THE
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THE FUTURE OF THE ARCHITECT

AS EXPRESSED BY EIGHT FORWARD-LOOKING MEN

ONCE MORE THE MASTER BUILDER

BY ERNEST JOHN RUSSELL

PRESIDENT, THE AMERICAN INSTITUTE OF ARCHITECTS

IS THERE a future for the practice of architecture? This is a question that is asked today because of existing conditions and one that has been asked periodically since the time of the pyramids. Charles Bulfinch, prominent architect of 125 years ago, answered the question in the negative and decided against training his son as a possible successor because of his belief that he would starve to death. When we ask this question our astigmatism is just as acute as Bulfinch's.

Strauss

When the entire work is comfortably housed and we are satisfied with our habitations in which to work, to study, to play and to worship, the question may have to be answered, but not until then. We think of our cities as built, and in some cases, overbuilt, and do not stop to realize that comparatively few existing buildings are permanent. As long as new appliances are invented and research of new materials and methods continues, just so long will we have to continue to rebuild; and when there is actually nothing new or undiscovered under the sun, then there may be a cessation of architectural design.

What is to be the future of the architect, is a comparatively new question. Originally, the architect was the master builder and had direct charge of his building operations. As the work increased in volume it seemed desirable to divide it into various branches, and this process has continued, with the result that subdivisions are essential and numerous.

The founders of the American Institute of Architects enjoyed their practice because time was not the essence of the contract in those days. The requirements for a building even then were relatively simple — so much so that it was possible for an individual to complete a set of drawings with his own hand. He may have had to struggle with the idiosyncrasies of the fireplace but, as we look back upon it, that was a more or less minor item. Today a man would have to practice for many years before he could turn out single handed a set of drawings for a moderate-sized house that would stand the acid test of even kindly criticism.

This constant evolution or progress has been of such slow growth that we have hardly been aware of it, but at the present time it has reached the stage where it takes an organization to design a structure just as it does to build or finance one. These organizations all operate as separate units, but the time is coming when they will act as one. They will realize that a client desires and is entitled to advice which will enable him to visualize his building problem from every possible angle and his inclination will be to turn to the individual whom he can trust to give the unbiased information he is seeking.

If the architect becomes once more the master builder his future is assured, but in order to regain

his position it is essential that he be familiar with the building problems of today, and that he unite, for purposes of cooperation, each of the branches that constitute the construction industry.

He should also realize that existing buildings need the services of a diagnostician in order to determine whether they should be repaired, remodeled or replaced. So far this has been a neglected field for any one branch of the industry, although the manufacturers of appliances and materials have scratched the surface for the mutual benefit of themselves and the owners. They have pointed the way and indicated the possibilities. The architect neglects his opportunities if he fails to take advantage of this situation as he is the one best qualified by his training and experience to act as the diagnostician. Inertia is the only attribute that will prevent the architect from again being the master builder.

The members of the American Institute of Architects have a keen realization of the changes that are constantly occurring and have called upon the Institute as an organization for guidance. The Institute in consequence has been gradually extending the field of its activities, particularly through its committees, and it intends to keep abreast of the times in order that the status of the profession will constantly improve.

The construction industry needs cohesion and its various branches look to the profession for leadership. So far they have not been disappointed, and the work will continue until it is perfected. It is a big undertaking and one that will require a great deal of time, and each step should be thoroughly understood before the next is taken. The architect can easily create and maintain for himself an enviable position in this great industry if he will recognize the constantly changing conditions and foresee the future developments in time to direct them intelligently.

CARAVEL OR MOTORSHIP?

BY

FRANK LLOYD WRIGHT

THE fate of the architect is largely in doubt. No longer an essential factor in our civilization, he is now a "designing partner" or an employer of "designing partners."

And this dismemberment has happened to him at a time when his services are as necessary as ever, if not more so, and because as "architect" he has preferred to sail or tow a caravel, instead of investing in a streamlined motorship of the line.

The caravel is picturesque but no longer practical. Until he can see the streamlined motorship as more beautiful than the caravel, 99 out of 100 American architects will continue to "design" their way to complete oblivion.

If this machine age needs an architect at all it needs him in the same place now as he was in former civilizations, and that place was the interpreter of the industry of his epoch, the builder of the buildings natural to their day.

