

# THE ARCHITECTURAL RECORD



Vol. XLV. No. 3

MARCH, 1919

Serial No. 246

*Editor:* MICHAEL A. MIKKELSEN

*Contributing Editor:* HERBERT CROLY

*Business Manager:* J. A. OAKLEY

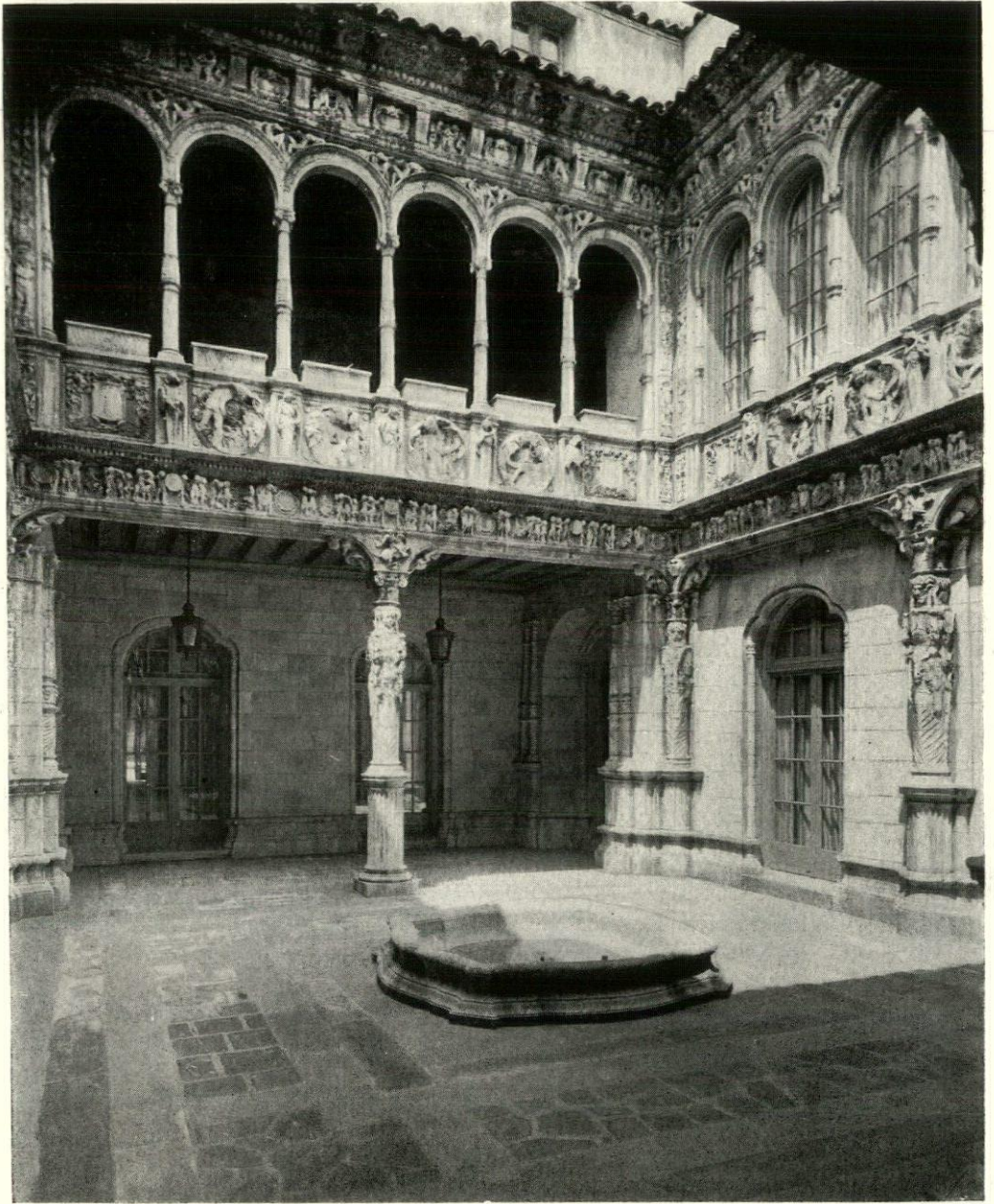
	PAGE
Cover—Hoisting the Gargoyle. Water Color <i>By Leon V. Solon</i>	
THE RESIDENCE OF MRS. ANDREW WELCH, San Francisco, California. Willis Polk & Co., Architects <i>By Leon V. Solon</i>	194
SOME PRINCIPLES OF DESIGN AND CONSTRUCTION IN DOMESTIC BUILDING <i>By Charles H. Moore</i>	210
A POST-WAR CONSTRUCTION PROGRAM. The Building Bureau of the International Committee of the Y. M. C. A. Part I <i>By Charles C. May</i>	217
THE GOVERNMENT'S HOUSING PROJECT AT QUINCY, MASS. <i>By Sylvester Baxter</i>	242
MODERN INDUSTRIAL PLANTS. Part V <i>By George C. Nimmons</i>	262
PORTFOLIO OF CURRENT ARCHITECTURE	283
NOTES AND COMMENTS	287

*Yearly Subscription—United States \$3.00—Foreign \$4.00—Single copies 35 cents. Entered May 22, 1902, as Second Class Matter, at New York, N. Y. Member Audit Bureau of Circulation.*

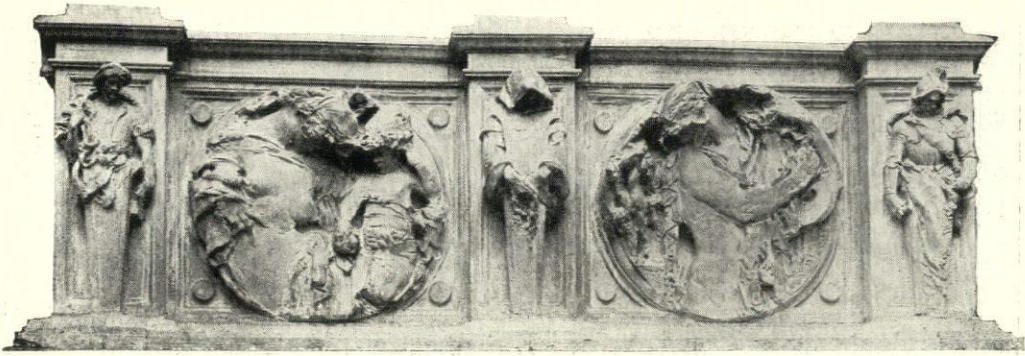
PUBLISHED MONTHLY BY  
**THE ARCHITECTURAL RECORD COMPANY**

115-119 WEST FORTIETH STREET, NEW YORK

F. T. MILLER, Pres.    W. D. HADSELL, Vice-Pres.    J. W. FRANK, Sec'y-Treas.    E. S. DODGE, Vice-Pres.



COURTYARD OF THE RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



*Detail of balcony. An excellent example of Leo Lentelli's technique.*

**The RESIDENCE of MRS. ANDREW WELCH  
SAN FRANCISCO, CALIFORNIA  
WILLIS POLK & CO., ARCHITECTS**



*By Leon V. Solon*

THE ARCHITECT'S CONTROL IN COLLABORATIVE WORK.

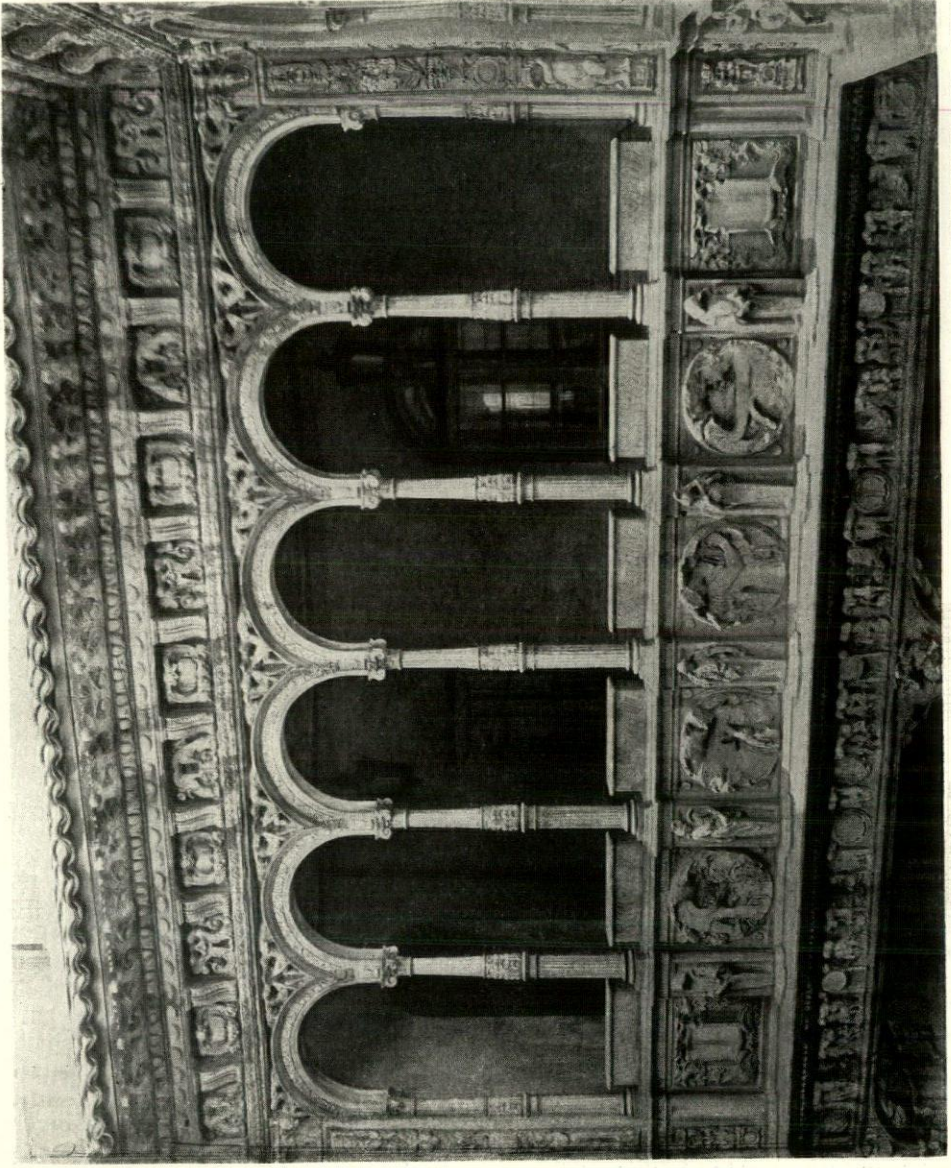
IN THIS house we find a test of that theory, so dear to the associate painter or sculptor, that the artist contributing a major accessory should be accorded complete freedom, within structural limitations, to conceive and execute as he deems fitting.

The central court of this residence is the subject of the experiment. The *Caza de Zaporta*, formerly of *Zarragossa* (now re-erected in Paris), is its model. This masterly example of Hispanic Renaissance architecture supplied both the structural skeleton and the disposition of ornamentation, which Mr. Willis Polk, architect, of San Francisco, entrusted to the accomplished sculptor, M. Leo Lentelli, to rejuvenate. M. Lentelli was given complete freedom to indulge in any imaginative luxuriance he might contrive that would conform to the ornamental plan existing in the court of the Infanta's house. The extent to which such a policy is safe and advisable, from the architect's standpoint, is a subject for weighty consideration.

A basic difference in scenic function exists between the individual piece of sculpture, and one that is carved to occupy a definite position in an architectural composition. The individual sculptural object is created and executed with the assumption that it will be viewed and judged at a certain distance, at which there will be no distortion through unforeseen angles of vision, and from which detail will be neither too insistent through proximity, nor effaced by distance.

The sculptured item in the architectural scheme differs in this essential, that it must be equally efficacious at an additional range of vision. It should possess such intrinsic merit that its existence is justified irrespective of association: this might be termed its "short range" effectiveness. Its "long range" effectiveness exacts surrender of identity, at that distance whence a unit of effect results from the amalgamation of contributory elements.

To each complete view of an edifice there is a *focal point* at which all optical



DETAIL OF BALCONY, RESIDENCE OF MRS.  
ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS  
POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.

conditions operate to its scenic advantage. From that position the relative and mutual importance of integral points is adjusted, free from the distortion produced by an inordinately high picture-plane in too near proximity; from there, masses of ornamentation become reduced to a mere enrichment of surface areas.

The great Spanish architects of the sixteenth century enjoyed in exceptional degree the gift of subordinating ornamentation. Their sculptured embellishment, which at "short range" was often of exotic luxuriance, when viewed from the focal point, reduces itself to comparative insignificance in its unassertiveness. The magnificent portal of the Hospital Real, Santiago de Compostela, of the early sixteenth century, contains much carving that is an illuminating example of this particular quality. In that great work we encounter boundless variety and freedom in figure and ornamentation, both in its imaginative quality and in technique; but all is conceived primarily with the aim that a figure, for instance, will become an unobtrusive incident in a frieze of figures, whatever its individual interest or sculptural merit; or, if it decorate a niche, it will so combine with its frame and conform with its companions, that the grouping of the niches in the eye will be aided by the equation in scenic value of each. Thus, by the homogeneity of its units, the group in turn becomes a complete and cohesive member in the great scheme. Throughout that intricate composition there is a wonderful adjustment of scale in the detail and in the degree of projection for the various carved ornamentations. There is no one type of member or item in the composition that tends to amalgamate or pair itself through similarity of treatment with any other with which it has no direct relation, thereby risking disturbance to balance in the major scheme.

The aim of these great architects appears to have been variety in the decorative elements, homogeneity in the ingredients of the group, and an individual decorative quality for each of certain members, which was attained by contrasting their sculptural treatments and carefully calculating ornamental dis-

tribution; finally, simple unity in ultimate result, whatever the intricacy of the component parts.

The façade of the University of Salamanca is another typical example, characteristic of the manner of that period; numbers of other edifices might be cited, not omitting the *Caza de Zaporta*, as the one most in point.

This masterpiece reveals to a remarkable extent the Hispanic gift for contriving ornamental variation without destroying similarity of mass in repeating or balancing items; it also shows us decorated areas so governed in their treatment and disposition that when viewed from the focal point they assume a tone or texture quality, by means of contrasting scale of ornamental motif. This tone quality is the aggregate effect of embossed design; it is used by the sixteenth century Spaniards as a means for separating or grouping architectural items. It is effected by subjecting the ornamentation, embroidering each item, to a rigid equation of decorative value, through careful regulation of its scale, massing and projection. The exceptional skill with which this adjustment is made constitutes one of the most conspicuous physical peculiarities of the Spanish manner of that period, which cannot be overlooked in any modern stylistic essay without a serious depreciation of quality.

The temperament of the artist usually determines whether the field for inspiration will serve for anchorage, or point of departure. Choice abounds; the original model will render service to the brain or to the hand of the architect, proportionately as he may be imaginative or literal; abstract properties exerting the major influence on the former type of man, and the mechanical on the latter.

In the Welch residence we have to consider a rendering of a classic after the literal manner. Though the paraphrase of detail does not rank high in the estimating of imaginative evolutions of an idea, it is, in actual fact, the most daring of undertakings; inasmuch as the creation of direct substitutes is a challenge to the original, on its own ground. A clear conception of the exact contribution made by



DETAIL OF DOORWAY LEADING OUT OF COURTYARD, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.

each mass of light and shadow to an architectonic effect, is the first essential for a successful issue.

From the point of view of technique, M. Lentelli has contrived each item with his habitual skill and grace. As individual pieces of modeling, there are many that delight the eye; but as contributory elements to an architectural unit of effect they lack the "long range" quality. From the focal point, the items that figure on repeating members do not develop architectural uniformity and symmetry, as they lose their individuality through distance. This is conspicuously the case in the medallions and the alternating figures in the balcony. There is in M. Lentelli's treatment a certain raggedness of light and shade in these medallions which is disturbing and lacks the reposeful dignity of the originals. In the balcony of the *Caza de Zaporta* these details are treated with half figures framed in circular mouldings, which are very varied in subject and treatment, but which acquire an equation of decorative value as distance absorbs them in the main scheme. Subject and detail have been subordinated there in each panel to one aim, namely, that light shall fall and shadow be projected in equivalent masses and corresponding locations; the initial and ultimate aim having been that the maximum variation of detail should underlie an undisturbed architectural regularity.

This vital architectonic quality has not been appreciated in M. Lentelli's free and ingenious paraphrase; while according him all due credit for his dexterous exposition of the modern Italian manner, we feel that his work would have carried greater weight had collaboration with an architect existed; by this means broader unity in final effect might have been attained by a closer interrelation of integral parts. One of the great charms in the prototype is its expression of decorative stability, a sense in which the new version is deficient.

A criticism of similar character applies to the frieze of children below the balcony, which is restless, and appears to undermine the superimposed members. Indulging the privilege of comparison invited by a paraphrase, the corresponding

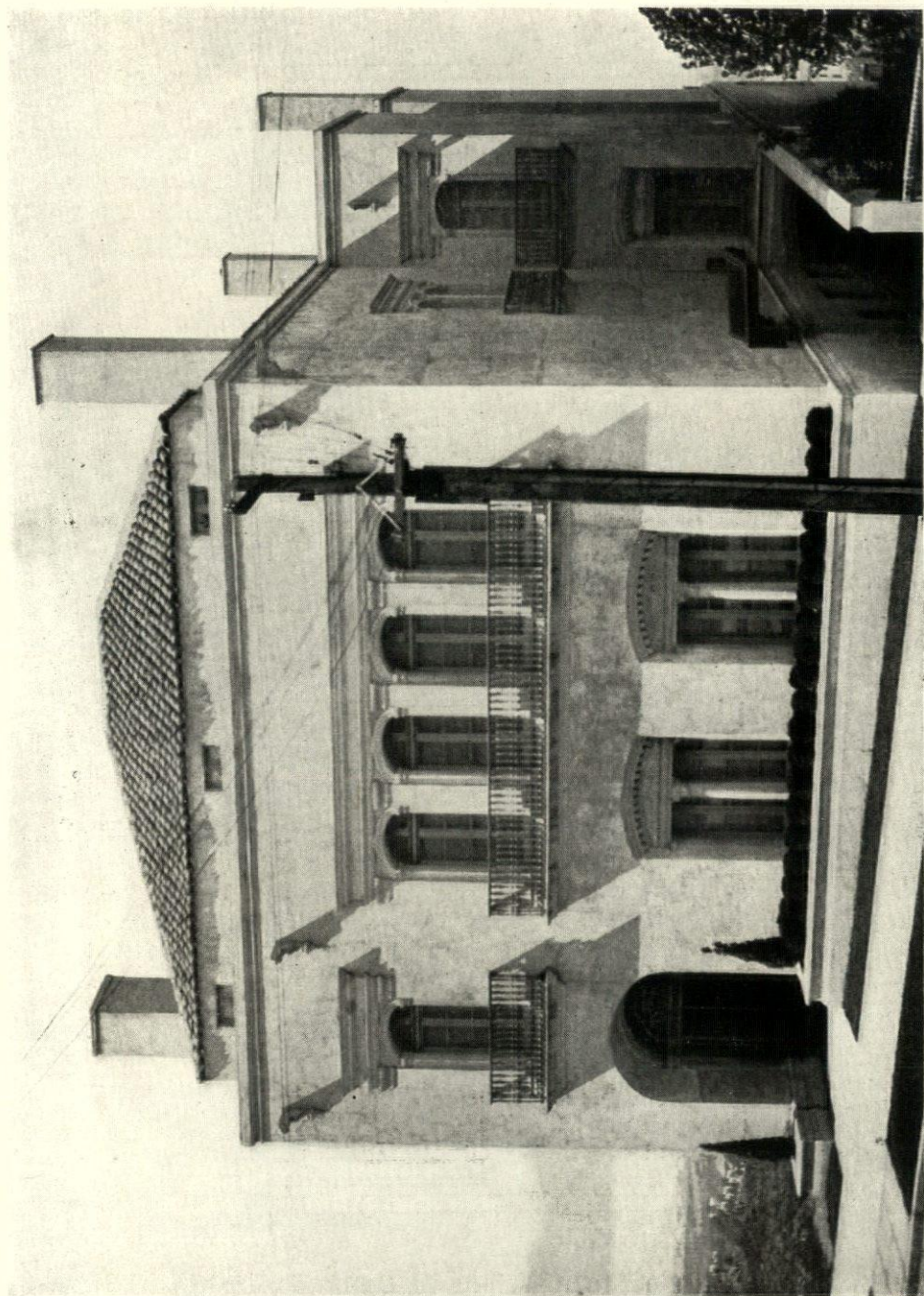
member in the *Caza de Zaporta* is a good example of decorative resourcefulness. The artist designing the original felt, as evidently M. Lentelli did, that the comparative proximity of this member to the eye demanded a degree of freedom in design; he consequently made an unusual compromise between the regularity of the recurring motif, and the irregularity of the free-running subject. The original gryphon motif is sometimes repeated, sometimes reversed, with occasional sections of free composition inserted with an amusing capriciousness, giving an impression of syncopated rhythm, punctuated at regular intervals by the repeating paterae, but conveying to the eye the impression of a uniformly decorated band of architectural ornamentation.

A careful examination of the detail of secondary importance fails to find much evidence of any inherent sympathy with architectonic ideals and aims; this sympathy should be an instinct of the architectural sculptor, curbing fancy to a rigid planning of motif. As an instance of this we note the spandrels over the caryatids in the *Caza de Zaporta* decorated with an extremely simple and symmetrical bird, arranged with outstretched wings (possibly the emblem of the Holy Ghost). The apparent strength of an important structural unit must not be impaired; for this reason, the silhouette of the bird follows the contour of this block, accentuating its form. In place of the bird M. Lentelli has chosen a knight on a prancing charger—the antithesis of the severe triangular bird motif. The concentrated vigor of the equestrian composition would be admirable in a spandril between arches, but is very detrimental to the sense of support essential here. The qualities we seek, and miss, are architectonic rather than sculptural. The capacity to appraise the scenic value of accessory sculpture must have been an important part of the craftsman training of both sculptor and architect from ancient times, down to the eighteenth century; such unvarying adjustment of values cannot be the result of hazard. Today this factor appears to have only a secondary importance; it is observed with little

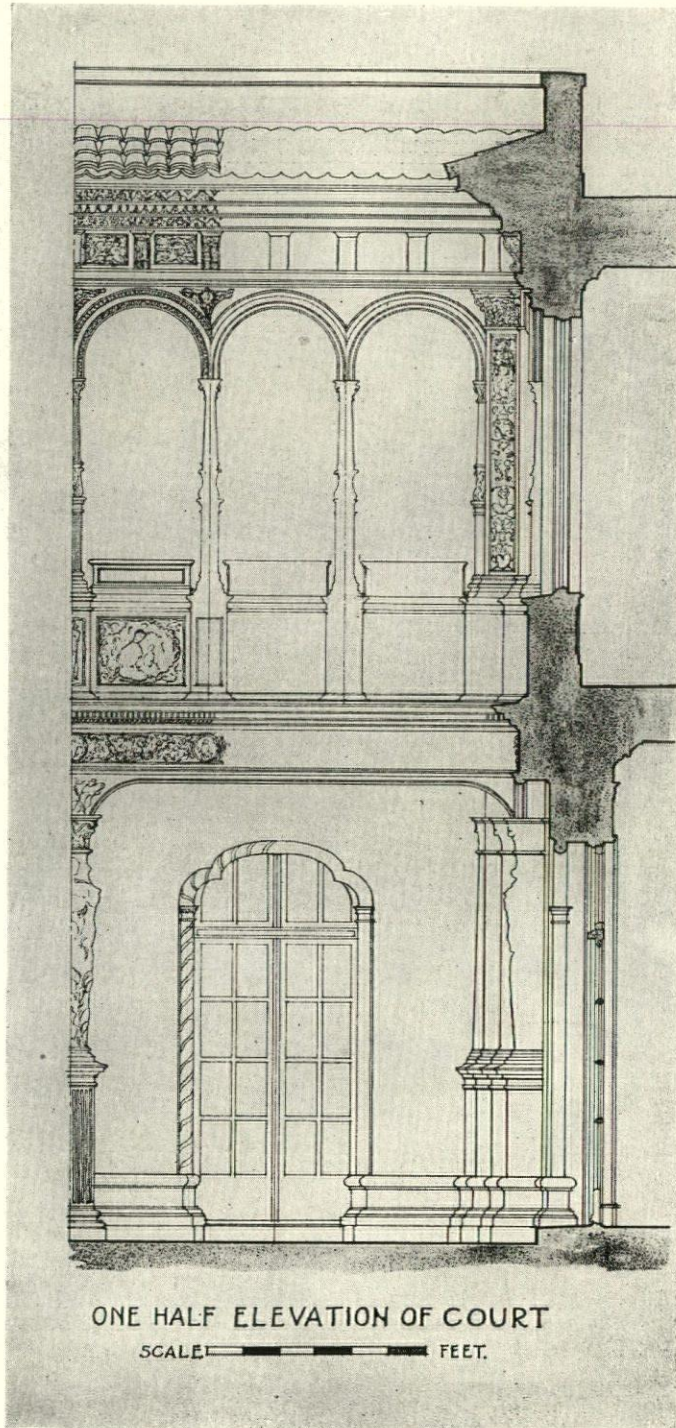


THE COURT, WITH ONE OF THE GALLERY WINDOWS, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.





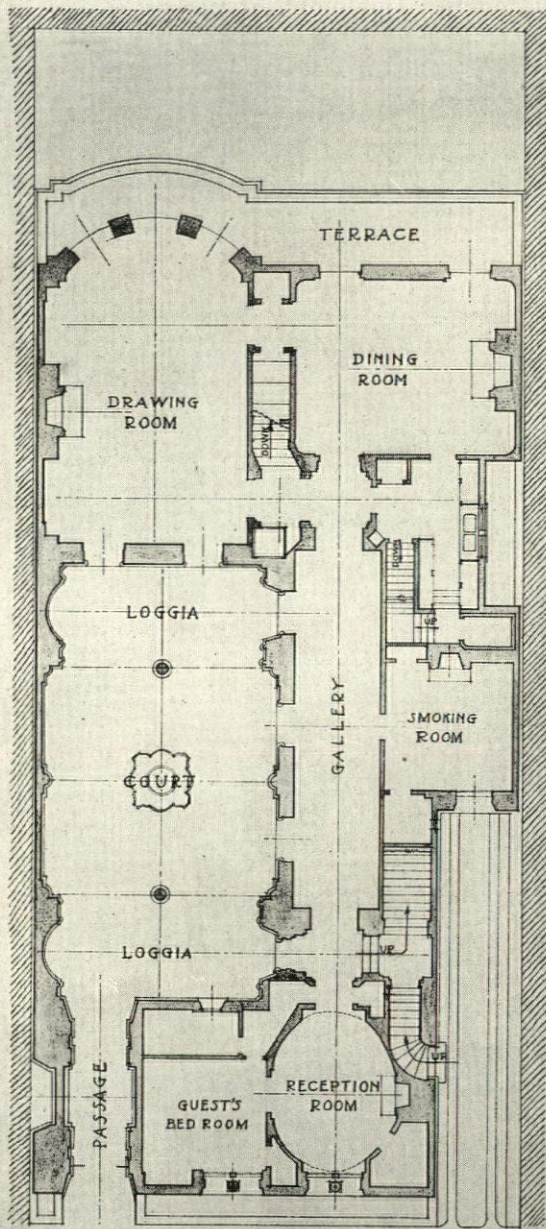
RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL.  
WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



ONE HALF ELEVATION OF COURT

SCALE  FEET.

DETAIL OF COURTYARD DESIGN, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



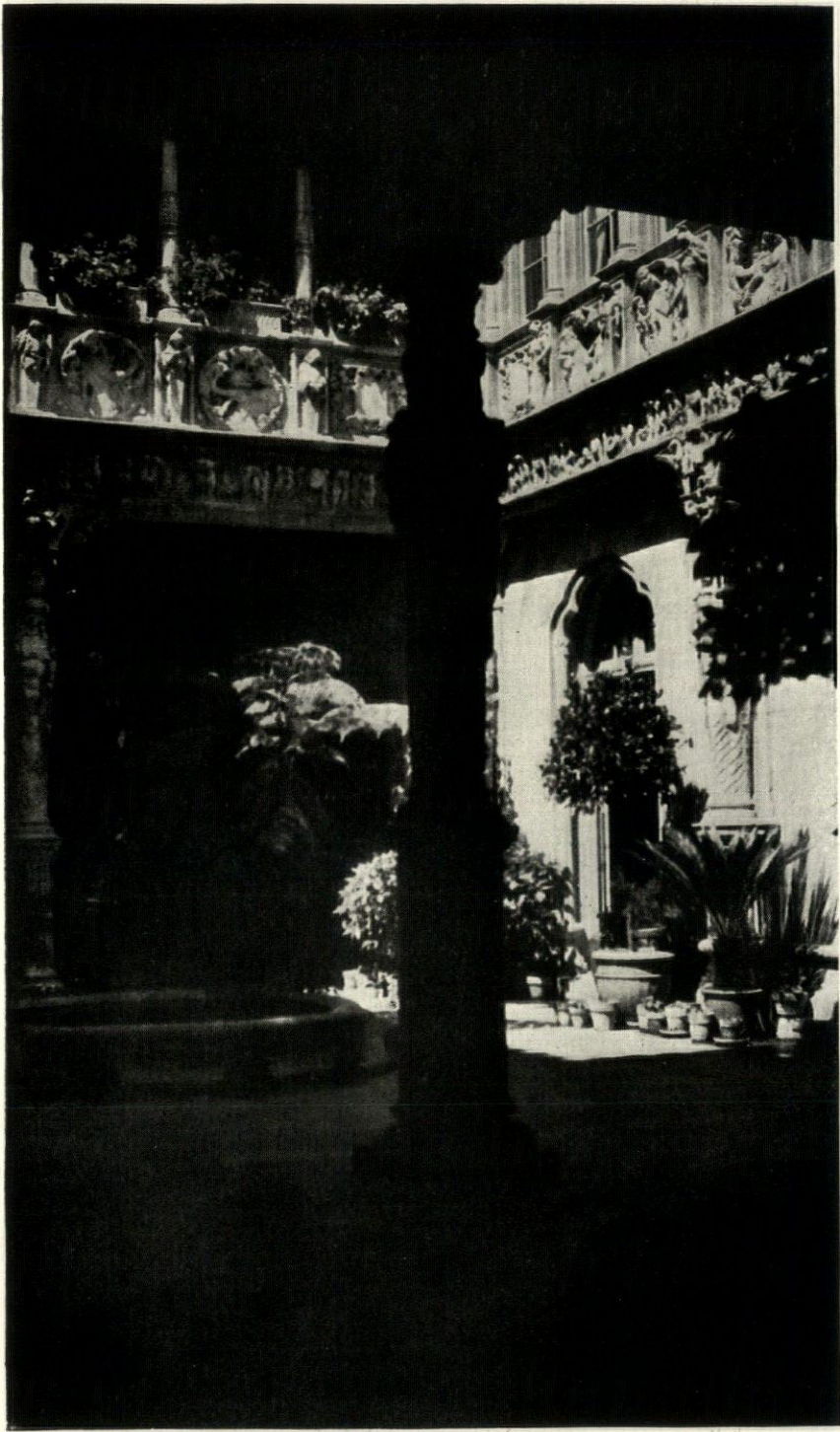
FIRST FLOOR PLAN

SCALE  1 FOOT.

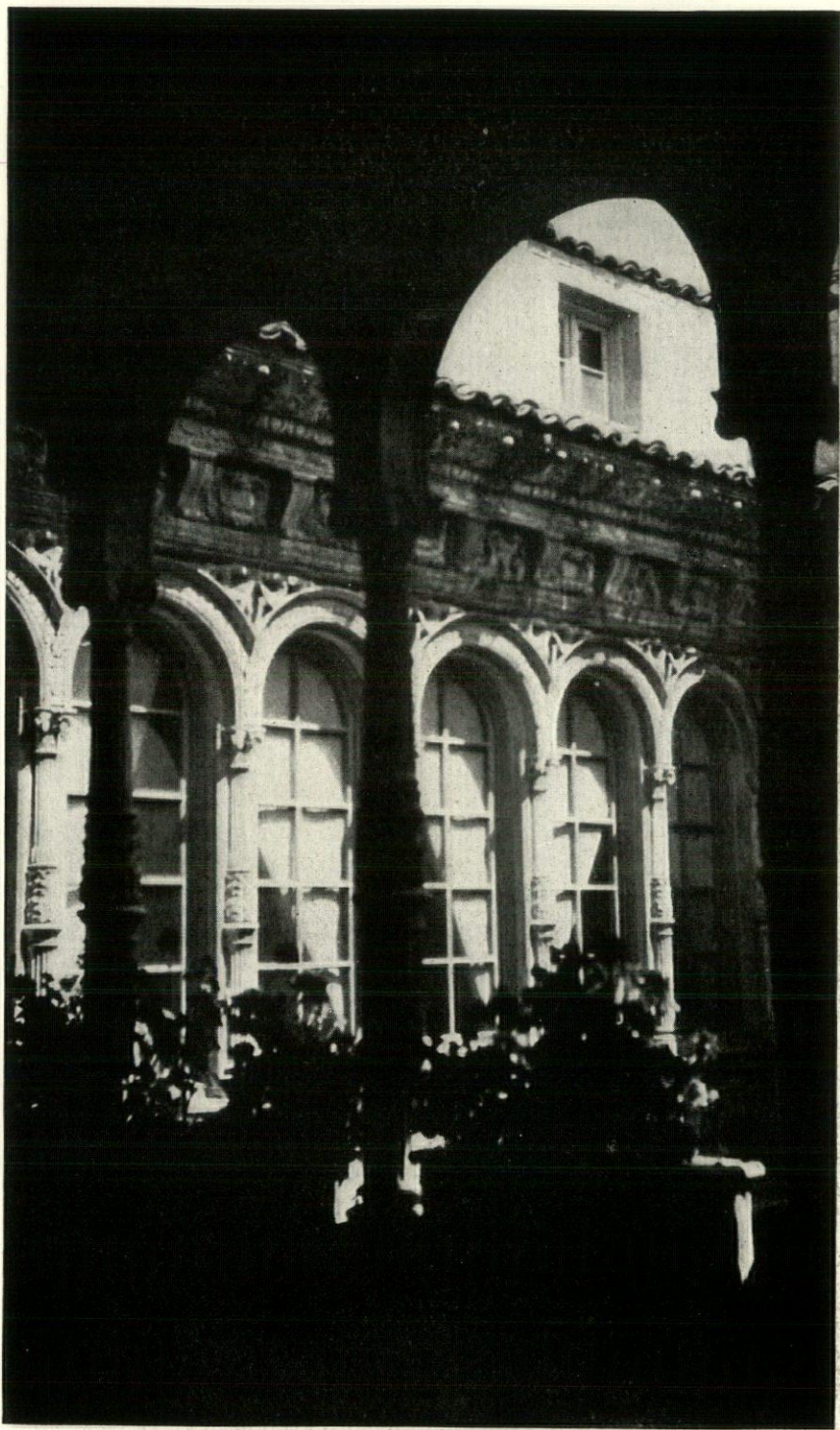
FIRST FLOOR PLAN, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



IRON GRILLE, RESIDENCE OF MRS. ANDREW  
WELCH, SAN FRANCISCO, CAL. WILLIS POLK &  
CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



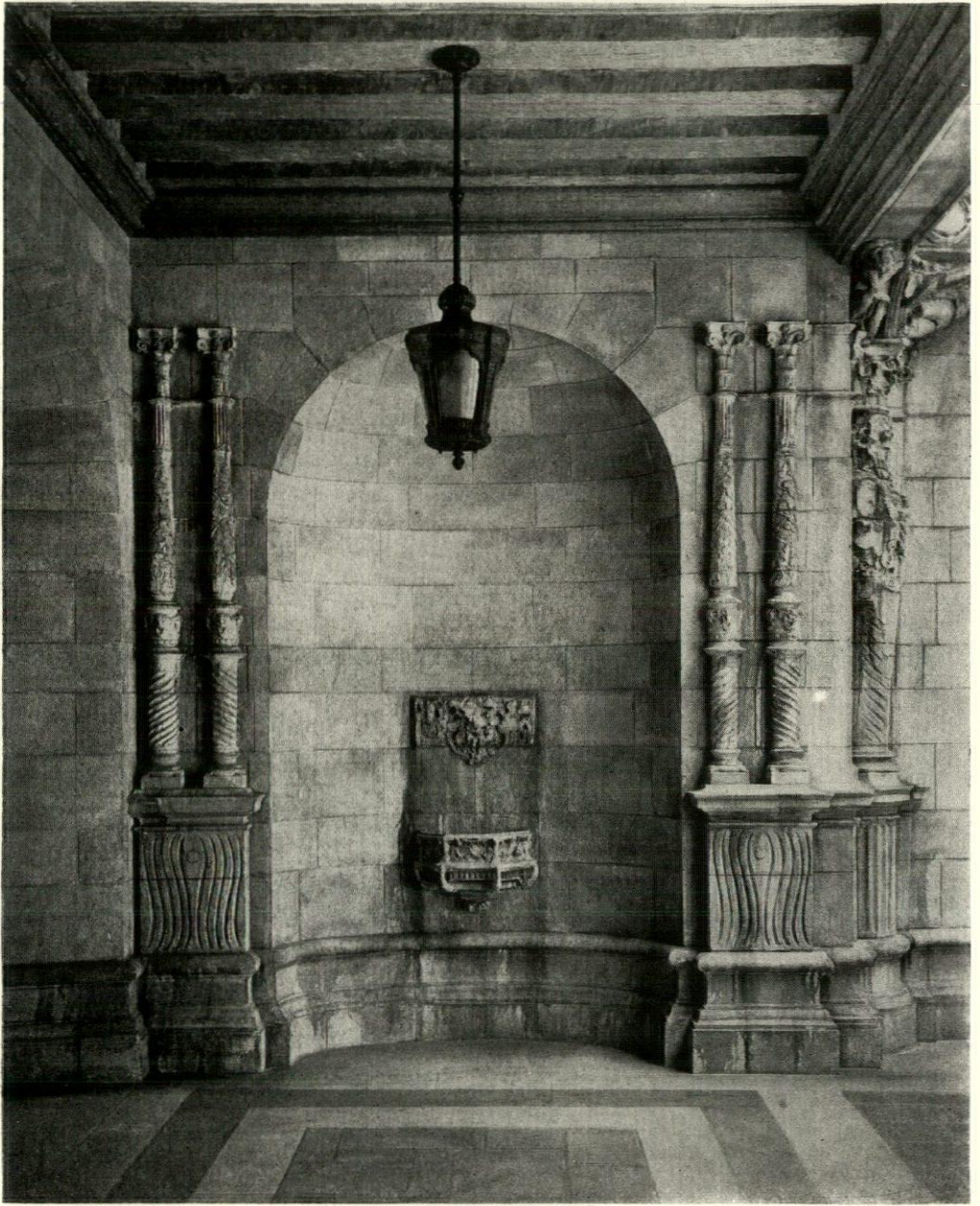
THE COURT, RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



THE WINDOWS OF THE SECOND FLOOR CORRIDOR,  
FROM THE LOGGIA, RESIDENCE OF MRS. ANDREW  
WELCH, SAN FRANCISCO, CAL. WILLIS POLK &  
CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



EXTERIOR DETAIL. RESIDENCE OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



FOUNTAIN OPPOSITE THE MAIN ENTRANCE, RESIDENCE  
OF MRS. ANDREW WELCH, SAN FRANCISCO, CAL. WILLIS  
POLK & CO., ARCHITECTS. LEO LENTELLI, SCULPTOR.



specific details of the position to be filled, together with the maximum and minimum salary he is willing to pay. These details are regarded as confidential by the Government and are withheld from the applicant.

