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THE ARCHITECTURAL FORUM

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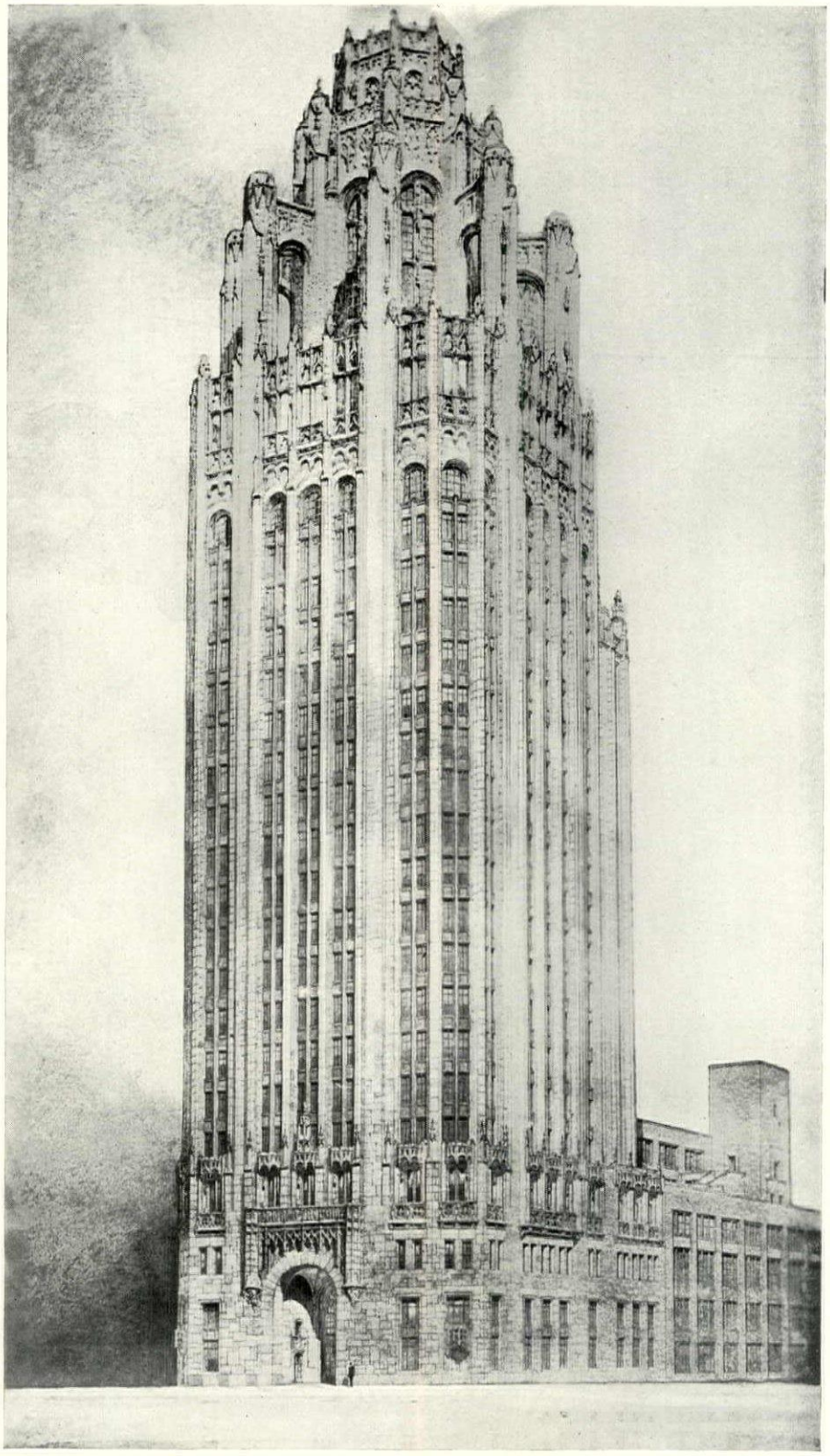


WINNING DESIGN
THE *CHICAGO TRIBUNE* COMPETITION

JOHN MEAD HOWELLS AND
RAYMOND M. HOOD, ASSOCIATED ARCHITECTS

The
ARCHITECTURAL
FORUM

VOLUME XXXVIII JANUARY, 1923 NUMBER 1

Mexican Renaissance

PART II

By WALTER H. KILHAM

MANY examples of later doorways show a remarkable development of the use of the horizontal shadow, which almost recalls the similar practice in some of the temples of India and lends color to the theory of some archæologists that in the mysterious past of Mexico a connection existed with the orient. The great portal of the Colegio San Ildefonso in Mexico City is an impressive example of this sort of thing, though quite purely Spanish in the general swagger of the scheme.

A good example of original handling of the style by an individualistic designer is the great Colegio de las Vizcainas in Mexico City whose massive facade, nearly 500 feet long, of red *tezontle* is relieved by three great doorways and two rows of gigantic windows, those of the upper story octagonal and attached to the lower row by curious connections of gray stone. All the windows have the deeply splayed jambs which are an important feature of much of the old work. This building, which stands in what is now an unsavory quarter, has figured in much of the history and literature of the Mexican capital, and is still of great architectural importance, even though its tremendously heavy walls have sunk so far into the yielding soil that the base of the facade is no longer visible.

The wonderful carved, gilded wood altars and *retablos*, of which large numbers remain in spite of changing fashions, are an important feature of almost all the church interiors. The wood of which they are made is usually covered with a thin coat of plaster on which is laid the gilding, heavy leaf or almost thin gold plate, turned by time to the rich color of old gold. Carved in the most bewildering manner of the Churrigueresque and intensified by the barbaric imagination of the Indian workmen, these great altars, which in some cases almost fill the ends of the churches, produce a feeling of mysticism, almost of awe, even in the most cynical of northern visitors. The niches are filled with little polychromed statues whose paint has the patina of old ivory, and the medallions often contain small painted gems of biblical subjects of so great a charm as to inspire wonder as to their origin. In many cases they may have been painted with reverence and zeal by forgotten artists, but it was also the habit, during the craze for Churrigueresque, to cut up old paintings and select figure groups to insert in the panels over the altars. The high altar of the delightful little Church of La Enseñanza in the national capital has one of the best, though not the most typical, of these *retablos*. The medallion-like paintings are of surprising merit, and would excite interest if they were found in any church in Italy.

The curiously paneled wooden doors of the older buildings show Spanish and even Moorish origin in their interesting and intricate designs. They are generally innocent of painters' finish and have acquired the color and finish given by centuries of exposure to the weather. The vigorous design of the woodwork is strengthened by the great bolt-heads with which they are liberally sprinkled and the formidable bolting apparatus on the inside. A Mexican house of the older type is entered only through a cavernous stone-flagged tunnel, high-studded and timber-ceiled, called a *zaguan*, big enough to admit not only a coach and four of the olden time but the owner's limousine of today, which often is seen lurking in the shadows at the base of the grand stairway. When this door with its four or five inches of tough wood is closed and bolted, the house becomes a sort of fortress, and many such show the marks of fruitless attacks by furious revolutionists during the years of the late unpleasantness.

The patio which is approached through the *zaguan* takes on its most coquettish aspect in a private house. The stone stairway swings up to the balcony level in a surprisingly nonchalant manner; bright flowers in boxes or pots bloom or fall from the balustrades. Birds are in wooden cages hung from the walls; gay rugs are thrown over the balustrades, and if the establishment is really old enough the family turkey may emerge from the arcades where Tomaso or Vicente is washing the car, and gobble in impotent defiance. They are delightful places to

live in, these old Mexican houses, and our American homes are not to be compared with them in interest.

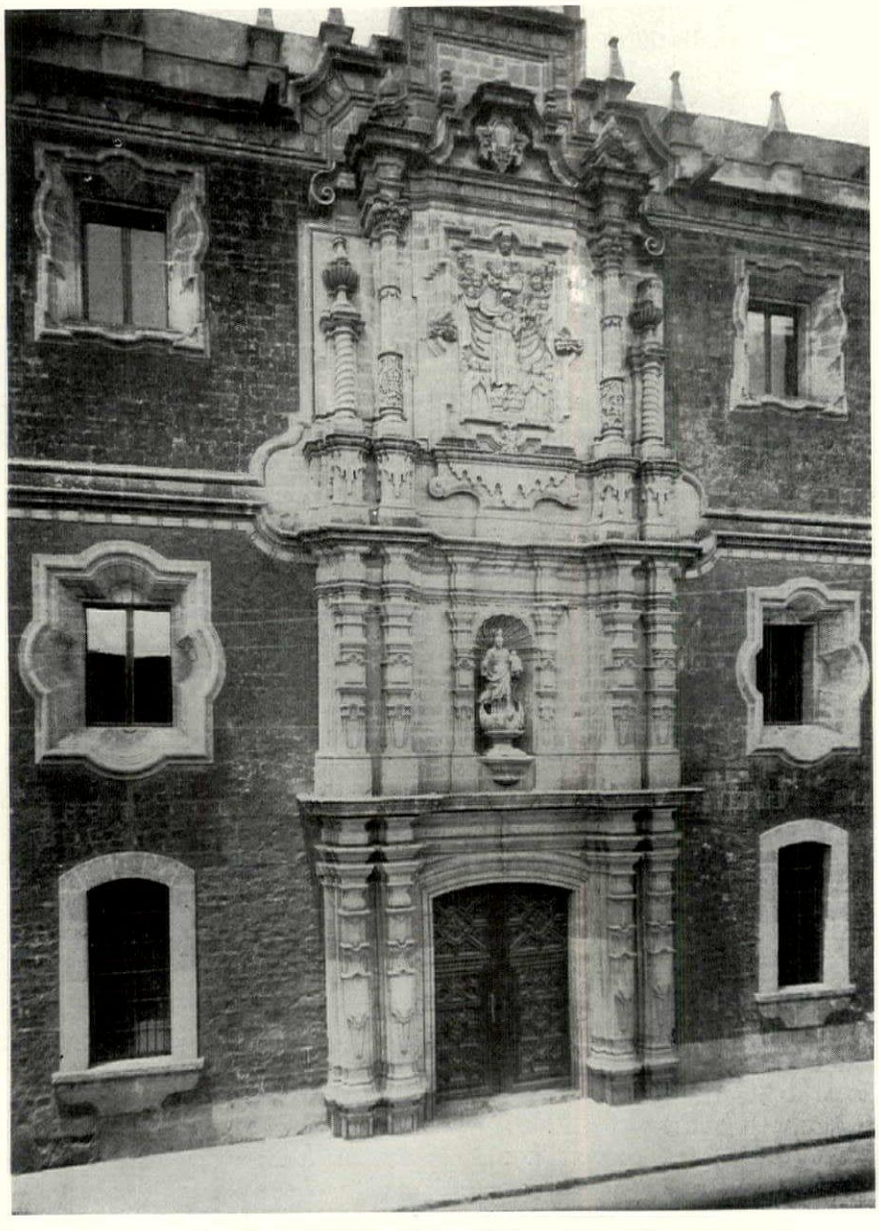
Much of the skill of the masons of old Spain came to Mexico, and the work in some of the stone stairways, notably those in the National Palace at Chapultepec, is worthy to be compared with some of the best in Europe.

The beautiful stanniferous faience or tin enameled tiles, the use of which forms one of the most distinctive features of Mexican architecture, was manufactured principally in the city of Puebla where the industry was established during the seventeenth century, probably by potters from Spain, some of whom,

Church of N. S. Loreto, Mexico City. By Tolsa

coming from Talavera in that country, caused the name of Talavera ware to be given to the productions of the Puebla potters. Allusion has already been made to the use of these enameled tiles for coverings of domes,* towers and walls as well as all sorts of interior purposes. The production must have been large, for a great many old churches and buildings possess wainscotings, lavabos and tablets in faience. As a proof that bathing was at least occasionally practiced in colonial Mexico, there is still to be seen in a rather plain old house in Mexico City a perfectly preserved tiled bathroom with a tiled tub, in the bottom of which is depicted with great fidelity and lifelike coloring a full-length effigy of a lady of considerable personal charm. Nearby in the garden of the government tobacco factory, once the famous Palacio de Buena Vista, the successive abode of two ill-fated generals, Santa Anna and the French Marshal Bazaine, there are some good examples of the decorative use of tiles in garden seats.

The Casa de los Azulejos, in the Avenida Francisco I. Madero, in Mexico City, is so well known as to need no extended description here, but it must take rank among the most beautiful buildings of the world. The walls are covered with blue, white and yellow tiles in charming patterns, relieved by original and interesting detail in gray stone. This building which was for a long time the home of the Jockey Club was, after being put to a popular use by President Carranza, bought by an American, who utilizes the patio as a restaurant and the front portion as a pharmacy. The slender stone columns of the patio, with their semi-Aztec fluting, and the great baroque fountain are delightfully idiomatic in style and well represent another individual handling of the Mexican work. On the



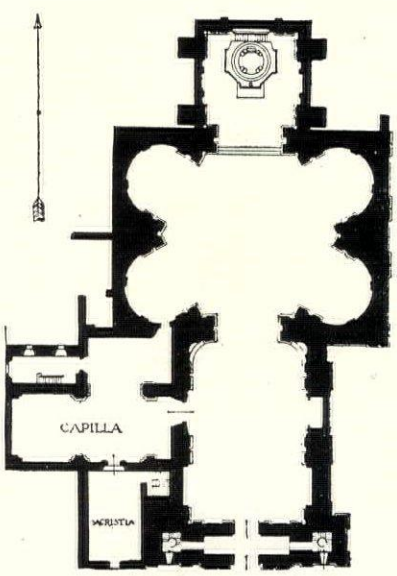
East Entrance, Colegio de San Ildefonso, Mexico City

*Some of the best were illustrated in *The Brickbuilder*, 1911-12.

stairway of this building is a remarkable tiled wainscot, thought by some to be of Chinese origin, but which good authorities emphatically pronounce eighteenth century Pueblan.

The designers of most of these splendid productions have shared the common fate of the architectural fraternity, and their names are lost in oblivion. If instead of producing useful and beautiful buildings they had murdered peaceful natives by the hundred, or engaged in wholesale destruction of priceless books and records, every schoolboy in America would be forced to memorize their names; as it is, very little is known of the early colonial builders. The original design of the great Cathedral of Mexico was by Alonso Perez de Castañeda, royal master of architecture about 1572, but his plan was modified in Madrid by one Juan Gomez de Mora, architect to Philip III, whose plan was sent over under royal seal with orders to use it. These two are remembered with half a dozen others of lesser fame, and it is said that the Cathedral of Puebla is by the same Herrara who designed the Escorial in Spain, though Señor Revilla, who ought to know, attributes it also to De Mora. There is an interesting legend about one Alferino Gutierrez, a poor Indian, self-trained and having no technical knowledge as a draftsman, who imparted his ideas to his workmen by marking off his working drawings with a stick in the sand. This man produced some remarkable work in his native town of San Miguel de Allende. The churches of La Santisima Trinidad and the Sagrario Metropolitano, illustrated in Part I of this series,

Entrance, Colegio de la Vizcainas, Mexico City

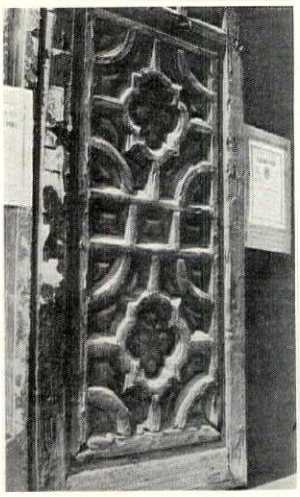


Plan, Church of N. S. Loreto, Mexico City. By Tolsa

were designed by Lorenzo Rodriguez, a devoted student of the style of Churriguera.

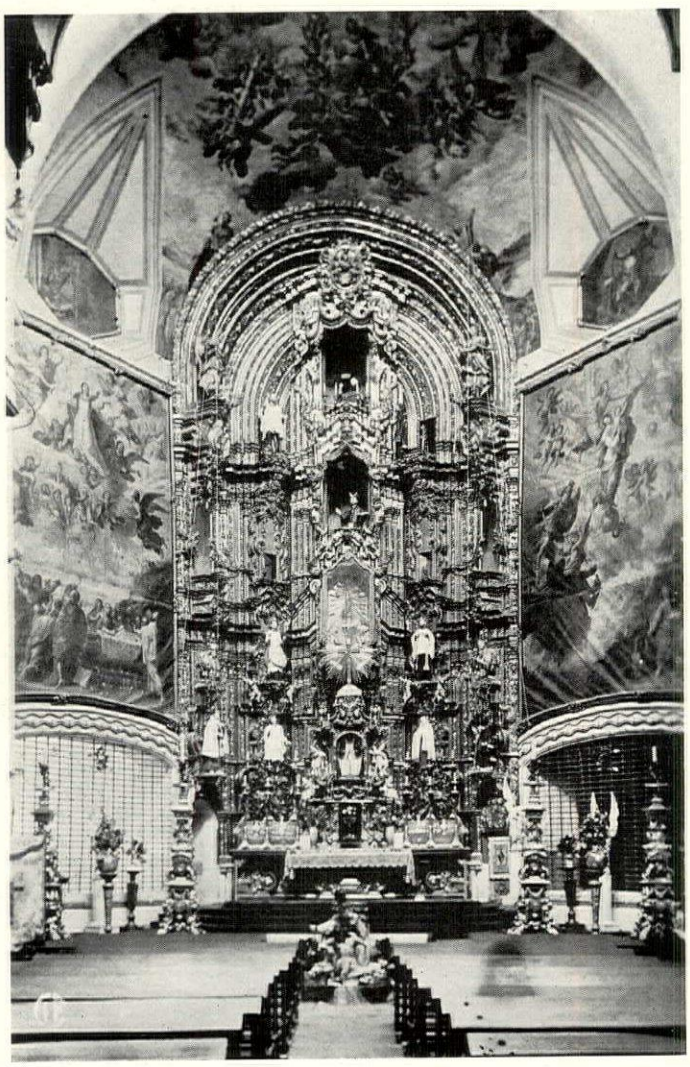
As the eighteenth century drew to a close, however, two important architectural names appeared and seem to be secure in a fame all their own. Francisco Eduardo Tres Guerras and D. Manuel Tolsa were true artists of the renaissance, records of whose romantic careers would fittingly adorn the pages of another Vasari, and like the Italian architects of the *cinquecento*, each excelled in arts other than architecture. Tolsa indeed was perhaps even greater as a sculptor, while Tres Guerras was also not only successful as a painter and engraver, but is remem-

bered for his sonnets as well. The latter was born in Celaya in 1745 and spent most of his life in his native city, refuting the proverb about a prophet's being without honor in his own country, for it was his home town which gave him the opportunity to produce his greatest work, the beautiful Iglesia del Carmen at Celaya. This church was dedicated in 1807 and cost $225,000. According to Terreros, who has written an interesting sketch of his life, he was compensated from 1802 to 1807 by an honorarium of 2,000 *pesos* annually, which according to the tradition in Celaya he took in real estate consisting of some small houses which existed until recently, enjoying the name of "Banos de Tres Guerras." Tres Guerras has left his own description of his masterpiece, wherein it is worthy of note that he says the dome is of the same height as the tower, 70 *varas* (195 feet), and is elliptical in plan with eight windows in the drum, which he points out give 90 square *varas* of light for the interior. The interior decorations, including a dramatic Last Judgment and a Resurrection of Lazarus are by his own hand. His other most important works were the Convent of the Teresitas at Querétaro, the Teatro Alarcon at San Luis Potosi, the Casa Rul at Guanajuato, and the bridge over the River Laja between Querétaro and Celaya.



Wooden Door, Cathedral of Mexico City

Although most of Tres Guerras' long life was spent in the small city of Celaya, it was not entirely without incident. Besides at times holding the office of sindico, registor and alcalde, he was always a patriot and was involved in the insurrection of Hidalgo against the Spaniards in 1810, but escaped punishment when it was suppressed, and it is told that when Mexican independence was finally consummated he raised the commemorative column in the plaza of Celaya, wrote a patriotic ode and "rejoiced in such a manner that some qualified his demonstrations of joy as those of a crazy man." He lived to the ripe age of 88, and the picture of his declining years as related by Terreros must excite a feeling of envy among the architects of this hurried age. It seems that he was fond of playing the flute, and during the last years of his life he might be seen going on foot every afternoon towards a little hacienda which he owned in the vicinity of the town. With his long cloak over his shoulders he would march along playing his flute and followed by his faithful and inseparable dog. Then seating himself in the shade of a tree he would, with all the simplicity of a little child, alternate between playing with the dog and calling forth the harmonious notes of his favorite instrument. From this improvised Arcadia he could gaze upon the lovely and peaceful landscape and contemplate with the highest satisfaction the distant outlines of the greatest works of his active life. Not until the late afternoon, when the herds came slowly down to drink from the waters of the Rio Laja, and the last rays of the dying sun illuminated the graceful dome of Carmen, would he turn away and retrace his steps to his home in the city.

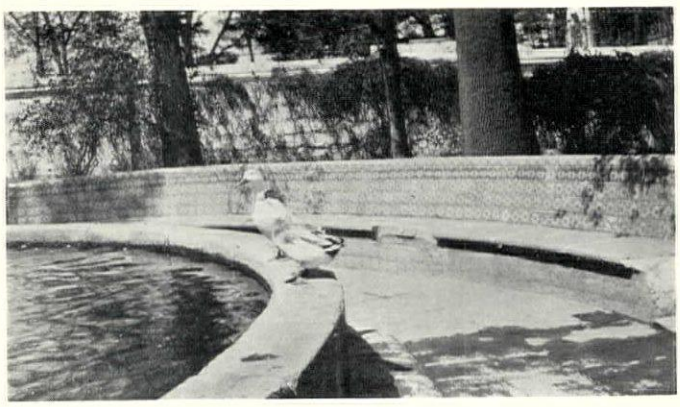


High Altar, Church of La Enseñanza, Mexico City

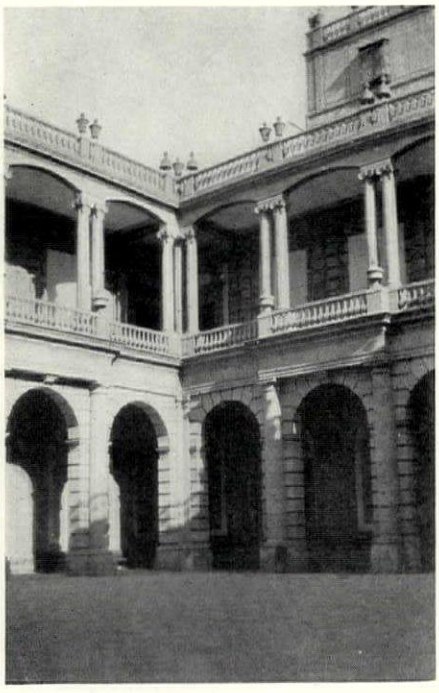
Although his paintings are considered to be of less importance than his buildings, he believed himself to be much greater as a painter than as an architect, which leads Terreros to remark that artists are seldom good judges of their own work. Like most men of genius he had his troubles with envious rivals, and he owned to a certain acid wit to which he occasionally gave vent. When he built his column of victory in the square of Celaya it is said that he made the

eagle which surmounted it with its head looking backward, away from the city hall, so, as he explained to a friend, that it "might not see the barbarities committed by the municipal authorities."

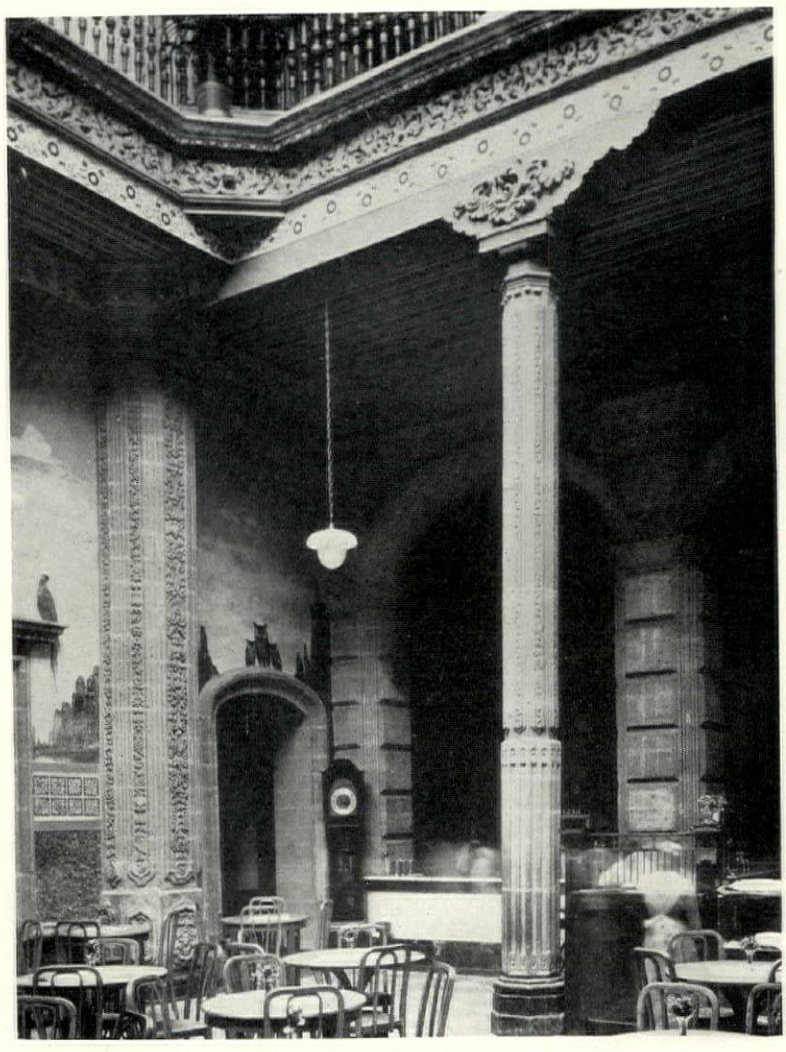
Quite different was the career of Tolsa. Born in Spain in 1757, he had already acquired sufficient fame as a sculptor to be invited to go to Mexico in 1791, in company with the painter Ximeno, to take charge of the classes in sculpture at the new Academy of San Carlos, the royal school of art in New Spain, which was probably the only institution of the sort in the new world, at least the first in North America. As a sculptor, his greatest work is the noble equestrian statue of Carlos IV, a classical treatment, which, though not generally well known, should by virtue of its natural movement, graceful lines and majesty of form, take rank among the great equestrian statues of the world. Tolsa's reputation as a sculptor was already secure when he decided to take up architecture, but his works in this latter field are of equal importance. He is best known in connection with the vast pile of the Mineria, or school of mines, a somewhat gloomy affair of blackened volcanic stone whose long facades, never entirely completed, enclose a patio and grand stairway of great majesty. His style was the Greco-Roman, modified evidently by the severer phases of French work of the period, which had a quieting influence on the riotous local baroque. Another very interesting work of Tolsa's is the Church of N. S. de Loreto, whose dome is raised on a curious hexagonal plan very satisfactory in internal appearance, though unusual as seen on paper. Tolsa's engineering was badly at fault in both these operations, as each has sunk far beneath the pavement and the Loreto has a bad list to port; still, he may have an excuse in the case of the Mineria, as Terreros relates that he had only two months to make the plans for the enormous building, together with a detailed



Tiled Seat in Garden of Government Tobacco Factory, Mexico City



Courtyard of the Mineria, Mexico City. By Tolsa



Detail of Patio, Casa de Los Azulejos, Mexico City
Architect Unknown

estimate of cost which he put at 217,617 *pesos*. He was appointed at the customary wage of 2,000 *pesos* per year, at the end of January in 1797, and work on the building was begun the latter part of March. Various interruptions intervened, and the works were not terminated until 1813, by which time the original estimate of cost had grown to a million and a half *pesos*. In spite of the serious settlement of the foundations the building is a splendid monument, and the view of the patio illustrates the correctness of the detail. The treatment of the lintel between the coupled columns of the main story has been questioned, but it may well be put down as a praiseworthy attempt to improve the lighting of that portion of the building. Tolsa further completed the facade of the Cathedral of Mexico and designed the central lantern, which he is said to have purposely kept light in design so as not to compete with the two fine towers. He designed the splendid tabernacle of the Cathedral of Puebla and certain houses of Mexico City. Compared with the elegance and graciousness of the work of Tres Guerras, his is severe and cold but of great purity. The influence of the pair was to stop, probably forever, the vogue of the baroque and Churrigueresque. Tolsa died in 1816, before the consummation of Mexican independence. Tres Guerras survived until 1833. Terreros esteems him as the best architect that Mexico ever produced, rating him higher than Tolsa on account of the greater stability of his work. Certainly up to their time the United States had produced nothing which could approach the work of these two men.

