The
ARCHITECTURAL FORUM

VOLUME XXXVIII | APRIL 1923 | NUMBER 4

Recent Housing in the Netherlands*

By EDITH ELMER WOOD

IT was the good fortune of Holland that she escaped being drawn into the devastating vortex of the world war. It is the great merit of Holland that she took advantage of her peaceful state and unimpaired finances to inaugurate and carry on a great program of social reform and human conservation, which will be reflected for years to come in lower death rates, healthier children and happier homes. The Dutch are a practical people, not easily stampeded into hasty action, and not easily turned aside when they have once decided upon their course. Their housing program is not an emergency measure, hastily adopted—not a flash in the pan resulting from popular clamor and the post-war housing shortage. It is a deliberate policy, worked out after years of thought, discussion and careful experiment on not too large a scale.

In 1901 Holland passed the most complete and compact all-around housing law that any country has yet put on its statute books. It touches all sides of housing, restrictive and constructive. On the restrictive side it establishes minimum standards of light, cubic air space and sanitation. It provides for the closing of unfit houses and for the clearance of slum areas. On the constructive side it provides

*We are permitted to publish these extracts from the chapter on Holland in Mrs. Wood's forthcoming book on industrial housing in western Europe.—*Editor.*

Street View in Heyplaat, Rotterdam, Garden Suburb for Employes of Rotterdam Dry Dock Co.
Mr. Baanders, Architect

Street View in Heyplaat, Rotterdam
Through archway showing street fountain and tenements

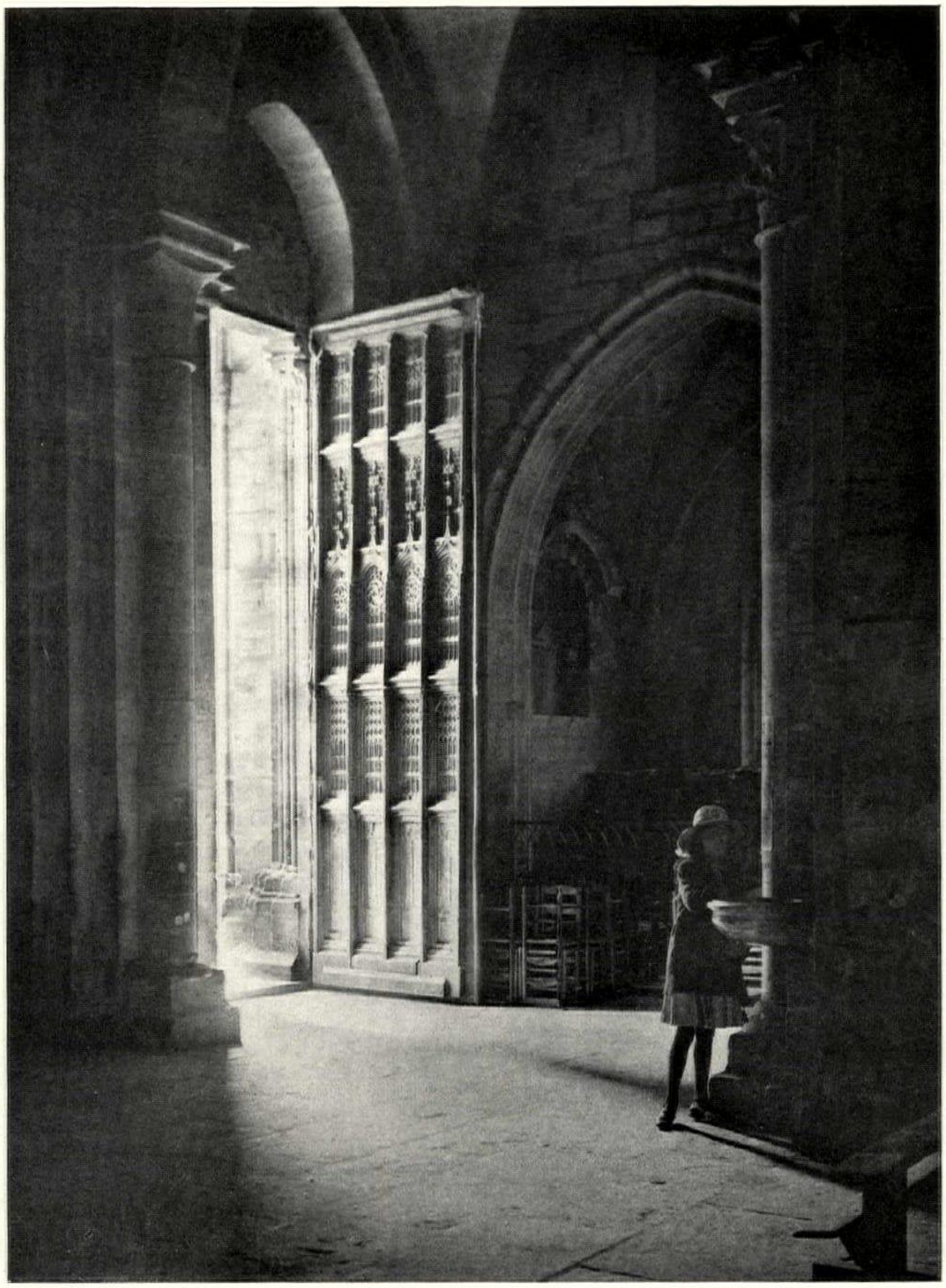
credit for building workingmen's homes to the extent of 100 per cent, on an at-cost basis. That is to say the national government will lend the whole construction cost, for a period of 50 years, to municipalities wishing to build working class dwellings, or to approved housing societies guaranteed by their municipalities. The rate of interest is the actual rate at which the government can borrow money on the Amsterdam exchange at the date of the agreement. In this most important provision of the act it will be seen that no subsidy is involved. There is still another source of credit,—Postal Savings Bank deposits, which play a useful, though a limited, role.

Town planning is obligatory on all communes with over 10,000 inhabitants, and the plan must be revised every 10 years. Administration is vested in a board of three with a paid secretary, which passes on all loans. There are provincial and local housing authorities, and the slothful ones can be compelled to act by those higher up. The housing societies played a much more important part in the early years than the municipalities, but the logic of events has worked the other way, and though the societies are as active as ever—indeed more so—the city housing departments are nearly everywhere outstripping them. In Amsterdam, where the societies have reached their greatest development, they are still in the lead, but the housing department is catching up.

Dutch housing societies are, as elsewhere, of two sharply distinguished kinds—the philanthropic and co-operative. The latter kind in Holland is always a *tenants'* society. Home ownership is not an issue. The little that has been done in that way has been with the aid of loans from the Postal Savings Bank. In the villages and among the farmers more than half the families own their homes, whereas in cities of over 100,000 inhabitants only 6½ per cent of the dwellings are owned by occupants.

It is generally conceded that there are too many small co-operative housing societies in Holland—something over 2,000, I believe. It would be better in many ways (and certainly easier for the city housing departments, which have to supervise them) if the co-operators could be induced to

Patrimonium Court, Co-operative Housing Society Development, Amsterdam
Two-family houses with separate street entrances to each floor
Kuipers & Ingwersen, Architects

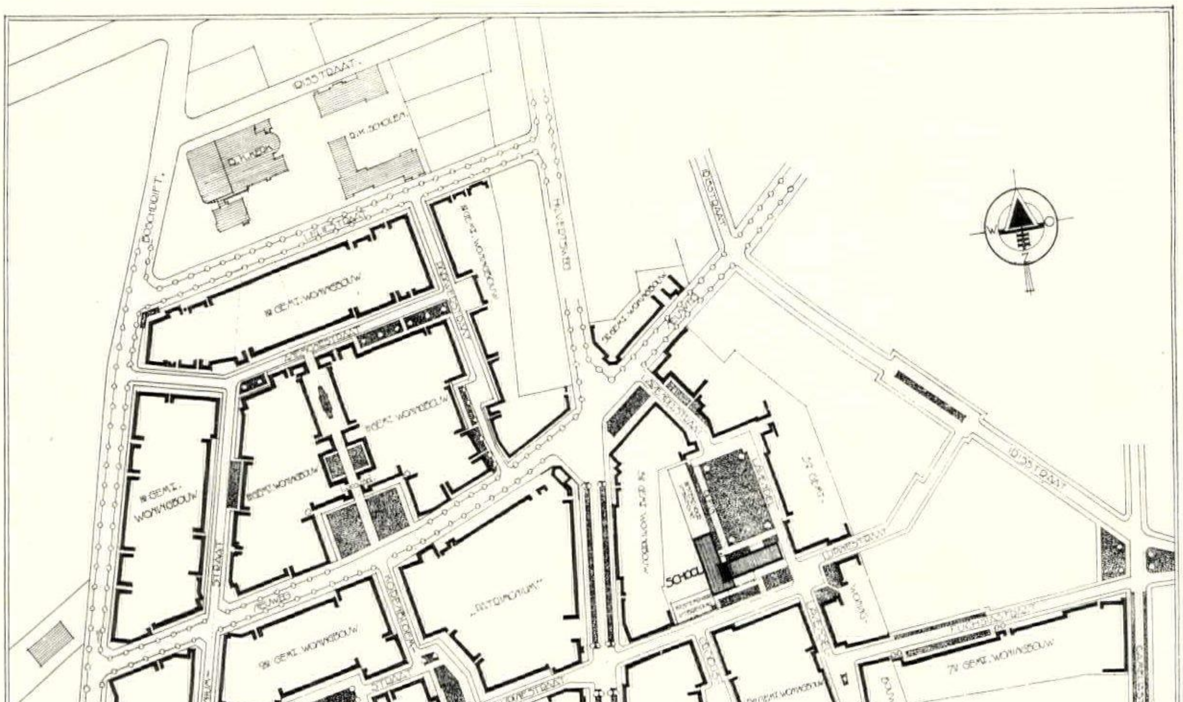


NORTHWEST DOOR, NOTRE DAME CHURCH
BEAUNE, FRANCE

FROM PHOTOGRAPH BY G. DOLBY

coalesce into a reasonable number of strong organizations. Work proceeded methodically along these lines until the second year of the war, but rapidly increasing costs brought things to a standstill by 1917 when subsidy division between municipality and nation was adopted. Payment of subsidy is conditioned on the charging of a "fair rent," which in Holland is officially held to be one-sixth or one-seventh of the family income.

The Dutch prefer single-family houses where practicable, but the exaggerated cost of land on 30-foot piling makes it impossible to house the people of Amsterdam in this manner excepting in a few outlying districts. One of these lies to the north of the harbor, where a municipal ordinance forbids structures of more than 2½ stories. Here the housing department has erected an extensive garden suburb with 1½-story brick or brick and frame cottages in long rows, according to the Dutch custom, with little flower gardens in front, and often climbing roses over the doors, but with no vegetable gardens behind, because of the cost of the land. Most of these cottages have five rooms. All have sewer-connected toilets, running water and electric lights. The roofs are of red tile, and the woodwork around the doors and windows is painted in bright, cheerful colors. One notes in Holland a complete absence of shutters. This is an economy, for one thing. It would seem also to indicate a greater sense of security, and it carries with it a possibility of having fresh air in the bedrooms. Whether it goes farther than a possibility is another matter, for the built-in cupboard bed with closed wooden doors is still the favorite sleeping place of an appreciable part of the population. Its abolition is a live issue in the way of hygiene, and one of the rules regulating government loans and subsidies is that they cannot be had for houses containing cupboard beds. Adjoining land has been developed by a number of housing societies, philanthropic and co-operative. Large districts are built up in 2½-story, two-family houses. This is a favorite Dutch type. The street floor contains a four-room apartment. An entirely separate entrance leads to the second floor. This also has

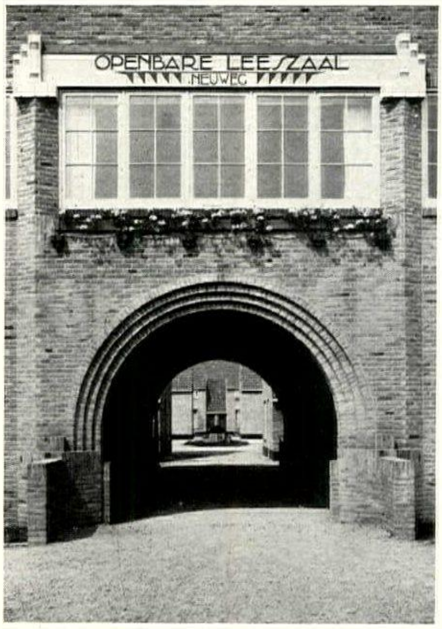


General Plan of Municipal Housing Development at Hilversum

W. M. Dudok, Architect and Town Planner

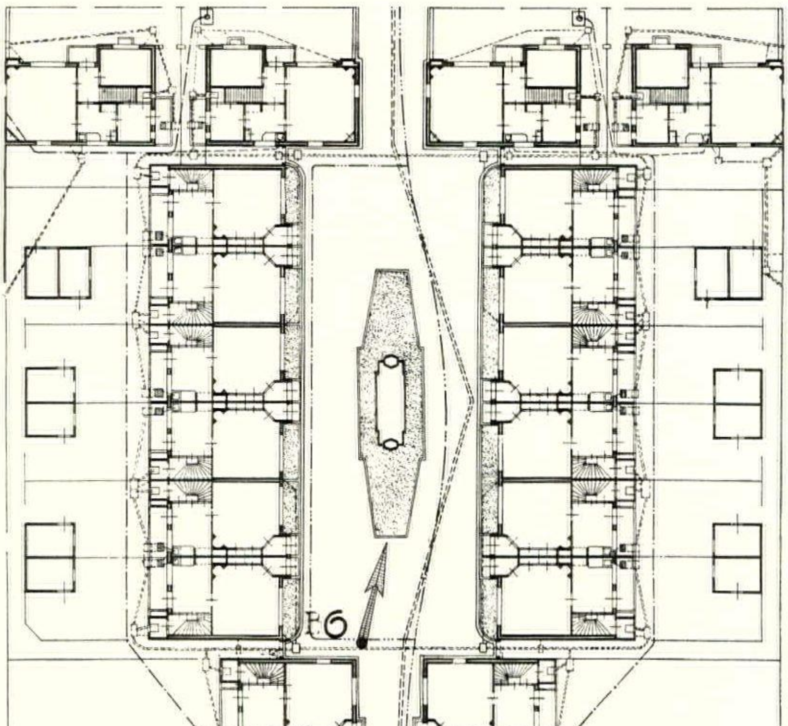
four rooms, but the second floor tenant has the attic in addition, which besides storage space, contains one or two finished bedrooms. There are no cellars in Amsterdam and few in Holland.

The young insurgents against tradition who compose the new modernist school of architecture, which has attracted so much attention, owe much to Mr. Keppler, the architect at the head of the Amsterdam housing department, for their chance to show what they can do. Many of them found their opportunity for self-expression in designing blocks of apartment houses for co-operative societies. Some of them have been employed by private builders to design middle class apartments. A whole extension at the south of the city, block after block, street after street, is being filled with them. This would seem to indicate that the new school has struck a genuinely popular chord. Speculative builders, as a class, are not strong on Art for Art's sake. To the credit of the modern school, it must be said that it has discovered (or rediscovered) the beauty of plain wall surfaces, that it masses its windows instead of sprinkling them, and that it treats the backs of houses and the interiors of blocks as carefully as the street facades. It is a characteristic of the school (whether a merit or not, I do not pretend to say) that it revels in horizontal lines and flat roofs, but unless well handled they are likely to produce monotony.



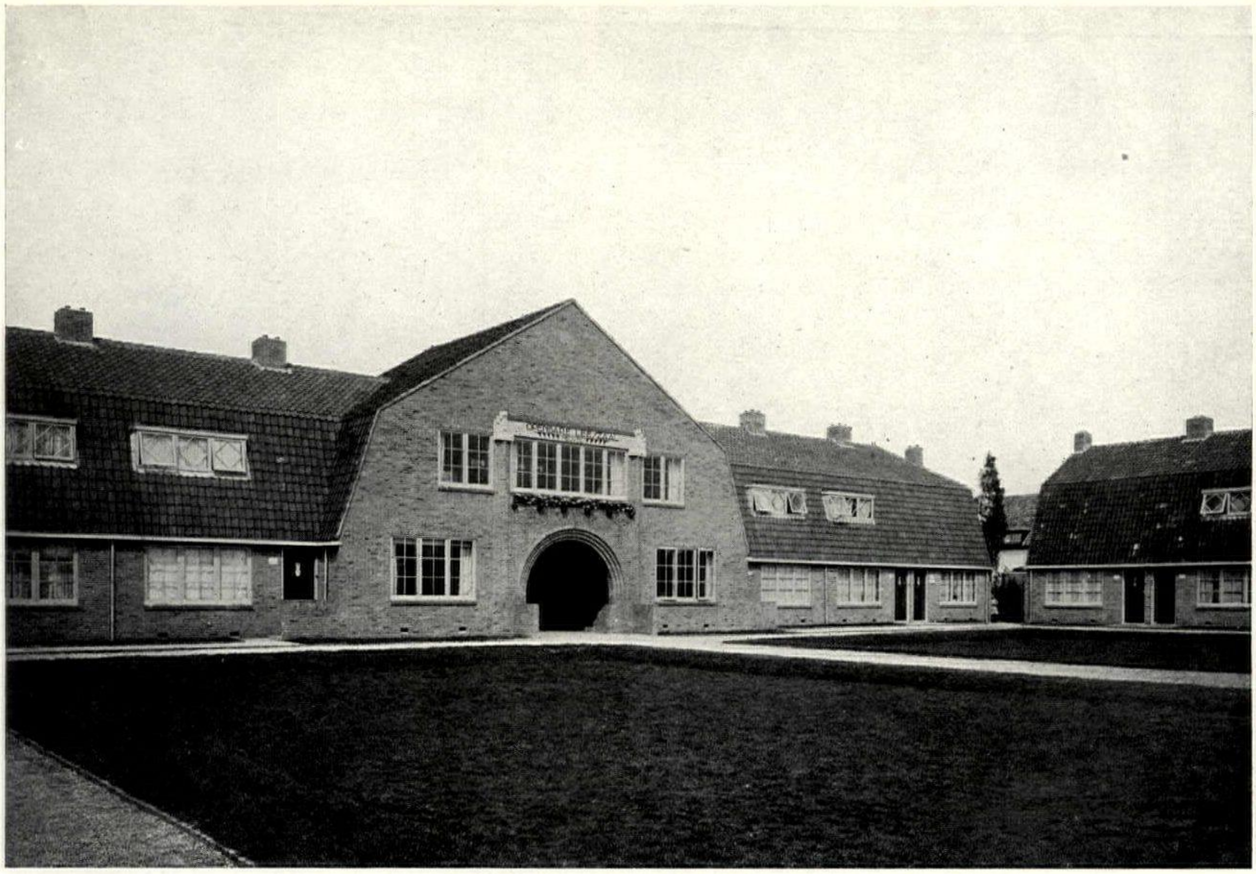
Entrance to Library
Showing full vista along main axis of plan below

On the other hand, it sometimes seems to my unenlightened lay mind to be straining to make bricks and mortar do things for which they are essentially unfit,—to make them curve and billow and cascade,—even to "symbolize the rapid movement of modern life,"—as if it weren't bad enough to have to run after street cars oneself without going home at night to a house which appears to be doing the same thing! In any group struggling for new forms of expression, since genius is scarce and talent unevenly distributed, many who aim at originality achieve only eccentricity. "But it is the artist's business to externalize his dreams," a distinguished exponent of the school said to me. And the Puritan in me could not help replying, "If he is going to externalize them in houses, which someone else has to pay for, and the taxpayers have to subsidize, and men, women and children have to live their lives in for the next 75 years, then he has no moral right to indulge in nightmares."



Detail Plan of Central Portion of Block at Northwestern End of Hilversum Municipal Housing Development

I am afraid I shall be suspected of being too elderly to appreciate modern Dutch architecture if I do not hasten to describe a place where I enjoyed it wholeheartedly. Hilversum is a residential suburb of Amsterdam, 18 miles distant, with



VIEW IN FORECOURT OF NORTHWESTERN BLOCK, WITH LIBRARY IN CENTER

VIEW OF COTTAGES IN QUADRANGLE, LOOKING TOWARD LIBRARY

MUNICIPAL HOUSING DEVELOPMENT AT HILVERSUM, HOLLAND

W. M. DUDOK, ARCHITECT

about 45,000 inhabitants. But in addition to its homes of prosperous Amsterdam business men, it has woolen mills, perfume distilleries, and some other industries, and consequently a considerable working population. For them the city has undertaken an extensive building program, which is being carried out by its director of public works, W. M. Dudok, who is a well known modernist architect.

Seven hundred 1½-story cottages have been built on a very irregular tract of land already owned by the city, surrounded and even penetrated by other buildings, making a difficult problem for the architect, which has been treated with much skill. The settlement is grouped around four centers, each with a distinctive character of its own, yet harmonizing with its neighbors. The principal center is about a large school building with outspread, protecting wings and a tall square clock tower which dominates—and keeps guard over—the whole community.

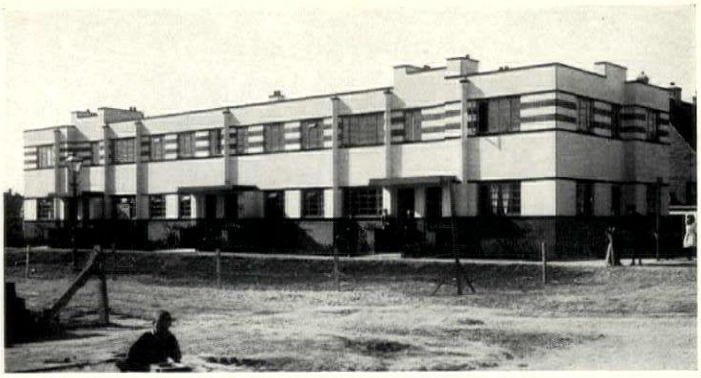
Two other centers contain schools, one a business high school with a quiet blue and gray interior color scheme, calculated to soothe the sensitive nerves of adolescence, the other for little children,—wonderfully gay inside with the tulip colors the Dutch love so well—brilliant yellow walls, brilliant green paint on doors and window frames, with sash curtains of red and white checked gingham, and with red geraniums growing in pots. The fourth center is a singularly peaceful little quadrangle behind the public library. Old people and childless couples are largely lodged there. Big families with romping

View along Geranium Street, Showing Vista Closed by Hilversum Church

Store Group with Small Apartments on Second Floor Served by Main Entrance

Group of Houses with Enclosed Gardens along Boschdrift, Hilversum
W. M. Dudok, Architect

children congregate elsewhere. The coloring is quiet and restful. The library and reading room are over a large round archway leading into this sequestered spot. A straight opening between houses leads out at the other end. Looking from in front of the library through the circular arch, past the lozenge-shaped bed of dark green shrubbery in the center of the quadrangle, through the straight opening beyond, the eye rests on a pair of cottage doors on the opposite side of the transverse street, painted a vivid parrot green and surmounted by a long slope of red tile roof, behind which in the distance rises the old Hilversum church. The effect is startlingly decorative and wonderfully picturesque.



Municipal Concrete Houses, Rotterdam
Mr. Van Hardeveld, Architect

Near the tulip-colored school is a public bathhouse with flat roof and plain brick walls, which first gave me the cue for which I had half consciously been groping. What was it these Dutch modernists reminded me of with their horizontal lines and unbroken wall surfaces? Why, Egypt of course! They think it all comes out of their ultramodern inner consciousness, but it doesn't. The brown skinned architects of Karnak and Luxor dreamed the same dreams three thousand years ago. Be that as it may, the cottages of Hilversum are not Egyptian, but Dutch,—thoroughly and essentially Dutch,—and that is why I like them so much. They preserve the red tile roofs of Holland and the traditional aspect of a Dutch cottage, than which no more peaceful, homelike, wholesome type exists. Why should a country blessed with red tile roofs want to trade them off for our ugly flat roofs?

Mr. Dudok apparently does not, but he varies his tile roofs astonishingly. Some have only a moderate pitch; others slope steeply, and others still are bent to form mansards. They are built in rows, but the rows are broken, here by a pair of steep gables, there by a change in the setback. Excepting for some experiments on the first few streets, the walls of all the dwellings are of plain red brick. The Hilversum brick is of a dull shade, almost grayish below the deep red of the roof tiles. But the doors and window casings afford a chance for brilliant and beautiful color effects. Deep green and bright orange are the favorite colors, set off by narrow lines of black. It is surprising how much character these black lines add.

The strangest thing is the way you can depend on Dutch housewives to hang just the right shades of curtains in the windows and to plant just the

Details of the Large Tenement Blocks Built in the More Intensively Developed Areas of Rotterdam
T. T. P. Ond, Architect

right shades of flowers in the tiny garden plots. Not one of them trains crimson ramblers around those orange and black window casings or plants purple petunias in the beds. No, they plant masses of flaming marigolds, and their little boys and girls wear knit scarfs and caps of the same vivid greens that adorn their doors.

Wherever one goes in the Hilversum garden suburb there are vistas, interesting both in form and color,—a great deal of variety with complete, essential unity of style and purpose. All this has been brought about by the use of very simple and inexpensive means. The varying angles of the roofs, the heights and widths of chimneys, the sizes and groupings of windows, the shapes of the window panes, the treatment of front doors, the occasional use of a low brick wall on the boundary line,—these and a hundred other details have been employed to bring about the desired effects. The final, acid test of the merit of the Hilversum cottages is, to my mind, that the working people for whom they were built have never for a moment been subordinated to æsthetic considerations, and expense accounts have been so carefully watched that after completing the 700 dwellings planned there remains a surplus which will permit continued building. The beauty of it is therefore a free gift. Not a single family less gets a new house because of it.

Rotterdam has a very strong philanthropic housing society which has constructed a whole garden suburb, with some 3,000 red brick cottages at Vreewyk, which means "Place of Peace." It lies to the south of the river Maas, the main part of the city being on the north bank. I visited one cottage of the largest type, containing parlor, living room, kitchen and four bedrooms, one of them in the mansard. It was occupied by a family with seven children, and the rent was only 5 florins ($2) a week. I noted a generous supply of closets and cupboards. Contrary to popular impression, which I used to share, large families are not prevalent in Holland. The average number of children per family is less than three, and the number is decreasing.

The streets of Vreewyk are straight, but the layout is not that of a gridiron. The cottages are in rows, but considerable care has been taken to avoid monotony, and open places with shrubbery and trees are frequent. Sometimes the houses are built directly on the sidewalk, and sometimes there is a setback with a bit of greenery. On east and west streets this is found on the south side of the street only. I had noticed the same thing in Amsterdam. It was pointed out to me (1) that flowers do not grow well on the north side of the street, (2) that no garden at all looks better than one which is ragged, and (3) that the amount of money saved, in view of the cost of land, is really worth saving. In Holland the smallest bit of land is valuable.

A housing trip to Rotterdam would be incomplete without a visit to Heyplaat, a garden suburb built for its employes by the Rotterdam Dry Dock Company shortly before the war. It contains about 400 brick dwellings, a square with a bronze fountain, and a picturesque archway, with single rooms for bachelors over it and a restaurant adjacent. There is also a kindergarten from which were emerging, when I was there, as plump and rosy a set of youngsters as one could wish to see. Heyplaat has been built long enough for trees and shrubbery to be well grown.