Once introduced to each other the employer and applicant are left to work out details. Often a number of applicants with equally good qualifications are referred to the same employer in order that he may decide for himself on a basis of their personalities.

### A Projected War Memorial.

In a recent meeting of the New York Chapter of the American Institute of Architects the following resolution was passed with reference to a suggested memorial to commemorate the valor of American soldiers and sailors in the world war:

"WHEREAS, The Fine Arts Federation is about to appoint a committee to consider the form to be taken by a permanent memorial to commemorate the valor of the American soldiers and sailors in the world war; and

"WHEREAS, The realization of such a memorial, of whatever nature, is of vital importance to the community in that it should be a true expression of the sentiment of the citizens of New York as to form a memorial deemed most appropriate:

"BE IT RESOLVED, That the New York Chapter of the American Institute of Architects present to the Fine Arts Federation, for its earnest consideration, the following program and plan of procedure:

"That a committee be appointed to institute a preliminary competition of ideas or suggestions, to be open to all citizens residing or maintaining an established place of business in Greater New York.

"That their ideas or suggestions be presented in one of the following mediums:

"A—In letter form.

"B—In sketch form—a perspective and plan.

"C—In plastic form—a model and plan.

"A location or plot plan to be submitted if the idea be in the form of a structure.

"As an essential part of this preliminary competition a first prize, with possibly secondary prizes, should be awarded.

"That the judgment of this competition of ideas be rendered, after public exhibi-

tion, by a jury composed of representative citizens. It is suggested that the jury of award be composed of fifteen members, three members appointed by each of such organizations as the New York Chamber of Commerce, the Merchants' Association, the Fine Arts Federation, the Society of Arts and Letters, etc.

"That the idea awarded the first prize in this preliminary competition be made the subject of a final competition.

"That the winner of this final competition be awarded the commission to execute the memorial.

"In conclusion the New York Chapter feels that in this manner can best be obtained the opinion and the sentiment of the citizens of New York as to the form of the memorial."

### A Dearth of Architects.

There are sound reasons for the fact that the architect as a rule chooses the large city for his headquarters. The big undertakings come to the big cities, but it seems as though

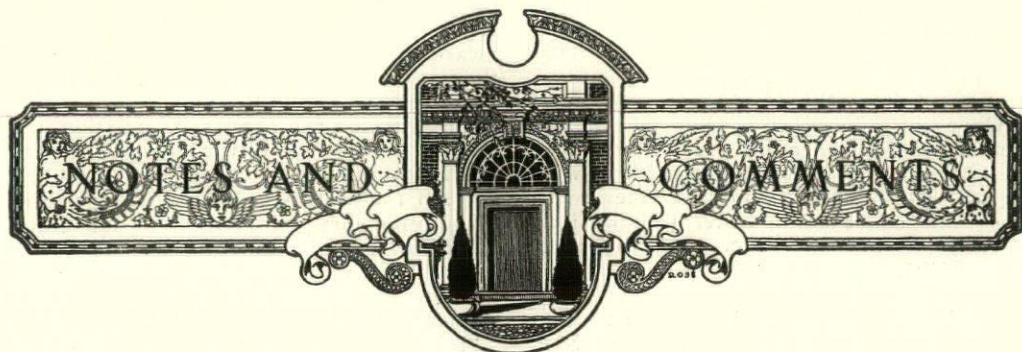
the natural tendency of the profession to gravitate toward such centers sometimes works an injustice upon the smaller towns. Mr. O. R. Hardwell, secretary of the Chamber of Commerce of Freeport, Ill., expresses himself upon the point as follows:

"Have you ever preached to your readers, particularly of the younger generation, about the opportunity for the live and ambitious architect in the American Middle-West?

"I think it was Horace Greeley who said, 'Young man, go West.' Greeley was right. Architects are rare birds in these parts. Take Freeport as an example. Here we are, right in the heart of the richest farming country in America, tapped by nine railway lines, three hours' ride from Chicago, and not a single architect in our city of 22,000 population. Can you beat it?

"This peculiar situation is common to many towns of our size in the Mississippi Valley. Moreover, it strikes home with a cold thud, when we begin guessing about our prospective work in this period of rebuilding and reconstruction—who is going to make our plans?

"Your publication can do some good missionary work and your readers can profit by the suggestion."



### **A Government Employment Bureau.**

Engineers, executives, men of college training and practical experience in business and technical fields are now being released from the army, navy and war work. The Profes-

sional and Special Section of the U. S. Employment Service, a branch of the Department of Labor, has been organized for the benefit of employers in need of these men. The service is entirely free of charge.

The organization already has thousands of well educated, experienced men on its lists and is daily placing many of them in touch with employers. Mr. I. W. Litchfield, the head of the Professional and Special Section, was one of the organizers and directors of the U. S. Public Service Reserve, which supplied high-grade engineers and business men to the Government for war work.

The U. S. Employment Service is now divided into two great zones for the purposes of the Professional and Special Section. The New York office, headquarters for the eastern zone, at 16 East 42d street, is in charge of the following states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Ohio, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida and Alabama.

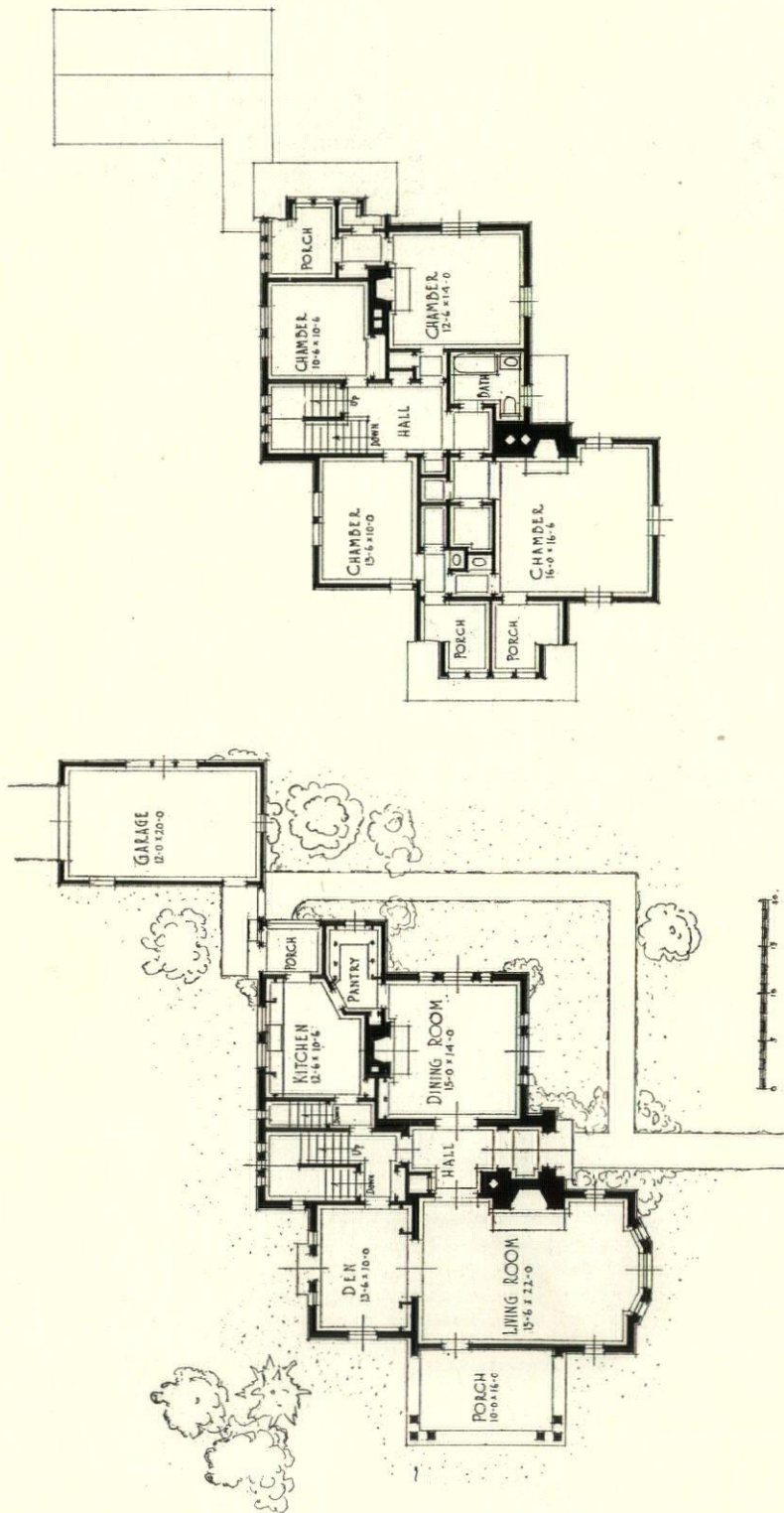
The Chicago office, headquarters for the central zone, at 63 East Adams street, is in charge of all remaining states. Later zone offices will be established to take charge of part of the territory now in the Chicago zone. The U. S. Employment Service is now represented in each of the forty-eight states by a head office under the immediate jurisdiction of the Federal Director for that state.

The zone offices at New York and Chicago have become clearing houses for their respective parts of the nation, where returning men are classified in accordance with their qualifications, and where the requisitions of employers are matched against them. So complete is the system of classification and so diverse the qualifications of the thousands of applicants that the most exacting requirements of an employer, as stated in his requisition, can be met in each detail. When the qualifications of a man and the specifications for a position are accurately matched the man and employer are immediately placed in touch with each other by the Professional and Special Section.

The United Engineering Societies, composed of the four great engineering organizations—the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers and the American Institute of Mining Engineers—are now co-operating with the Professional and Special Section in placing men in the engineering professions. The high standards maintained both by the Government organization and by the societies has proved to be of the utmost benefit to employers, as well as to experienced engineers seeking employment.

The interests of women fit for high-grade business, technical and professional positions are cared for by another branch, which is administered by experienced professional women. In order to register in the women's branch an applicant must be either a college graduate or experienced in some particular line of executive or administrative work.

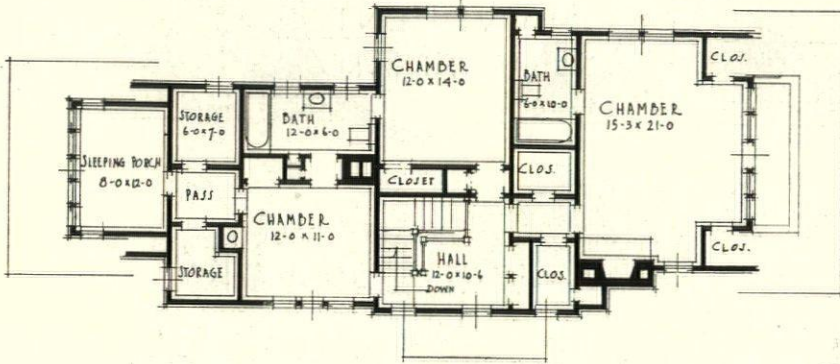
The employer should at once get in touch with the office of the Federal Director in his state or write direct to either the New York or Chicago zone offices. It is important that the employer give complete and



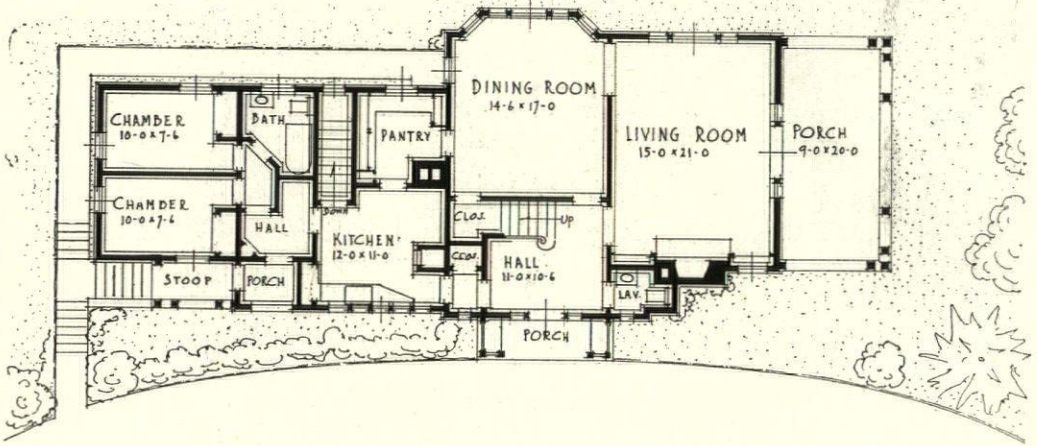
FIRST AND SECOND FLOOR PLANS—RESIDENCE  
 OF D. W. GREEN, ESQ., PORTLAND, OREGON.  
 LAWRENCE & HOLFORD, ARCHITECTS.



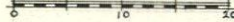
RESIDENCE OF D. W. GREEN, ESQ., PORTLAND,  
OREGON. LAWRENCE & HOLFORD, ARCHITECTS.



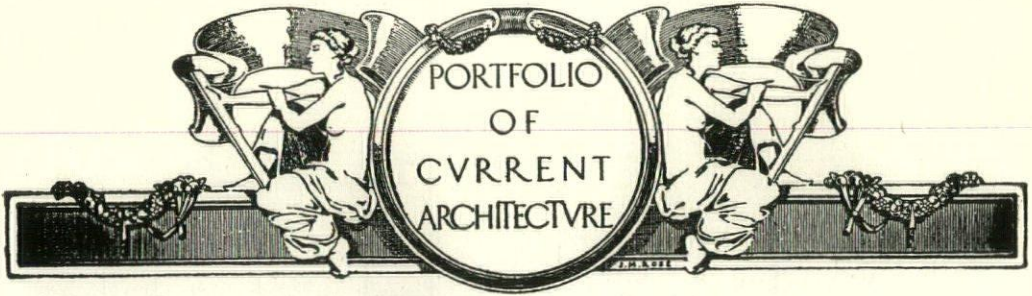
SECOND FLOOR PLAN



FIRST FLOOR PLAN



FIRST AND SECOND FLOOR PLANS—RESIDENCE OF CHARLES THORNTON LADD, ESQ., RIVERA, OREGON. LAWRENCE & HOLFORD, ARCHITECTS.



PORTFOLIO  
OF  
CURRENT  
ARCHITECTURE



RESIDENCE OF CHARLES THORNTON LADD, ESQ.,  
RIVERA, OREGON. LAWRENCE & HOLFORD, ARCHITECTS.

roof and cinder floor, totaling 379,000 square feet. Necessary administration building, heating plant, repair shops, etc., are included. There are 3,586 lineal feet of berthing space for ships, necessary supporting railroad connections with the Atlantic Coast Line, Southern Railroad and the Seaboard Air Line.

#### NORFOLK, VIRGINIA, QUARTERMASTER TERMINAL.

Col. M. A. Butler, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

A. O. Leach, Supervising Engineer.

Porter Bros., Contractors.

This project is located at Bush Bluff, about 4 miles from Norfolk, Va., and consists of eight one-story warehouses with tile walls; concrete floors, and mill construction roofs with a total of 2,016,000 square feet, and 2 piers with pier sheds of steel and guncrete construction totaling 620,800 square feet. Necessary administration building, heating plant, repair shops, etc., are included. There are 5,400 lineal feet of berthing space for ships, and necessary supporting railroad yards. Railway connections are via Virginia Railway over which the belt line has operating rights. There is also connection by car floats with the C. & O., and the F. & N. Railways.

#### NEW ORLEANS ARMY SUPPLY BASE.

Major A. P. Hoover, Supervising Constructing Quartermaster.

Major C. H. Fisk, Supervising Constructing Quartermaster.

George A. Fuller Co., Contractors, New York.

Ford, Bacon and Davis, Engineers, New Orleans, La.

The New Orleans Army Supply Base is located on the Mississippi river in the city of New Orleans and consists of three 6 story reinforced concrete warehouses of about 500,000 square feet each. Two thousand feet of dock with two story dock shed, and containing approximately 346,000 square feet. On account of soil conditions the three warehouses are set back from the river and connect with the dock by means of bridges that connect the third and fourth floors of the warehouses with the second floor level of the dock shed.

The warehouses are of flat slab design and carry floor loads of 400 pounds first floor, 350 pounds second floor, and 250 pounds above. The dock shed is of structural steel above pile and timber substructure, covered with corrugated iron and designed for a deck load of 400 pounds per square foot, and for 250 pounds on the second floor. Foundations for the warehouses are of untreated piles and for the dock and dock shed the pile and timber substructure are creosoted.

Ample elevator service is provided for the warehouse and dock shed and intercommunication between the various units is by means of electric tractors with trailers. The warehouses and dock shed are equipped with sprinkler system, electric wiring for light and power and battery charging facilities for the tractors.

Necessary supporting railroad yards are provided and all equipment necessary to meet the requirements of the Army.

cluded. There are 7,400 lineal feet of berthing space for ships and necessary supporting railroad yards, with connections over the Pennsylvania Railroad.

The construction of this terminal is entirely unique compared with all of the other terminals, as it has its storage facilities provided for upon the piers. In other words the two pier sheds are really storage buildings with complete loading and unloading facilities arranged to operate directly with the ships as well as the railroads. The railroad yards are located at the left of the building in the plan and open spaces are provided between each pair of tracks for the use of storage and accessibility of trucks and wagons. The doing away with the "spotting" of cars is well provided for in this freight yard.

The buildings are particularly interesting as their roofs have been utilized for the handling of freight. By reference to the sectional drawing, it will be seen that the second and third stories of these buildings have been set back on one side so as to make shelves at these levels to serve as platforms in handling of goods directly into the story where they are to go or from these platforms into the ships.

On the top of each building it will be seen that there are hoists and cranes which operate in connection with those on the ships to load goods from any level of the sheds directly into the ships or vice versa. The building hoists are movable so that they may be adapted to the location of the hatches in the ships as they come along the dock. The floor loads of the dock level are 500 pounds per square foot and those of the second and third floors 300 pounds per square foot.

#### PORT NEWARK QUARTERMASTER TERMINAL.

Newark, N. J.

Col. F. E. Lamphere, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

Clarence Healy, Consulting Engineer.

Mason & Hanger, and McArthur Bros., Contractors.

Port Newark Terminal consists of 9

warehouses, containing about 1,652,000 square feet and 2 open sheds of about 368,000 square feet area, built at right angles to a dock about 3,800 feet in length. The location of this work is on a piece of hydraulic fill made on the Jersey meadows, three miles from the city of Newark. The warehouses are entirely upon pile foundations, 60,000 piles being used in this work and in the dock. The warehouses are all one-story with plank floors, six-inch terra cotta walls and mill construction roofs, except one which has brick walls. This one was carried to two stories over a part of its length to afford space for office use. Barracks were provided for approximately 1,800 men, together with mess halls, officers' quarters, fire station, garage and other necessary supplementary buildings. Although the work was done in the face of weather conditions of unprecedented severity in the latter part of 1917 and the early part of 1918, most of the project was completed within three months. To complete the work on schedule in the face of these difficulties, over 10,000 men were at one time employed. Sixty-seven pile drivers were simultaneously used and other equipment in proportion. Some of the principal items involved were:

- Lumber, 28,000,000 board feet.
- Brick, 3,500,000 bricks.
- Terra Cotta, 400,000 square feet.
- Dredging, 800,000 cubic yards.
- Railroad track, approximately 12 miles.

#### CHARLESTON QUARTERMASTER TERMINAL.

Charleston, S. C.

Col. F. E. Lamphere, Constructing Quartermaster.

W. E. Gove, Prin. Ass't Engineer.

Mason & Hanger Contracting Company, Contractors.

This project is located on Cooper River about eight miles west of Charleston, S. C., and consists of six warehouses with tile walls, concrete floors, and mill construction roofs, totaling 1,152,000 square feet with connecting dock shed with tile walls, mill construction floor and roof, containing 269,000 square feet. Two open sheds with mill construction



Fay, Spofford & Thordike, Consulting Engineers.

W. F. Kearns Company, Contractors, Boston.

The Boston Terminal is laid out on an entirely different principle from the Brooklyn Base, on account of the different shape of the site and the entirely different conditions which prevailed there.

The pier shed is placed parallel with the main storage building, the navy pier sheds at the end of the property on the right and the administration building at the left of the main storage building. This project was built to include provisions for the Navy as well as the Army. There is a huge dry dock which is being constructed and is located, in the perspective, just over the top of the main storage building. The trackage and switch yards are at the left of the building. The entire project of the Army Base will cost approximately \$28,000,000 and covers thirty-seven acres of land and twenty acres of water.

The main building is an eight-story reinforced concrete warehouse of beamless ceiling or flat slab construction with the first floor designed for five hundred pounds per square foot and the upper floors for three hundred pounds per square foot, covering a ground area 126 x 1,638 feet. The exterior is finished concrete. The first concrete was poured May 14th, 1918, and the last October 3rd, 1918. The brick masons followed the concrete workers (and each succeeding trade followed the preceding one) so closely that upon pouring the last concrete the building was virtually finished. There are 4,000 lineal feet of wharfage and 1,970,000 square feet of storage space in the eight-story building and the adjacent pier sheds. A railroad supporting yard has been built providing  $11\frac{1}{4}$  miles of single track with capacity for 722 cars, and a terminal yard of  $6\frac{1}{2}$  miles of track giving a total permanent track mileage of approximately 18 miles. In addition to temporary and other small supplemental buildings, the project includes:

Main building, 126 x 1,638 feet, 8 stories.

Power house and coal crusher, 80 x 85 x 78 feet high.

Main building wharf shed, 2 stories, 100 x 1,638 feet.

Navy pier sheds, 2 three-story buildings, each 100 x 924 feet.

1 story and basement electric sub-station, 86 x 52 feet.

3 stories and basement administration building, 122 x 88 feet, designed for three additional stories.

West open wharf, 120 x 1,100 feet.

East open wharf, 72 x 580 feet.

Incomplete figures indicate that not less than the following principal items were used in the construction of the project:

Dredging, 2,500,000 cubic yards.

Reinforcing steel, 13,000 tons.

Structural steel erected, 4,300 tons.

Bricks, 5,550,000.

Sewer and water pipe laid, 7 miles.

Wood piles, 30,000.

Raymond concrete piles, 6,650.

Freight cars received and unloaded, 7,200 cars of materials.

Concrete, 240,000 cubic yards.

Square feet of forms built and erected, 5,750,000.

Temporary and permanent track, 30 miles.

Square feet of windows set and glazed, 265,000.

#### PHILADELPHIA QUARTERMASTER TERMINAL.

Philadelphia, Pa.

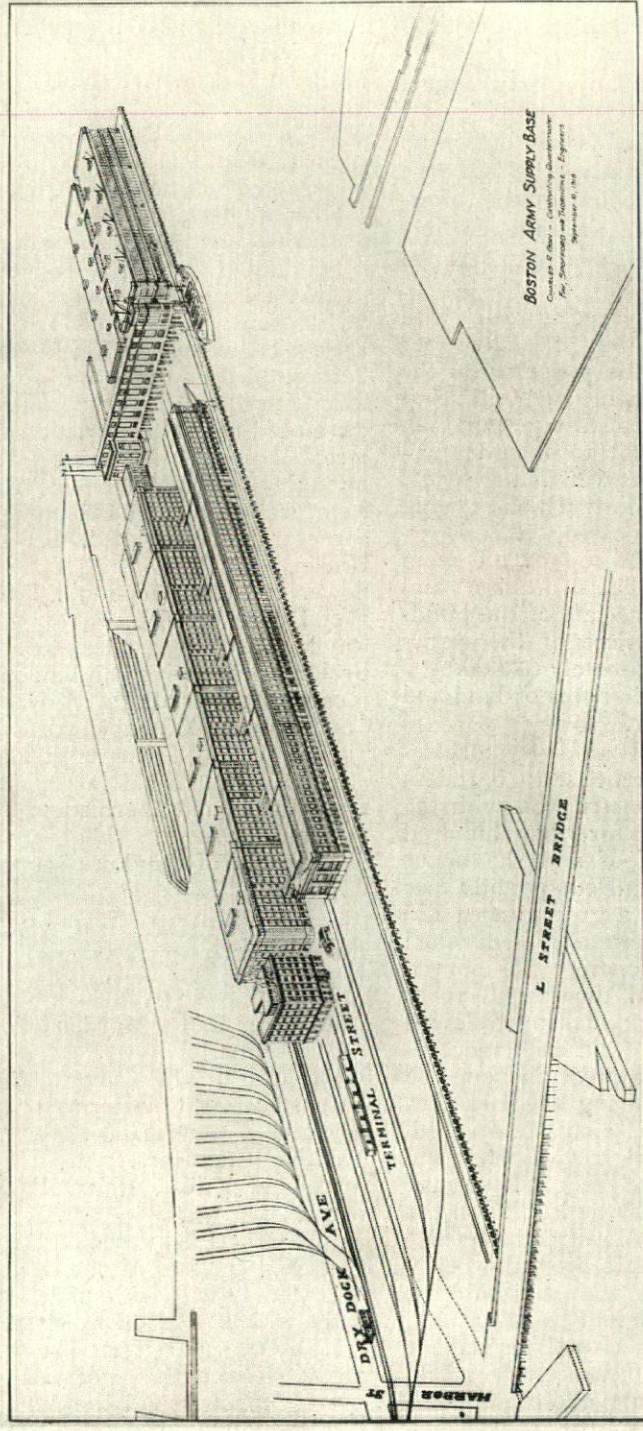
Lieut. Col. E. B. Morden, Constructing Quartermaster.

Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.

Day and Zimmerman, Phila., Pa., Consulting Engineers.

Snare and Triest, Phila., Pa., Contractors.

This project is located on the Delaware River and consists of one open pier, and two piers each with three-story pier sheds, with a total enclosed storage area of 1,707,000 square feet. The foundations consist of concrete pedestals supported on wooden piles and the superstructure is of reinforced concrete, flat slab design. Necessary administration area, heating plant, repair shop, etc., are in-

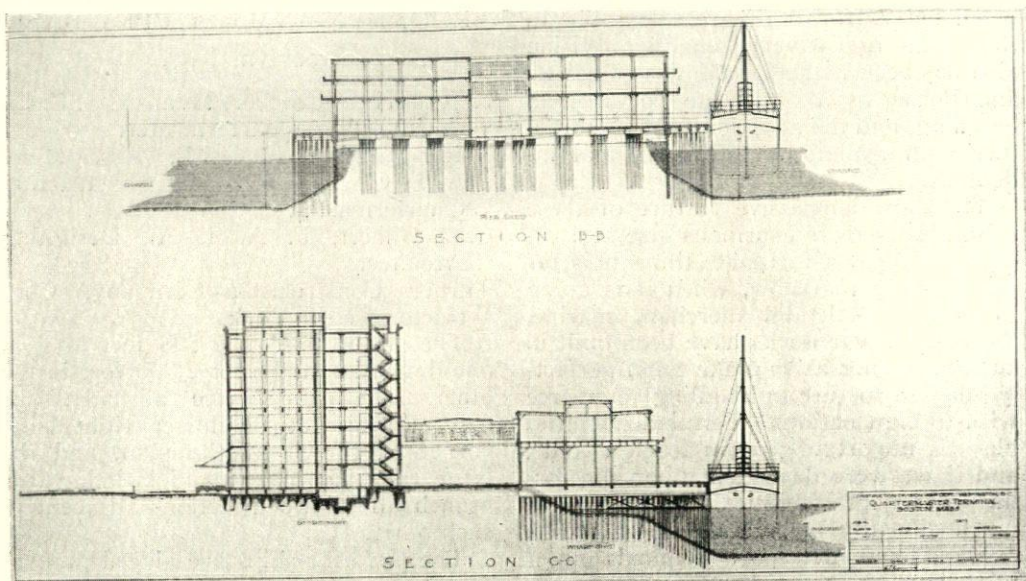


**BOSTON ARMY SUPPLY BASE**  
 Charles O. Rice - Consulting Quartermaster  
 For, Spofford and Thorndike - Engineers  
 September 6, 1914

NAVY STOREHOUSE

ARMY STORAGE AND LOADING

BOSTON ARMY SUPPLY BASE, BOSTON, MASS.  
 Maj. C. R. Gow, Mem. A.S.C.E., Constructing Quartermaster.  
 Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.  
 Fay, Spofford & Thorndike, Consulting Engineers.  
 W. F. Kearns Company, Boston, Mass., Contractors.



BOSTON ARMY SUPPLY BASE, BOSTON, MASS.

Maj. C. R. Gow, Mem. A.S.C.E.,  
Constructing Quartermaster.  
Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E.,  
Supervising Constructing Quartermaster.

Fay, Spofford & Thorndike,  
Consulting Engineers.  
W. F. Kearns Company, Boston, Mass.,  
Contractors.

ing the two stories of each of 1,110,000 square feet. These piers are 150 feet wide by 1,270 feet long. The open one-story pier marked No. 1, is 150 x 1,270 feet long.

The slips between piers are 250 feet wide and the depth of water in them at low tide is 35 feet, with the exception of the slip between piers 3 and 4, where the depth is 38 feet at low tide. Both sides of piers are equipped with cargo hoists to facilitate loading and unloading. The total berthing space of the pier is 9,000 lineal feet, which allows fifteen ships to berth simultaneously. In addition to the main warehouses and piers, there is an administration building, 206 x 70 feet, three stories, of reinforced concrete, and a boiler house, 92 x 137 feet, containing a battery of six 200 H. P. boilers equipped with automatic stokers, for heating and furnishing power for the entire project. A repair shop with adequate facilities to make all necessary repairs on ships berthing at this port is included in the plan. About 22½ miles of railroad track serve this terminal and the yards have a capacity of approximately 1,100 cars.

It will be noted in the two interior photographic views of the incomplete building that there is a large court inside of building "B", through which two railroad tracks are to pass. At the top of this court under the skylight there are to be located various traveling cranes to raise freight from the platforms below to the projecting balconies—which look like huge opera boxes—on each side of the court. From these balconies freight will be moved directly into the floor of the building where it is to be stored. This operation is also, of course, to be reversed when goods are going out of the building.

In addition to this means of handling goods vertically, there will also be seventy-eight elevators in the warehouses and eighteen on the piers.

BOSTON ARMY SUPPLY BASE.  
Boston, Mass.

Major C. R. Gow, Mem. A. S. C. E.,  
Constructing Quartermaster.

Major Clinton H. Fisk, Ass. Mem., A. S. C. E.; Supervising Constructing Quartermaster.

vided by platforms of great length. In this connection a very general provision also has been made for the use of cranes and hoists as a substitute for manual handling, and the adoption of motor tractors with trailers for platform and indoor use.

The most impressive feature of these terminals is their enormous size and capacity. What a fortunate thing it is for this country that now, when it is going to have a splendid merchant marine, these great war docks have been built in such a manner as to make them perfectly adapted for use in handling commerce with foreign nations. Terminal facilities play an important part in foreign trade, and if we were dependent upon the former inadequate facilities, there would be much difficulty in building up a foreign trade. These new port terminals ought to reduce the cost of handling, save considerable time in shipment and afford a very low insurance rate on any goods stored at these points. All of these economies will be material aids in reducing our selling prices to foreign customers.

The capacity of these great projects is so vast that it seems on inspecting them that there should be room enough for handling all of the resources of this country that we would ever care to part with. Their huge extent makes it difficult to reduce any illustrations of them down to a reasonable size for printing.

There are seven of these great port terminals along the Eastern Coast. A few of them have not been completed but the work on these will be finished in a few months. The total storage space which then will be made available will equal 17,613,800 square feet, or 404 acres in all, divided as follows: at Brooklyn 5,042,000 square feet, Norfolk 2,636,000, Boston 1,970,000, New Orleans 2,138,800, Port Newark 2,020,000, Charleston 1,800,000, and at Philadelphia 1,707,000 square feet.

In addition to this vast storage space there will be berths for sixty-five great ocean liners which can be loaded or unloaded at one time.

A brief general description of these port terminals is as follows:

#### BROOKLYN ARMY SUPPLY BASE, Brooklyn, N. Y.

Lt. Col. H. S. Crocker, Mem. A. S. C. E.,  
Constructing Quartermaster.

Major Clinton H. Fisk, Ass. Mem.  
A. S. C. E., Supervising Constructing  
Quartermaster.

Cass Gilbert, F. A. I. A., Designing  
Architect.

Turner Construction Company, Con-  
tractors, New York.

The site utilized is 2,598 feet long in one dimension and over 2,000 feet in the other. The main service railroad tracks enter the site at the lower right hand corner as shown by the plan, and the large railroad storage and switch yards branch off in two directions adjacent to each other.

The piers for ships are placed perpendicular to the two warehouses, connect with them by means of bridges, and are provided with railroad facilities.

The complete Brooklyn Army Supply Base project represents an expenditure of approximately \$32,500,000. The purpose of this project was and is to provide storage, loading and unloading facilities for over-sea shipment for the American Expeditionary Forces and also to provide a permanent port terminal. Port terminals in war times must provide for handling supplies, and possess facilities for their immediate transfer from cars to ships and the reverse, also must receive supplies for storage pending shipments which may be delayed from various causes for an extensive period.