Central Lantern, Cathedral of Mexico City. Attributed to Tolsa

In the preceding article allusion was made to the strong Aztec influence visible in many of the renaissance buildings of Mexico; it can only be said in passing that this evident architectural infusion of the taste of an alien and subject race forms one of the most engaging and romantic features of an architectural visit to Mexico.

The mention of architectural detail leads us on to a brief examination of further detail. Stairways alone deserve a volume, not to mention walls and gateways, and the *nichos*, tiles—blue, white and yellow. Some day I am going to write about them.

Photo © C. B. Waite

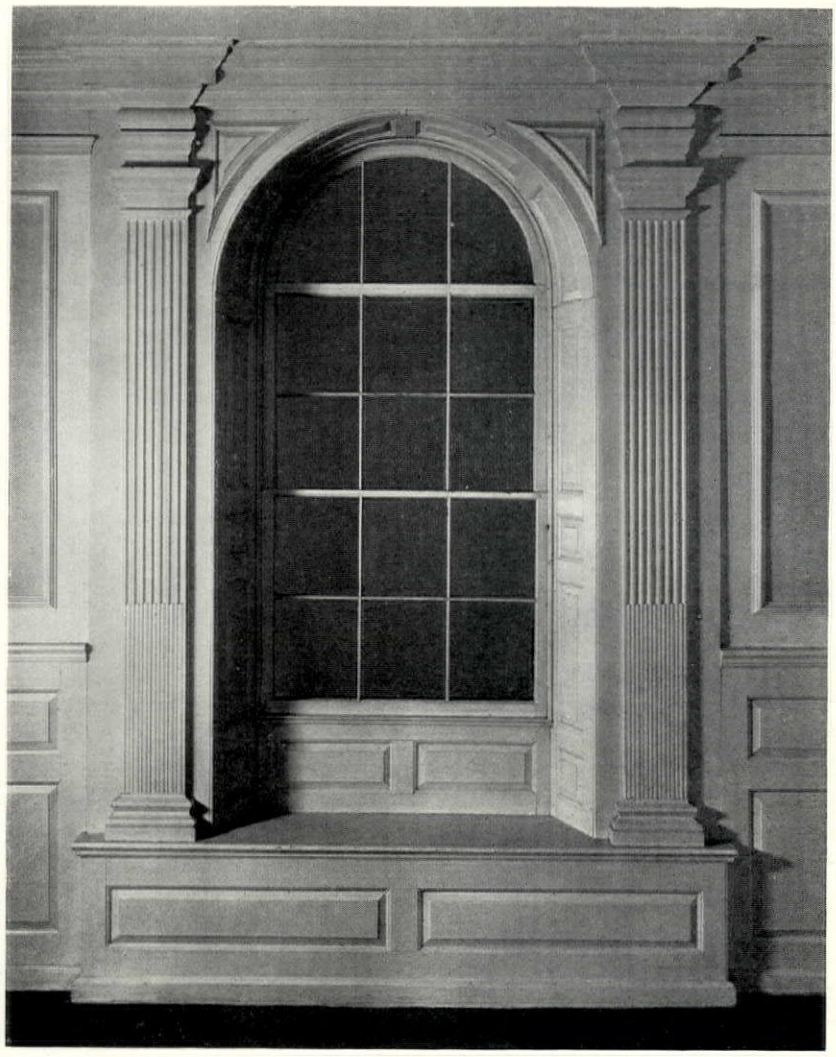
Church of Carmen, Celaya
Francisco Eduardo Tres Guerras, Architect

EARLY AMERICAN DETAILS

PLATE 46

MEASURED DRAWING

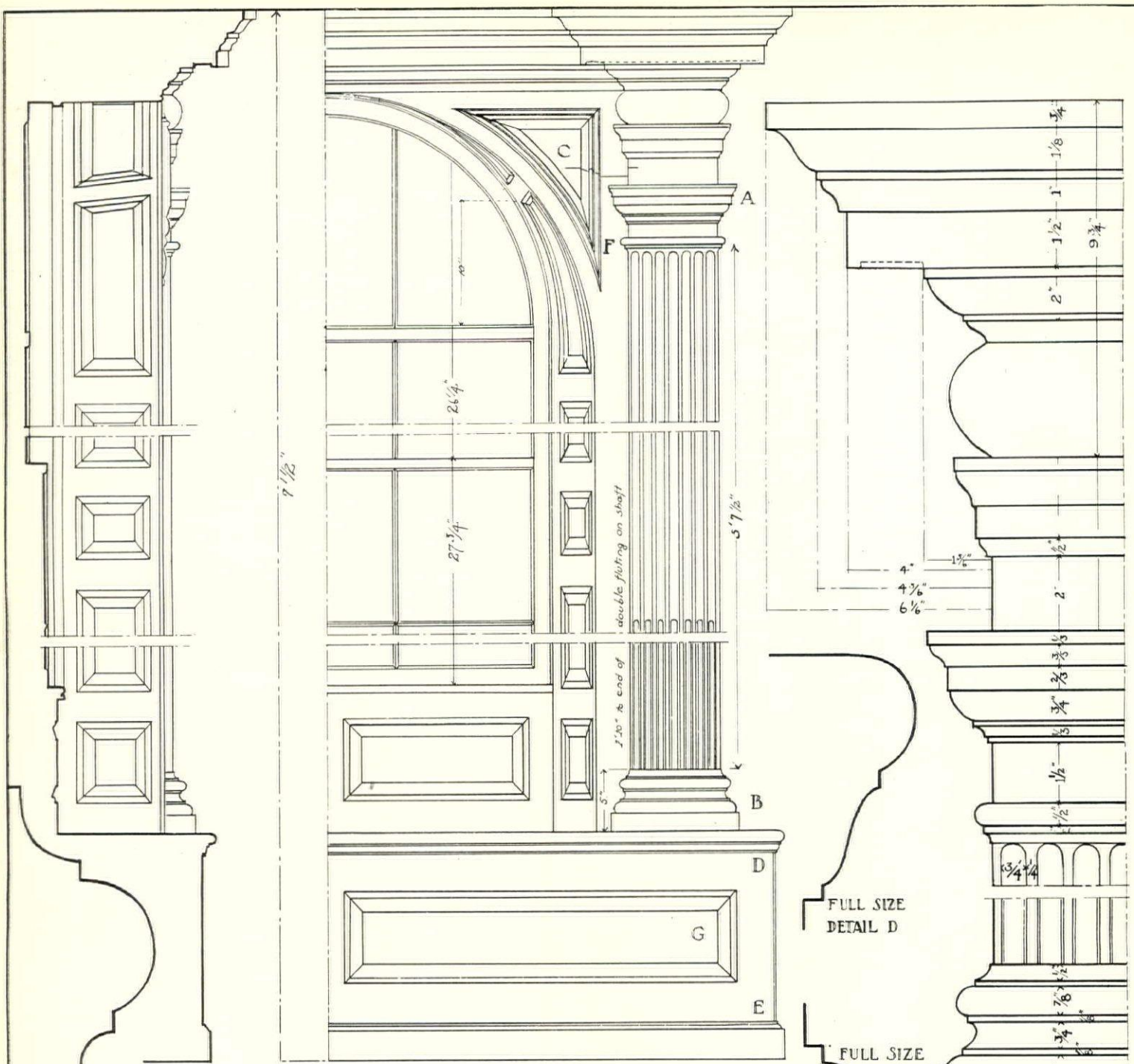
By MARY P. CUNNINGHAM



WINDOW IN SECOND FLOOR HALL

SAWYER FREE LIBRARY, GLOUCESTER, MASS.

THIS is an excellent example of American mid-eighteenth century interior woodwork. The early builders were fully aware of the value of developing the main axis of a room with some architectural feature as a terminus. This window is in the center of the end wall of a second floor hall where it immediately claims attention from being opposite the head of the staircase. The means of securing this emphasis are the simplest—a round-headed window framed by pilasters, with full entablature and a continuously paneled reveal and soffit. The classic severity of the mouldings, the proportions and scale are all admirable and deserving of the closest study.



SECTION Scale 1 inch equals 1 foot

HALF ELEVATION OF WINDOW Scale — 1 inch equals 1 foot

THREE INCH DETAIL OF COLUMN.

HALF PLAN OF SEAT Scale 1 inch equals 1 foot

Plate 46 January 1923	WINDOW IN SAWYER FREE LIBRARY GLOUCESTER MASSACHUSETTS	Measured & Drawn By Mary P. Cunningham

BUSINESS & FINANCE

C. Stanley Taylor, *Editor*

Building Survey for 1922 and Forecast for 1923

By C. STANLEY TAYLOR

ONE year ago, in December, 1921, THE ARCHITECTURAL FORUM undertook the making of an unusual survey in the field of building construction. This meant a definite effort to measure and classify probable building activity for the year 1922.

This investigation was carried out by obtaining from the offices of a large number of architects, confidential reports as to the building operations then on their boards for 1922 construction, and regarding projects which had progressed sufficiently far in negotiation to practically insure the beginning of construction within that year. It was felt that if the future market for building construction could be gauged with fair accuracy, such information would be of great value in the development of production programs of building materials and in the encouragement of increased financing of building construction.

The publication of the survey for 1922 met with responsive interest in every division of the building construction industry, and it is gratifying to record here that the forecast has met the test of the figures of actual construction, both in approximation of the volume of building and in classification of demand. Naturally, it could not be expected that the figures estimated for the future would prove to be exact, but in this instance prophecy and actuality have paralleled so closely that the survey herewith presented for 1923 is unquestionably justified.

In the survey for 1922 a four billion dollar building year was predicted. Construction reports covering about three-quarters of the country show well over three billion dollars for the year, and taking into consideration the balance of the country it is quite evident that the total construction ran well over the four billion, a condition which was not anticipated, and certainly not measured in advance, through any medium excepting THE FORUM'S survey.

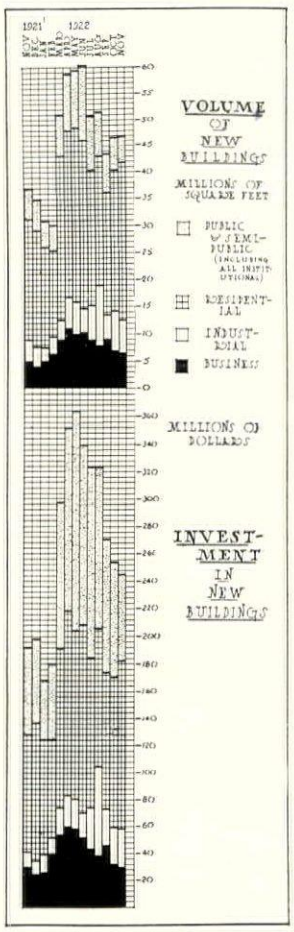


Fig. 2. Volume and investment in building construction during 1922 divided into four types

What Occurred in 1922

Building activity for the year 1922, together with various economic trends importantly affecting such activity, is graphically pictured in Fig. 1 showing the volume of new building; the amount of money invested in new building, and the trend lines indicating the course of building costs; general commodity costs; contemplated construction; money value of new construction, and square feet area of new construction.

Fig. 2 indicates a division of the volume and investment in building construction into the four general classes of public and semi-public building, residential building, and industrial and business building.

Following the various index lines on the chart showing monthly changes, it will be noted that as the index of building cost penetrated

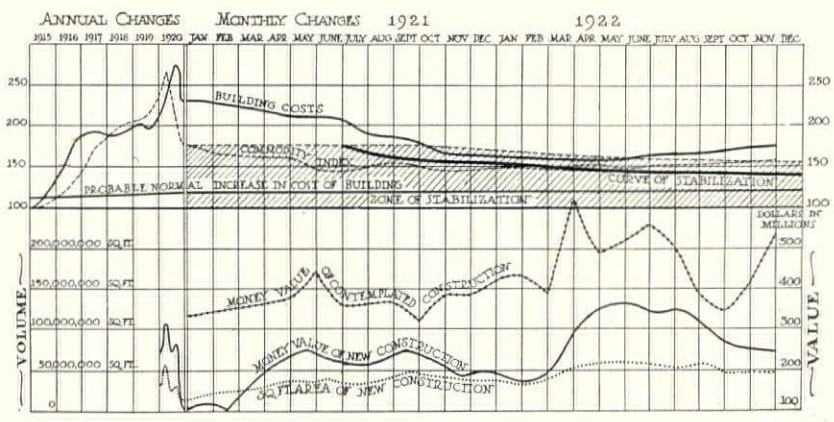


Fig. 1. The trend of building costs and other important factors affecting volume and cost of building construction in the United States

BUILDING TYPES	N. EASTERN STATES	N. ATLANTIC STATES	S. EASTERN STATES	S. WESTERN STATES	MIDDLE STATES	WESTERN STATES	U. S. A.
Dwellings (Under $20,000)	$16,622,000	$86,465,000	$12,825,000	$12,084,000	$59,160,000	$34,925,000	$222,081,000
" ($20,000 to $50,000)	11,668,000	41,828,000	8,587,000	10,552,000	33,468,000	12,757,000	118,860,000
" (Over 50,000)	6,045,000	27,481,000	2,031,000	6,113,000	21,077,000	10,444,000	73,191,000
Apartments	56,020,000	237,296,000	25,392,000	34,323,000	229,552,000	80,302,000	662,885,000
Hotels	33,589,000	141,146,000	27,683,000	40,765,000	205,332,000	60,475,000	508,989,000
Clubs, Fraternal, etc.	15,888,000	58,221,000	13,268,000	28,784,000	109,700,000	50,406,000	276,266,000
Churches	17,577,000	128,120,000	15,128,000	25,519,000	82,903,000	43,688,000	312,936,000
Community, Memorial	14,620,000	27,401,000	1,950,000	6,209,000	46,509,000	21,099,000	117,788,000
Welfare, Y.M.C.A., etc.	3,295,000	15,702,000	2,576,000	3,302,000	15,680,000	9,688,000	50,242,000
Hospitals	13,594,000	54,166,000	6,972,000	27,438,000	105,096,000	52,148,000	259,414,000
Office Bldgs.	21,157,000	88,877,000	18,089,000	26,359,000	190,486,000	82,603,000	427,570,000
Banks	17,608,000	54,328,000	8,835,000	18,783,000	154,482,000	38,669,000	292,705,000
Schools, Public Bldgs.	65,159,000	158,165,000	41,515,000	31,930,000	383,036,000	190,228,000	870,034,000
Theatres	9,573,000	34,847,000	2,759,000	7,381,000	29,388,000	17,943,000	101,891,000
Stores	11,113,000	35,383,000	6,826,000	7,480,000	58,361,000	27,723,000	146,887,000
Industrial	29,859,000	162,762,000	38,824,000	25,231,000	241,871,000	49,488,000	548,037,000
Automotive	11,988,000	35,942,000	2,799,000	8,386,000	52,464,000	15,190,000	126,768,000
Total Value of New Buildings	$355,375,000	$1,388,130,000	$236,059,000	$320,639,000	$2,018,565,000	$797,776,000	$5,116,544,000

Fig. 3. Estimated building activity in the United States for the year 1923 based on actual reports from 1767 architects' offices and conditions described in text herewith

into the zone of stabilization, a period of great activity developed in the spring and summer of 1922. Then came a condition effected by several factors aside from the natural seasonal change. These included the rail and coal disturbances, together with a depletion of manufacturers' stocks. The resulting increase in the cost of construction, which was first visible at the end of June, 1922, has since developed until general building costs are from 14 to 16 per cent higher than last spring. Naturally, this condition has affected the volume of new construction, although reports for November and December show a continuation of normal strength in the market and a considerable anticipation in the form of contemplated construction as measured by plans filed in building departments in all sections of the country.

In the field of building finance 1922 has been a most encouraging year. The investing public during this year has definitely returned to the building field as an outlet for conservative investment money, and at no time for many years has there been so much financing available for building loans and permanent mortgages. The large mortgage bond houses report an unusual volume of investment in their securities, and in the residential field the building and loan associations are lending in greater amounts than previously known.

Real estate activity has greatly increased because of the building boom, and judging from sales of vacant property recorded within the last few months, it is evident that there is great activity in obtaining sites not only for residential properties but for industrial, institutional and commercial buildings.

What 1923 Promises

This year, 1923, will show a greater volume of building activity than the year 1922! This prediction is based on the returns indicated in the comprehensive building survey and forecast for 1923, just completed by THE FORUM.

Last year THE FORUM survey was developed from confidential reports received from 955 architects' offices. The results of this survey were divided into ten building classifications. The present survey for 1923 is much more extensive and is based on reports received from 1767 architects with a division into 17 building classifications. These reports give a total amount of construction of $1,650,498,000. From these actual reports the various amounts of building, classified as to type and location given in Fig. 3, are derived and indicate the probable total value of new building for 1923 to be $5,116,544,000. The figures in this chart were arrived at by taking the actual reports from the offices of 1767 architects and multiplying these totals by the index figure of 3.1. This index figure has been arrived at by a comparison of the reporting offices with all architectural offices as to volume

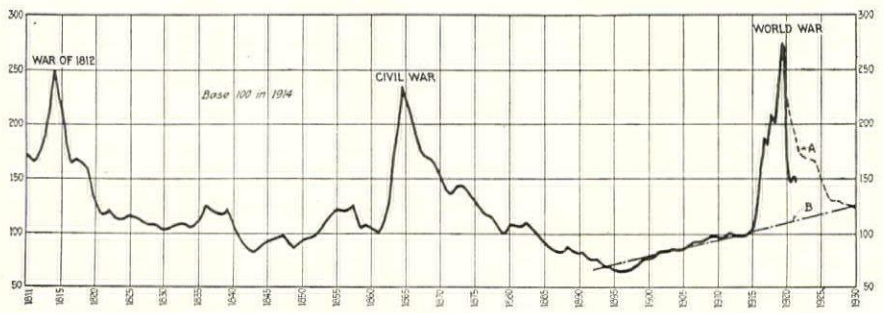
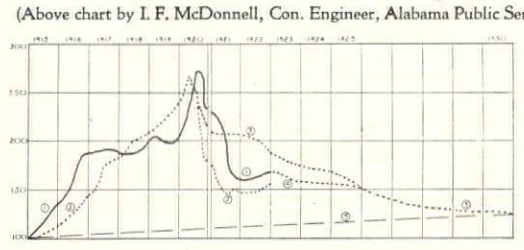


Fig. 4

(Above chart by I. F. McDonnell, Con. Engineer, Alabama Public Service Commission in *Engineering News-Record*)



The upper chart presents a graphic history of the general price trends since the year 1811. This shows the effect of the War of 1812, the Civil War and the World War.

The line designated as "A" is a composite curve of the two previous after-war price declines, showing that we have reached the present level of prices four years faster than after previous wars.

The lower chart is an interpretation of the upper chart from the year 1915 to 1930. Line 1-1 shows trend of cost of building with dotted line 4 a logical interpretation of future trend. Line 2-2 is trend of general prices with broken line 3-3 showing trend toward normal if at same speed as after previous wars. Line 5 shows normal building cost increase if uninterrupted by economic disturbance.

and classification of work from data maintained on each architectural office in the country and filed in the Architects' Registry which is kept in the office of THE FORUM. This information, together with comparative percentages of construction work not controlled by architects as indicated, justifies the assumption of the index figure 3.1, exactly as the index figure 5 was assumed for total valuations in the survey of 1922.

The Trend of Building Costs

While it is true that the cost of building has advanced considerably within the past few months, it is anticipated that this is but a wave in the general downward course of building costs, and that with renewed production activity and with relief from the rail and coal situations the cost of building should be on a downward trend again in the spring of 1923. It is highly important that all construction interests realize that the building market for 1923 is a market which must not be discouraged by high prices. It is a market which spells opportunity to take profits on volume of business rather than large profits on small business. The action of manufacturers, labor, finance and other factors which control building costs during the year 1923 will have much to do with the permanent prosperity of our industry. If a shortsighted policy is adopted, involving the forcing of high costs because of demand, prospective owners of buildings of every type will find practical reasons for putting off construction, and the confidence of the investing public, bankers and financiers will be destroyed, even as it was encouraged during the period of declining costs late in 1921 and early in 1922.

This question of the future trend of building costs, particularly of the cost of building materials, is one which is seriously debated with strong opinions both as to increase and decrease. A statement has been made by James A. Wetmore, Acting Supervising Architect for the United States Government, that within the next 18 months the country may look for a very material drop in the cost of building.

This fact has been seriously questioned by the Associated General Contractors of America in a recent bulletin statement which says:

"Not only has the cost of building been going up for several months, but so has the cost of materials. Wages in the building trades have more recently begun to increase also. The general average of wholesale prices has been increasing since the first of the year.

"The behavior of all these prices in increasing during a time of recovery from business depression is entirely normal. It is a phenomenon which always occurs during like periods. We believe it is a very strong indication that prices in general have been stabilized for the present on a new price level in the neighborhood of 70 per cent higher than that which prevailed in 1913.

"Instead of expecting that building costs will be materially lower 18 months from now, we anticipate that they will continue to increase during the great part of that period and that they will be at that time, perhaps, at about the beginning of a decrease, but at a point higher than the present. We believe, further, that the decrease which may be expected to begin at about that time will not go to a point very much below the figures reached during the past winter."

In explaining their reasons for these opinions, contractors say that the costs of building materials are going up partly because they are partaking of the general tendency of prices to rise during this part of the economic cycle, and partly because we are experiencing a building boom of unprecedented volume. Wages of building labor are increasing partly because of the shortage brought about by this same building boom and partly because of a recovery in other lines of industrial activity, which

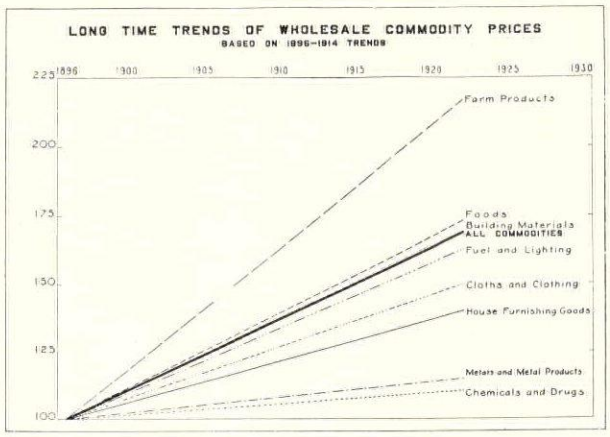


Fig. 5. Prepared by the Federal Reserve Bank of Boston, based on Commodity Price Index of the U. S. Department of Labor. Note how closely building materials costs follow composite commodities

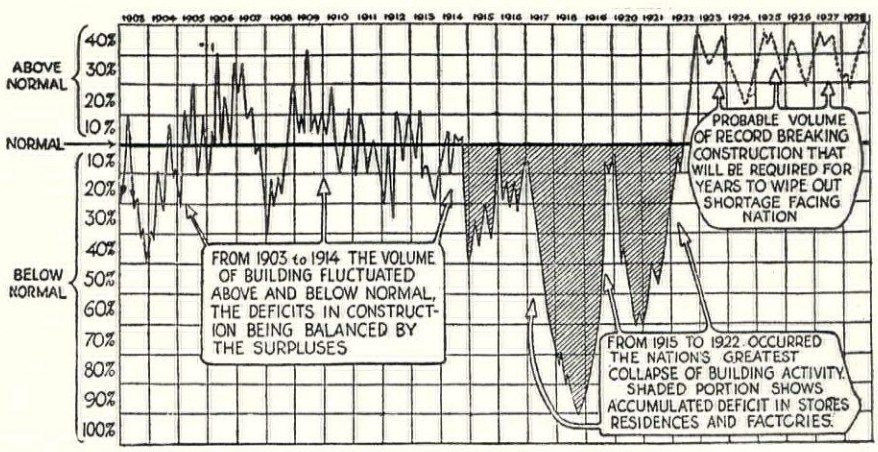


Fig. 6. A graphic presentation of the building shortage which has created an unprecedented demand for new buildings of every type. From *New York Times*, Sept. 3, 1922

is already beginning to produce labor shortage. It is the opinion of the Associated General Contractors, however, that "the building boom shows no signs of abating. For six successive months the figures for contracts let have been record-breaking. The slight recession of August is less than the usual seasonal recession. As a result of very painstaking investigations it has been estimated that the deficit in building, the country over, is so great tha tbuilding could continue for ten successive years, beginning with this year, at 25 per cent above normal before catching up with that deficit. We do not predict any such sustained activity, but we do point to the figures as proof that there is no possibility of the present building boom's coming to an end within the next few months because of having completely filled the demand for new construction." It is the opinion of the Research Department of THE FORUM that the present increase in prices is a natural reaction due to factors such as depletion of stocks, coal and rail disturbances and similar influences, and that the general trend of prices will be downward without any further increase, and probably with a decrease showing again early in 1923.

