathing, underfloors, etc., shall be of the kinds and nominal dimensions specified under Part A, well seasoned according to use and, unless otherwise specifically noted under Part A, of commercial association grades conforming to the "American Lumber Standards" as follows:

(a) All lumber less than two (2″) inches thick, used structurally, and all studding two (2″) inches by four (4″) inches (nominal) shall be not less than grade No. 2 common yard lumber.

(b) Lumber, four (4″) inches to two (2″) inches in thickness, used for load bearing purposes, shall be not less than grade No. 1 or No. 2 common yard lumber, as specified under Part A.

(c) Lumber five (5″) inches and thicker, used structurally, shall not be less than commercial grades conforming to common structural material.

(d) All structural timbers to be designed for the higher working stresses allowable for commercial structural grades, conforming to basic grades for select structural material, shall be grade-marked or trade-marked or otherwise identified by authenticated certificate as qualifying for such higher working stresses.

8. Materials for finished carpentry, which includes interior and exterior woodwork, shall be of the species and dimensions specified under Part A or indicated on the Contract drawings and shall conform to the following requirements:
9. Unless otherwise specified under Part A, material for painted finish may contain such sound tight pin knots as will not detract from the finished appearance of the work and shall be free from heavy sap-stain, worm holes, exceeding 1/16 inch, or other defects impairing either the durability or appearance.
10. Material for natural, stained, varnished, lacquered or waxed finish, unless otherwise specified under Part A, shall be free from knots, shakes, sap, stain, worm holes or other defects impairing either durability or appearance.
11. Materials having marked difference in color shall, in addition to conforming to the requirements specified under Paragraph 10, be selected to obtain uniform color.
12. Where vertical grain is specified under Part A, the material shall be free from coarse pores.
13. Where, under Part A, panels or other portions of the work are specified to be selected for figure and grain, the material shall be carefully matched for figure and color.
14. All material, for exterior finished woodwork, shall be thoroughly air dried; interior finished woodwork shall be kilndried and protected from moisture.

Fireproofed Wood.

15. Where, under Part A, fireproofed wood is specified, the process used shall be such as will produce results acceptable to the local Building authorities having jurisdiction. It shall be the duty of this Contractor, as a part of his Contract, to obtain certificates of approval from the local Building Department. Where tests are required in order to obtain such certificates, all expense in connection therewith shall be borne by this Contractor, as a part of this Contract. **Fireproofed Wood**

Handling and Protection.

16. All exterior and interior finished woodwork shall be protected from the weather while in transit from point of production or fabrication to the building; when delivered at the site it shall immediately be placed under cover and be adequately protected from the weather. Kilndried material shall not be stored or erected in wet or damp portions of the building or in sections where plastering, terrazzo or similar work is to be executed until such work has been completed and become reasonably dry. **Handling and Protection**

Sizes and Thicknesses.

17. All sizes and thicknesses specified in either Parts A or B of this Division shall be interpreted in terms of American Standard Association lumber and moulding rules, except where the Contract drawings show sizes of members and profiles of mouldings at large scale or full size. In such cases the Contract drawings shall be followed notwithstanding any trade standard rules or customs to the contrary. **Sizes and Thicknesses**

Shop Drawings.

18. Where so specified under Part A, this Contractor, before proceeding with any finished carpentry work, shall submit to the Architect, for approval, prints of shop drawings **Shop Drawings**

in duplicate, illustrating, in detail, the construction of all doors, frames, sash, paneling and special work.

19. These drawings shall be based upon and follow the Contract drawings and scale and full size details. They shall be modified and revised as may be required by the Architect for the purpose of more perfectly carrying out the intent and meaning of the Architect's drawings and specifications. When these drawings have been approved, all work shall be executed in accordance with them.
20. After approval, this Contractor shall supply the Architect with two additional prints of each drawing. He shall supply additional prints as may be required to secure the coöperation of other trades, at the cost of reproduction.

Workmanship—Rough Carpentry.