In the main, the construction consists of two warehouses, three two-story piers and one open pier. The warehouses are eight stories and basement high, of reinforced concrete in flat slab construction. In size the warehouses which are marked Buildings "A" and "B" on the plan are respectively 200 x 960 feet and 306 x 980 feet long, totaling 3,932,000 square feet of floor area. These buildings generally have spread footing foundations and are designed for a live load of 300 pounds on first, second and third floors and 250 pounds on all other floors.

The three covered piers marked Nos. 2, 3 and 4 have a total floor area includ-



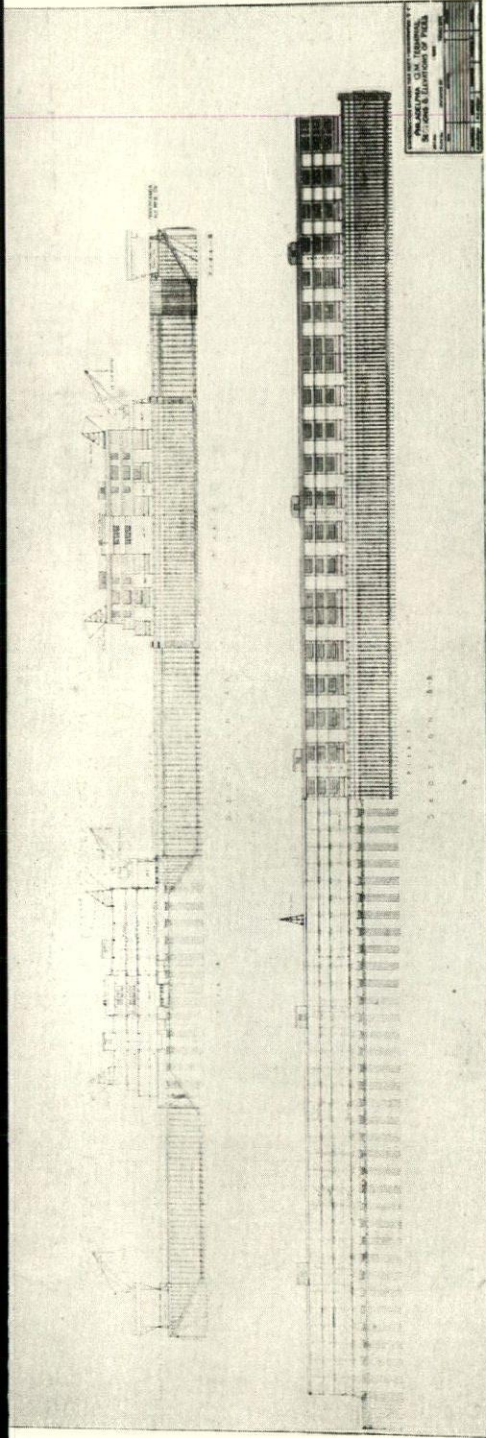
**NEW ORLEANS ARMY SUPPLY DEPOT, NEW ORLEANS, LA.**

Maj. A. P. Hoover, Constructing Quartermaster.

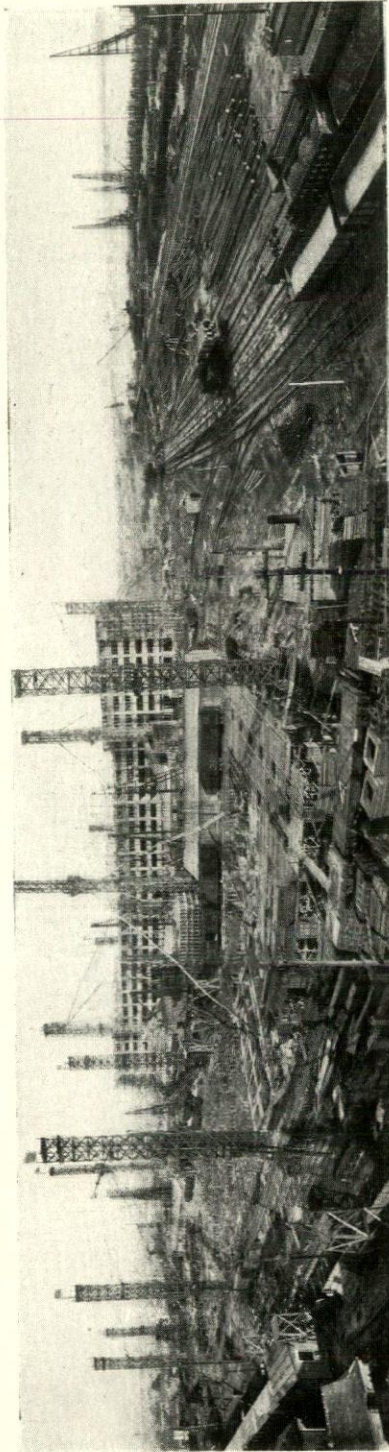
Maj. Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.

Ford, Bacon & Davis, Engineers.

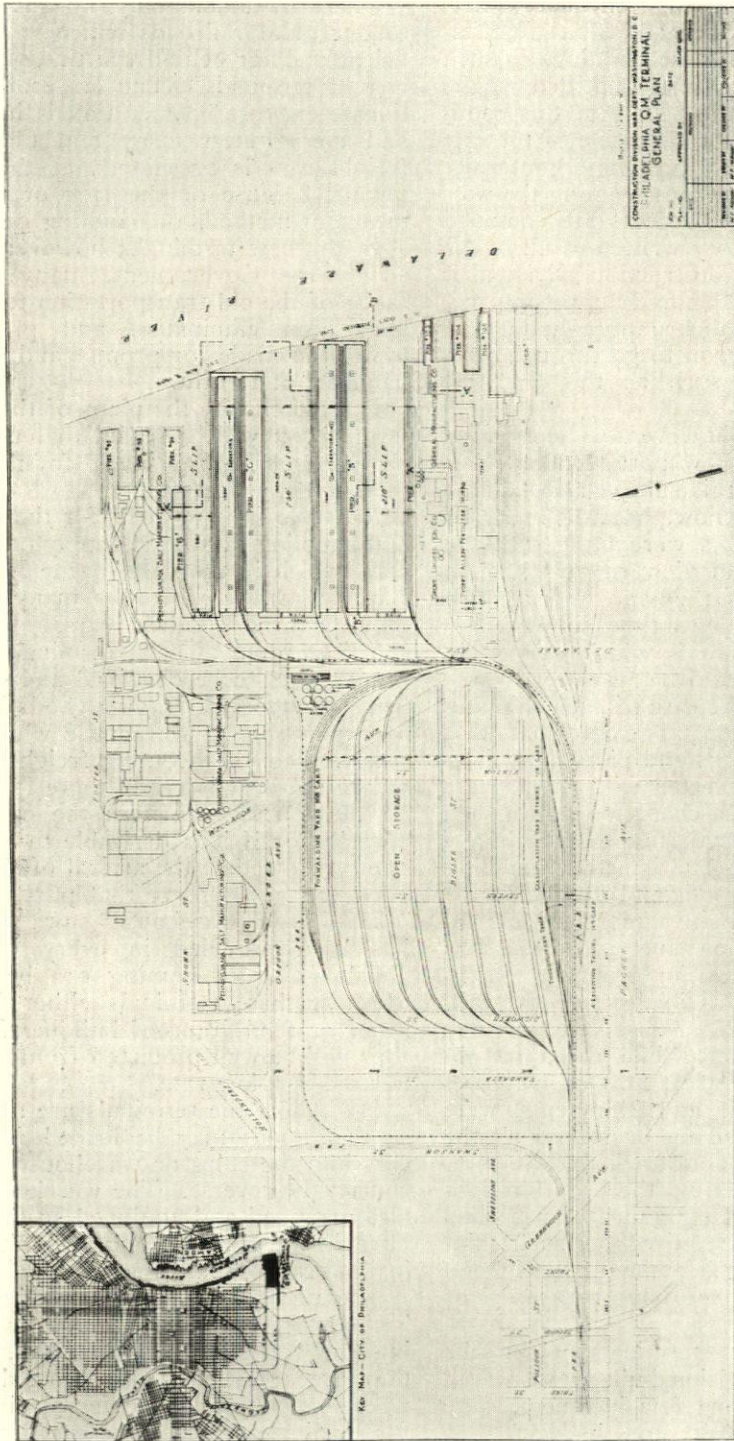
George A. Fuller Company, Contractors.



PHILADELPHIA QUARTERMASTER TERMINAL, PHILADELPHIA, PA.  
 Lieut. Col. E. B. Morden, Constructing Quartermaster.  
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.  
 Day & Zimmerman, Consulting Engineers, Philadelphia, Pa.  
 Share & Triest Co., Contractors, Philadelphia, Pa.



NEW ORLEANS ARMY SUPPLY DEPOT, NEW ORLEANS, LA.  
 Maj. A. P. Hoover, Constructing Quartermaster.  
 Clinton H. Fisk, Supervising Constructing Quartermaster.  
 Ford, Bacon & Davis, Engineers.  
 George A. Fuller Company, Contractors.



PHILADELPHIA QUARTERMASTER TERMINAL, PHILADELPHIA, PA.  
 Lieut. Col. E. B. Morden, Constructing Quartermaster.  
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.  
 Day & Zimmerman, Consulting Engineers, Philadelphia, Pa.  
 Snare & Triest Co., Contractors, Philadelphia, Pa.

struction Division, the contractors, material men, workmen and all the craftsmen who erected these buildings in such a short time, are justly entitled to the gratitude of all the people of this country, and to a wide recognition of the fact that they did make good and contribute their full share towards winning the war.

When all of the reports are compiled and the final history written of all of the projects of the Construction Division, it will make a valuable and interesting record to refer to if this country should ever again be called upon to go through with an undertaking such as this war required.

This article, however, is concerned chiefly with the new port terminals. It so happens that this subject also has the greatest interest now, because many of the large terminals were built with the double purpose in view of fulfilling an urgent need for the war and a most important use in peace times as well.

The port terminals which existed in this country before the war were hardly sufficient to take care of such shipping and transportation as existed at that time, and the docks and piers as well as the railroads connected with them, were as a rule of such a character and in such condition, as to make impossible the efficient, prompt and satisfactory handling or shipment of goods and products—the docks were often in a more or less dilapidated condition and possessed few modern appliances for handling goods. As a result of this inadequacy the railroads became choked up at the port terminals, which acted like dams or obstructions in the great flow of materials to the seaboard, and shipments were sometimes blocked up or stalled all the way from New York back to Pittsburg. This condition tied up the use of freight cars and railroad equipment far beyond the time usually required for such shipments, and the coal famine of the following winter was one of the many serious results.

The new port terminals which the Construction Division built and are still completing in some few instances, were an absolute necessity for the war.

There is, undoubtedly, no one feature of our great railroads which is as inefficient and far behind the times as their freight terminals. The largest proportionate expense in operation is incurred, and the greatest delay and tie up of freight cars is occasioned at these terminals, because of the lack of efficient means or methods of handling goods.

In the new terminals, however, erected by the Government, many of the faults of the old transportation terminals have been eliminated, and provisions have been made for prompt and efficient handling of freight.

By reference to the plans of these port terminals it will be found that adequate provisions have been made for the three most essential features:

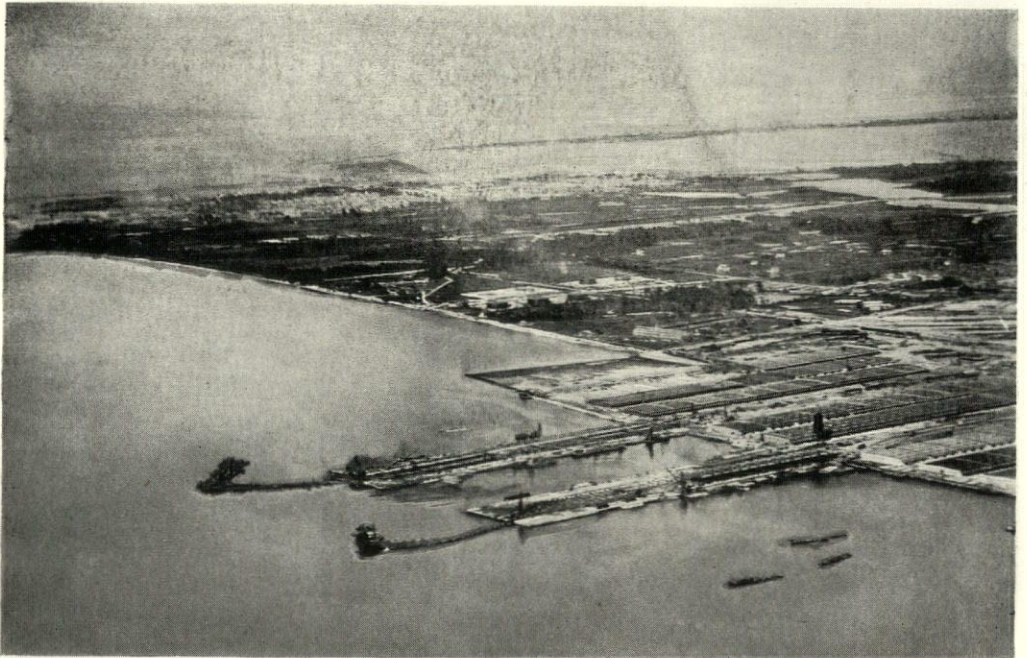
I. Ample freight yards for the storage and handling of a good supply of freight cars, which in the case of the Brooklyn Base has trackage for as many as one thousand one hundred cars. There is sufficient room at each terminal for incoming cars to be classified and conveniently grouped for loading goods into the particular ship or warehouse which is to receive them. If incoming freight arrives before the boat is ready there is a place on these tracks to store the cars temporarily, or if it is desirable to accumulate cars ahead of the arrival of ship cargoes, the tracks serve that purpose also.

II. Large warehouse storage space has been provided in every instance. Goods going or coming can be stored away at these terminals either in fire-proof or semi-fireproof buildings, where they will be well protected from fire and insured at a low rate.

III. All of the terminals are arranged so that goods may be loaded from the cars into the ships or warehouses, or, of course, the reverse. The warehouses are also arranged and equipped so that they have in all cases adequate facilities for loading cargoes into the ships.

The necessity for car "spotting" has been almost entirely eliminated by grouping car tracks largely in pairs, where they are accessible from two sides and where capacity in space for placing cars for loading or unloading has been pro-





TWO VIEWS OF THE NORFOLK VIRGINIA QUARTERMASTER TERMINAL,  
NORFOLK, VIRGINIA.

Col. M. A. Butler,  
Constructing Quartermaster.  
Lieut. Col. L. L. Calvert,  
Supervising Constructing Quartermaster.

A. O. Leach,  
Supervising Engineer.  
Porter Bros.,  
Contractors.

leaving one hundred and fifty thousand net, which, when his income tax and excess profit taxes of last year had been deducted, would leave him just about sixty thousand dollars to divide up among the several members of his firm or company for doing a ten million dollar job. Any criticism of such a showing can readily be met by realizing that a contractor could have taken his capital involved in such operations and invested it far more safely, and comfortably in securities or in Government bonds, with a much larger resulting profit.

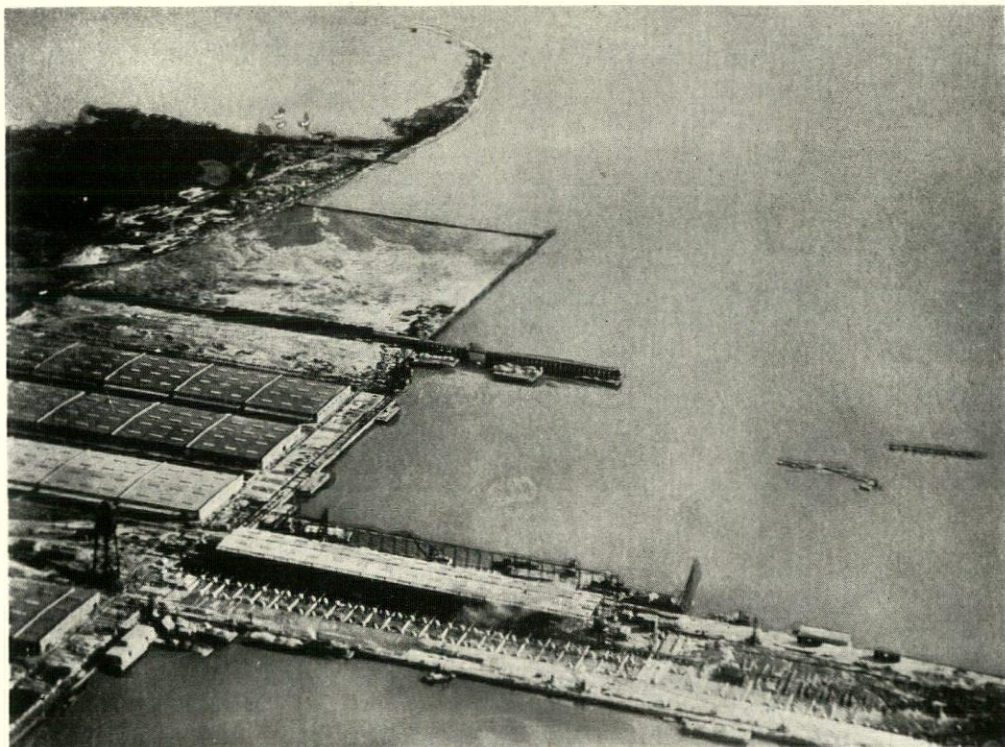
The criticism that workmen and mechanics loaf on any job where their boss is not responsible for its cost, can be refuted by the records, which show that such speed of construction has never been equaled in this country.

The many and diverse projects of the Construction Division are full of interest and all played an important part in the

outcome of the war. Now that it is over and the work done by the different departments of the Government is being examined and scrutinized for the real and authentic records of history, the value of the service performed in each case will undoubtedly be determined by whether or no it resulted in providing its product to the soldiers who went over to fight in the trenches. Were the things they needed produced, or was there a reasonable excuse for not completing some of the things which they did not get?

The boys may not have had their letters and packages delivered to them, nor adequate ammunition, guns or flying machines from this country; but they did have here their comfortable and sanitary living quarters, training camps, the warehouses for their food and supplies, and all the buildings necessary for them to accomplish what they did.

By reason of this fact alone the Con-



NORFOLK VIRGINIA QUARtermaster TERMINAL, NORFOLK, VIRGINIA.

Col. M. A. Butler,  
Constructing Quartermaster.  
Lieut. Col. L. L. Calvert,  
Supervising Constructing Quartermaster.

A. O. Leach,  
Supervising Engineer.  
Porter Bros.,  
Contractors.



NORFOLK VIRGINIA QUARtermaster TERMINAL, NORFOLK, VIRGINIA.

Col. M. A. Butler,  
Constructing Quartermaster.  
Lieut. Col. L. L. Calvert,  
Supervising Constructing Quartermaster.

A. O. Leach,  
Supervising Engineer.  
Porter Bros.,  
Contractors.

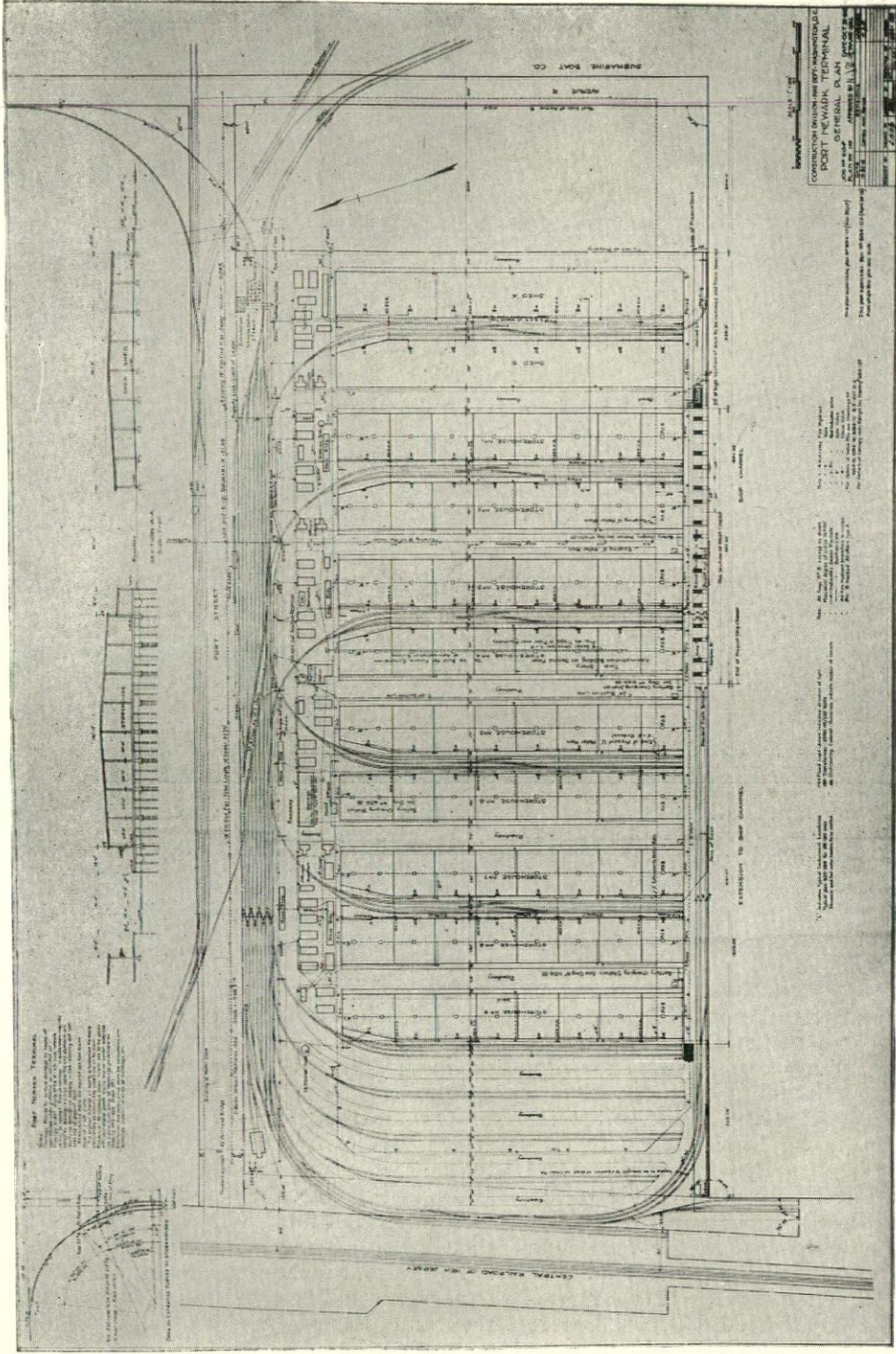
Government at a very low rate—or at least as a rule did so.

To give some idea of these building contracts and the amount of profits realized, the cantonment contracts may be cited. The Division realized in the first place that the building of these cantonments was a new proposition, often removed from direct connection with railroads, sources of materials and labor, and surrounded often by unfavorable conditions which would cause anyone to figure high who sought to secure the work by a fixed sum bid. The unsettled conditions of labor, the material market, transportation and the great speed demanded, were causes alone which would lead to the addition of large sums for contingency and risk in any contract they would be able

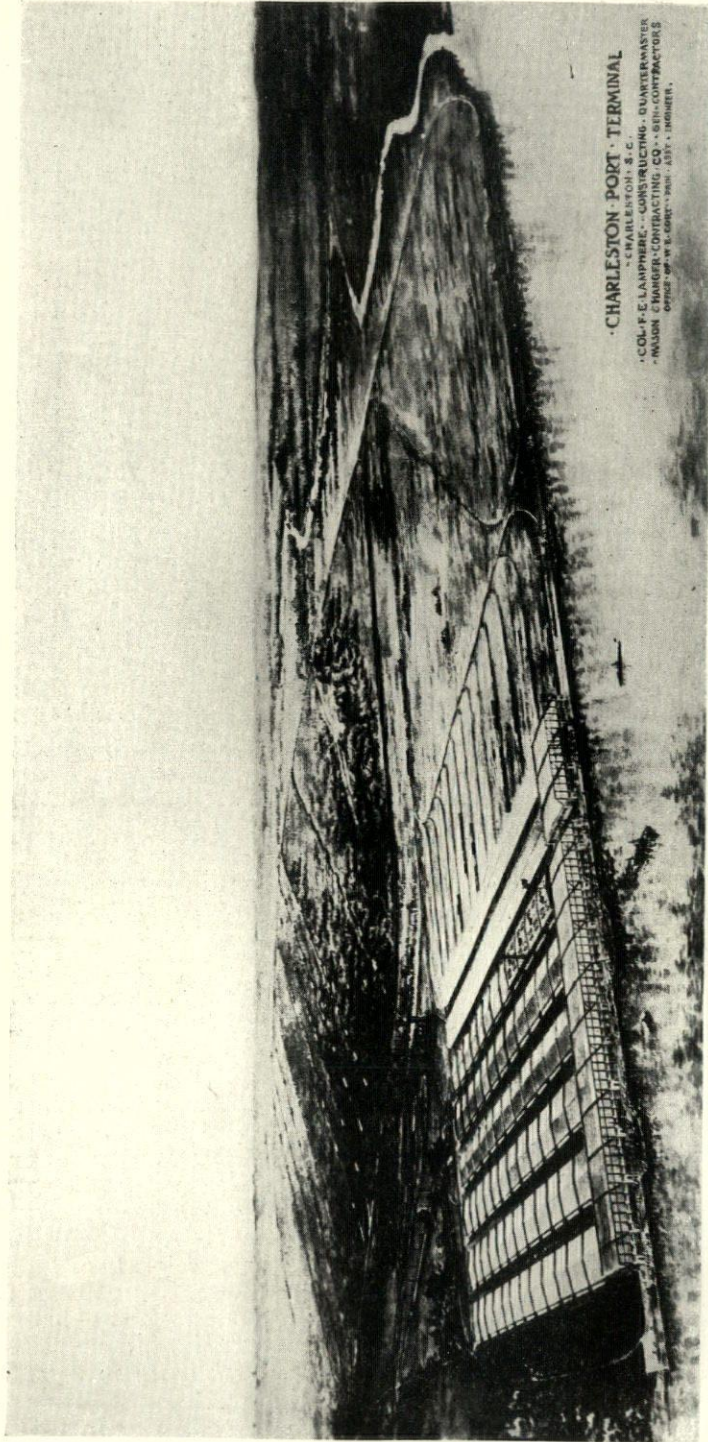
to let under the old system of competitive bids.

The Division therefore very wisely decided that it would be true economy for the Government to carry this risk, by paying to the contractor an agreed sum determined on a sliding scale for his profit plus the exact cost of the work, which was easily recorded and checked by the methods adopted.

As an example, the contract for a single cantonment may be taken. Assuming that this cost ten million dollars, the contractors profit including certain overhead expense, would be two hundred and fifty thousand dollars—just two and a half per cent. of the cost of the work. The overhead expense to the contractor would run about one hundred thousand dollars,

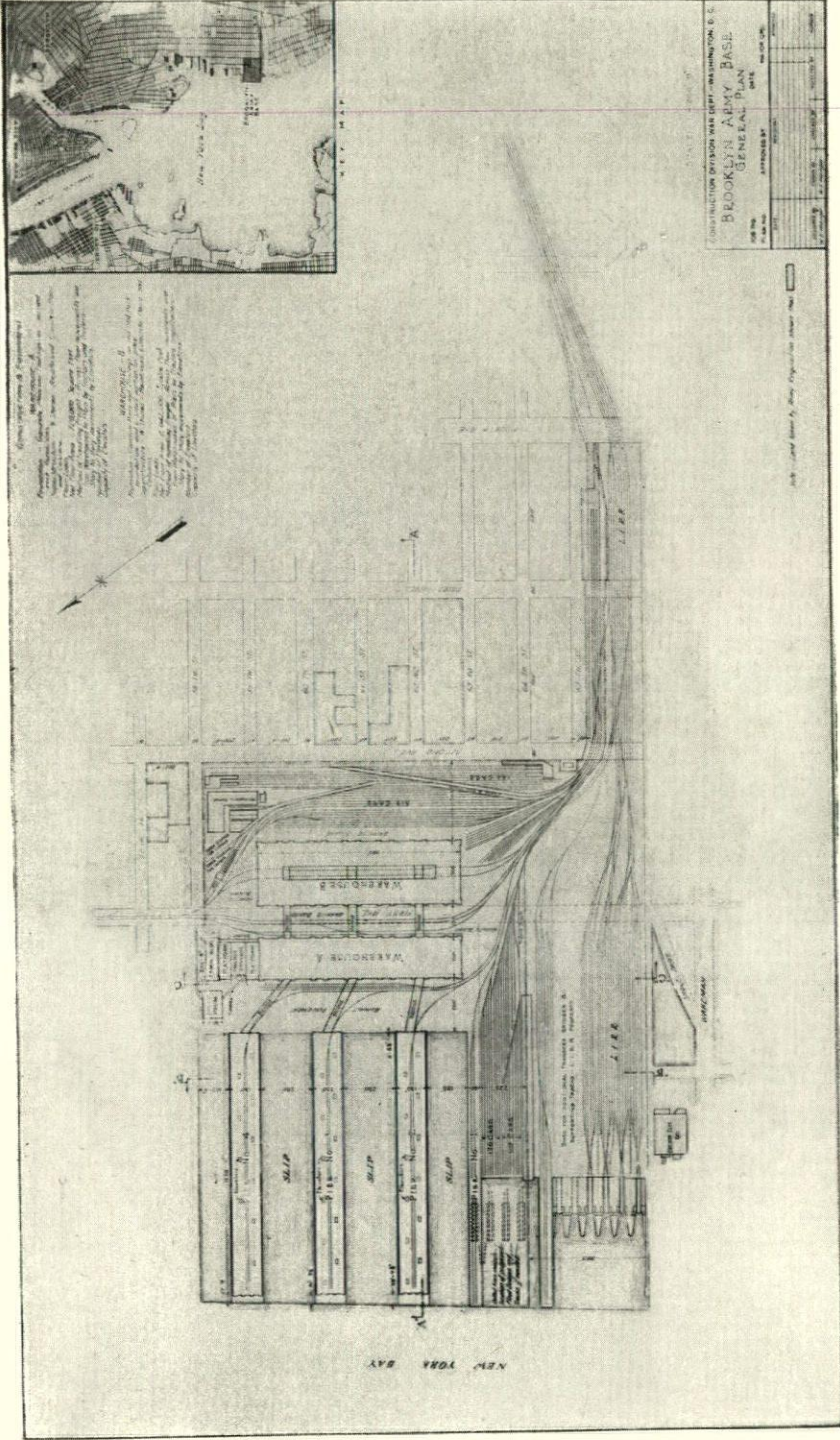


PORT NEWARK QUARTERMASTER TERMINAL, NEWARK, N. J.  
 Col. F. E. Lamphere, Constructing Quartermaster.  
 Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.  
 Clarence Healy, Consulting Engineer.  
 McArthur Brothers and Mason & Hanger Company, Contractors.



CHARLESTON PORT TERMINAL  
- CHARLESTON, S. C.  
- COL. F. E. LAMPHERE - CONSTRUCTING - QUARTERMASTER  
- HANSON HANGER CONTRACTING CO. - BIRMINGHAM, ALA.

CHARLESTON QUARTERMASTER TERMINAL, CHARLESTON, S. C.  
Col. F. E. Lamphere, Constructing Quartermaster.  
Lieut. Col. L. L. Calvert, Supervising Constructing Quartermaster.  
Mason and Hanger Contracting Company, Contractors.  
W. E. Grove, Prin. Ass't. Engineer.



**BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.**  
 Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.  
 Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.  
 Cass Gilbert, F.A.I.A., Designing Architect.  
 Turner Construction Company, New York, Contractors.

diers from practically nothing to two million two hundred and fifty thousand men at one time.

Emergency warehouses, terminals and transportation facilities grew up in all parts of the country from the efforts of the Construction Division in a correspondingly short space of time, including permanent fireproof storehouses. The latter buildings, six to eight stories high, thoroughly fireproof and modern in every particular, containing as they did over a million and a half to four million square feet of storage space in each, were completed in some instances sufficiently for occupancy in five months, when such buildings ordinarily would take from twelve months to two years to build.

Notwithstanding the difficulties of getting sufficient labor and materials, and the delays in railroad transportation which was already overcrowded with shipments of fuel and all the various war supplies, the records made in the speed of construction far excelled any previous showing. One of the most spectacular performances of the Division was the erection of a forty bed hospital unit. This unit was much needed in an emergency and as a result of the speeding up of all the operations for an extreme effort, the building was actually erected and completed, ready for the beds, in just ten hours and thirty-eight minutes.

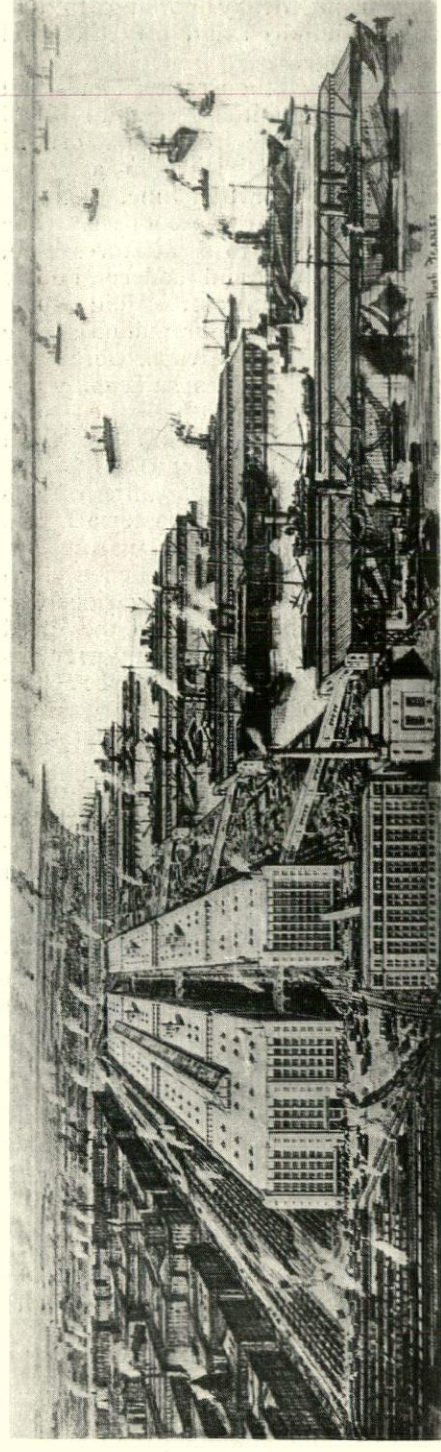
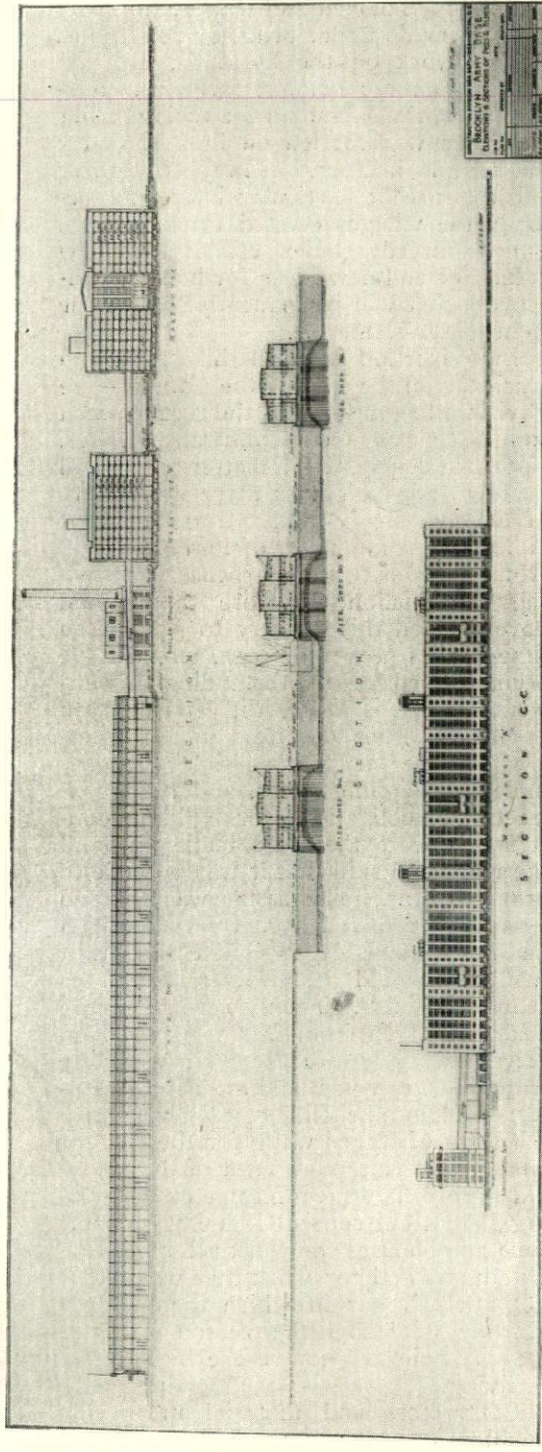
The reason that the Construction Division succeeded in accomplishing such wonderful results was owing to the fact that it drew to its organization the best and most capable engineering and executive talent in the country who had been instrumental in building up the industrial and commercial life of the nation and who found that in this organization they could work along lines to which they were accustomed. These men worked days, nights and Sundays, and were able and patriotic throughout all the field of their operations. The builders and the workmen imbued with the same spirit and loyalty felt that by doing their best they were helping to win the war. Friendly competitions for speed and the passing of the hat for funds for a flag raising were not uncommon among the humblest of the workmen. Things went with a dash

and the men moved and worked in a way they never do under ordinary conditions.