In Fig. 4 the general commodity price trend since 1811 is portrayed together with an interpretation of the decline of prices since the world war and a prediction of the trend of building costs. In analyzing price trends and building costs for any period of years it is very interesting to note that the trend line of building costs usually follows very closely the course of the trend line of general costs.

In Fig. 5 is shown the long time trend of wholesale commodity prices. It will be noted that the cost of building materials almost parallels the line of all commodity prices for the long period from 1898 to 1922.

The first great waves of speculative building and construction of the cheaper type have passed, and 1923 will be remembered as a year in which a great volume of good building construction was produced. It is evident that residential construction will continue in volume almost equal to that of 1922, with greater activity in the more expensive types of dwellings and probably in the hotel field. Fig. 7 shows the allocation by percentage of public demand for new buildings in 1923 and approximates the probable divisions of investment to be made.

Industrial construction indicates surprising strength, and the fact that so much of this work is reported by architects shows that a large proportion of the volume of industrial construction for next year will be of a permanent, well designed character. Much of this construction represents plant expansion by well established manufacturing concerns, together with the establishment of new industries of substantial character.

All evidence points to the fact that there will be available an ample amount of financing for this great volume of projected building construction.

The problem of labor conditions is one on which no forecast can be made, but it is quite probable that 1923 will show a fairly good spirit of co-operation between employers and labor in the building industries. Labor leaders are becoming more farsighted, and in certain of the trades there is a growing interest in the apprentice problem and in the idea of admitting a larger proportion of new men into the ranks. Certain reactions must be felt by the unions as the enforced shortage of mechanics in some of the trades brings about an increase in the amount of work performed by mechanical methods or by substitution of materials not within jurisdiction of the particular trade in question.

Considering all facts, it is certain that 1923 should be a year of sound prosperity for all branches of the construction industry, provided no advantage is taken of conditions either by the cheapening of the quality of materials or the enforcement of prices which represent too great a margin of profit.

The great drop in construction costs is over, and those who wish to build may do so in 1923 without fear of loss through the shrinkage of existing building values incidental to rapid price deflation.

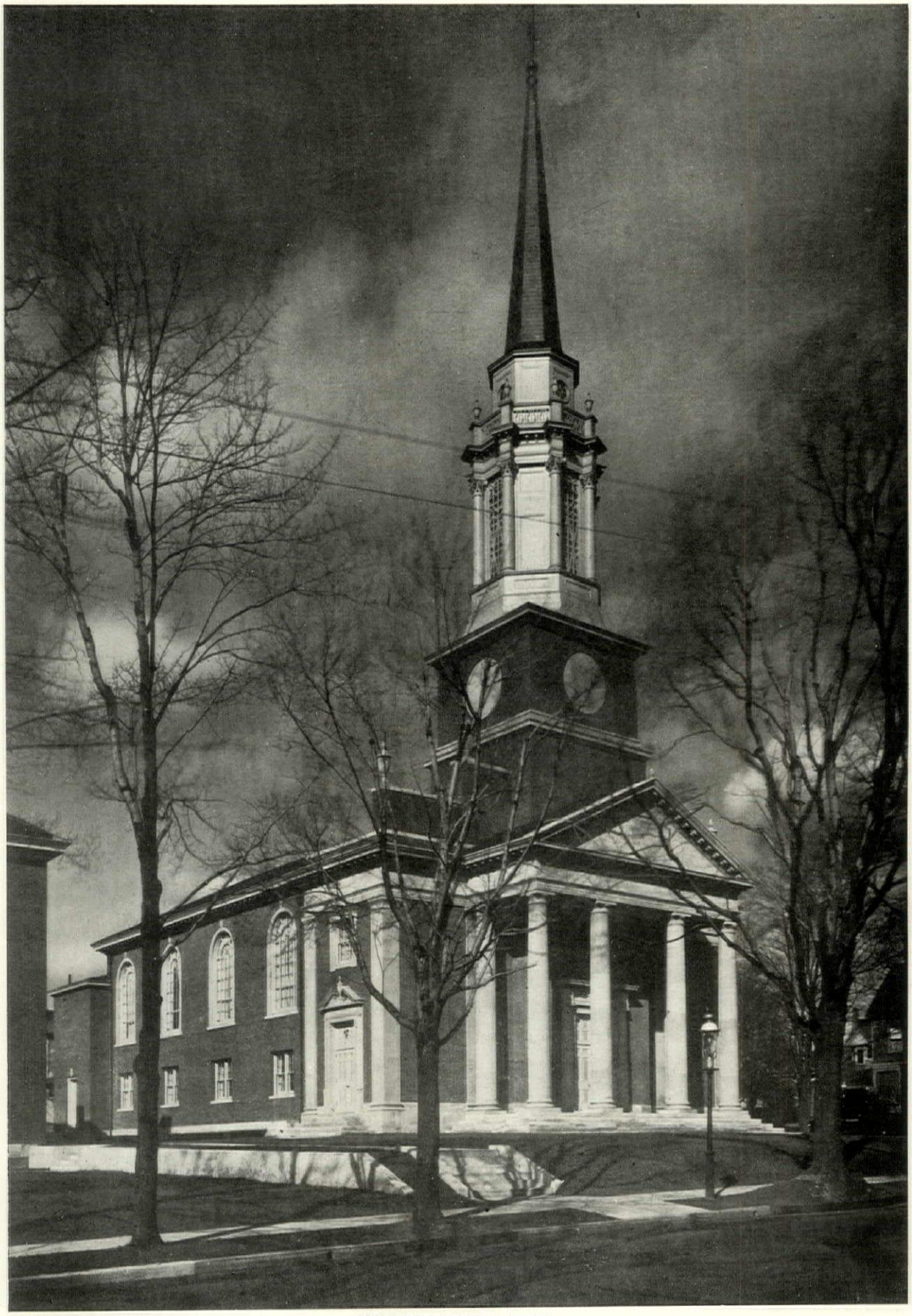
Plan your buildings efficiently, use good materials and equipment, and there need be no fear of loss of principal or failure to enjoy good investment or utility returns. Remember that the long swing of building investment values means keen occupancy competition at certain periods. Cheap construction and careless planning represent false economy and are an open road to foreclosure.

Insist on plan economy, which means efficiency of purpose; on integrity of construction to insure low maintenance and depreciation costs, and on good architecture which includes both these factors.

It is their appreciation of practical requirements as well as their skill in the art of three-dimension design which is establishing the architects of America as the leaders of their profession today, and architecture, in its broadening scope of service, is becoming recognized as a highly important contribution to the strength of the economic structure of the United States.

GEOGRAPHICAL DIVISIONS	Dwellings under $20,000	Dwellings $20,000-50,000	Dwellings over $50,000	Apartment Buildings	Hotels	Clubs and Fraternal	Churches	Community and Memorial	Welfare Y.M.C.A. etc.	Hospitals	Office Buildings	Banks	Schools and Public Bldgs.	Theatres Motion Pictures	Stores	Industrial	Automotive
	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT	PER CENT
Northeastern States	4.7	3.3	1.8	15.7	9.4	4.4	4.9	4.2	1.	3.8	6.	5.	18.3	2.7	3.2	8.4	3.2
North Atlantic States	6.2	3.	2.	17.	10.1	4.2	9.	2.	1.1	4.	6.4	4.	11.4	2.6	2.5	11.7	2.6
Souteastern States	5.4	3.8	1.	10.8	11.7	5.6	6.4	.8	1.	3.	7.6	3.9	17.5	1.	2.9	16.4	1.2
Southwestern States	3.8	3.3	2.	10.7	12.7	9.	8.	2.	1.	8.5	8.2	5.8	9.9	2.3	2.3	7.8	2.6
Middle States	3.	1.8	1.3	11.4	10.2	5.4	4.2	2.3	.7	5.2	9.4	7.5	18.9	1.4	2.8	11.9	2.6
Western States	4.3	1.6	1.3	10.4	7.7	6.3	5.4	2.7	1.2	6.5	10.3	5.	23.8	2.2	3.4	6.1	1.8
National Percentages, U.S.A.	4.7	2.8	1.7	12.6	10.4	4.8	6.4	2.	1.	5.1	8.	5.3	16.6	2.	2.8	10.4	2.4

Fig. 7. Tabulation showing by percentages approximate strength of demand for various types of new buildings in each section of the United States for the year 1923. Based on reports from 1767 architects' offices

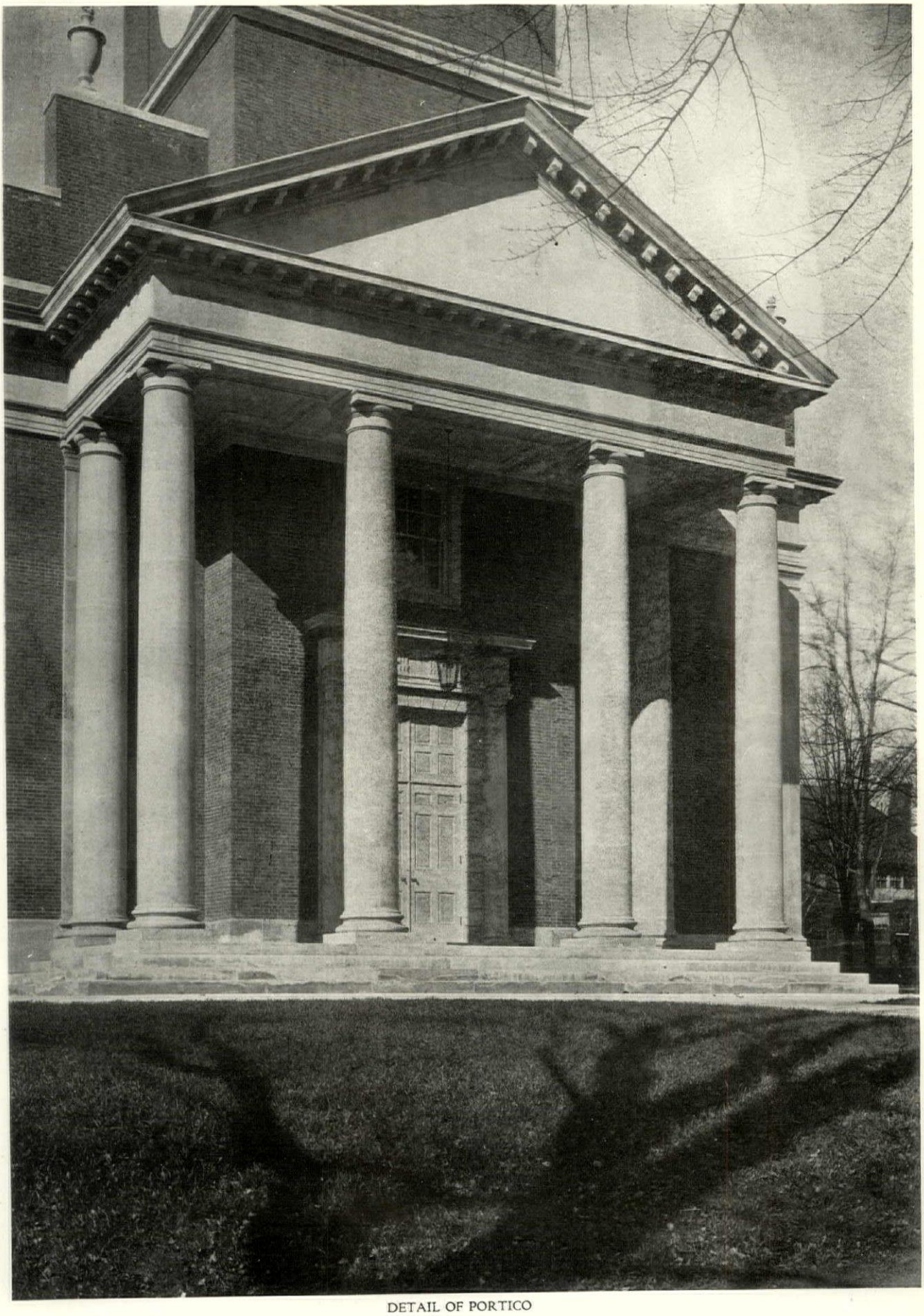


Photos by John Wallace Gillies

GENERAL EXTERIOR VIEW

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

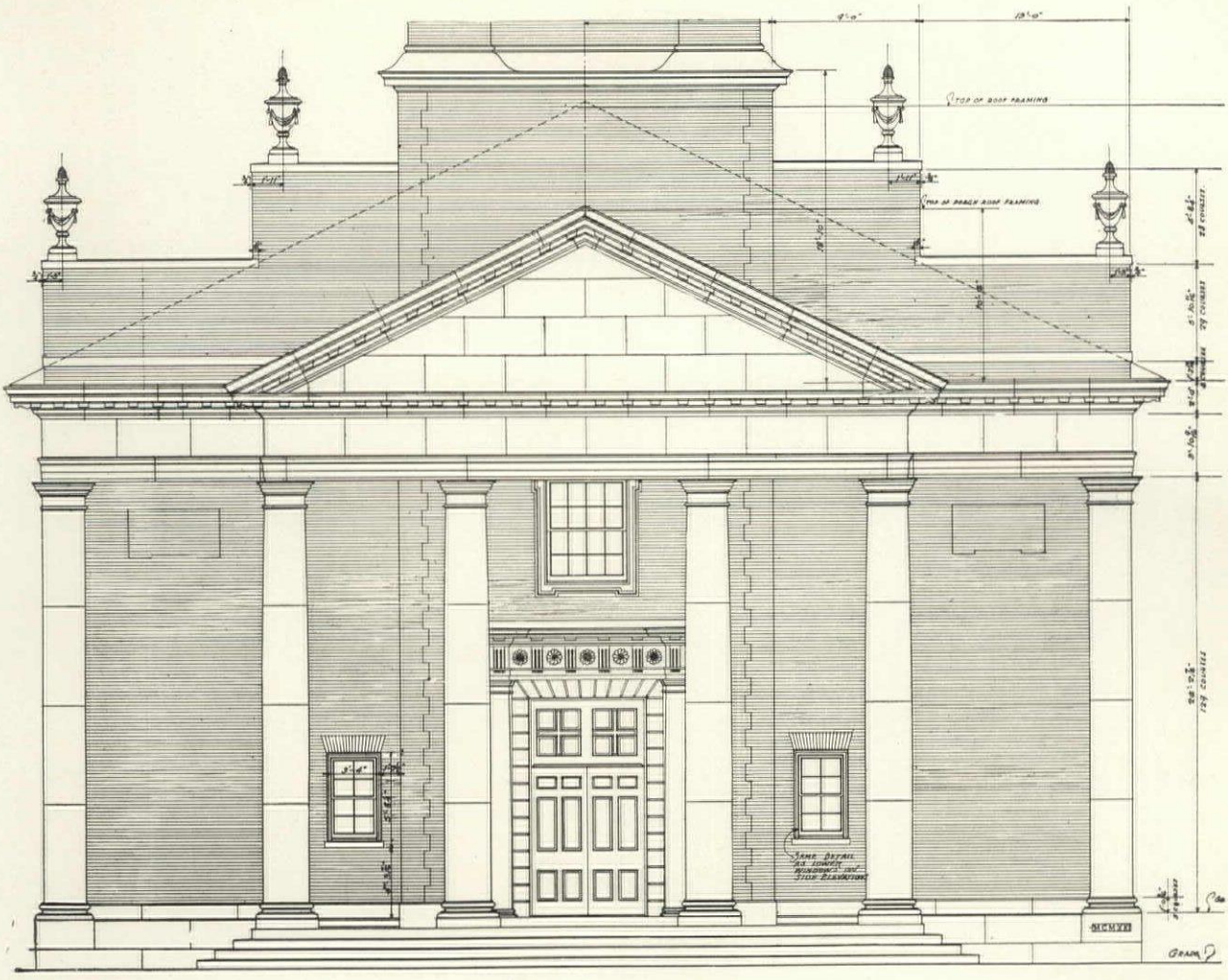
CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED



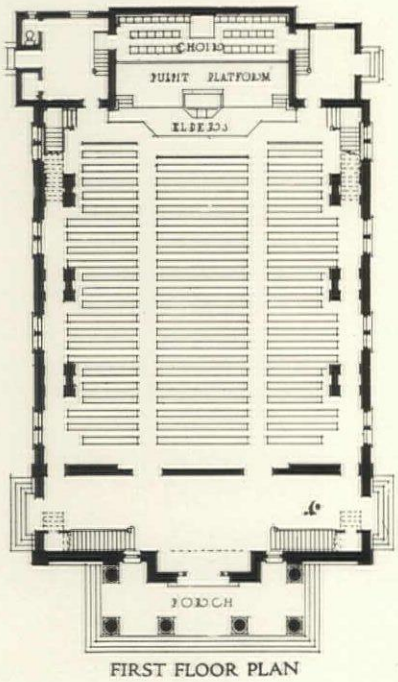
DETAIL OF PORTICO

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

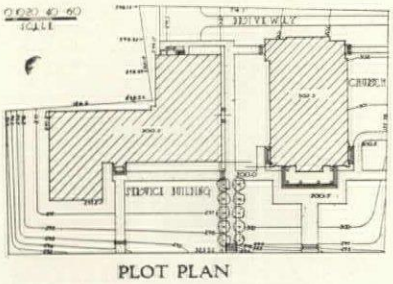
CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED



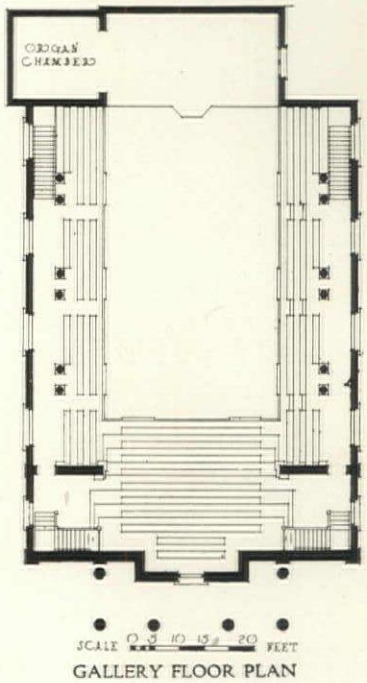
DETAIL OF PORTICO



FIRST FLOOR PLAN



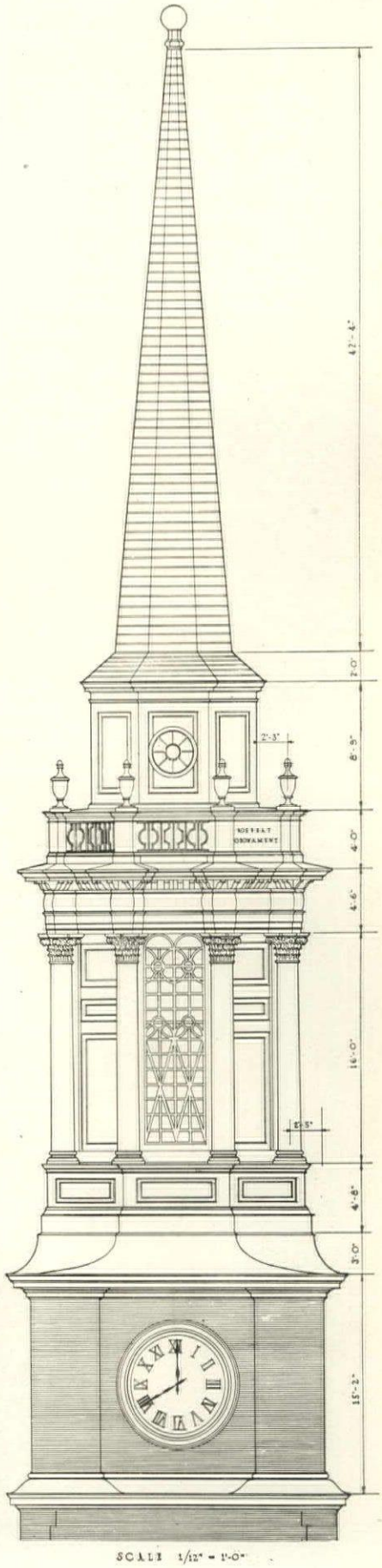
PLOT PLAN



GALLERY FLOOR PLAN

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED

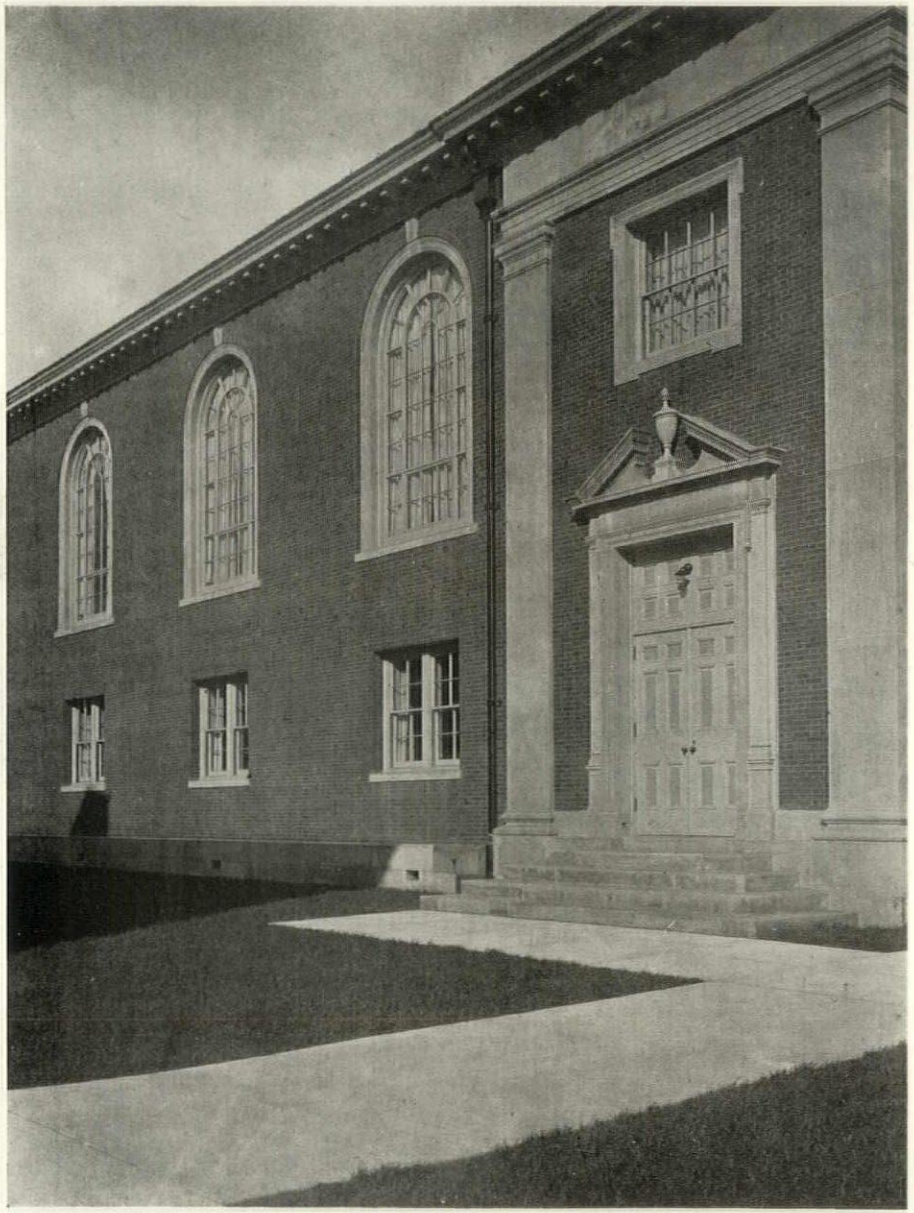


SCALE 1/12" = 1'-0"

DETAILS OF STEEPLE

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED



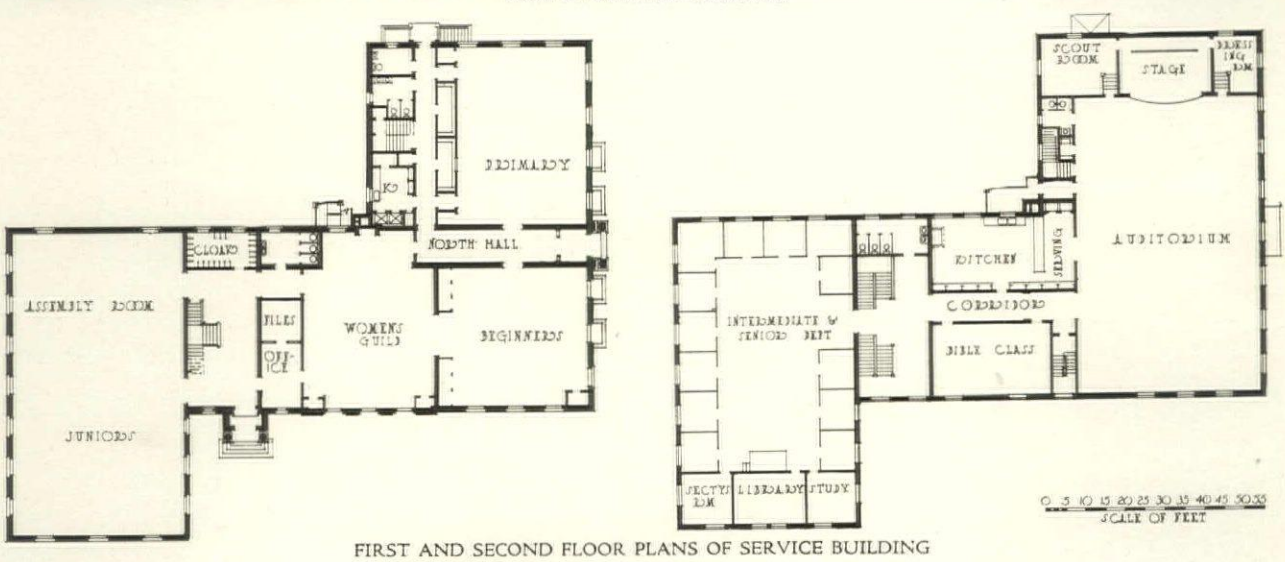
DETAIL OF SIDE ELEVATION

INTERIOR OF AUDITORIUM

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED

VIEW OF SERVICE BUILDING



FIRST AND SECOND FLOOR PLANS OF SERVICE BUILDING

CENTRAL PRESBYTERIAN CHURCH, MONTCLAIR, N. J.