21. Joists, beams, girders and rafters shall be set with their crowning edge upwards and, where bearing on masonry walls, shall be splayed not less than three (3") inches in their depth, with bearings of not less than four (4") inches. Each tier of joists bearing on walls shall be tied to masonry walls at intervals not exceeding four (4') feet by metal anchors, furnished and installed by this Contractor, not less than ¼ of an inch by 1¼ inch cross section and at least twenty-four (24") inches long securely spiked near the bottom of the joists and provided with split and upset ends or other approved means for building into masonry. Joists parallel to masonry walls shall be provided with similar anchors at intervals not exceeding six (6') feet, engaging three (3) joists. Upset and "T" ends on anchors shall develop the full strength of the anchor strap. **Workmanship —Rough Carpentry**
22. Framing in all cases shall be kept at least two (2") inches clear of all fireplace breasts, hearths, chimneys and flues.
23. Where studding, forming bearing partitions or walls occurs over sills, girders or plates, they shall extend down to these and be securely spiked to bearings and, where possible, to the floor joists as well. Joists carrying parallel bearing partitions shall be doubled under them. Bearing partitions at right angles to joists shall rest on doubled plates. Non-bearing partitions may rest on single plates, laid over sub-floors. All stud bearing partitions and walls shall have doubled caps and cross bridging of same material as studs, at intervals not exceeding six (6') feet in height securely nailed with at least two nails at each end.
24. In general, studs shall be doubled at all corners and angles, and sides, and heads of openings. Truss over all openings wider than three (3') feet, and over all openings in bearing partitions.
25. Where framing out is necessary, both header and tail beams shall be supported with approved wrought iron joist hangers or stirrups furnished and installed by this Contractor. Where more than two joists frame into a header, both trimmers and headers shall be doubled in size.

Bridging.

26. Bridge between all joists at intervals of not less than eight (8') feet with a double row of cross bridging. Except where special steel or iron bridging is specified under Part A or approved by the Architect, material for bridging shall be of spruce not less than 1 1/16" x 2⅝" and shall be nailed with two 8d nails at each bearing. **Bridging**

Roof Sheathing.

27. Roof sheathing shall consist of close sheathing or shingle lath as specified under Part A. **Roof Sheathing**
28. Where close sheathing is specified it shall consist of tongued and grooved or ship-lap boards of material noted under Part A, dressed to an even thickness not less than 25/32 inch thick, driven tightly together, breaking joints at least every twenty-four (24") inches and nailed with two nails at every bearing.
29. Where shingle lath are called for, they shall consist of material of the dimensions specified under Part A, spaced to suit the weatherings of the finished roofing, and nailed at every bearing. All joints, except where sheathing is end-matched, shall be made over bearings.

Wall Sheathing.

30. Wall Sheathing shall consist of materials as specified under Part A. Where wood sheathing is specified, the boards shall be dressed to an even thickness, ont less than 25/32 inch thick, laid diagonally with close joints and nailed at every bearing with at least two nails. All joints, except where end-matched sheathing is used, shall be made over bearings. **Wall Sheathing**

Grounds.

31. Permanent grounds shall be provided wherever required to afford proper nailing of **Grounds**

all finished Carpentry and, where so stated under Part A, for the securing of metal covered wood or hollow metal trim.

32. Where so specified, temporary grounds for the work of other trades, shall be installed in the rooms or spaces enumerated under Part A.
33. All grounds shall be dressed to sizes required on details, and shall be secured in position in a manner absolutely rigid, straight, level, even and plumb, so that the surfaces of the finished coat of plastering shall be flush wtih the face or edge of all grounds.
34. Grounds generally shall be ⅝ inch by 2 inches in size, where same are applied to block work, and ¾ inch x 2 inches where applied to lath work. Grounds shall be in as many lines as required to properly set trim.

Floor Sleepers.

35. Where, under Part A, floor sleepers are called for, they shall be of the material and sizes specified and shall be secured to the floor construction by metal clips or tie wire supplied and installed by this Contractor. Unless otherwise specified under Part A, sleepers shall be set at sixteen (16″) inch centers, except where special conditions require closer spacing. They shall be carefully levelled and blocked, special attention being paid to see that there will be no sagging at ends or anywhere throughout their length. Where underflooring is specified to be laid diagonally, headers shall be installed where necessary to provide a continuous bearing. **Floor Sleepers**
36. Form transverse runs, where directed, to accommodate pockets for electric conduits, steam piping, plumbing and other service piping.
37. After sleepers are laid, cinder concrete fill will be placed between sleepers, under another division.

Underflooring.

38. Underflooring shall consist of square edged or tongued and grooved boards of material thickness and widths specified under Part A, dressed to an even thickness, not less than 25/32 inch thick, and face nailed with at least two nails at each bearing. **Underflooring**
39. Unless otherwise specified under Part A, underflooring shall be laid at right angles to joists or sleepers. End joints, except where end-matched boards are used, shall be made over bearings. Joints between boards shall be tight or open as specified under Part A.
40. Where tile floors are to be placed over wood joist construction, the tops of joists shall be trimmed to a bevelled edge, and a close under floor cut in between three (3″) inches below the top of joists.

Wood Furring.