Now, it may be that the buildings natural to our day may be only plain or fancy masks, and a masquerade may be all our under-educated, overtutored people have coming to them. In that case the function of an architect is that of a decorator and chiefly important to women who do not know what architecture is — but do know what they like.

The business of industry is not one thing and architecture another thing. If it is, then the God of things as they are will have done with both.

And when the matter gets down, as it has, to a struggle as to whether architecture is to be "modern" or "antique" there is a laugh in it somewhere at the "business" as well as the "art" of architecture.

Why do we have "modern" architecture?

Just because it seems necessary to *insist* that the motorship is more natural to us, more native than the caravel — that is all.

The "academic" can't remodel the old caravel into the new motorship without sinking, so there "architecture" is, for the time being — at sea in a caravel.

That means if we are going to have architects at all, in any vital sense, we will apprentice them, not to academics or the landlord or to business, but, humbly, to the industry of our time.

The place for the architect, adolescent or adult, is in this field directly connected with the making of things the way we now make them in order to show us how to make them better by making them more appropriate and significant.

Architectural education as it stands must be abolished and this apprenticeship substituted before we can get our architects back again where they belong.

But perhaps it is too late.

The caravel is a prideful institution.

TO ORGANIZE, TO DIRECT, TO DESIGN

BY

WILLIAM ORR LUDLOW

Blank & Stoller

THERE is today a ringing challenge to the architectural profession, especially to the young men, to prepare themselves for leadership and then to step into those positions of authority and control for which their training and ability have fitted them.

George B. Post enjoyed telling often the story of how in the early days of his professional career he applied to a big banker for the job of designing a $50,000 bank building, and was told by the banker that he really couldn't give him the work as he had "a carpenter in his employ all the time."

From that time to this the necessity of the service of the architect has been increasingly appreciated by the public. The call for leaders is insistent, and the building industry is looking to the architects. They are the men whose training teaches them to think constructively; they learn to imagine great things, and then to make them possible; it is their job to organize, to direct, to conduct projects to completion. The architect of today is not only an artist, as in the days of George B. Post, but he is a business man, an engineer, a man in command, an executive, and the possibilities held out now to the practicing architect for the doing of big things was never so great. An architect's success today need be measured only by his own size — the size of his job is unlimited.

Yet occasionally we hear it predicted that in these times of great mergers the architect will become a mere adjunct to the builder's office, which is perhaps just as possible as that the builder will become an adjunct to the architect's office — this is not a matter of profession at all, the dominant man will be the man best fitted to direct.

But the probability is that neither of these things will happen. The builders and architects are likely for many years to stay just where they are, coordinated instead of merged, which is the probable future trend in all other business relationships.

There is perhaps color for the belief of some that in big, commercial building production the builders will have first place as against the artist-architect. The artist-architect, however, is not looking for that kind of a job, he will always have his independent field in monumental and residence work, which, with the growth of culture, is an ever-increasing field; but the man best fitted to head up the great commercial project is the man who has a general grasp of all the affairs involved — the business-architect.

It is sometimes predicted also that mass production and standardization are going to make a catalogue performance of much building — no architect required. Perhaps so, but only low-price housing and some commercial work will be done in this fashion, for, aside from these lines, identical plans for different people and different projects in different locations are utterly impracticable.

Until better times come, the volume of work will undoubtedly be curtailed, but depreciation has already made an immense volume of work necessary, and in these days of rapidly changing requirements obsolescence comes so quickly that the next years will see a record activity in building from one cause.

Then the design of specialized work, such as hospitals, schools, apartment houses, churches, city planning, will require as never before a great number of architects, trained and experienced in the particular fields, and we are only at the beginning of specialized practice.

Further, it was not so many years ago that the public was satisfied with the appearance of what the builder could give them. Today the prospective house owner demands a good-looking building, and the church, the school, the hospital, and even most commercial buildings must be satisfactory in design.

So the architect is no longer a luxury but a necessity, and has come into a position of importance and influence quite unknown when he was just a "man who drew pretty pictures."

Again, as we increase in education and culture, the demand for designed buildings correspondingly increases. Not many years ago not 10 per cent of the money spent on buildings was for work designed by architects; today over 50 per cent is so designed.