CARRERE & HASTINGS, ARCHITECTS; SHREVE, LAMB & BLAKE, ASSOCIATED

Two Recent Chicago Playhouses

THE TWIN SELWYN AND HARRIS THEATERS

C. HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS

ONLY occasionally does an opportunity come to a modern architect of designing adjoining buildings in a manner which makes for harmony and symmetry, each structure possessing its own individuality and character while contributing its share to the well ordered dignity of the group, large or small, of which it is a part. An opportunity of this kind, productive of excellent results, and full of suggestions as to what might be achieved upon a somewhat more ample scale, was recently presented in Chicago in the building of the Selwyn and Harris Theaters by the same architects.

The fact that the two structures were to be occupied exclusively as theaters and not as office or loft buildings, in which theaters were to be masked or concealed, added considerably to the interest of the problem and aided in securing the beauty of the completed result. The twin structures are by no means identical in appearance or even in exterior arrangement, but their heights and chief characteristics are in complete accord, and the eye of the observer notes with satisfaction the long horizontal lines of their lower or basement stories and the parapets before the windows, the round Roman arches and the pilasters of their upper facades, and finally the strong, vigorous lines of the parapets which are placed above the cornices. The material of the exteriors is light toned terra cotta with color suggested in the trim of the windows, the canopies over the main entrances, and the bulletin boards used at various places.

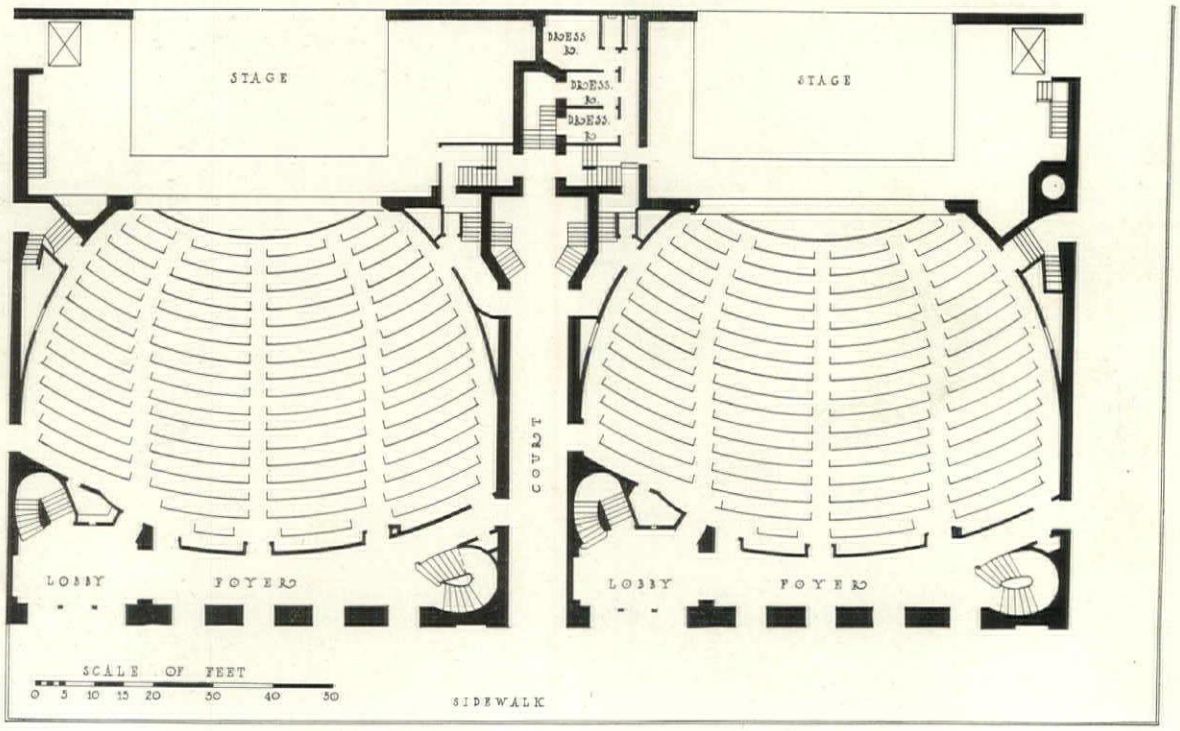
The fact that each building is exclusively devoted to an individual theater has had its due effect upon the plan, for since no provision must be made for shops, with the approaches to the theater made of secondary importance, the entire front of each building has been given up to providing adequate entrances which lead directly into the theater auditorium proper. The lobby, containing the ticket offices, may be open the greater part of the time, the other doors, leading from the auditorium to the sidewalk being opened only when an audience is leaving the theater.

The interior of the Selwyn Theater might be described as being a sumptuous though refined development of the styles of the English renaissance, exhibiting certain characteristics of what would be regarded as Georgian architecture and decoration while in certain other details suggesting uses which are more closely associated with the reign of Queen Anne. The walls from the carpeted floor to the coffered ceiling are paneled with the finest English

Exteriors of the Twin Theaters, the Harris and Selwyn, Chicago

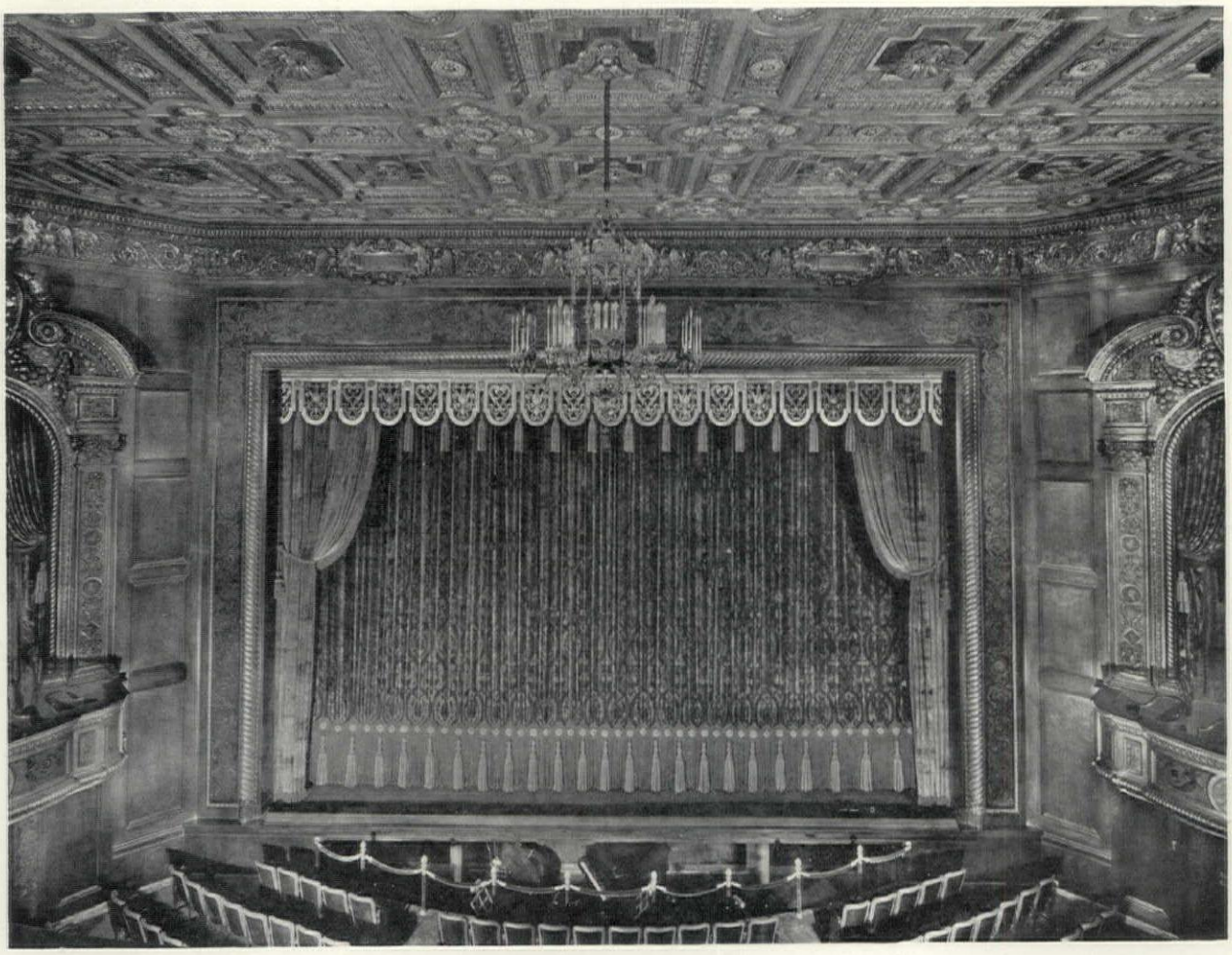
Detail of Harris Theater Facade

walnut, especially selected because of its rich grain and texture and for the mellow softness which this wood possesses. The walls are divided into large panels entirely devoid of carving excepting above the proscenium arch, around the boxes and in certain other places where carving in high relief after the manner made popular by Grinling Gibbon emphasizes the rich severity of the paneled walls. In contrast with the soft brown of the walls the ceiling of the theater is elaborately coffered and polychromed in antique green, cream and gold, the coloring being toned to produce the effect generally conferred by age. Lighting fitments, whether hung from the ceiling or used as wall lights in the boxes and at other points in the auditorium, are of cut crystal and gilt, producing a sumptuous appearance



Auditorium Floor Plans of Harris and Selwyn Theaters

MAIN LOUNGE OF HARRIS THEATER



PROSCENIUM OF HARRIS THEATER, CHICAGO

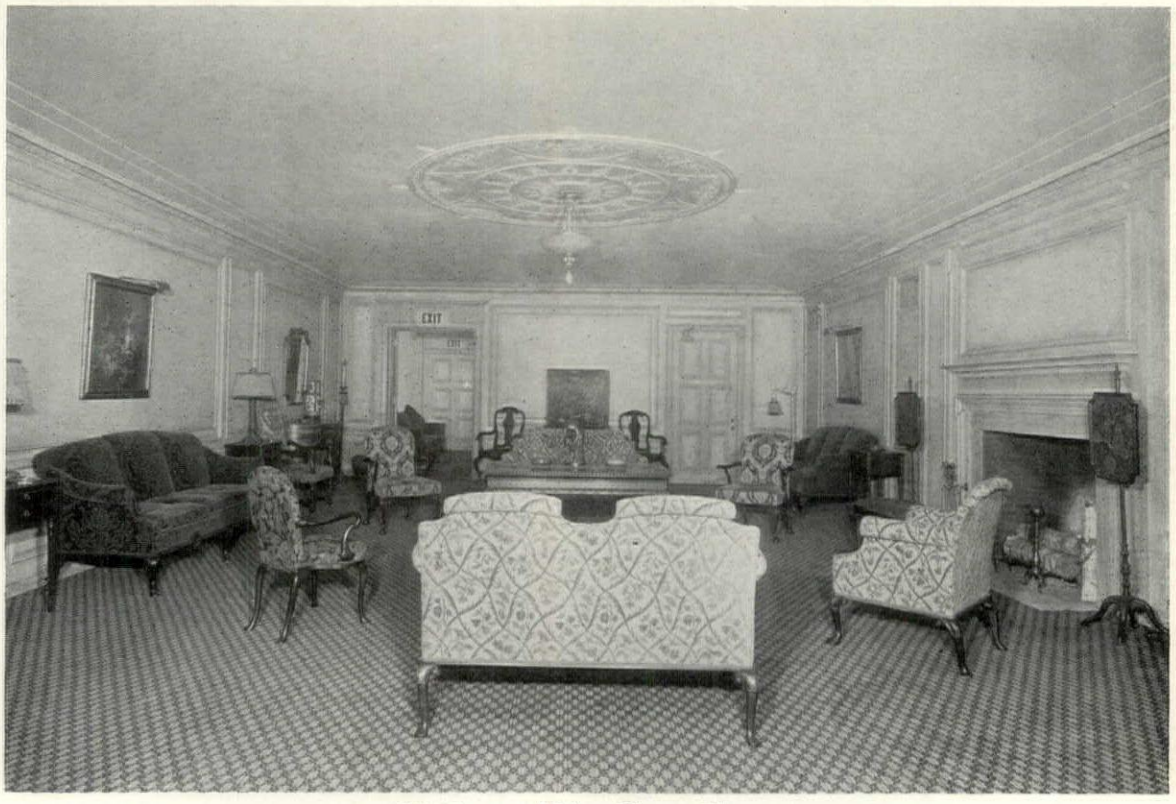
C. HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS

when seen against the walnut paneling, all this splendor of effect being enhanced by the use in draperies at the proscenium and around boxes of French silk in green and gold, arranged in rather simple fashion and avoiding the elaborate festoons, cascades and superabundant valances often seen in theaters. The entire effect is that of richness, but of richness restrained by good taste.

Fully as successful as the Selwyn is the Harris Theater next door. Here the architecture and decoration are not inspired by the English renaissance of the seventeenth and eighteenth centuries but by that of Italy two centuries earlier, this interior suggesting Florence at the height of her splendor. Here again the walls are paneled with walnut, but now the wood is not English but Italian and embellished with elaborate intarsia and ornament in gold. With the richness of walnut panels and intarsia as a background, the details of proscenium arch and boxes are worked out in full color which is repeated in the Italian renaissance ceiling, and the curtain and the draperies about boxes are of crimson velvet.

In both these theaters the notes established by the auditoriums themselves are sustained throughout the entire buildings. The same effect of luxury has been given to the lobbies, the foyers, lounges, smoking rooms, women's rest rooms and managers' offices. While maintaining the note of luxurious comfort through all these departments there has been no monotony of effect or repetition of decoration. The sumptuous Georgian architecture and decorative treatment of the Selwyn's auditorium, for example, are suggested in the far simpler Georgian treatment of the main lounge in the basement, where wood paneled walls are painted in parchment color, creating an excellent background for color in paintings. The women's rest room is finished with apple green walls and fitted with furniture painted parchment color and illuminated with brilliant color after the manner of Venetian furniture, while the men's smoking room has its walls paneled in old ivory tones with walnut furniture.

Of all these accessory rooms in the two theaters, those which might seem to many to be most interesting in certain respects are the main lounge and the smoking room of the Harris Theater, which are based upon certain apartments in the Davanzati Palace in Florence. The walls of these rooms are of the rough textured plaster so often used in old Italian buildings. The wood beamed ceiling has its heavy timbers illuminated in color, while the chimneypiece is almost an exact reproduction of one which has stood for centuries in one of the palace's principal rooms. Furniture used is largely patterned after Italian models, the addition of certain pieces, such as broad, low divans, being perhaps to add a note of friendly comfort to a public room which must be used by a large number of people. This note of Italian luxury and splendor, large scale and opulence of color, is carried even a step further in a mezzanine lounge which is part of the Harris Theater, where the walls are of stone, and the ceiling is groined or vaulted and then decorated in fresco. A theater demands treatment quite different from that given a building of almost any other kind. Its very purpose and function presuppose richness and luxury, and these qualities are rarely handled with the success which has been attained here.