41. Wood furring, unless otherwise stated under Part A, shall consist of ¾ inch x 2 inch soft wood, of kind specified under Part A, dressed to an even thickness, spaced twelve (12″) inches on center. **Wood Furring**
42. Where wood furring is specified to be applied to masonry surfaces, a secure nailing shall be provided by drilling and plugging, except where metal nailing plugs are specified under Part A.
43. Where, under Part A, metal nailing plugs are specified, they shall be furnished by this Contractor, before masonry is built and will be built in by the Contractor for Masonry at this Contractor's direction.
44. Where wood furring is to be secured to wood framing, it shall be firmly nailed at every bearing.

Bucks.

45. Where wood bucks are called for, they shall be of the plain or rebated type of material and sizes specified under Part A. Legs shall be dadoed into heads and heads pointed at both ends. Where rebated bucks are specified, they shall be the full width of the partition plus the thickness of plaster on each side and shall be rebated 1/2 inch to receive partition blocks. **Bucks**
46. Bucks shall foot upon the floor arches or on top of concrete fill, as may be necessary, but shall be of sufficient length to permit either form of construction and shall have continuous footing piece ⅞ inch thick by the width of the buck. All bucks shall extend in one piece, the full height of the openings, and shall be provided with No. 16 gauge galvanized iron crimped anchors, 1½ inches wide, at least three to each jamb.
47. The location of partitions receiveing wood bucks will be established on each floor under another division, either by placing pilot blocks or marking center lines of corridors on floor slabs or walls. Accurate dimensions and levels will also be furnished giving the position of each buck. This Contractor will be required, as a part of his Contract, to accurately locate all door bucks in accordance with the information given.

48. Bucks shall be accurately set, plumb and true and properly stayed until built in.

Finished Carpentry.

49. In general, all finished carpentry shall be finished and assembled at the mill, as far as practicable, and delivered at the building ready to set in place. The material shall be worked in the best manner known to the trade; mortised, tenoned, dowelled, blocked and glued together so as to avoid the use of nails as much as possible; mouldings cleanly cut, sharply defined and mitres accurately made. Plain butt joints without an approved device for preventing separation at joints will not be accepted. Where nails and screws are necessary they shall be concealed. Unless otherwise specified under Part A, all surfaces shall have a smooth machine finish. **Finished Carpentry**

50. Panel work shall be assembled in such a manner as to allow free movement of panels Where applied mouldings are called for, they shall be secured to stiles and rails. Unless otherwise specified under Part A, panels shall be built up of veneers as specified for doors with stiles and rails solid. All panels shall be primed or stained before being framed into place.

51. All frames and finish of every sort shall be put up plumb or level, straight and true; trim shall be put up with proper grounds in every case and firmly secured to same.

52. Interior frames, trim or other finish of any sort shall not be set until the plaster is on and dry, in the judgment of the Architect.

53. All work shall be fitted and scribed to plaster or other finished work in a careful manner, so as not to injure the surface in any way. Where plastering or other work has become needlessly damaged or disturbed by this Contractor, it shall be made good at his expense and in a manner approved by the Architect. All nailing shall be blindnailed wherever possible, but, where not possible, the nailing shall be so located and driven as not to be visible in the finish.

Siding.

54. Exterior siding shall be furnished in long lengths of the material, thickness and width specified under Part A. All siding shall be placed with edges true to the horizontal, butted closely and neatly against window and door frames or trim, be accurately mitered at corners with intermediate joints vertical and be nailed securely at every bearing. **Siding**

Exterior Wood Trim.

55. Exterior wood trim shall conform to sections and sizes indicated on scale and detail drawings and shall consist of materials and be prepared to receive finishes specified under Part A. **Exterior Wood Trim**

Stairs.

56. Stairs shall be constructed with open or closed strings as noted under Part A or indicated on the Contract drawings. **Stairs**

57. Where open string construction is called for, rough carriages shall be provided consisting of material as specified for general floor framing not less than two (2") inches thick and spaced not more than 2 feet-0 inch center to center in the width of the stair. These carriages shall be accurately cut to the rise and tread required for the stair and securely and rigidly fixed in place ready to receive finished strings, treads and risers.

58. Finished strings, treads and risers shall be of material specified under Part A. Where closed strings are specified or shown on Contract drawings, they shall be dadoed to receive treads and risers. Where an open outside string is specified or shown, the string shall be scribed to underside of treads, and be accurately mitered to the risers.

59. Where open strings are called for, the treads shall be firmly secured to carriages, have nosing formed as indicated on details, returned on outside string, mortised for balusters, grooved on under side at the front to receive risers, and tongued at back edge into risers.

60. Risers, on open string construction, shall miter with outside string, be tongued into underside of tread, grooved at lower edge to receive tread and finish with moulding as indicated.

61. Where closed string construction is called for, the treads and risers shall be housed into the strings and tightly wedged and glued. The risers shall be tongued into tread above and grooved to receive tread below.