The work on the hospitals, aviation camps, gunnery schools, factories, housing for workmen and all the various other buildings was carried on in a similarly successful manner. Many of these projects are of particular interest, especially the villages erected for workmen, which already have established new standards and new ideas for housing employees that will permanently benefit the industries of America.

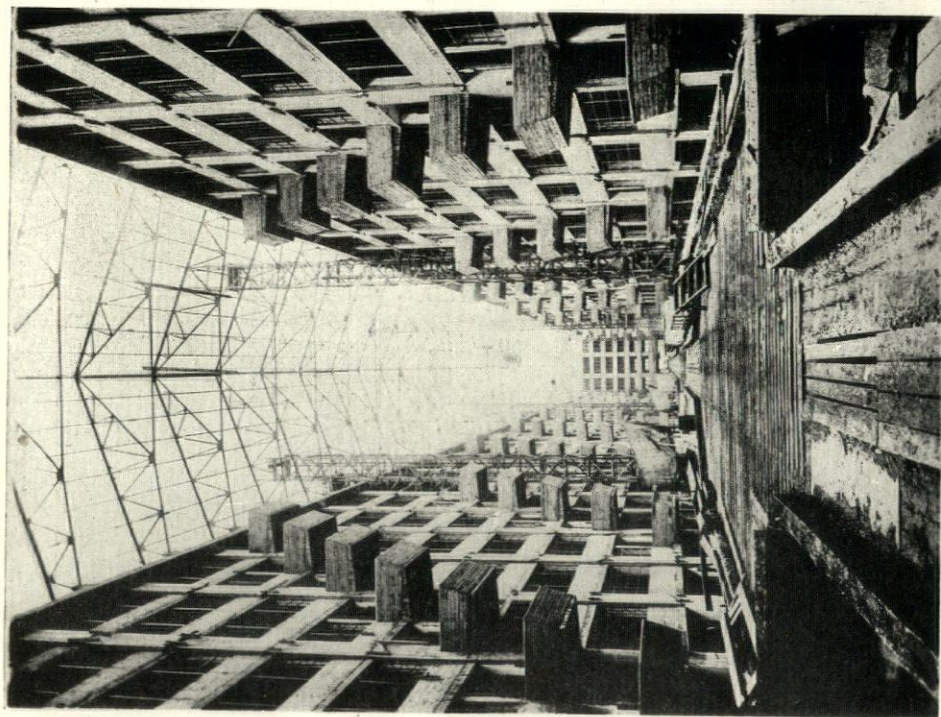
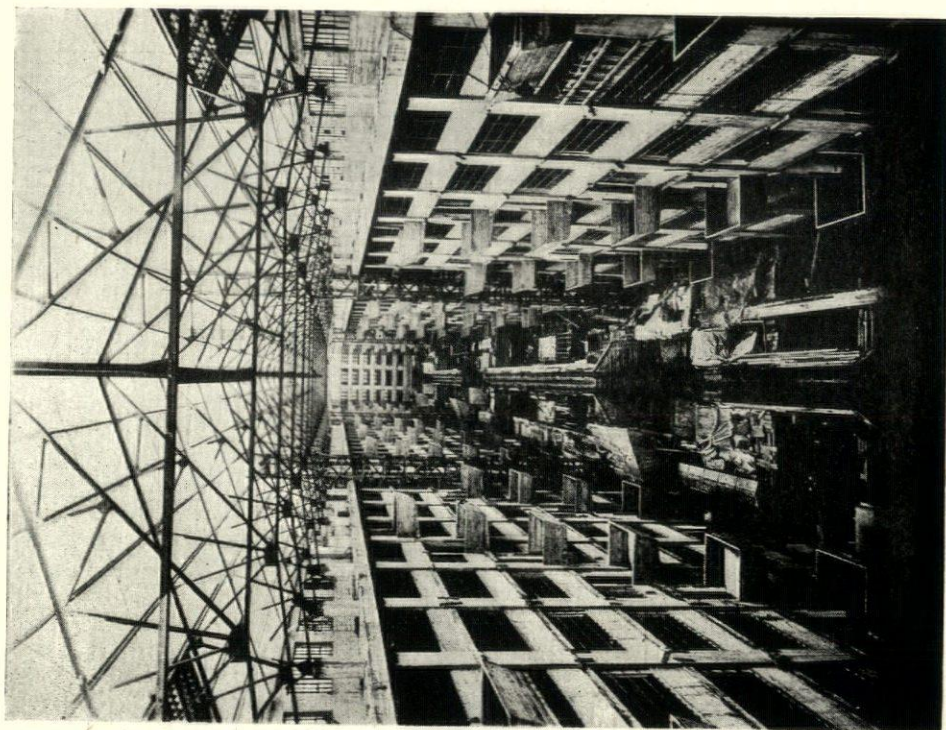
In connection with all this speed and efficiency on the part of the Construction Division, the question of the cost of work to the Government naturally arises. Speed, of course, was a matter of life and death to the nation, as there was plenty of evidence finally produced to show that America was in danger of foreign attack. Almost any necessary expense in building construction therefore that would have enabled this country to prepare in time for its proper defense, would have been justified. Notwithstanding this extreme need for haste, the Construction Division did not lose sight of the necessity for the strictest possible economy under the circumstances, and their contracts and obligations for building construction were therefore made with all the vigor and skill that it was possible to bring to bear. The result was that no contractor received a contract by which he would make anything like the profit which he would ordinarily make in his regular business. The men who did reap a larger return from war work than on private work before the war, were the workmen, craftsmen and mechanics. This increased income did not as a rule take the form of larger wage for the regular work hours (although most of the trades did raise their wages to some extent during 1918), but consisted chiefly of overtime and bonuses for work after the regular hours and for work that was either not attractive or in which there was a scarcity of labor—the reason for this scarcity being of course the higher cost of living.

Contractors and material men, who could afford to pay the higher cost of living, were called upon to work for their



ELEVATION AND PERSPECTIVE OF BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.  
 Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.  
 Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.  
 Cass Gilbert, F.A.I.A., Designing Architect.  
 Turner Construction Company, New York, Contractors.





BROOKLYN ARMY SUPPLY BASE, BROOKLYN, N. Y.

Major S. S. Crocker, Mem. A.S.C.E., Constructing Quartermaster.  
Major Clinton H. Fisk, Ass. Mem. A.S.C.E., Supervising Constructing Quartermaster.  
Cass Gilbert, F.A.I.A., Designing Architect.  
Turner Construction Company, New York, Contractors.



# MODERN INDUSTRIAL PLANTS



By George C. Nimmons

PART V.

## THE GREAT ARMY SUPPLY BASES AND QUARTERMASTERS' TERMINALS OF THE UNITED STATES GOVERNMENT CONSTRUCTED ALONG THE EASTERN COAST FOR WAR PURPOSES.

THE next subject in the discussion of Modern Industrial Plants, according to the outline published in part II of the December issue of THE ARCHITECTURAL RECORD, was to have been the "Turnover of Labor" and the features in industrial plants that have been found effective in reducing it. An opportunity, however, has come since that article was published, to describe and illustrate the great port terminals, which will now take precedence over the question of labor turnover.

When this country entered the war and decided to do its part in the great world struggle, it thereby imposed upon itself in the way of a building industry, the biggest, if not the most difficult undertaking with which it has ever been confronted. Few people realize that the raising, training, equipping and transporting of an adequate army and its supplies, involved immediate building construction on a scale and at a speed such as never had been attempted or accomplished in the world before.

This country had practically nothing adequate in the way of training camps, arsenals, warehouses, wharves, piers, port terminals, aviation fields, proving grounds, hospitals, embarkation camps, engineer camps, gunnery schools, munition plants or housing for employees. All of these had to be built in an incredibly short time in order that America might take part successfully in the war.

The task of building the cantonments was intrusted to the Cantonment Division

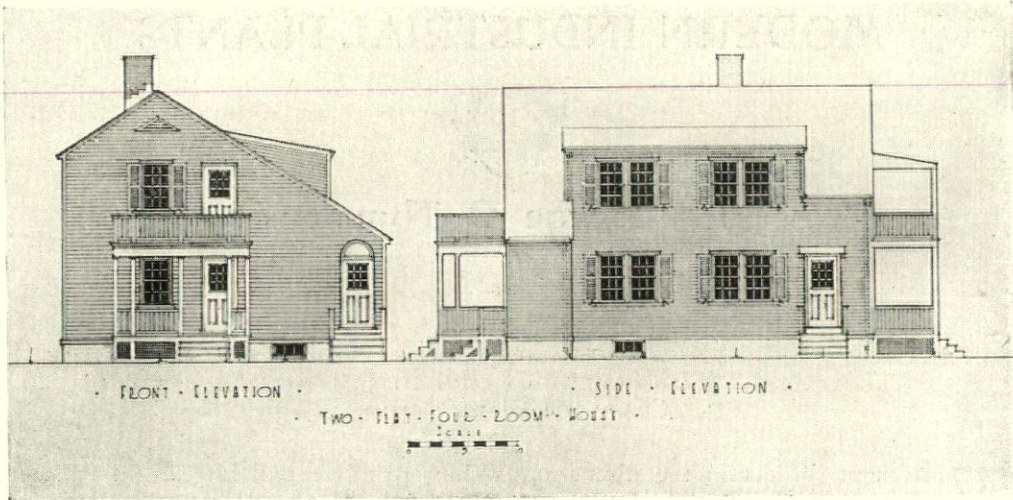
under Brig. General Littell. In the winter of 1917, Gen. Littell was worn out and was relieved, and the scope of the work was enlarged to cover all construction work for the Army in this country and the name changed to the Construction Division of the Army in charge of Brigadier General R. C. Marshall, Jr. A diagram showing the principal officers, their relative authority and division of the work is given.

The extent of the work done has included construction in every state of the Union but one. It will have cost when completed in the neighborhood of a billion dollars, and have involved the employment of two hundred and fifty thousand workmen at one time.

The 16 cantonments and 16 National Guard Camps, which were needed first for housing and training the drafted men, were great military cities, each one accommodating about fifty thousand soldiers. Each of these was built out in the open country in about three months time, complete with hundreds of buildings, new streets, sidewalks, sewers, electric lights, heating plants, mess halls, drill grounds, hospitals, administration buildings and various other structures.

The cost of these cantonments, together with the cost of the National Guard camps, was in the neighborhood of two hundred million dollars.

This construction work, together with other camps and those for special training and embarkation, brought up this country's capacity for turning out sol-



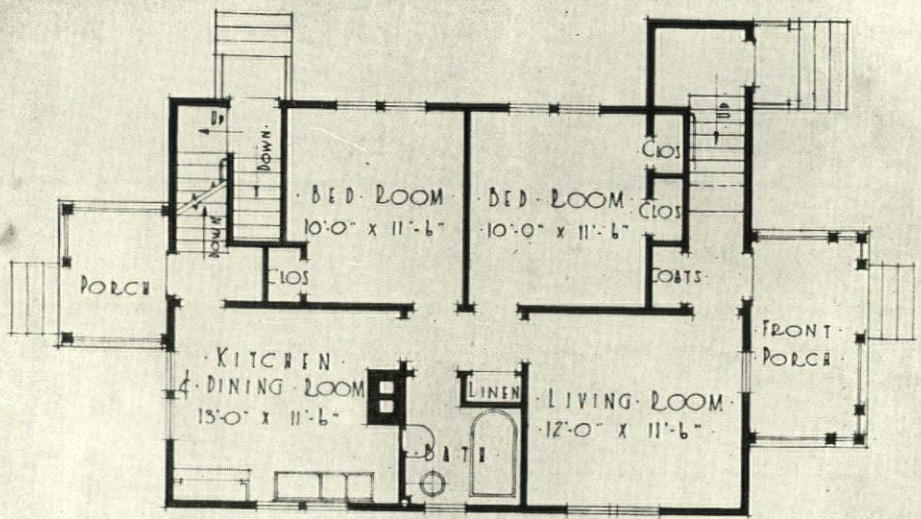
ELEVATIONS OF TWO-FLAT FOUR-ROOM HOUSE. (PLANS ON PRECEDING PAGE.) QUINCY HOUSING PROJECT.

feet; the minimum set-back of the houses is 15 feet. The minimum distance between houses is 16 feet, but it is usually 20. One excellent feature is the placing of the houses so that each gets the sunlight in every room at some time of the day. Nearly all the chambers have windows on two sides; no chamber is without two windows. The heating is by hot-air furnace, with the pipes of extra size and ample enough so that there can be no question as to sufficient heat. In every kitchen there are double laundry-trays. Through the winter hot water is provided from a coil in the furnace which keeps the boiler well supplied; for summer use an instantaneous gas heater is provided. Gas is the fuel for cooking; the lighting is by electricity. In the kitchen, bathroom and in one bedroom of each house there is a plug-socket for attaching a pneumatic cleaner and other electric conveniences.

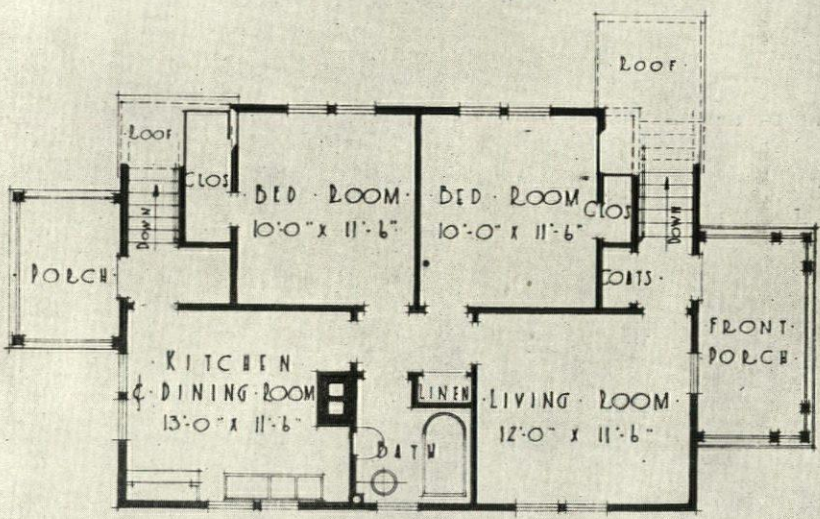
The houses are of frame construction, or brick. The frame houses are painted either white or a very light gray, with green blinds. There is no hint in any of these cheery, new streets of the dull mon-

otony that characterizes the average locality where the cheap contractor has cast his blight upon the scene. Neither is there any suggestion of the uneasy striving for originality, where each house seems to be crying out: "Here I am! Just look at me!" With several standard types of plan in common, the architectural expression obtained from these has been brought out in what seems to be a practically infinite diversity in design, obtained by variations in surface treatment, color, form of porch, etc. For instance there are two types of five-room houses, and each type has three different elevations. By distributing these judiciously among the streets and making slight changes in detail features, all danger of tedious uniformity is avoided.

The various types of dwelling have all been designed for obtaining the greatest practicable economy in construction through careful consideration as to height of rooms, etc., so that the timbers and floor-joists could be cut in even lengths. There is but one contractor for the construction of the entire project.

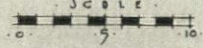


• FIRST FLOOR PLAN •

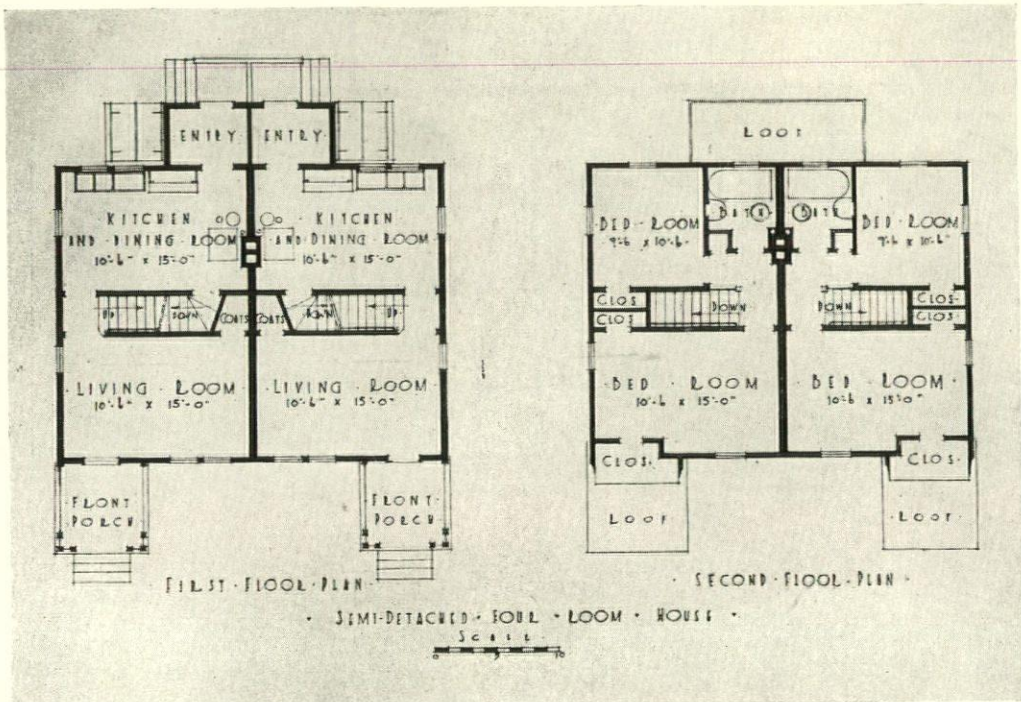


• SECOND FLOOR PLAN •

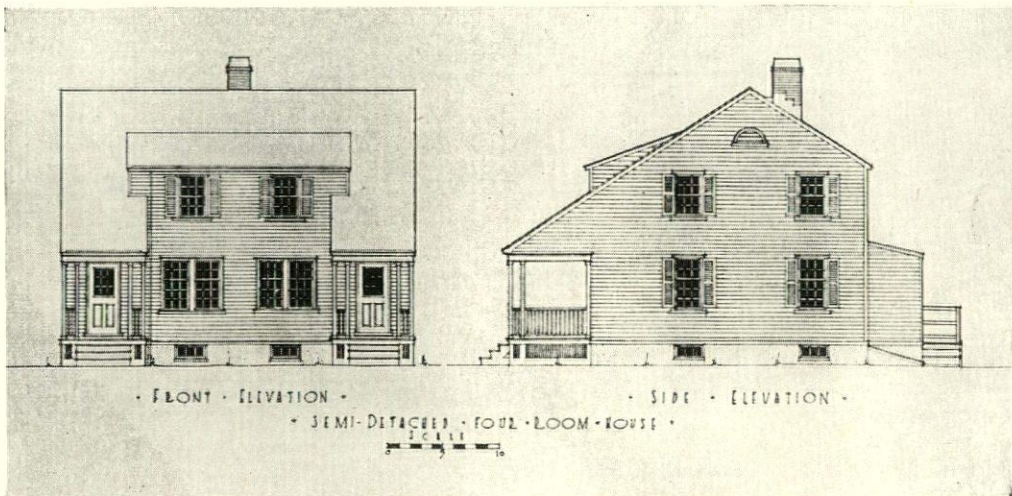
• TWO FLAT • FOUR ROOM HOUSE •



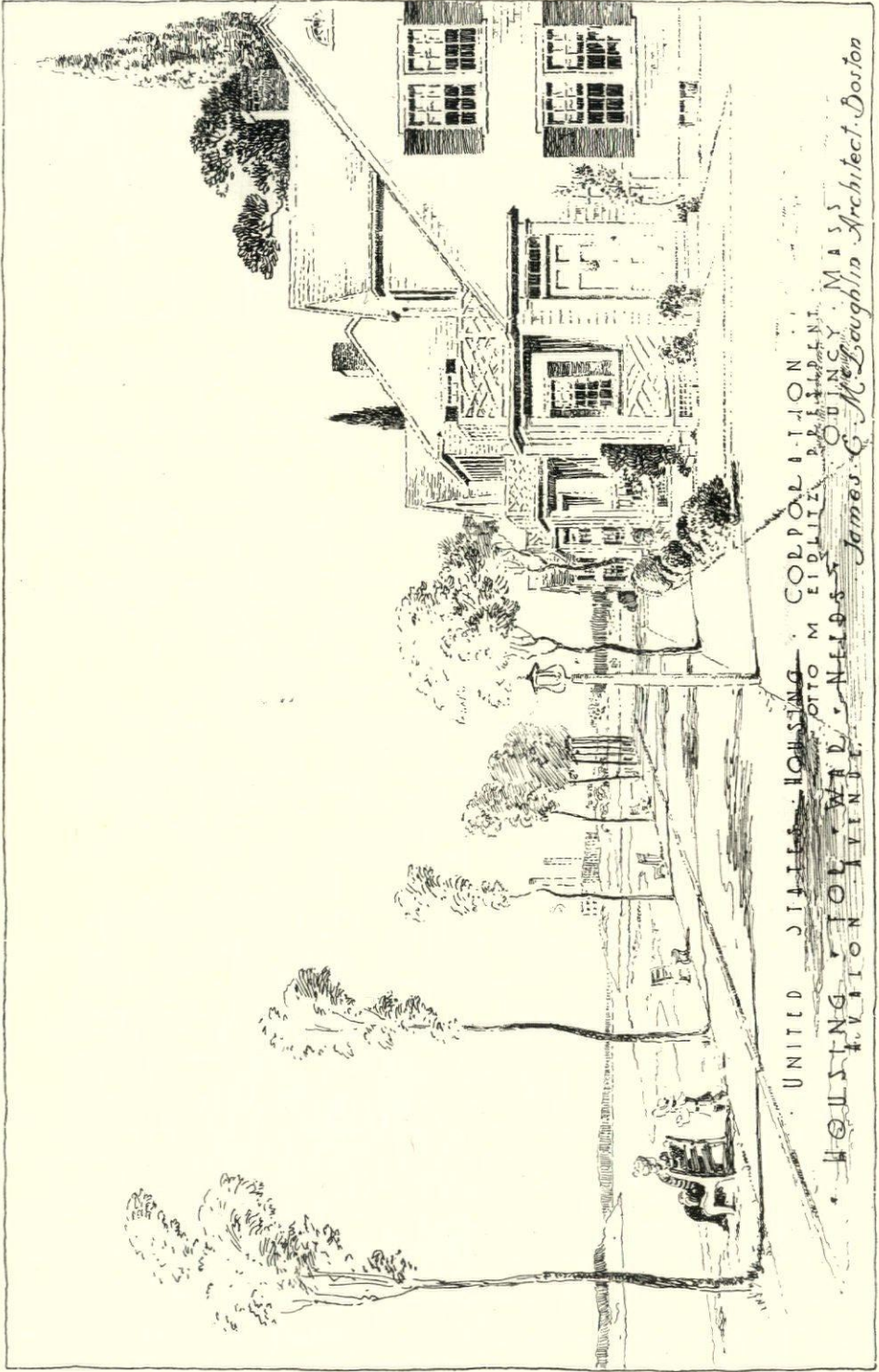
PLANS OF TWO-FLAT FOUR-ROOM HOUSE.  
 (ELEVATIONS ON NEXT PAGE.) QUINCY HOUSING  
 PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



PLANS OF SEMI-DETACHED FOUR-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.

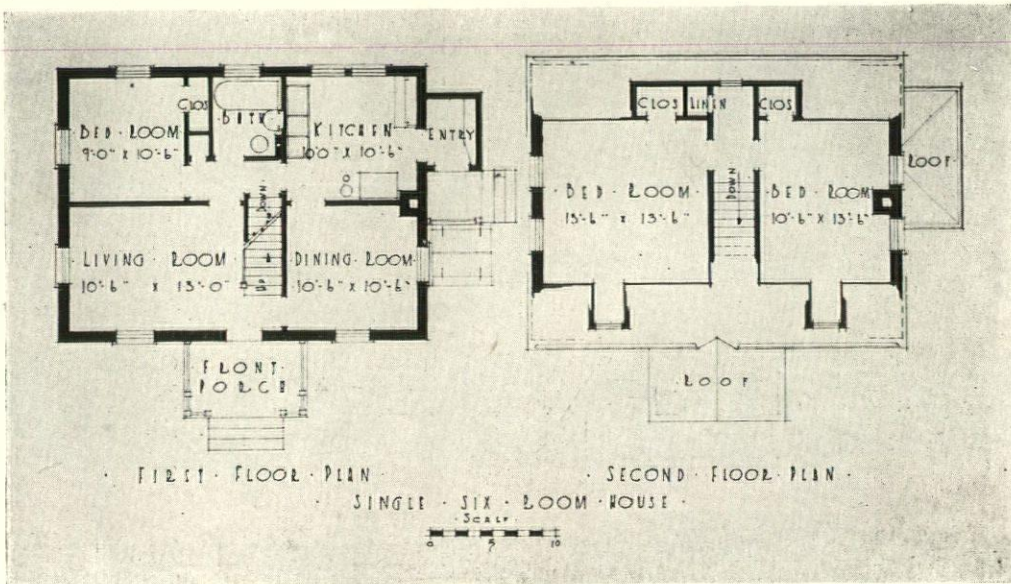


ELEVATIONS OF SEMI-DETACHED FOUR-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.

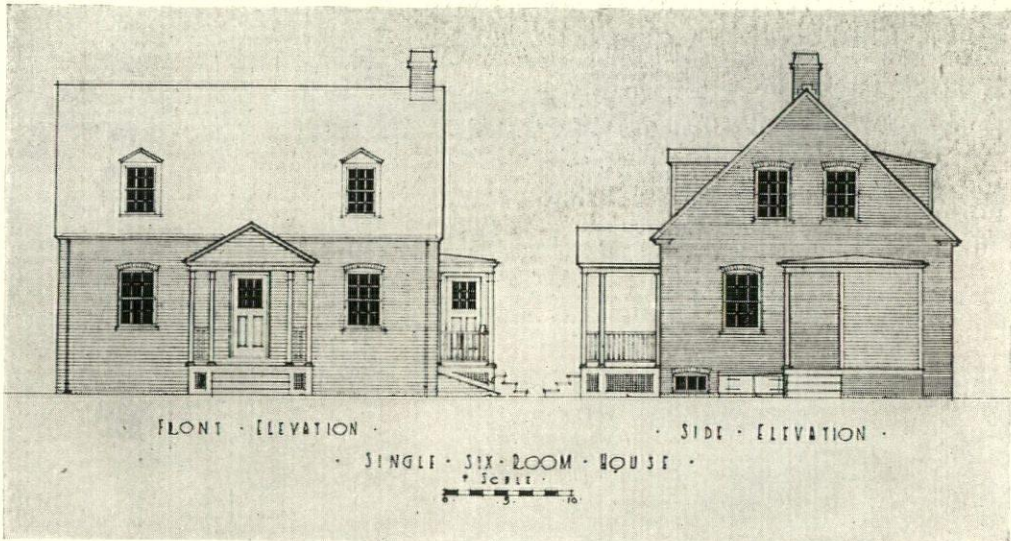


UNITED STATES HOUSING CORPORATION  
 HOUSING DIVISION  
 WASHINGTON, D. C.  
 OTTO M. EIDLITZ, ARCHITECT  
 QUINCY, MASS.  
 James C. McLaughlin Architect, Boston

PERSPECTIVE OF THE WATER-FRONT ON AVALON STREET,  
 FACING THE WATER-FRONT RECREATION GROUND  
 ON TOWN RIVER BASIN, QUINCY HOUSING PROJECT.

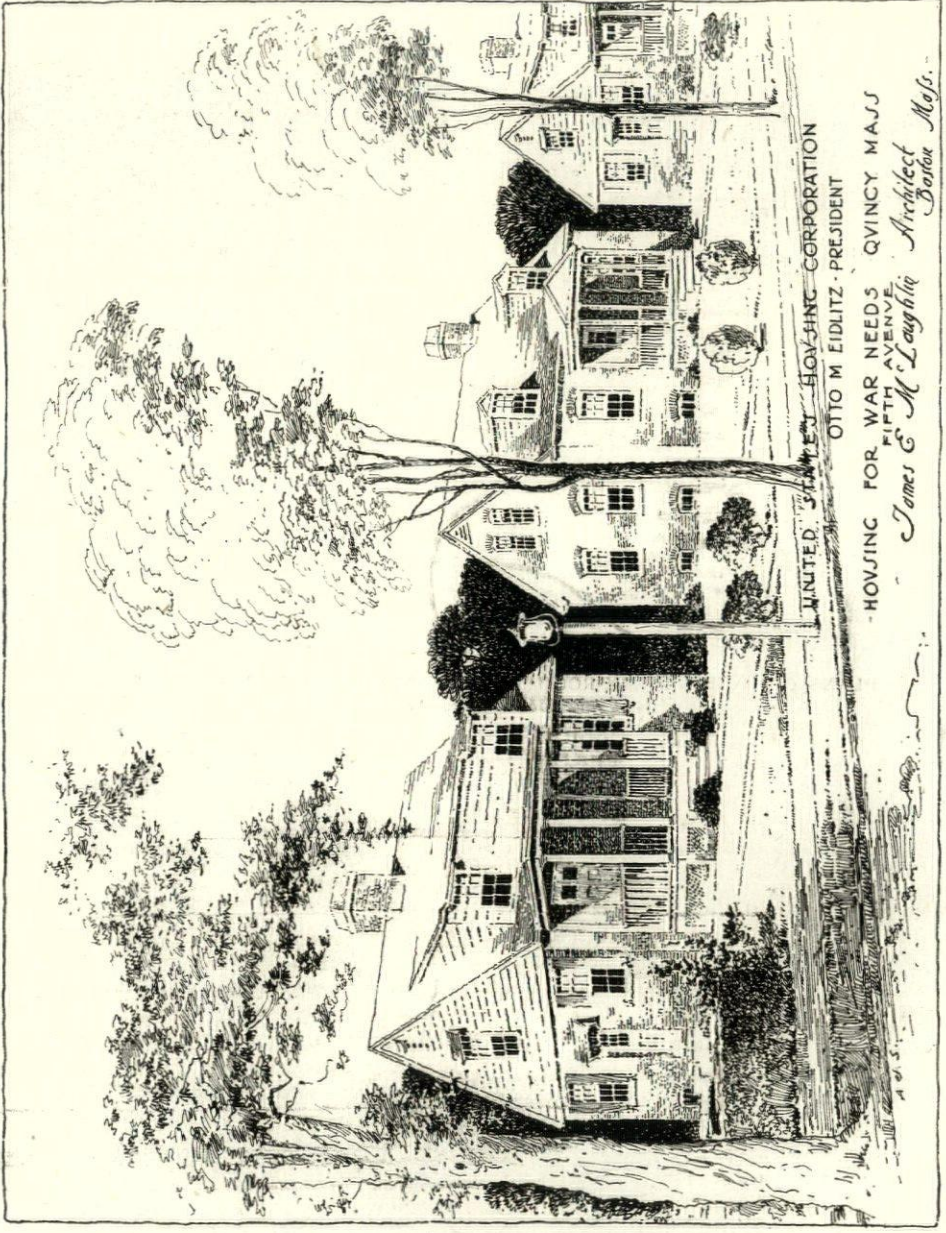


PLANS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.



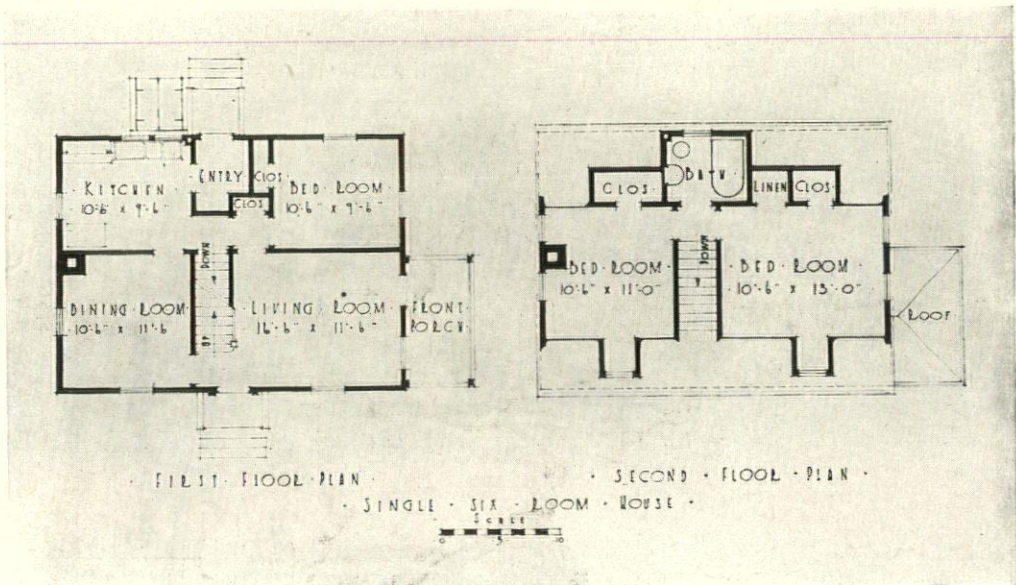


UNITED STATES HOUSING CORPORATION  
OTTO M. EIDLITZ - PRESIDENT

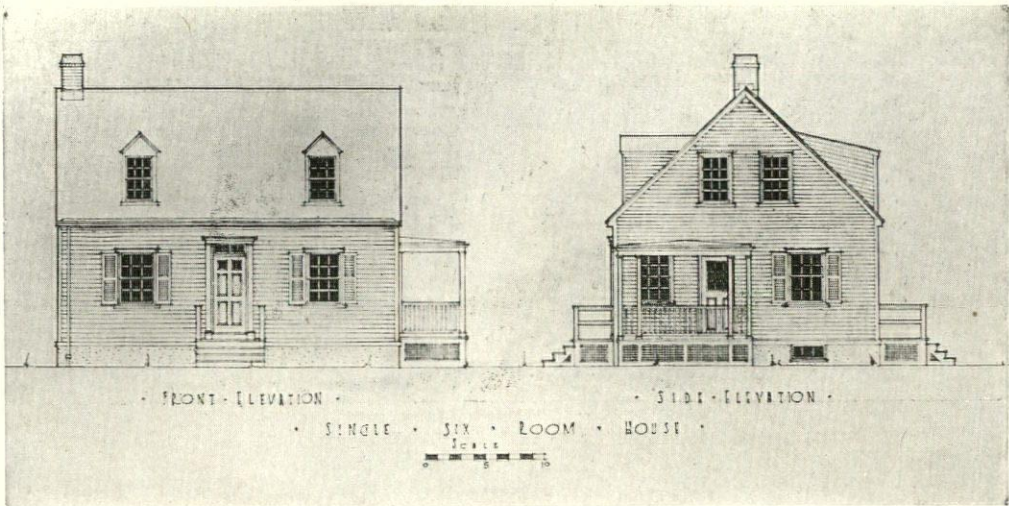
HOUSING FOR WAR NEEDS - QUINCY MASS  
FIFTH AVENUE

*James E. McLaughlin* Architect  
*Boston Mass.*

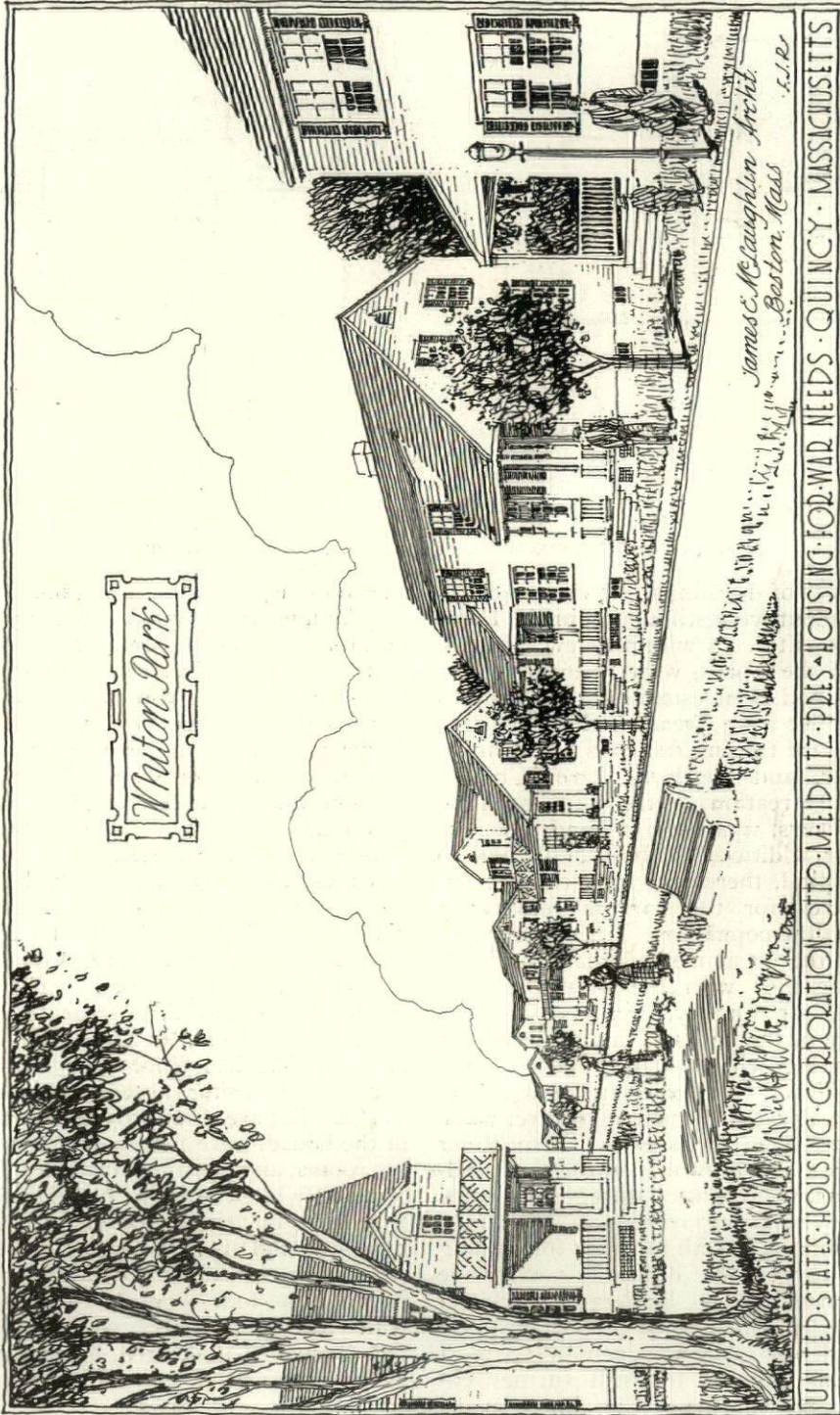
SINGLE HOUSES OF BRICK ON FIFTH AVENUE. QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



PLANS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.