A Street of Red Brick Cottages in Vreewyk, Rotterdam
Grandpré Mollière, Architect

High Buildings and Beauty

PART II

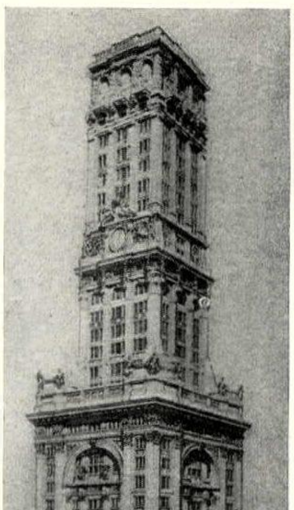
By IRVING K. POND, F.A.I.A.

THIS article completes Mr. Pond's consideration of high building design with special reference to the recent *Chicago Tribune* competition. For the convenience of the reader we have repeated in this paper some illustrations from the first article (February, 1923) referred to by the author.—*Editor.*

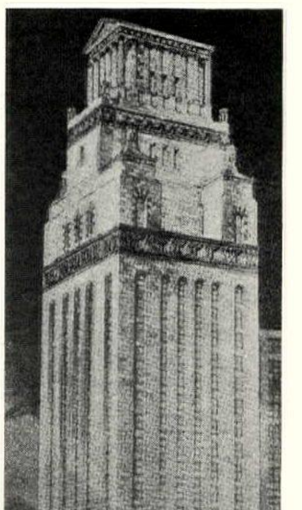
IN continuing my comments upon designs and types of design submitted in the competition for the proposed home of *The Chicago Tribune*, I wish to discuss the attitudes of mind and the avenues of approach displayed, or at least seemingly displayed, by the competitors.

All, as I have said, considered extreme height as a necessary concomitant of beauty,—for in this competition beauty alone was sought,—and, therefore, at least one setback was demanded by the exigencies of the case; for above a certain fixed limit of height, and that evidently not commensurate with the requirements of supreme beauty, the local building ordinances restrict the area and use of the structure. The setback, or rather offset, under the present local restrictions need not necessarily occur on the principal front,—it may be on one, two, three or four sides of the superstructural embellishment and determined only by the character of the design or the whim of the designer. Thus designers in certain northern European countries effected the diminution of area by means of steeply pitched roofs presenting high, sharply pointed gables to the street after the fashion of the cottages and lesser buildings of their own immediate environments, betraying in this way certain of the racial limitations to which I referred in my preceding paper. A Roman designer who presented a rarely brilliant rendering in pen and ink, shot his tower without transitional steppings up out of the center of a cubical mass. His offering both in rendering and design carried the evidences of his race and training, and displayed his limitations in the presence of such a problem.

Let me dispose in a few words of one factor which, as I have already indicated, influenced the attitude of many of the competitors toward the problem; that was the publication by *The Tribune*, before and after the competition was instituted, of examples of existing buildings, with the suggestion in each particular instance that the type therewith presented might form the basis of the future *Tribune* design. Not once, I am quite certain, was it even suggested that the problem of *The Tribune's* office building might be solved on its own merits, and therefore designer after designer ignored a logical and straightforward solution in order to superimpose upon an office building some feature, like a mosque, an oriental tomb, a Greek temple, a Gothic chapel or a laminated Italian tower, hoping thereby to gain *The Tribune's* favor. Sometimes this superimposition struck a note which was echoed through the substructure and produced a semblance of superficial harmony; at other times, notably in the case of the design placed third, it did not. Perhaps I might better have said a "superficial semblance of harmony," for while there was a semblance of harmony on the exterior it was superficial only and did not run through and permeate the structure and bring it thoroughly into accord with the fundamental purpose of the building, and without this there can be no true harmony—no true beauty. It was a blessed relief, in viewing the pictorial presentations, as it surely would be in viewing buildings erected in consonance with them, to turn from the superficial applications of Byzantine and Aztec and Gothic and pseudo-classic and claptrap to the subtly modulated, harmoniously inter-related and loftily conceived second design.

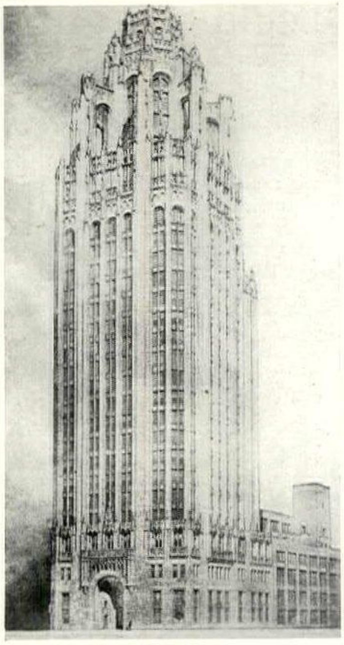


Design Submitted by
Prof. Giuseppe Boni
Rome



Design Submitted by
Frank Fort, Architect
New York

There were two very distinct avenues of approach to the solution of this particular problem, as to that of the lofty steel-framed structure generally, which were traversed by designers according to the individual attitude of each toward an ideal of beauty; and there were designers, many of them, who tried to tread in both of these paths at the same time—and made a mess of it. The author of the design placed first tried and came out pretty well, consider-ing. One of these avenues is to treat the entire structure as a masonry design, ignoring absolutely the steel skeleton; the other is to recognize the character of the structure and give it expression in the external forms. Of the latter, I find the design placed second far and away the most satisfactory. Of the former, it seems to me that the design submitted by Bertram Goodhue is the most refreshing and carries the most of charm. With its logic I disagree, as with the logic of all its sort. Others do not so disagree and will enjoy all phases of the design. The design placed first is, at first blush, almost of a pure masonry type, but soon scale and mass and dimensions proclaim the presence of steel while dominant forms deny it. I am not insensible to the charm of the outline and the richness of composition as displayed in the drawings. I recognize the harmony existing between the octagonal crown and the substructure with its chamfered corners, and I recognize that the round and segmental arches have saved the design from a banality which pointed arches would have conferred upon it. But to me it feels structurally impossible, while the restlessness of its crowning feature with the arched buttresses, in spite of a seeming poise, disturbs me. The great piers of masonry rise "four square" with the walls, above which they must be skewed to meet the direct thrust of the arches, or the arches on the axes of the octagon must meet the piers at an angle; in either case there is imparted a sense of restlessness.

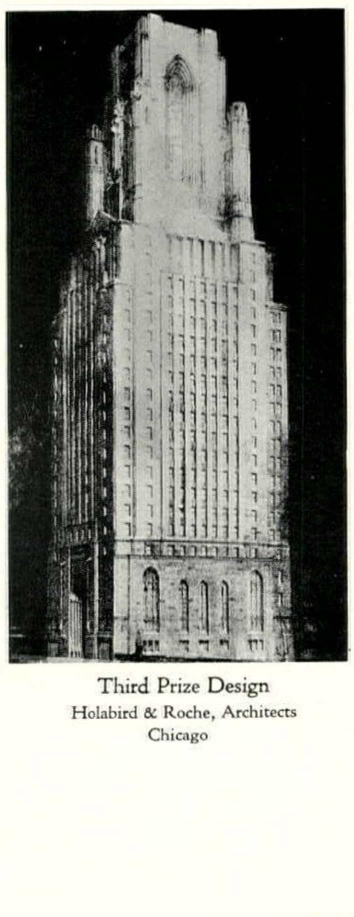


First Prize Design
John Mead Howells and
Raymond M. Hood, Associated

I am going to take the liberty of quoting the appreciative criticism of this design from one quite competent to judge, from one whom I would perhaps consider the most competent. The author of the second prize design in a private letter, since published by *The Chicago Tribune*, says: "As far as I am able to judge from the pictures that are at my disposal, the project submitted by Mr. Howells is very successful. It is strong and whole in form and proportions and displays a beautiful and, at the top, well rounded outline, at least as it appears on the perspective drawing. It is possible that the project will not give the same whole impression at close range. I fear that the top will sink down and the flying buttresses surrounding it shoot up too high in the sky, and thus cause the outline to be meager and broken. In my opinion an important principle in the designing of a skyscraper is that the top is formed so that the logical construction can be followed by the eye in all the different parts of the building clear up to the highest pinnacle, not only from a longer distance but also at close range." Please underscore, in your mind's eye, that last sentence; I shall use it later as a text. And now let us take stock of the comparatively few, in all the number of designs submitted, which can make any pretension whatsoever to a possession of architectural merit. Let us study the psychology of their designers and determine if we can, and if we cannot determine to our satisfaction, let us wonder at least "how they get that way" in this "land of the free and home of the brave." We must absolve in a way a very small element, best represented, perhaps, by an example from San Francisco and another from the university town of Ann Arbor, for these designers sought to solve the problem on its merits and came to it with independent minds restricted only by the seeming necessity for height and setbacks. If buildings were only elevations on paper these, as many another of the solutions presented, would have been very satisfactory—the lines in elevation soared beautifully from the base to the pinnacle. But unfortunately a real building has three dimensions, and the object of this competition was to get a real building—to get a beautiful building, and not necessarily (as is announced generally in competitive programs) an architect to actually supervise building.

A certain other large class came to the problem limited not only by the seeming necessity for height and setbacks, but with their minds gripped in the

Design Submitted by
Weeks & Day, Architects
San Francisco



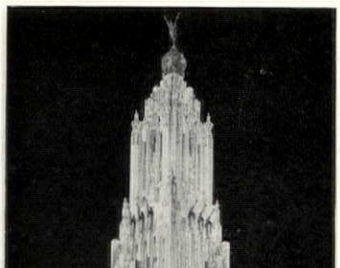
Third Prize Design
Holabird & Roche, Architects
Chicago

strangle hold of conventional forms—Gothic, classic, oriental—and so did not see the inherent possibilities at all. We all know how such minds react to any architectural proposition—our streets are lined with their stupidities. And then comes a larger class which interests the more because they seemed to sense a special problem in what *The Tribune* had set before them, and they were bound to tax their sociological and architectural experience and observation and their highly conventionalized minds in an attempt to visualize what seemed to them the public's latest dictum as to beauty; in other words, they wanted to materialize a popular conception of beauty. Well! how to do it?—how to get at it? Fortunately, a starting point had been provided, one for the classicist and one for the Gothicist. The Nebraska state house tower, essentially classic in its topping out, had met, seemingly, yes, assuredly, popular and professional favor; while for the Gothicist there were the towers of the Harkness memorial—the best advertised and exploited and admired group of the decade. Here were the necessary elements, height and materialized concepts of beauty, all ready to hand! The only problem for the competitor, then, seemed to be how to place these towers on top of an office building or how to envelop their shafts in an office building and still minister to the eternal harmonies—a problem difficult indeed.

Second Prize Design
Eliel Saarinen, Architect
Helsingfors, Finland

One designer, who won an honorable mention (not so much of an honor in this competition, as it was given to all but one of the paid competitors, and to at least one other from each of the 22 countries represented, regardless of merit, and to several others), arguing to himself that if one Harkness tower were beautiful, two would be twice as beautiful, slipped the Boston tower down through the St. Giles of Wrexham, punched the latter full of office windows, modified the pinnacles a bit, and let the transition take care of itself. In fact he made more modifications than I have indicated, but in essence I have outlined his psychological reaction to the problem.

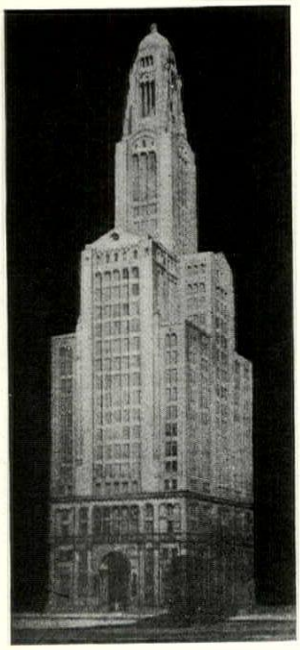
Now this same restricted attitude of mind in the presence of a living modern problem shows itself in several similar designs, and even in that placed first. These other designers were not content with letting the transition take care of itself, but sought to effect it harmoniously by developing flying buttresses or introducing traceried screens between the pinnacles or piers and, in the case of the design placed first and in one or two others, by incorporating both features into the composition. As I indicated in the earlier article, most of the real work on many of the designs in this competition consisted in trying to effect some scheme of transition between the office building beneath and the beautifying object above. Precedents—real *bona fide*, established precedents—were wanting, and the architects had almost to use their brains. What has happened to all our architectural schools that they have given us no formulæ to apply in such a case? But, seriously, why have the schools not taught something of the value of outline—of contour against the sky—where the building must be made effective when viewed near at hand and also at a distance? I fear that, after all, it is not a matter of teaching but a matter of feeling, and that one who fiddles away his life on forms of petty detail cannot bring himself to feel in terms of mass. Of all the conventional types presented, the design placed first was the most successful in the larger mass, though I feel, as must have felt the authority I quoted, that it is too much a draftingboard mass and too little a structural mass.



Design Submitted by
Albert J. Rousseau
Ann Arbor, Mich.

Design Submitted by
Bertram G. Goodhue
New York

In numerous instances in which the setback was featured in an endeavor to effect a graceful transition, the great value, in fact the absolute necessity, of vertical continuity to a unified and altogether beautiful composition was lost sight of. The ratios of setbacks to corresponding verticals resulted in



Design Submitted by
Butler & Corse, Architects
New York

a sharply concave form, so sharply concave that the form would be lost to view excepting at a considerable distance or from a high elevation, and the tower or crowning feature if seen at all would be seen as a detached object and not in its proper relation to the mass. Cutting out the corners has served to obviate this difficulty and is used to good effect by both Mr. Saarinen and Mr. Goodhue. Some of the designers seemed to argue about setbacks as the man mentioned did about the towers—if one were beautiful, then more would be proportionately more beautiful; and so we find instances where setbacks bob in and out and up and down in bewildering profusion. Mr. Saarinen in the design placed second has demonstrated, as I tried to do in my book, "The Meaning of Architecture," the value of the cutout corner in giving the effect of verticality—of vertical movement—combined with poise and stability; and showing, too, the harmony which results when the same principle is applied to constituent piers and lesser elements of the mass. I wish that the interested reader would follow the lines of the corners in Mr. Saarinen's design and compare them with the lines in Figs. 21 and 24 in my book, especially in Fig. 24, which represents the tower of the University of Michigan Union at Ann Arbor. It is because the editor of THE FORUM originally asked me to continue my article on the effect of zoning laws upon high buildings along the lines of the theory of modified verticality laid down in my book that I take the liberty of mentioning it here and inviting a study of it in connection with the discussion of the matter in hand.

There were square yards of beautiful draftsmanship displayed in the contributions to this *Tribune* competition. There were extremely few designs which gave any indication that their authors had any deep feeling for structure or knew in the least how their designs would look in execution. Some designs which looked free and even airy in the drawings would have been hard as nails in materialization; like the vaporous spooks at a seance they would have proved gross material if poked with the finger of flesh. And some were humorous—humorous to a degree—not intentionally so, perhaps, as those contributed by *The Tribune* cartoonists, from which they could with difficulty be distinguished. In fact viewing the results as a whole it does not seem that this competition could have been taken seriously. It seems to have been regarded as an opportunity to do stunts of design, but more particularly of draftsmanship, expecting,—if there were any expectations at all,—that a non-technical jury would fall for something flashy, and that lightning might knock down a $50,000, or a $20,000, or a $10,000 plum into an acquiescent if not altogether deserving pocket. There were certain competitors who took themselves too seriously — seriously enough to be comic and to gain honorable mention. There was only one, and he an alien, who grasped the problem in all its essentials. The work of the other foreigners was scarcely on a par with that of the natives. Where was our native idealism? Where was the bold, free stroke of the American? Why did every American who had technical control, with but one or two exceptions, couch his thoughts in terms of Europe or the orient? There were, besides these two or three, several who struck out along individualistic lines, but whose work, whether or not definite and coherent, was alien not only to nationality but to the realm of pure design.

Design Submitted by
James Gamble Rogers
New York

There is, floating about somewhere in the limbo of abstractions, an American ideal. It has not as yet been caught and distilled; at least the results of this competition would seem to indicate that the native designer had not as yet clothed the spirit in flesh. The man from Finland came closest to it, in his intentions, idealism and conception of beauty.

Is there no American as American in his feelings as the man from Finland appears to be? What has straight-jacketed us and left us powerless to move excepting in conventional channels? Is it the schools?—is it fatty degeneration?—is it prosperity?—is it inertia and lack of initiative?—is it a numbness in our sensatory nerves? Something is the matter with us, as the results of this competition serve to show. Again—just to think of it!—unlimited millions at our disposal with which to produce sheer beauty!—and when the results were not plain, everyday "commonplace" they seemed to be factitious combinations of copy plate features. Think of it!—unlimited millions with which,—but this isn't intellectual criticism and analysis;—it's just emotionalizing against the seemingly inevitable, and I'm going to stop it—and give my readers a chance to think.

Recent Dormitories at Smith College

J. W. AMES, K. S. PUTNAM AND E. S. DODGE, ARCHITECTS

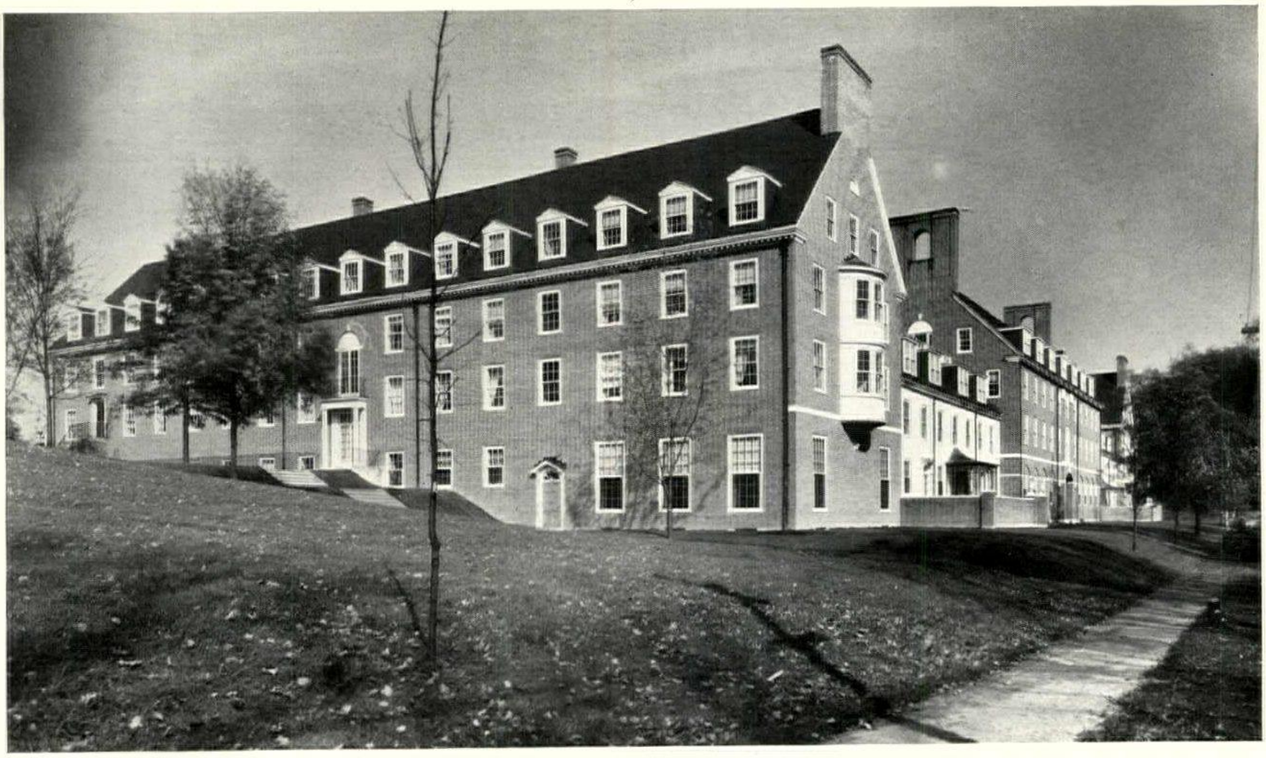
THE several dormitories recently completed for Smith College, as an investment of part of its endowment fund, are of interest in various ways, for in addition to representing an unusually successful solution of the college dormitory problem the buildings are planned to aid in carrying out certain well defined social policies which prevail at Smith.

The three buildings illustrated in these pages are the nucleus of a large group and form half of a projected quadrangle, the remaining half of the quadrangle shortly to be built. This quadrangle divides into two sections an alley, which bi-sects the group, and at each side of the quadrangle and fronting also upon the alley there are to be two additional courts or minor groups, each built about three sides of a square. This group of 15 dormitories, three of which, as just said, have been completed, occupies what was known as "Allen Field," the central part of which was a large bowl approximately represented in this group by the quadrangle. The tract involves a considerable slope, and there is accordingly a difference of some 10 feet in grade between the quadrangle and the North alley and its two courts, and a further difference of 15 feet between the quadrangle and the grade of the South alley and its buildings. The character of the building site was therefore such that to plan and group successfully the number of buildings required it was necessary that each be kept a separate entity while contributing its part to the whole.

Smith's policy is to avoid dormitory units so large that the individual student is practically lost among a vast number. Each of the 15 dormitories, built or projected, is intended for the accommodation of 60 students, each building to have its own dining room and to be in effect a separate house. On the first floor of each building are two small apartments, each consisting of a study, bedroom and bath, one for the use of the head of the house and the other for a resident member of the faculty. Investigation was made of the possibility of having one kitchen for the group, but the idea was abandoned. Serving these three buildings there are two kitchens, one for Cushing House, and another kitchen for the 120 students occupying Jordan House and Ellen Emerson House, the larger kitchen being placed, it should be noted, between the serving rooms of the two buildings. Use of this kitchen is something of an experiment, and it is as yet too early to judge of its practicability and of the use of anything other than individual kitchens in planning future dormitories.

The interiors of these grouped dormitories, particularly their living and dining rooms, possess a character quite different from that of the older buildings scattered about the Smith campus. Fireplaces are designed in the old fashioned way to draw well and to throw out heat; their facings and hearths are of soapstone, and the mantels are simple and unpretentious, in keeping with the structures themselves. Woodwork as well as walls is generally painted in light colors so that the effect is cheerful and domestic, with no overpowering display of monumental hardwood trim. Floors of dining rooms and corridors are covered with battleship linoleum, and the floors of living rooms are of plain oak, while the bedrooms have floors of hard pine, stained and waxed. In one building the walls of bedrooms are painted, and plain paper covers the walls of the other two, while in the interests of economical upkeep bedroom doors are of natural wood stained walnut. Each of these dormitories was decorated and furnished by a graduate of Smith College—Jordan House by Blanche Morse of Boston, Ellen Emerson House by

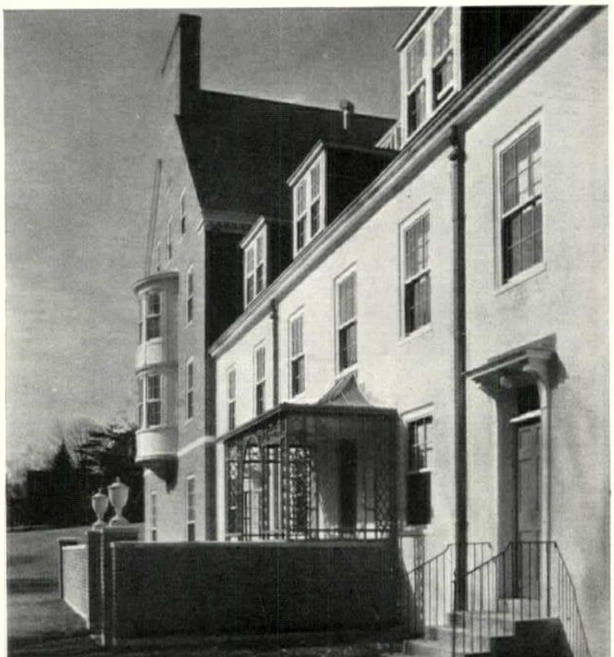
View of Quadrangle from Loggia of Cushing House
Dormitory Group, Smith College



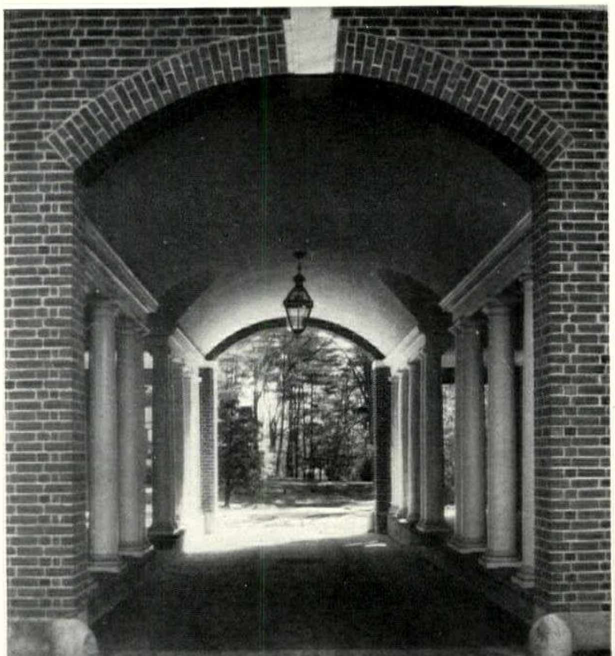
View from the South Looking along Paradise Road
Note steep grades of property to be developed southwest of present group

Louise P. D. Lee of New York and Cushing House by Julia MacAlister of Philadelphia, interior decorators.

The policy of the college further requires that each student have an individual room and that the rooms be of about the same size. No private baths are provided in these dormitories, but showers as well as tubs have been installed as an experiment, the idea being that use of showers may save time. Near each of the bathrooms or lavatories lockers have been provided, one for each student, for keeping towels, etc., a decided improvement over the arrangement prevailing in the older dormitories where damp towels are necessarily hung in the unventilated closets of the bedrooms. In addition to piazzas or loggias for each building there is at each end of Ellen Emerson House a sleeping porch where 10 or 12 girls can sleep, each of the porches so arranged that it can be entered from two dormitories.