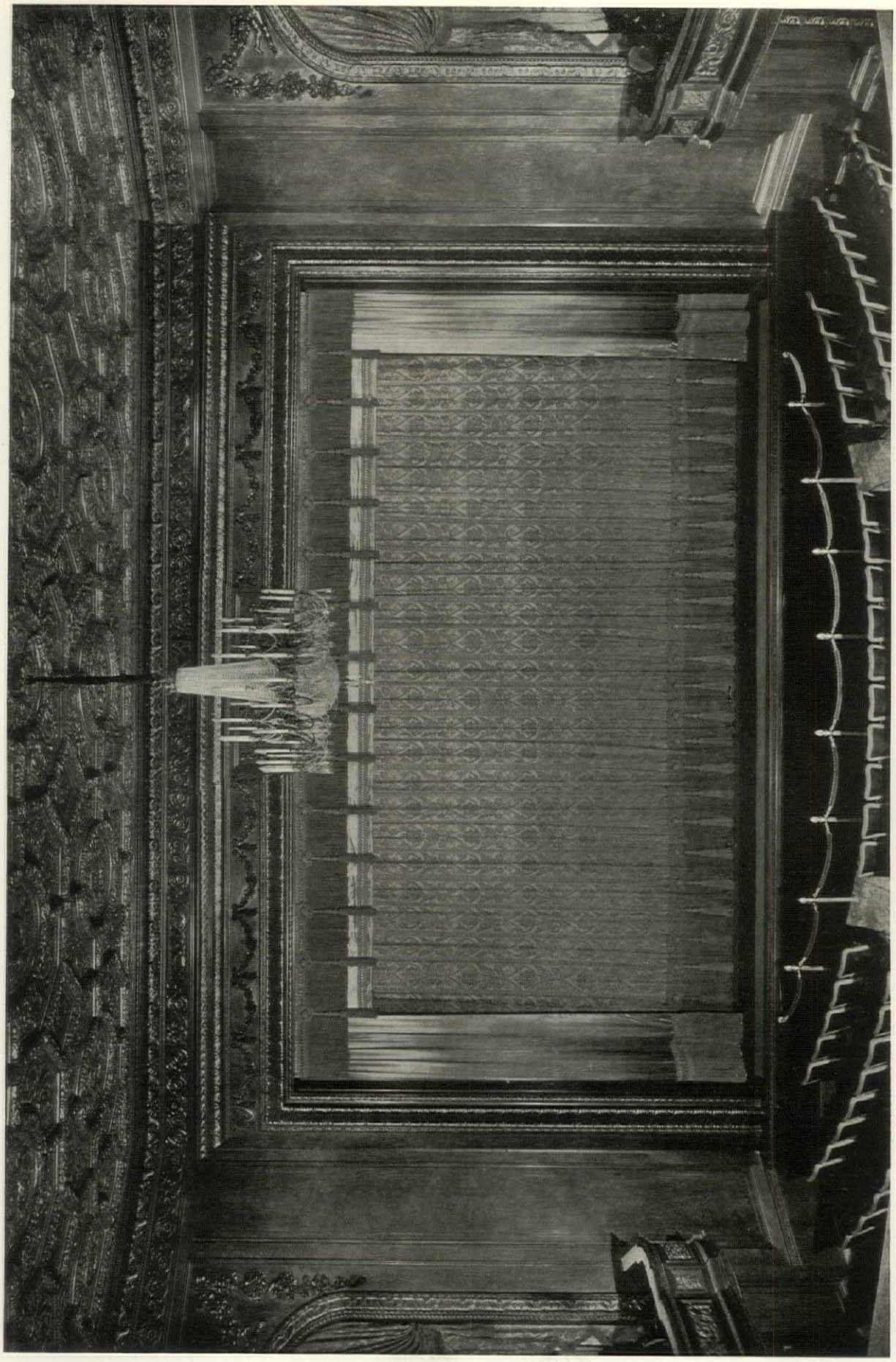


Main Lounge of Selwyn Theater, Chicago

Photos by Fowler

SELWYN THEATER, CHICAGO

C HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS



AUDITORIUM

SELWYN THEATER, CHICAGO

C. HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS

DETAIL OF BOX

SELWYN THEATER, CHICAGO

C. HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS

DETAIL OF BOX

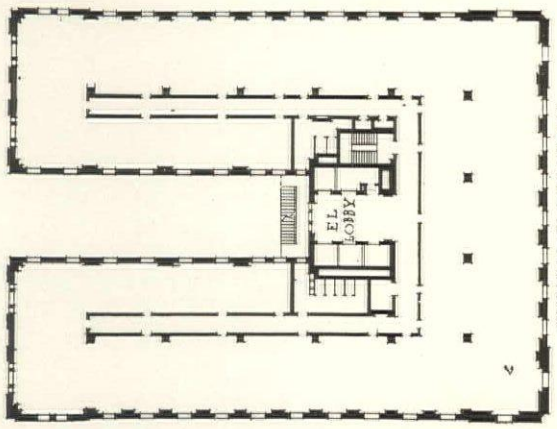
HARRIS THEATER, CHICAGO

C. HOWARD CRANE, KENNETH FRANZHEIM, ARCHITECTS

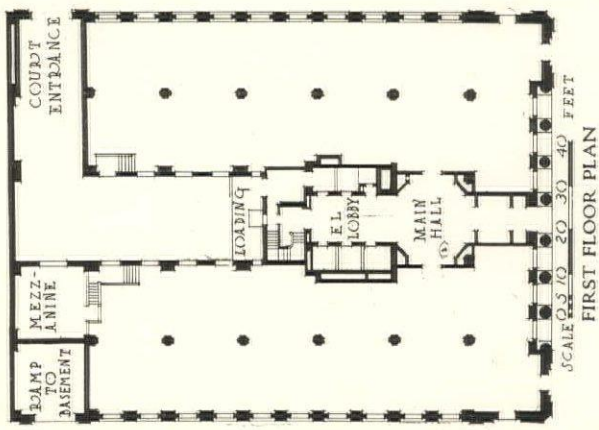
Photo by Charles H. Barnard

CANADA CEMENT COMPANY BUILDING, MONTREAL

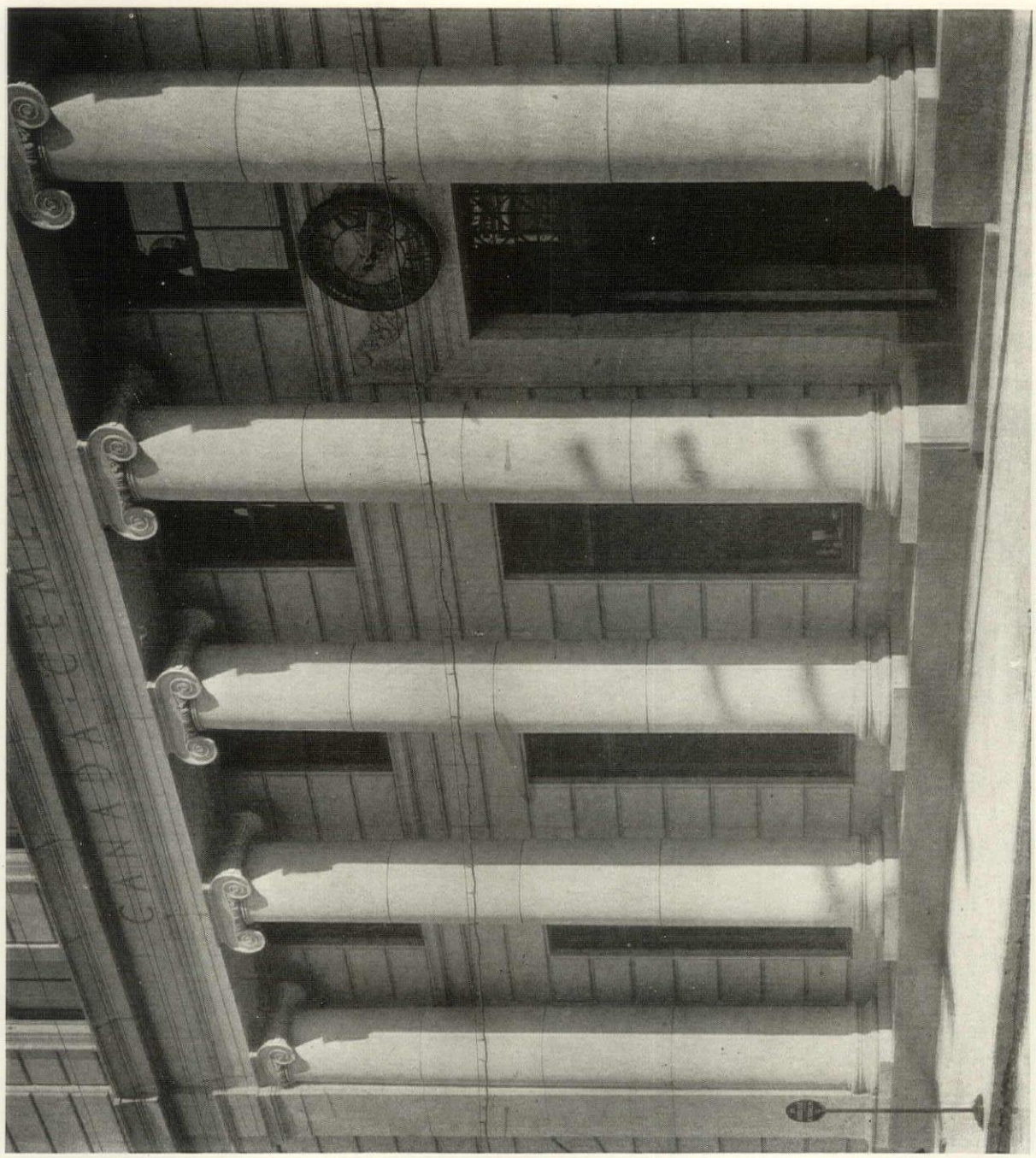
BAROTT & BLACKADER, ARCHITECTS



TYPICAL FLOOR PLAN



FIRST FLOOR PLAN

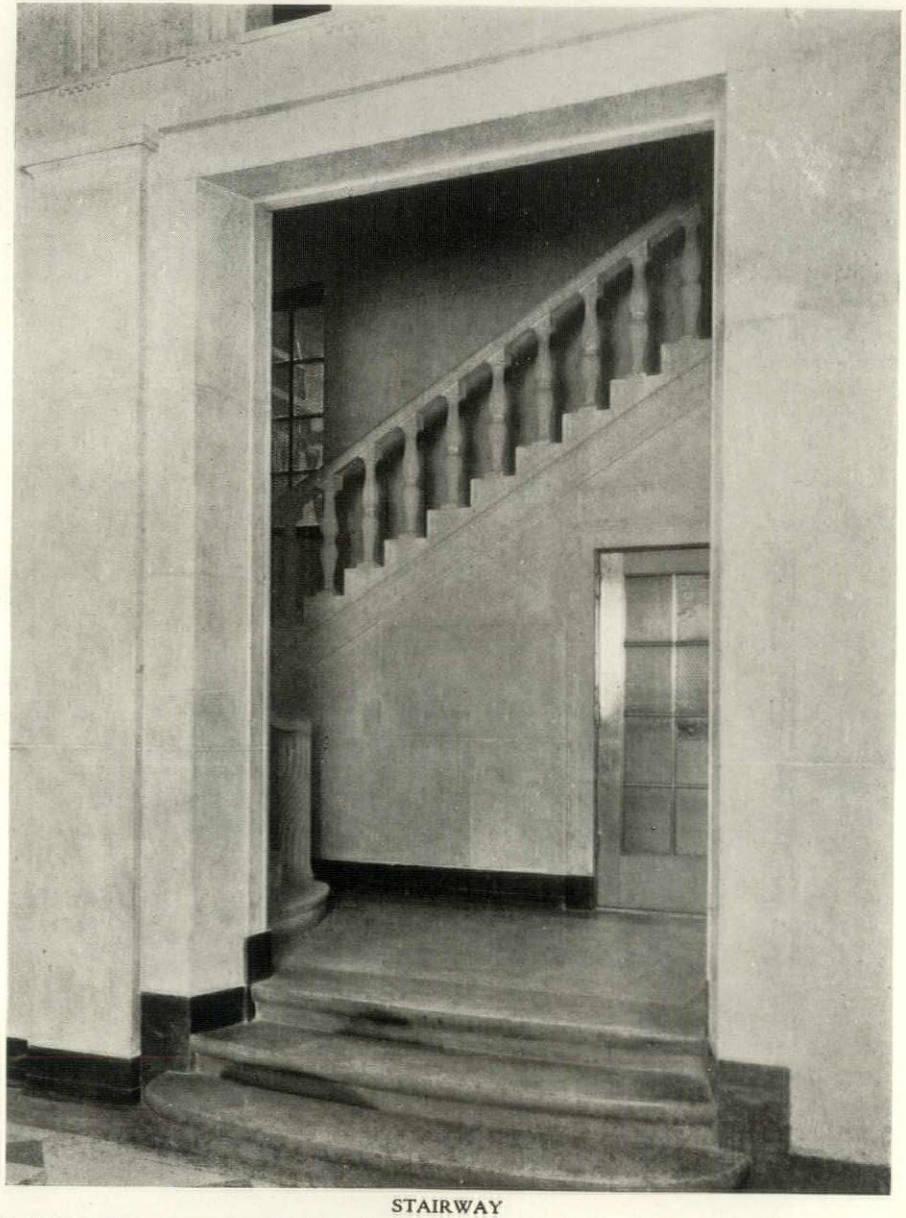


DETAIL OF COLONNADE

CANADA CEMENT COMPANY BUILDING, MONTREAL

BAROTT & BLACKADER, ARCHITECTS

ELEVATOR LOBBY

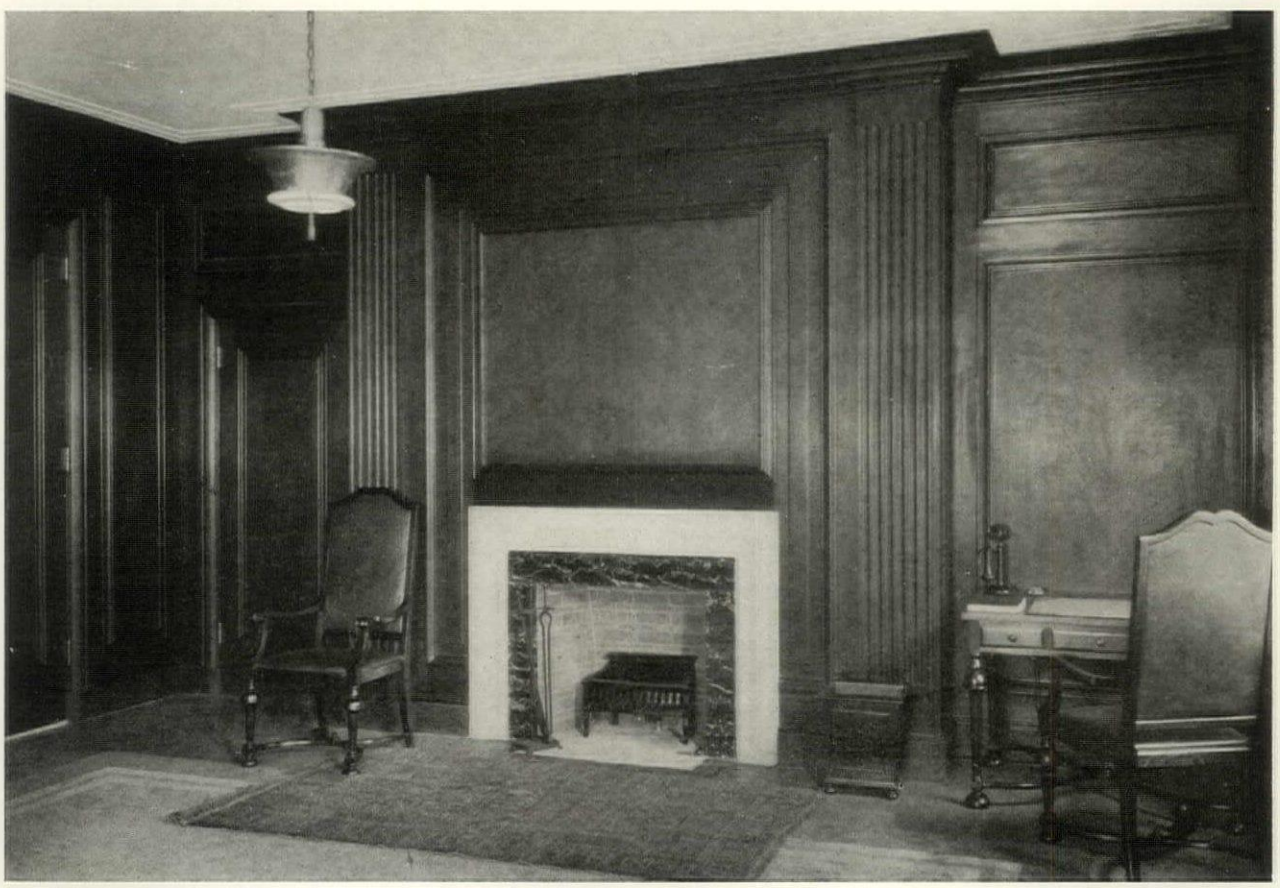


STAIRWAY

CANADA CEMENT COMPANY BUILDING, MONTREAL

BAROTT & BLACKADER, ARCHITECTS

PRIVATE OFFICE



Photos by Notman & Son

BOARD ROOM

CANADA CEMENT COMPANY BUILDING, MONTREAL

BAROTT & BLACKADER, ARCHITECTS

Canada Cement Company Building, Montreal

AN ARCHITECTURAL ACHIEVEMENT IN THE USE OF CEMENT PRODUCTS

BAROTT & BLACKADER, ARCHITECTS

THE erection in many countries of tall buildings proves that their economic advantages have won for them a popularity which is destined to endure, and which has already changed the aspects and skylines of cities everywhere. Different cities in the Dominion of Canada have made wide use of steel construction, and in Montreal there are many structures which rank well as examples of what such buildings should be.

The dignified ten-story structure built by the Canada Cement Company is a striking instance of what may be done with a comparatively tall building, for it embodies designing and planning of a high order. It is also of special interest because cement in a wide variety of uses has been employed in every practical way in a building the owners of which were naturally interested in displaying the advantages of their product. The effort is entirely reasonable. No attempt has been made to use cement products where other materials would be more suitable or less costly. The structure is reinforced concrete, and the exterior facing is of cast cement.

The building occupies what is perhaps one of the most desirable locations in Montreal, an entire block front facing Phillips square, in the center of which stands the statue of King Edward VII. Streets upon each side of the building afford permanent natural light upon three sides. Provided thus with a distinguished setting, the building presents a highly architectural exterior, the two lower stories forming a base and recessed across the front to form a colonnade flanked at each end by a pylon. The base is rusticated, and this treatment has been continued up the corners of the building, the two upper stories being treated in a way which repeats the colonnade motif by the use of engaged columns which support a rather delicate cornice.

The main entrance to the building from Phillips square opens into an octagonal hall from which one passes into the lobby with its six elevators,—four passenger, one of the "push-button" type, and one for freight. Walls of entrance vestibule, main hall and elevator lobby are of artificial stone, floors of black and white marble, and the plastered ceilings, coffered in Italian renaissance style, are colored. Corridors above the ground floor are provided with cement floors and dadoes of gray marble with black marble trim and base. The bases of these upper floors are planned with spaces behind for laying of telephone or bell wires.

In the cast cement facing of the exterior with its correct and semi-classical lines, the aggregate has been selected to give an effect similar to that of granite, and the ornament is hand tooled throughout. The columns of the colonnade across the front of the building, of the same material reinforced with steel, are used structurally and are not plastered on as mere ornament.

In addition to being used as exterior facing, for exterior and interior columns and for floors, cement has also been used for the roof, this building being one of the first in the Dominion to follow the modern tendency toward the complete use of concrete and reinforced concrete construction. The customary arbitrary method of using concrete, which prescribes the use of certain portions of cement, fine and coarse aggregates, was disregarded, and a study was made of such aggregates as are to be had in the vicinity of Montreal. The strength of the concrete required for different classes of work in the structure was specified. Consistency was regulated by "slump tests," and the compressive strength was checked by the test cylinders taken from the concrete as it was poured, the results agreeing comparably with the specifications. This is an improvement over the methods generally adopted where concrete is used, which assume a certain strength for given proportions, while the concrete which is actually obtained may differ considerably from that called for in the

Detail of Upper Stories

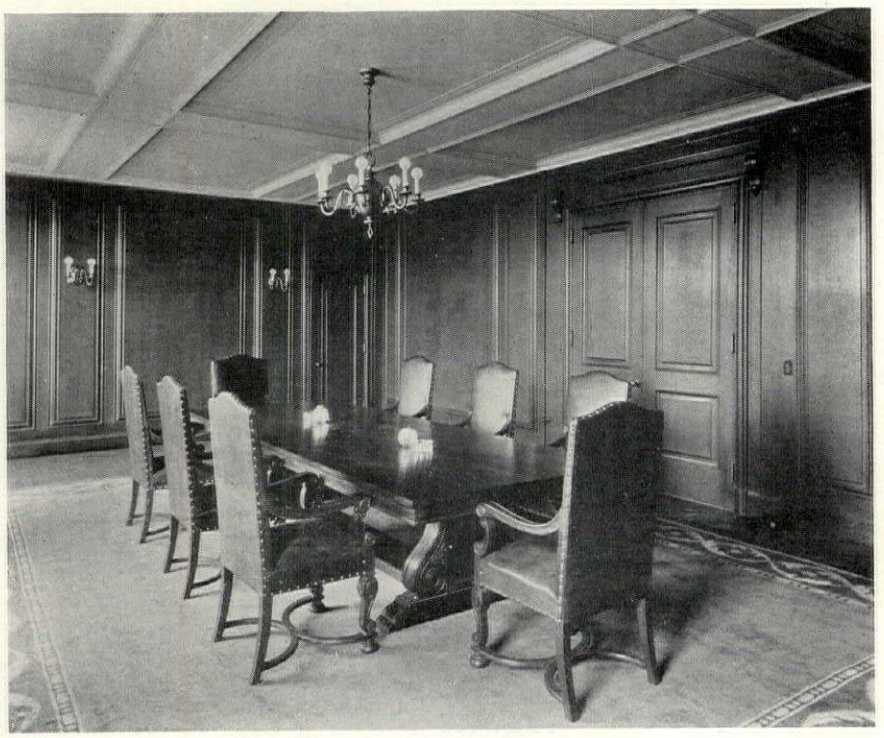
General Office in Canada Cement Company's Quarters

specifications and figured on in designing the structure. Concrete designed for a compressive strength of 3,000 pounds was used for the columns, and 2,500-pound concrete was employed for the floors.

Heating in the building is of the vacuum type, and the system makes use of about 22,000 square feet of direct radiation. Everywhere throughout the structure the radiators are placed in front of the windows and a few inches lower than their sills. Excepting in the basement and the sub-basement all the pipes, including the branches and risers, are concealed in furred spaces. Supply pipes are protected by asbestos covered with canvas, return pipes being covered only where they pass through cold air spaces. In laying out the heating installation care was taken to have the system suitably valved in order that it could be sectionalized for necessary inspection and repairs.

Two water tube boilers of 175 h.p. capacity, designed for 160 pounds water pressure, are included in the installation, and a pit in the sub-basement and close to the smoke flue was provided for the boilers. Vacuum and feed pumps are in duplicate, and to make possible the installation of a steam and electrical plant, which the owners of the building may soon require, high pressure pumps were included and the boiler room, piping and auxiliaries were laid out with this in view so that in event of a generating plant's being installed the exhaust steam could be used for heating purposes. The water supply is under tank and street pressure. Upon the roof is a 1,500-gallon tank which is filled from automatically controlled booster pumps in the sub-basement. Water for the five upper floors is taken from this house tank, the lower floors being fed from the 45-pound main in the street, although if necessary the house tank can supply the entire building. Hot water is supplied from a low-pressure steam water jacket placed in the boiler room, equipped with a coal-fed jacket heater for use during the summer.

Electrical power and light are supplied by the public service companies at 200 volts, 2-phase, a transformer being provided in the basement. Light and power are distributed from the main switchboard which is placed in the engine room. The tenants' lighting is metered on their various panelboards. Conduits for the electrical wiring on different floors are laid directly in the concrete floor slabs, and a special conduit system is provided for the telephone and telegraph wires. Mechanical ventilation is provided only for the boiler room, which is supplied with fresh air by a fan. The building contains about 3,000,000 cubic feet and cost approximately 49 cents per foot, not counting architects' fees.



Wood Paneled Directors' Room

Domestic Architecture by Miller & Reeves

ILLUSTRATED FROM RECENT WORK AT COLUMBUS, OHIO

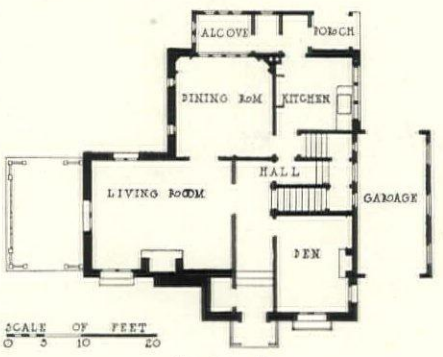
By WILLIAM DWIGHT SMITH

ANYONE who follows the progress of American domestic architecture as it is recorded year after year in the journals which serve the architectural field, and in publications of somewhat broader scope which cover the fields of building and furnishing, will realize the extent to which excellent domestic work is being done in every section of the country. Much of this work is due to architects of what might be called the younger school, men who have been trained in the offices of older architects and now entered upon careers of their own. The work of these younger men shows that a firm grasp is had upon the American country or suburban home and its problems, and quite a variety of types are being handled with success which means much for the future of American architecture.

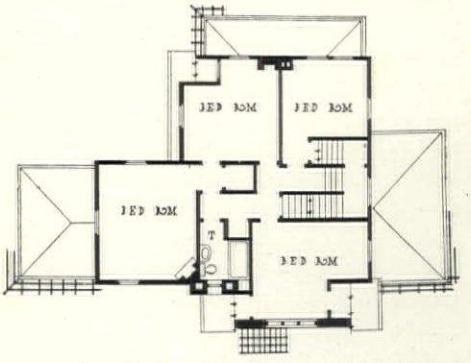
Any review of the work of comparatively young organizations may rightly include that of Miller & Reeves of Columbus, Ohio. By reason of strict devotion to architectural ideals, such as simplicity, sincerity, logical design and economy, their work has done much to cultivate a none too fertile field in the middle west.

As is so often the case, the leaven of their influence has worked first in rapidly growing suburban subdivisions, where new capital and young families seek investment and domicile. The temptations are so strong in such work, to cater to fads and whims, to sacrifice simplicity and sound construction for temporary investment and display, that only steadfast adherence to first principles can prevent ultimate artistic failure.

Regardless of the particular style which Miller & Reeves choose for the exterior dress of their compositions, they seem to indulge in none of the flashiness which is all too common in much recent domestic work. In the choice of this dress their work shows eclecticism to a marked degree. In the process of "finding" themselves they have used interpretations of several different styles with uniform good taste in handling. In their small work, such as the houses in Bexley Park and in the Drexel avenue group, which includes the Fuller, Coleman and Matchneer



First Floor Plan



Second Floor Plan

Exterior and Plans, House of O. C. Miller, Esq., Bexley Park, Columbus, Ohio
Miller & Reeves, Architects

House of G. L. Fuller, Esq., in Drexel Avenue Group

residences, their success depends primarily upon simplicity and dignity of mass, but this is enhanced by interesting diversity of detail which usually looks to well established colonial forms for inspiration. With the concentration of architectural interest about a main entrance there is justification for the use of somewhat intricate detail. For economy of construction and execution of detail, as well as for a certain sentimental charm given by its old fashioned "country carpenter" character, the early American architecture has much to commend it for use in our residential work. In addition to the Fuller residence, the Myers house shows the influence of the Pennsylvania prototypes in sturdiness and in simple irregularity rather than in any direct copying. Much of the picturesqueness of some of our early American examples may be traced to the accidents of alterations and additions. The deliberate incorporating of such picturesqueness into new compositions is only justifiable when the results obtained are eminently pleasing and not illogical as to plan arrangement.

The three largest examples of the work of Miller & Reeves shown on these pages exhibit the influence of three different styles. Of their work in colonial character the residence of Mrs. Harry W. Brown is perhaps the largest. Its plan arrangement is largely determined by its location on an eminence overlooking a valley to the south and west with a view across to the golf course of the Columbus Country Club. The problem of providing maximum of porch area, often difficult in colonial work, has been handled here by the simple expedient of including the porch on the south end of the house, within the mass of the building itself. This permits the placing of the long one-story porch on the middle of the west facade, where it serves both the living room and dining room. The boldness of the entrance feature is quite in keeping with the simple mass of the building itself. This is accompanied by a commendable restraint in the use of detail, which is as effective as it is economical.

Approach to Entrance, House of G. L. Fuller, Esq.

The second of the larger houses shown here is of the Italian villa type, the residence for Judge Robert P. Duncan (plates 15, 16.). The plan and exterior of the main portion of the house are severely symmetrical, as in the larger prototypes. We have come to think of much of the larger Italian work as being designed from the outside first,

House of W. W. Matchneer, Esq., in Drexel Avenue Group

where irregularities and inconveniences of interior arrangement may be winked at when the greater purpose of exact exterior symmetry is served. Extensive publication of work of the smaller villa types during recent years, however, has made more widespread the influence of the informal and the asymmetrical Italian work. In the Duncan residence the service departments, such as kitchen, servants' quarters, garage and the like, are appended to the main composition in a fashion entirely compatible with the style. This rambling appendage adds a certain picturesqueness which even a questionable change of scale does not mar.

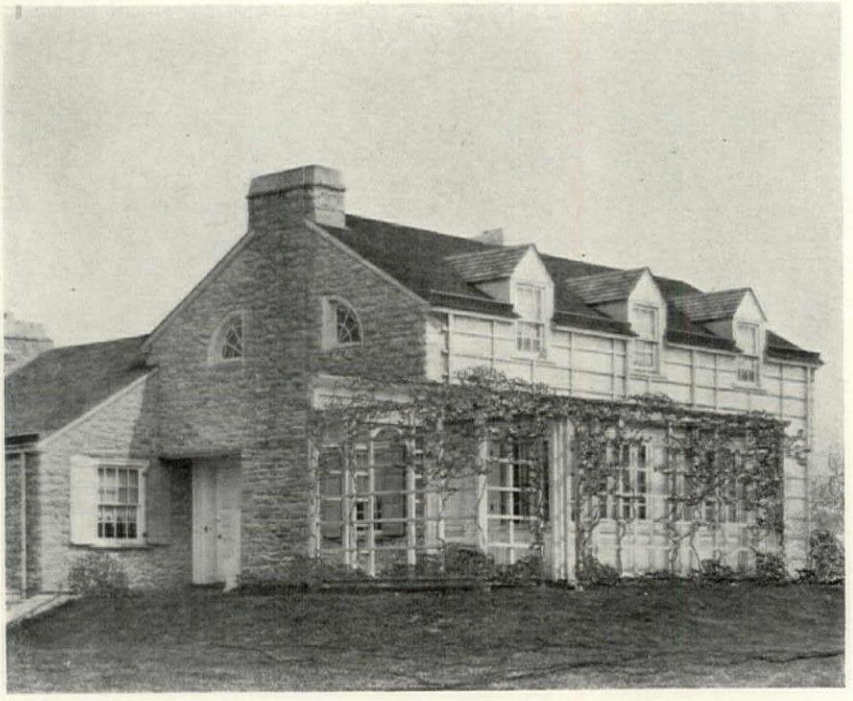
The second of this group of large residences, that of H. B. Halliday, shows but little of the influence of classic traditions which is evident in the Brown residence. The informal asymmetrical creations of modern English work, typified best perhaps by the prolific work of E. L. Lutyens, give wonderful opportunity for such irregular fenestration and arrangement of voids and solids as may be best suited to requirements of interior plan and convenience. In this feature the style is, of course, quite unlike that which inspired the Brown residence, both in plan and in exterior treatment. In the Halliday residence the "library" of Lutyens is fairly well used up,—what with stone and stucco, bays and dormers, small paned windows and leadings, stone coped gables and stiff sweeping rakes. The rough slate roof, so effective in much contemporary work of this character, is missed in this example.

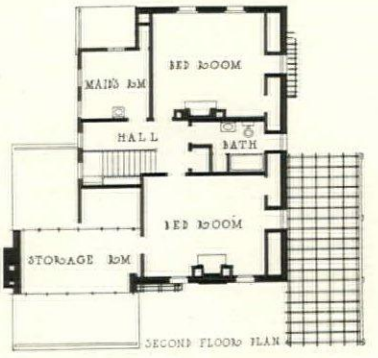
The Halliday plan takes advantage, to a certain degree, of the possibilities of domestic privacy which irregularity often offers. Our English contemporaries have a way of developing an irregular plan so as to foster privacy in domestic affairs and still avoid a forbidding coldness to the casual visitor. This is usually accomplished by a studied arrangement of the principal living apartments so as to have only remote or obscure contact with the main entrance and recep-

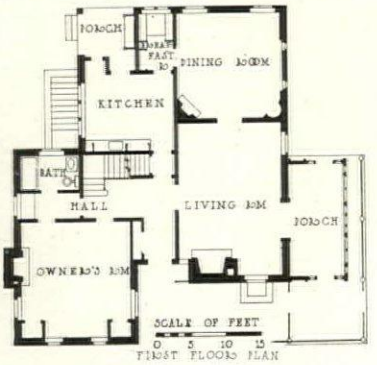
House of F. A. Lichtenberg, Esq., in a Group of Houses in Bexley Park

House of H. B. Coleman, Esq., in Drexel Avenue Group

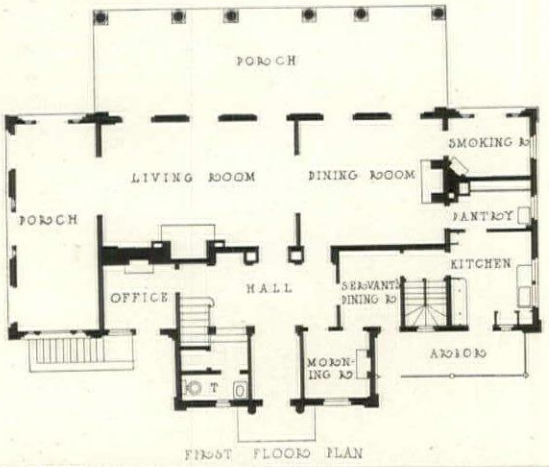
Group of Houses in Drexel Avenue, Bexley Park, Columbus, Ohio
Miller & Reeves, Architects

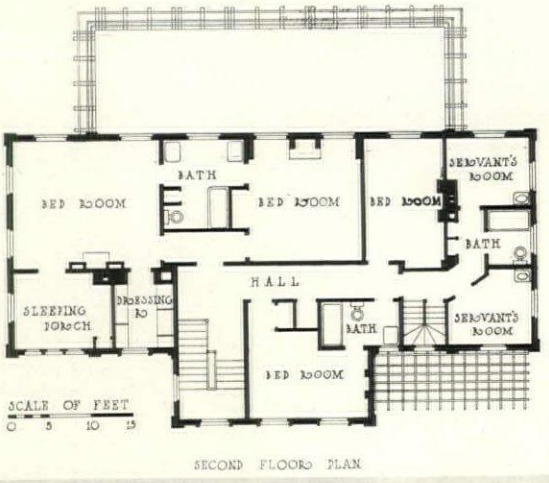






EXTERIOR AND FLOOR PLANS, HOUSE OF MRS. C. F. MYERS AT BEXLEY PARK

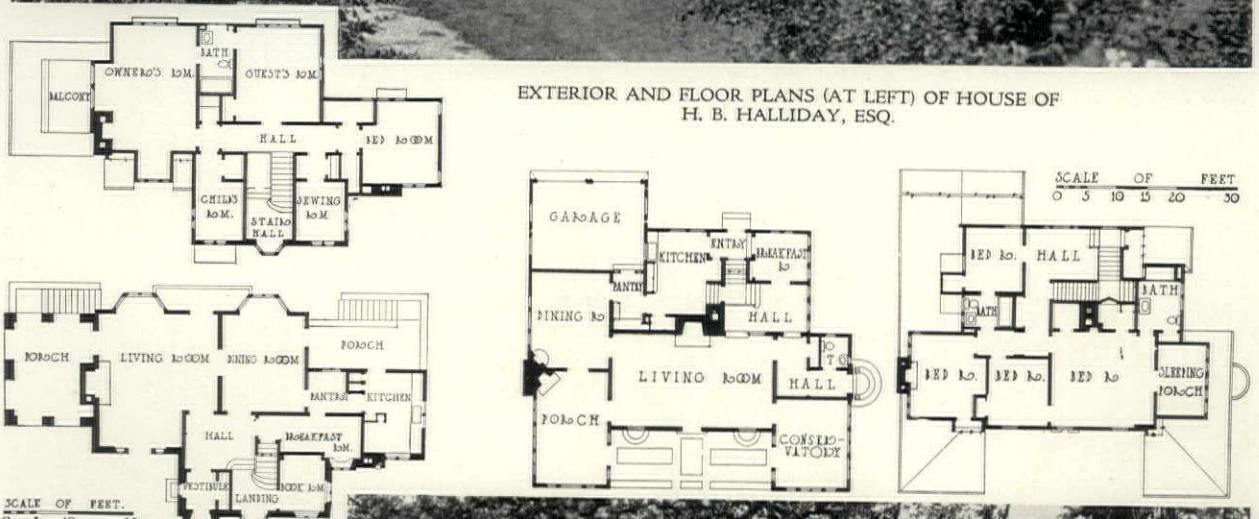




EXTERIOR AND FLOOR PLANS, HOUSE OF MRS. HARRY W. BROWN

TWO HOUSES AT COLUMBUS, OHIO

MILLER & REEVES, ARCHITECTS



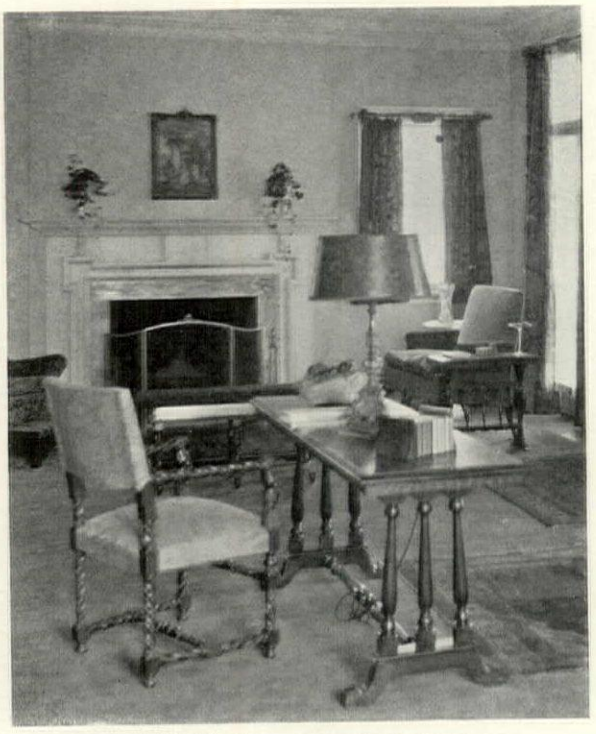
EXTERIOR AND FLOOR PLANS (AT LEFT) OF HOUSE OF H. B. HALLIDAY, ESQ.