62. Outside strings shall be panelled or plain as shown on Contract drawings, finished on top with a moulded shoe prepared to receive balusters and with scribe or soffit mould as required. The wall string shall be finished on top with a scribe mould or arranged to form base for panelling as indicated.

63. All strings shall be shaped to conform to contour of stair well, as indicated, with all necessary ramps and easements. Newels shall be panelled, turned or plain, finished with cap and drop as indicated on Contract drawings and rigidly secured to stair construction. Newels on stairs of closed string construction shall have intersecting strings, treads, and risers housed into them.
64. Hand rails shall be moulded in accordance with details, grooved or bored to receive balusters, provided with fillers where grooved, secured to newels with concealed bolts, formed with all ramps, easements and goose necks specified under Part A or indicated on Contract drawnigs and be securely and rigidly erected in place.
65. Where wall rails are called for, brackets for support of same, will, unless otherwise specified under Part A, be furnished and installed under another division. Where wood mats or grounds to receive wall rails or wall rail brackets are specified, they shall be furnished and installed by this Contractor.
66. Balusters shall be square, turned or otherwise shaped in accordance with details and spaced as indicated or specified. On stairs of open string construction, the lower end of balusters shall be dove-tailed into treads.

Finished Floors.

67. The finished flooring shall be of the materials, grades, face and thicknesses specified under Part A and shall be air dried, kilndried and accurately milled. **Finished Floors**
68. Unless otherwise specified under Part A, all finished flooring shall be tongued and grooved and end matched. Flooring 25/32 inch and greater in thickness shall be hollow back; flooring less than 25/32 inch in thickness shall be grooved in the back.
69. Finished flooring shall not be delivered to the building in damp or wet weather nor shall it be stored in newly plastered rooms or otherwise exposed to dampness.
70. Finished flooring shall not be laid until after all partitions have been erected and plastered and until plastering and masonry work is dry.
71. It shall be the duty of this Contractor to examine the building and assure himself that the underflooring, plastering and the building generally are in proper condition to receive flooring. He shall see that the underflooring or nailing concrete, where used, is level, free from plaster droppings, projections or dampness and shall report to the Architect or General Contractor any defects which would tend to prevent the laying of a finished floor of the character specified. Failure to make such an examination and report shall be construed as an acceptance of building conditions and preparatory work.
72. This Contractor shall lay between the underfloor or concrete base and finished floor an insulating material, waterproof where specified under Part A and weighing not less than twenty (20) pounds per 100 square feet. The insulating material shall lap at least two (2″) inches at all joints.

Direction of Boards.

73. Unless otherwise specified under Part A or indicated on Contract drawings, flooring boards shall run the long dimension of the room or space. **Direction of Boards**

Borders.

74. Where, under Part A, borders are called for they shall be laid as specified or indicated on Contract drawings. All joints between borders and floor strips shall be tongued and grooved; butt joints will not be accepted. **Borders**

Nailing.

75. Each piece of flooring shall be well driven into position. All tongued and grooved flooring shall be blind nailed, using nails and spacing as follows: **Nailing**
Flooring 25/32 inch thick, 8d. steel cut light flooring nail, 12 inches to 14 inches apart.
Flooring 15/32 inch thick, 6d. bright wire finishing nail, 8 inches to 10 inches apart.
Flooring 11/32 inch thick, 4d. bright wire casing nail, 6 inches to 8 inches apart.

Scraping and Surfacing.

76. After laying, all flooring shall be swept clean, scraped lengthwise of the grain and rubbed down with No. 1½ sand-paper, again swept and the dust removed with a soft cloth. Unless hand scraping is specifically called for under Part A, a machine scraper may be used. **Scraping and Surfacing**
77. After scraping and cleaning, all finished floors shall be completely protected by this Contractor with heavy building paper. This protection paper shall be maintained by this Contractor until the contractor for painting and finishing commences his work.

Door Frames.

78. Exterior and interior door openings shall be fitted with frames for hinged or sliding doors as indicated on drawings, constructed in accordance with details, of kilndried stock of grade, materials and dimensions specified under Part A. These frames shall be rebated or fitted with stops, provided with jamb and head lining, or finished the full thickness of walls or partitions and arranged to receive trim or scribe mould on one or both sides in accordance with detail drawings. Frames shall be rigidly blocked, wedged and firmly secured to bucks or rough studding. **Door Frames**

Doors.