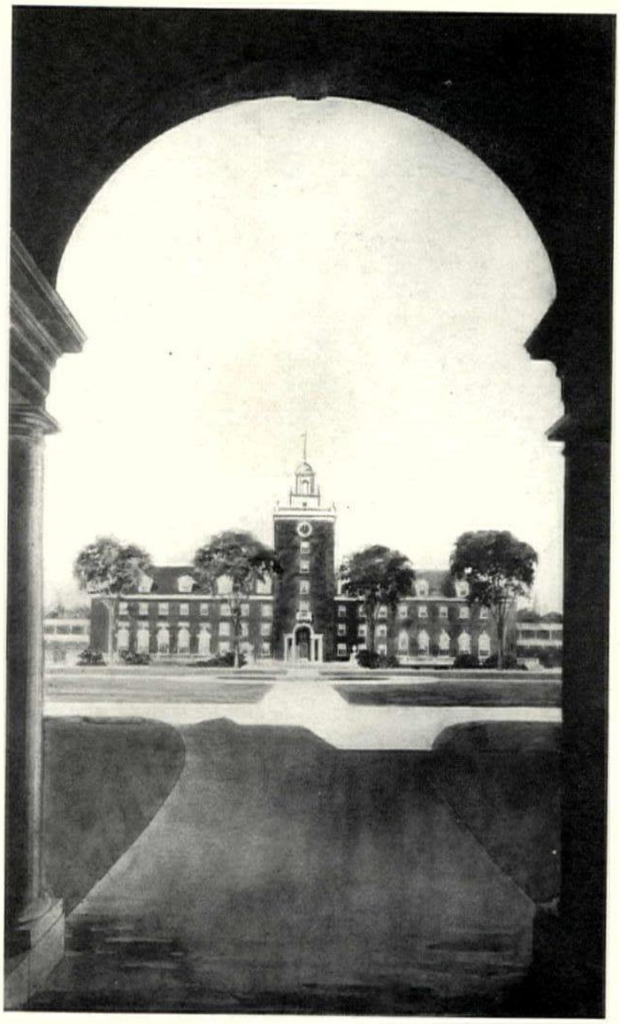
Enclosed Service Yard of Ellen Emerson House



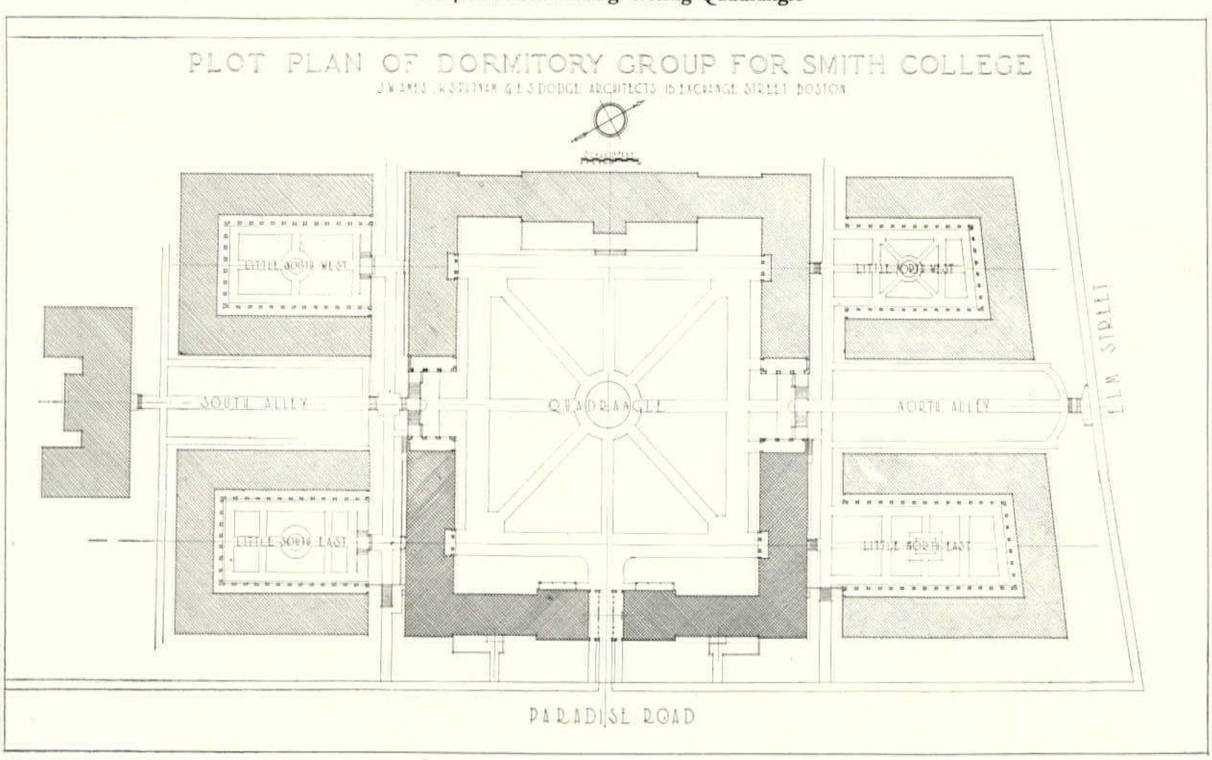
Passage to Quadrangle through Ellen Emerson House

If it is found that the use of sleeping porches does not endure, these spaces can easily be made into bedrooms.

Smith's traditions to some extent led to the adoption of a rather free and extremely simple type of New England colonial architecture, the buildings of the group being somewhat reminiscent of Massachusetts Hall at Harvard. With a large number of bedrooms necessarily of uniform size, window openings must be equally spaced, and the balance of architectural effect thus secured agrees well with the form of architecture selected. The windows throughout are placed within 1½ inches of the face of the brickwork, and there is a full casing of wood between the sash and the brick. The detail is the same as in the windows of Hollis and Stoughton Halls at Harvard and the old state house in Boston. Since there is considerably more white paint about the windows than is usual in modern buildings, giving a cheerful appearance, the architects felt that blinds at the windows would be unnecessary. It is both difficult and expensive to hang blinds on windows with wide casings so that they will not conceal the woodwork when they are open; specially made hinges must be used, and this adds materially to the expense. Many people think they cannot sleep unless the window blinds are tightly closed, but most physicians agree that the free admission of air into a bedroom at night promotes sound sleeping, and it is not difficult to become accustomed to sleeping



Perspective of Building Closing Quadrangle



Complete Plot Plan of Dormitory Group at Smith College, Northampton, Mass.
The double hatched U portion indicates part now built

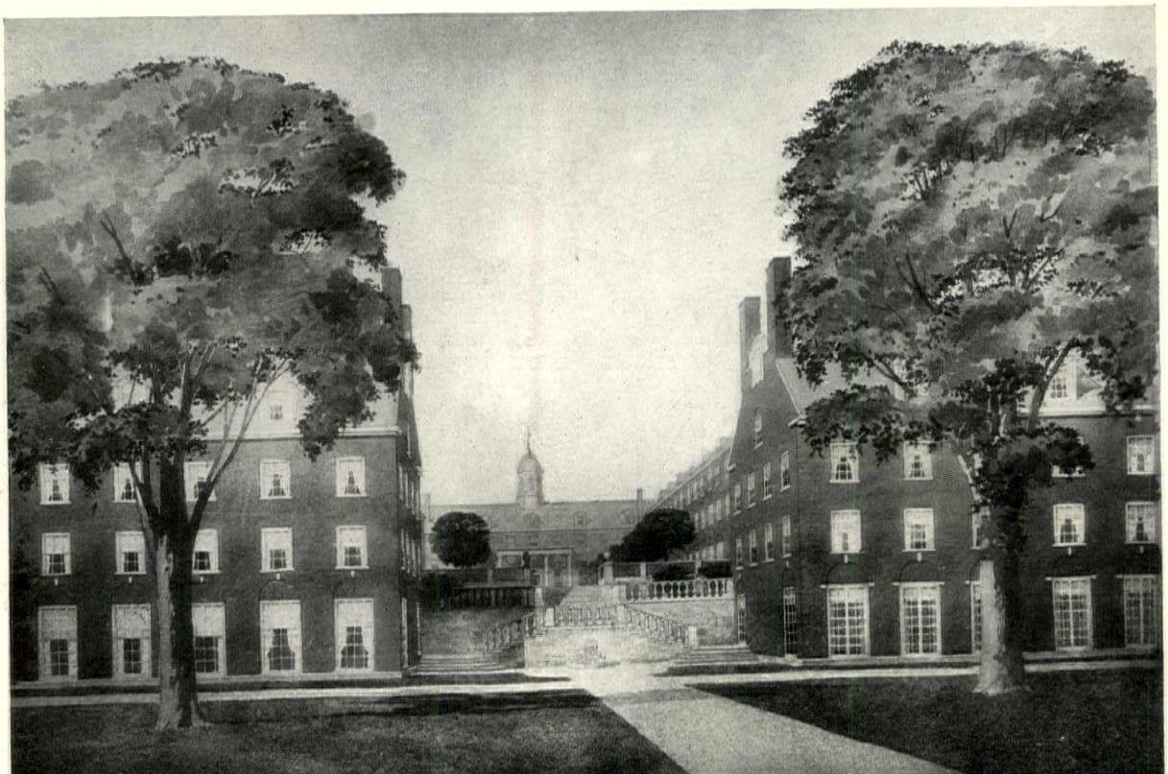
J. W. Ames, K. S. Putnam and E. S. Dodge, Architects

A Typical Parlor in the Dormitories Showing Simple Scheme of Decoration

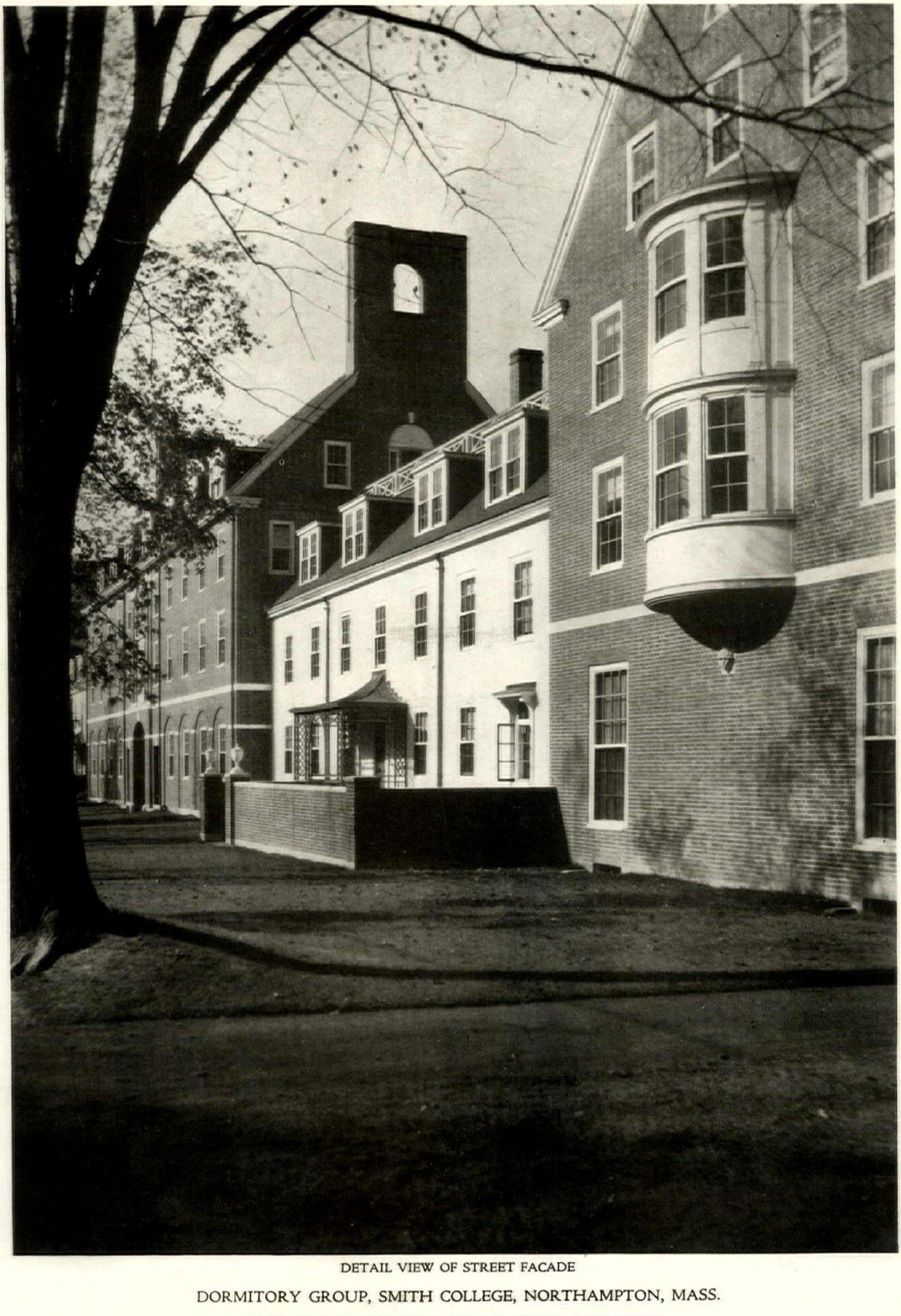
in a fairly light room. Although these are the only Smith College dormitories without blinds, no complaint has yet been made.

The foundations of the buildings are of concrete. The grass courses and outside steps are of granite; the string courses between the first and second floors of marble; the floors of the loggias, piazzas and passageway through Ellen Emerson House of blue stone; the walls above the first floors are of terra cotta blocks, veneered with local sand-struck brick laid in modified English bond; windows are built without stone sills or brick arches over them, the wooden window sills being heavy and projecting beyond the brick line. The cornices are of wood and gutters and conductors of copper. The roof space forms one of the bedroom floors, and for this reason large double dormers were used in many cases, because they make light and attractive rooms, really better than the rooms below the cornice, so that in spite of the extra flight of stairs, they can be rented for the same prices. In the two wings connecting the central building with the flanking dormitories the brick veneer was omitted and the terra cotta blocks were covered with stucco. It was thought that this might break the monotony of the brickwork on the long facades, especially when future dormitories are built.

Smith College has no central heating plant, and instead of planning one such plant for the entire group of 15 new dormitories it was thought best to subdivide the units. The contract was let July, 1921, and the cost was about 43 cents per cubic foot.



Perspective Sketch on Main Axis of Quadrangle Looking into South Alley
Dormitory group at Smith College, Northampton, Mass.



DETAIL VIEW OF STREET FACADE

DORMITORY GROUP, SMITH COLLEGE, NORTHAMPTON, MASS.

J. W. AMES, K. S. PUTNAM AND E. S. DODGE, ARCHITECTS

Photos by Paul J. Weber

QUADRANGLE FRONT OF MAIN BUILDING

DETAIL OF PRINCIPAL ENTRANCE

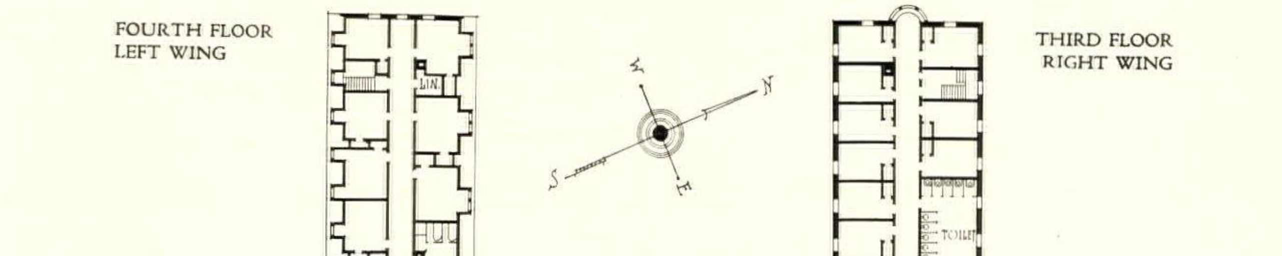
DORMITORY GROUP, SMITH COLLEGE, NORTHAMPTON, MASS.

J. W. AMES, K. S. PUTNAM AND E. S. DODGE, ARCHITECTS

GENERAL VIEW FROM STREET

FOURTH FLOOR LEFT WING

THIRD FLOOR RIGHT WING



FIRST FLOOR PLAN OF GROUP

SECOND FLOOR PLAN OF FRONT PORTION

DORMITORY GROUP, SMITH COLLEGE, NORTHAMPTON, MASS.

J. W. AMES, K. S. PUTNAM AND E. S. DODGE, ARCHITECTS

LIVING ROOM OF ELLEN EMERSON HOUSE

DINING ROOM OF ELLEN EMERSON HOUSE

DORMITORY GROUP, SMITH COLLEGE, NORTHAMPTON, MASS.

J. W. AMES, K. S. PUTNAM AND E. S. DODGE, ARCHITECTS

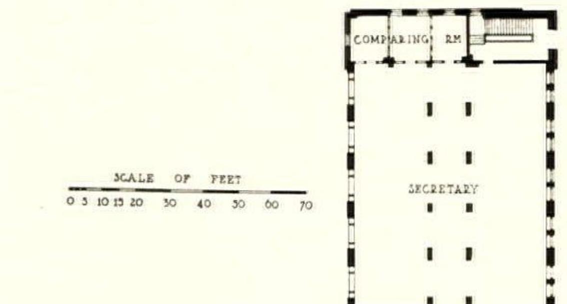
DETAIL OF ENTRANCE PAVILION

NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT

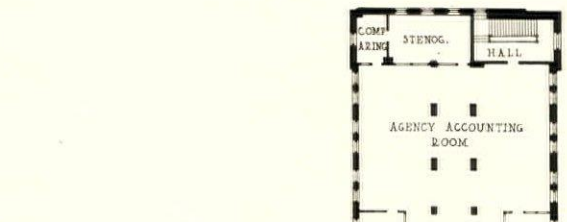
CRAM & FERGUSON, ARCHITECTS

Photos by Paul J. Weber

GENERAL VIEW OF EXTERIOR



FIRST FLOOR PLAN

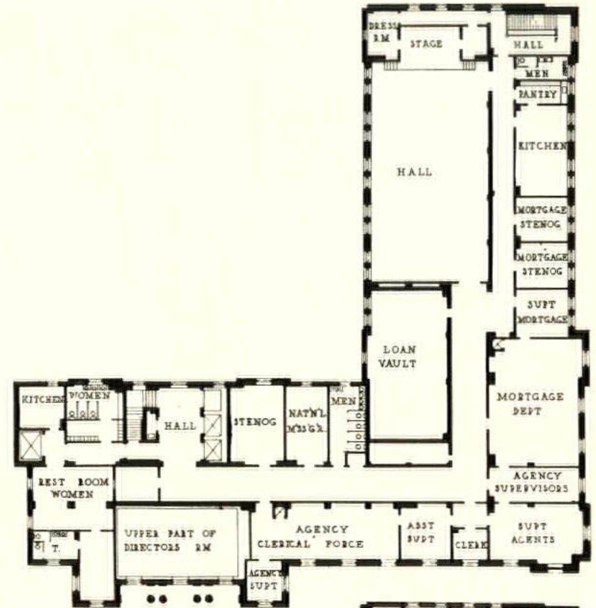


SECOND FLOOR PLAN

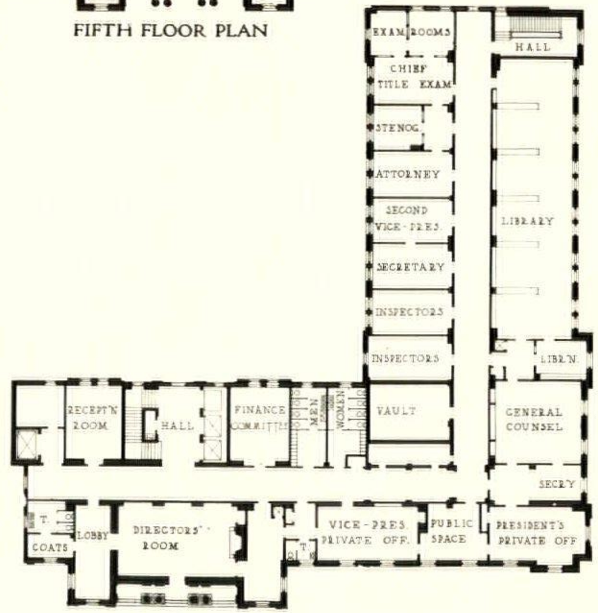
NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT.

CRAM & FERGUSON, ARCHITECTS

MAIN FACADE



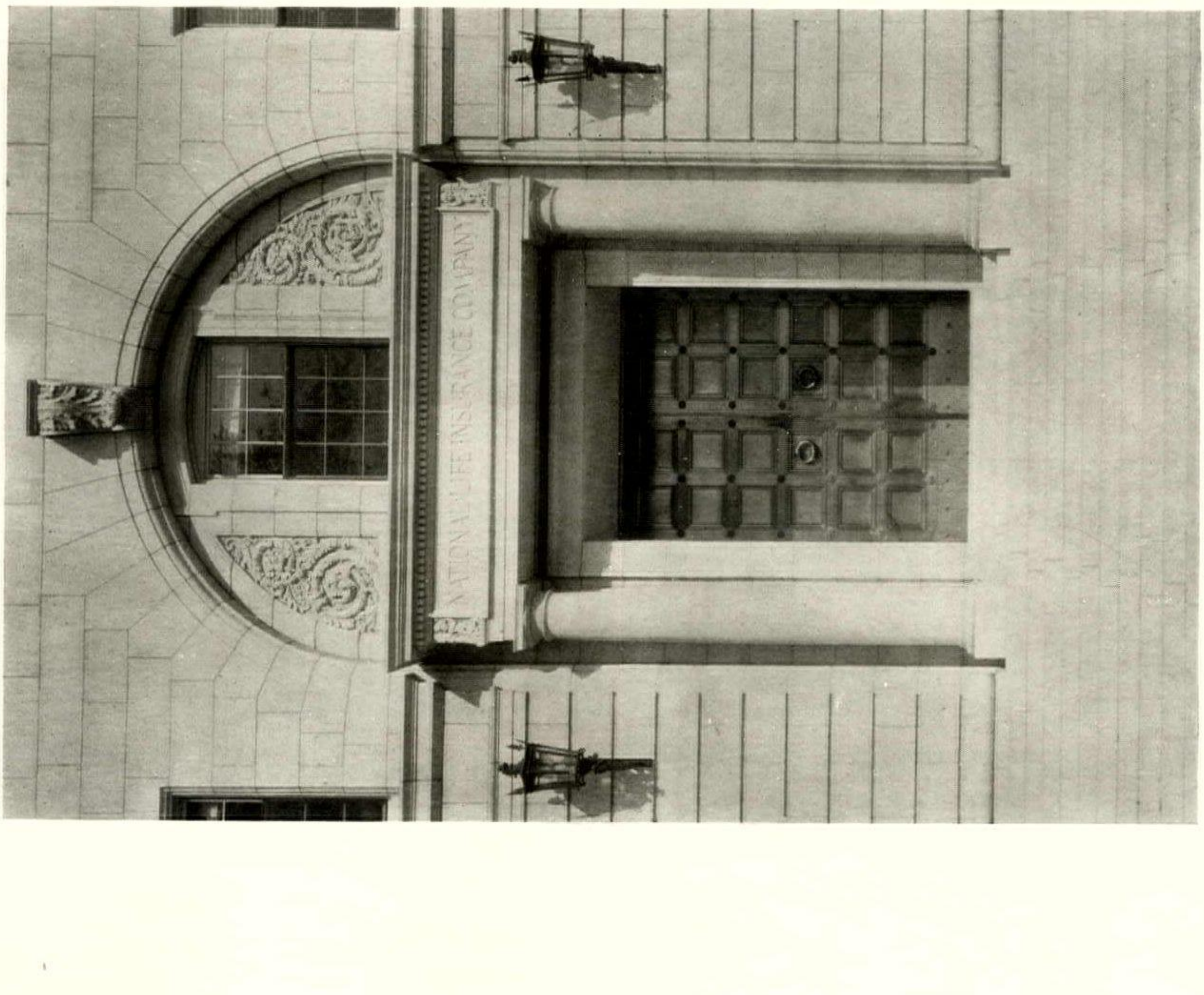
FIFTH FLOOR PLAN



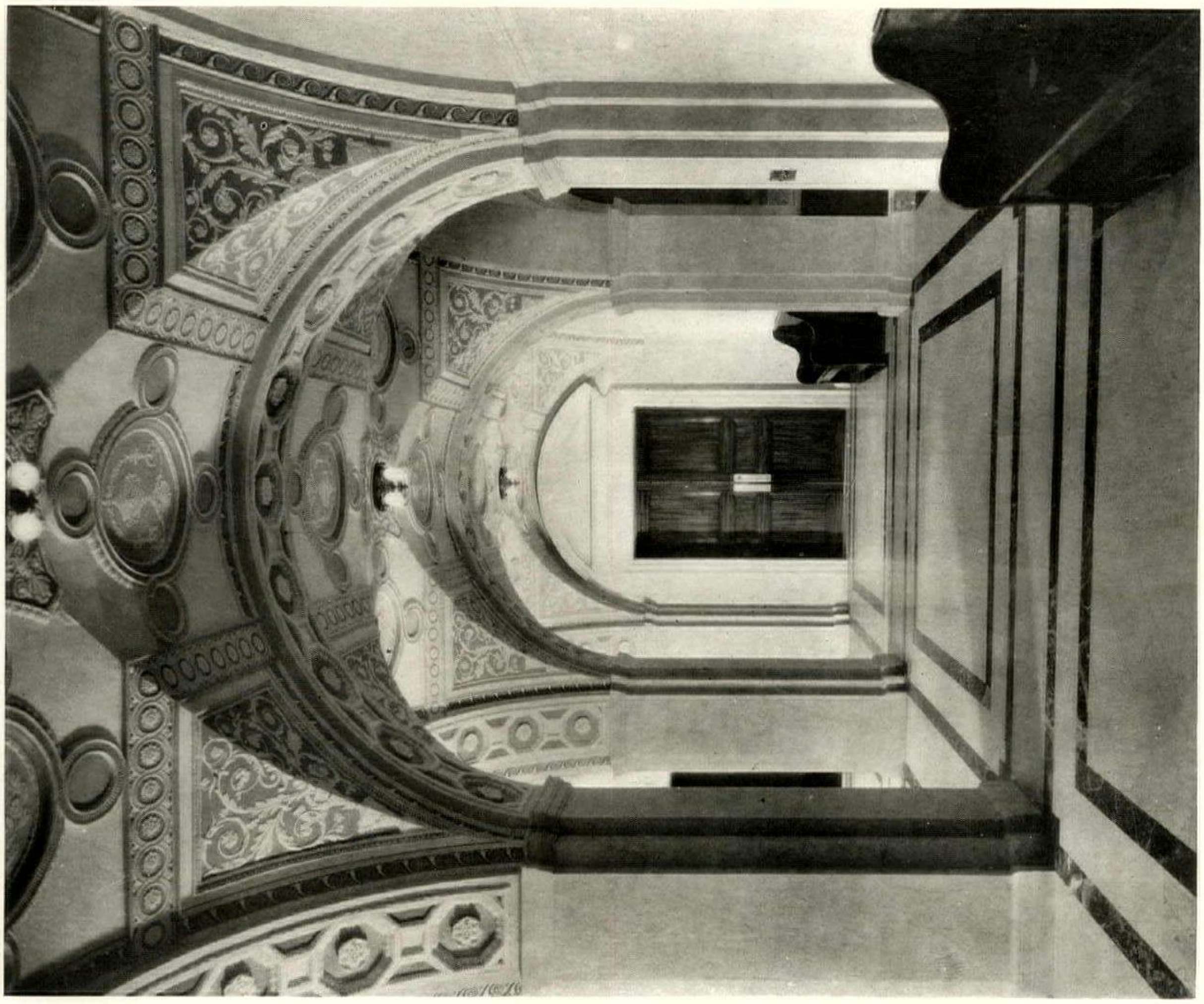
FOURTH FLOOR PLAN

NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT.