To meet, then, the new and great requirements of our professional work by special study and preparation would seem to be the reasonable thing. The architect's opportunities for future work and usefulness are unlimited and his field of possible activities widens with the passing years. He should be the dominating force in the building industry, and the best we can wish for our profession is that its splendid opportunities will attract to its membership men of ambition, enthusiasm and high character.

THE ARCHITECT'S FUTURE IS NOW

BY

R. BUCKMINSTER FULLER

IN ANSWERING the question, "What is the future of the architect?" an opinion-of-probability is called for. Opinions-of-probability, when unqualified by inclusive provision of factually sustained logic, merit little credence in these days of increasing discernment. Texturally prohibitive limits, precluding adequate documentary support of opinion in this answer, do, however, allow of substantiation-by-inference deducible by refinement-out-of-definition. Definition of the dominant categories into which architects may readily be subdivided is necessary to a creditable understanding of any opinion-of-probability which may be tendered.

This answer postulates, and will amplify the notion that there is *now* greater opportunity of high social service and harmonious articulation for the architect than in all recorded time. The cursory reader may stop here. If in disagreement, through misunderstanding sustained by lack of definition, he will probably snort, "Pollyanna."

The opinion proffered excludes from its qualifying definition of "architect" those who calculate that an investment of a specific period-of-time-and-dollars in a professionalizing course of "architecture," and its traditional "apprenticeship," entitles them to a positive "cut," and compounding "interest," in the shelter business. The definition excludes the professionals who huddle in protective associations, consciously opposing progress, until such time as they may be able to impose a cash-in of their "technique." In fact, those who persist in a closed-formula, predicated on past architectural performance, will participate to ever less degree in the highly responsible architectural service now potential to universal growth.

The financial exploitation of evolutionary exigencies, usually indicated by the selfish word "participate," will be progressively supplanted by unconscious initiation of harmoniously disposed shelter-service to mankind's every activity, to the spreading breadth of operation of such activity, and to the resultant increasing human mobilization. Concurrently, the bread-and-butter patronage-aspect of architecture is peremptorily transferred from dominance by private-idiosyncrasy to the essentially enforced-adequacy of popular patronage.

In such transfer superficial-æsthetic-notion, ethically-enshrouded-hypocrisy of competition, and self-asserted omnipotence, practiced in the matter of conscious arbitration of activity in relation to evolutionary revelation, have no part. Popular-patronage eschews Pragmatists and "Planners."

The service of the "architect," designated in the opinion-of-probability, involves constancy, intellectual integrity, universal inclusiveness of conceptual attack, all animated by an enthusiasm born of the potentials of scientific contemplation, and pervaded by a pro-social dominance.

Such service is effectively articulatable through increasing *anonymity* of initiation, invention, correlation, stimulation, and allocation. The cooperative nature of industrial selection-and-composition in its one-for-all and all-for-one merger is directly proportionate, in its effectiveness, to the degree of spontaneous anonymity of initiation.

It is the responsibility of the architect, of the unselfconscious-service-definition, to develop through the synchronizable instrumentality of shelter, its component mechanics, and continuity of service considerations, an increasing equality of realization by humanity of the universal forces progressively harnessed by science and industry. It is the responsibility of the architect to *raise* the level of universal existence to the progressively "highest" standards of survival and growth. This process constitutes the dynamically-considerate *evolutionary* course of human growth, as opposed to the counter-dynamic *revolutionary*, lazy, stop-short-method which would first *level-down* high standards of existence to the lowest-common-denominator, slave or bourgeois, to satisfy an inferiority complex and excuse a political imposition of the devastating "class" wedge, vindictively prolonging misunderstanding, prejudice, and selfishness, enforcibly sustained, through bipolar competitive survival.

Responsibility rests with the "architect" for the irrevocable integration into society of universally accredited primary survival, in the matter of disposition of the constantly improving availably "best" shelter, clothing, and sustenance, in a world which now (as indicated by scientific survey of the North American continental industrial activity) can, by elimination of precious-accounting and pretense, through the effort of one man out of every five, working but one day a month, produce and distribute all the goods and services of current

distribution and standard. Resourcefulness and diligence, in the conscientious perusal of the myriadly available technological data of ways and means, for the integration involved, will mark the "architect." Effete buck-passing of technical responsibility and hopeful guesswork will find no foothold in the emerging "architecture."