79. Doors shall be of thickness given under Part A and of designs shown on Contract drawings. **Doors**
80. Generally the construction shall conform to the following requirements, but Contractor desiring to furnish doors produced by manufacturers favoring special methods may submit same to the Architect for approval.
81. Exterior doors shall be solid or veneered as specified under Part A. Where veneered doors are specified, the stiles and rails shall have 3/8 inch thick veneers applied to cores built up of ⅞ inch strips and put together with waterproof glue. Doors, exposed to the weather when open, shall have the top edge covered with metal by this Contractor, as specified under Part A.
82. Interior panelled doors shall have stiles and rails veneered with ⅛ inch thick veneer, sawed or rotary cut as specified under Part A. The veneers shall be applied over built up cores of white pine or chestnut and finished on the outside edges with a ¾ inch strip of material matching face veneers. Panelled doors shall have plain or raised panels and with flush or raised mouldings as specified under Part A or indicated on Contract drawings.
83. Flush doors shall consist of slab or framed up construction, as specified under Part A.
84. Slab construction shall consist of glued up cores of ⅞ inch strips, cross banded with ⅛ inch thick veneers and faced vertically on both sides with 1/20 inch thick veneers and, on vertical edges, with ¾ inch edge strips.
85. Framed up construction shall consist of stiles, rails, and flush panels, all of ⅞ inch core construction, cross banded and finished with face veneers and edges, as specified for slab doors.
86. Sheathed doors shall be constructed with cores as specified for framed up flush doors and shall be faced on both sides with material of thickness and width specified under Part A.
87. Double leaf single swing doors shall have moulded astragals, unless otherwise shown on details. Double swing doors shall have rounded meeting stiles.
88. Glazed doors shall be provided with moulded glass stops on room side and where muntin divisions are shown, they shall be of wood with moulded glass stops unless otherwise specified or detailed.

Window Frames.

89. Window frames shall be constructed for sliding, hinged, pivoted, or fixed sash, as indicated on the Contract drawings, and of materials specified under Part A, using clear grades for exposed parts and merchantable grades for concealed portions. **Window Frames**
90. Where vertical sliding counter weighted sash are called for, the frames shall be constructed with pulley stiles, parting strips, inner and outer casings, back linings (forming weight boxes), pendulum strips and sash stops, except where stops are specified to form part of interior trim, and outside scribe moulds. The frames shall be fitted with sash pulleys of side or overhead type specified under Part A, and be provided with an acceptable method for access to weight boxes.
91. Frames for horizontal sliding, hinged, pivoted or fixed sash shall be rebated or otherwise constructed to permit the operation indicated or accommodate special hardware specified under Part A.
92. All frames for openings in masonry walls shall be provided with exterior scribe moulds. These shall be left removable until after joint between frame and masonry is caulked and pointed and then secured permanently in place. Caulking, unless specifically noted under Part A, will be executed under another division.

Sash.

93. Sash shall be constructed of kilndried stock, of grade and material and thicknesses specified under Part A, moulded and checked in accordance with detail drawings, mortised, tennoned, glued and pinned in accordance with the best trade practice. **Sash**

Counter weighted sash shall be hung with sash chain or cord of the kind specified under Part A and of size suited to weight of counter weight. Counter weights shall be of cast iron; or of lead where conditions of heavy sash or narrow mullions require that lead weights be used, as specified under Part A.

Trim.

94. The material, character and extent of the trim shall be as specified under Part A. Where splines, dowels or a special device, at joints in architraves or between architraves and plinth blocks are specified, these shall be furnished—otherwise architraves shall be neatly and accurately mitered at corners and butted on plinths. **Trim**

95. When stools are called for, the stools shall be tongued into the window sills. Where aprons are required, the stools shall be plowed to receive them. Stools and aprons shall, unless otherwise specified or detailed, be finished with a return at either end.

96. Where jamb and head linings are called for, they shall be plain or paneled, as specified under Part A or indicated on Contract drawings. The inner edge shall be tongued into shoe heads or window frames and the outer edge finished flush with plaster or jointed to wall paneling, where panel ng occurs.

97. Where sash stops are specified under Part A or indicated on Contract drawings to form part of interior trim, they shall be secured to the frames with brass screws and adjustable countersunk washers, furnished as part of the finished hardware.

Saddles.

98. Where wood saddles are required, they shall be of materials, specified under Part A, and in locations listed or indicated on drawings. Unless otherwise specified or detailed, saddles shall be five-eighths (5/8") of an inch thick above finished floor, line with edge of the trim on the door side and extend beyond the door the full width of door stop, or, where rebated frames occur, not less than two (2") inches. **Saddles**

Miscellaneous Fittings.

99. Miscellaneous fittings such as mantels, cupboards, bookcases, cabinets, shelving, hook strips, hanging rods, etc., shall be constructed of materials specified under Part A and in the manner indicated on detail drawings. The standard of construction and finish shall conform to the requirements specified under paragraphs 49 to 53, inclusive. **Miscellaneous Fittings**

Back Painting and Priming.