CRAM & FERGUSON, ARCHITECTS



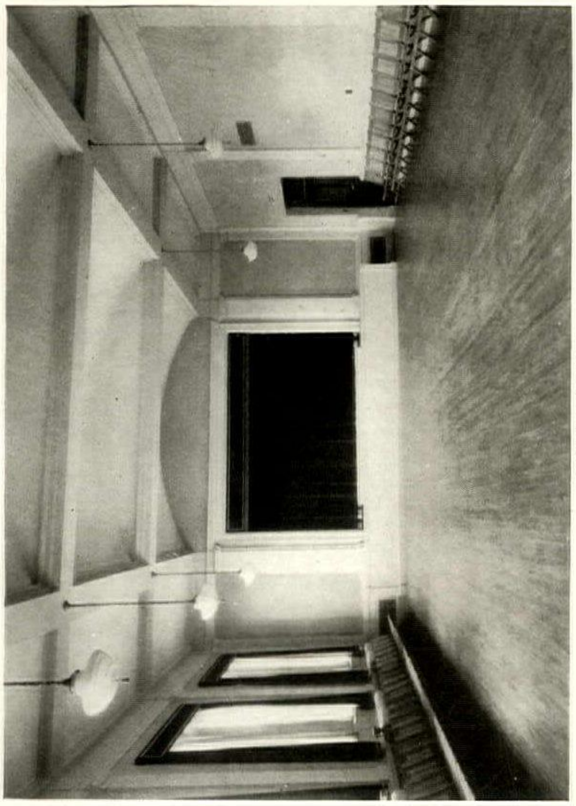
DETAIL OF MAIN ENTRANCE



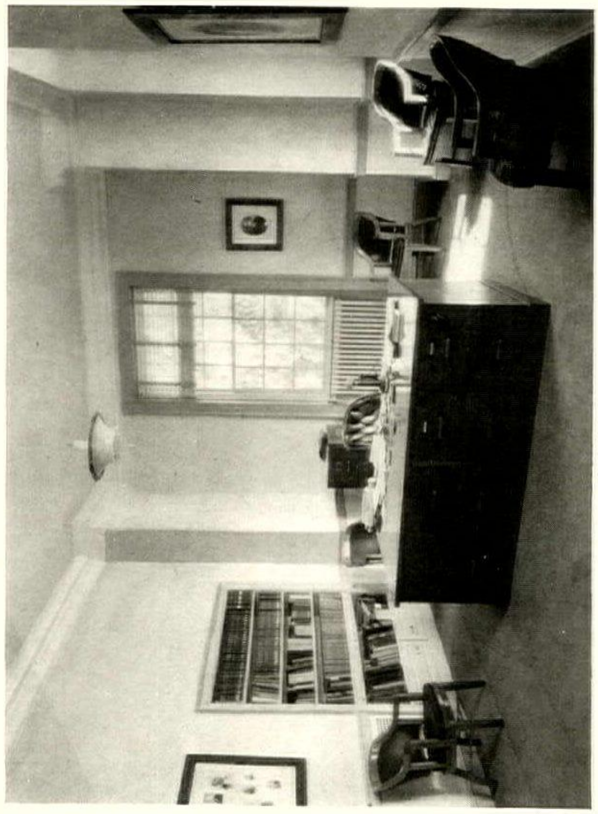
DETAIL OF MAIN LOBBY

NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT.

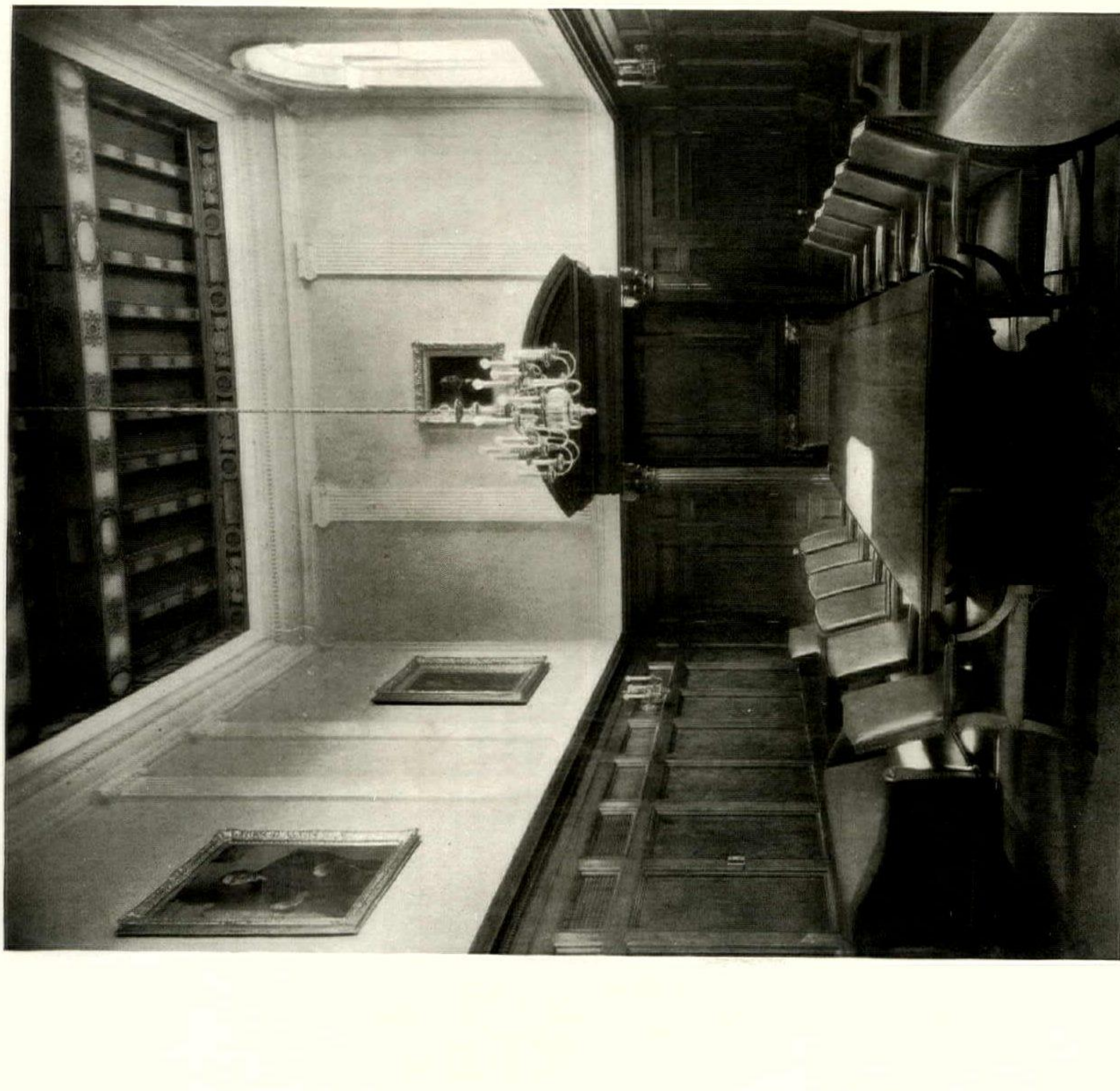
CRAM & FERGUSON, ARCHITECTS



ASSEMBLY HALL



PRIVATE OFFICE



DIRECTORS' ROOM

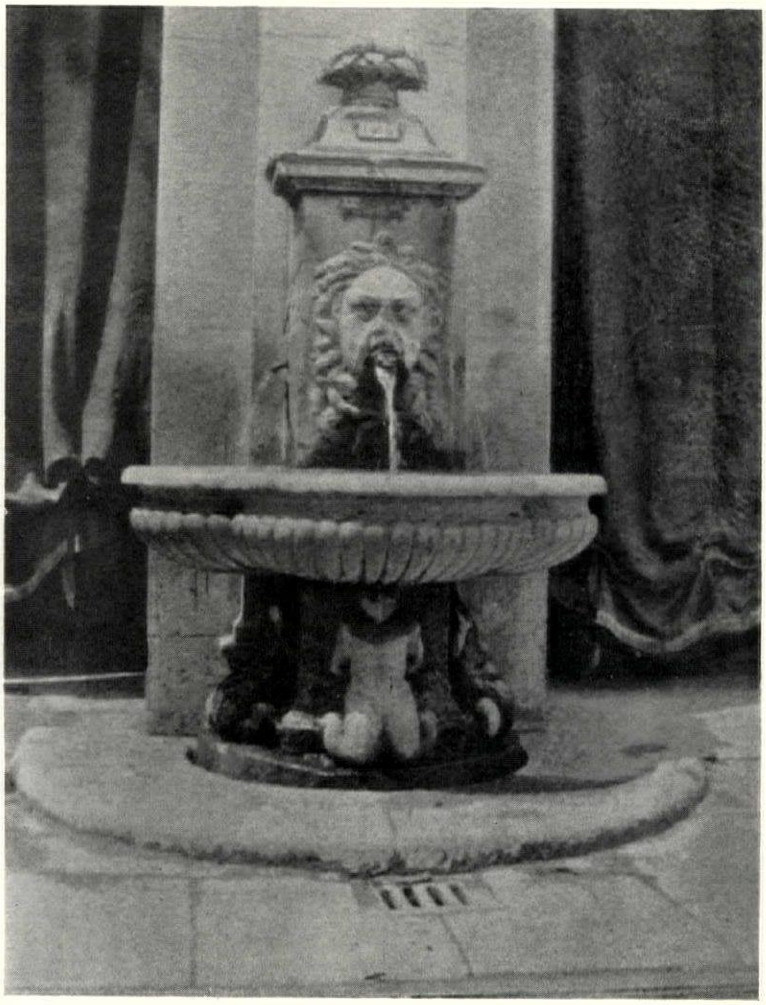
NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT.

CRAM & FERGUSON, ARCHITECTS

ITALIAN RENAISSANCE DETAILS

A SERIES OF MEASURED DRAWINGS

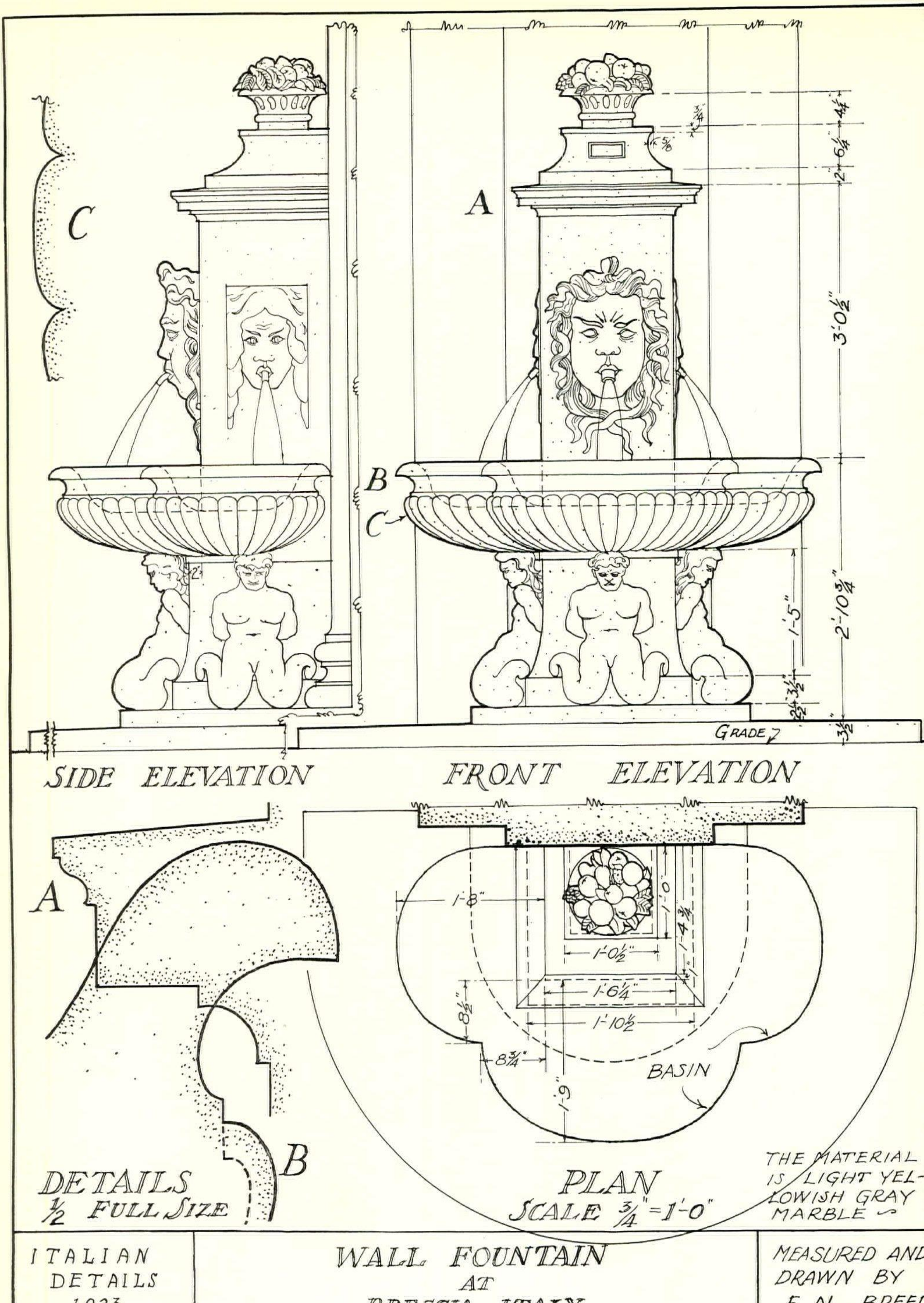
By F. NELSON BREED



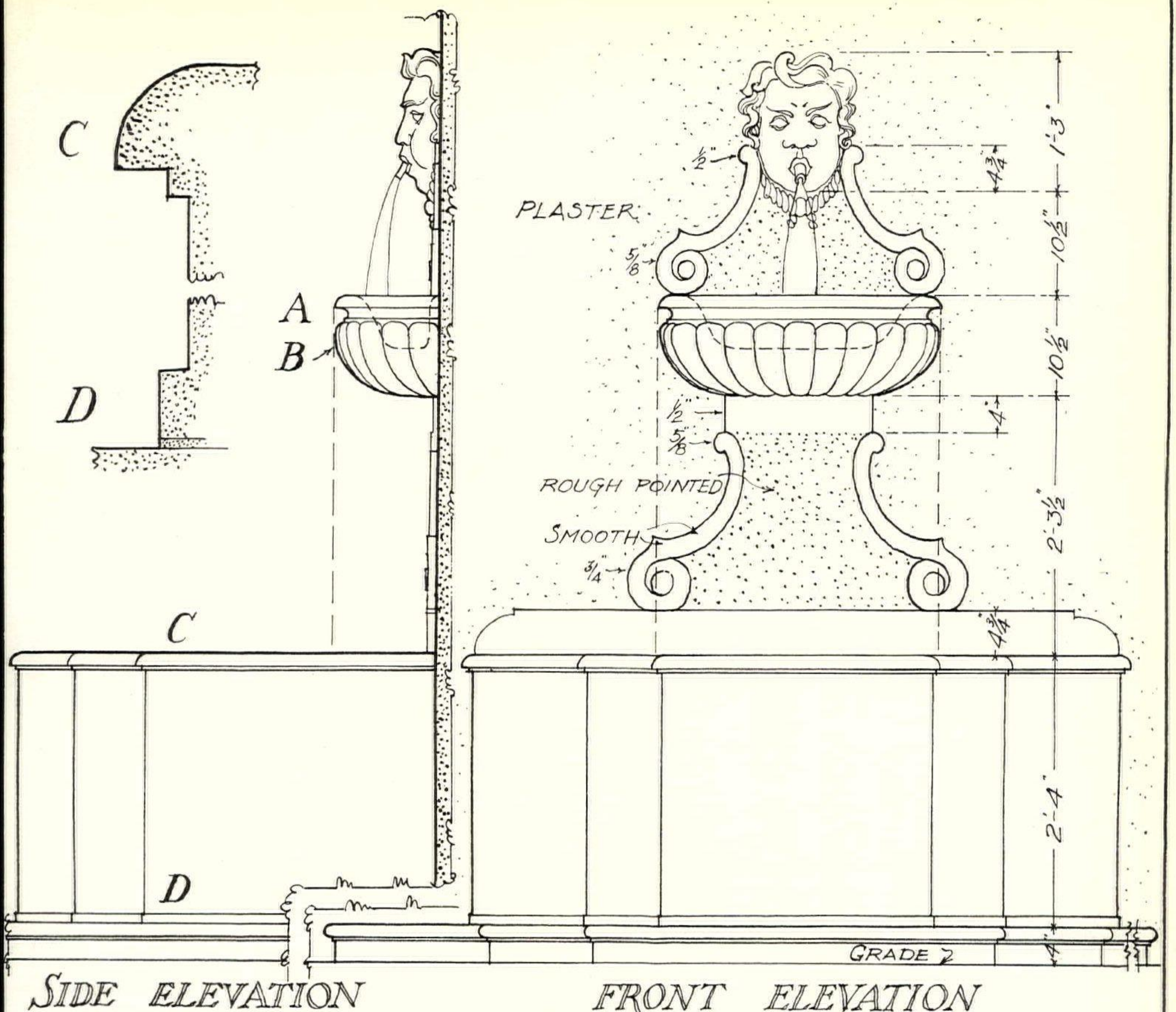
MARBLE DRINKING FOUNTAIN
PIAZZA DEL COMMUNE, BRESCIA

THE little drinking fountain illustrated here is one of two which are placed symmetrically against the piers of the colonnade at the end of the Piazza del Commune at Brescia. These fountains are cut from a putty colored marble which is unpolished, unless one regards as a kind of polish the patina which has gathered around the edges of the basin against which countless people have leaned to quench their thirst.

Like many of the ornamental accessories in the squares, "piazzas," and other open spaces of Italian cities, this fountain is of a size and character which would render it an excellent model for garden use. While it possesses considerable dignity it is not sufficiently monumental or large in scale to be overwhelming in a garden of even average size where the design and surroundings are of an Italian character. Such a fountain would be particularly successful placed against a wall sufficiently long and high to give the necessary background.



ITALIAN DETAILS 1923	WALL FOUNTAIN AT BRESCIA, ITALY	MEASURED AND DRAWN BY F. N. BREED

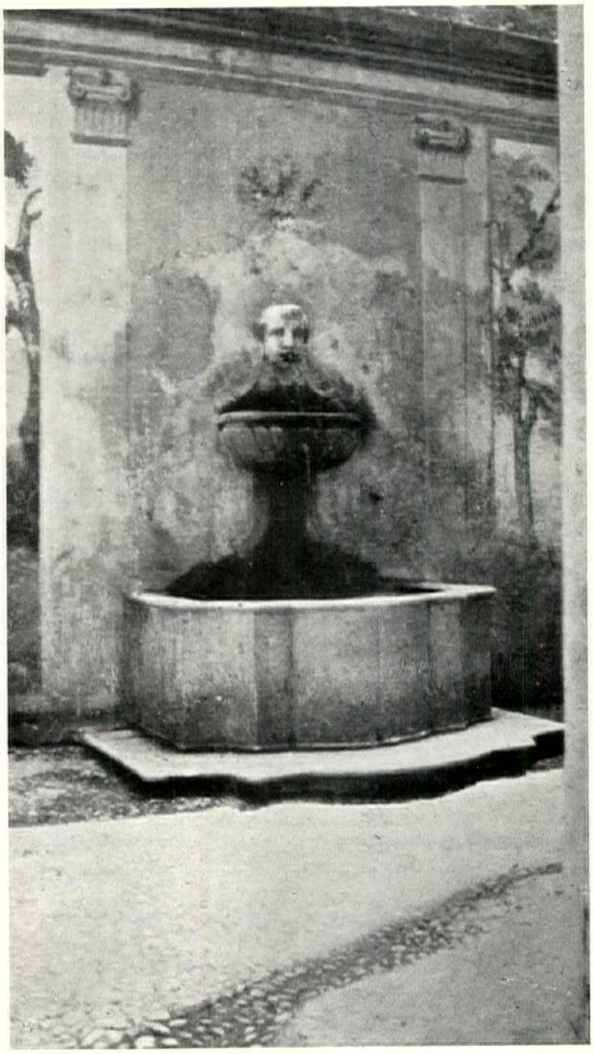


ITALIAN DETAILS 1923

WALL FOUNTAIN AT BRESCIA, ITALY.

MEASURED AND DRAWN BY F. N. BREED.

ITALIAN RENAISSANCE DETAILS



MARBLE WALL FOUNTAIN
GARDEN IN BRESCIA

ONE finds in Brescia a great number of fountains of different kinds, placed wherever an appropriate space exists—in public areas of every sort, and particularly in the shaded courtyard or garden or in the cortile, which is part of many an Italian house.

This wall fountain of a somewhat naive design stands within a small enclosed garden. The pilasters and other decoration of the wall behind it are painted, but the fountain itself is of the putty colored marble so extensively used in Brescia, and the surfaces of parts of the marble have been roughened to give contrast to the parts not so treated. The fountain, which affords an illustration of what may be done with simple materials when used with taste, offers interesting opportunities for use as a model, for owing to its simplicity of form it could be readily developed in cement or some similar material. It would be difficult to discover a wall fountain which would be more appropriate for use in a modern garden.

BUSINESS & FINANCE

C. Stanley Taylor, *Editor*

Business Factors in Architectural Practice

II. ARCHITECTURAL FEES AS DEFERRED PROFITS

THE first article of this series appeared in the February, 1923 issue of THE FORUM under the heading "Mortgage Financing for Moderate Cost Dwellings." Before entering upon a discussion of the financing of larger buildings of various types, it is important to consider the architect's position in relation to the business development of such projects. There are many times when the co-operation of the architect is of great importance during the final stages of financing, and he may be in a position through deferred payment for professional services to contribute a share in the equity to make certain the immediate beginning of construction.—*Editor.*

THE subject of the actual participation by architects in the ownership or financing of proposed buildings is by no means new. For years architects have at times found it expedient to enter into direct business relations with the developers of building projects or to accept service payments in the form of deferred profits in order to facilitate equity financing. At no time in the history of the construction industry, however, has this practice been so general or so profitable to architects as at the present time. For this reason it is felt that before giving detailed consideration to the methods of mortgage and equity financing for various classes of buildings, it will be wise to analyze this subject of participation by the architect in the business phases of speculative and investment building projects in which his clients may be interested.

We may preface this discussion by a brief analysis of the fundamentals of the average speculative or investment building venture. The elements of cost usually involved include the cost of land; cost of the building (including contractor's profit); the architect's fee; cost of financing, and general costs which may involve real estate brokerage, insurance and similar items. The problem of the client is to secure the necessary financing to cover this total. The ordinary methods of providing this requisite total include borrowing on first and second mortgages, leaving a cash equity which the client must provide. In many instances, however, particularly on large commercial building ventures, this cash equity is not readily forthcoming, and unless a more adequate method of financing be entered upon, it would be necessary to abandon the project which to the architect would mean a loss of large prospective commissions.

It is generally assumed that any investment or speculative building will bring returns in the form of rentals and profits which will be sufficient to amortize a large proportion of the equity cost within a few years. The building as a business venture represents in effect collateral not only for the first mortgage but for various credits which may be extended as assistance in the complete financing of the project. The usual financial analysis of a new building project includes negotiations for deferred payment on several items, such as land, contractor's profit, architect's fee, and sometimes a portion of sub-contractor and material payments. It is often the case that the owner of the land will be found willing to take practically all the cost of land in the form of a second mortgage on the finished project. The land is therefore purchased with a small cash payment under a contract which allows the placing of building and permanent first mortgage loans, with the purchase price of land subordinated as a second mortgage. When this is done the owner of the land is usually allowed a more liberal price for his property than if it were an outright cash purchase. Another method for obtaining the land on a deferred payment basis is to form a preliminary syndicate which purchases the land for cash and turns it into the holding company at a substantial profit under a second mortgage arrangement.

In negotiating with the general contractor who is able to finance his work and take deferred payments, there are several methods through which the transaction may be consummated. In some instances the contractor is paid by a series of long-term notes. Again, he is given bonds of the owning company or a direct interest in the ownership of the building. Occasionally a third mortgage is created in which the interests of various deferred creditors are included. Where the general contractor is in a position to assist in the original investment by taking deferred payments he is usually allowed considerable latitude in the contract price of the building and often is given the work on a cost-plus-fixed-fee contract, eliminating competitive bidders.

The next negotiation is usually with the architect, and he may be asked to take his full commission or part of his commission in the form of deferred payments. The architect who is in a position to do this is fortunate in that he receives a substantial commission (often 10 per cent on the cost of the building) and at the same time he contributes importantly to the business development of the project, in this manner bringing work into his office which might ordinarily go to another architect so situated as to be in a position to co-operate in this way.

During the past few years a large proportion of the better class speculative and investment buildings in our larger cities have been made possible through a more or less elaborate system of financing along the lines indicated here. In fact, there are many instances on record in which the original promotion has been started through co-operation between an architect and an owner, real estate broker or the owner of land logically situated for development.

Many architects have realized the advisability of fairly close association with mortgage loaning interests. Through this knowledge of the sources of mortgage financing for local building operations the architect is often in a position to aid materially during the promotional stages of the project. This assistance is rendered not only through the preparation of plans and specifications as required but because of established confidence on the part of the mortgage source which may encourage a more liberal attitude toward the project if the architect is in good standing in such financial quarters.

In addition to taking deferred payment for commissions, many architects are finding it expedient to make small cash investments during the early stages of the development of building projects. Often this direct investment helps materially in bridging the gap between credit financing and money available for the use of the owning company. Thus the architect's deferred fee, or fee and investment, is made repayable to him within a comparatively short period and provides not only a substantial commission but often a handsome profit in the transaction. Perhaps the most specific manner in which to demonstrate the method under which many large building projects are being made possible, to the ultimate profit of the architect, we may cite several examples, selecting first an instance in the field of co-operative apartment house promotion.

One large apartment project now under construction in New York was developed by a real estate firm under these conditions: The first step was to arrange with a real estate operator to purchase the necessary land and turn it into the owning company in the form of a second mortgage on the completed project which included an excellent margin of profit on the land. The next step was to seek the services of an architectural firm which indicated its willingness to prepare sketch plans and outline specifications for the purpose of tentatively arranging the mortgage loan. Working closely with the architects on this project, an experienced general contractor provided a fairly close estimate of the cost so that, with liberal allowances for the fluctuations of the building material and labor markets, an up-set price could be established in order to safeguard the interests of prospective tenant-owners. A complete description, including sketch plans and outline specifications covering the proposed project, was presented to a mortgage company, and a general agreement was entered into covering the amount of mortgage financing which might be expected in the form of a building and permanent first mortgage loan. This left an equity amount of approximately 50 per cent of the total cost which was to be provided through the sale of stock to prospective tenant-owners. A corporation was then formed, capitalized to the amount of this equity. The stock in this corporation was apportioned in accordance with the sizes of the various apartments and carried with the purchase the usual tenant privileges involved in a co-operative apartment house project.*

At this point the business phase of the architects' service proved its value in several ways. Their first step was to agree to take part of a liberal fee in the form of stock in the corporation, and in addition to this they entered a cash subscription covering three of the apartments which they felt could readily be disposed of as soon as the building approached completion. This, of course, was a matter of business judgment and involved a knowledge of the local market for apartment sales and rentals, but it provided the nucleus necessary for the immediate carrying out of the project. In this way the architects enjoyed not only a liberal commission for their work but actually participated in some of the investment and promotion profits of the transaction. Of course to operate in this manner requires an amount of liquid capital, but in many instances architects are in a position to bring in acquaintances or business connections for the purposes of financing of this character. In fact, we know of several architects who are considered money-makers for those who invest with them in assisting toward the completion of the financing of projects.