GARDEN SIDE AND FLOOR PLANS (ABOVE), HOUSE OF W. D. FULTON, JR., ESQ.

TWO HOUSES AT BEXLEY PARK, COLUMBUS, OHIO

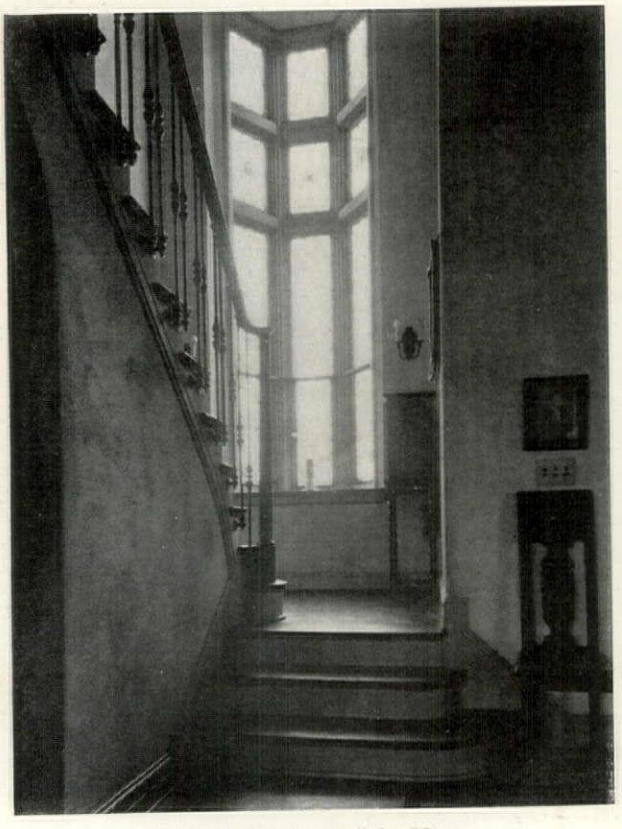
MILLER & REEVES, ARCHITECTS

tion room. That lesson seems hard for us to learn in America. Possibly we do not want to learn it. Perhaps we, of the urban middle west particularly, do not want to give up our front porch architecture where space is provided for us to sit Sunday afternoons to see and be seen. It does seem, however, that the similarity of living conditions in England and America should lead us to take advantage of their longer years of experience and benefit by their lessons in planning.

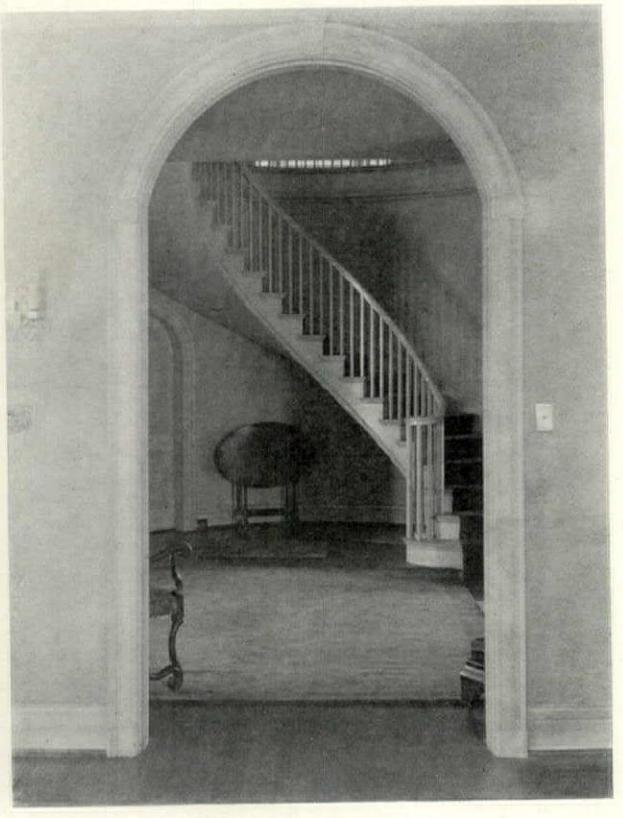


Typical Living Room in Bexley Park House

The increasingly high standards of living in America have made the architects' problems more numerous. The architects of comparatively small practice have greater opportunities for service because thereof. The successful solution of the domestic architectural problems of a community creates a confidence among a satisfied clientele which widens the field of service. In the case of Miller & Reeves, their five years of practice have now placed upon them wider responsibilities in the community. While their standing is largely based upon residential work, they now have to their credit a number of commercial and ecclesiastical commissions. As one looks over the illustrations of the work of this firm which are given here it will readily be seen that to obtain pleasing and interesting exteriors it is by no means necessary to cater to a craze for specious quaintness or picturesqueness which in some quarters seems to afflict architects or possibly the clients for whom they are planning. These architects seem to have discovered the means of solving the problem of residence design in what is after all the only logical way—of first forming a plan suited to the needs of the family for which the house is built, then making the exterior conform to the plan, depending upon straightforward treatment, good proportions and use of appropriate materials to secure the interest and expression to which any building is entitled. Their work is typical of that of a growing group.



Stair Hall Detail in Halliday House



Stair Hall Detail in Bexley Park House

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Granolithic Finish

By E. F. ROCKWOOD

IN January, 1921, a committee of the American Concrete Institute prepared a report on, and specifications for, granolithic finish. Using this report as a basis, these specifications for cement floors are suggested.

A. TYPES OF FLOOR FINISH

1. *Monolithic Granolithic.* In this type of finish a topping about ½ inch thick of cement and fine aggregate is spread over the concrete slab immediately after it has been laid and screeded off. This topping is then floated and troweled.

2. *Granolithic.* For a floor of this type a topping of from ¾ inch to 2 inches thick of cement and fine aggregate is laid on the concrete slab after it has set. This topping is then floated and troweled.

There are two methods of laying granolithic floors, viz., laying them with the base concrete and laying them after the base concrete has set. The first, or monolithic, method has an advantage in that the finish so laid forms a part of the structural slab and gives a thinner and lighter construction. Its disadvantage is that it is hard to protect it against bad weather and against the wear and damage resulting from premature use. The second method has the advantage that the finish is not laid until the building has been closed in, when the finish can be protected against weather and premature use. It has long been thought that a finish laid in this manner would not bond to the base concrete, but if the directions given in this article are followed, a perfect bond will result. This method gives a thicker and slightly more expensive floor, but its wearing qualities are well worth the increase in cost. The American Concrete Institute's report claims that by keeping all traffic off a granolithic floor for 10 days after it is laid its wearing qualities will be increased 50 per cent. It is almost impossible to obtain this protection with monolithic granolithic. It is therefore recommended that for the best results ¾ inch to 1 inch of granolithic be laid on the concrete slab after it has hardened and the building has been enclosed.

B. MATERIALS

1. Cement shall be a standard brand of American Portland cement, conforming to the latest specifications of the A.S.T.M.

2. Sand shall be clean, sharp and thus graded by actual screening:

100 per cent shall pass a ½-inch mesh screen.

Not more than 10 per cent shall pass a 50-mesh screen; not more than 2 per cent a 100-mesh screen.

The sand should be of such a quality that mortar composed of one part Portland cement and three parts sand by weight shall show a tensile strength equal to that of mortar made in the same proportions with the same cement and standard Ottawa sand.

3. Coarse aggregate shall consist of crushed or screened gravel, crushed granite, or trap rock which will pass a ½-inch screen and be retained on a 3/16-inch screen.

C. MIXING AND PLACING

Granolithic shall be mixed in the proportion of one part cement to ¾ part sand and one part coarse aggregate as already specified. The American Concrete Institute reports that the use of iron filings or any other specially advertised brand of hard aggregates improves the wearing qualities of the floor only to the extent that they are retained upon or near the finished surface. The writer's own experience with iron filings leads him to believe that they may even be detrimental to the finish, due to their rusting which may loosen the surrounding particles of cement and sand. As rapid wear results not from the materials' wearing away, but from their loosening, the wearing qualities of a floor depend more on the way it is bound together than on the hardness of the materials in it.

In general, all granolithic should be machine-mixed. Hand-mixed granolithic should not be used excepting with the express consent of the architect. Mixing should be thorough and continued until the mass is uniform in color, and homogeneous. Granolithic should not be mixed or laid unless it is maintained at a temperature of not less than 40° during mixing and for at least 72 hours thereafter, or until it has thoroughly hardened. If it is impracticable to comply with these conditions, specially prepared solutions of calcium chloride should be used in accordance with the directions of their manufacturers.

1. Machine mixing should always be done in a batch mixer of a type which will insure the uniform distribution of the materials throughout the mass, and it should continue for at least 1½ minutes after all the ingredients are assembled in the mixer.

2. Hand mixing should be done on a watertight platform, and special precautions taken after the water has been added to turn all the ingredients together at least six times, or until the mass is homogeneous in appearance and color.

D. Consistency

The wearing qualities of a granolithic floor improve greatly as the amount of water used in the mix is diminished. Hence the finished mixture should be of the dryest consistency possible to work with a sawing motion of the strike board. As even this is too wet for the best results, one of the two methods described here should be employed to further dry it. It has long been claimed that sidewalks and floors laid on the ground usually seem harder and less dusty than self-supporting floors. The writer believes that this is due in many instances to the fact that the surplus water is drained away by the fill on which such floors are laid. Some other means should be employed to accomplish the same result on self-supporting floors, hence the two methods given here:

1. The surplus moisture should be removed by spreading the cement and sand of the next mix over a sheet of burlap laid over the freshly screeded surface of the finish, thereby absorbing the surplus moisture, and then using the dampened cement and sand for the next mix.

2. To the mixing water should be added a specially manufactured solution of calcium chloride, in the proportions specified by the manufacturer.

Both of these methods are recommended by the American Concrete Institute, as it is claimed that otherwise it is generally impracticable to obtain a sufficiently dry mix. It calls attention to the fact that the calcium chloride must be in solution, must be free from all other chlorides, and that all free acids in it must be neutralized. If such conditions are complied with it accomplishes the desired results and does not injure the concrete. This precludes the use of commercial calcium chloride, and renders it essential to purchase it prepared especially for granolithic work; it can be obtained under various trade names. The calcium chloride method, however, is cheaper than that described in D. 1 and accelerates the setting of the cement so that a floor finished by this method will attain in four days the wearing qualities that would otherwise be obtained in from 10 to 14 days; also, the floor will be ready for troweling in about half the time it would otherwise require. The economy in labor by using calcium chloride will more than pay for the material.

E. Preparation of the Base

When granolithic is to be applied to concrete that has already set, the base should be treated thus:

The surface should be thoroughly roughened with picks, and then all loose particles removed by scrubbing with wire brushes; the surface should next be scrubbed with a weak solution of muriatic acid and wire brushes until all dirt and laitance have been removed. The surface should then be thoroughly washed to remove all trace of the muriatic acid. A grout of neat cement ought then be spread over the surface and well worked in with wire brushes. A specially prepared solution of calcium chloride should be used in making this grout.

F. Placing

The granolithic topping for a floor such as is described in A. 1 should be spread over the concrete base before it has set. The granolithic topping for type A. 2 should be spread over the floor with a trowel before the neat cement grout has set.

G. Floating and Troweling

After the granolithic has been spread over the base, it shall be screeded with a long, straight edge. When the proper consistency has been reached it should be wood floated first around the edge, then in the center. It should then be troweled with a steel trowel.

H. Protection

The granolithic finish should be kept wet down and protected from all wear for a period of at least 10 days after it has been laid. If the specially prepared calcium chloride solution has been used in mixing the finish, the period of protection may be cut to 4 days.

If the methods described here have been followed a dense, hard and non-dusting floor should be obtained, and the application of a liquid hardener to the finished floor would add nothing to its wearing qualities. There are, however, many old floors which are in poor condition, and there are several methods of treating them.

The first method tried out consists in applying silicate of soda. The objection to this method is that silicate of soda is soluble in water, and therefore its effect is not lasting. A later method employs magnesium fluo silicate. This unites chemically with the unhydrated particles of the cement and forms insoluble crystals. This method case-hardens the surface and prevents dust, but after this case-hardened skin has been worn or broken through, the surface below is no harder than before the treatment, and in some instances has even been softened by the treatment. Further applications are useless, as by the time the case-hardened surface has been worn away all the cement has become hydrated and no chemical action can take place. A third method consists in applying various mixtures of gums and oils which penetrate the floor, fill the pores and help bond the particles together. Such a treatment has a physical, not a chemical, effect and can be renewed.

The writer believes that the application of a chemical hardener is advisable only when it is necessary to immediately harden a new and soft floor.

The specifications outlined at the beginning of this article will produce the best results, but even they will not produce a wearproof floor but only one which is slow-wearing and non-dusting. To maintain such a floor in good condition it is advisable to treat it from time to time with one of the physical treatments just mentioned. These should not be applied until the concrete has thoroughly dried out and has been subjected to a period of wear of at least 6 to 12 months, and it should preferably be applied by specialists who will know how many coats to apply and the proper consistency for each coat.

Oil Fuel and the Architect

By MAURICE M. OSBORNE, M.E.

THE architect, in his advisory capacity to his clients, has for a number of years past been faced with the question of using oil as a fuel in the heating and power plants of buildings. Oil fuel is not a new thing, but at the close of a long and trying strike in the coal mining industry, with its resultant shortage, high prices and uncertainty as to deliveries, the question of using oil is brought up with renewed emphasis. The architect's conscience, prodded not a little by eager manufacturers of oil-burning apparatus, forces him to weigh with especial care the advantages and disadvantages to his clients of the use of oil and of coal as fuel to generate steam in their buildings.

With the use of oil as a fuel in central power stations, for industrial processes and for marine and locomotive use, the architect will not be directly concerned. Accordingly, this discussion will treat directly with oil fuel only as applied to commercial, residential and public buildings of the types ordinarily met with in average architectural practice. The fuel is used mainly for heating, and occasionally for small power plants.

The use of oil in the United States as a fuel in place of coal first began in those regions where coal was scarce and oil plentiful, notably in California and Texas. Its use was general in California by 1906, and in Texas by 1908. There was a real economic reason for this, quite apart from matters of pure convenience. The oil was patently cheaper than coal. In California locomotives and stationary boilers were soon equipped to burn oil, and have been burning it ever since. More will be said later on the probability of a long continuance of this practice. Since 1908 the burning of oil in place of coal has advanced enormously. In particular this applies to larger installations where 300 tons or more of coal per year would be needed to replace the oil burned.

Let us review the present methods by which oil is burned in place of coal under large boilers. Fuel oil in its usual sense is crude oil, from which the lighter constituents or "fractions," such as naphtha, gasolene and kerosene, have been removed. There are two general types of crude oils, paraffine base and asphaltum base. The final product of the refining of the first type is paraffine and of the second, asphaltum. Paraffine base oils are lighter than asphaltum base oils and are not so generally used for fuels, their chief value being as lubricating oils after the lighter "fractions" have been removed. The asphaltum oils are heavier, not so high in yield of lubricants, and sometimes are so "poor" in gasolene and naphtha that the crudes are used direct as fuel without refining.

It will be seen from this brief description of the nature of fuel oils that they must vary widely in their components and qualities. As a rule, at least on the Atlantic seaboard, the heavier oils are the cheapest and consequently the most used. Fortunately, these heavy oils have the highest heat value. These oils are so thick and viscous that they must frequently be heated so as to flow at all. This is especially true in cold weather. By heating the heavy oils, they can be made to flow readily.

The heating or calorific value of fuel oil is very much greater per pound than that of coal. This means that each pound of oil burned completely, without excess air, gives off more heat than the same weight of coal burned in the same way. Although there is a wide variation in the heat values of different oils and coals, fair average figures would be:

Oil, 19,050 B.t.u. per lb. (20° Beaume°).
Coal, 14,000 " " " " "

By taking a high heat value for oil, and a low heat value for coal, or *vice versa*, protagonists of oil and coal can make their figures tell very different stories. On the basis of these figures, if oil cost the same price per pound as coal, and both could be burned under boilers with equal efficiency, the oil would be worth 1.36 times the coal. But the mere fact of the greater heat content of oil is in itself of no economic advantage, excepting where storage space is paramount, as on shipboard. What counts is the cost per B.t.u. With bituminous coal at $9 per short ton, and cheap Mexican oil at $1.95 per barrel, we have:

Coal, $.00450 per lb. Oil, $.00575 per lb.

Reducing this to cost per 1,000,000 B.t.u., we have:

Coal, $.321. Oil, $.301.

The prices given here for coal and for oil are not those prevailing in all parts of the country, but are merely the approximate current prices at Boston. Prices will vary widely in different localities, depending upon transportation facilities, etc. Before coming to any conclusions as to relative costs of coal and oil in any given locality, a careful investigation must be made. Extravagant claims are frequently made for equivalent values of oil in comparison with coal. Comparisons are often not reduced to equivalent figures and are misleading. The figures given here are representative.

We also have these advantages for oil: loss of heat up the chimney is less than for coal, because of smaller amount of excess air required for combustion; there being no necessity for opening and closing doors for firing, furnace temperatures are more constant with oil; as a result, furnace efficiency is higher, or rather higher furnace efficiency is easier to get with oil than with coal. The cost of handling fuel is much reduced. Oil is pumped from storage

tanks to burners; there are no ashes, and the labor charge is much cut down.

The cleanliness of oil-burning plants is notable, as far as the boiler room is concerned, but many complaints have been made of oil-burning plants because of soot from the smoke and of bad odors from the chimneys. A poorly operated oil-burning plant can be more of a nuisance than a poorly operated coal-burning plant.

There is no question but that steam can be raised more quickly in a boiler with oil than with coal, and that standby losses are less than with banked coal fires. To exceed the rated load of a boiler, the draft must be sufficient. Oil will not necessarily give greater overload capacity than coal. This depends on the chimney. At the present time deliveries of oil are sure and steady. Coal has not this advantage. It is claimed that oil saves in storage space, and this is certainly true. But most far-sighted owners, installing oil-burning apparatus, have provided coal storage space in their buildings as well, so that this argument has not much force for general practice.

So much, for the moment, of the pros and cons. Let us go on to describe the apparatus used in burning oil under boilers. The oil is stored either in large, horizontal, cylindrical steel tanks, buried underground, or set up in basements, or else in concrete tanks. Suitable piping is installed to carry oil from a sidewalk connection to the tanks. A small steam heating coil is usually placed around the pump suction pipe in the tank to insure free flow of oil into the suction line. From the storage tank the oil passes through filters or strainers, to remove water, and thence through the pumps to the heaters. These heaters are so arranged as to deliver the oil to the burners at as nearly a constant temperature as possible. There is a very definite reason for this. Only if the oil is kept at a constant temperature will it be at constant viscosity, and flow in a constant stream through the burners. A sudden cooling of the oil will retard the flow tremendously; a warming up will increase the delivery. Sudden variations in temperatures of oil delivered at the burners are responsible for most cases of smoke, imperfect combustion and lowered efficiency in oil-burning plants.

At some point in the piping a relief valve, with bypass to the tank, is set, so as to maintain a constant pressure. This is as necessary as the constant temperature. When very heavy oil is used, the piping should allow it to flow in a complete circuit to some extent at all times.

The so-called "burners" are really misnamed. The oil burns in the furnaces under the boilers and not in the burners. Their function is to break up the oil into a large number of fine particles, and blow them in the form of a mist, properly mixed with air, into the furnace, there to be burned. Burners are of a number of types:

1. Rotary, in which the oil is atomized by a mechanically operated whirling device, which throws it off in fine spray and into the furnace.
2. Steam atomizers in which dry steam is used to break up the oil. Sometimes high pressure compressed air is used instead of steam.
3. Low pressure air atomizers.

Other types of burners exist, not adapted to the installations under consideration.

Rotary burners of the first type are usually operated by small electric motors, sometimes in conjunction with air blowers. If heavy oil is used, it must be thoroughly heated before use, or else a light oil must be used for starting. The steam or high pressure atomizers are most commonly used. Even though they consume on an average 2½ per cent of the total steam generated, they are economical by comparison with other types of burners. The steam must be dry or damage to the furnace is sure to result. The low pressure type is used frequently where high pressure steam is not available. It is made in many satisfactory forms.

In all types of burners the stream of oil to be fed at light loads is so small that once the average steam requirements fall below a certain amount, it is not practicable to maintain a steady fire with heavy oil. This is why there is a line beyond which, at present, heavy oil installations do not successfully go. Smaller plants, for house heating, must use lighter oils, and will be described presently.

Boilers set up to burn oil need no grates, and should be set to allow for ample gas travel and room for combustion. But as a matter of fact, they are usually arranged so as to be readily convertible to coal burning by installation of grates. Ash handling facilities are likewise allowed for. The first cost of the simplest practicable oil-burning system is very much higher than that of the corresponding coal-burning system.

Small oil-burning installations for heating residences of average size are now on the market. During the present emergency manufacturers of some of them have confidently marked up prices. Several such systems are practical, and give clean, automatically regulated heat with a minimum of attention. They burn either kerosene or a light grade of fuel oil called "furnace oil." Really heavy crude is impracticable for reasons already given. These systems have everything on their side excepting first costs and operating costs. On these two counts there is nothing to be said in favor of them, but they will save much worry over the coal situation and be delightful luxuries in every way. A house owner will make no mistake in installing such a system if he can afford it. After all, the investment is not the first consideration in a home, and comfort and peace of mind are paramount. There is not the slightest question that use of these devices will increase these two last desirable items to a very great extent, but they will not eliminate the choreman altogether. No choreman works full time on a coal-fired house boiler.

The architect will be called on to advise his client as to oil-burning equipment. His client's best

interests will be differently served, depending on the purpose to which his building is to be put. A classification may be:

1. Buildings for immediate sale on completion.
   Office buildings, theaters, apartments, hotels, stores, other business buildings and residences.
2. Buildings where sure service is necessary, such as hospitals, etc.
3. Buildings for personal use such as residences.
4. Buildings for investment.
   Office buildings, theaters, apartments, hotels, stores and other business buildings.
5. Public buildings.

Let us leave this classification for a time and consider more closely the general economics of oil *versus* coal; then we may return to it and form some conclusions.

First let us look at the actual conditions as they are at present. Coal is high and hard to get; oil is cheap, for oil, and easy to get. On this count alone the oils have it. Comparative costs on a really fair basis are impossible to get. Unless two absolutely identical plants existed side by side, with identical demands on each, one burning oil and one coal, comparison could not be made. Average temperatures and heating requirements vary from year to year. If the plants in question make electrical current as well as supply heat, a comparison is all the more difficult, for hours of light and darkness also vary from year to year. However, such figures as are available seem to show that oil, with its many advantages of convenience, at least has split even with coal for the last few years on a hard dollars-and-cents basis, and frequently, as nearly as can be told, has beaten coal.

Now for the future. It has long been known that the oil reserves of the world are very much less than its coal reserves, and that at the present enormous rate of oil consumption, exhaustion of world oil supplies, at least to the point of vastly higher oil prices than at present obtain, will be a matter of a comparatively short time. Our country is now producing 62 per cent of the world's annual supply of oil, and is using 75 per cent of that supply. Our requirements are growing, and will continue to grow until checked by high prices due to scarcity or high production costs.

It is increasingly apparent that at least two-thirds of the oil reserves of the world, outside of the United States, are not to be open to development by American capital. The present oil reserves of the world outside of the United States have lately been estimated at from 60 to 70 billions of barrels, recoverable by present methods. This is sufficient at the present rate of consumption of all countries outside of the United States to last them 215 years. Our own reserves are estimated at 9 billion barrels, recoverable by present methods, while our consumption in 1921, a professedly bad year, was 470 million, or almost one-half billion barrels. If we kept on at that rate, all our oil would be gone in 18 or 19 years. However, there is no danger of this because long before this point is reached oil will be so much harder to recover and will therefore have risen so much in price that in all probability we shall be producing it for 75 years to come. This is a point that is not always clearly brought out in the press or in discussions regarding oil supply. We do not expect to run out of all oil suddenly and in a short time. Long before that time is reached oil will cost so much, on account of the difficulty of extraction and transportation costs, that its decreasing use will increase the period of its exhaustion. The first increases are not far off, as will be shown. It will not take a very great increase in oil cost to make oil burning far less advantageous than at present. We are already dependent on foreign oil to meet our requirements, and in 1921, a period of industrial depression, we imported one-quarter as much oil as we produced. Almost all of this came from Mexico, and nearly all of this Mexican oil came from the Tamposopo field, a unique axis of folding in limestone, containing in its high points great pockets of gas and oil, under terrific salt water pressure. These pools have produced oil in such enormous quantities and with so little effort that oil fuel has been cheaper and more readily available than ever before.

Some purveyors of oil and oil-burning apparatus have told the public that this Mexican supply is practically inexhaustible. But as a matter of fact most of these wells are going or have gone to salt water, and in a comparatively short time it is expected that the remainder of Mexico's oil will have to be wrung from wells of the ordinary type by hard work and at an increased cost. In fact, to keep up the export of oil from Mexico at the present rate, when supplied by ordinary wells, it is believed by experts that a price comparable with the cost of extracting oil from shale would have to be charged.