The "architect," with varying dominance in his three primary categories of harmonic service, to wit: inventive, compositional, and interpretative, is privileged to initiate the transitional "suspension bridge" through the medium of the currently unifying and concentrating attention of all industrial and social forces upon shelter, with its consequently inevitable outgrowth of universally conceived and industrially reproduced elements.

Specious "planning" abortions have been disgorging through the press in plague-proportion over the signatures of personally ambitious unemployed schemers, only to bewilder and mock the herds-of-transition. "Plans" inflame the popular sense-of-futility by reciting, in chorus, the potentials of survival-abundance "on the other side" of some social-lunacy-system-barrier, weakly suggesting that the barrier be legislatively voted down, blithely discounting political fallacy and mental inadequacy of politically compromised "representatives." The "architect" will, through the universal inclusiveness of his design for industrial organization of shelter service, clearly indicate that industry, to attain true economy of operation and freedom of scientific expedience, must automatically accredit primary survival to all. The architect will diagrammatically indicate how unification of such industrial accounting will be effected through industry's correlating medium — the press — as the latter, progressively divorced from advertising compromise and the political circus, concentrates on survival.

What future architects? — Architects future now.

THE ENCOURAGING ECONOMIC FACTORS

BY

FRANKLIN D. ROOSEVELT

GOVERNOR OF THE STATE OF NEW YORK

Keystone

I FEEL that the present economic depression will prove a great boon to the architectural profession. It has given us a chance to take stock of how well or how poorly we have been building these many years.

More expert planning by the better trained men is necessary to meet the economic adjustment. In the past, many buildings have been erected from plans prepared by men without proper architectural training and this has resulted in a reckless waste of space and awkward and inconvenient arrangements. Competition is demanding better planned and designed buildings which will, in a large measure, eliminate the jerry-built construction. Mortgage companies are requiring higher standards which will necessitate the employment of architects fitted to meet their requirements.

Also because of economic conditions, every piece of material used in a building must be put to a severe test. Is a certain material economical? Will future maintenance make it costly in the end? Does it best fit its purpose? Has it the required æsthetic qualities?

To make this analysis is not the work of an incompetent man, but that of the architect with training, experience and judgment.

For the past three years there has been a retrenchment in business, social and community activities. Naturally, architecture has suffered along with the rest. There is not a village, town or city which has not constructed fewer buildings during this depression. As soon as business improves it is only natural to expect that there will be a decided stimulation in building construction throughout the country.

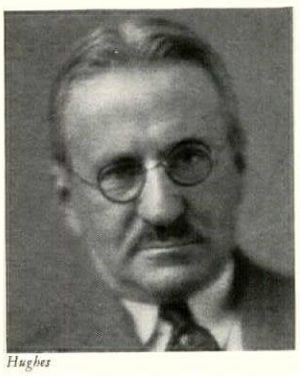
It is true that the building of homes at this time has been almost at a standstill. Families have been obliged to combine forces and live in the same quarters. When conditions improve, an impetus to home building will take place and new developments will spring up. There is already a decided trend toward more carefully supervised developments. This means more desirable and attractive places in which to live at no greater cost than some of the hideous developments of rows and rows of unsightly houses which are a blot on our landscape.

With these conditions in mind, it would seem that the architect's position is more secure than ever to assure our country of buildings more efficiently designed, more economically sound, and more properly related to their social needs and communities.

FEDERAL AID TO THE SOCIAL WELFARE

BY

ALBERT KAHN



Hughes

WHILE things at the moment look rather chaotic and a change for the better seems far distant, there is no cause for losing faith in the ultimate return to normalcy. The world has not come to an end and although the country has been over-built for the present, a revival of the building industries is bound to occur, perhaps sooner than now seems probable. Obviously, everything must be done to hasten the day of recovery. The construction industry is one of the largest employers of men, one which influences innumerable other activities wherefore it deserves especial consideration.