100. Where so specified under Part A, this Contractor shall prime and back paint all exterior frames, sash and exterior and interior trim. **Back Painting and Priming**

101. Where, under Part A, this Contractor is required to back paint interior trim designed for stained, waxed or varnished finish, he shall paint all concealed surfaces with one heavy coat of dampproof paint. Where so specified under Part A, the back of finished flooring shall be similarly painted.

102. All priming and back painting shall be applied before leaving the shop. This Contractor, however, shall notify the Architect at least one week before the work is ready for priming or back painting, so that if desired, an inspection may be made of the unpainted work.

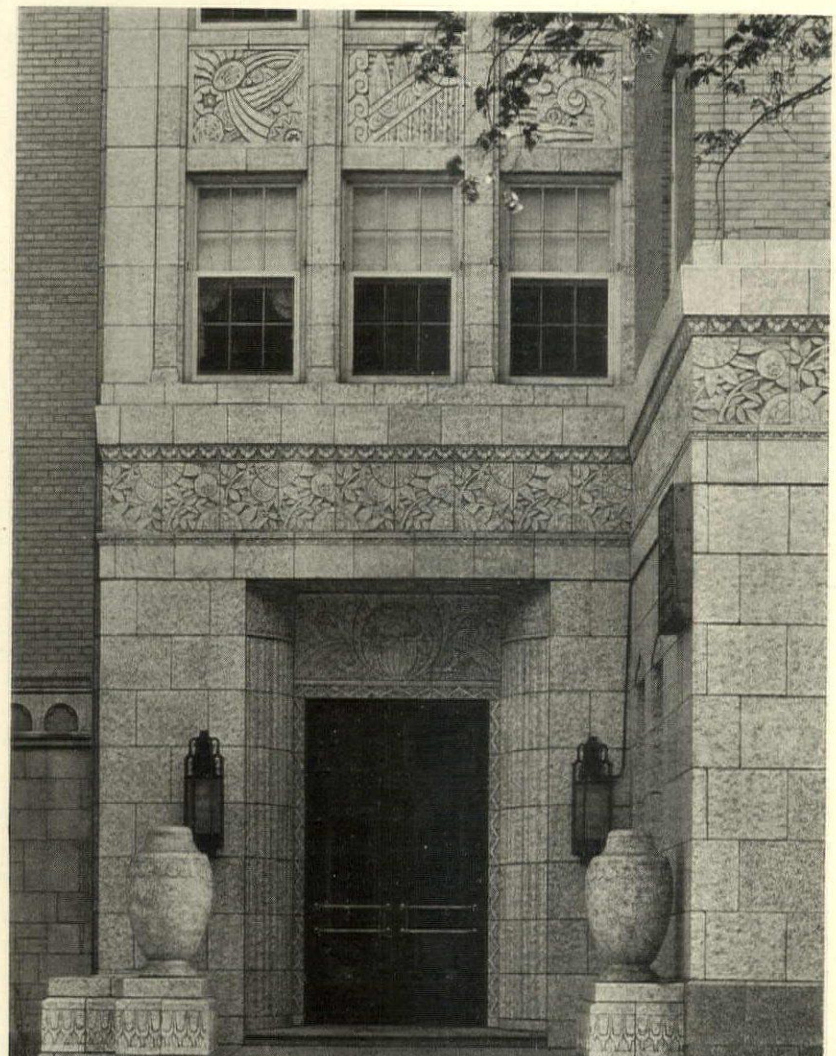
103. Where so required under Part A, this Contractor shall provide at his shop a room of satisfactory character and sufficient size to permit the Painting Contractor to apply the finish before delivery at the building. When this is required, this Contractor shall notify the General Contractor or the Painting Contractor when the finished wood work is ready for finishing.

Hardware.

104. This Contractor shall provide and apply all rough hardware required for the proper execution of all Rough and Finished Carpentry. Rough hardware shall include tracks and hangers for sliding and accordion doors and metal standards for the W. C. stall divisions, where same are specified to be constructed of wood. **Hardware**

105. He shall also apply all finished hardware and shall obtain from the Contractor supplying "Finished Hardware" complete information as to type and sizes and make all allowances necessary to properly receive the hardware to be used.

106. The finishing hardware to be applied under this Division will be delivered to this Contractor at the building. He will be required to receipt for same and shall assume full responsibility for all hardware so received until application and acceptance of the work in this Contract.