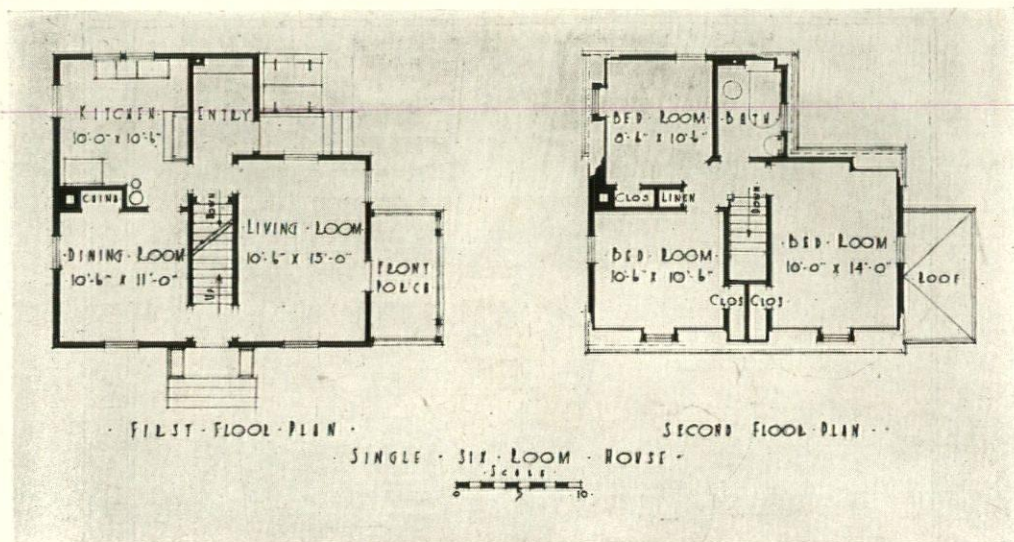


Whiton Park

James C. McLaughlin, Archt.  
Boston, Mass.  
S.I.R.

UNITED STATES HOUSING CORPORATION · OTTO MEIDLITZ · PRES · HOUSING FOR WAR NEEDS · QUINCY · MASSACHUSETTS

SEMI-DETACHED HOUSES ON WHITON  
PARK. QUINCY HOUSING PROJECT.  
JAMES E. McLAUGHLIN, ARCHITECT.



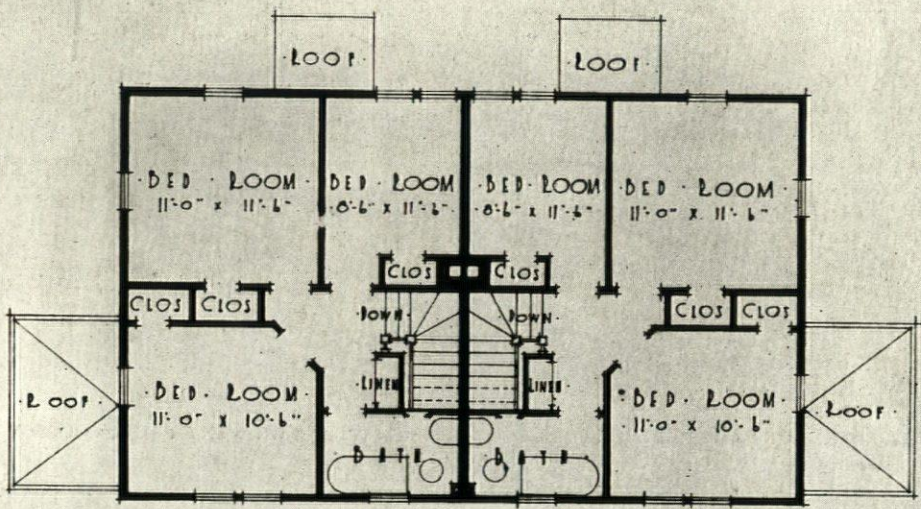
PLANS OF SINGLE SIX-ROOM HOUSE. QUINCY HOUSING PROJECT.

good class of dwellings, but various tracts round about were still unoccupied. Three excellent sites, all within a few minutes' walk of the works, were selected. Good schools had been established by the city near by but were already well filled. Sufficient local trading facilities were handy, however, and the Fore River Club, a capital recreation centre established by the workers, was close at hand. So, except for additions to the schools and to the hospital, there was little call for expenditures for the various community needs of the population. For outdoor recreation the great metropolitan park system, together with the local pleasure-grounds of Quincy, supplied a large measure of the needs in this respect. But in planning what is called the "Baker's Basin Tract" an excellent playground, Whiton Park, was made a feature, while the attractive frontage on Town River Bay, that had been in use for the building, repair and winter-storage of yachts, was reserved for recreation uses as a waterfront park with facilities for bathing and boating. Mr. Kellaway's extensive experience as a landscape architect in the development of important park and parkway projects—including a most admirable scheme for still further enhancing the charms of the almost model residential Greater Boston town of Win-

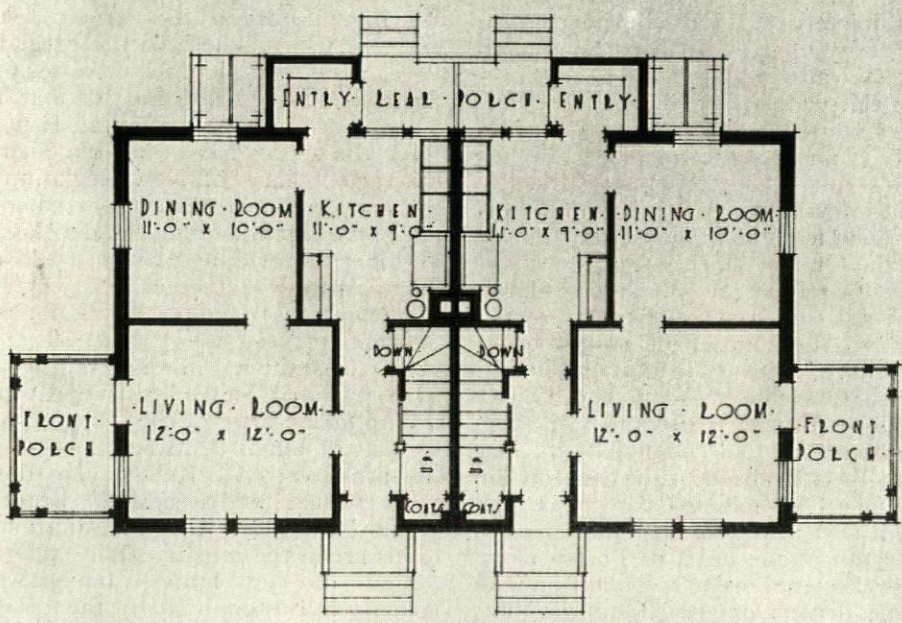
chester—here stood him in good stead, in so planning his layouts as to carry a connection with the Metropolitan Parkway system quite effectively through the property. This "Pilgrim Parkway," as Mr. Kellaway appropriately calls it, forms a valuable link between the Metropolitan system's Quincy Shore Drive and its continuation in the Pilgrim highway, just built by the State along the South Shore, as aforementioned.

These three developments fit harmoniously in with the built-up sections in the midst of which they are placed—all being typical of a prosperous middle-class population, pleasantly housed. The entire project comprises 256 separate houses, all told. Of these, 90 are single houses, 57 semi-detached, and 109 two-family houses. Housing accommodations for 422 families are thus provided for. Most of the houses have five rooms; some have six rooms, and one type, designed for uncommonly large families, has eight rooms. The semi-detached houses, as a rule, have five and six rooms; the flats in the two-family houses have four and five rooms. The four-room flats are designed with convertible rooms, so as to provide two chambers, if desired, by making one room serve as living and dining room in common.

The lots average about 5,000 square

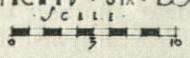


• SECOND FLOOR PLAN •

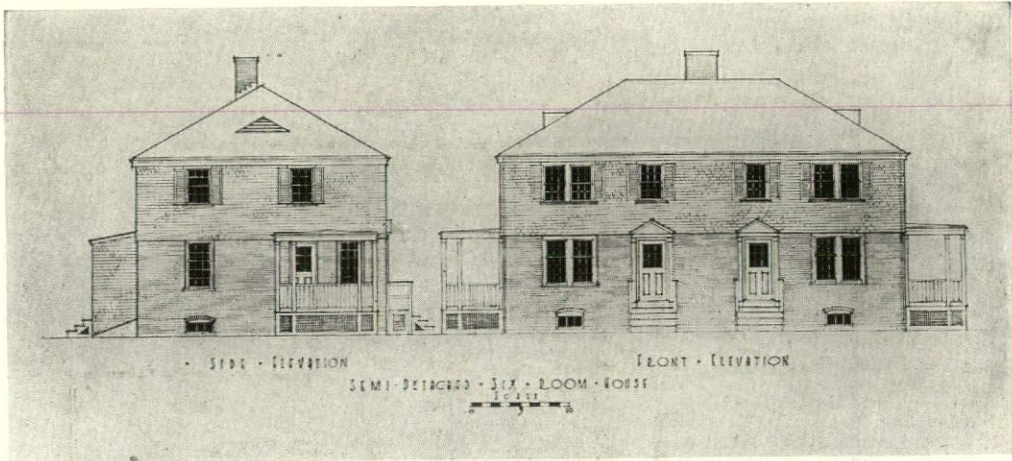


• FIRST FLOOR PLAN •

• SEMI-DETACHED SIX-ROOM HOUSE •



PLANS OF SEMI-DETACHED SIX-ROOM HOUSE. (ELEVATIONS ON PRECEDING PAGE.) QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



ELEVATION OF SEMI-DETACHED SIX-ROOM HOUSE. (PLANS ON NEXT PAGE.) QUINCY HOUSING PROJECT.

ceptional degree. Quincy, like so many other suburban municipalities of Greater Boston, covers a widespread and highly diversified territory, from the near mountain scenery of the wild Blue Hills to an extensive waterfront. Along a large portion of this waterfront the waters of Boston Bay are so shallow as not to be available for commercial development. When Boston's famous metropolitan park system was developed this fact gave opportunity for the planning of a fine parkway along the Quincy shore, with connections for the Blue Hills and the Neponset valley. With the growth of motor-vehicle traffic and the consequent congestion of the ordinary highways leading into southeastern Massachusetts—the Old Colony region—there came a demand for a special pleasureway to accommodate it. This need has been realized by the construction of the new Old Colony Parkway in Boston as a part of the Metropolitan system, leading out of the heart of Boston along the Dorchester shore to a connection with this fine drive along the Quincy shore; the line of pleasure-traffic is planned to be further continued by what is known as "the Pilgrim highway," a beautiful new State road now partially completed along and near the shore through the several towns of the South Shore region towards Plymouth and Cape Cod.

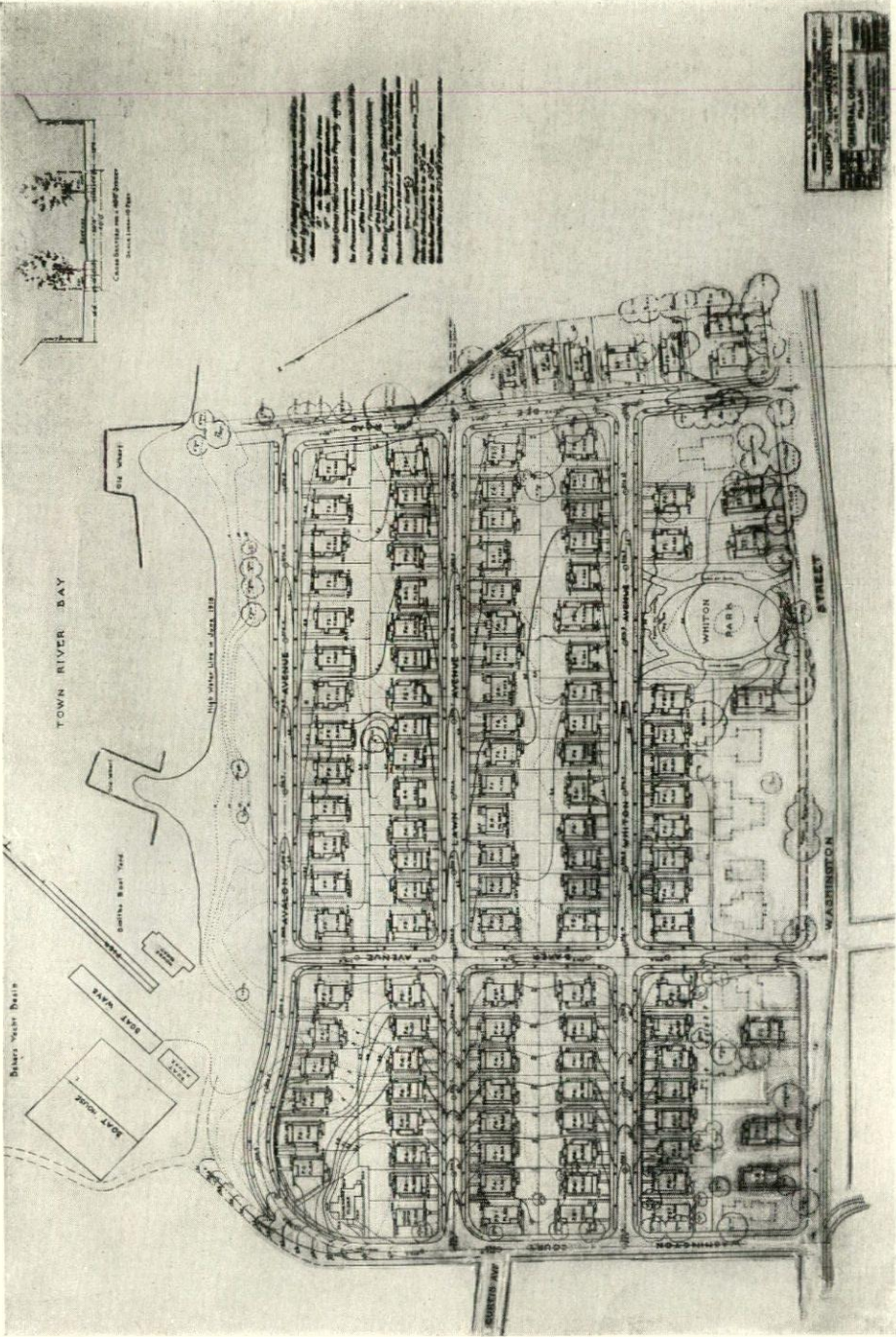
The developments of the Quincy housing project are happily located in sections near this great artery of travel, and one

through which the proposed parkway has been so planned as to take excellent advantage of the circumstance. Weymouth Fore River, on the Quincy shore of which is located the great Fore River plant, is a picturesque estuary that makes in from Boston Bay, or that landlocked portion of it known as Hingham Bay. Its shores have their due share of the varied charm of New England coast scenery, and the contrast presented between the gigantic industrial development of the ship-building plant, spread over many acres, and the pleasant landscape of the region round about, is not at all displeasing.

The committee of designers appointed by the United States Housing Corporation to take charge of the Quincy project consists of James E. McLaughlin of Boston, architect; H. J. Kellaway, of Boston, town planner; and Ernest W. Branch of Quincy, engineer. Mr. McLaughlin has to his credit the monumentally handsome design of the huge Commonwealth Armory in Boston, built for the local cavalry unit of the Massachusetts State Militia and National Guard, which as a portion of the heroic 26th division distinguished itself in the War. Mr. Kellaway worked as town planner for the cantonment division of the War Department on the layout of Camp Devens.

Before the war the growth of the Fore River Works had caused an extensive building-over of the neighborhood with a





LAYOUT FOR THE BAKER BASIN DEVELOPMENT,  
 WITH 117 TWO-FAMILY HOUSES. QUINCY HOUSING  
 PROJECT. JAMES E. McLAUGHLIN ARCHITECT.

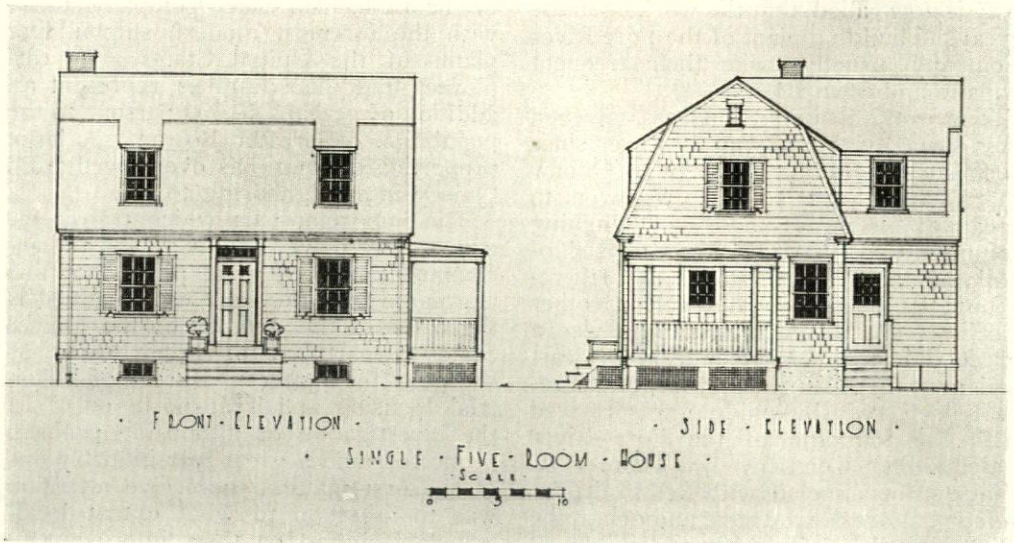


communities where housing could be found.

The Fore River Company has two enormous plants at Quincy: the original one on Fore River, and the "Liberty works" on the peninsula of Squantum, which rose over night, as it were, just across the mouth of the Neponset opposite the Boston shore. With all the thousands of employees at the "Liberty" plant it was not found necessary to develop new housing projects on their particular account, for the reason that the local transit system that serves Boston could rapidly transport the workers between the works and the homes which they could find in widely scattered sections of the widespread metropolitan territory of Greater Boston. The city of Boston built a bridge across the river, and over this a new line of the surface trolley system of the Dorchester district was constructed—connecting quickly with the new tunnel and subway route that had only just been opened—a route extending the Cambridge subway into Dorchester. By means of this huge transit system workmen at the Fore River Company's "Liberty" works (devoted to the building of destroyers for the navy) could leave their homes in the northern suburb of Malden, something like ten miles away,

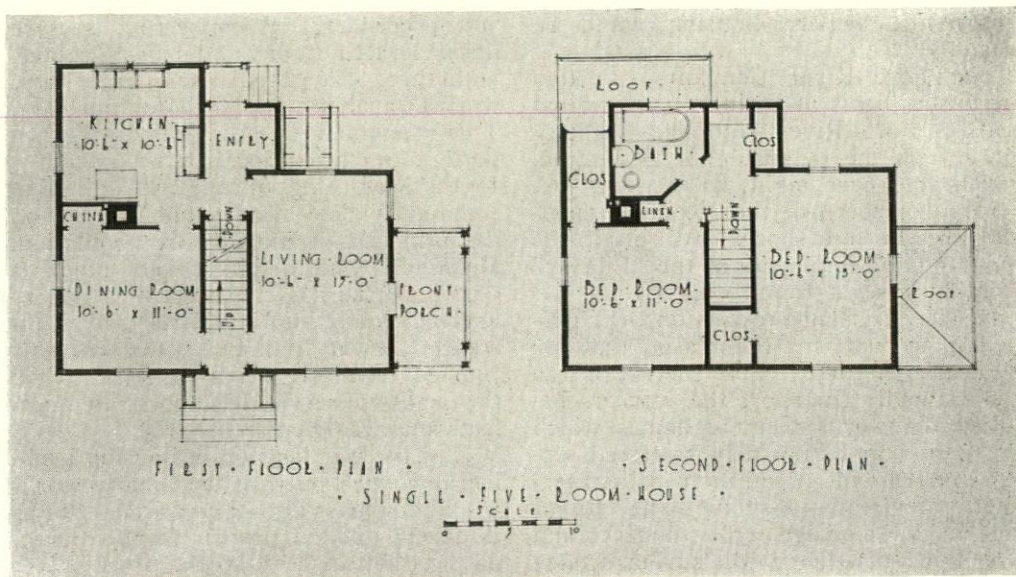
and proceeding by connecting surface lines, elevated, tunnel and subway routes, with three changes of cars, reach their work in an hour. And all for one fare. This demonstrates how immensely important an efficient local transit system is to the well-being of a great industrial community that has been developed on the principle of mobility of population. Unhappily, with the piling up of expenses our local transit systems are now degenerating swiftly into inefficiency. For instance, the fare unit in Boston has been jumped from five cents to eight, while the quality of service has depreciated perhaps another 60 per cent.

Had the war kept on, a housing problem in connection with the Liberty works would doubtless also have arisen. But as it turned out the project for accommodating the workers at the Fore River plant proved the only one to be taken in hand. Local conditions here have been uncommonly favorable for the development of a model housing project within a few minutes' walking distance of the works. The employees are of a high grade of skilled workers, well paid, and requiring a correspondingly high grade of dwellings—attractive without and within. Fortunately this element of attractiveness existed in nature to an ex-



ELEVATIONS OF SINGLE FIVE-ROOM HOUSE. (PLANS ON PREVIOUS PAGE.) QUINCY HOUSING PROJECT.

James E. McLaughlin, Architect.



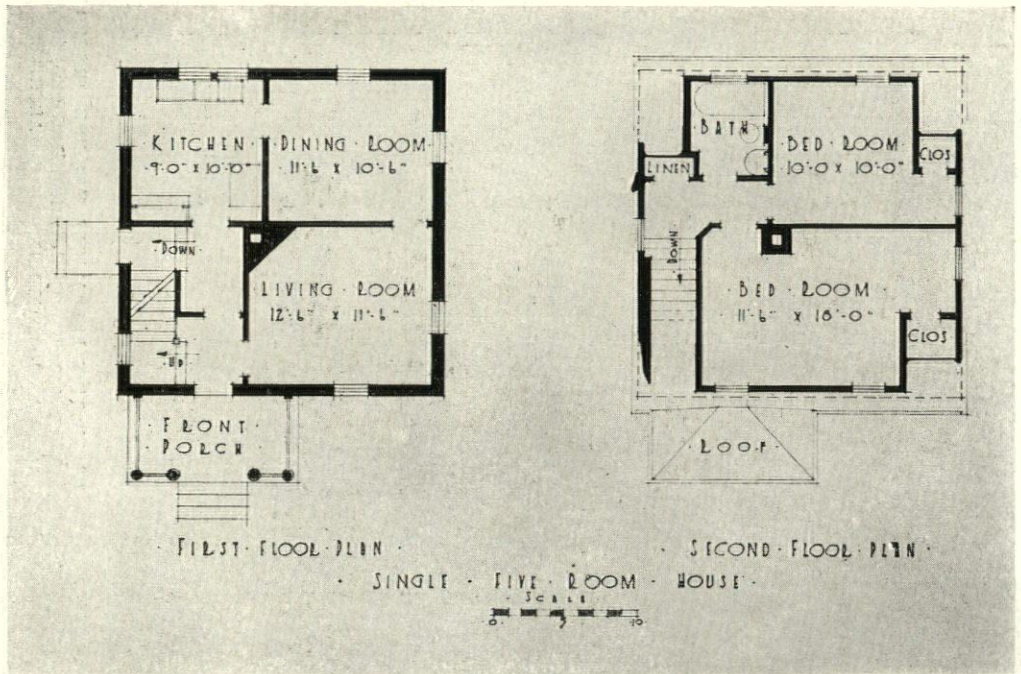
PLANS OF A SINGLE FIVE-ROOM HOUSE. (ELEVATIONS ON NEXT PAGE.) QUINCY HOUSING PROJECT.

great New York, New Haven & Hartford system. And since a thing is as old as its oldest constituent part, this makes the "New Haven" the oldest railroad corporation in the United States as Charles Francis Adams pointed out in his monograph on American railways. It is over the "Granite Branch," as this ancient railway is now called, that the workers in the great shipbuilding plant of the Fore River Company usually make their frequent trips to and from Boston.

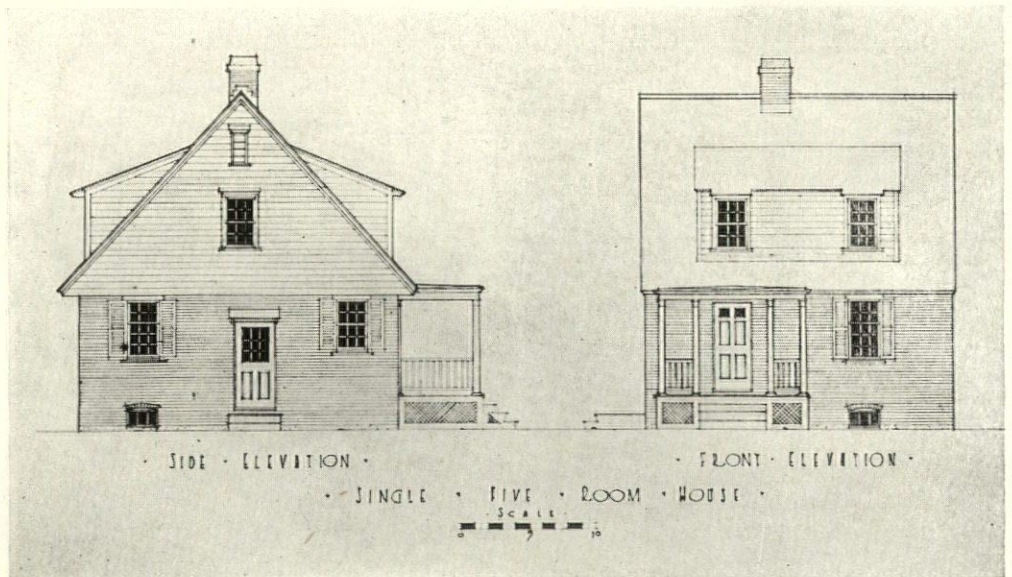
The granite quarry business, given a new scope by the railway, has ever since been such a leading industry in Quincy that Charles Francis Adams was wont to speak of his native town as "a mining community." But in the early days shipbuilding at Quincy Point and thereabouts, as in Boston and various other localities on Massachusetts Bay, was a great industry. A generation at least had gone by when history began to repeat itself and shipbuilding was revived with the founding of the Fore River Shipbuilding Company by Thomas A. Watson, the associate with Bell in the development of the telephone and one of the six "original Bell Telephone Men" whom the invention made into millionaires—one of the most romantic episodes in the his-

tory of modern invention. The growth of this vast enterprise has made shipbuilding again the great industry of Quincy; so great, indeed, that all others combined, extensive and diversified as they are, sink into insignificance beside it. The Fore River Company, now one of the subsidiary industrial corporations of the Bethlehem Steel Company, ranks with the foremost modern shipbuilding plants of the United States. Its employees and their families represent an addition of perhaps 40,000 persons to the population of Greater Boston. A large proportion of these has overflowed from Quincy into neighboring towns.

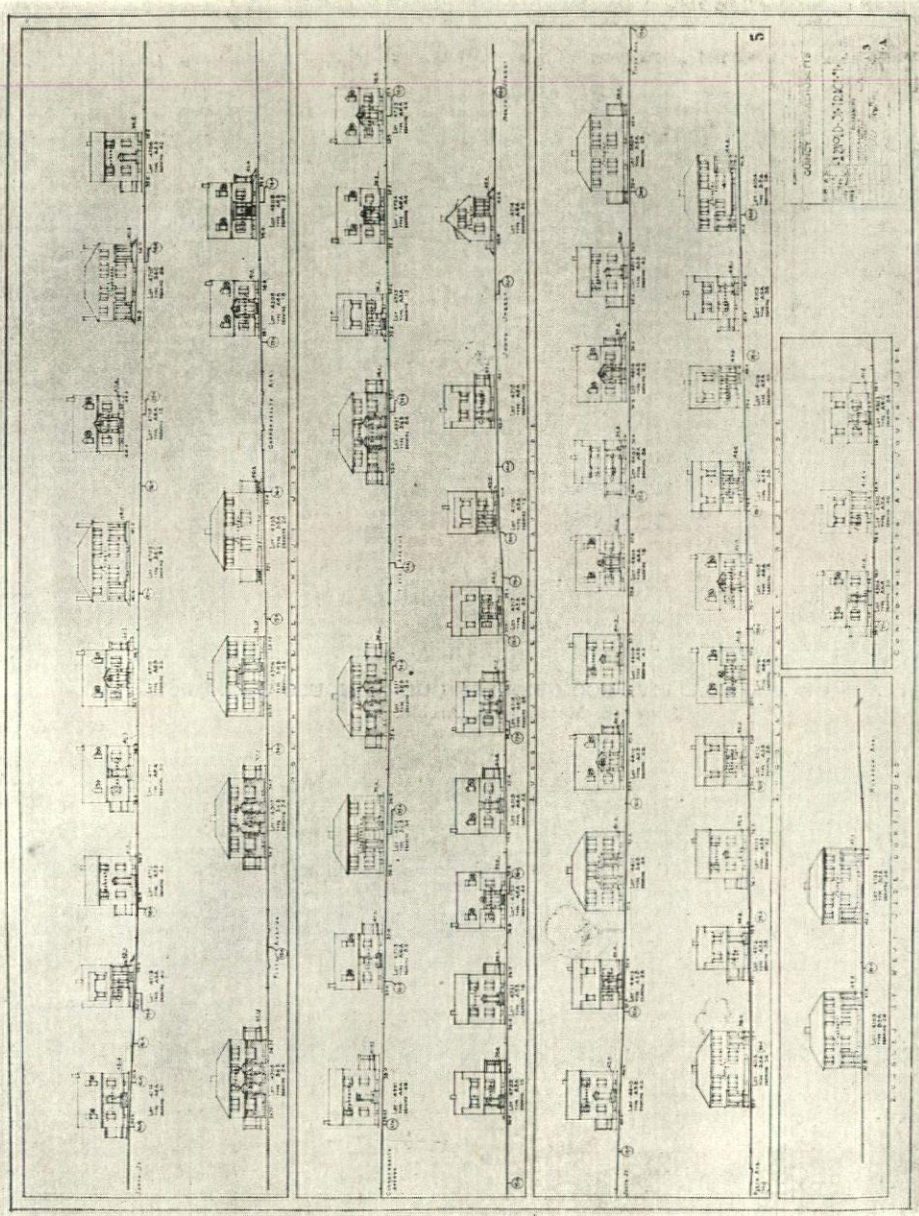
The important part which transit facilities have played in caring for the accommodation of a great portion of this aggregate indicates how well justified is the name of the division of the United States Department of Labor that has charge of the matter: "Bureau of Industrial Housing and Transportation." In the investigation of a housing problem connected with a great war-industry one of the first matters to receive attention was to ascertain to what extent local-transit facilities, or their improvement, could be depended upon to care for the daily movement to and from neighboring



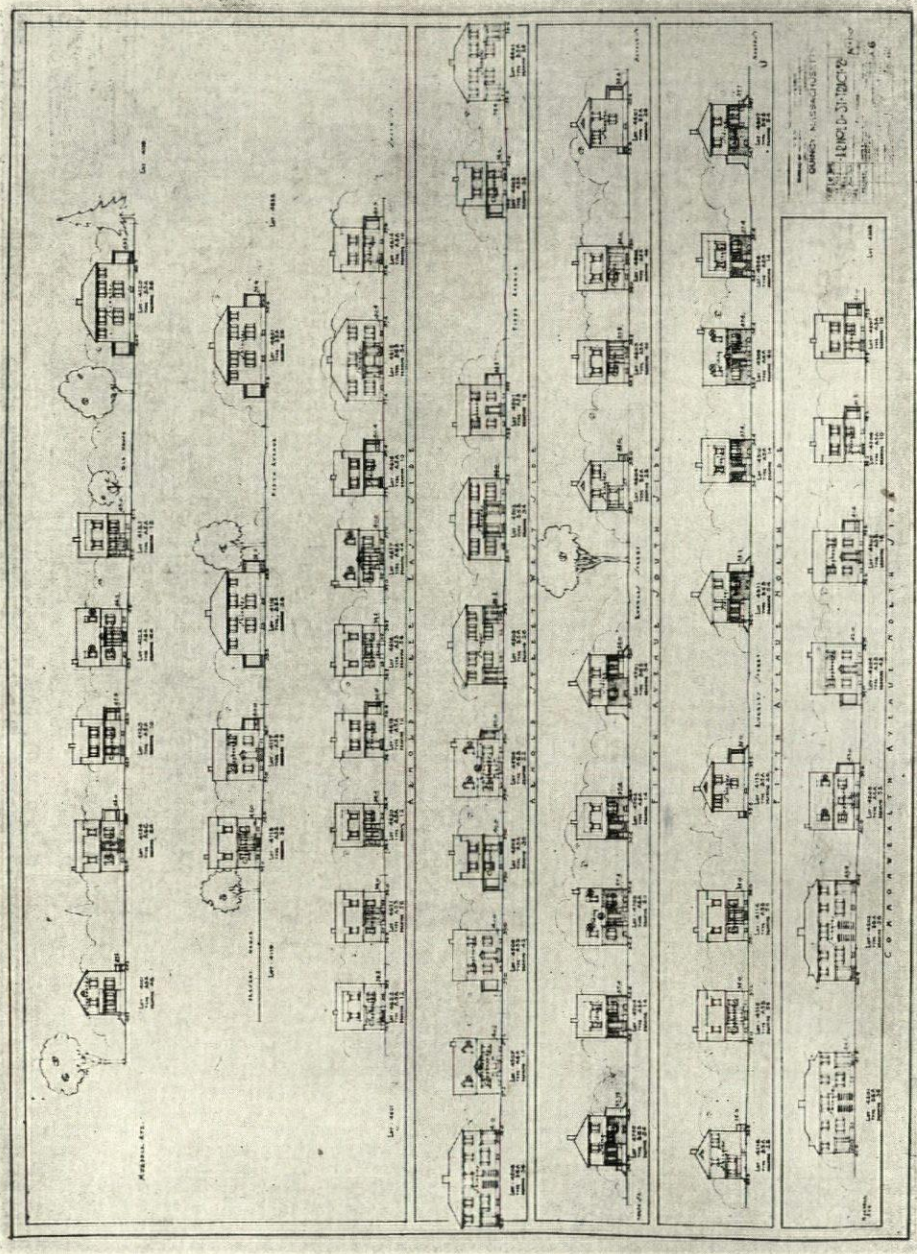
PLANS OF A SINGLE FIVE-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.