Another interesting co-operative apartment project will soon be announced involving an expenditure of over $1,000,000 for the building. The history of the business development of this operation is interesting and instructive. The original idea was conceived by a real estate man who felt that a large co-operative apartment house would prove successful in a certain residential district. Having neither land nor money himself, but knowing a group of individuals who would be interested in purchasing tenant-ownership in such a building, he proceeded in this fashion: First, he located a piece of land which was satisfactory for the purpose and on which he was able to obtain a short-term option at a favorable price. This price was approximately $200,000 and the landowner agreed to take $50,000 in cash and to allow the balance of the purchase price to be paid in the form of a second mortgage on the completed project. At this step it was evident that if the necessary $50,000 could be found for the purchase of the land it would be possible to arrange mortgage financing and deferred payments of architects' and contractors' fees which, with the sale of stock to tenant-owners, would make possible the entire operation. To attempt to sell stock in a co-operative building venture with the entire plan on paper only is usually a waste of time, and it is far better to concentrate upon an intermediate step

*The various details of tenant ownership are fully explained in The Architectural Forum for July, October and November, 1922.

which insures ownership of the land and the arrangement of mortgage financing. The promoter's problem in this case was, first, to find the $50,000 necessary to insure the purchase of the land, and this he proceeded to do.

He approached three prospective tenant-owners who had some money, and offered them a chance to provide $10,000 each as their contribution to the $50,000 pool for purchasing the land, with the understanding that the land would be put into the new corporation at a substantial profit and that the original investment would be returned to the prospective tenant-owners in the form of stock in the new company, carrying the privilege of occupancy. This left a balance of $20,000 to be provided. The promoter next approached an architect who had had considerable experience in designing apartment houses but who had never developed a co-operative apartment project. After the location and type of building were carefully described, the architect realized that it was a sound building project and agreed to provide the necessary architectural service on a deferred payment basis and, furthermore, to secure $10,000 of the $50,000 buying pool, which he provided through friends interested only in the real estate profit involved. This left $10,000 to be raised, and a logical source was found to be a well known general contractor who, in view of a possible large contract on liberal terms and with little possibility of there being investment loss, agreed to put up the final $10,000 to make possible the purchase of the land.

The land was then purchased, and having sketch plans and outline specifications, tentative arrangements were made for the mortgage financing. Working drawings and specifications were then completed and an up-set contract price determined in order that the owning company might be incorporated for the equity. This incorporation having been established, the land was turned in at a substantially increased price, the profit going to the original contributors to the buying pool. At this point all arrangements had been completed for offering tenant-ownership stock for sale. A part of this was immediately taken up by the group of prospective tenant-owners which was the original inspiration for the promoter's efforts, and at the present time over 60 per cent of the stock has been sold, insuring the immediate beginning of construction. In this instance the architect, through the use of business judgment and the ability to recognize a sound business proposition, was able to assist materially in the first stages of promotion, with the result that he has on his boards a large project on a liberal commission basis. As the sale of the stock progresses his commission is being paid rapidly, and it is evident that within one year his entire deferred interest will be repaid.

From the viewpoint of the architect, the power of business analysis of a proposed building project should be developed not only as to financing but also in respect to the actual efficiency of purpose of the building or what might be termed the "service character" of the design. There are two elements which control the success of the average investment building, whether it be an apartment house, office building, hotel or of other rental earning type. These elements are, first, the efficiency of plan, and, second, the efficiency of management. There can be no question but that too many of our investment buildings in the United States have been designed without close co-operation with those who must ultimately manage the business of the building. The result is that operating companies and building managers often have reason to find fault with architects, since buildings are frequently planned in ways which interfere materially with profits.

It is quite obvious that the architect can in but few cases be thoroughly familiar with the detailed problems of renting and maintenance, and the logical step for him to take is to arrange with the owners for consultation with those who will have the responsibility of managing the building after it is completed. In each of the special classes of investment buildings, expert management service has been developed, and it might well be said that in the field of apartment houses and office buildings the function of building management has now been developed until this might be termed a new profession of considerable importance in the economic scale. In the hotel field it is quite customary that a division of investment interest be established. The building is often financed by one group and leased to an operating company which usually provides the complete furnishings. The profits of the owning company are derived from the rentals on land and building, together with any increment value which may be enjoyed, while the profits of the operating company are received directly from the operation of the building. To call in the building manager or the hotel expert at the time when plans are in preliminary stages seems a simple and logical proceeding, but unfortunately in many instances this is not done.

Architects are beginning to realize fully the importance of this measure, and that recommendations to the owner which include bringing in various types of specialized consulting service are not confessions of weakness but indications of giving real service. An interesting example of the far-reaching effects of this policy may be pointed out by a brief description of a recent hotel project which was brought to the attention of the Consultation Committee of THE FORUM. The hotel, as originally designed for erection in an important city in the United States, involved a building expenditure of over $7,000,000, and tentative arrangements had been made for a $3,000,000 first mortgage loan. The plans had been developed in what seemed to be a logical way, but no practical hotel man had been consulted in regard to the actual features of operation. After reading an article which appeared in THE FORUM under the heading "Practical Points in Hotel Planning," by Daniel P. Ritchey, the architect sent in his plans to THE FORUM'S Service Department ask-ing for recommendations and practical criticism. An examination of these plans by a hotel expert indicated many radical changes desirable from a service viewpoint and from that of probable changes in the neighborhood. Negotiations which followed resulted in the appointment of a practical hotel man to render advisory service on plans and to open the hotel and put it on a running basis during the year following completion of construction. After the plans had been made thoroughly practical from the viewpoint of the operating company, and the various financial interests were brought to realize the importance of the changes which had been made, several interesting occurrences took place. The first mortgage was increased by almost $1,000,000 without any increase in the cost of land and building; deferred credits for furniture and other items were arranged, because of confidence in the management of the building, and totaled almost $700,000, which directly reduced the amount of equity necessary in the early stages of the operation, and an extensive amount of interesting publicity was developed because of the official connection with the project of a man who is recognized as an authority in hotel management. In fact, it was through the common sense of the architect in seeking advice that many of the business difficulties facing the project were eliminated and success was made certain, where under the original plans the project would probably not have materialized, and a serious loss might have been incurred by the owners who had already invested in land and excavations. This is but another example indicating the possibilities which exist for the architect who will give consideration to the business elements involved in the average project.

Architects who are not in a position to provide cash investments will usually find that they have a certain amount of time which can be invested, particularly in the development of smaller projects, and it is wise business procedure to undertake some work under these conditions. Many architects have built up large practices through small beginnings in which the original investment was of time only.

It is interesting to note that good architecture is stimulated rather than adversely affected under these somewhat involved business conditions. In cases where the architect enters into a project on a basis of deferred commissions he is usually allowed more latitude in carrying out his design of the building. An analysis of the business methods behind various building projects will show that practically every building of inferior architectural design has been constructed either without the service of an architect or under a limited expenditure for architectural service which precluded securing the services of good architects and discouraged all efforts to achieve either good design or good construction because of the "penny-wise" attitude of the owners.

Another most interesting situation has been developing in the building construction field during the past few years which involves the sound business judgment of the architect in bringing into relationship with the project certain forms of specialized and consulting service to meet specific problems which arise in connection with the design, construction, equipment and administration of a building.

The general impression of the building public has for many years been that the architect must be a person of almost omniscience in that he is expected to have detailed knowledge of all structural and management requirements which may arise in connection with buildings of any type. It is true that there are architects who specialize in particular building types and who have developed organizations in which this knowledge is completely compassed. This type of architectural organization is somewhat uncommon, however, and in general it may be said that an important part of the service which an architect may render to a client is to recognize the need for specialized service and to recommend the employment of well qualified advisers.

The various types of consulting engineering service are quite familiar to architects, and in the solving of involved problems of plumbing, heating or ventilating systems, or problems arising out of difficult foundations and substructure conditions, the architect has become fairly well accustomed to calling in the service of engineering specialists. There are other phases of consultation service, however, with which he is not so familiar, and in many instances the failure to arrange for such service has resulted in deficiencies of plan or equipment which represent a direct investment loss to the investor and add difficulties in connection with the administration.

A typical advisory service which does not receive sufficient consideration on the part of the architect is that of the building manager who will control the renting and maintenance of the structure after it is completed. In the early stages of preparing plans the architect will find it of great advantage to determine whether or not the owner has selected a building manager, and if not to recommend that this be done immediately in order that his advisory services may be introduced to the advantage of both owner and architect.

It will be found that the competent building manager has a thorough knowledge of rental requirements not only as to sizes and shapes of spaces, but in respect to mechanical equipment, interior finish and the various utility features of the building. Having a definite knowledge of the most advantageous type of rentable space, he is in a position to suggest a rearrangement of room divisions and sizes to provide at once the most economical and the most easily marketable spaces of the type provided in the building in question. In relation to mechanical equipment, interior finish and other features which contribute to administration expense, he will have valuable suggestions to make which will tend to decrease labor cost, replacement and depreciation costs during the life of the building. This intimate advisory relationship will be found of constant value as plans are developed, and serves to safeguard the interests of the owner.

GENERAL EXTERIOR VIEW

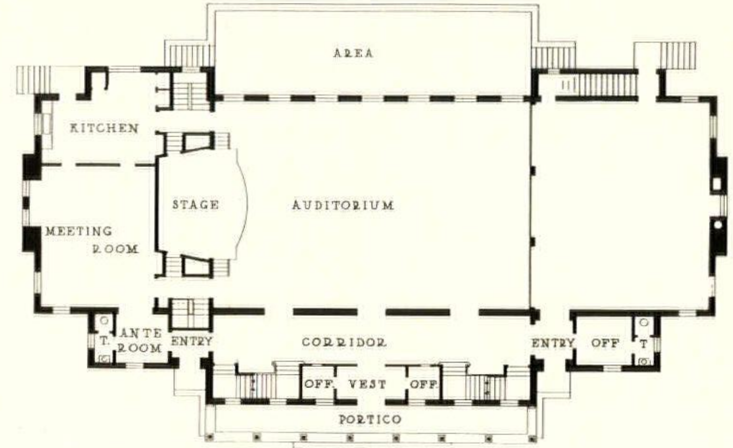
DETAIL OF PORTICO

FIRST PARISH COMMUNITY HOUSE, LONGMEADOW, MASS.

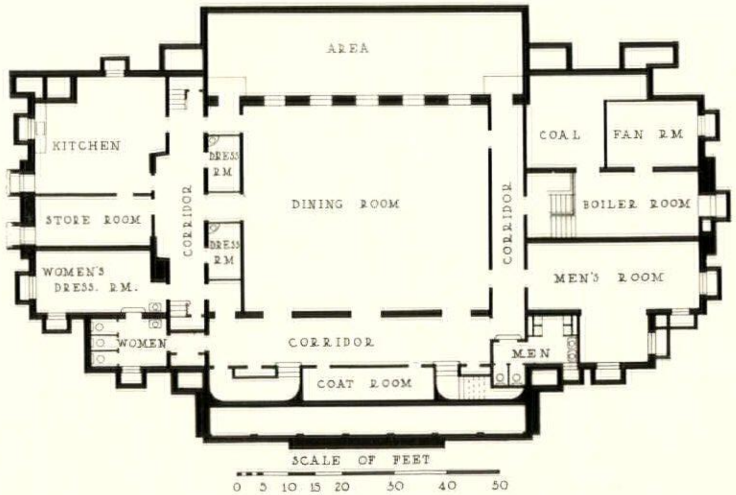
SMITH & BASSETTE, ARCHITECTS

Photos by Paul J. Weber

AUDITORIUM FROM THE GALLERY



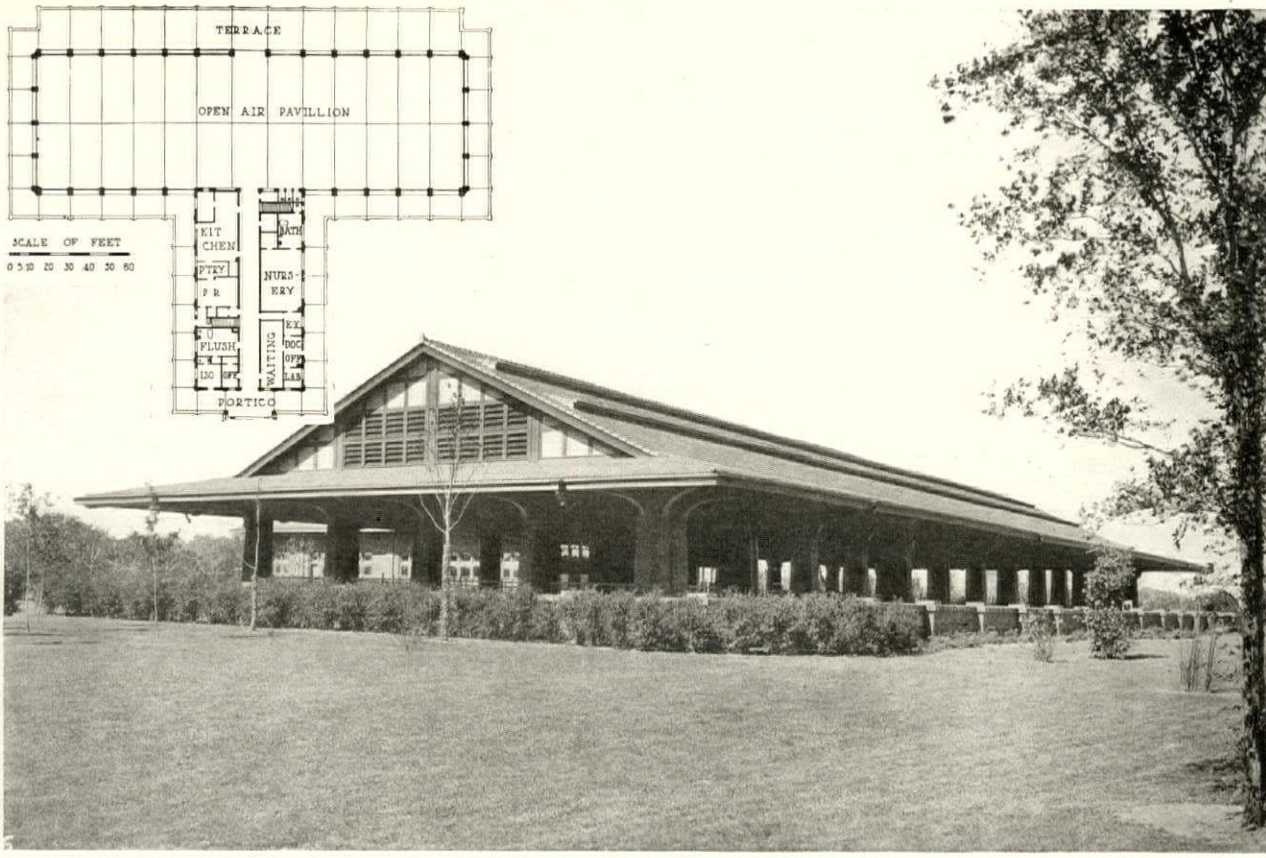
FIRST FLOOR PLAN



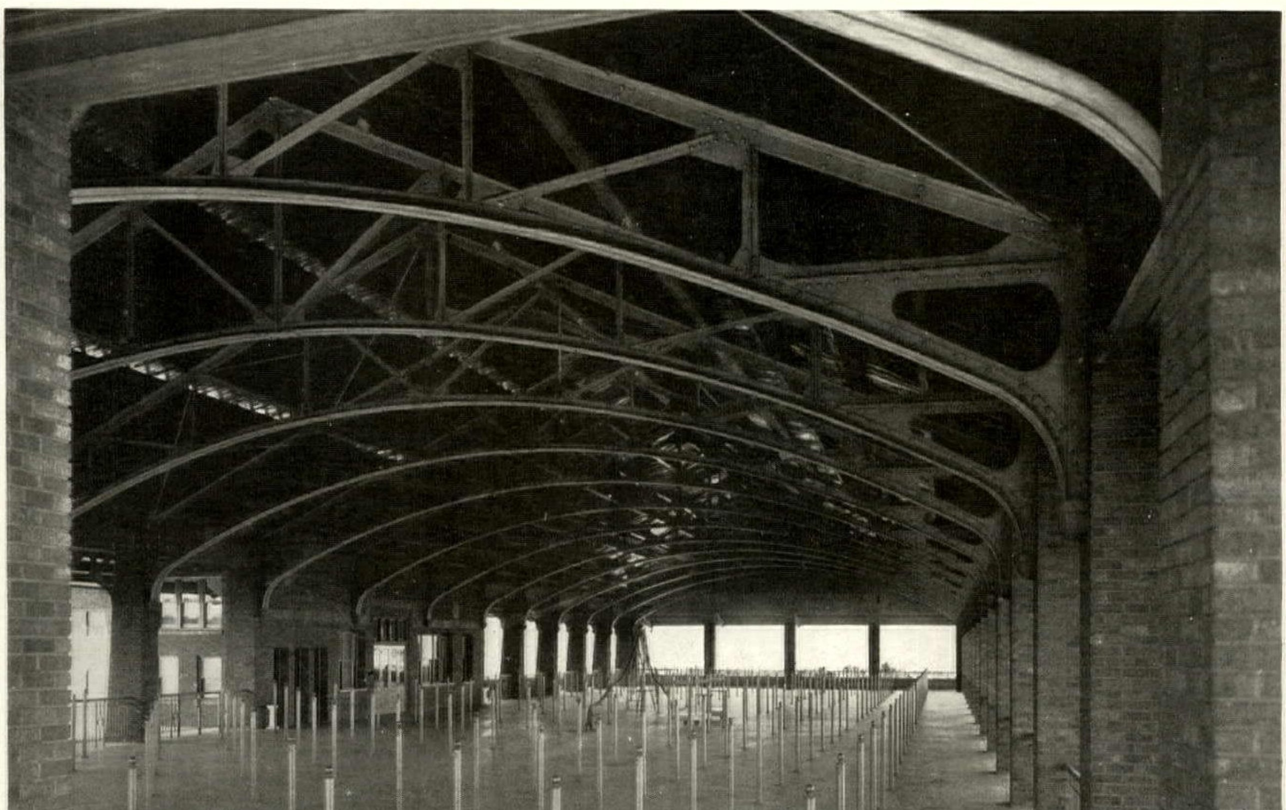
BASEMENT FLOOR PLAN

FIRST PARISH COMMUNITY HOUSE, LONGMEADOW, MASS.

SMITH & BASSETTE, ARCHITECTS



GENERAL EXTERIOR AND FLOOR PLAN

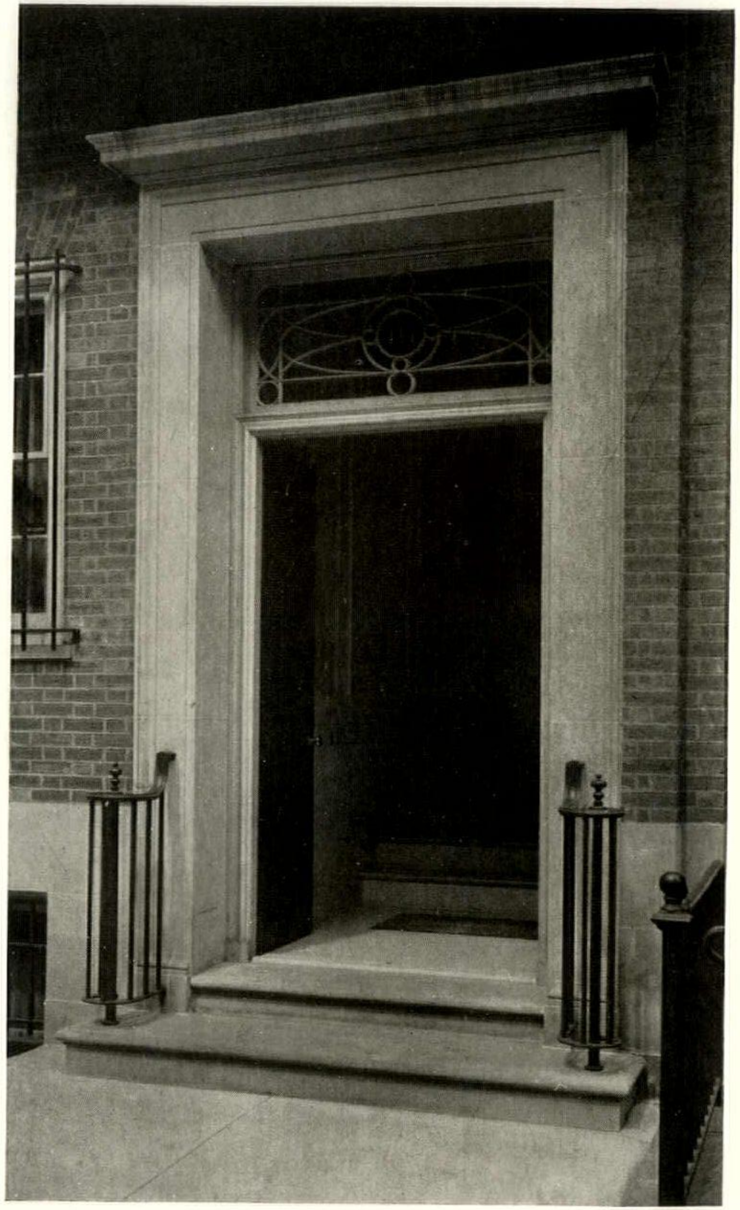


INTERIOR VIEW SHOWING PROVISION FOR HAMMOCKS

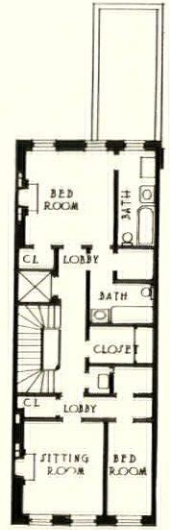
DAILY NEWS SANITARIUM, LINCOLN PARK, CHICAGO

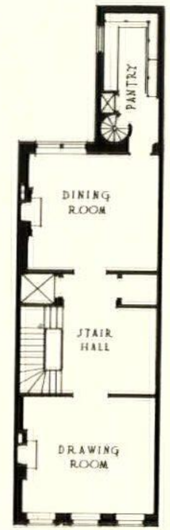
PERKINS, FELLOWS & HAMILTON, ARCHITECTS

Photos by Henry Fuermann & Sons



DETAIL OF ENTRANCE





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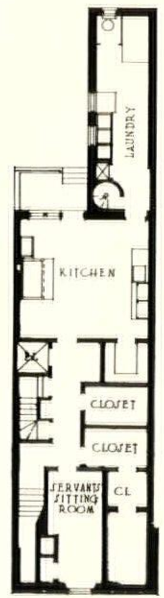
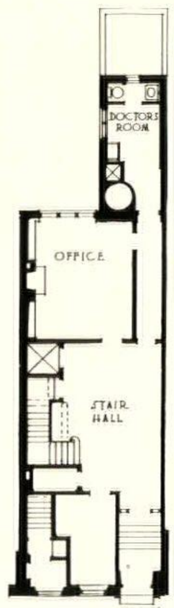
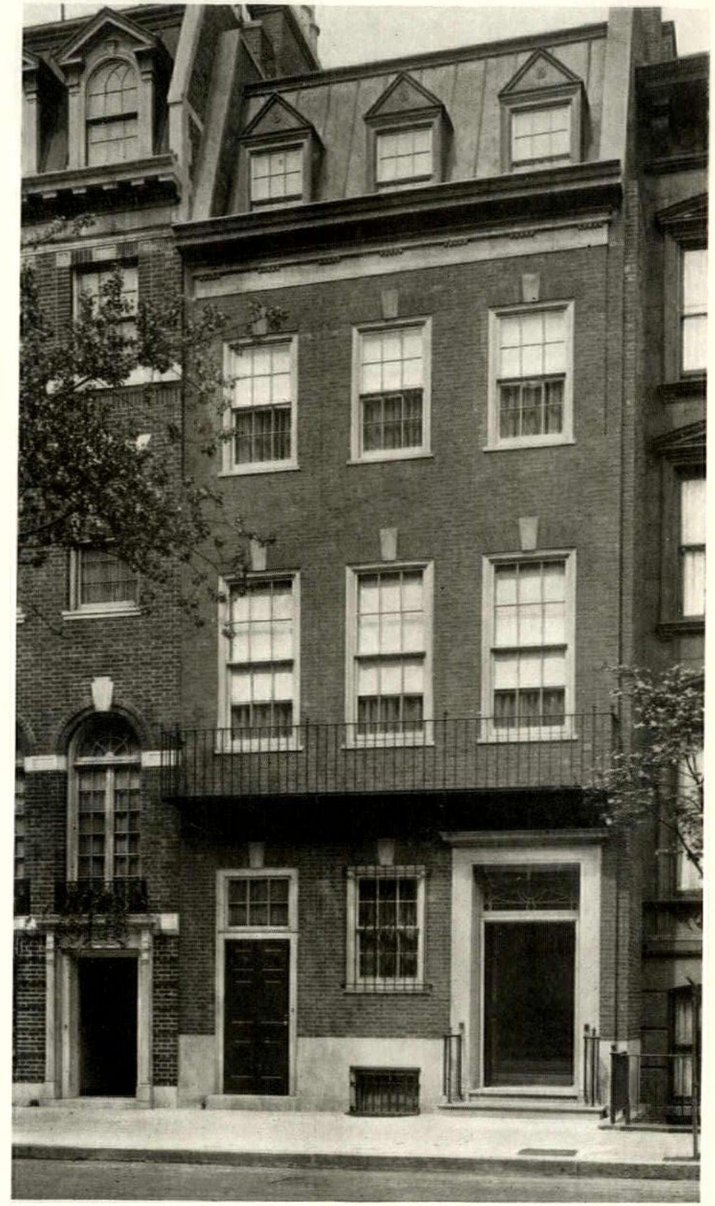
SCALE OF FEET