Every indication points to higher prices to come for oil, particularly in the United States. We have enjoyed lower oil prices than almost any other large nation, and the time is not far off when we shall have to pay more for it. With the inevitable decrease in cheap Mexican oil production coming not far in the future, the first price rise is likely to come. And when that takes place, what shall we do about burning oil in stationary boilers in buildings? We shall give it up because we can no longer afford it.

In California the problem of oil depletion is already being faced by leading engineers. They are turning to coal as the only reliable fuel for the future, and are already figuring on where it can be obtained. The world's coal supply has been estimated at about 5,000 billion tons. Our own reserves are ample. There is absolutely no question but that coal in some form will be the fuel of the future. Oil will continue to be used in marine transportation, this being where it particularly shines as a fuel, because of space requirements and other patent advantages. It will pay to burn oil on shipboard long

after it ceases to be profitable on land. The views here expressed are not those made public by some people, but after a careful examination of available information they seem to represent the more conservative aspect of the situation.

Now let us turn again to our classification of buildings:

1. If the owner builds for immediate sale, he can well install oil-burning apparatus, whatever the type of building, and let the purchaser do the worrying in case the price of oil advances too far. Such advance is not likely for a few years to come at least.

2. If the building is to be a hospital, where heat and light must be provided at all times and at all costs, oil burning is well advisable, with its attendant advantages in other directions. But the architect should consider future coal storage requirements and provide for them in his plans. The furnaces under the boilers should be convertible to coal burning without too much difficulty or delay.

3. When buildings are for personal use, and the owner is willing to pay first cost and running expenses, the small house heating oil-burning systems are in every way practicable and worth while, and are a great luxury and convenience for the family.

4. When an owner builds for investment, it is much more questionable whether oil burning will pay. It would be worth while to consult with owners of similar buildings, burning both oil and coal, before coming to a decision. Coal will be easier rather than harder to get next year than now. It should also be cheaper, or at least no more expensive. In the event of oil's being decided upon, space should be left for coal storage, and arrangements made for ready conversion of the plant to coal burning at any time it seemed best.

5. Public buildings, being everybody's business, are often matters of extravagance—but as a fact, they should be considered, as far as operation is concerned, on a parity with buildings built for investment, and treated accordingly.

Note: The subject matter in this article dealing with world oil reserves is based on these papers:

"The Oil Supply of the World." David White, Chief Geologist, United States Geological Survey, published in *Mechanical Engineering*, official monthly Journal of the American Society of Mechanical Engineers, September, 1922.

"The Future Fuel Supply of California." C. H. Delany, Pacific Gas & Electric Co., San Francisco.

"The Marine Fuel Problem of the Pacific Coast." D. Dorward, Jr., Consulting Engineer, San Francisco, published in *Mechanical Engineering*, October, 1922.

Plate Description

Central Presbyterian Church, Montclair, N. J. Plates 1–6. The more advanced type of the New England meeting house has obviously supplied the basic motif upon which Carrere & Hastings, with Shreve, Lamb & Blake as associate architects, have developed this dignified and practical church group. The church proper, with all its architectural correctness of portico and spire, is amplified by placing slightly to one side an auxiliary building which provides quarters for the manifold activities now included in the work of a church in a rapidly growing suburban town.

These buildings, which are designed in a comparatively simple version of the Georgian style, are of red colonial brick with light mortar joints, trimmings and base courses of Indiana limestone, wood cornices and slate roofs. The ground floor construction of the church is of reinforced concrete, and the roof trusses are of steel. The portico surrounds the square tower which forms the base of the spire, as in several of the meeting houses built during the later colonial period, and at the sides of the building are large round-topped windows placed over smaller square-topped windows to conform to the interior arrangement which makes use of the familiar galleries at each side and across the west end of the auditorium proper. The organ is not placed, as was customary in the older buildings, at the west end over the entrance, but in accordance with present-day usage is at the opposite end, and it is divided into two sections which are played from one console or keyboard.

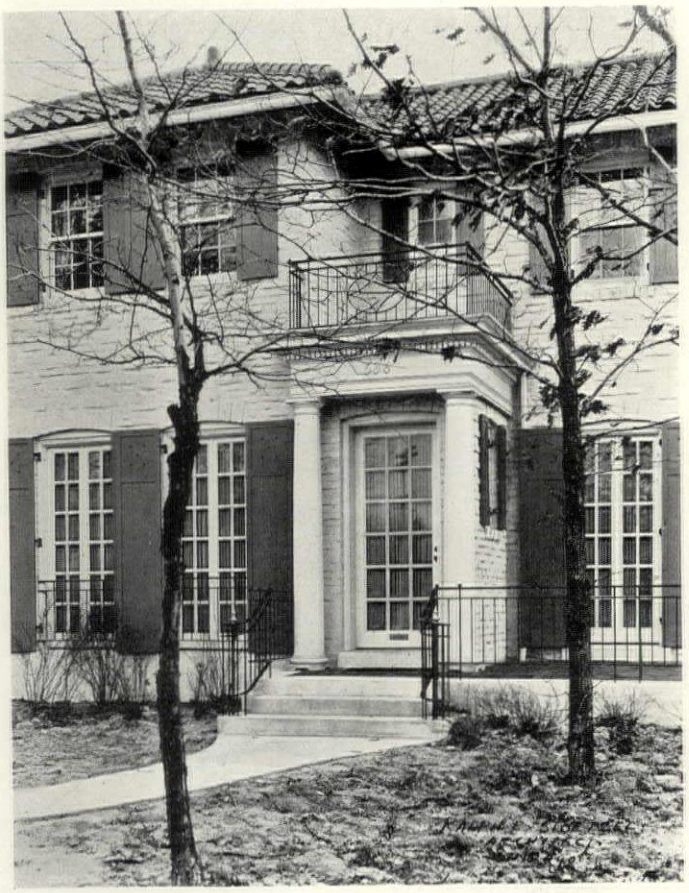
To render the pews in the side aisles more useful than is generally the case in the older churches the columns or piers which support the galleries are placed closer to the outside walls, thus affording a view of the minister's desk and the pulpit from practically every seat in the auditorium. The general finish of the church's interior—plaster walls, ceilings and wood trim—is of ivory tinted enamel, with mahogany used for furniture, screens about the pulpit and communion table, and for the cap mouldings of pews and the hand railings of stairways. Floors under the pews are of oak; cork tile is used for aisles and about the entrance and at the platform, while in the vestibule the floors are paved with quarry tile. The recessed pulpit end of the church is lighted indirectly by cove reflectors on the top of the cornice, while the rest of the auditorium is lighted by drum fixtures. The ground floor of the auditorium seats 600; the gallery, 364.

Materials for the auxiliary or service building are substantially the same as for the church, and the basement contains the plant which supplies low-pressure steam heating with direct radiators for both church and service building. The bellows for the church organ is also in this basement. Plaster walls and ceilings are painted in light colors; interior trim is also painted. Kitchens and auditorium have floors of maple, other rooms being floored with comb grain, long leafed pine, while in wash rooms and shower rooms floors and bases are of tile with hard cement plaster wainscots. Stairways are of wood, painted excepting the treads and handrails which are stained. The auditorium of this building is intended for motion pictures and amateur theatricals and also for use as a gymnasium, and a balcony is placed across one side.

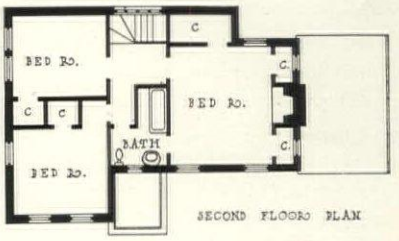
A Small Brick House with Unusual Wall Texture

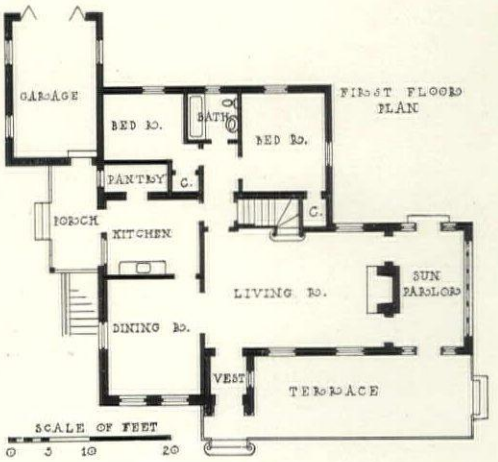
RALPH H. STOETZEL, ARCHITECT

CEMENT WASHED BRICK HOUSE AT GLENCOE, ILL.



THE charm of many old brick buildings lies in their texture. Here upon common brick of unusual roughness, a single brush coat of dampproofing white cement affords a surface full of character and texture.





EDITORIAL COMMENT

AMERICAN ART TRADITIONS

FOR many years there has been persistent neglect in acknowledgment and appreciation of the art efforts of the early days of this country. Every important city has developed an art museum, but for the most part the trustees have placed all their emphasis on securing examples of European art, thinking possibly that otherwise their dedication to the "fine" arts would not be justified. This has been a great mistake, because we have in early American work examples of high artistic merit, not only in painting, but in architecture, furniture and silver making and numerous other crafts. They furthermore exhibit a native character, modeled of course on European precedent, but of more than passing interest because of being produced under the handicapping conditions of use of less magnificent materials, and lack of large financial patronage and the thorough academic training enjoyed by European artists. Early work was largely a product of men who were able to appreciate the fine things produced in Europe and who were sufficiently skilled to produce things in the same spirit, even when they were forced to simplify them greatly.

To American architects may largely be given the credit for bringing about a consciousness of the value of our early art traditions. They recognized the beauty of colonial architecture and its appropriateness to modern domestic requirements particularly, and have in recent years through study of the examples of early houses extant acquired a knowledge of the principles of colonial design that has enabled them to handle the style with marked intelligence and a freedom that makes it today a live factor in American architecture.

An undertaking that will greatly aid the work of instructing the public so well begun by architects is the building of the American wing of the Metropolitan Museum of Art in New York. The museum has for several years been forging a link between its collections of art and the various industrial arts, through which the designers engaged in commercial pursuits could have access to and be influenced by the treasures housed in the museum. The benefits derived from this museum activity are already notable in many branches of American industry in which the element of design is important. There is a wide application of early American ideas in furniture, fabrics, silver and other objects to modern articles of trade, and with the new wing the Metropolitan will have the opportunity of displaying adequately and in a proper setting the wealth of material it has collected. This collection embraces examples of all the arts and crafts, and the new wing will for the first time afford an opportunity for a comprehensive survey of the evolution and varying characteristics of early American art.

The plans for the structure have been prepared by Grosvenor Atterbury in collaboration with the museum authorities, and construction work has already been begun. It will be three stories in height, measuring about 81 feet by 60 feet, and will contain 18 exhibition rooms, mostly of a small and domestic character befitting the objects to be installed in them. Each floor will have a large central exhibition gallery opening on three sides into smaller rooms. The central gallery will be used for the arrangement of collections of furniture and other decorative objects grouped by material. In the smaller rooms will be installed the actual woodwork from a number of early rooms, and they will be furnished with various articles which will contribute toward the recreation of the effect of a room of the period from which the woodwork dates.

As part of the south facade of the wing there will be reconstructed the marble front of the building familiarly known as the old United States Assay Office, formerly at 15 Wall street, New York. This fine facade was preserved for the purpose through the efforts of Robert W. de Forest, president of the museum, who with Mrs. de Forest is the donor of the new wing. In its final development the wing will form the north side of a quadrangle on the south of which will be incorporated the Wentworth-Gardner House* from Portsmouth, New Hampshire, purchased some years ago by the museum. The east and west sides of this quadrangle will be formed by one-story connecting corridors against whose walls will be set colonial doorways. The ground of the quadrangle will be treated as a colonial garden.

When this notable collection of early American work is worthily installed its interest will by no means be found to be confined to sentiment or history. It will teach the present and future generations of our people that the men to whose struggles they owe the foundation of the American commonwealth were refined in their tastes and by no means indifferent to beauty. Though for the most part they neglected the arts of painting and sculpture, their instinct found its expression in the houses they built and the furniture they bought for daily use. Their builders and craftsmen were endowed with a fine sense of line, proportion, and the proper limits of decoration. The Metropolitan Museum is deserving of the greatest praise for the opportunity it presents for such education, and we trust that the public and artists will respond in a fitting manner.

*Complete measured drawings of the Wentworth-Gardner House were published in THE ARCHITECTURAL FORUM, February, 1920.

DETAIL OF ENTRANCE FRONT

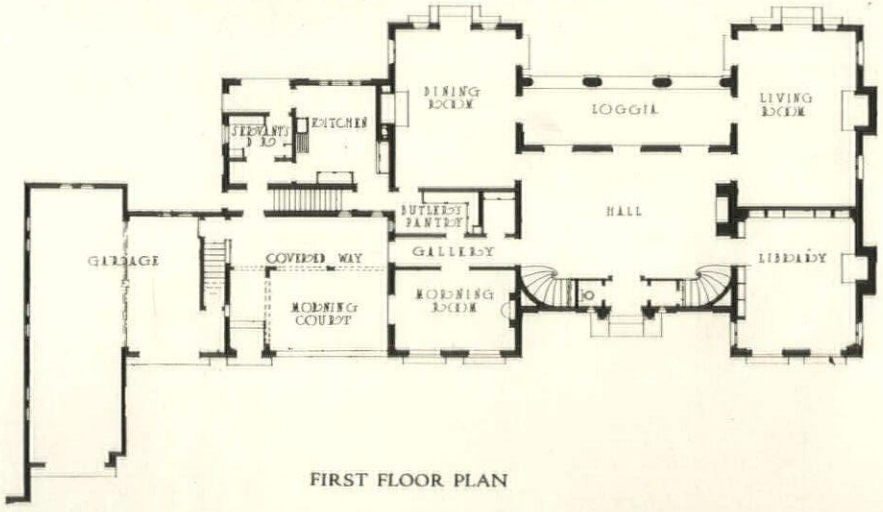
Photos by F. H. Haskett

DETAIL OF SERVICE WING

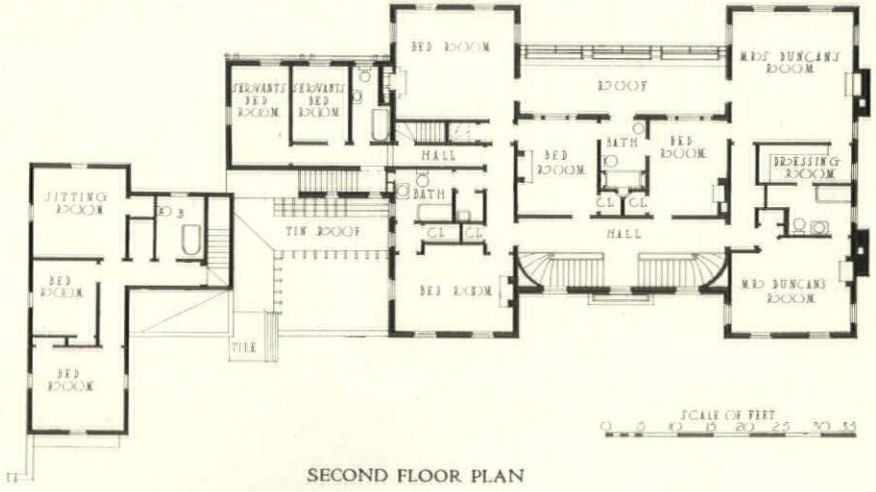
HOUSE OF ROBERT P. DUNCAN, ESQ., BEXLEY PARK, COLUMBUS, OHIO

MILLER & REEVES, ARCHITECTS

GENERAL EXTERIOR VIEW



FIRST FLOOR PLAN



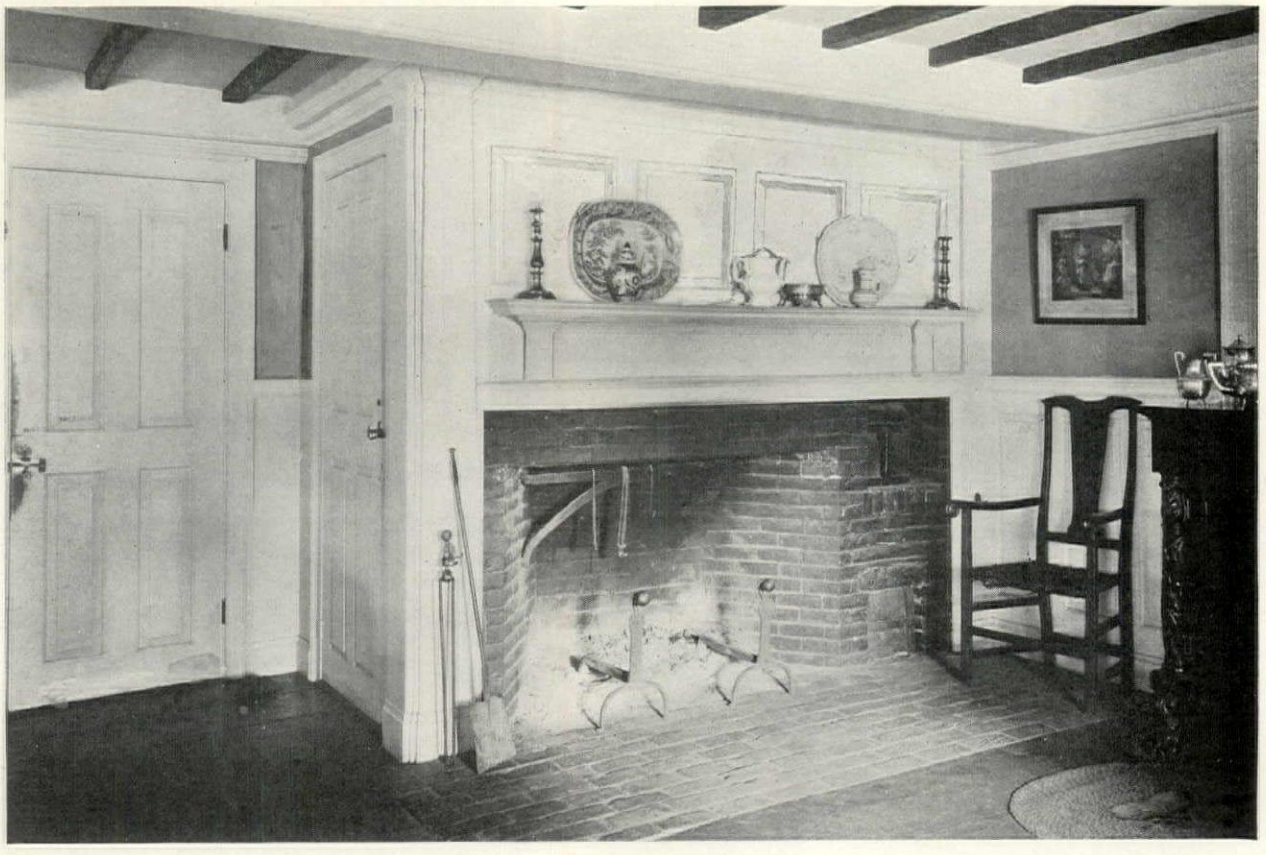
SECOND FLOOR PLAN

HOUSE OF ROBERT P. DUNCAN, ESQ., BEXLEY PARK, COLUMBUS, OHIO

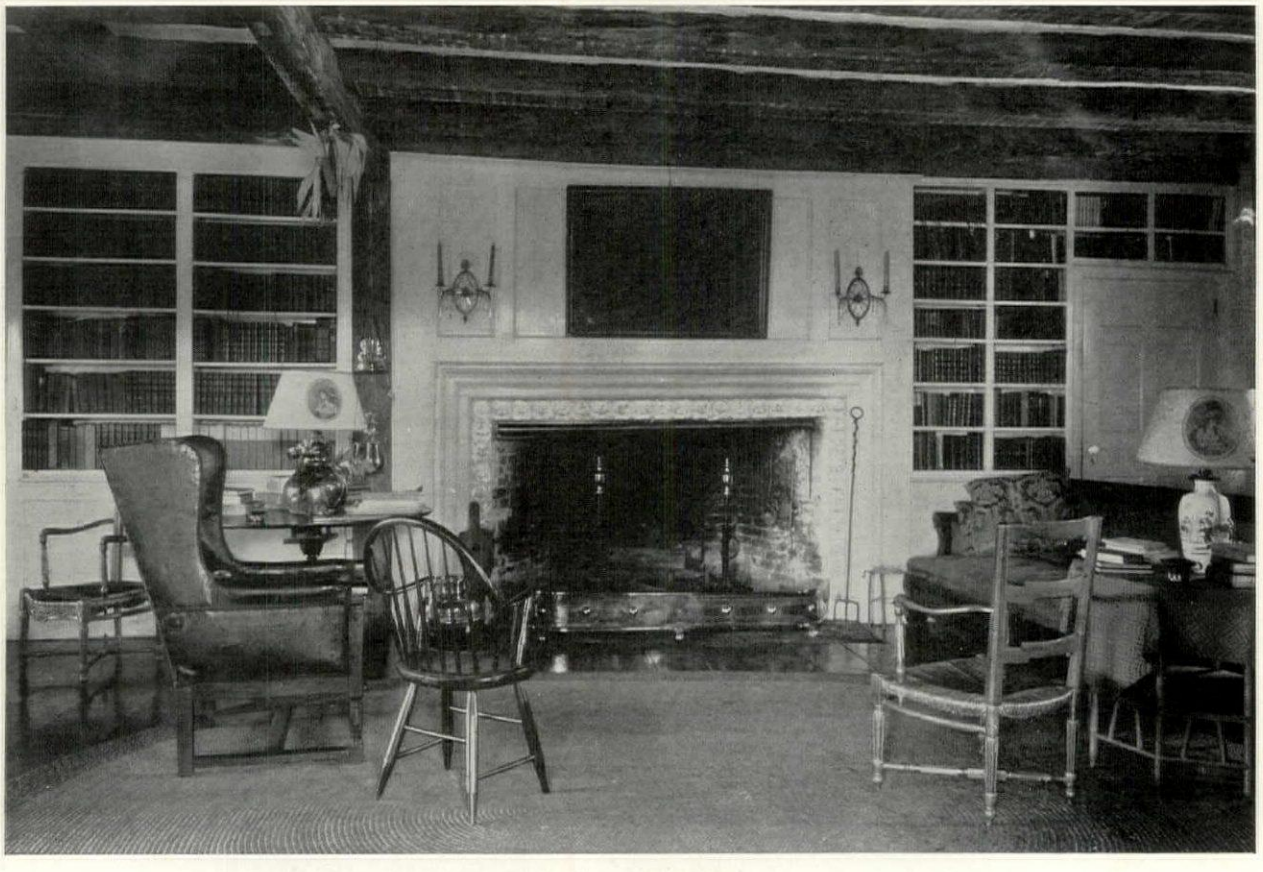
MILLER & REEVES, ARCHITECTS

DECORATION *and* FURNITURE

A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS



DINING ROOM FIREPLACE, WAYSIDE INN, SUDBURY, MASS.



LIVING ROOM IN RESTORED EIGHTEENTH CENTURY FARMHOUSE, LONG ISLAND

PEABODY, WILSON & BROWN, ARCHITECTS

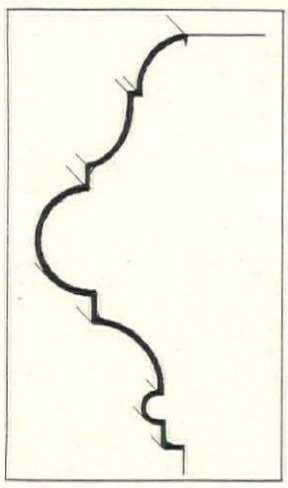
Early Eighteenth Century American Interiors

By EDWIN J. HIPKISS
Keeper, Department of Western Art, Museum of Fine Arts, Boston
Drawings by the Author

THE purpose of these notes is to give some thought to the character of interiors and the finer furnishings of American houses during the first three or four decades of the eighteenth century. It is hoped that an attempt at bringing together some of the things which help to express style, or a spirit of the time, may prove interesting and possibly helpful to designers in connection with their work today.

It is well perhaps to recall that houses had been built here in a simplified form of the contemporary English renaissance before the end of the seventeenth century, and that in England the career of Sir Christopher Wren was at its height. In furnishings, the influence of the Dutch was strong, for the accession of William the Stadtholder to the English throne in 1698 brought about "an invasion" of Dutch craftsmen, ideas, materials and designs which largely shaped the course of decorative arts through the succeeding reign of Queen Anne.

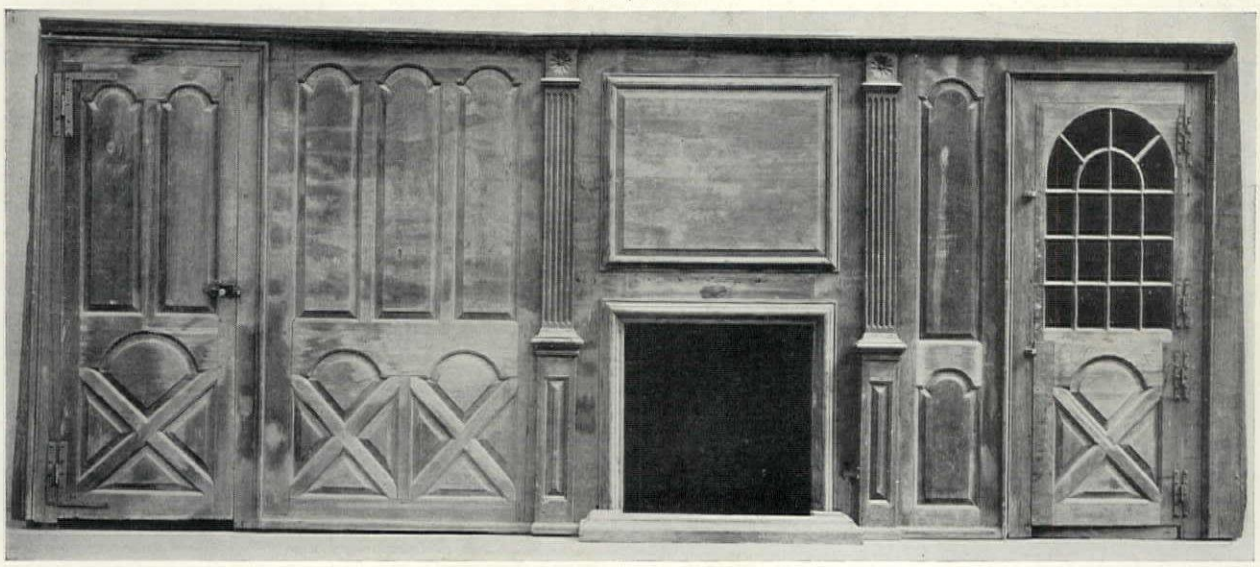
Some of our houses of the eighteenth century, ranging in date from about 1715 to 1735, are the Short house at Newbury, Mass., the Warner house at Portsmouth, N. H., the Brenton-Coe house at Newport, R. I., Shirley on the James River, Va., the Royall house at Medford, Mass., and the "Dorothy Q." house at Quincy. The earlier rooms we find were often paneled in native pine, with raised panels framed with bolection mouldings, reflecting English practice, in larger scale, at that time. Fireplace facings were also framed with heavy bolection mouldings. There was seldom a mantel shelf. Important rooms were 10 feet high in New England and higher in the South.