ELEVATIONS OF A SINGLE FIVE-ROOM HOUSE. QUINCY HOUSING PROJECT.  
James E. McLaughlin, Architect.



COLLECTIVE ELEVATIONS FOR THE ARNOLD STREET LAYOUT. QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



COLLECTIVE ELEVATIONS FOR THE ARNOLD STREET LAYOUT. QUINCY HOUSING PROJECT. JAMES E. McLAUGHLIN, ARCHITECT.



## *The* GOVERNMENT'S HOUSING PROJECT - AT QUINCY, MASS. -

*By*  
*Sylvester Baxter*

THE Federal Government's project for the housing of industrial workers in the Massachusetts city of Quincy is designed for the employees in a single great industry—the Fore River Ship-building Company, a subsidiary of the Bethlehem Steel Corporation. Although relating to a purely ship-building proposition, it at present concerns the Navy Department more than the Shipping Corporation, the Fore River Company being chiefly engaged in the construction of warships, both large and small. Possibly for that reason the greatly needed housing-work here was undertaken by the United States Housing Corporation rather than by the Shipping Corporation.

The Fore River Company has long been one of the leading ship-building concerns of the country, and since the war began the increase in the number of its employees has added enormously to the population of Quincy—one of the most famous historic towns of Massachusetts. Quincy is the home of two families that have long been celebrated in the history of the United States—the Quincys, who gave their name to the town, and the Adamses, who gave it the unique distinction of being the birthplace of two Presidents of the United States, father and son.

Quincy has long been an important industrial community, as well as a favorite residential suburb of Boston—a constituent part of Greater Boston. Here Gridley Bryant built the first railway in the United States—the Granite Railway, it was called—constructed to carry the stone for building Bunker Hill Monument in Charlestown from the quarries of Quincy to the waterside of the Neponset river. Steam was not used

on the railway until its absorption by the Old Colony Railroad Company late in the 18th century; the cars, loaded with granite, ran by gravitation down-grade all the way to the water and were hauled back light by horses. Bryant, the builder of the railway, was really a great engineer; railway-practice owes to him two fundamental inventions, without which successful operation would be impracticable—the railway-switch, or “points,” as the English say; and the pivot-truck. Architects will be interested to know that Gridley Bryant was father of the prominent architect, Gridley J. F. Bryant, who was one of the leading practitioners in Boston in the third quarter of the nineteenth century. In Boston he was long a partner of the celebrated Arthur Rogers, who designed the Equitable Buildings of New York and Boston and planned the Back Bay district of Boston with its stately thoroughfares. The firm was Bryant & Rogers; together they were authors of the Boston City Hall and the handsome renaissance of the first Horticultural Hall. Later Bryant was responsible for a large proportion of the new business structures erected in the “burnt district” after the great Boston fire of 1872.

The Granite Railway, in its early days, was one of the great sights for Boston people; so many used to go to witness its operation that a tavern was built at the summit for their accommodation. The granite for the monument, when it reached the water, was transferred to a steamboat that unloaded it in Charlestown. So here were already associated under one management the two great features of modern transportation: the railway and steam navigation. This first American railway is now a part of the

enterprise, with this single exception, that throughout the period both architect and owner are entitled to and receive the service of an expert adviser—first on planning, then on construction and operation. Thus, the architect, during the development of his drawings, is furnished with a vast amount of information in the form of standard details, suggestions as to materials and equipment, all with a view to permanence, efficiency and economy in upkeep of the building. Before issuing the drawings for bids, the bureau makes a detailed check in order to eliminate the probability of extras and to make certain of the appropriateness of materials and equipment.

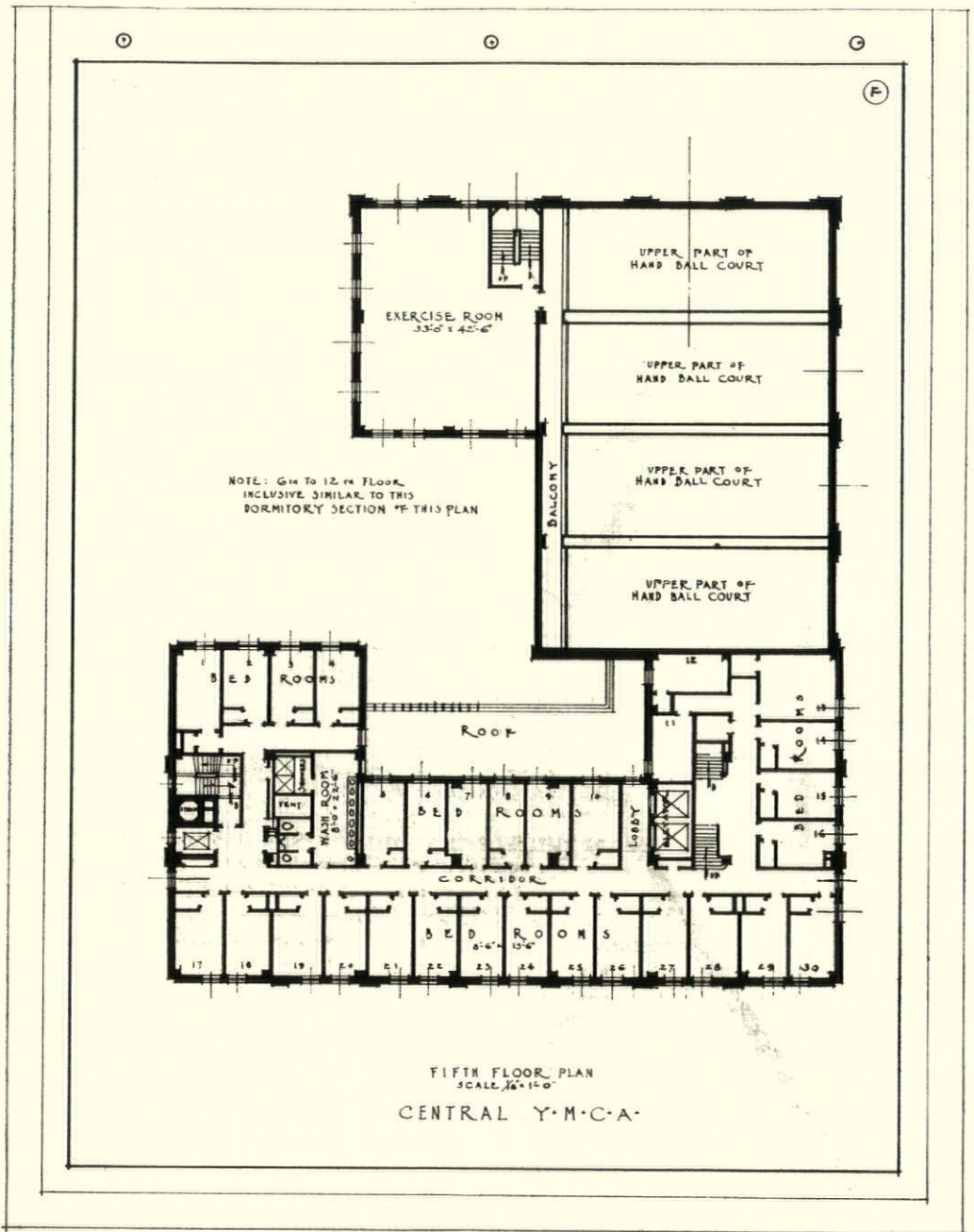
Following the opening of bids, the bureau will share with the architect the rigors of that period of negotiation with low bidders for further economies and final adjustments. At this point also the bureau prepares a detailed statement of the financial aspects in the building operation and the maintenance of the plant, so that the owner may be forewarned of all the liabilities he is incurring. In the past, embarrassment has sometimes resulted from the apparition of legitimate but unforeseen charges.

During construction, the architect

maintains his initiative and supervision over the work. The bureau, in its status as advisory agent for the owner, visits the job several times during its progress, not supplanting but supplementing the superintendence from the architect's office. Upon completion, a final check by the bureau places the stamp of approval by the organization upon the executed contract, so that payment may be prompt upon the architect's final certification.

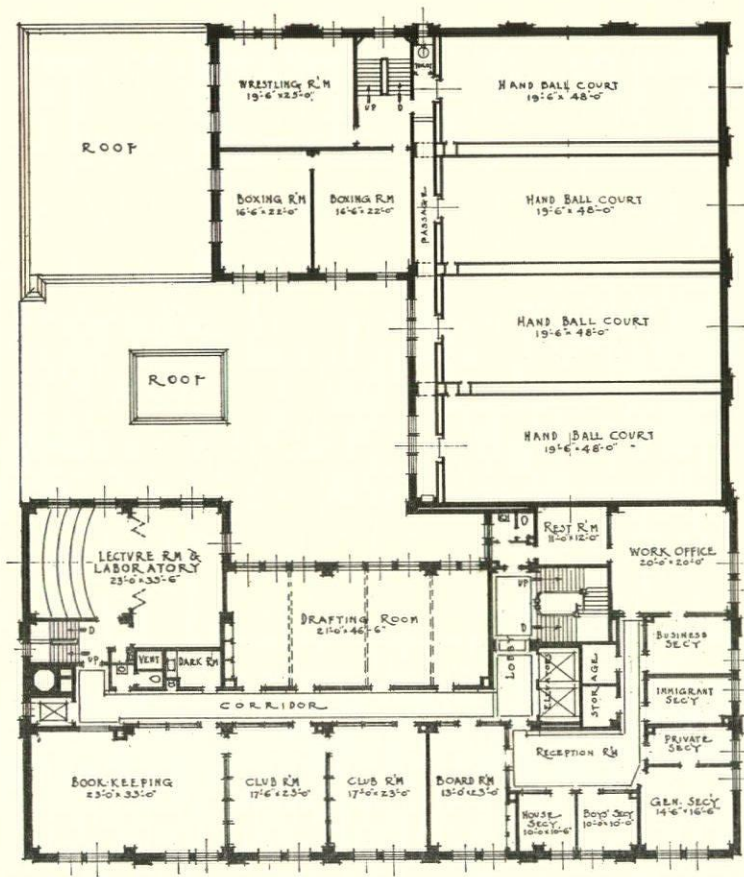
Under the Full Designing Service, all the activities we have described are carried on in the same way, except for the additional service by the bureau in preparation of the preliminary studies. Even in this case the work is done in close relationship with the architect, and open-minded consideration is given to any alternative scheme which may be suggested. Thus far, however, experience has proven that many an alternative scheme, having apparent advantages, has proved upon analysis to fall short at some vital point; and experience, too, has happily shown both architect and bureau accepting the results of such analysis in a spirit of open-minded co-operation which is the most promising augury for their relationships in the future.





LONG LAMOREAUX & LONG Assoc. Archts  
SNATUCK & HUSSEY

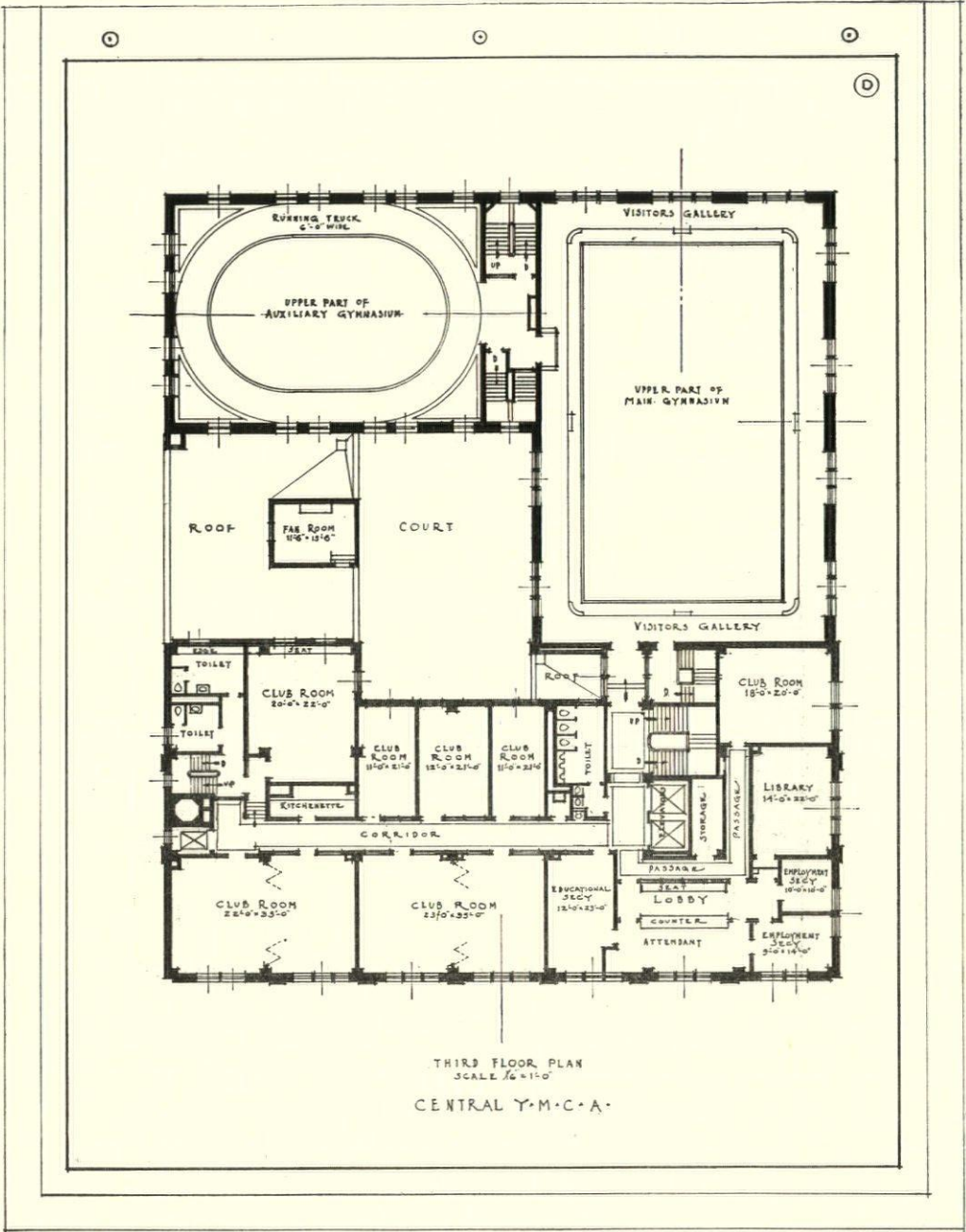
ONE OF THE MOST RECENT AND BEST  
OF THE LARGER CITY BUILDINGS.



FOURTH FLOOR PLAN  
SCALE 1/16" = 1'-0"  
CENTRAL Y.M.C.A.

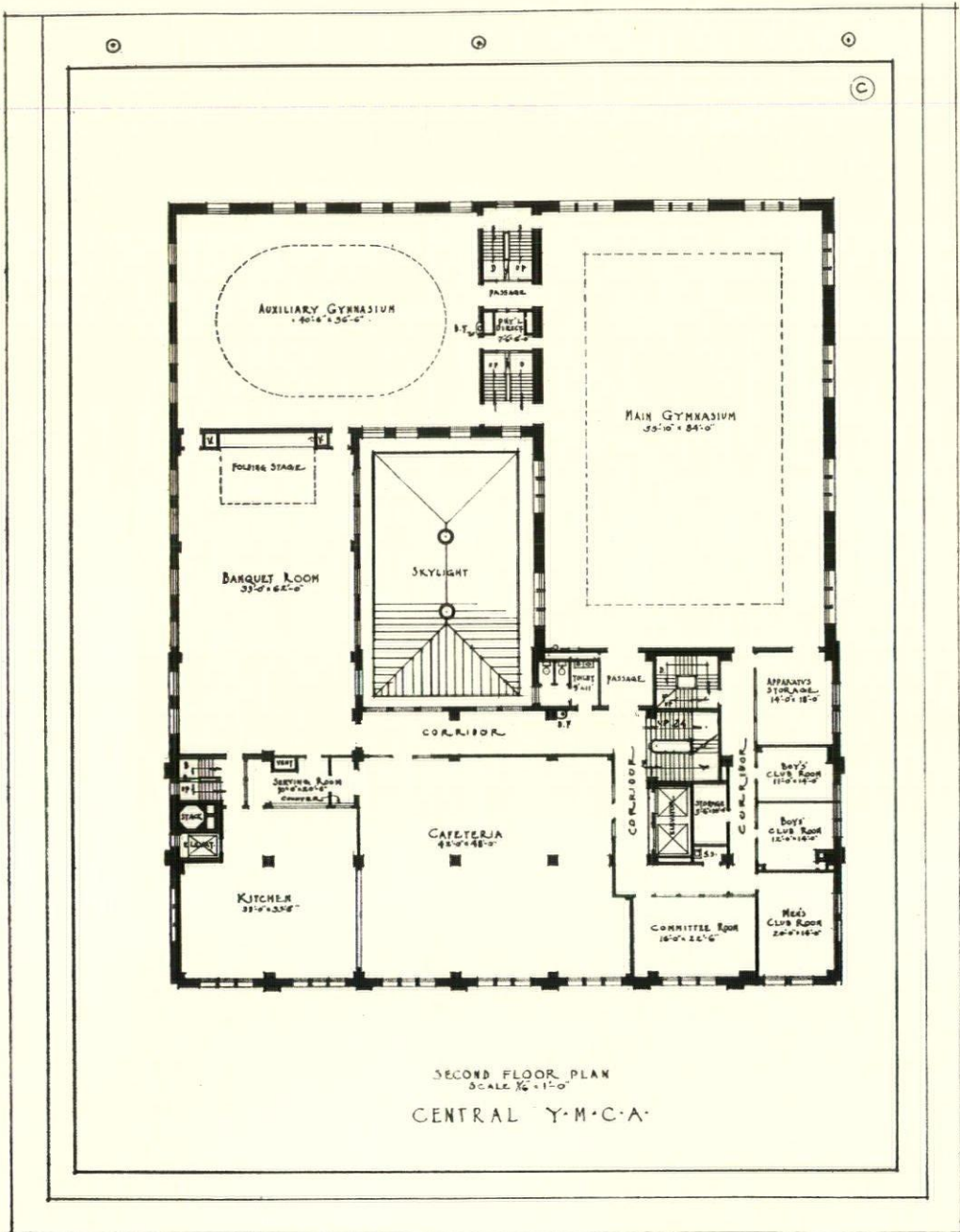
LONG JAMOREAUX & LONG Assoc. ARCH'TS  
SHATTUCK & HUSSEY

ONE OF THE MOST RECENT AND BEST  
OF THE LARGER CITY BUILDINGS.

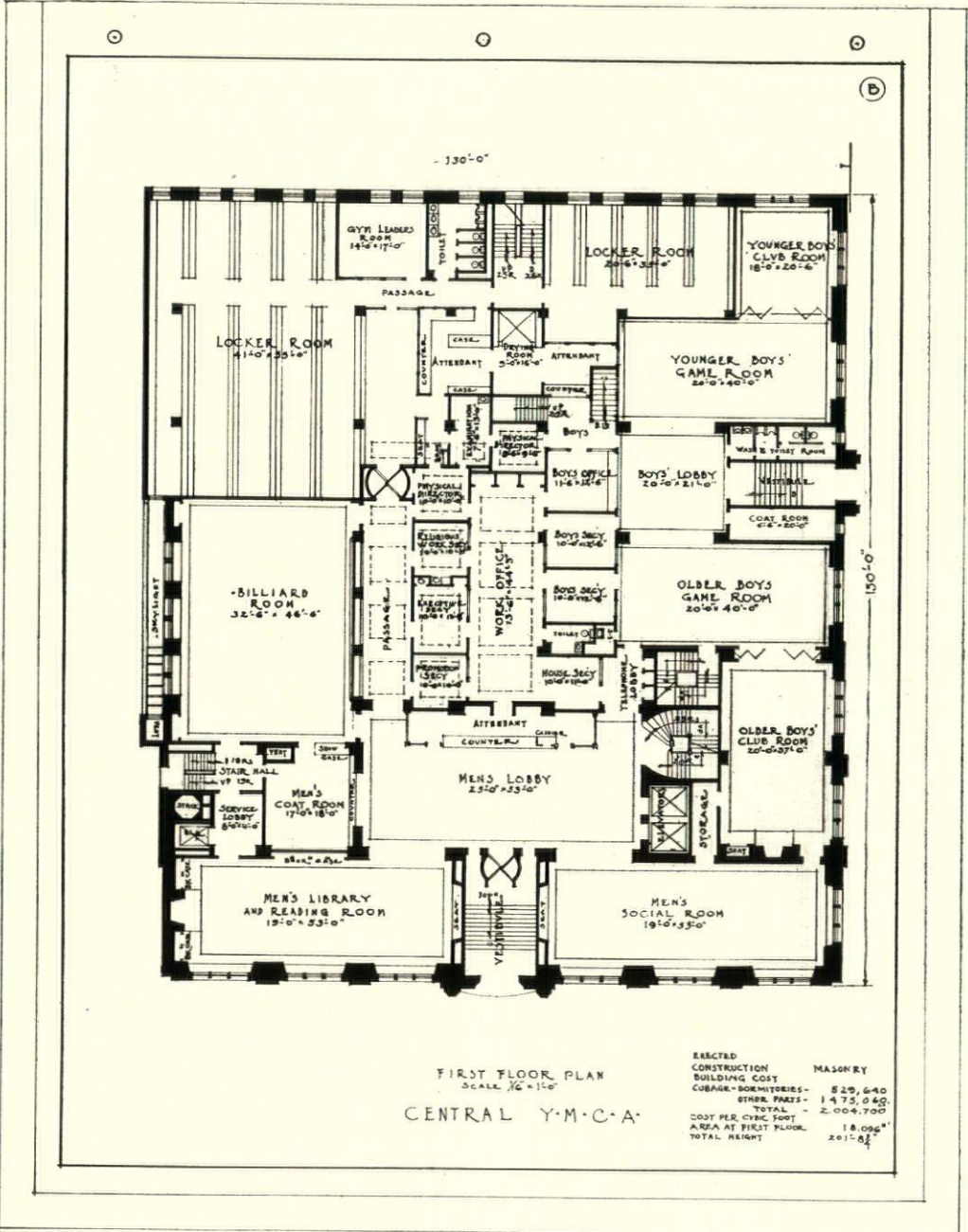


LONG LAFOREAUX & LONG ASSOC. ARCHTS  
 AND SHATTUCK & HUBBARD

ONE OF THE MOST RECENT AND BEST  
 OF THE LARGER CITY BUILDINGS.

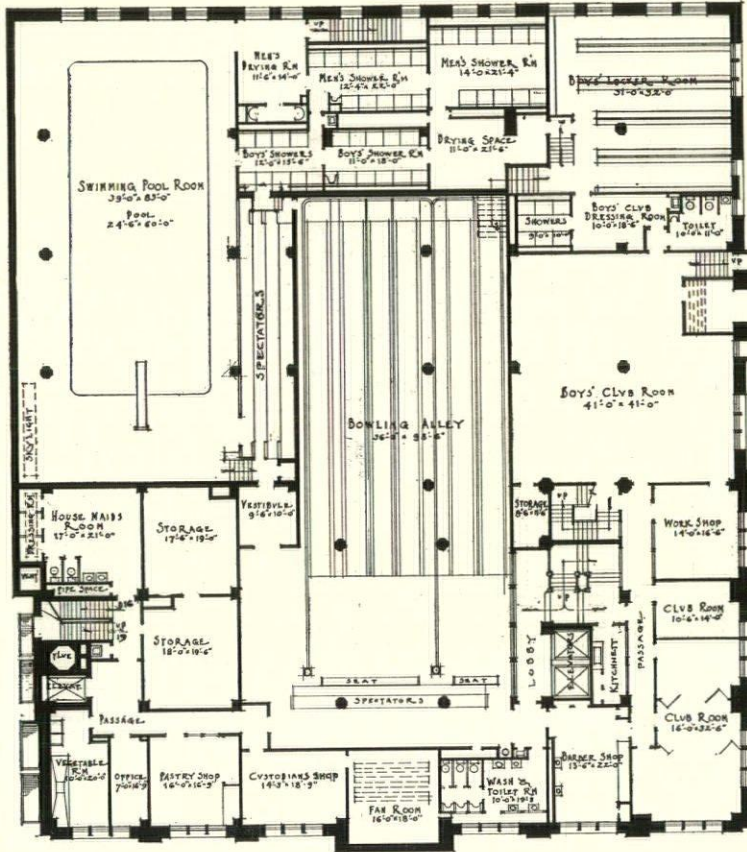


ONE OF THE MOST RECENT AND BEST OF THE LARGER CITY BUILDINGS.



LONG LANDRAUX & LONG Assoc. ARCHTS  
SHATTUCK & HUSSEY

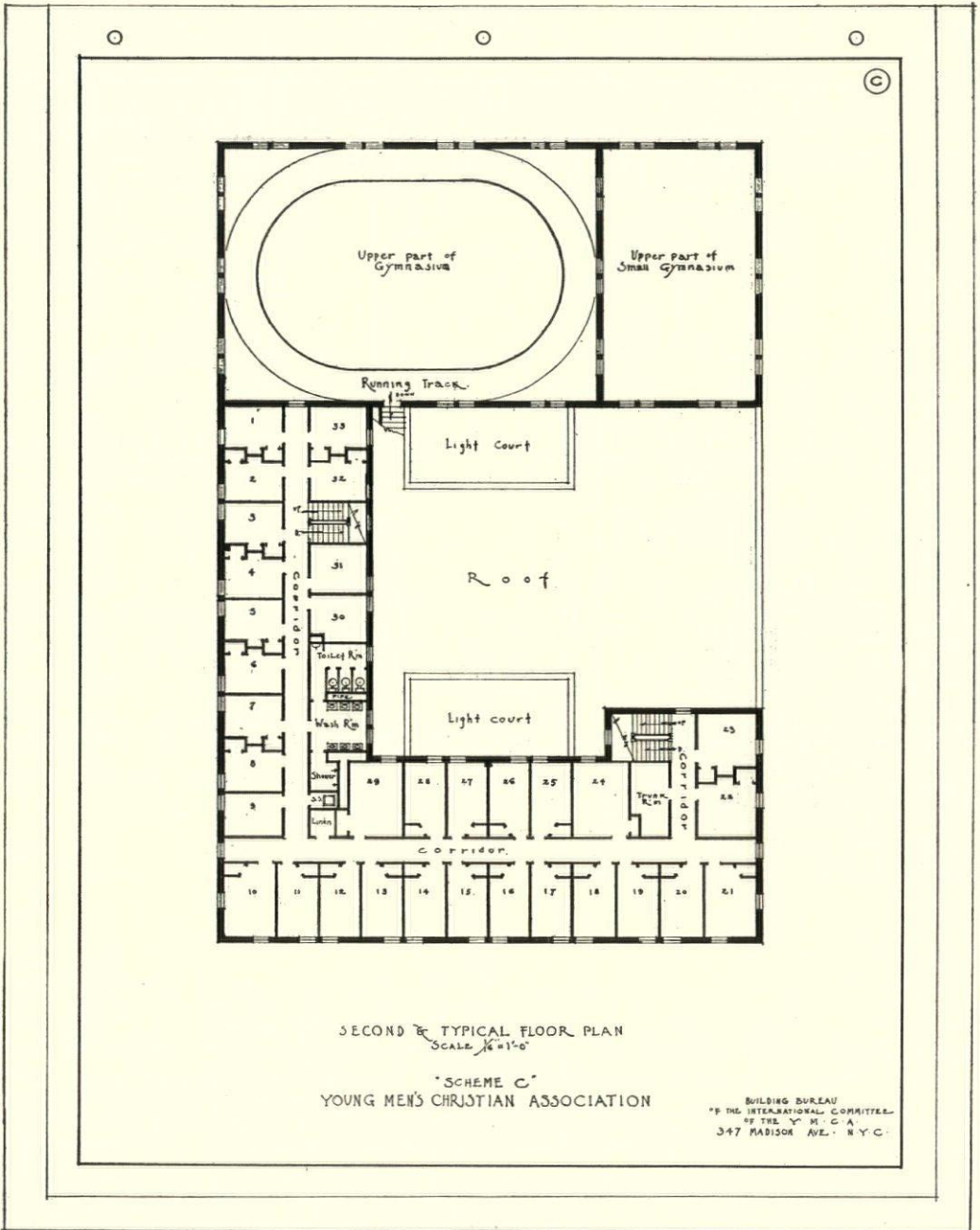
ONE OF THE MOST RECENT AND BEST  
OF THE LARGER CITY BUILDINGS.



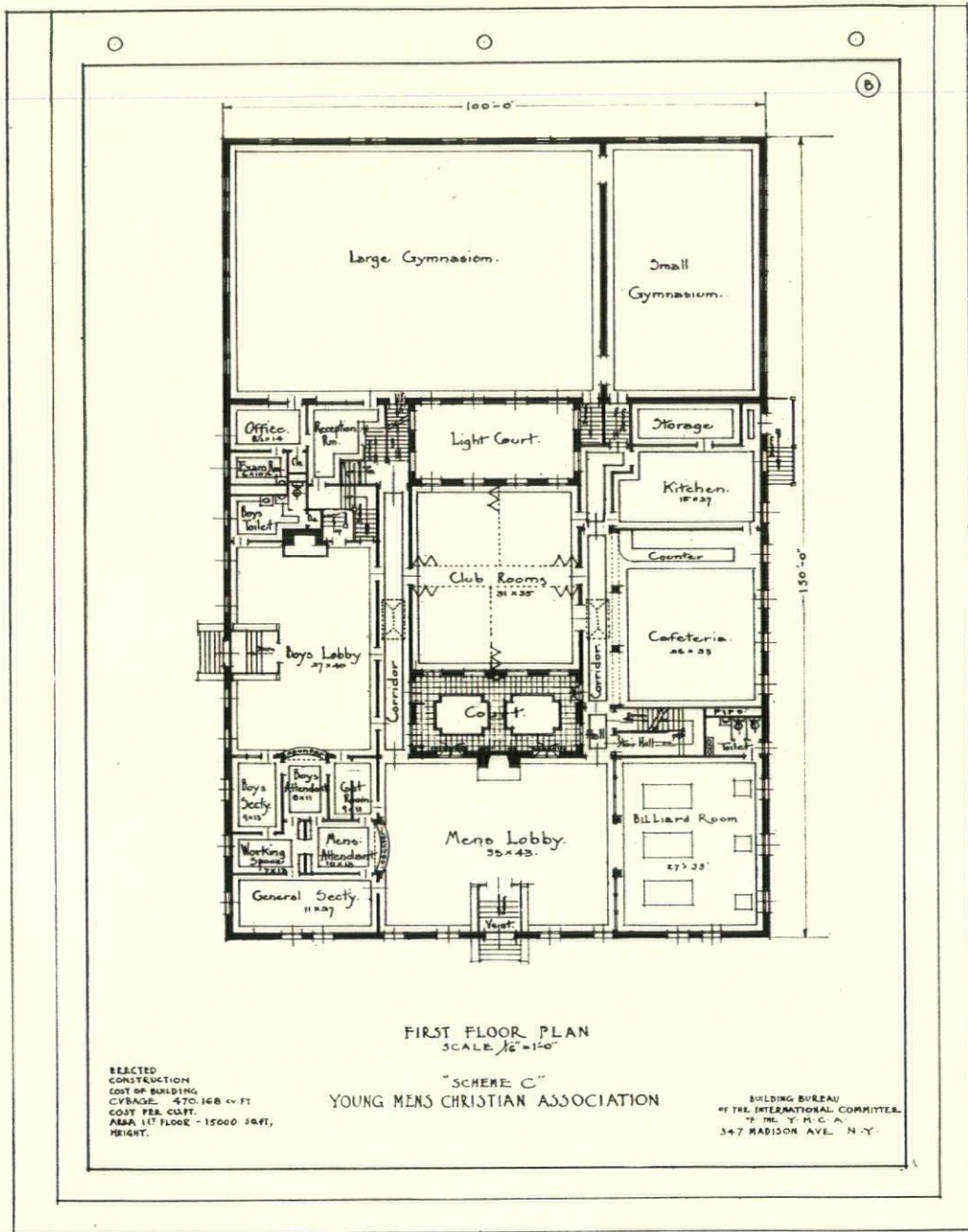
BASEMENT PLAN  
SCALE 1/8" = 1'-0"  
CENTRAL Y. M. C. A.

EDNA LAMOREAUX & LOUIS SHATTUCK & HUSSEY ASSOC. ARCHTS.

ONE OF THE MOST RECENT AND BEST OF THE LARGER CITY BUILDINGS.

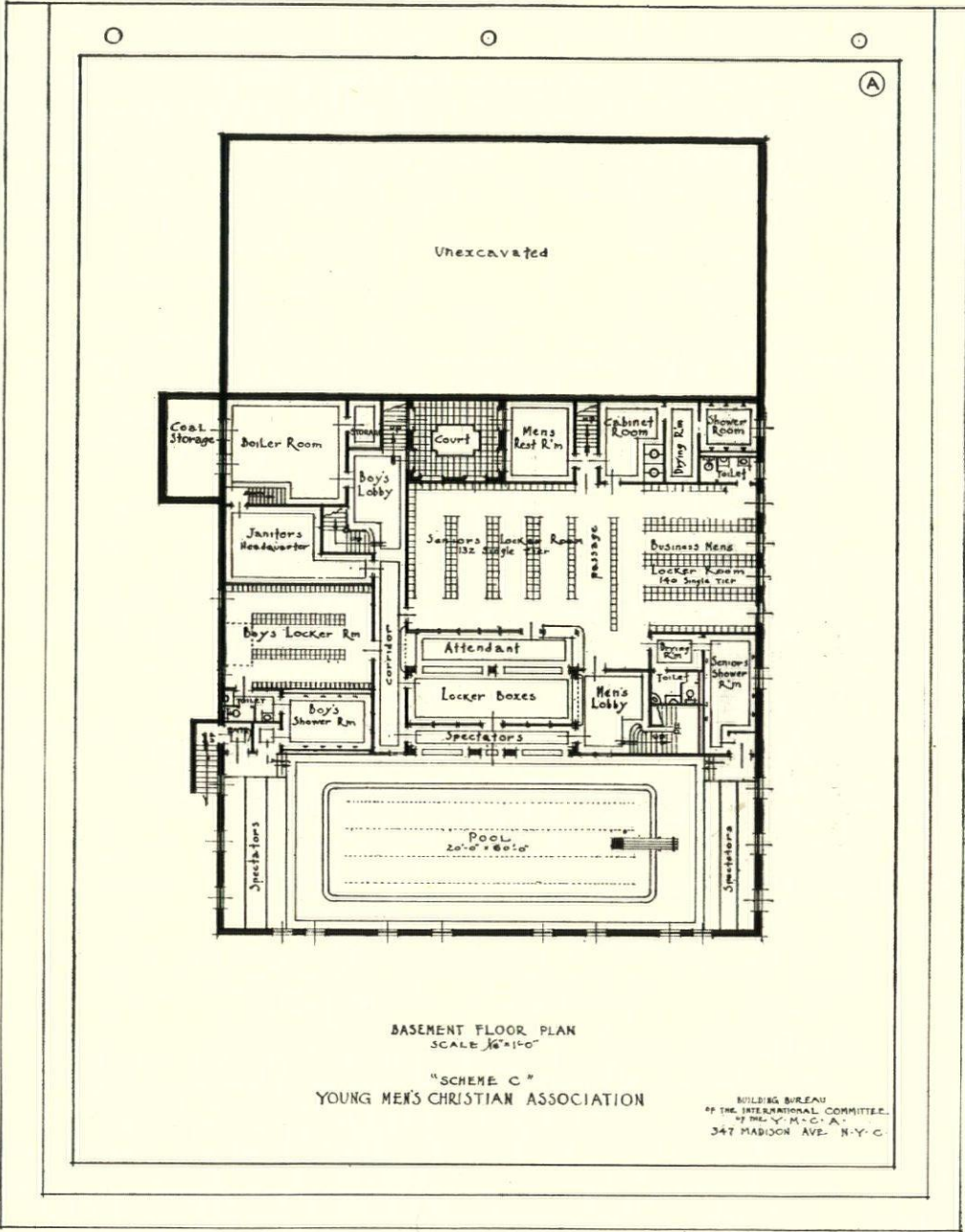


A BUILDING FOR WHICH DRAWINGS ARE NOW UNDER WAY TO SERVE A SMALL CITY. AN UNUSUALLY COMPLETE LAYOUT FOR A BUILDING OF THIS SIZE.