BOOK REVIEWS

HANDBOOK OF GREEK & ROMAN ARCHITECTURE

THERE have been few books written on the architecture of Greece and Rome which are so free from pedantry, as clear and concise in the statements of facts and as choice in the selection of material as Robertson's *Handbook of Greek and Roman Architecture*. The aim of the book is by no means new, but the presentation is so natural and inevitable, and the deductions seem so logical and unquestionable that it is a joy to read it. This is one of the few technical books which one can open almost anywhere at random and find something interesting. The author states that his knowledge of architecture is mostly derived from long study of English and foreign publications and monographs, an admission which few authors seem willing to make, and it is typical of the breadth of the author's vision that he could accept help of this kind and still preserve the balance of judgment on the different periods. Eighteen centuries ago one magnificent architectural tradition ruled the whole basin of the Mediterranean and extended down toward the barbarians, and that tradition, notwithstanding the enormous development of succeeding centuries, has maintained its place and is the criterion for nearly everything that has been done since. An appreciation of this is what makes the book so valuable.

The book is fully illustrated by very discriminating plans and sections and by a multitude of photographs, not encumbering the book or intruding into the general scheme but illustrating what the author is trying to tell. There is an excellent analysis of the construction and of the plan of the dome of the Pantheon at Rome which does not altogether agree with Choissy and brushes aside some of the traditions about the way the Romans used concrete in their domes. There is a chapter on Town Planning, but this is of less interest because, after all, the Greeks had no idea of what we would call Town Planning today; axes, through-ways and squares did not exist; and the Romans were hardly any better. The Imperial City at its best was a mess and a jumble and group planning on a monumental scale simply was not considered in those days.

The book is for the lover of architecture—one especially would be responsive to the fineness of Greek art. It is supplemented by an excellent list of known buildings giving dimensions, dates and almost a synopsis of the whole subject. There is also a complete bibliography, a glossary of architectural terms and a carefully prepared general index. All of these help amazingly in an understanding of this thoroughly admirable work.

A Handbook of Greek and Roman Architecture, by D. S. Robertson, M. A. New York: The Macmillan Company. 406 *pages, illustrated, size* 6 1/2 *x* 9 1/2. $10.00.

DAEDALUS AND THESPIS

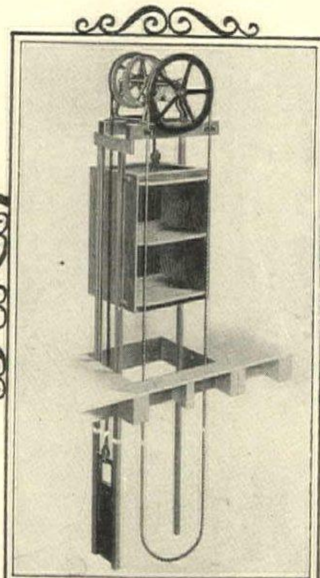
THE author states in his preface that this volume has been a long labor of love. One can quite believe it. It is a fine thing that some one will do just what has here been wrought out so conscientiously. It includes a study of practically all of the important Greek monuments and presents quotations from the dramatic poets that explain or refer to each structure. No review can be adequate to give a correct idea of the wealth of material which is presented in such usable shape. It must be dug into, pondered over, allowed to grow on the mind, to be read and re-read, and for those who have the time, it would be well worth while. In fact, also for those who have not the time it might be a healthful antidote for the modern venom of haste. At first reading it seems hopelessly dull. Even the exquisite illustrations, which are so well chosen and so well presented, do not quite offset the numerous pages of quotations from the Greek authors, which are understood by most readers only by reference to the accompanying English translation. However, it will bear re-reading more than once. The diction is clear and well chosen, equal to the illustrations, but it is, after all, a pretty stiff dose of erudition mingled with a great many reflections on architecture as set forth in the old dramatic poets.

Daedalus and Thespis: The Construction of the Ancient Dramatic Poets to Our Knowledge of the Arts and Crafts of Greece, by Walter Miller, of the University of Missouri. Vol. I, "Architecture and Topography." New York: The Macmillan Company, 329 *pages,* 48 *illustrations, size* 8 x 11. $6.50.

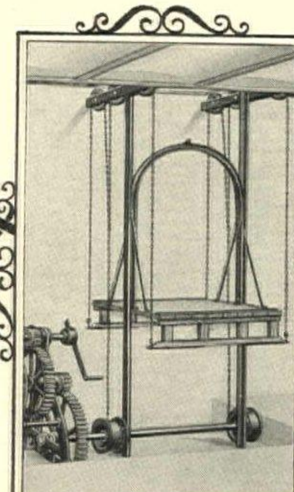
SEDGWICK

DUMB WAITERS *and* ELEVATORS

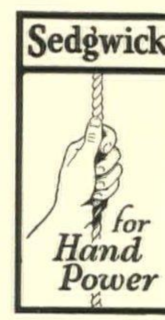
For all purposes



Geared Automatic Brake Dumb Waiter Type "FDCG"



Sidewalk Elevator at Left



MODERN construction necessitates the most improved and economical equipment of every kind. Most architects are well acquainted with the advantages of Sedgwick Dumb Waiters and Elevators.