THIRD FLOOR SECOND FLOOR





BASEMENT FIRST FLOOR



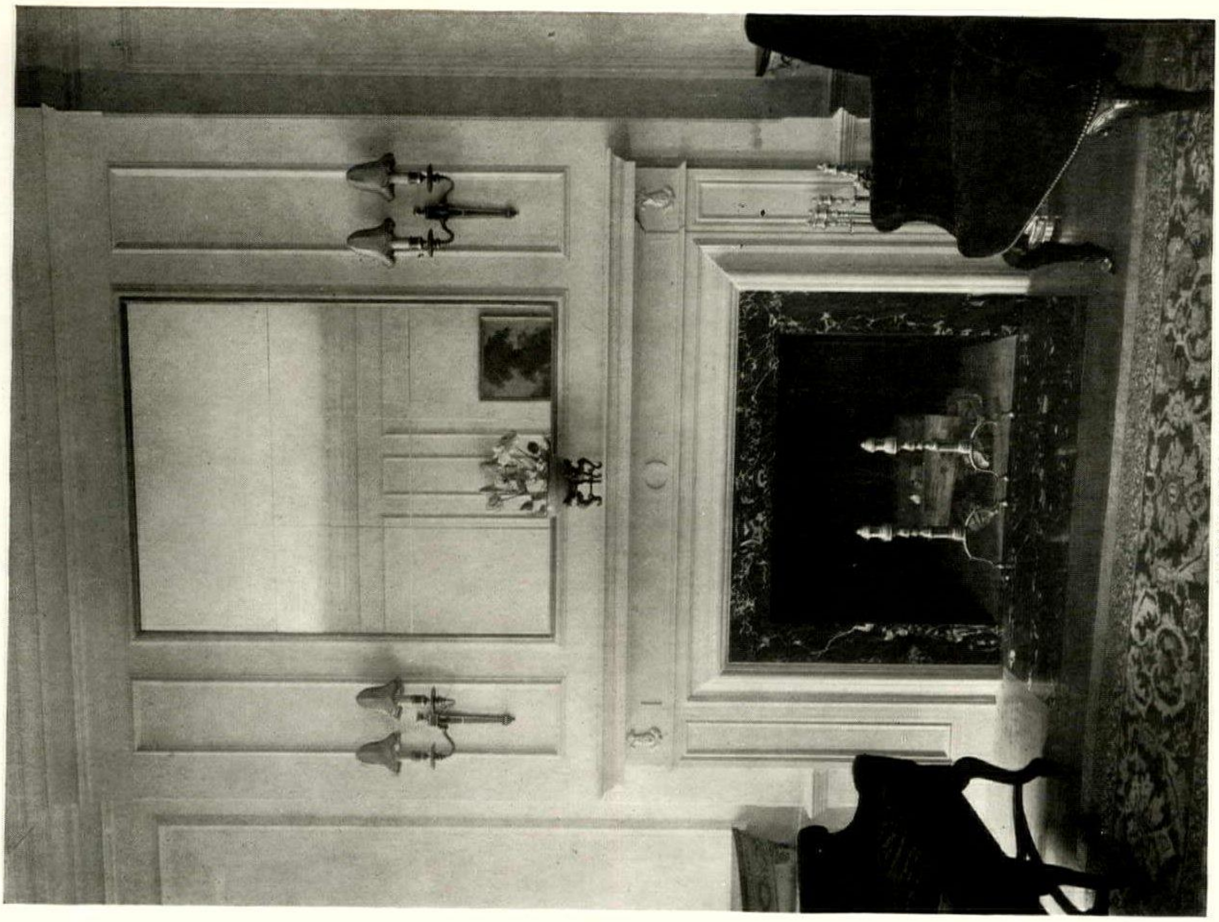
GENERAL VIEW

HOUSE OF DR. SAMUEL MILBANK, 117 EAST 65TH STREET, NEW YORK

EDWARD M. WHEELER, ARCHITECT

Photos by John Wallace Gillies

DINING ROOM MANTEL

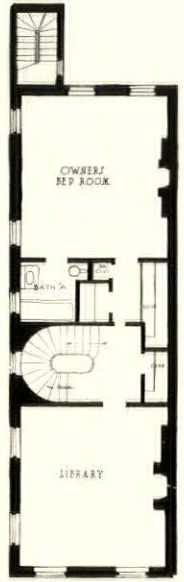


LIVING ROOM MANTEL

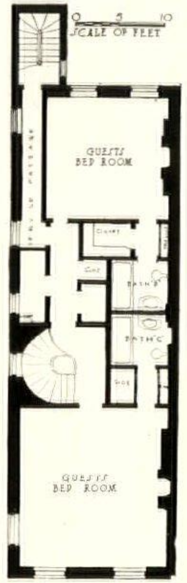
HOUSE OF DR. SAMUEL MILBANK, 117 EAST 65TH STREET, NEW YORK

EDWARD M. WHEELER, ARCHITECT

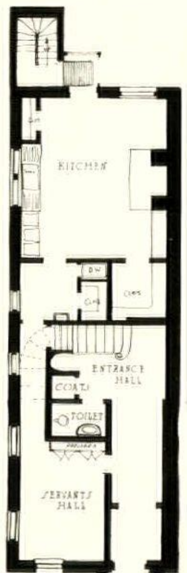
GENERAL VIEW OF FACADE



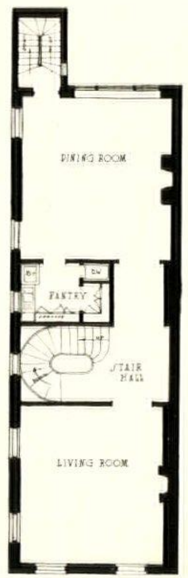
SECOND FLOOR



THIRD FLOOR



BASEMENT



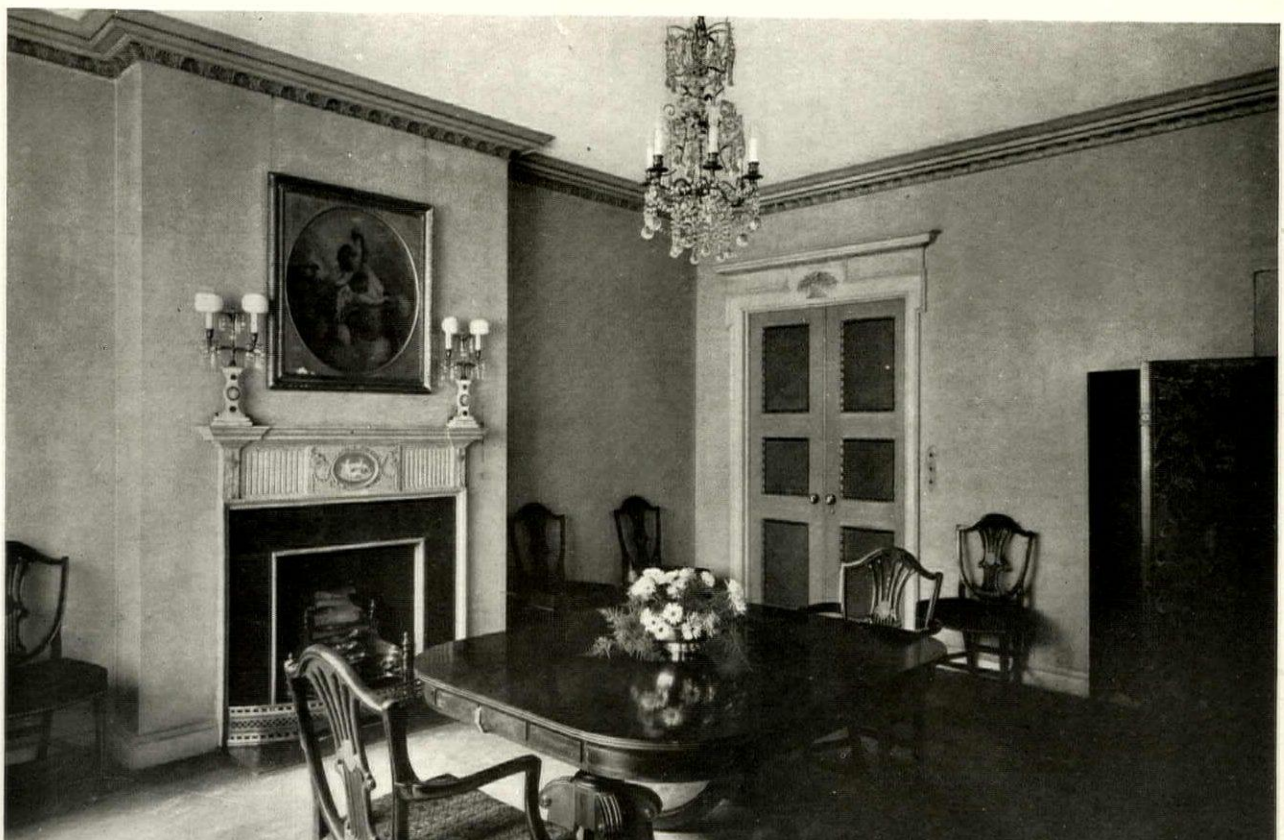
FIRST FLOOR

DETAIL OF ENTRANCE

HOUSE OF HARVEY D. GIBSON, ESQ., 52 EAST 69TH STREET, NEW YORK

WALKER & GILLETTE, ARCHITECTS

DRAWING ROOM



DINING ROOM

HOUSE OF HARVEY D. GIBSON, ESQ., 52 EAST 69TH STREET, NEW YORK

WALKER & GILLETTE, ARCHITECTS

The Use of Handbooks

ACCOMPANIED BY DISCUSSIONS OF DEFINITE PROBLEMS IN WOOD AND STEEL FLOOR FRAMINGS

PART I

By E. F. ROCKWOOD, *M. Am. Soc. C. E.*

THERE are certain handbooks published to aid architects or engineers in the designing of floor slabs, beams and girders, columns and other structural members, and these same handbooks contain much other useful information on loads on floors, weights of materials, allowable stresses and functions of members.

For wood construction, the Southern Pine Association publishes the "Southern Pine Manual," and the West Coast Lumbermen's Association the "Structural Timber Handbook of Pacific Coast Woods." For steel construction handbooks or "pocket companions" are published by the Carnegie Steel Co., the Cambria Steel Co. and Jones & Laughlin. For concrete the Corrugated Bar Co. publishes "Useful Data," and in addition there are many textbooks on reinforced concrete construction which contain useful tables, such as Taylor & Thompson's "Concrete Plain and Reinforced," Turneaure & Maurer's "Principles of Reinforced Concrete," Thomas & Nichols' "Reinforced Concrete Design Tables," and an entire series of books by Hool & Johnson.

It might be well to mention two structural slide rules which the author has found very useful. They are the "Merrit Beam Scale" and the "Wager Timber Scale," and both may be procured through houses selling architects' and engineers' supplies. The author has never seen for sale a satisfactory slide rule for concrete. He has made several himself and has published them in the *Architectural Review* of the Massachusetts Institute of Technology, and in the *Journal of the Boston Society of Civil Engineers*, but has never manufactured and sold them.

For an architect or engineer who is thoroughly familiar with the principles of the design of structures, these handbooks can save a lot of time and computation, and such a man can best learn how to use them by studying them and finding out what is in them and where it is. And once that is learned, he can easily discover for himself how to use them to get the best out of them. On the other hand, there are many architects who have never studied structural design or who have forgotten most of it. If such a man could, by referring to a handbook, design or check a simple floor, he would find it of great help. It is for such an architect that this article is written, but particular emphasis must be laid on the fact that "a little knowledge is a dangerous thing" and that a thorough training in both the principles and practice of design is necessary for all but the simplest cases.

The designing of any structural member divides itself into two parts, first finding the loads carried by that member, and next finding the size member necessary to carry those loads. The first step is the same whether the member be wood, steel or concrete, and is to determine what are the loads coming on that member and how they are applied.

Determining Live and Dead Loads

Structures carry two kinds of loads—live loads and dead loads. Live loads consist of the weight of contents of buildings,—carriages, cranes, etc., and their supported loads, machinery, merchandise, persons or other moving objects, the support of which is the purpose of the structures, also snow and ice, and wind stresses. Live loads vary with the character of the structure and its proposed use. In buildings they consist of uniform loads per square foot of floor area, and concentrated loads, such as weight of heavy safes or machinery, which may be applied at any point on the floor. In most cities the minimum live loads to be used are fixed by public ordinances and are intended to cover general conditions, but do not include machinery or other concentrations. If such concentrations occur on floors, special provisions should be made for them in the framing. Dead loads consist of the actual weight of the structures themselves with the walls, floors, partitions, roofs and all other permanent construction and fixtures. They can be calculated from the known weights per unit of the materials composing the floors, walls, partitions or other permanent construction. The dead loads stress the structure at all times and the building must be proportioned to sustain them at all times without reduction. The live loads, on the other hand, may be taken at their full values or reduced in accordance with the probabilities that the structure as a whole or its principal members will not be subject at all times to the full theoretical loading.

A study of recent building codes and of good practice leads to several suggestions regarding live loads.

Live loads shall include all loads excepting dead loads. All floors and stairs shall be of sufficient strength to bear safely the weight to be imposed thereon in addition to the dead load, but shall safely support a minimum uniformly distributed live load per square foot as specified in this table:

Class of Building	Pounds per sq. ft.
Armories, assembly halls and gymnasiums	100
Garages for more than two cars	150
Hotels, lodging houses, boarding houses, clubs, convents, schools, colleges, hospitals, asylums and detention buildings;	
Public portions	100
Residence portions	50
Wholesale stores, heavy manufacturing and storage buildings	250
Retail stores, light manufacturing and storage buildings	125
Office buildings;	
First floor	125
Other floors	75
Public buildings;	
Public portions	100
Office portions	75
Residence buildings, including porches	50
Stairs, corridors and fire escapes from armories, assembly halls and gymnasiums	100
Stairs, corridors and fire escapes excepting from armories, assembly halls and gymnasiums	75

Every plank, slab and arch, and every floor beam carrying 100 square feet or less, shall be of sufficient strength to bear safely the combined dead and live loads supported by it, but the floor live loads may be reduced for other parts of the structure in this manner:

In public garages, for all flat slabs of over 300 square feet area reinforced in more than one direction, and for all floor beams, girders and trusses carrying over 300 square feet of floor, and for all columns, walls, piers and foundations, 25 per cent reduction.

In all buildings excepting armories, garages, gymnasiums, storage buildings, wholesale stores and assembly halls; for all flat slabs of over 100 square feet area, reinforced in two or more directions, and for all floor beams, girders, or trusses carrying over 100 square feet of floor, 10 per cent reduction.

For the same buildings, but carrying over 200 square feet of floor, 15 per cent reduction.

For the same structures, but carrying over 300 square feet of floor, 25 per cent reduction.

These reductions shall not be made if the member carries more than one floor, but instead reductions in accordance with the following table should be made:

In all buildings excepting storage buildings, wholesale stores and public garages, for all columns, girders, trusses, walls, piers and foundations:

Carrying one floor, same reduction as for flat slabs, beams, girders and trusses.

"	two floors,	25 per cent reduction.
"	three floors,	40 " " "
"	four floors,	50 " " "
"	five floors,	55 " " "
"	six floors or more,	60 " " "

Roof Live Loads

Roofs shall be designed to support safely minimum live loads according to this manner:

Roofs with pitch of 4 inches or less per foot, a vertical load of 40 pounds per square foot of horizontal projection applied to either half or to the whole of the roof.

Roofs with a pitch of more than 4 inches and not more than 8 inches per foot, a vertical load of 15 pounds per square foot of horizontal projection and a wind load of 10 pounds per square foot of surface acting at right angles to one slope, these two loads being assumed to act either together or separately.

Roofs with a pitch of more than 12 inches per foot, a vertical load of 5 pounds per square foot of horizontal projection and a wind load of 20 pounds per square foot of surface acting at right angles to one slope, these two loads being assumed to act either together or separately.

Pressure on Vertical Faces

All buildings and structures shall be calculated to resist a pressure per square foot on any vertical surface:

For 40 feet in height,	10 pounds.
Portions from 40 to 80 above the ground,	15 "
Portions more than 80 feet above the ground,	20 "

The next step is to determine the amount of load coming on a given member and how it is applied. In most types of floor construction the load is carried primarily by the flooring, floor arches or floor slabs. These in turn are carried by floor beams, these by girders or walls, and finally by walls or columns which are carried by the foundations. Excepting for heavy concentrations the flooring carries a uniformly distributed load, and all that is necessary is to take a strip of floor 1 foot wide and to find the total load coming on that strip for the given span. The span of a floor, excepting a concrete floor, is the distance from center to center of supports. The span of a concrete floor may be the same or it may be taken as the clear distance between supports, but in either case the tables in the handbooks will show which to use. Most floor beams are loaded uniformly, and the loads coming on them may be considered to be the total loads on the floors halfway to the adjacent beams, plus the dead load of the beams themselves and of any partitions or walls carried by the beams. Girders carry concentrated loads, consisting of the reactions of the beams framing into them, plus the uniform loads of their own weights and of any walls or partitions running along them. The reactions of uniformly loaded beams are one-half the total loads on them. The simplest way of figuring a girder is to substitute for the concentrated loads equivalent uniformly distributed loads. In the case of a girder with a single concentration at the center, the equivalent uniformly distributed load is twice the concentration. For a girder with equal loads at the third or at the quarter points, the equivalent uniformly distributed load is 4/3 the sum of the concentrations. For any other combination of loading the equivalent uniformly distributed load can be found in the handbooks, but it is safer and better to employ a trained engineer for such a case. Columns carry the reactions of all beams and girders framing into them, but in practice it is customary to consider that they carry all the load halfway to the adjacent columns, and excepting in very unusual instances this method is safe.

Selecting Members for Given Loads

The next step is to select the proper member to carry these loads. Two factors determine the size of the member required to carry a given load, viz., the allowable stresses in different portions of that member and the allowable deformation of that member. In a very rough and elemental way it might be said that columns are subjected to compressive stresses and fail by the material crushing or buckling, while beams are subjected to both bending stresses and shearing stresses—a wooden beam may fail in bending by the crushing of the top fibers or pulling apart of the bottom fibers at the point of maximum moment. It may also fail by shearing or splitting apart in a horizontal plane at its support. Similarly, a steel beam may fail in bending by crushing at the top and pulling apart at the bottom or it may fail in shear or by buckling of the web at the supports. Of course when crushing at the top is referred to, the case of a beam supported at both ends is meant, as in a cantilever beam the crushing occurs at the bottom. Columns may also be subjected to both direct load, which causes compressive stresses, and to bending, which increases the compressive stresses on one flange and reduces them on the other. So to design a member it is necessary to know what stresses are allowable, and if a table is used it must agree or be corrected to agree with the stresses selected. Of course the allowable stresses are not the stresses that will cause failure, and the ratio between those causing failure (the ultimate stresses) and those used (the working stresses) is known as the "factor of safety." The proper factor of safety depends, among other things, upon the reliability of the material, the probability of the chosen loads being correct, the kind of load (whether steady or vibrating, and whether being a constant load or only one that will occur very rarely), and the use of the structure, whether for permanent or temporary use.

The second factor in determining the size of member is the allowable deflection. Experience has shown that deflections of more than 1/360 of the span will crack plastered ceilings, and even where there is no plaster it is advisable to keep the deflections small as the structure is much stiffer and freer from vibration when the deflections are small.

Wood Floor Framing

The way to use the handbooks is best shown by examples: required to design the floor of an ordinary house with a span from center to center of partitions of 15 feet,—the suggested live load for such a floor is 50 pounds per square foot. The weight of the flooring itself would be about 7 pounds per square foot. The spacing of the joists is determined by the lathing for the ceiling rather than by the strength of the ⅞" under-flooring as that will safely span over 2 feet. The weight of the joists and ceiling will be about 8 pounds per square foot, and the usual joist spacing is from 12 to 16 inches center to center. For this problem assume a spacing of 16 inches center to center, then with a span of 15 feet the total load on a joist is 65 (the total load per square foot) times 1⅓ (the spacing in feet), times 15 (the span in feet) or 1,300 pounds. On page 326 of the "Carnegie Pocket Companion," 1913 edition, is a table for spruce beams 1 inch thick (or wide) based on an allowable fiber stress of 1,000 pounds per square inch (stress on extreme fiber in bending), which value is sanctioned by good practice. With this span a 1" x 10" will carry 741 pounds total load, and to carry 1,300 pounds total load will require a 2" x 10." In order to avoid cracks in plastered ceilings, the deflection should not exceed 1/360 of the span. Referring to page 321 in the same handbook, we find that the maximum span for a 10" timber should be 14′ 6″. Deflection varies with the fourth power of the load, so that with a 15′ span the deflection will be $\left(\frac{15.0}{14.6}\right)^4$ or 1.06 times as much. On the other hand, a load of 65 pounds per square foot (the design load) divided by 1.06, or 61 pounds per square foot, will not exceed this allowable deflection, and a load of that amount will probably never be actually obtained. Therefore it would be safe to use 2" x 10" joists 16 inches center to center.

Factory Floor Problem

As a more complicated problem take that of a factory floor with columns 16 feet apart each way. For light manufacturing, a live load of 125 pounds per square foot is sufficient. Such a floor would usually be built with yellow pine planks and beams, and for the best grade of such material a stress of 1,600 pounds per square inch is permissible. On page 40 of the 1920 edition of the "Southern Pine Manual" is a table for plank floors. With the given live load and the allowable stress, a 2½" plank will span 8 feet, 6 inches, but the maximum span based on a deflection of 1/360 of the span is 5 feet, 7 inches. A 3" plank under the same conditions will span 6 feet, 11 inches. Under these circumstances it would be good practice to space the beams 8 feet on centers. The maximum deflection to avoid plaster cracks is 1/360 of 8 feet or 0.27 inch. As deflections vary with the fourth power of the span, the deflection of the 2½" plank will be $\frac{5.58 \times 12}{360} \times \left(\frac{8.00}{5.58}\right)^4$ or 0.66 inch, and for the 3" plank $\frac{6.92 \times 12}{360} \times \left(\frac{8.00}{6.92}\right)^4$ or about 0.34 inch. Although such a floor would not have a plastered ceiling, it would probably be better to use the 3" plank.

With beams spaced 8 feet center to center and spanning 16 feet, the load on each beam is the total load per square foot times the spacing of the beams in feet, times the span of the beams in feet. As the area carried by each beam is 8 x 16 or 128 square feet, it would be safe to reduce the live load 10 per cent. The total load on each beam is then 112½ (the reduced live load) plus 13 ⅓ (the dead load of the plank and upper flooring), times 128 or 16,100 pounds. To this must be added the weight of the beam itself or say 35 pounds times 16, or 560 pounds. On page 26 of the "Southern Pine Manual" is a table showing the "Safe Load in Pounds Uniformly Distributed for Yellow Pine Beams." This table is based on a fiber stress of 1,800 pounds per square inch, and to use it for 1,600 pounds fiber stress the loads given in it must be reduced in the ratio of 16/18 or the actual load as found above must be increased by 18/16 or to 18,700 pounds. For this revised load the table shows that a 10″ x 14″ beam will be required, and that such a beam will carry 18,260 pounds without excessive deflection. For deflection, the actual load on the beam (16,660 pounds) should be used and not the load as corrected for fiber stress as it is the actual load that produces the deflection. On page 30 is a table for 16″ beams, and a similar method shows that an 8″ x 16″ beam will be satisfactory. Such a beam will contain less material than a 10″ x 14″, and the question of head room will probably determine which size should be used to give the best results.

The girder carries an area of 16 x 16 or 256 square feet, and this will allow a live load reduction of 15 per cent. So the concentration at the center of each girder is 8 (the spacing of the beams in feet) times 16 (the span of the beams in feet), times ½ (½ the load on each beam is carried to each end) times 2 (the number of beams framing into the girder at its center), times 106 (the reduced live load in pounds per square foot), plus 13 ⅓ (the dead weight of the flooring in pounds per square foot), plus 36/8 (the weight of the beams per foot of length divided by their spacing in feet) or a total concentration of 15,900 pounds. The equivalent uniformly distributed load would be twice this amount or 31,800 pounds. To this must be added the weight of the girder, or say 900 pounds, which will give a total of 32,700 pounds. As with the beam, this must be multiplied by 18/16 because the allowable stress is only 1,600 pounds per square inch. The final corrected load is then 36,800 pounds and reference to the table on page 30 shows that this will require a 14″ x 16″. It might be preferable to use a steel girder, and a table on page 188 of the 1913 edition of the "Carnegie Pocket Companion" shows that with a span of 16 feet a 15″–42# I-beam will carry a uniformly distributed load of 39,300 pounds. As this table is based on a fiber stress of 16,000 pounds per square inch and as good practice allows that stress on steel, the correction for fiber stress does not have to be made. On page 177 of the same book is another table from which deflections can be checked. For a fiber stress of 16,000 pounds and a span of 16 feet the coefficient of deflection for uniformly distributed loads is 4.237, and this divided by 15 (the depth of the beam in inches) gives the actual deflection as 0.282 inch. Reference to the table on page 171 shows the deflection for a concentrated load to be 0.8 of this amount or 0.225 inch. 1/360 of the span is 0.53 inch. At this point it might be advisable to call attention to the fact that the weight given, 42 pounds, is the nominal and not the actual weight of the beam. The actual weight is 42.9 pounds, which is also shown in another table. As this latter table is on an unnumbered loose sheet, its location in the handbook cannot be given.

Steel Floor Framing

For the next problem assume the first floor of a steel-framed hotel with columns spaced 20 feet apart each way. For floor construction assume a clay tile ribbed slab. The live load should be 100 pounds per square foot. This type of floor construction will span economically 20 feet, and only one line of beams will be necessary excepting for small tie-beams the other way for erection purposes. On page 69 of the book "Useful Data," published by the Corrugated Bar Co., is a table for this type of construction based on stresses of 16,000 pounds per square inch on the steel and 650 pounds per square inch on the concrete, which stresses agree with good practice. This table is for interior spans and shows that a 10″ tile with a 2½″ topping and with 0.75 square inch of steel in each rib will carry a superimposed load of 118 pounds per square foot, and this amount will allow for flooring and a plastered ceiling in addition to the live load. On the preceding page is a table for end spans and a twelve tile with a 2″ topping and 0.82 square inch of steel in each rib will be required for such spans. These slabs will weigh 94 and 91 pounds per square foot respectively, so the uniformly distributed load coming on a beam will be 20 (the spacing of the beams in feet) times 20 (the span of the beams in feet), times 75 (the live load in pounds per square foot reduced 25 per cent), plus 112 (the dead weight of the slab, flooring and ceiling in pounds per square foot), plus 272/20 (the weight of the beam and its fireproofing in pounds per foot divided by the spacing of the beams in feet) or a total of 80,000 pounds. Reference to page 188 of the Carnegie book shows that this will require a 24″–69.5#-I, but as it may be hard to obtain this size, a 24″–80#-I will probably have to be used. On page 231 is a table which shows that a 15″–60#-I with two 9″ x ⅝″ plates will also carry the load. Such a riveted beam girder will weigh 18.3 pounds more per foot but will be 7½ inches shallower, and on that account may be preferable. The coefficient of deflection for such a beam is 6.62 which divided by 16½ (the depth of the girder in inches) gives an actual deflection of 0.4 inch. The span divided by 360 is 1⅛ inches.

Live Loads in Office Buildings

RESULTS OF INVESTIGATIONS BY C. T. COLEY, M.E.