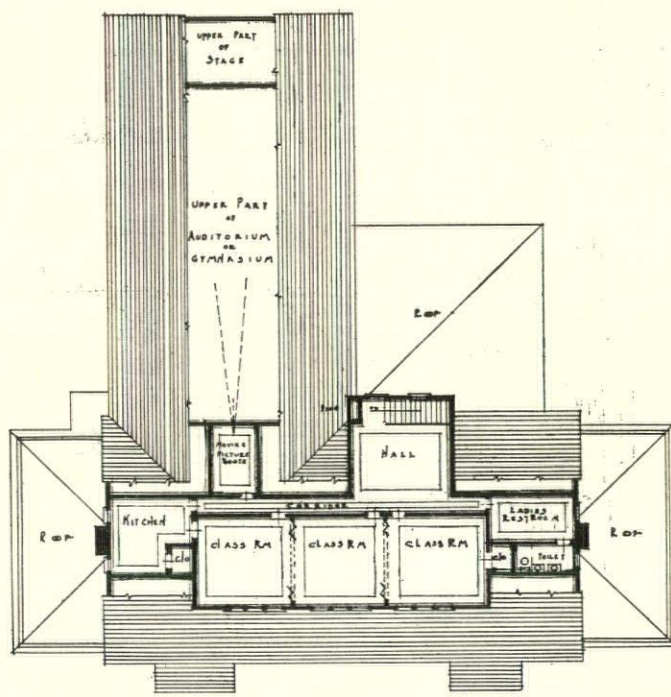


A BUILDING FOR WHICH DRAWINGS ARE NOW UNDER WAY TO SERVE A SMALL CITY. AN UNUSUALLY COMPLETE LAYOUT FOR A BUILDING OF THIS SIZE.





A BUILDING FOR WHICH DRAWINGS ARE NOW UNDER WAY TO SERVE A SMALL CITY. AN UNUSUALLY COMPLETE LAYOUT FOR A BUILDING OF THIS SIZE.

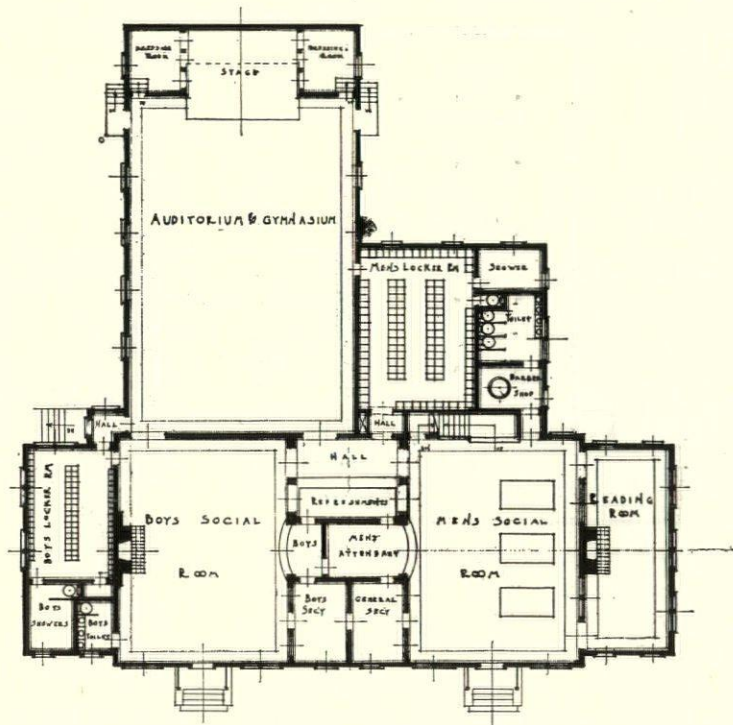


SECOND FLOOR PLAN  
 SCALE  $\frac{1}{16}'' = 1'-0''$   
 TYPE C 4

BUILDING BUREAU  
 OF THE INTERNATIONAL COMMITTEE  
 OF THE Y.M.C.A. OF THE U.S.  
 847 MADISON AVE. NEW YORK, N.Y.

IN CHARGE OF	BY	DATE
DESIGNED BY	REVISION	REVISED
APPROVED BY	SHEET	

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



FIRST FLOOR PLAN  
SCALE  $\frac{1}{8}'' = 1'-0''$

• TYPE C 4 •

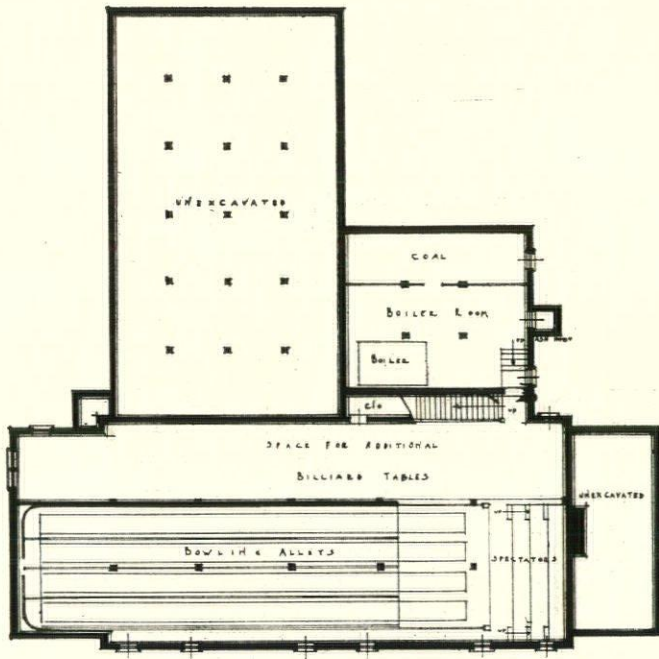
TOTAL AREA - 8,700 SQ. FT.  
TOTAL CUBAGE - 107,700 CU. FT.

BUILDING BUREAU  
OF THE INTERNATIONAL COMMITTEE  
OF THE Y.M.C.A. OF THE U.S.

247 MADISON AVE. NEW YORK, N.Y.

IN CHARGE OF	DESIGNED BY	DRAWN BY
CHECKED BY	APPROVED BY	DATE
SHEET		

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



BASEMENT FLOOR PLAN  
SCALE 1/4" = 1'-0"

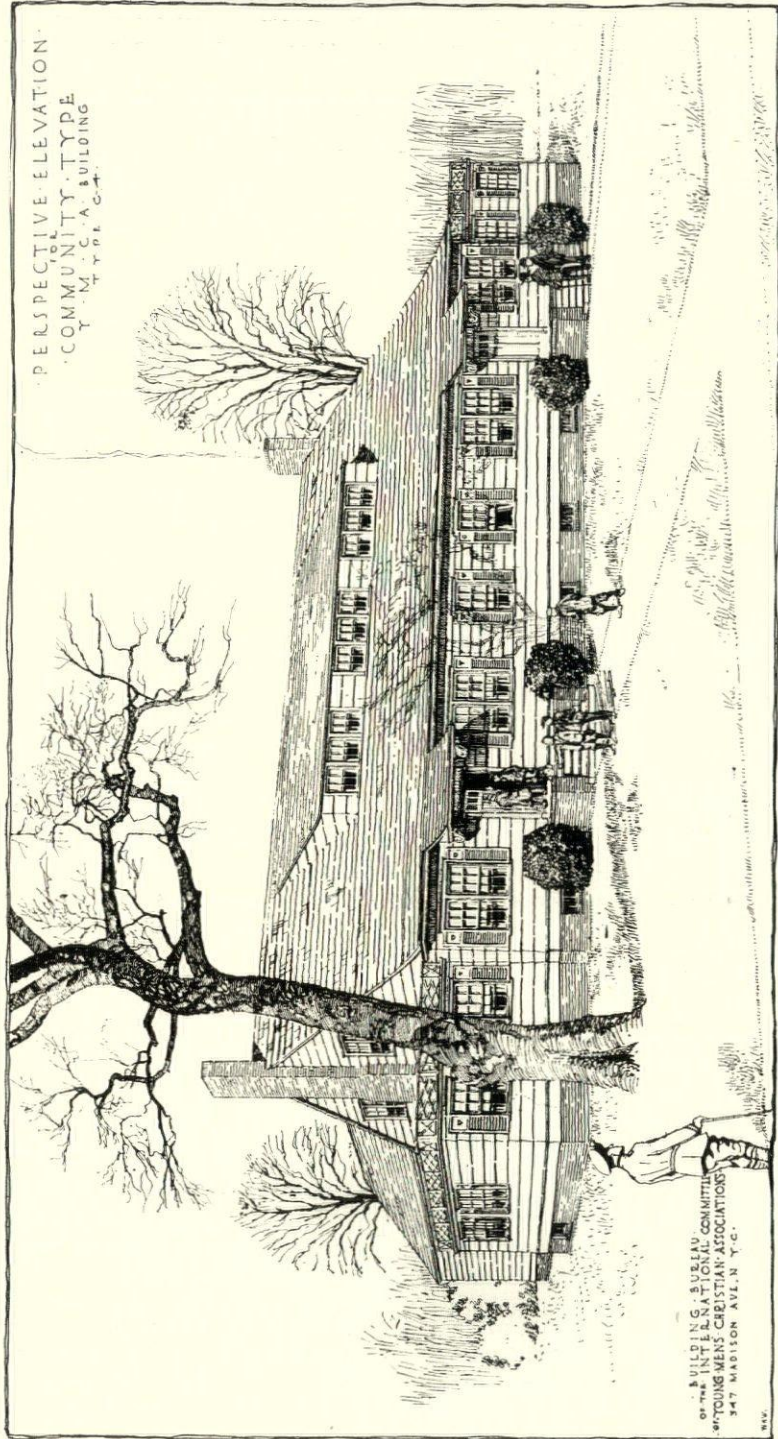
TYPE C4

BUILDING BUREAU  
OF THE INTERNATIONAL COMMITTEE  
OF THE Y.M.C.A. OF THE U.S.

247 MADISON AVE. NEW YORK, N.Y.

IN CHARGE OF DESIGN BY		NEW YORK, N.Y.
CHECKED BY		DATE
APPROVED BY		REVIEWED

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.

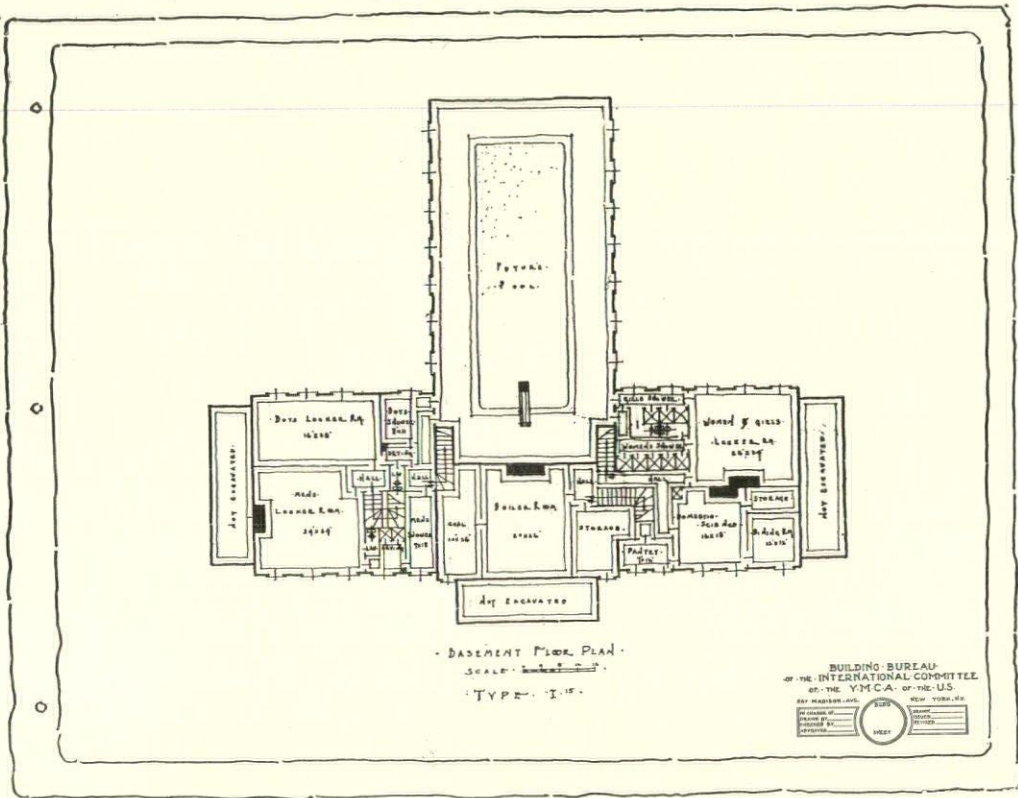


PERSPECTIVE ELEVATION  
 COMMUNITY TYPE  
 T. H. C. B. C. T.

BUILDING BUREAU COMMITTEE  
 OF THE INTERNATIONAL ASSOCIATION  
 OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS  
 347 MADISON AVENUE, N. Y. C.

M. V. C.

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS  
 OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A  
 BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO  
 SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.



DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.

tect should be reflected in the amount of his fee.

It should also be noted that the contract provides increased compensation for the architect in case the requirements for the building itself should be altered in any vital respect. This is not unheard of, for a sudden wave of enthusiasm may produce a larger building fund than was originally counted upon.

We digressed from the chronological order of events in order to take note of the nature of the architect's contract. The next step after its signature is likely to be a tour of inspection of existing plants, by architect, local building committee, and a representative of the bureau. This tour may run through a week or ten days, and during this time the process of saturation of the architect's mind with the Y. M. C. A. idea, and with the elements of the planning problem, has been continuing, together with the accu-

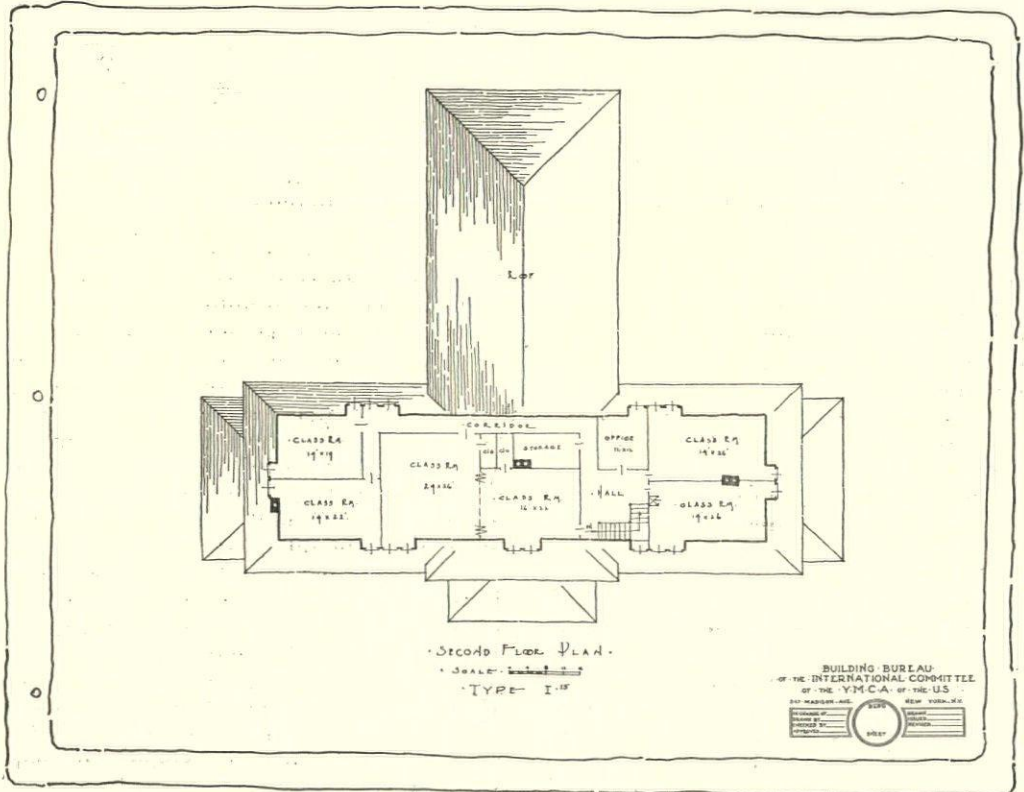
mulation of ideas and principles for application to his own planning problem. There is a difference (let us note in passing) between this kind of accumulation of *principles*, and the accumulation of *things* with which the building committees used to return home, with the result that there was a call for the embodiment in the building, of the gymnasium from Brooklyn, the swimming pool from Rochester, the locker room from Minneapolis, and so on, *ad infinitum*. That system of accumulation tended to produce confusion rather than simplification.

In all probability the preliminary studies have been started *en tour*; at any rate their preparation, discussion, revision and adoption become the immediately ensuing task for the architect committee and bureau. From this point through to the construction and occupancy of the building the procedure is precisely that of the usual architectural

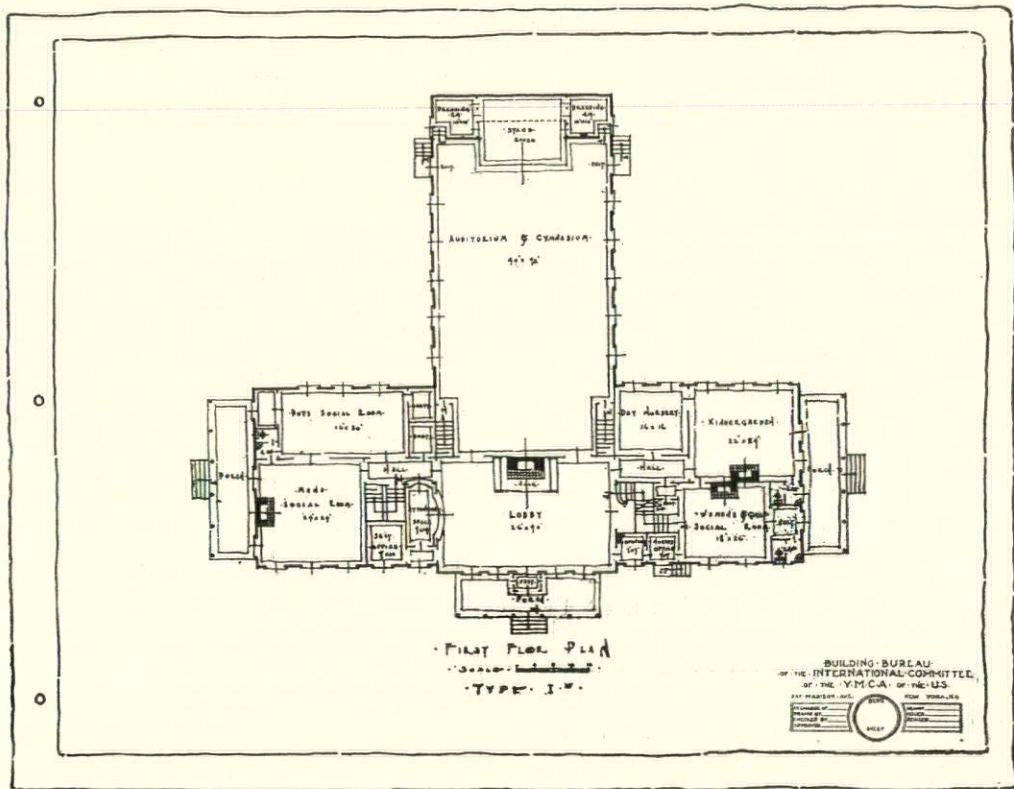
garding free revision of drawings might easily work hardship to the architect, for no one can forecast costs with any accuracy so long as labor and material prices maintain their hectic instability. On the other hand, it should be remembered that this contract is drawn up with a view to the whole era of peace-time construction which is in vivid anticipation throughout the Y. M. C. A. circles. Under stabilized conditions, and with the accumulated knowledge in the bureau's experience, it should become possible before long to make a very accurate preliminary estimate of the building cost before drawings have left the architect's office for bids.

The question may properly be asked, who pays for the work of the bureau? Is the cost of its service to be deducted from the commission the architect would ordinarily receive, and does the fee fixed in the contract represent such a net sum?

That, happily, is *not* the case. The sum paid the architect is a matter of adjustment for each case, determined by the individual conditions, but based upon and in some cases as great as the usual professional fee for the service required. The bureau receives compensation from the local organization, for its services as expert adviser, exactly as the consulting engineer or operating adviser is called in by the owner or architect in other problems of a technical nature. For the limited service, that is, for the case where preliminary studies are prepared by the architect, and the bureau's capacity is purely advisory, the charge is a fixed fee of 1 per cent. on the proposed cost of the building; for the complete service, where the bureau itself makes the preliminary studies, the charge is 1½ per cent. In this case, of course, it is proper that the smaller amount of work done by the archi-



DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.



DEVELOPED FOR A COTTON MILL COMMUNITY NEEDING A BUILDING TO TAKE CARE OF MEN, WOMEN, BOYS, GIRLS AND SMALL CHILDREN.

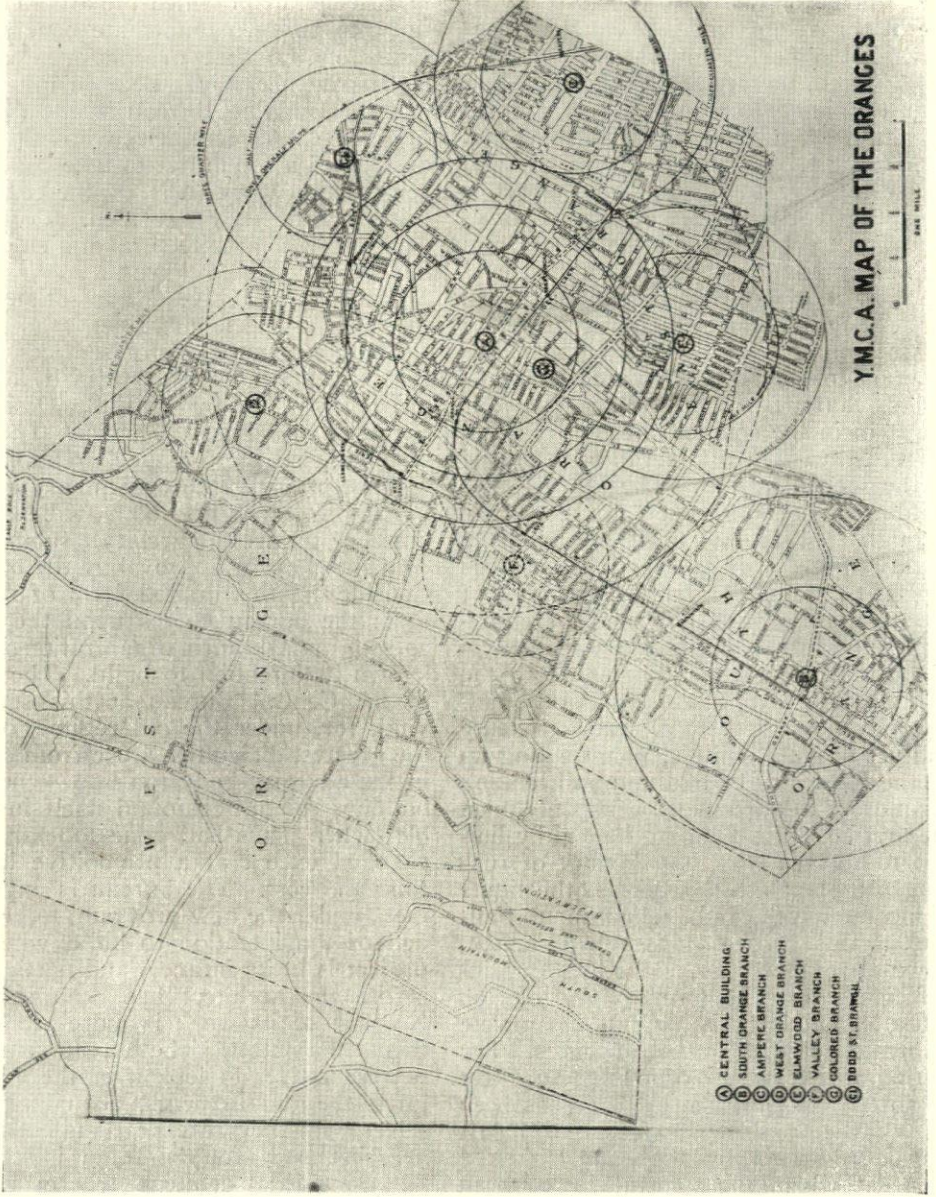
committee with a definite recommendation.

If this recommendation goes through, as it is all but certain to do, the formal appointment of the architect takes place, and the contract, which is always made for professional services, is drawn up and duly executed. This contract (we are speaking of the case of advisory service on the part of the bureau) differs little from the usual document of its sort, except for one or two clauses. These are, however, noteworthy. For the first, the architect virtually guarantees to design a structure which can be built for the appropriation—a sum stipulated in the contract as the cost of the building. That is to say, in case the bids received on his estimating drawings exceed the appropriation, he agrees to make such revisions as may be necessary to bring the price down to the desired limit, without cost to the owner. This does mean, to be

sure, at greater or less cost to himself, for the other noticeable feature of the contract is that the architect's commission is not based on a percentage of the cost of construction, nor calculated from the drafting and overhead costs, but is a fixed sum, agreed upon in advance and laid down in the contract. The percentage fee is discarded because of the usual criticism that under it the interest of the architect runs counter to that of the owner. It ought, presumably, to run parallel, or at the least be independent. Here it is hoped that, by making definite from the first the exact amount receivable, the architect's mind may be set free to devote itself to the single purpose of producing the desired set of accommodations at the given price, by the most direct route and in the most efficient manner possible.

Under conditions prevailing at present it is fair to say that this stipulation re-





**Y.M.C.A. MAP OF THE ORANGES**

- Ⓐ CENTRAL BUILDING
- Ⓑ SOUTH ORANGE BRANCH
- Ⓒ AMPERE BRANCH
- Ⓓ WEST ORANGE BRANCH
- Ⓔ ELWOOD BRANCH
- Ⓕ VALLEY BRANCH
- Ⓖ COLORED BRANCH
- Ⓗ 8000 ST. BRANCH

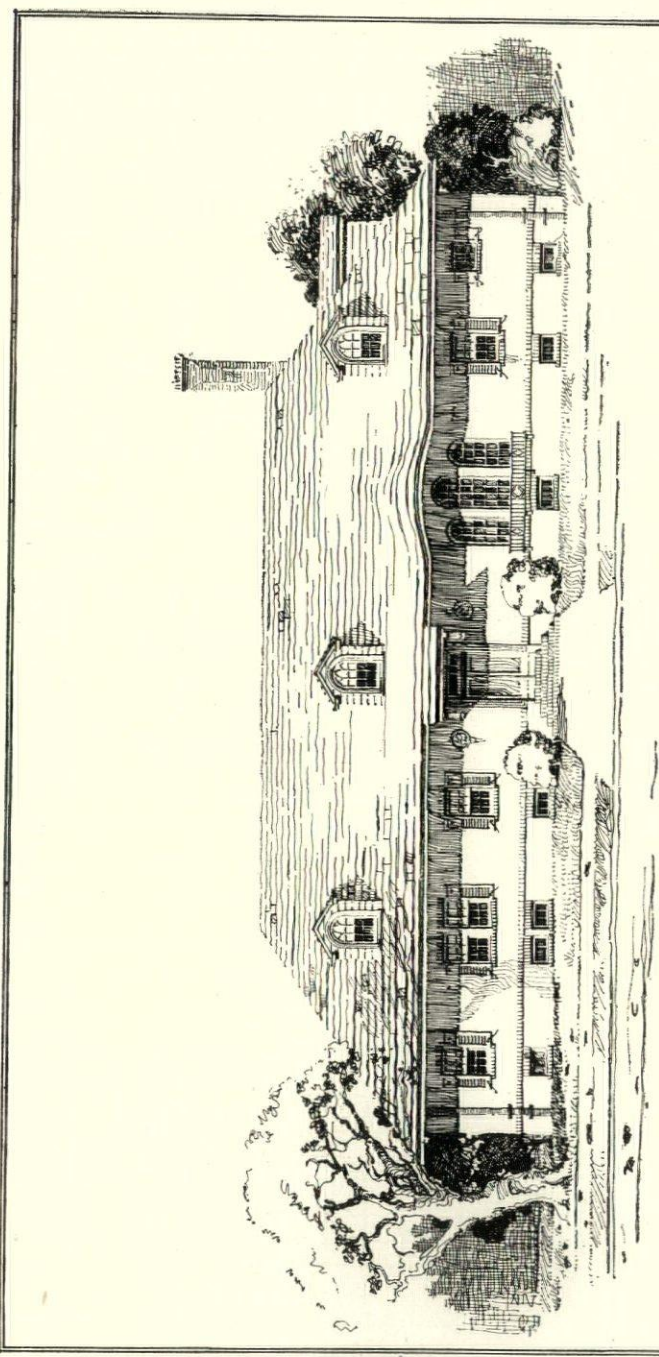
accommodations so that the lowest bidder of the group will just equal the immovable number of dollars.

Then, too, the architect is here dealing with a building committee which, it must be admitted, is not invariably a unit within itself, nor always equipped with the seeing eye to distinguish the better from the worse; even secretaries sometimes have pet ideas whose absence from the new building will leave it in their eyes a hollow mockery, and their own spirits, areas of devastation. This responsibility to a committee of diverse personnel is common to other types of architecture—banks, churches, and the like—but it is one item in the composite background in the Y. M. C. A. work. Add to these one further consideration. The Y. M. C. A. building makes its appeal to the public through its architectural design, the quality of its finish, and the more obvious aspects of planning; that is, directness of access, quality and sufficiency of equipment, comfort and pleasureable aspects of the club features. These are to the organization, also, essentials; but a building may possess them all par excellence and yet prove a white elephant eating up all the fodder to be had and still looking for more. In other words, not only must the first cost of a building be rigidly limited to a given sum, but the cost of running the plant must be within the limits of income which can be relied upon. Failure in this respect gives an ill-kempt, down-at-the-heel look to the building, insufficient control and supervision of club activities, and, probably, an incomplete utilization of the plant's capacities. The testing of this feature of maintenance cost by forecast from a set of plans has been one of the troublesome features in past procedure—it is by the same token a point at which the Central Bureau can most directly prove its worth and earn its cost for the national organization.

With these points in mind, we can better move on to look over the program of the Building Bureau for its wider and widening activities. And at the outset it should be made clear that what it is anxious *not* to do is to usurp the architect's prerogatives or to destroy his initiative. It desires rather to provide a co-operating source of accumulated and authoritative

knowledge, upon which the architect can draw to his own immediate benefit and, ultimately, to that of the organization and its membership. Bear in mind also that the Building Bureau is *not* a group of Y. M. C. A. secretaries who have been designated a committee to take charge of construction work; it is, on the contrary, composed of technical men, adequately equipped with architectural and engineering training, who have been absorbed into the Y. M. C. A. organization from the professional field.

There are two kinds of services which the bureau proposes to furnish for any prospective building: Full Designing Service and Advisory Service. They are distinguished in that the bureau, in the former, prepares the preliminary studies in its own drafting room while in the advisory service the architect submits his own sketches for approval by the bureau. Considering this limited form of service first: the bureau comes upon the scene as soon as a branch organization makes known its intention to build. The entry of the Central Bureau at this stage is vital, for, under the old régime, one of the greatest difficulties arose from calling in the advisory body too late—when the building committee found itself in trouble; when plans had gone too far to be changed except at a prohibitive loss in time and cost. The bureau is expected, then, under the new program, to be notified of the intention to build when the project is in its infancy, and particularly before the architect has been selected. No part of its work is more vital than this at the outset. The bureau sends out representatives to look over the ground, learn the requirements, acquaint themselves with the professional talent in the neighborhood—for the policy is strongly for using local architects wherever feasible—examine sites and confer with the local committee on all questions of early policy. Having acquainted themselves with the general features of the problem, having examined executed work of the architects under consideration, the bureau's representatives are in a position to narrow the choice down to three or four names; with these they go into the matter further in detail, until they are ready to go back to the local building



SUGGESTED ELEVATION.  
 COMMUNITY TYPE T-M-C-A-BUILDING.  
 SCHEME C-1.

BUILDING BUREAU  
 OF THE INTERNATIONAL COMMITTEE  
 OF T.M.C.A.  
 347 MADISON AVE., NEW YORK, N.Y.