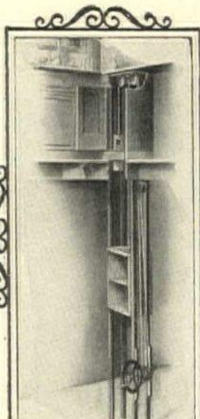
Early Consultation Advisable

Blue prints and detailed specifications covering the exact equipment best adapted to your requirements will be gladly furnished upon request.

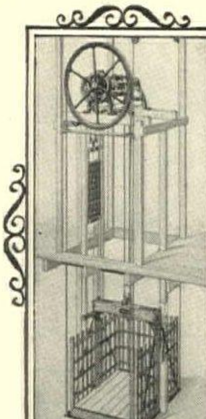
If our A. I. A. Catalog is not in your files, write for it today.

REPRESENTATIVES IN MANY CITIES

SEDGWICK MACHINE WORKS
159 West 15th Street New York



Under Counter Dumb Waiter



Freight Elevator

SEDGWICK SERVICE SATISFIES

CURRENT NOTES

CHURCH BUILDING COMPETITION

THE Christian Herald Bureau of Church Planning has announced its second annual Church Building Competition. This competition is for Protestant churches, seating from 150 to 600 persons, that have already been built. There are three cash prizes to be awarded and divided between the architects and the churches. The jury of awards will consist of Harry Wiley Corbett, Hubert Frohman and Elmo Cameron Lowe. R. H. Blatter, consulting architect of the Bureau, will act as professional advisor. The competition calls for photographs and plans of churches completed since July 1st, 1927. Entries must be made on or before November 15th, 1929. The competition rules may be obtained by addressing the Bureau of Church Planning, Christian Herald Association, Inc., 419 Fourth Avenue, New York City.

PHILADELPHIA ARCHITECTS TO HOLD EXHIBITION

THE American Institute of Architects, Philadelphia Chapter, and the T-Square Club of that city, will hold their Thirty-second Annual Architectural Exhibition from November 1st to the 15th, inclusive. The Joint Exhibition Board of the affiliated organization has announced that the exhibition will be held this year through the courtesy of John Wanamaker of Philadelphia in the art galleries of that store.

The Joint Exhibition Board in charge of this year's display is Nicola D'Ascenzo, Chairman; Howard L. Shay, Vice-Chairman; George Wharton Pepper, Jr., Secretary; James Bush-Brown, Treasurer; D. Knickerbacker Boyd, Managing Director; Herbert R. Leicht, Harry Sternfeld, and Isabel W. McCoy, Executive Secretary of the Philadelphia Chapter, A. I. A.

A Circular of Information is now available which, together with entry slips and labels, may be had upon application to the Executive Secretary, 112 South 16th Street, Philadelphia, Pa.

Photographs for the Year Book illustrations and return of entry slips must be received by the Executive Secretary before Tuesday, September 10th. Exhibits will be received from October 21st to October 23rd, and they will be discharged on the 16th of November, 1929.

PRIZE WINNERS IN 1929 NATIONAL BETTER HOMES COMPETITION ANNOUNCED

DESIGNS submitted in the National Better Homes Competition, conducted by the Home Owners' Service Institute, were recently judged and resulted in the first grand prize being awarded to H. Roy Kelly of Los Angeles. Harrison Clarke of Los Angeles received the second grand prize, and Amadeo Leone was awarded the third grand prize. In addition to the national or grand prizes, the competition included regional prizes for thirteen sections of the United States. The regional judgments replaced the customary preliminary competition in arriving at the national awards. The total value of all prizes awarded was $29,000. The national awards were $5,000, $3,000 and $1,500.

CHICAGO WAR MEMORIAL

THE War Memorial Committee of the City of Chicago announces, to all architects residing in the United States, that a nation-wide competition will be held for the Chicago War Memorial with prizes and in accordance with competition rules of the American Institute of Architects. Programs will be issued September 1st and judgment announced early in December. Under this general invitation programs may be obtained up to October 1st by qualified applicants from Earl H. Reed, Jr., Advisor, War Memorial Competition, 435 North Michigan Avenue, Chicago, Illinois.

PERSONALS

Randolph Frantz, architect, of 376 Walnut Avenue, S. W., Roanoke, Va., writes that he would like to receive manufacturers' samples and catalogues.

Hoit, Price & Barnes, architects, announce the removal of their offices to 2500 Telephone Building, Kansas City, Mo.

Margon & Holder, architects, announce the removal of their office to 18 East 41st Street, New York City, from 29 West 57th Street, New York.