Manager Equitable Building, New York

DURING the latter part of 1922 a detailed investigation was made of live loads on several floors of the Equitable Building, New York. This structure is known as perhaps the largest office building in the world, and the varied nature of its occupancy made possible observations which should be useful in the designing of future office buildings and in the proper regulating of those already in use. The study was instituted by the Department of Commerce Building Code Committee, which is investigating the possibilities of greater economy in structural design, and the objects were to determine the maximum, minimum and average floor loads existing in actual office practice, the nature and distribution of such loads, and the relations which they should bear to the assumptions for design of floor slabs, floor beams and columns as governed by prevailing building code practice.

THE Building Code Committee of the Department of Commerce is engaged in compiling a survey covering the probable live loads in buildings of different kinds excepting private dwellings. It has been maintained by some engineers that such loads are being computed considerably in excess of what buildings are actually called upon to sustain. There is no way by which this important data can be secured, unless architects will place at the disposal of the committee such information as they may have or may be able to obtain. Data covering schools, churches, hotels, assembly halls, theaters, hospitals, workshops, factories, printing establishments, machine shops and public garages is particularly desired. The chairman of the committee is Ira H. Woolson, addressed care Department of Commerce, Washington.—*The Editor.*

With this in mind it was necessary to determine the actual weights of office furniture and merchandise, also their locations with reference to partitions and floor beams. In order to cover a wide range of usual office building occupancies, three floors of the Equitable Building were selected, representing light, medium and heavy classes of occupancy, and the entire area of these three floors was surveyed. Several other offices on various floors, representing what appeared to be unusually heavy occupancy, also were investigated. The entire survey covered over 200 rooms. The investigation was planned and supervised by C. T. Coley, M.E., manager of the building. A force of five men equipped with platform scales and field books spent several days weighing and tabulating every article of furniture within the areas mentioned. Sketches were prepared for each office, showing the locations and weights of all articles of furniture, so that the distribution of loads could be quite closely determined. Figs. 1, 2 and 3 are typical examples of these sketches. The results form a most interesting and valuable collection of data and are believed to be of much significance both to the designers of office buildings and for the purpose of determining proper building code requirements.

There is included here a brief tabulation showing the outstanding features of the report on this study. It will be noted that little difference exists between the average loading of the floor selected as the heaviest in the building and that which appeared to the investigators at first glance to be loaded the lightest.

The weights given do not include the radiators, which averaged 200 pounds each, with two to each bay, located under the windows. These would add approximately 1 pound per square foot for all exterior bays. The weight of the partitions was not included in the calculations. These in general are 3-inch hollow tile, plastered on each side, and a careful weighing of one which was being removed showed a weight of 30 pounds per square foot, or approximately 350 pounds per running foot. The weight of occupants, taken at 150 pounds per person, is probably high, as a considerable number of such occupants are females, and some studies indicate that their average weight would not exceed 120 pounds.

MAXIMUM, MINIMUM AND AVERAGE LIVE LOADS IN EQUITABLE BUILDING

	No. of offices	Maximum lbs. sq. ft.	Minimum lbs. sq. ft.	Average lbs. sq. ft.
Light occupancy floor (20th)	67	55.4	.87	10.26
Medium occupancy floor (37th)	64	30.73	3.27	10.67
Heavy occupancy floor (11th)	62	33.84	5.00	13.96
Totals and averages	193			11.6
Selected heavy occupancies throughout building	14	78.3	21.4	42.4

Discussion of Results. The careful sketches of load arrangement have made it possible to throw some light on the prevailing method of assuming uniformly distributed live loads as a basis for floor design and help to indicate what relation such assumptions should bear to actual total loads. Examination of bays for which the live loads were more than 25 pounds per square foot showed wide variation in the distribution of such loads. The larger proportion was found, as might be expected, within a zone approximately 3 feet wide around the walls, the remainder being distributed variously in the centers of the rooms. In one or two cases, however, the major proportion of all the load was situated away from the walls, and this condition must be provided for by designers. There is also the probability that practically all furniture may be collected in the central portion of a floor area when occupants are moving, or when painting or cleaning is in progress.

The sketches show that the heavier loads, such as library shelves and double filing cabinets, are likely to be located away from walls and partitions. This is obviously for ease of access, and the same consideration demands that when the concentrated loads per square foot are excessive, generous unloaded floor areas should be provided adjacent to the concentrations so as to assure a safe distribution.

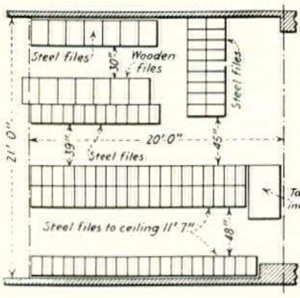


Fig. 1

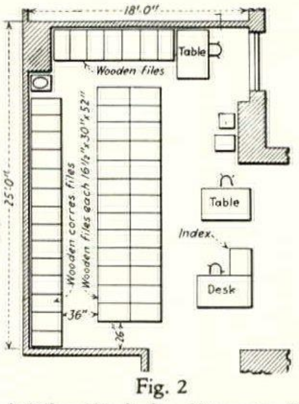


Fig. 2

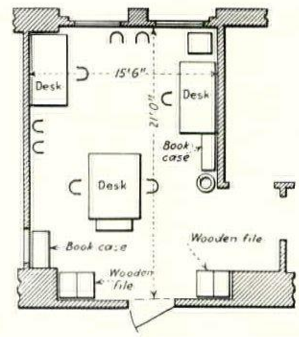


Fig. 3

Plans of Typical Offices Studied to Determine Floor Loads

Among the heaviest occupancies found is the stack room of a large law library. The entire floor area is covered with rows of steel stacks, placed back to back with 32-inch aisle spaces between rows, and extending from floor to ceiling, the story height being 11 feet, 7 inches. There is a main aisle 4 feet wide crossing the middle of the room at right angles to the stack rows. The total weight was taken as found and consisted of:

556 shelves of books@ 75 lbs.	41,700 lbs.
114 empty shelves@ 25 lbs.	2,850 "
Books on floor	500 "
7 ladders	100 "
2 persons@ 150 lbs.	300 "
Area 588 sq. ft.	45,450 lbs.

Load per sq. ft., 77.3 lbs.

It is evident that the possibility of all shelves being filled should be considered, and if this were assumed the average loading would be increased to 87 pounds per square foot.

Examination of all the floor sketches shows but eight articles of furniture (safes) over 2,000 pounds in weight. A number of sectional filing cases and bookcases with contents weighed much more, but these weights were distributed over such a large area they could not be regarded as concentrated. Of 36 safes and safe cabinets, 23 weighed less than 1,000 pounds; five between 1,000 and 2,000; two weighed 2,200; two 2,360; one 2,800; one 3,000; one 3,500; and one 4,250 pounds. This seems to indicate that if care in regulation of occupancies were exercised, considerable economies might be possible in providing for concentrated loads. To what extent such regulation is practical is a matter for deliberation.

As would naturally be expected, the live loads were found lightest next the outside walls. Single-row filing cases, cabinets, safes, bookcases and bins are usually placed against blank interior walls. Whether by accident or otherwise, the heavier loads were not found where partitions cut up the floor space into small rooms, indicating that allowance may not be necessary for both removable partitions and heavy floor loads. Several instances were found where two adjacent floor bays supported average loads of 25 pounds or more, but in no case were two adjacent bays found in excess of an average of 40 pounds per foot.

There are but few instances in the floor plans discussed where three offices or store rooms meet at the same column, and it is probable that this condition will be found but rarely in buildings with light and ventilation. In view of this and of the surprisingly light average floor loads discovered, it becomes an interesting question whether in a building of this type further reductions in loads assumed for column design could not be made with safety. The building was designed for a live load of 100 pounds per square foot on the first floor and 75 pounds on all others.

C. H. Blackall, architect, of Boston, and Arthur G. Everett, of the Boston building department, published in the *American Architect and Building News* for April 15, 1893, the results of their investigation of three prominent office structures of that city. Average weights for furniture were assumed, and the human occupancy was taken as the greatest known to have occurred in each of the offices investigated. Here is a resume of the results obtained:

Structure	No. of offices	Total area in. sq. ft.	Total wgt.	Av. wgt. per sq. ft.
Rogers Bldg.	41	18,127	294,984 lbs.	16.8 lbs.
Ames "	70	32,151	544,419 "	15.6 "
Adams "	99	26,183	425,109 "	16.7 "
Average				16.3 lbs.

The 10 heaviest loadings in each building averaged 25.9, 29.8 and 29 pounds per square foot respectively. The highest load found was 40.2 pounds per square foot, and in only 12.4 per cent of offices was the floor load in excess of 25 pounds per square foot, and in only 26 per cent did it exceed 20 pounds.

Mr. Blackall recently conducted a similar investigation of live loads in the Little Building in Boston, which is reported in the *American Architect and Architectural Review*, January 3, 1923. Sixty-four offices were surveyed, the results indicating live loads even smaller than those discovered in his earlier investigations. The maximum floor load was 14.7 pounds per square foot, and but four offices had loadings over 10 pounds per square foot. The minimum loading discovered was 1.3 pounds. A full interpretation of the data received discloses many significant facts which space does not permit of presenting here. A detailed report will be prepared as soon as sufficient information is obtained.

Foundations of New York County Court House

ENGINEERING SKILL, LATEST EQUIPMENT AND METHODS ADOPTED FOR PLACING MORE THAN A MILLION DOLLARS' WORTH OF BURIED STEEL AND CONCRETE

By FRANK W. SKINNER, *C.E.*

FROM the log cabin at the southern end of Manhattan Island, which sheltered the first Dutch officials, to the frame houses, brick buildings and so on, ever larger and better, to the present court house, New York County has provided continually finer and finer homes for its judiciary, until, to match its lofty Municipal Building with a whole city's equipment and population inside its walls, there is now being built a splendid new court house designed by Guy Lowell, to give a spacious and worthy home for the elaborate court machinery needed for the millions of citizens in New York County.

The beautiful 7-story building, 316 feet or nearly a city block in diameter, and 130 feet high above the street, is being constructed and equipped, like a modern office building, with skeleton steel framework, concrete floors, and brick walls encased with exterior granite, massive and imperishable. An office building of the same capacity, 8,000,000 cubic feet, would cost, under present conditions, about $8,000,000, which does not necessarily indicate very closely the final cost of this building for which many of the important contracts have not yet been awarded.

The site of the court house, formerly occupied by a number of old buildings, was unfavorable in that the soil, covered by an artificial fill and obstructed by large quantities of old foundations, consists of a stratum of sand reaching to hardpan and rock at a depth so great that no attempt was made to carry the costly foundations down to it, although they must be built in the very bed of an ancient stream still carrying a great flow of subterranean water that saturates the soil up to within a few feet of the surface. This volume of water is great enough to fill any pit as fast as it can be excavated and to turn to treacherous quicksand soil that if dry and undisturbed would safely support heavily loaded foundations.

In similar wet soil, minus the flowing water, the foundations for the numerous column piers of the neighboring Municipal Building were sunk separately by the costly pneumatic caisson process which merely amounts to the use of diving bells, some of them carried down to rock and almost to the limits of human safety. This system, which has been adopted for most of the New York skyscrapers, also built in wet sand, was rejected for the court house

General View of Foundations Showing Partial Waterproofing of Lower Walls

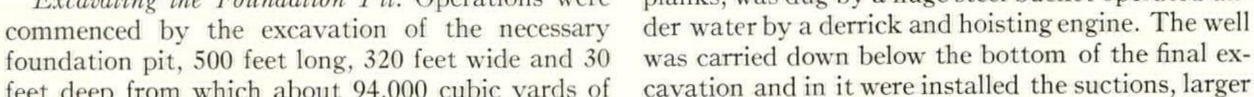
Moran, Maurice & Proctor, Foundation Engineers

Vertical Reinforcing and Bonding Steel, Projecting above Foundation Rings
Excavation earth backfills between the rings

where a simpler and less costly construction was possible by arranging the principal walls and columns in parallel rows supported not as separate foundations on single piers but on a series of four huge concentric concrete rings, the inner circular and the outer hexagonal, that act like enormous curved girders and are so thick that they distribute their thousands of tons of load over very large surfaces without settlement on the wet sand. Each of these rings, about 20 feet deep and some of them 20 feet wide, contains, with the massive basement floor slabs that it supports, about 19,000 ordinary two-horse truck loads of concrete and is strengthened by about 2,500,000 pounds of steel bars embedded in it.

Excavating the Foundation Pit. Operations were commenced by the excavation of the necessary foundation pit, 500 feet long, 320 feet wide and 30 feet deep from which about 94,000 cubic yards of material were removed by a group of four powerful steam shovels gradually digging themselves down from the surface of the ground to the bottom of the pit, 10 feet below the water level. The first shovel scooped out, across the full length of the plot, a canal 30 feet wide that sloped rapidly from street level to an elevation 10 feet lower which formed the bottom of the first lift. Returning at the same level it doubled the width of the canal and gave an opportunity for the other shovels, working both ways from this canal, to excavate the remainder of the area down to the 10-foot level. Another canal was cut across the bottom of the pit, and from it the shovels worked both ways to extend the entire excavation to a depth of 20 feet, and once more dropped down nearly 10 feet farther on the center line and worked outward to the edges of the great pit with their heavy-toothed buckets, scraping up the sand, a wagon load at a time. The shovels, operated by two men each, excavated in about two months material that dug by hand would have required for removal 100 men working hard for four months.

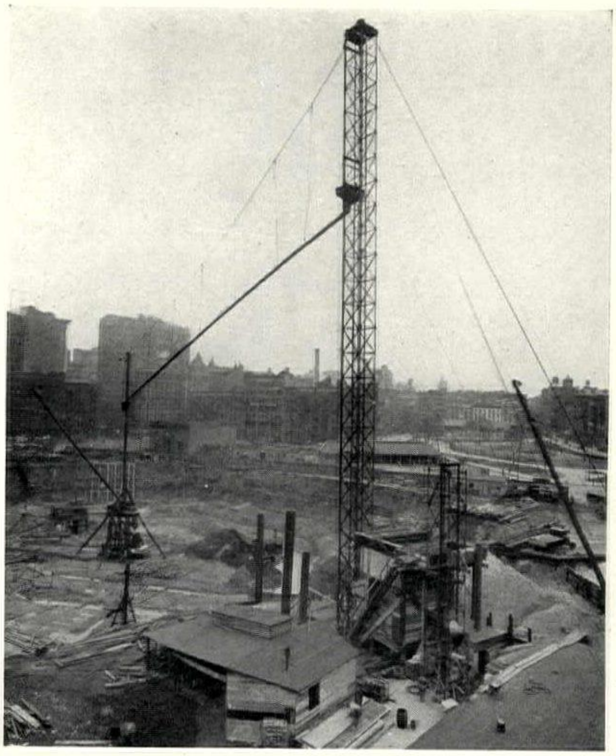
Draining and Pumping. When the shovels worked down to the second level they encountered there vast quantities of water flowing in from all sides and rising through the bottom so rapidly that it threatened to drive out the men and submerge the machinery besides making the bottom so soft and treacherous that it could not support the heavy machines or automobiles that were used. To remedy this a well, 18 feet square with sides lined by heavy wooden planks, was dug by a huge steel bucket operated under water by a derrick and hoisting engine. The well was carried down below the bottom of the final excavation and in it were installed the suctions, larger than stove pipes, of seven enormous pumps to remove the water even faster than it flowed in. This drained the soil surrounding the pit and rapidly



Elevation Diagram of Concrete Placing Plant and Half Foundation Key Plan dried out the bottom. Five of the great pumps, operated by electricity continuously, pumped as much as 4,000,000 gallons per day. The two remaining pumps, driven by steam, formed a reserve battery.

To collect the water in this pumping well there were continually maintained in the bottom of the pit numerous short and shallow trenches from the steam shovels to each of six large steel pipes radiating in different directions from the well and lowered as the excavation progressed until finally they were depressed below the finished bottom of the pit and served to drain this whole area while the foundations were being built and the earth filled back around them up to the basement floor, above ground water level.

Concreting Operations. Before the excavation was completed thousands of yards of concrete were placed in the foundation at the bottom of the crowded pit, and in order to carry on this work without interfering with the shovels, trucks and pumping and other operations and machinery in the pit itself, a system of costly and elaborate equipment was installed for the continuous mixing and delivery of the concrete. The cement in bags was hoisted by an elevator to the mixer, from which thoroughly mixed concrete was discharged every two minutes into a steel bucket and hoisted to the top of a steel tower 150 feet high. At the top of the tower the bucket automatically dumped its contents into a steel hopper and returned for another load. Through a gate at the bottom of the tower hopper an attendant regulated the flow of the plastic concrete into an inclined steel trough, suspended from an overhead cable. The concrete was thus delivered in an almost continuous stream to a second hopper that was supported nearly 100 feet above the bottom of the excavation by a huge derrick mounted on a tower in the center of the foundation pit. Passing



Concrete Mixing and Distributing Plant and Cement Storage Shed

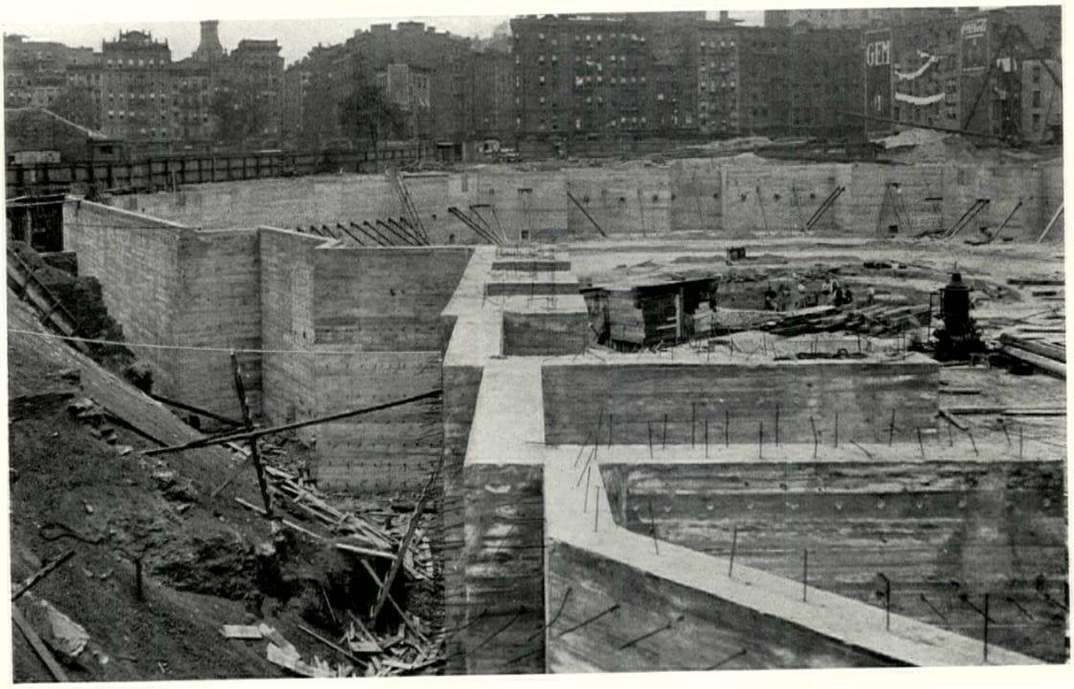
Spouting Concrete into Upper Part of Hexagonal Form with the Aid of Counterbalanced Chutes which May be Easily Handled by Two Men through the derrick hopper, the concrete continued flowing through a succession of steel troughs that passed through and were supported by the boom. As the boom could revolve horizontally in a complete circle about 120 feet in diameter, the concrete could be carried far above the heads of the workmen in the pit to a point within this area and there spouted down to exactly the required position in the foundation.

A second section of the trough, 50 feet long, was pivoted to the end of the derrick trough and supported on a heavily counterbalanced truss, thus enabling it to revolve around the end of the derrick boom while the latter was also revolving about the derrick mast and thus covering another distribution area 220 feet in diameter. Two more pivoted troughs attached to the end of the trough just mentioned made possible the concrete's being continually discharged down a long slope that could reach to any part of the foundation pit and be doubled on itself, extended at any angle, or revolved from different centers so as to cover every possible position and keep clear of all the men and machinery underneath.

Among the details that contributed to the economy, efficiency and rapidity of the work was the washing of the concrete machines, buckets, hoppers and the long steel troughs with a copious stream of water night and morning to prevent the concrete's hardening on the steel surface; otherwise it might have been necessary for men to be stationed on the lofty, swaying troughs to coax along the flow of the concrete. As the 114,000 bags in which the cement was received were worth 25 cents each when empty, care was taken to preserve them, and two men were constantly occupied in shaking them and pressing them into small bales, wired for transit to the mills. This forethought saved about $28,000 worth of cement and $28,000 worth of empty bags.

Placing the Concrete. The smooth, dense sand in the bottom of the pit was carefully leveled to form a regular surface on which there were built vertical wooden forms 15 or 20 feet apart and about as high, braced on the outside and tied together by many steel crossbars to prevent their spreading under the pressure of wet concrete. Hundreds of tons of long steel reinforcing bars were carefully bent, wired together, and supported a little above the bottoms and a little below the tops of the forms before the concrete was poured. To keep the reinforcing in position and prevent its displacement, when the concrete was poured, the rods were separated by small concrete cubes made by the contractor. On a wide wooden platform, resembling a huge pastry board, there was spread a thin layer of cement mortar. As soon as it began to stiffen, parallel lines were cut through it from top to bottom in both directions, dividing it into small squares like a checker board. After a few hours the mortar became sufficiently hard to be broken up on the lines already scored. In this way 8,000 of the little bricks or cubes were easily made every day.

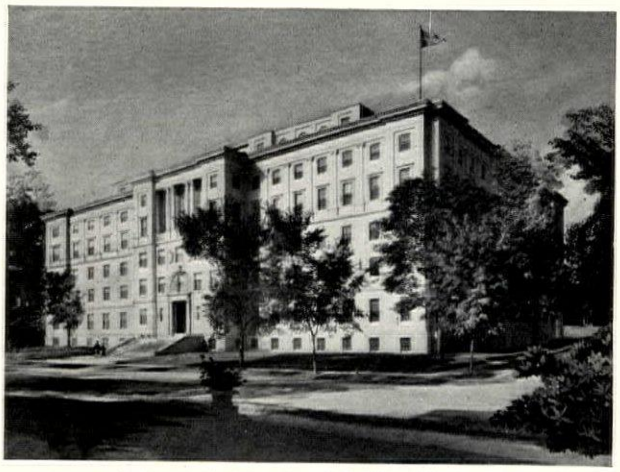
After the complicated framework of steel bars was placed to make a sort of skeleton floor and roof in the form, the wet concrete was poured in an almost continuous stream, gradually progressing from end to end of each of the sections into which the great rings were divided for convenience of construction. After the removal of forms the work was completed by a man with an acetylene torch which burned off the ends of the tie rods projecting from the concrete much more quickly than could be done by saws or chisels, this being in accord with present practice.



Substructure Nearly Completed, with Tie Rods and Bonding Steel Projecting from Walls
The tie rods which braced the wood forms are burned off by acetylene torches

Plate Description

NATIONAL LIFE INSURANCE COMPANY BUILDING, MONTPELIER, VT. Plates 37–41. The completed structure will include a central pavilion with two extended wings, but one of which has been built. Exterior walls are faced with light colored granite from Vermont and gray brick, and the window trim has been painted a somewhat lighter gray than the materials of the walls. Composition has been used for roofing, and the interior finish, excepting in a few instances where special finishes have been used, is of enameled metal. For the assembly room a wood floor has been provided; in the executive offices the floors are carpeted, and for other parts of the building the floors are covered with linoleum.



General View of the Completed Building for the National Life Insurance Co., Montpelier, Vt.

Every part of the building is thoroughly ventilated by use of supply and exhaust fans, and heating is supplied by vacuum steam, in a combination of direct radiation with warmed air from supply fans. The cubic area of the part of the structure thus far completed is about 1,597,292 feet, and the cost has been approximately 88 4-5 cents per cubic foot; the contract was dated April 18, 1921.

FIRST PARISH COMMUNITY HOUSE, LONGMEADOW, MASS. Plates 42, 43. While constituting part of a church's equipment, this building, of which Smith & Bassette are architects, serves many of the purposes of a village community center. The floor plans show it to be unusually complete, for in addition to an auditorium with stage and galleries there are smaller meeting rooms, various offices, dining room and kitchen, in fact every detail of equipment likely to render such a building useful. Views of the exterior show an interesting use of the colonial style. Brick is used for building the enclosing walls, but to add a note of variety the facade under the portico is stuccoed over the brick.

DAILY NEWS SANITARIUM. LINCOLN PARK, CHICAGO. Plate 44. For more than 30 years the *Chicago Daily News* has been instrumental in maintaining a sanitarium for babies whose parents live in the crowded districts of Chicago, in what are popularly known as the "river wards," the children and their mothers being conveyed to and from the sanitarium in busses. During many years the sanitarium occupied a large frame shelter on the shore line of Lake Michigan, but recent enlargements of the park have made what was once the shore line far inland. This, together with the fact that the old structure was badly out of repair, led to the building of a new sanitarium at the present shore line and erected under the personal direction of Victor Lawson, owner of the *Daily News*.

The new structure, planned by Perkins, Fellows & Hamilton, is both fireproof and weatherproof. Roofs are of tile, piers of rough-surfaced vitrified brick, floors are of thick reinforced concrete slabs with waterproof surface, everything being built with a view to cleanliness and durability. The upper floor of the west projecting wing contains a well equipped hospital where emergency or serious cases can be treated, and which is also used for other purposes when stormy weather renders impossible the use of the pavilion proper. The sanitarium was opened early in 1921 and cost approximately $275,000.

HOUSE OF DR. SAMUEL MILBANK, 117 EAST 65TH STREET, NEW YORK. Plates 45, 46. The charm of the exterior of this city house is due to the excellent planning of the facade and the care with which the detail has been designed. Brick is the material with which it is faced, the color and texture of the brick being emphasized by the white of the trim and the black of the wrought iron balcony.

Since the house is intended as the offices as well as the home of a physician, the hall of the ground floor is used as a patients' waiting room; beyond is the office proper, and still beyond the office and occupying the extension is the utility room which a physician's work requires.

HOUSE OF HARVEY D. GIBSON, ESQ., 52 EAST 69TH STREET, NEW YORK. Plates 47, 48. This residence, of which Walker & Gillette are the architects, is an excellent example of a modern city house in the Adam style. The facade of the lower floor is faced with stone, and stone is also used for the exterior trim, the walls above the ground floor being faced with old English brick. To remedy the apparent height of a 5-story building of narrow width the upper floor has been recessed behind a brick and stone coping, the low mansard roof being covered with old slate.

Ornament about the main entrance, which in this instance is at the sidewalk level, has been given a restrained Adam treatment, and the front door is painted bright green. The consistent Adam design of the exterior has been maintained throughout, the interior walls being painted the light colors often used in late eighteenth century English houses, affording good contrast with well detailed woodwork.

EDITORIAL COMMENT

A WORD FOR COMPETITIONS

WITH each succeeding competition of large scope, attracting many entrants, it is but natural for architects to look upon the cost to them in the venture and for many to reach the conclusion that the time, effort and money expended in designing a building and presenting it by imposing exhibition drawings are an economic waste. The recent *Tribune* competition, which is outstanding in scale in several respects when past competitions are recalled, serves to raise anew discussion of competitions.