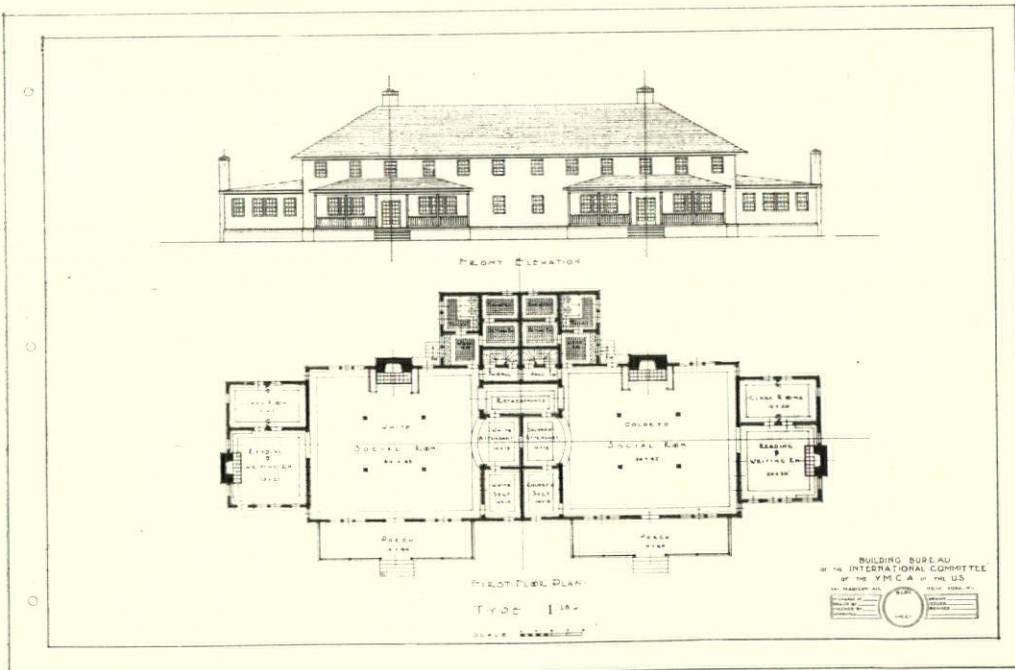
1934

A NEW TYPE FOR SMALL COMMUNITIES OFTEN SUBSIDIZED

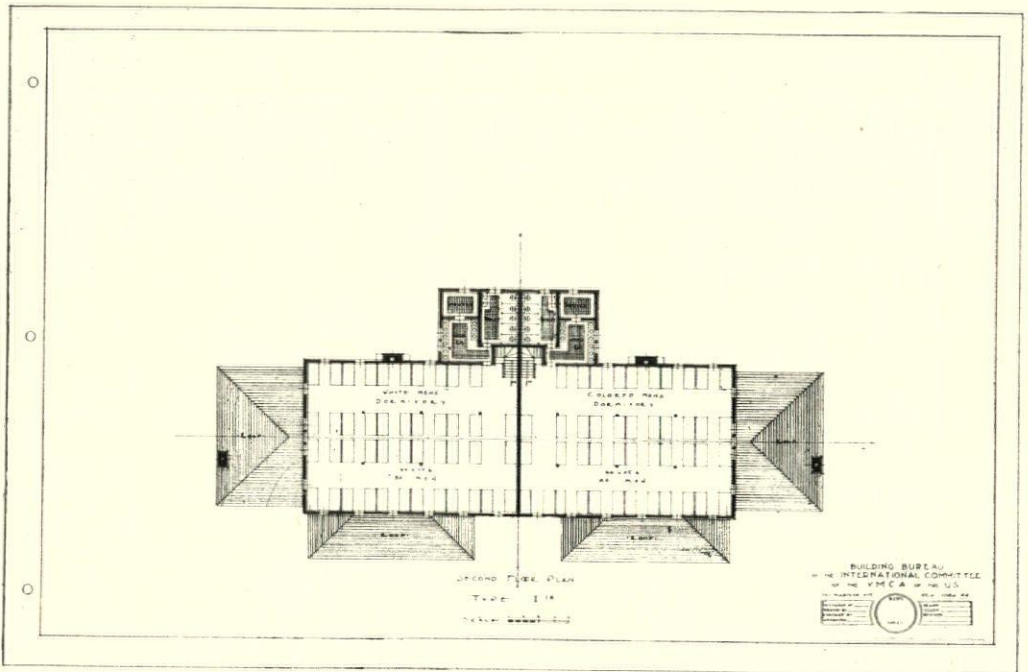
three years; then there is the influence upon future construction, of a new conception of the Y. M. C. A. in relation to its work in large cities and in moderate-sized ones having satellite communities more or less closely allied with them. Under such conditions it is proposed, instead of maintaining a single large central plant, to recognize the *neighborhood* tendency as it is being more and more expressed in community life. There will still be a Central Branch Y. M. C. A. building, but somewhat smaller in size, and there will be, in addition, a number of buildings of the new "community" type, located at strategic points, preferably adjacent to athletic fields. The illustrations show sketches for one of the earliest of this type of building, as well as a map showing in diagrammatic form the locations and spheres of influence of a cluster of such units. This map indicates, finally, a branch of work which promises to require a considerable amount of new building construction—that is, the industrial type. Here the Y. M. C. A. proposes to establish buildings as centers for the community life of

the workers in a single large plant, or those of a group of smaller plants in an industrial town. Taken in the aggregate, these anticipations of building activity are impressive, even to our present enlarged habit of mind.

Before we speak of the specific program there are a couple of considerations which apply to the Y. M. C. A. building as a class, and which thereby become a part of the background for every such planning problem. To begin with, the building appropriation is almost without exception a sum fixed with a Medes-and-Persian fixity. Other classes of building set a limit upon the appropriation, but there is always a financial factor of safety—a slight degree of flexibility wherewith to meet the exigencies of building operations—some of which admittedly cannot be foreseen. In Y. M. C. A. work the requirement is to do the work for the appropriated sum—or go without. And, remembering that bids on identical plans and specification are wont to vary by 10, 20 or even 30 per cent., it becomes no mean task for the architect to incorporate in his building the maximum



FOR A SHIPBUILDING YARD, EMPLOYING WHITE AND COLORED HELP.



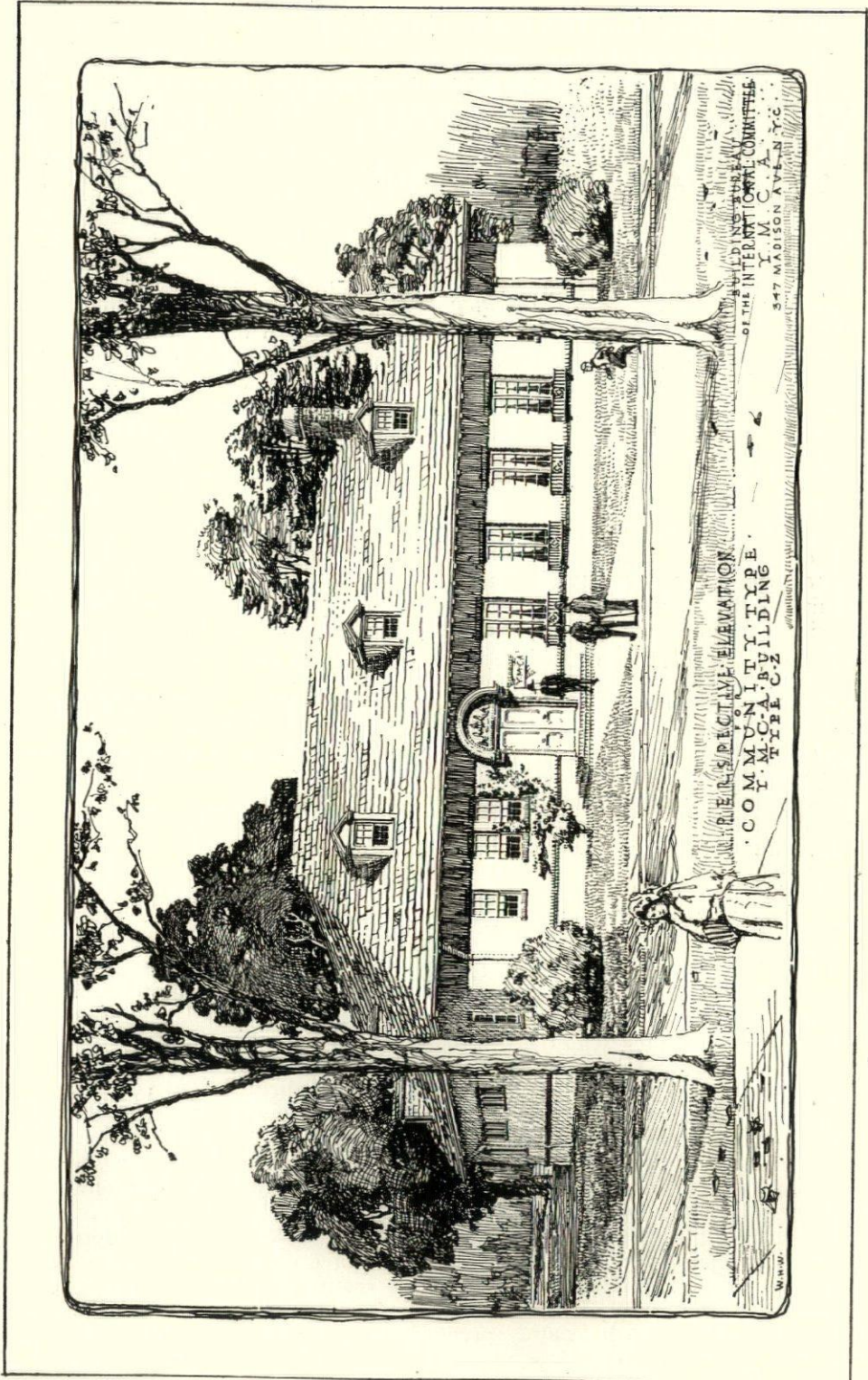
FOR A SHIPBUILDING YARD, EMPLOYING WHITE AND COLORED HELP.

intensive study of the planning problem from the organization standpoint; during this time Mr. Neil McMillan, Jr., Director of the bureau, traveled very extensively, visiting almost every important Y. M. C. A. building in the country. Then came this country's entry upon the war, and for the following eighteen months the bureau had charge of all that tremendous amount of construction work for the Y. M. C. A. which was done among the war camps; the other six months have been equally busy in preparation for and launching out upon its new program. The bureau had formerly been able to serve local building committees to a certain degree. It had, for example, been accustomed to furnish plans for previous buildings which were hopefully intended to aid in solution of the problem in question. Unfortunately, a plant of so many interdependent branches as a Y. M. C. A. building (and no one who has not planned such an outfit can appreciate this intricacy)—can not clearly express these functional relations on a set of blueprints, nor can the most intelligent student divine them by examination from the outsider's viewpoint. The result

of this system of blueprint distribution, therefore, left much to be desired. As often as not, the main idea was overlooked, and minor specialties, visible to a superficial eye, were pounced upon for use in a plant where they applied not at all. Taken in the large, the wonder is that the architectural output of Y. M. C. A. building has been as good as it is. The Building Bureau of the International Committee hope to make it better still. They foresee, with no telescopic vision, a tremendous increase in the demands upon their organization in the approaching peace era; they propose to make their future plants increasingly the expression of a focusing of the most able and widely distributed architectural talent of the country upon their problems.

This forecast of future large demands upon the Y. M. C. A. building organization is based upon several well-grounded premises. There is, to be sure, the normal growth of the organization, which cannot conceivably fall short of the record of the pre-war period; there is, again, the extra amount of work which must to some degree compensate for the very serious underbuilding of the past





BUILDING TYPE  
 OF THE INTERNATIONAL COMMITTEE  
 I. M. C. A.  
 347 MADISON AVE. N. Y. C.

PERSPECTIVE ELEVATION  
 COMMUNITY TYPE  
 I. M. C. A. BUILDING  
 TYPE C-2

A NEW TYPE FOR SMALL COMMUNITIES, OFTEN SUBURBS  
 OF A LARGER TOWN. THESE BUILDINGS WILL HOUSE A  
 BRANCH OF A LARGE ASSOCIATION, OR WHEN THERE IS NO  
 SUCH CENTRAL BODY, AN AUTONOMOUS ORGANIZATION.

# A POST-WAR CONSTRUCTION PROGRAM

THE BUILDING BUREAU *of the*  
INTERNATIONAL COMMITTEE *of the* Y.M.C.A.

## PART I

*By Charles C. May*

ONE who stops to think over the various classes of architectural work which find their way into the pages of the professional magazines will doubtless be surprised to find how small a proportion of these pages have dealt with the planning and design of Y. M. C. A. buildings. In general the plate files of the architectural office become cluttered with a mass of material accumulating faster than normal absorption can take care of it. With Y. M. C. A. buildings the opposite is true. Oftentimes the architect's file is empty; otherwise the material is fragmentary or obsolete; in fact, no case of an article within the past five years treating the subject in a manner at all comprehensive comes readily to mind.

This lack of published material is the more striking when contrasted with the bulk of executed work. During the past fifteen years, Y. M. C. A. buildings throughout the country have multiplied prodigiously. Not less than 500 new buildings have been erected, aside from the numerous cases where alterations have transformed buildings for Y. M. C. A. use. Count the cost of such new construction work at the seventy-five millions of dollars to which it has mounted, and the matter becomes of interest to the least worldly-minded among the profession.

It may be that this apparent apathy has been due to an assumption on the part of the practitioner that Y. M. C. A. work, unless he were a "Y. M. C. A. architect," was a closed door to which he held no key. The term "Y. M. C. A. architect" is accurate, not as a personal Homeric epithet, but as denoting a highly specializing and numerically small group within the profession. For the fact is that more

than two-thirds of this mass of work during the last fifteen years has been handled by a half-dozen or so firms which have confined themselves almost exclusively to this branch of work. To them is due a large measure of credit for the development, enlargement and elaboration of function in the physical plants, as they have constantly been put to it to keep pace with the increasing size and complexity of Y. M. C. A. activities. For it must be realized that this is one of the most highly specialized and in certain respects most intricate planning problems in the whole field of design.

There is, however, the obverse side of this, as of all similar pictures. With intense specialization there is prone to appear a tendency toward fitting one's favorite formula to a set of given conditions instead of allowing the conditions themselves, through study with open mind and fresh eye, to dictate the solution. Furthermore, when the job was to be handled by an outsider—a non-specialist—it was extremely difficult for him to gain the intimate knowledge of Y. M. C. A. working principles, departmental functions, controls and interrelations, which together constitute the stock in trade of the inner circle of specialists. It became evident in the course of time that there was need for a central bureau within the organization, which could direct its own building activities and act as a clearing house for such information—a mass of data constantly accumulating, always in flux, and reflecting progress and modification of the Y. M. C. A. idea.

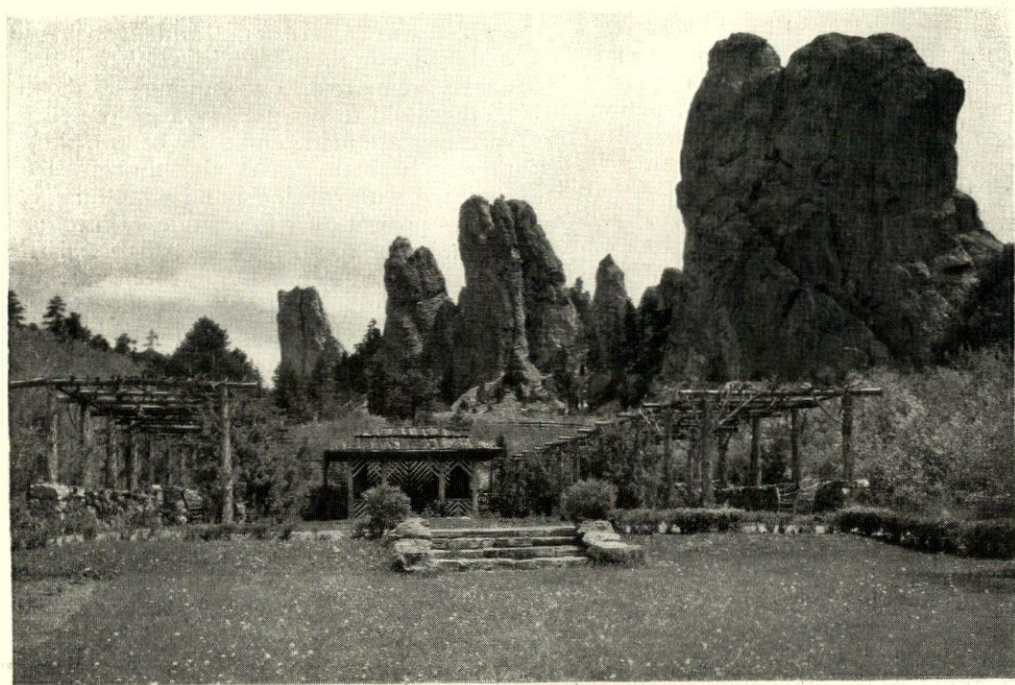
The Building Bureau of the International Committee of the Y. M. C. A. is not a new institution, for it has been in existence some three years. Of this period twelve months were spent upon an



simulate old work, they are sometimes gone over with an adze.

Whatever materials or methods be employed in building, the results will be good only in so far as the designer is imbued with the principle of structural and aesthetic honesty. Let him indulge in no capricious fancies or oddities. Let him not copy foreign styles or features that are not germane to the conditions of cli-

mate, or the modes of life, for which he should provide; and let him not seek to be original. There is little possibility of individual originality in domestic building. Every genuine architectural evolution—like every development in other departments of human activity—is worked out for the most part unconsciously, and collectively, not individually.



the brickwork, and no lathing occurs, save on ceilings, and on the wooden partitions that may be needed on upper floors.

In normal English building, roofs are strongly framed with timber of good scantling, and double wall plates. The best are of oak, but spruce and fir are now becoming common. They are covered with boards and felt, on which battens running up and down are nailed, and on these are fastened horizontal battens to hold the tiles, or slates, that are almost universally used in England.

Casement windows are commonly, though not exclusively, used in country houses. The best have stone frames, with mullions and transoms, and metal sashes. They are set flush with the outer face of the wall, and the sills are weathered up to the sash. The jambs and lintels of the interior are usually plastered, and thus in this mode of construction no wood occurs about the windows, and no repairs are required. If the frames be of oak, they are left unpainted, as oak is durable in exposure without paint, and harmonizes well with brick or stone walls. If they be of deal, they are, of course, painted, but their sills should be of oak without paint.

It is unnecessary in this brief paper to speak in detail of interior wood fittings. There is much to be said in favor of oak, or other hardwood, without paint, for all interior woodwork. The initial cost of it is more than made up by the future saving of expense and inconvenience of repaintings that cheaper woods require. But interior fitting is of secondary importance. Where a comfortable house is wanted at limited cost, it is better to economize on interior finish than on construction. Have good foundations, solid walls, and safe chimneys, at whatever sacrifice of other things.

Of other methods of domestic building in England, one, which was very prevalent during the later Middle Ages, and still survives to some extent, is the so-called half-timber method, in which a frame of timber is filled with panels of brick or stone. The panels are brought flush with the outer face of the framework, which last is left exposed. This

kind of construction, as practiced in the olden time, is very picturesque. The timbers then were hewn, and were naturally more or less irregular, and often very crooked, though cut so as to lie evenly in the plane of the wall. In such construction the strength of the wall depends on the timber frame—the brick panels, being only for enclosure, have only the thickness of one brick. It is hardly a good way to build, though where heavy oak timber is available, it may be made very solid. Without oak, or other equally strong and durable timber, it would be quickly perishable and unsafe. In the past this mode of building prevailed extensively in the streets of many towns of Northern France, and particularly of Normandy. The picturesque charm of such towns as Lisieux and Rouen is mainly due to these buildings. Where the streets are more or less winding—as those of these old towns usually are—the perspectives are made endlessly beautiful by them. In many cases the timbers are enriched with carvings, and where upper stories project over lower ones—in order to get more room on upper floors than the restricted ground areas on narrow streets afford—timber braces are fixed under the overhanging parts, and these braces are sometimes enriched with figure carvings.\*

But modern conditions make the half-timber method impracticable. Oak timber is now hard to procure, and is very costly. Moreover, as I have already said, it is not a really good way to build. The combination of wood and masonry in construction is never a good one. Either build solid walls of brick or stone, or build in wood altogether. Only aesthetic fancy is now the motive that leads to half-timber construction, and it is never carried out in the old-fashioned way. Where it is now practiced in England, the timbers are sawn, not hewn, and in order to

\*All this wealth of old time picturesqueness is fast disappearing before the march of modern life, and for the most part without any necessity. But the importance to ourselves, and to coming generations, of the world's artistic patrimony is very great, and is not enough realized. The value of the great monuments of the past, that have been wantonly destroyed by the Germans during the past four years, is beyond all computation. The pleasure and profit to Americans of visiting Europe has been deplorably curtailed since 1914.

tended so that the walls may be built upon it. The method is as follows: An excavation of about sixteen inches in depth is made over the whole area to be covered by the house, and this extends about a foot beyond what is to be the outer face of each wall. This excavation is then filled with cement concrete to a depth of not less than twelve inches, and the concrete is covered with a damp course of melted tar, pitch, and sand. On this foundation the walls are built—all partitions, as well as outer walls, being of brick, save where, on upper floors, partitions may be required over voids. The bricks commonly used in England are roughly  $4\frac{1}{2} \times 9 \times 2\frac{1}{2}$  inches in size, and for a house of not more than two stories, the outer walls will be three bricks thick, or roughly about fourteen inches. But for dryness the outer walls are often built hollow, that is to say, a solid wall of two bricks, or nine inches, in thickness, is supplemented by another wall of only one brick in thickness, standing at an interval of two and a half inches outside of it, so that the inner, or main, wall is shielded from the weather. These walls are carried up together, and are connected by iron ties about eighteen inches apart on every third course. This is not the best way to build a wall, but the protection from humidity and the warmth which it gives is a matter of great importance. In such construction the solid inner wall should be thick enough to give all the strength required—the function of the outer one being only that of a screen. This screen wall does, however, add considerable strength to the whole structure, besides giving dryness and measurable uniformity of temperature to the house. Hollow walls are now sometimes made of two four and a half inch walls, bonded as before with iron ties; but such walls are insecure if carried up for more than one story, and ought therefore never to be built above that height, if at all. The older houses of England have very thick walls, built solid. They are not seldom four bricks, or more, thick; and being plastered internally directly on the brickwork, they are cold and damp.

Where walls are built hollow for dry-

ness, in the manner just described, a question of architectural morality arises. The outer screen, being only one brick thick, would naturally be built in stretcher courses only. But the absence of headers suggests weakness—since the appearance to the eye is that of a wall wholly without bond, as where two four and a half inch walls are made to serve. To avoid this appearance, the outer wall may be built with half bricks where headers in a solid wall would come. But this may appear to savor of structural deceit, which can have no place in exemplary building.\* But if the outer screen wall may be regarded as an expression of what really exists internally—the inner wall being truly bonded—perhaps it may be justified. To adopt this treatment where the structure consists of two thin walls in which no brick bond occurs at all would be indefensible. This may appear a small matter, but the principle of rectitude in design and construction is vital to architecture.

In good English building the walls of all chimneys, except the internal walls that separate the flues, are two bricks thick from the foundation to where they come out of the roof. Above the roof they may be diminished in thickness. Chimney breasts are of solid brickwork all the way up, having no hollow places in them, save those of the flues. This gives powerful anchorage to the house, as well as security against fire.

In addition to the damp courses laid over the whole concrete foundation, damp courses are laid on the first course of bricks in every wall, and on the last courses of chimneys below where they come through the roof.

Finally, the concrete foundation is covered everywhere within the walls, to a depth of about four inches, with coke breeze and cement, into which the floor planks are nailed, or on which tiles may be laid. A house so built is free from drafts from the floors, and impervious to vermin, as well as to dampness. And there is great security against fire, since the interior plastering is laid directly on

\*Structure may be concealed—it is largely so of necessity in every organism—but that it must not be falsified is an immutable law.

each house builder must decide for himself.

In more elaborate building other features, as bays, pavilions, and turrets; or such details as base courses, string courses, and cornices, with which the house may be enriched, ought to be governed by the same principles of structural propriety. However amplified and ornamented, a good design admits no superfluity. Florid excess is a mark of bad taste in building, as in everything else.

We may now consider materials and methods of construction. In America, since Colonial times—more particularly throughout New England—the use of unsubstantial materials and methods has prevailed, with unhappy results on the general character of house architecture. Not only has wood been used almost exclusively, but it has been used with little regard to substantial building. Haste and cheapness have been sought at the expense of all that makes for duration and genuine architectural character. Houses framed of soft timber of small scantling, often in great part held together with nails only, and covered with thin clapboards, also of soft wood—their scant chimneys almost as unsubstantial as the woodwork—are deplorably common. Such building cannot have the humanized expression that ought to characterize the habitations of civilized man. This expression depends on good building, and adaptation to the amenities of human life. Buildings of wood may indeed be made substantial for a considerable time (as our Colonial houses, and as Swiss chalets are); but the best materials are brick and stone. These are durable, are more safe against fire, they weather well, and always harmonize with the landscape. The charm of the older domestic buildings of European countries—particularly those of England—lies largely in their being built of materials that take the patina of time and the ivy mantling, by which nature adorns the work of man's hand and makes it one with itself. Only brick and stone receive this touch of nature kindly, and these only lend themselves to substantial building. As for concrete, now so much in vogue, it is of course only an artificial stone. It

has the merit of cheapness, but no other advantage; and its uniform surface is less pleasing to the eye than the varied surfaces of natural stone and brick. For color and texture no other materials can equal these. The most agreeable bricks are hand-made and wood-burnt. These often have a great variety of quiet color, ranging from dull reds—sometimes inclining to ochery hues, and sometimes to subdued crimson—to countless varieties of reddish and bluish greys and purples, all endlessly interfused and blended. Such bricks, laid with natural mortar joints brought flush with the face of the wall, and following the minor irregularities of thickness and outline in the bricks, make a wall the picturesque charm of which is only heightened by weathering.

The older brick houses that survive in New York and other American towns on the eastern seaboard are substantially built after English methods, and some of them are models of sound construction. But much of the more recent brick building of America is scamped and unsubstantial. No architecture worthy of the name is possible, however, in any kind of jerry-building. It may be worth while to describe a substantial method of brick construction still practiced in the better class of English country houses on a modest scale. A cellar extending under the whole house is rare, and there may be no cellar at all—the uses to which a cellar is usually put being provided for in extensions of the ground floor, and in contiguous outhouses. The footings for the walls are sunk deeply enough to make them secure against the action of frost, and dryness is prevented by damp courses in the brickwork, and by covering the ground within the walls with not less than six inches of concrete—the floor beams being raised about a foot above the concrete. A better way, however, is not to have the floor raised above the ground. In this case no beams are used, but the concrete itself makes the floor, the planks or other covering being laid directly on it. According to this method the concrete must be deeper, and must be effectively guarded against dampness. In this case, too, no particular wall footings are required, since the concrete is ex-

ceilings will give the total height of the house exclusive of the roof.

This brings up the question of proportions. No theory of proportions can be applied in designing a house. Proportions are largely, if not altogether, fixed by conditions. For while the heights of ceilings in all the rooms on each floor are normally the same, the floor areas of the rooms may differ greatly; and the proportions of the house as a whole are necessarily resultants of those of the units—rooms, passageways, and stories—which compose it. But within limits the designer may modify the proportions of the parts so as to secure agreeable proportions in the house as a whole. What it is that makes proportions agreeable can hardly be defined with precision, for aesthetics, in building as in everything else, lie in the domain of feeling, and transcend our faculties of reason. It may, however, I think, be said that the governing principle of proportions in any organism is that of effective function and congruity of parts. Apart from this principle there can be no true proportion in anything, and therefore all formulas of proportions are futile. Proportions will take care of themselves when the designer works without sophistication, as we see in all simple works, such as rural cottages and other unpretentious buildings in every country.

The form of the roof ought to grow naturally out of the exigencies of shelter and construction. It should, as far as possible, be such as to insure prompt and effective discharge of rain water, and in a climate where heavy snow storms occur, it will naturally have a high pitch. If there are rooms, either wholly or in part, in the roof, these may have to be lighted by dormers breaking the outline. If the plan of the house be a simple rectangle, the natural way to roof it will be in plain gable form. This form has the advantage of simplicity of construction, and also, where the pitch is high enough, of affording space for attic rooms that may be lighted by windows in the gable walls, so that the roof will not need to be broken by dormers. Or the roof may have the curb, or gambrel, form, giving headway over a larger area. This com-

plicates construction, but is justified by the additional cubic space it affords. Or again, we may have a hip roof, but this also complicates construction and diminishes space. Where the plan of the house is broken, the roofs of the several parts, if on the same level, will mutually intersect, and if their spans be unequal their ridges will be at different heights; but there need be no objection to this, it only gives a natural picturesqueness to the composition. The pitch of a roof may vary according to circumstances, but in general, as already remarked, it will naturally be high in a northern climate and low in a southern one. But conditions in any given case may call for a flat roof over some part of the house, as where a low projecting part, if roofed with a gable, or incline, would prevent proper lighting of the interior enclosed by wall against which high roofs would come. In such cases there need be no objection to flat roofs covered with copper, lead, or tin; but it is better in northern climates to avoid such roofs as far as possible.

The best architectural treatment of eaves and gables is that which is most natural. Construction alone may give an ornamental character. If the ends of the rafters be allowed to reach over the wall, their rhythmical series will have ornamental value. Ordinarily no cornice or solid parapet ought to rise above the eaves, because such a feature obstructs the free discharge of rainwater.\*

In the treatment of gables, as of eaves, a natural method is best architecturally. No considerable overhang of roof is necessary at the gables, and the fixing on of vergeboards has no justification in structure. It is a superfluity which the straightforward designer will generally avoid.

Roofed verandas have the objection of darkening interiors, and whether the advantage of their shade in hot seasons balances the objection is a question that

\*In large buildings, or churches, where a passageway is needed along the eaves, an open parapet—like that of Blois, or of Soissons or Chartres—may be necessary, and become a feature of great architectural value. In such cases the roof is set back considerably in retreat of the outer face of the wall, and a wide gutter receives the rainfall, discharging it at intervals through conduits.

possibilities and enriches his art; but this is very different from the promiscuous and capricious borrowing of foreign features now so increasingly prevalent in the designing of American houses.

Starting with the purely practical, let us consider what may be called normal procedure in the design and construction of a house. The first thing, of course, to be considered is the available ground area, and its orientation and conformation. Then the number and dimensions of the apartments required. Next their disposition with regard to convenient access—which involves the determination of halls and passageways and stairs, with spaces for the convenient location of the required baths and cupboards. The size of the ground area will determine the number of these apartments that can be situated on the ground floor, and we may proceed to develop the floor plans. Upper floor plans ought as far as possible to follow the plan of the ground floor, in order to get proper support for partitions.

The location of fireplaces for convenience and economy is a matter of great importance in planning that is not always enough considered. It is desirable, so far as possible, to avoid placing chimneys against outer walls, since when so placed they are exposed to the outdoor cold that will be likely to affect their drafts unfavorably. Whatever the general mode of heating, it is best to have if possible an open fireplace in every room. This secures the best means of ventilation, and the cheer of a fire when needed is worth a great deal of sacrifice to obtain.

Though planning may not always be found easy, its principles are simple, for domestic needs do not greatly differ among families of the same general status in life, and house planning for all conditions has been long enough practiced to have established an abundance of what may be called model plans, which, with minor readjustments of details to suit particular needs, will fulfil every requirement. Variations of plan may arise from the different conditions of ground area and conformation, just alluded to, as well as from different domestic requirements; and generally to follow what I have

called model plans does not mean that any two houses need be exactly alike. There may be an infinity of differences in the carrying out of a given general scheme.

It is a platitude to say that the best planning is that which gives the maximum of convenience and comfort, but convenience and comfort are not seldom sacrificed for the sake of some fancy that is incompatible with their attainment—as where in small houses a disproportionate amount of space is given to an entrance hall, so that the rooms have to be cramped, or reduced in number. This is too common in the more recent planning of small houses. A spacious hall comports only with a large house, and is not in keeping with the needs of a small one. But in the planning of halls and passageways, care ought to be taken to give them as much space as other requirements can be made to allow, and particular care is needed in contriving stairways. Considerable sacrifice in other parts of the house is preferable to restricted spaces for stairs. It is especially desirable to avoid winding stairs in narrow, and particularly in dark, places. Narrow winding stairs are a perpetual discomfort, as well as a source of danger. Then, too, all possible sacrifice elsewhere in the house is worth making in order to render stairs easy by low risers and broad treads; and it is of great importance that halls, passageways, and stairs should be well lighted.

It may be taken as a maxim that all fine aesthetic quality in building is based on strict rectitude of design and construction. This principle will, I believe, stand all tests, and its observance will be a sure safeguard against architectural aberrations.

After the floor plans are settled the elevation may be developed. The heights of ceilings must, indeed, be determined before these plans can be completed, for we have to know the number of steps required before we can find how far the stairs will extend on plan; and in order to determine the length of stair wells, head-room over the stairs must be considered. Then, of course, the thickness of each floor added to the heights of the

## - SOME PRINCIPLES OF DESIGN AND - CONSTRUCTION *in* DOMESTIC BUILDING



By Charles H. Moore

IT may, I think, be laid down as an axiom that wherever the domestic building of a people develops normally, with an eye to shelter and comfort, it will be agreeable in aspect, if not beautiful. However rude or humble, it will, when thus developed, have at least the quality of fitness, and will pleasantly mate with the landscape in which it is set. The peasant's cottages of European countries—the Swiss chalet, the French chaumière, and the English cottage—whether of the brick and tiled, or the half-timbered and thatched variety of the southern counties, or the stone and rough-slated cot of the north—are everywhere proverbially charming in aspect. Even the log cabin of the American backwoodsman has a natural picturesqueness, and an expression of adaptation to its surroundings, and to the life of the occupants, that make it pleasing to the eye. The old Dutch farm houses of New York, simply planned and solidly built of stone or brick, and the primitive New England farm house of weather-boarded timber—with its roof extended at the back in order to enlarge the ground floor—are invariably grateful in appearance.

Rising in the scale of architectural quality are the dwellings of the European upper middle classes, which in England acquire a particularly homelike expression, and from one phase of which we get our so-called Colonial style. These houses of average well-to-do people are attractive in proportion to their frank expression of straightforward provision for simple domestic needs and amenities; and it may be said that in every kind of house, on whatever scale, and of whatever degree of elaboration, architectural

merit will depend primarily on this expression embodied in substantial materials and sound construction.

Unhappily these principles have not governed recent domestic building in America, as they have that of the past. Instead of frank sobriety, and resultant dignity, in design, we now too often have all manner of sophistications in cheap materials, hasty construction, and meretricious ornament, so that our domestic architecture almost everywhere presents painful crudities and jarring discords, which the great inventive ingenuity of our time, that has revolutionized sanitation, and annihilated household drudgery by mechanical contrivances for convenience, cannot redeem.

It may seem a platitude to say that in designing houses there ought to be no sort of affectation, no preconceived notion of effect, internal or external; that everything should be based on the requirements of convenience and propriety. Yet it would be hard, I think, to find a large number of houses in America, built within the past few decades, that wholly conform to this principle. Most failures in design arise from want of that good taste which forbids the incorporation of borrowed fancies or features that are unnecessary or inappropriate in any given case; and it may, I think, be said without qualification that in so far as the designer starts with any aesthetic *parti pris* to which he bends any natural requirement of his project, he heads straight for disaster. This is not to say that he should never borrow. He may borrow freely from any source that offers appropriate suggestion, or adopt any form of which he can make rational use. By so doing he enlarges the range of his

method, subjected to no basic rules, and often left to chance.

In explaining his plan, Mr. Polk tells us that the reason for the interior court in San Francisco is very different from that which would determine its erection in Spain, Mexico or other warm countries. In these lands its object is to provide shelter from the extreme heat of the sun's rays; in San Francisco the court is intended for protection from the cold winds and sea mists prevailing at certain seasons, and is built to enable the residents to enjoy the available sunshine despite adverse climatic conditions. Certain arrangements of plan affecting exposure of rooms have also been dictated by circumstances of a purely local nature.

The exterior design of this residence has little to recommend it. It is representative of the type of stucco residence favored by the well-to-do merchants of Central and South America. The cornice and pilasters framing the windows of the second story are devoid of refinement. The entrance is disproportionately wide for its height. One is forced to conclude that the façade is a deliberate foil to the courtyard, intended to augment the reaction of surprise in a visitor's mind when entering the house.

Mr. Polk has been frank in his use of the *Caza de Zaporta*, and has not fallen into the frequent error of attempting to palm off an antique as currency. He realized that an exact reproduction is devoid of interest other than antiquarian, and that only in a remote degree. He has attempted to inject a touch of modernity in the surface treatment, but obviously without any intention of clipping a war horse to pass it as a polo pony.

We look to the Californian architects for the development and perpetuation of the sixteenth century Hispanic mode, which is theirs by inheritance, climatic conditions and natural setting. An array of essays accumulate in their State, representing varying degrees of professional attainment, ambition and opportunity; in

the majority, the indigenous "Mission" style prevails over the nobler phases of this art. We have yet to welcome the ideal combination of qualities in which the Californian will reveal his thorough appreciation of the esthetic ideals of the prototype when creating an edifice inspired by his pride of nationality.

When the intellectual activity of a race is thoroughly saturated with its national ideals, these are transmitted to its art impulse; they find concrete expression in those physical peculiarities of manner that we recognize under the generic term "style." By reason of the intangibility of the forces from which stylistic expression results, the national American style, when it finally evolves, will be unconsciously achieved; the vital and essential elements requisite cannot be assembled in deliberate creation.

Climatic conditions have always been a prime and controlling factor in architectural design, which argument should weigh in favor of a number of localized influences in treatment in the United States. A rational process of reasoning would single out the Pacific Slope as the birthplace of a definite phase of expression, stimulated by historic association and an innate attraction for the sixteenth century Hispanic. At the present moment this influence is at the stage of immature acquaintance, too unfamiliar to produce a habit of thought; but it apparently generates that type of enthusiasm and sympathy which is the most powerful motor of creative energy in all arts. The intellectual voice of every nation that has evolved a distinctive form of esthetic expression is attuned to that key best suited to its range, to which our modern capacity is rarely adjusted. It remains for the Californian architect to discover that congenial key into which the grandiose Hispanic Symphony may be transposed, that he may freely and naturally render this great theme, in works that will be golden contributions to the world's treasury of art.