Half Size Section Bolection Fireplace Moulding from Coventry Room

Against simple walls the richer pieces of furniture and the bright colors in furnishings must have been very effective, or a reversal of this idea might find simple pieces of walnut or maple against walls covered with landscape painting in oils or with Chinese papers from chair rail to cornice. More modest rooms, such as that in the Short house, had neither paint on the walls nor on the woodwork, but unpainted pine, toned into subtle browns as found in old rooms, has a richness of its own not easily duplicated.

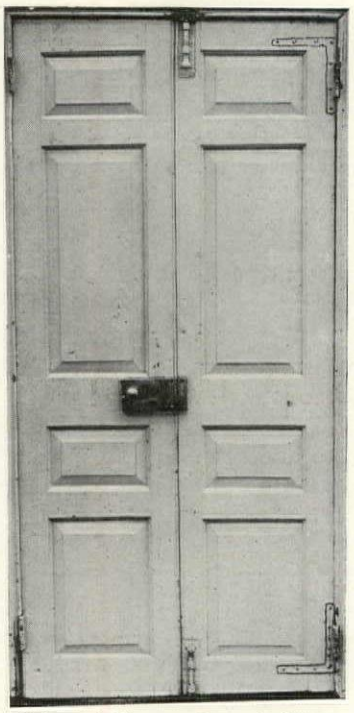
Wall Decoration. Walls were usually paneled on the fireplace sides; other walls were painted or papered above a dado. Rather literal-minded landscape scenes were executed by home or wandering talent; the East India trade contributed Chinese papers, and printed cottons came from India and Persia. The word "chintz" is of eastern origin. "Stained papers" were made in England early in the century and later here—about 1765. Wall papers were first made in square sheets and sold by the quire at the bookseller's. The Hancock house, which was demolished in 1863, was the last of early Boston mansions. Its builder, Thomas Hancock, wrote in 1737 to Mr. John Rowe of London: "Sir, Inclosed you have the dimensions of a Room for a Shaded Hanging



Early Eighteenth Century Pine Paneling from Coventry, Conn. Height of Paneling, 6 ft., 9½ ins.
Now in Metropolitan Museum

to be done after the same pattern I have sent per Captain Tanner . . . if they can make it more beautiful by adding more birds flying here and there, with some Landskips at the Bottom, Should like it well . . . In other parts of these Hangings are Great Variety of Different Sorts of Birds, Peacocks, Macoys, Squirril, Monkys, Fruit, Flowers, etc." These "Hangings" were wall papers for the Hancock house; note the date,—1737.

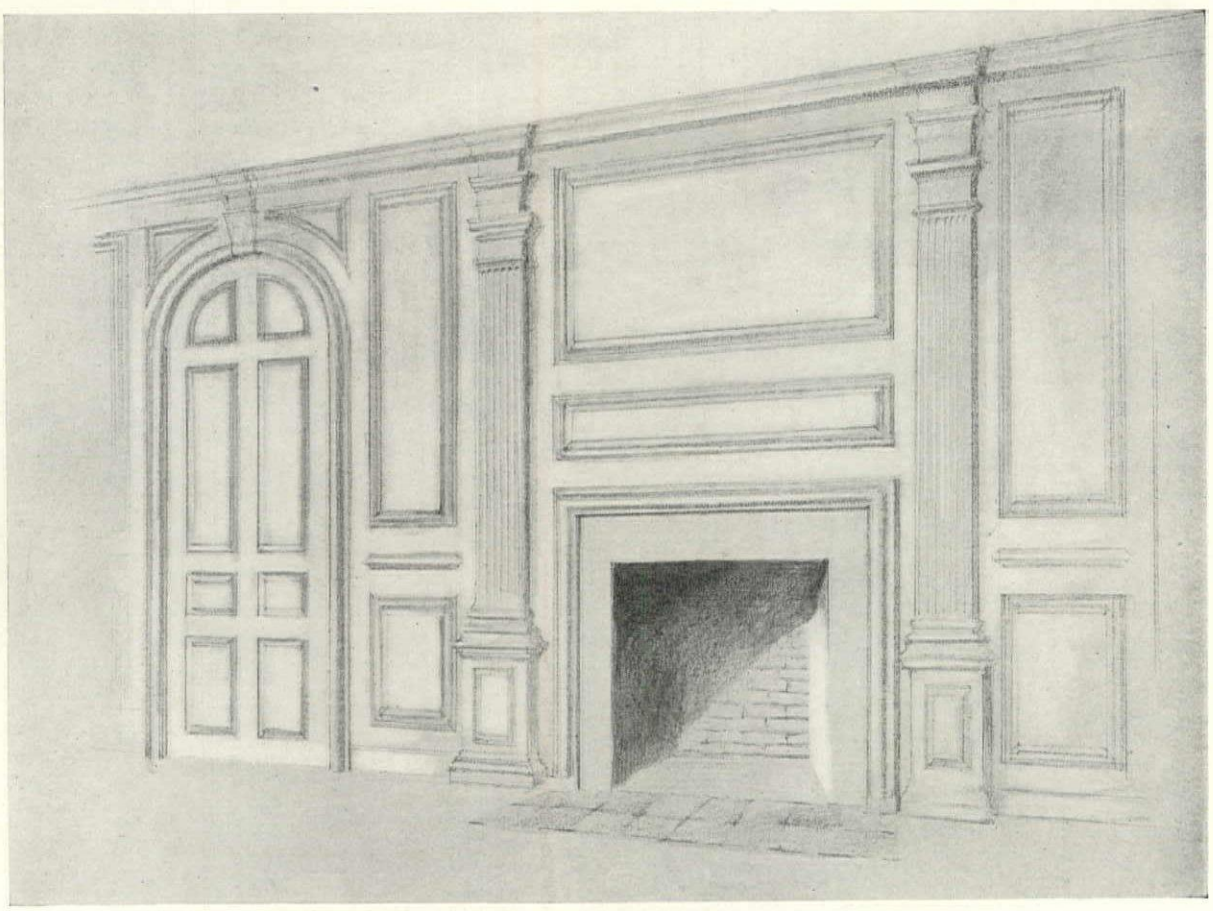
Furniture. In furniture we look for William and Mary and Queen Anne types in the main. An occasional earlier piece, such as would naturally come by inheritance, breaks up any tendency toward a rigid and unnatural "period setting." Walnut was the wood much used, but not exclusively. The simple, well made furniture, of marked native character in general use, was made mostly of maple and pine. Windsor chairs were made at Philadelphia in the second quarter of the century. On fine cabinets richly grained veneers and panels of japanned decoration were used; the latter were European versions of oriental work in lacquer. In Boston, as early as 1712, Mr. Nehemiah Partridge advertised that he was prepared to do all sorts of japan work.



Eighteenth Century Doors in Metropolitan Museum. Original H and L Hinges Indicated at Right

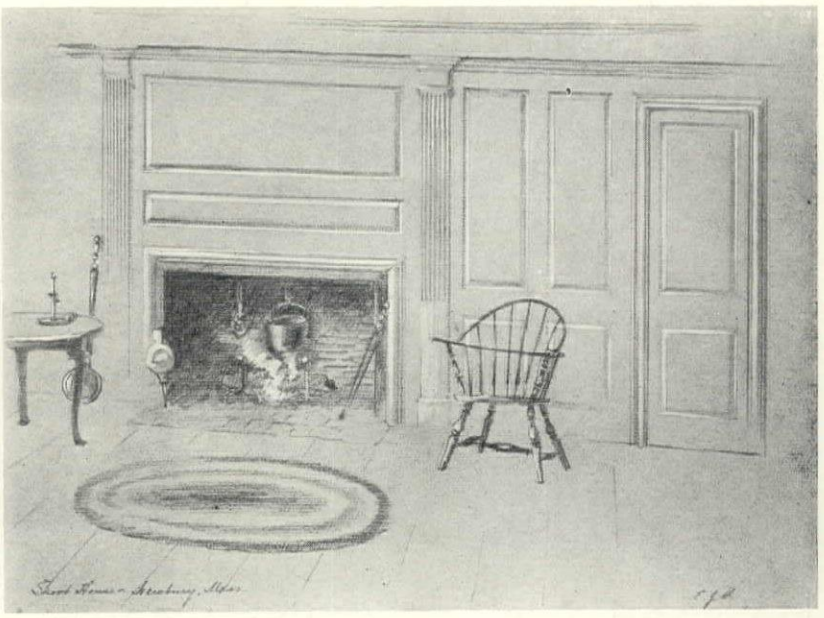
Looking glasses were highly prized. They were made in England during the latter half of the seventeenth century, for in Evelyn's diary, for the year 1676, we read of "the Duke of Buckingham's glass house at Lambeth" where are made "looking glasses far larger and better than any that came from Venice."

Fireplaces. The cavernous fireplaces of the seventeenth century, as wide as ten feet, now become reduced to five or six. Chimney breasts were simply paneled, and bolection mouldings enclosed the fireplace facings. These facings were often of Delft tiles with hearth of dark red quarry tiles eight inches square. Old brickwork always makes an obtuse angle at the jambs. Wrought iron cranes are characteristic, as are the fire tools—shovel, tongs and bellows. Iron firebacks, with decorative subjects in relief, were used as an aid to heating and to protecting the back walls against extreme heat.



Paneling in Brenton, Coe House, Newport, R. I.

Hardware. Wrought iron served almost exclusively for hinges, doorbolts and latches. On the principal doors were box locks of brass with brass knobs. In the Boston *News-Letter* of February 24, 1736, we learn that "William Coffin, at the Ostrich near the Drawbridge, makes and sells Mill Brasses, Knockers for Doors, Brasses for Chaises and Sadlers, Brass Doggs of all sorts, Candlesticks, Shovels and Tongs, small Bells and all sorts of Founders ware." Nailheads, freely faceted by five or six blows of the forgeman's hammer, add interest in old wrought iron hardware.



Early Eighteenth Century Paneling in Short House, Newbury, Mass.

Painting. It seems probable that the greater part of woodwork in both paneling and furniture knew no paint. Painters are hardly to be met with in early lists of workmen. Even late in the century it was said in Salem, "Well, Archer has set us a fine example of expense,—he has laid one of his rooms in oil"—a quotation for which we are indebted to Alice Morse Earle. Mansion rooms were "laid in oil" we believe on the evidence of old rooms, and two early examples show sage green to have been a variant in the use of white woodwork. Most furniture was given an oil finish on wood, and handiwork was of a kind which had nothing to conceal under a coat! Selected wood became richer in surface through years of service; and it took on character.

Floors. Wide boards of country pine were used for floors; a firm knot here and there was apparently not objected to. A room in the Wilder Tavern at Hingham has only eight boards in a room nearly 14 feet wide. The edges were halved and lapped about half an inch. Some old floor colors were pumpkin yellow, buff, warm gray, low toned green and blue.

Lighting Fixtures. Candle light shone forth from chandeliers, sconces, candlesticks and candlestands. There are few enough of the latter remaining and hardly one of the former. (The Warner house has a glass chandelier brought from England in 1765.)

Silver. Craftsmanship of the time is well exemplified in the work of American silversmiths. Accepting certain models, as being customary, their skill was bent toward executing those models exceedingly well. In a large collection of silver it will be seen that each piece has individuality, and yet the same forms were popular through two or three generations.

Such evidence as may be found in Hollis French's

Mid-Eighteenth Century Paneling, Warner House, Portsmouth, N. H.

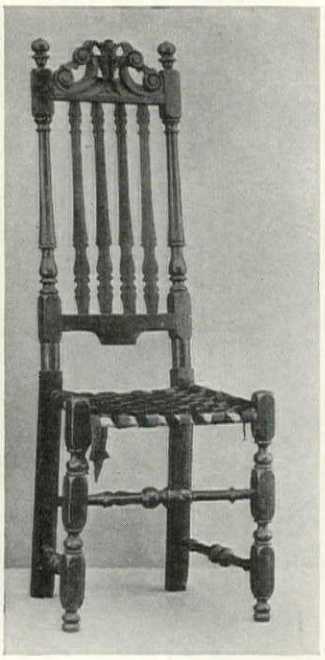
list of American silversmiths, published by the Walpole Society, controverts the impression given by some historians that little plate was in use at this time. The writer has selected from the list just mentioned the names of silversmiths working in Boston alone during the years 1700 to 1750 inclusive, and finds there were over one hundred master craftsmen, not including the silversmiths of Dorchester, Roxbury, Charlestown and other nearby places. John Hull, Allen and Edwards, Benjamin Burt, Jeremiah Dummer and Jacob Hurd are a few among makers of fine domestic and church silver. Fine engraving was a part of the craft, and examples will be shown in a succeeding article.

American Walnut Highboy
From the Metropolitan Museum of Art
Measured drawing on opposite page

Porcelain. "China," as all porcelain was and is popularly called after the land of its origin and highest development, is essentially of the eighteenth century in Europe. It would be interesting to know to what extent early English and continental porcelains were brought to the American colonies, for it is on record that some white clays from the Carolina mountains were imported by English porcelain makers. Bow, Chelsea and Derby porcelains had their beginnings in the second quarter of the century. Although woodenware, pottery, pewter and silver served generally, the increased knowledge of oriental porcelain stirred certain parts of Europe. Delft pottery had become pseudo-Chinese in forms and decorations, and formulae had been evolved for the making of soft porcelains through attempts to match the charming, mysterious substance brought out of the East, an indefinite and fascinating part of the world then spoken of as "India."

In 1709 the German apothecary, Böttger, discovered the secret of the Chinese, and true or hard porcelain was made in Meissen. He had so perfected it by the year 1716 that it has remained since that time the type for the whole of Europe. In New England in 1750 there was a tax of 5 per cent on all importations of "chinaware, gold and silver lace, French cambrics," etc. Pottery was made through the seventeenth and eighteenth centuries, but it was of humble character.

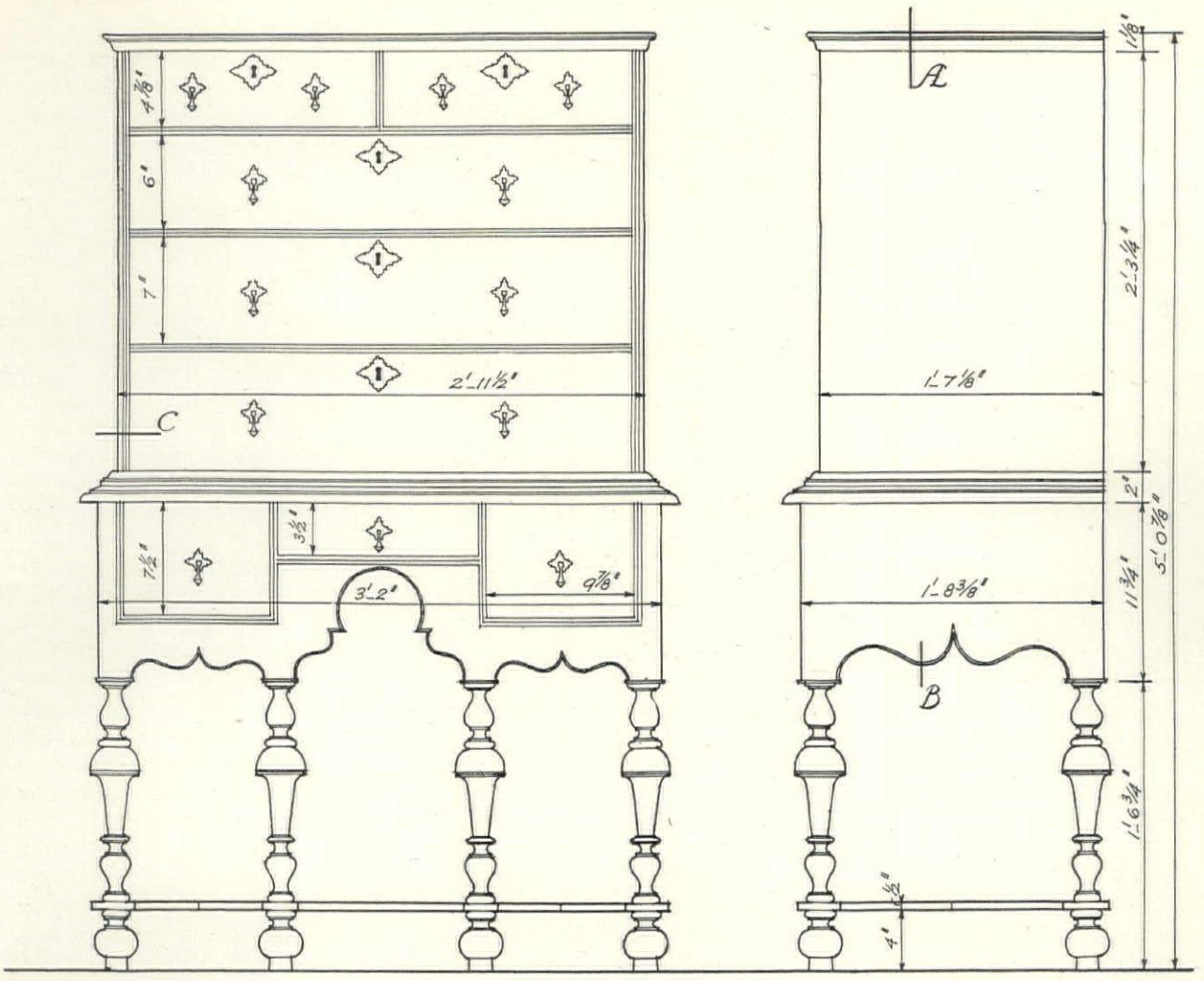
Floor Coverings. Carpets (*i.e.* rugs) had been brought to England for centuries from India and the Levant. In 1701 a charter was granted to Wilton for the making of carpets in England, and enthusiastic ladies also made them of needlework at home. It seems, therefore,



American Chair *circa* 1700, Indicating Charles II Influence

Gate Leg Table of Maple, Probably Second Quarter, Eighteenth Century

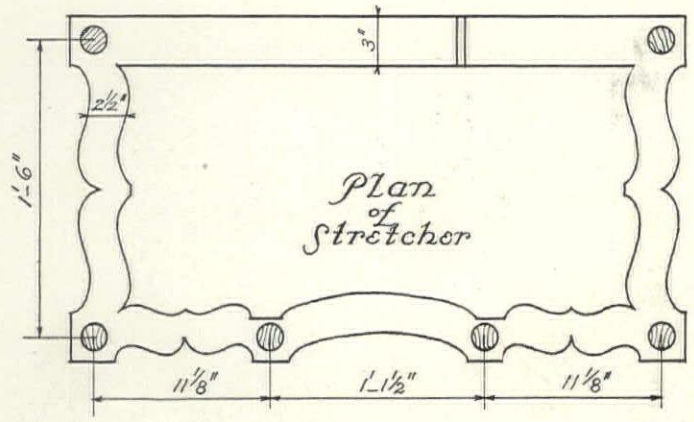
American Chair in Simple Queen Anne Style

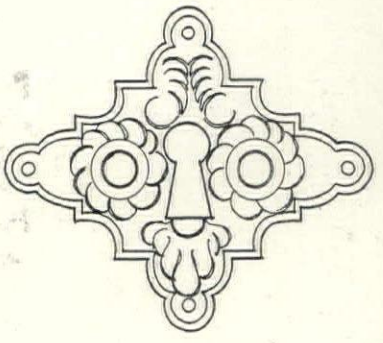


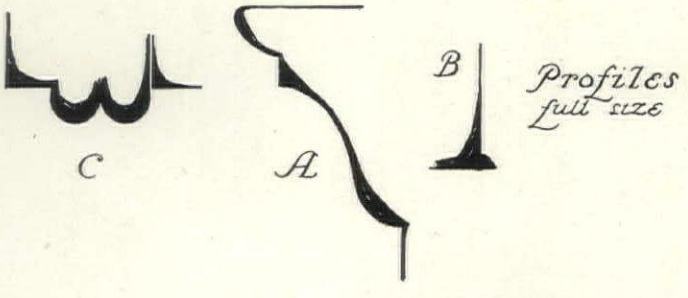
Front Elevation

Side

scale 1"-1'-0"







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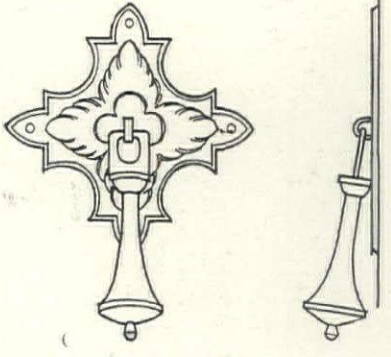


AMERICAN WALNUT HIGHBOY

1700 - 1710

From the Metropolitan Museum of Art.

NEW YORK CITY.

that the fine furniture which we know to have been in the colonies must have had its complement of fine carpets. The Copley portrait of Jeremiah Lee displays an oriental carpet at the feet of the original owner of the Lee mansion in Marblehead. The picture was painted in 1748.

Needlework. A minor art which takes on special interest in relation to early eighteenth century style is needlework. It was varied in stitch and design and was adapted to use with numerous items of furniture,—fire screens, beds, chairs, benches, sofas, and even to the panels of cabinets and frames of mirrors. The personal interest of Queen Anne gave a *cachet* to a form of domestic art practiced and taught by the ladies of the period.

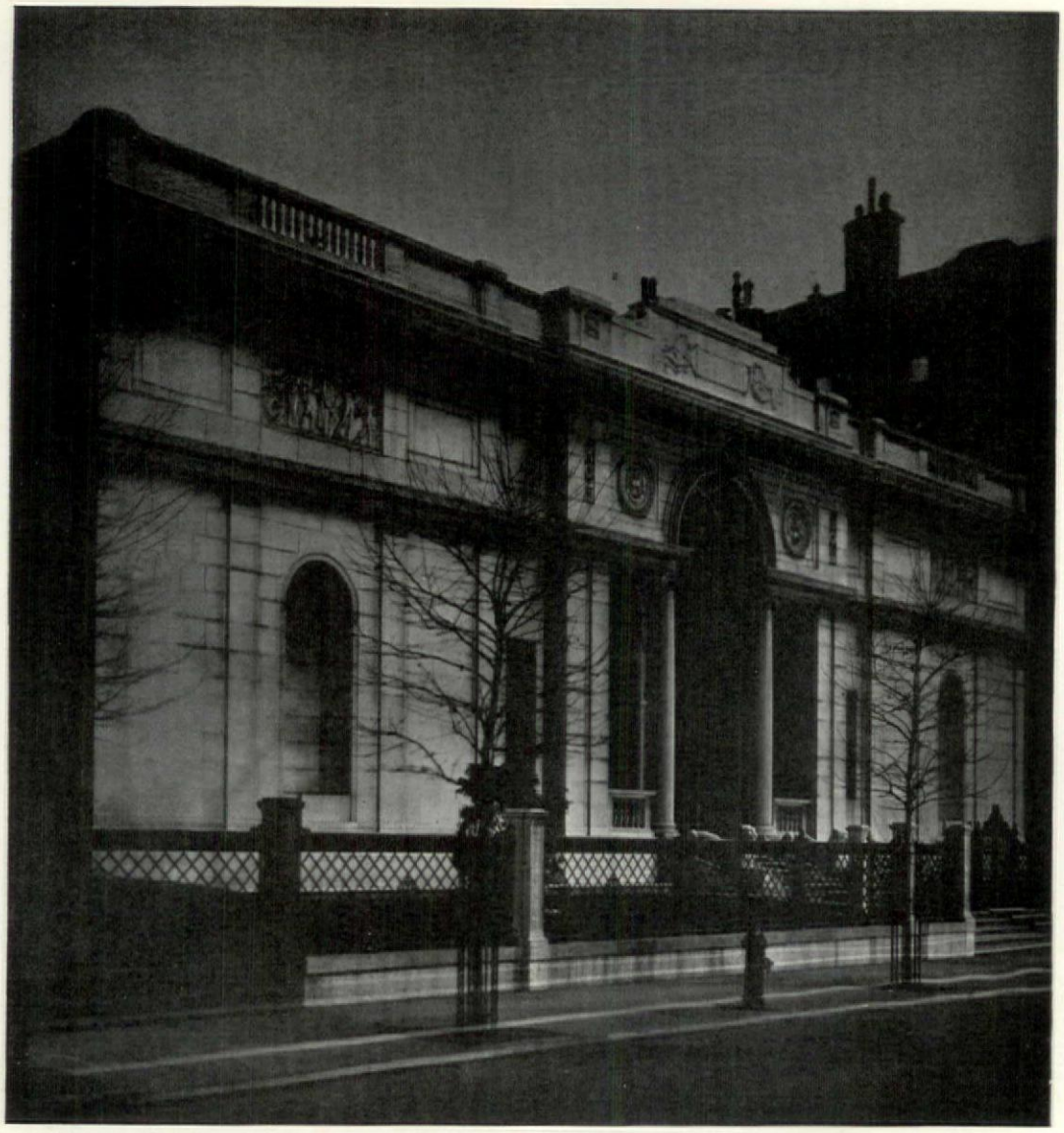
Textiles. England at the time of Queen Anne had splendid silks, velvets, damasks and other textiles, both of English make and imported. Spitalfields was a famous center of fine weaving. Our eighteenth century ancestors were fond of color, and fine costume in America was little short of gorgeous. Even in the seventeenth century there was cause for preaching and lawmaking against "excess in bootes, ribbonds, gould and silver lace" and other "wicked apparel."

High Chest of Drawers *circa* 1725
Japanned Surface Decoration

In Conclusion. Owing to the simplicity of architectural background and the lack of visual evidence as to what old rooms were at their best, does it not seem possible that our general impression of eighteenth century interiors needs touching up in color?

The claims of this early work on our attention are modest. It was all essentially domestic and intimate, and granting that it was a restrained expression as compared with contemporary European arts, we are inclined to feel that there was a large measure of beauty in it. It was their unassuming way to make the things of everyday life with real qualities of design and craftsmanship. Life and art were truly wedded. Here in the eighteenth century there was perennial growth in an accepted style, and that must have special meaning for us in the midst of annual fashions and "the last word."

Interior as Lately Furnished in the Webb House, Wethersfield, Conn.



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