The aggregate cost to architects of assembling the drawings for the consideration of *The Tribune's* jury has been estimated as high as half a million dollars. If this much money must be expended to enable an important business concern to select an architect or a design for a building even to cost seven millions of dollars, there is something frightfully wrong with the system and every means should be taken to abolish it. There are, however, some important results to be considered on the credit side, and *The Tribune* competition indicates the possible value of these results to a greater degree than almost any other competition within memory. If the great, underlying lesson of this competition is grasped by architects, its cost of half a million dollars will be as nothing to the benefits to come to architecture.

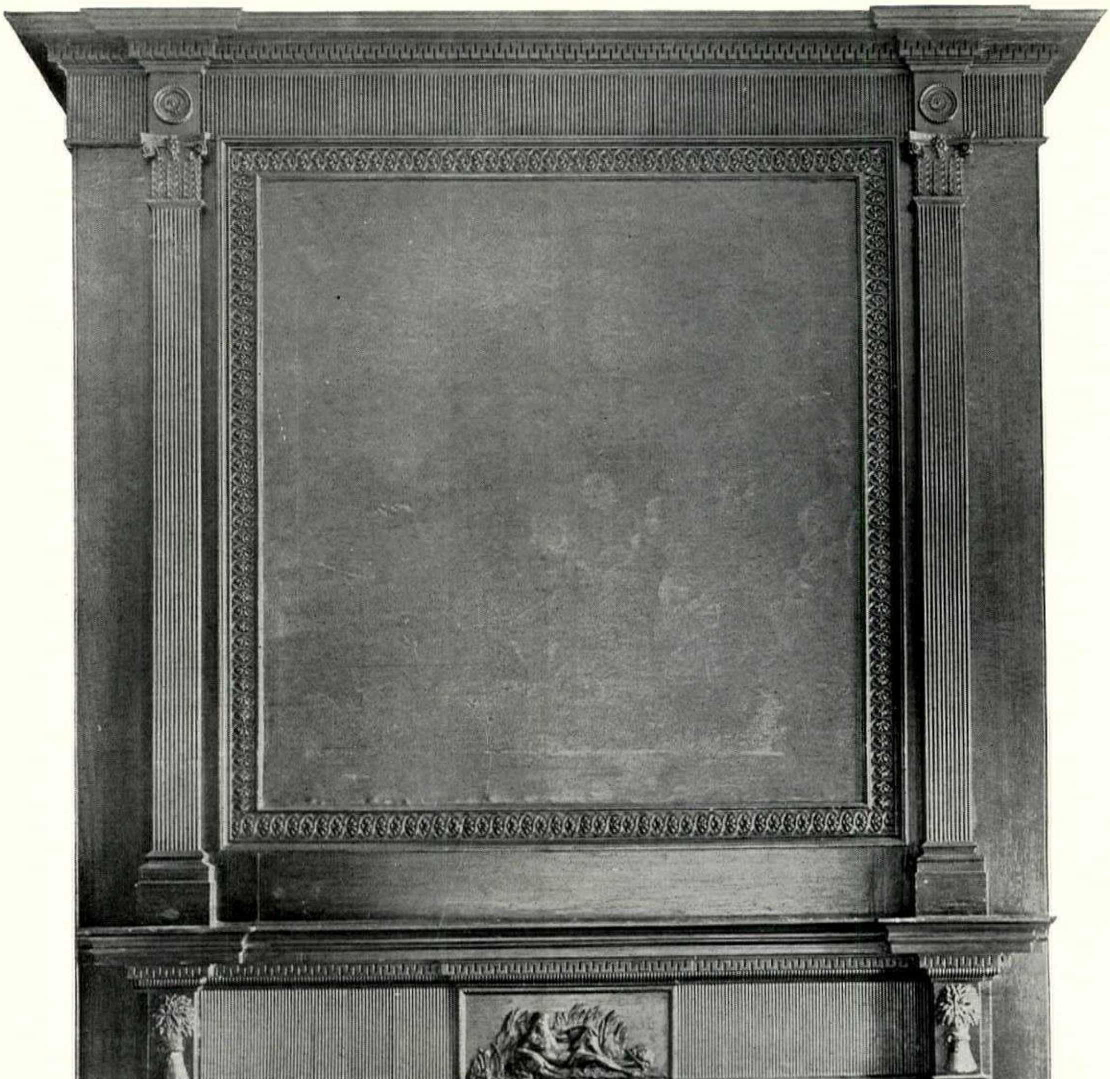
It comes on the architectural horizon as a rift in the clouds, letting in a beam of light that pierces a shadow which has enshrouded the greater part of modern architectural effort. The critical examination of the results gives opportunity for pause in our architectural humdrum; it leads us to reflect and meditate on our course, and that alone is a circumstance of priceless value. Only in moments of meditation do great fundamental truths reveal themselves. We have been living in an architectural age in America in which the forms of the great architectural expressions of all past eras are spread before us; we have been attracted first by one and then by another, and we have studied their external manifestations until we are thoroughly familiar with all the subtleties of detail and proportion; we have become the greatest exponents and practitioners of eclecticism in the whole realm of architectural history. But in this seeking for perfection in the old manners of building we have lost the spirit of architecture,—the true meaning of building as an art. We have assumed that all the songs have been sung, that all individual, creative effort has been expended, and that modern architecture is simply an expression of good taste in applying precedents.

The Tribune competition is an open book for all to read who will; it plainly marks the folly of our present conception of architecture. The tall commercial structure of our cities is wholly an American manifestation, a product of the conditions of our own day. Its necessity has evolved the marvelously efficient modern steel construction, but it has not sufficiently moved architects to find a correspondingly appropriate means of expressing it in suitable and meaning architectural forms. One very probable reason is that the great styles of building of past centuries have grown step by step with advanced knowledge of construction methods. Today structure and architecture are unfortunately divorced; the structural engineer provides the bones and sinews of the building, and the architect produces an envelope, pleasing to look at sometimes, but arranged in Greek, Roman, Gothic, renaissance or any other garb he may choose—all without any real relation to the structure which supports it. It is entirely reasonable that today with the vast increase in the complexity of building, specialization should exist, that the engineer should be responsible for structural methods and that the architect should concern himself with the visible covering of the building, but they should work in harmony and with a full understanding of each other's function—not, as too frequently happens today, at cross purposes, each looking to diametrically opposite ideals.

This real relation can be brought about in modern architecture, but the burden of its achievement lies largely with the architect; the engineer is able to produce his results because he is not enslaved by precedent and because he is required to do original thinking, whereas the architect is so fettered and bound by the continued associations from early student days with past forms that attempts at thought are more apt to result only in confusion. The ignorant man, however gifted, cannot of course create an architectural masterpiece; all must know the rules of architectural development which will prevent them from committing gross errors, but beyond this precedent should not bind them; true architecture can be produced only by intelligent thought. Real thinking is the important element lacking in our architectural efforts; it is the important element that our architectural schools have overlooked inculcating in the mind of the student. It is the outstanding necessity for a successful American architecture, and if occasional competitions will help us to analyze our efforts, to develop a faculty of thinking out our problems, they will well serve the architectural profession and their cost will not be considered in the greater sense of satisfaction that architects will find in their work and in the enthusiasm that the public will feel for an art that is clearly a part of its very life.

DECORATION *and* FURNITURE

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



CHIMNEYPIECE IN NORTHWEST PARLOR, DERBY-ROGERS HOUSE, PEABODY, MASS.

SAMUEL McINTIRE, ARCHITECT, *circa* 1800

Now in the Museum of Fine Arts, Boston

American Interiors of the Early Republican Period

WOODWORK AND FURNITURE OF THE DERBY-ROGERS HOUSE AT THE MUSEUM OF FINE ARTS, BOSTON

By EDWIN J. HIPKISS

Keeper, Department of Western Art, Museum of Fine Arts, Boston

ALTHOUGH American and English domestic architecture of the eighteenth century were branches of the same growth, each was expressive of its own people, and that American master builders used European books on design as source books and not as copy books seems evident through study.

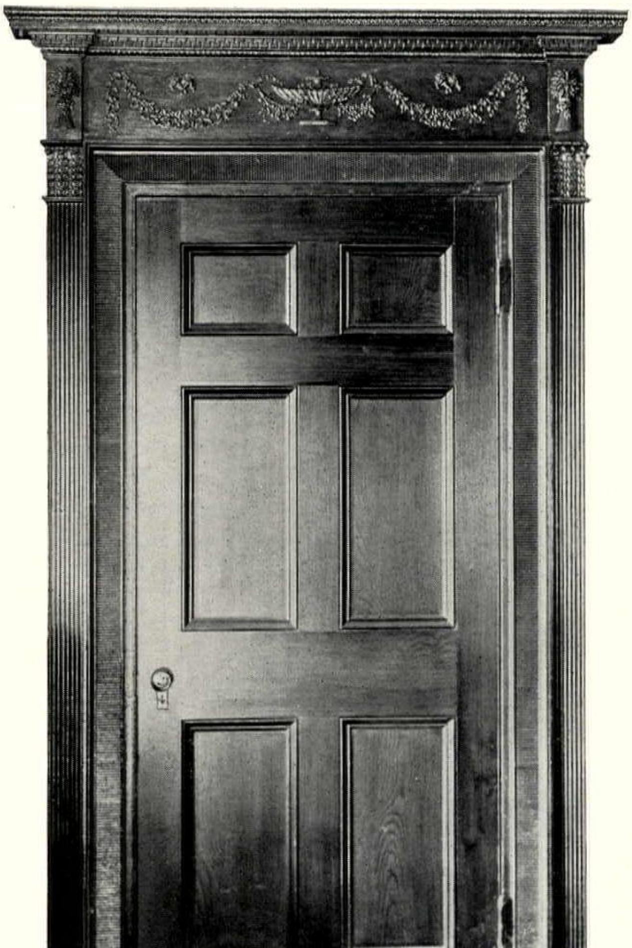
This is much less true of late work, and houses of the first few decades of the republic show use of distinct mannerisms of the Adam brothers, due undoubtedly to the thoroughness with which their work was published within their lifetimes and to the adoption of their style by their contemporaries.

The Derby-Rogers house at Peabody, Massachusetts, was in its prime one of the finest examples of the architecture and furnishings of the early republican period in New England. The house stands on a knoll in a large estate between Danvers and Peabody, known for a century or more as "Oak Hill." Samuel McIntire of Salem was the architect of the building and it was erected during 1800 and 1801 for Elizabeth Derby, the eldest daughter of Elias Haskett Derby, merchant, of Salem. In 1870 the house was rebuilt in part, the three chief rooms with their woodwork alone retaining the architectural value given them by McIntire. Parts of the house show also minor details in an earlier manner and probably remain from a house of the eighteenth century on the same site.

The house has long received the attention of architects. The detail is often ranked in importance with the woodwork made by McIntire for the Elias Haskett Derby mansion in Salem and placed in the Cook-Oliver house in 1803 after Mr. Derby's death. The mantel in the northeast parlor has been especially praised for its fine proportions and restrained treatment at a time when the use of applied ornament was common.

The entire woodwork of the three rooms with a few other details has now been purchased by the Museum of Fine Arts, Boston. The purchase is in accordance with the policy of the trustees in acquiring architectural detail only when the buildings it adorns await remodeling or removal.

The two principal mantels have panels painted in oil, representing village scenes called "Saturday Night" and "Sunday Morning." These are the work of the painter Corné. He is thus mentioned in William Bentley's diary for the year 1801: "Mr Corne of Naples, an Italian Painter in the Town, introduced by Mr. Derby, rode with me to the estate of Governor Endicott, to see whether he could preserve a likeness from the family picture of that venerable Puritan." They are now much darkened.

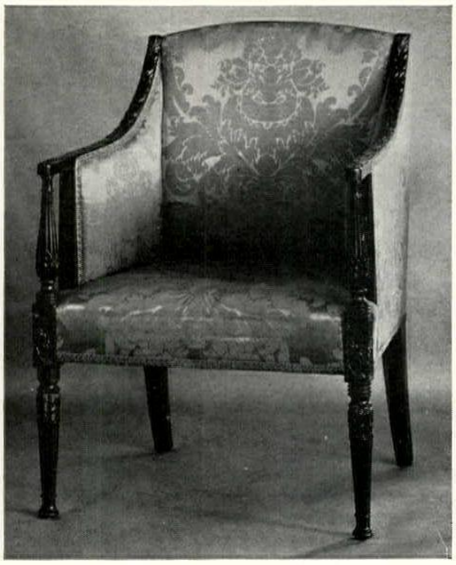


Doorway from Northwest Parlor

The door is modern and quite out of scale with its McIntire frame

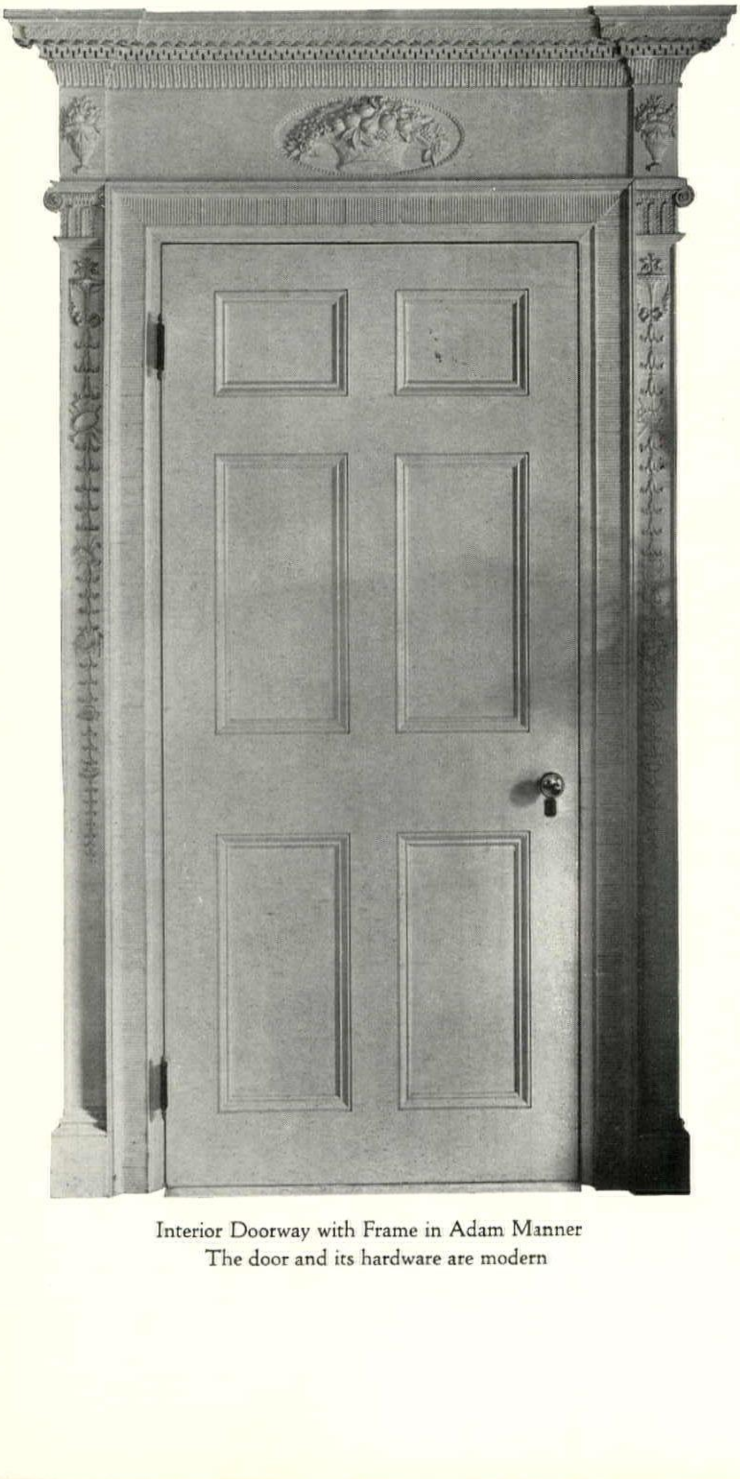
The scale of these rooms may be indicated by some dimensions. The southeast parlor is approximately 19 feet by 25 feet, 6 inches, with a height of 10 feet, 8 inches. The northwest parlor is approximately 16 by 20 feet. We have no evidence to show how the walls were treated originally, but it seems probable that wall paper with either a damask pattern or some Adam design was used. Mr. Bentley visited the house in 1801 and noted in his diary, "the paper and linen hangings were superb." The woodwork is of pine painted white, but the northwest parlor at some time later, perhaps in the 70s, was skillfully "grained" and came forth as walnut! The original white paint can be uncovered. The ornamental elements are not carved,—this was a period of "putting on style." The capitals, patera, ornamental bands and designs of *plenty and grace* were all stock patterns of French putty, probably sent over from a London stock such as pushing trade would favor over the honest carving McIntire could do. The ceilings are all plain, although it seems that the conditions and influences should have produced a ceiling decorated in the Adam manner. That was a feature not adopted by New England as far as we know.

The linings and hearths of the fireplaces are of soapstone. The facings are of white marble in two rooms with black marble in a third. In the southeast parlor the facing, decorated with a fret design, was probably put in later than the original work. It may have been added by Samuel F. McIntire, the son, who did some additional work at "Oak Hill," and who made out a bill, dated January 6, 1814, which is now in the possession of the Museum of Fine Arts.



Sheraton Mahogany Armchair
Part of original furnishings

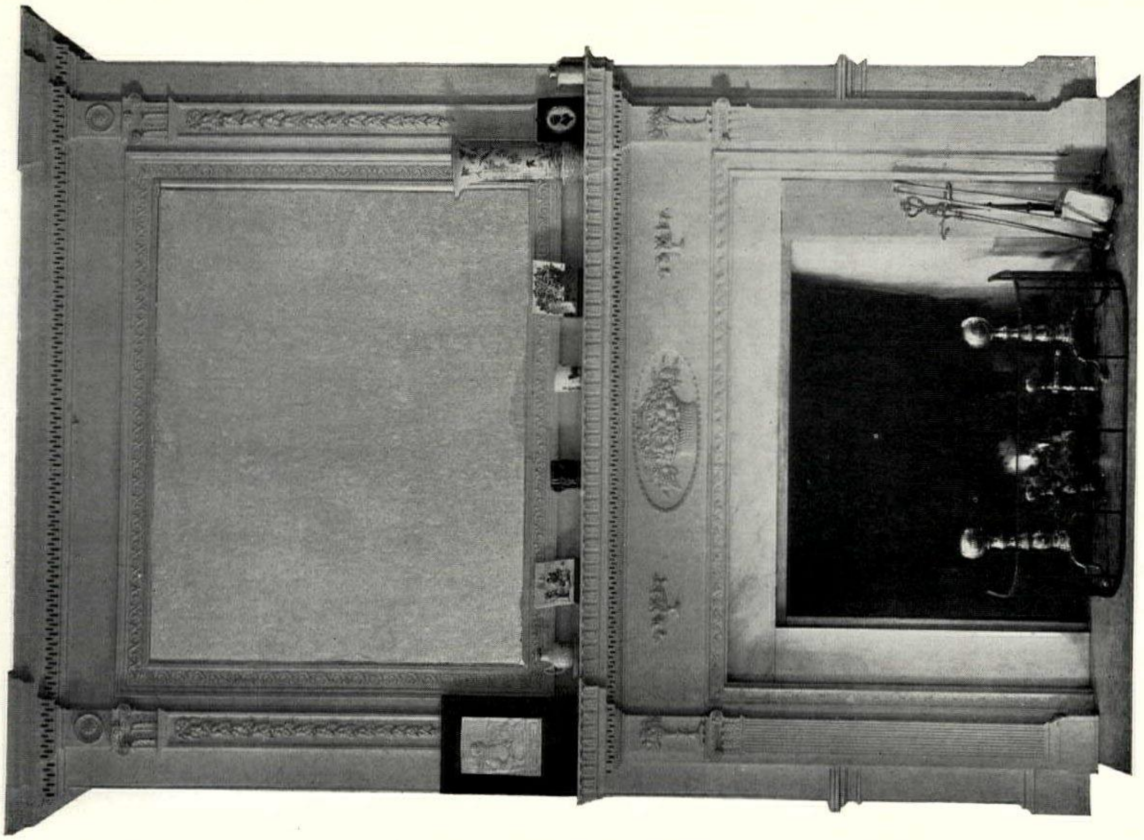
A generous gift which supplements this purchase includes fine furniture, window cornices and fire tools which were part of the original furnishings of these rooms and had become the property of the donor by inheritance. When the rooms are eventually set up in the museum, they will provide with their related objects a fine setting of decorative arts used in New England at this period.



Interior Doorway with Frame in Adam Manner
The door and its hardware are modern

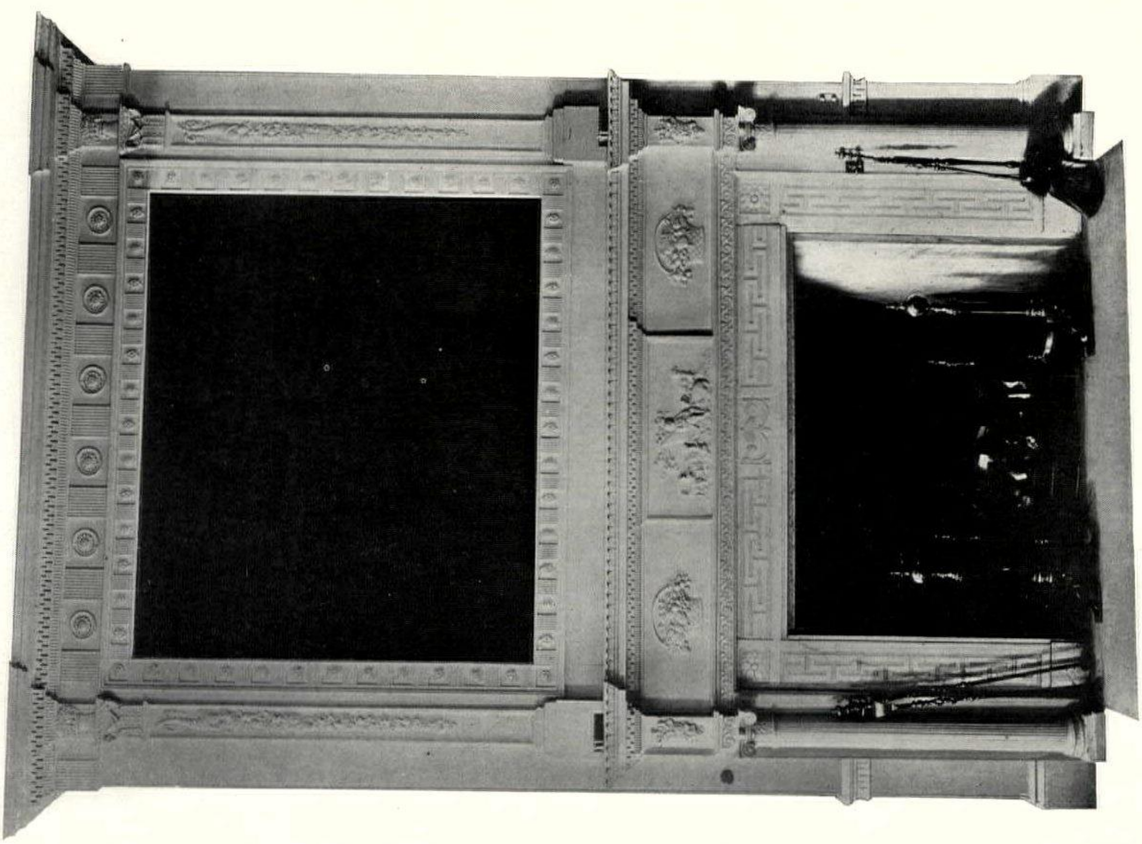
The furniture, however, is not by native cabinet makers. It was imported from England with, very likely, considerable pride in the ownership of London pieces in a fashionable house. The side chairs in the style of Hepplewhite, shown in the illustrations, are each representative of a set. That with the elliptical back is of beech, painted in vermilion and gilt. The splat design is, of course, due to the popularity of the Prince of Wales, thus his insignia in a chairback. The other is of mahogany, finely carved. They both were made about 1785. Mahogany is the material of both the Sheraton armchair and the fine Adam card table which is one of a pair. The textile coverings are not original; they were probably of damask with a pattern in finer scale. With its skillfully made joinery, inlaying, carving and pleasing lines, the card table well represents its kind and period—the last quarter of the eighteenth century, under the influence of Robert Adam.

The Essex Institute of Salem has published the diary of William Bentley, D.D., and on page 399 of Volume III there is an interesting reference to the furnishings of the Derby-Rogers house as Mr. Bentley saw them in 1801: "Through the great pasture we passed to the house erected by Mr. West, and executed in the taste and under the direction of his wife, the eldest daughter of the late Elias Haskett Derby. Its front eastward commands a most extensive prospect. The house in front is of two stories with four equal rooms. The apartments are finished in as good order as any I have ever seen. The furniture was rich but never violated the chastity of correct taste. The family of Esq. Collins



CHIMNEYPIECE IN NORTHEAST PARLOR

In recent years a mirror has replaced painting originally in overmantel



CHIMNEYPIECE IN SOUTHEAST PARLOR

The marble facing is of later date than the woodwork

CHIMNEYPIECES FROM THE DERBY-ROGERS HOUSE, PEABODY, MASS.

joined us to enjoy the rich beauties which multiplied around us. The pictures were excellent. The paper and linen hangings were superb. The movable furniture, rich and uniform, but simple. The mirrors were large and gave a full view of everyone that passed, and were intended for the house in town but were exchanged as those for this seat were too large. The markee bed was preferred to the full bed for its simplicity. It was surmounted by a golden eagle. The work of the room was finished by the needle of Mrs. West."

Canopy Bed, Part of Original Furnishings

Samuel McIntire was born in Salem in the year 1757 and died there in 1811. His life and works centered in his native city, and although the practice of his art was restricted within a somewhat narrow compass he attained outstanding distinction in his time and left an achievement in works now studied with interest. He belonged to the eighteenth century, and his last work, the fine Gardner-White-Pingree house, built in 1810, marks the end of an epoch in style and the on-coming of architectural revivals. The Greek temple with its portly wooden order became thereafter the ideal in all our cities and towns and was succeeded by so-called Gothic mansions, Italian villas and Swiss chalets. McIntire's work, while executed under the influence of the Adam style, has local and even individual quality. His designs have their imperfections in which criticism easily finds its target. But his achievement, based on actual contact with building materials and his ability to hold to a sense of style through the maze of the workshop at a period when knowledge of architectural design depended upon personal aptitude and the study of a few scarce books, can only ask for our warm appreciation. He was what must always be valued by us in the end—a master workman. His work has enjoyed its share of influence in forming the taste of a later generation of architects.

THERE are illustrated here three pieces of furniture comprising part of the original furnishings of the Derby-Rogers house. They are of English make and examples of fine craftsmanship. The table is one of a pair of card tables with an inlaid top in fanlight pattern. The chair at the right has no carving, the effect of relief being given by painting in black and gilt on a vermilion ground.