Private effort alone will not revive building construction. Government aid is essential in this emergency. Judiciously administered, billions of dollars might well be appropriated by the Federal Government for aiding construction work of all kinds. Not that a "pork barrel" is wanted but rather, support to make possible improvements which though much needed are too often not undertaken in normal times. The Government at the moment is carrying on extensive operations in Washington and is building many Post Offices. This is helpful but profits only a limited number of cities. All sections of the country need assistance. An extensive building program carefully worked out and aided by the Federal Government would provide it. State capitols, State office buildings, court houses, city halls, libraries and museums, armories and the like could well be built in numbers. Harbor and river fronts could be improved as in Europe, slums removed and blighted areas rehabilitated. Entire sections of cities might be cleaned out and developed into parks and playgrounds with benefit to all. With proper excess condemnation laws, the entire cost could be recovered. Streets might be widened, automatically stimulating building, and city plans improved. Every city might well have, as in Germany, its public stadium, its auditorium, its exhibition building, its public baths and other similar structures for the promotion of public welfare. New schoolhouses should replace many today unsafe and unsanitary. Many sections of the country are inadequately provided with properly equipped penal institutions, with hospitals and asylums for the mentally ill. Sewage disposal plants, water works and any amount of other construction work might be undertaken which would soon start to improve conditions.

Obviously, all this would mean increased taxes, but what objection to this with work plentiful and business prosperous? To provide the funds for the new improvements would mean inflation, but what of it? With things going, men and women employed, conditions would soon right themselves. Indeed the mere announcement of a vast building program would quickly have its wholesome effect. The chances are that Government aid would soon be unnecessary, with confidence restored, factories running and conditions generally improved. Federal aid given to road building has proved a boon to the entire land. Federal aid in public construction work of the kinds cited would no doubt prove equally salutary. Indeed in the present emergency such help is imperative. To spend large sums for extravagances merely to help non-employment would be folly. The importance of economy is not to be overlooked but a judicious expenditure is often the best economy.

"Keep the building industries going" should be the slogan of not only architects but all business men for all would benefit thereby. Concerted effort is all essential. In this the American Institute of Architects should take the official lead and call upon every possible agency for assistance. The radio, the help of good public speakers should be enlisted in broadcasting the need for Government help in construction work throughout the land. With the building industries revived, general business would soon recover and normal conditions again obtain in the architectural as well as every other field.

As for the fear sometimes expressed that contracting engineers and material men are usurping the architectural field, we need be little concerned. If architects cannot prove their service worth while, they deserve to be replaced by others. There is little danger of this, however, for important buildings will be constructed hereafter as heretofore and such will continue to be entrusted to architects whose training and experience warrant their engagement.

Times like the present test one's resourcefulness. The problems before us may appear overwhelming but with clear thinking, faith in one's self and a reasonable amount of optimism, the skies will eventually clear and all will be well again. In the meantime, everyone must bear his share of the day's burden. It will be well to do it with a smile.

ARCHITECTURAL LEADERSHIP

BY

EDWIN BERGSTROM

Underwood & Underwood

"IN THE schools of the wrestling master, when a boy falls he is bidden to get up again, and to go on wrestling day by day until he has acquired strength; and we must do the same, and not after one failure suffer ourselves to be swept along by the torrent. You need but will, and it is done; but if you relax your efforts you will be ruined, for ruin and recovery are both from within."

—Epictetus.

IN THE morass of anxiety that has lately engulfed the American mind, the architects are learning that doubt is the price we pay for our advanced intelligence and civilization — the dim night after a resplendent day. They have enjoyed the blessings of life during the careless, carefree day; and they have seen their business diminish, their goods become valueless, and their savings vanish — some are even fearful of what the future holds for their profession. Doubt is a natural phase of life, but as certainly as it is natural, it is also temporary. Knowledge is the cure of doubt, and if we work out the truth by our own exertions, we begin the cure.

Leadership is America's vital need today. It is essential that we shall have leaders who will face the truth honestly and squarely, who will lead us out of the morass in which we are bogged, put our feet on firm ground, simplify our objectives, point out clearly the way to achieve them, and guide us without fear and equivocation to their accomplishment. If we are to maintain our nation, there must come out of all this present confusion a leadership that will show us the way to regulate our industries and our commerce; that will make impossible again the artificial stimulation of business ventures, which has led inevitably to bankruptcy of both capital and labor; that will eliminate the repeated charges of the middle man, which has led to excessive costs of materials and services; that will make impossible again the piling up of fictitious capital, which has led to receiverships and to untold losses to innocent buyers; that will eliminate the control and direction of a business by entrepreneurs who are not familiar with its processes, which has led to unwarranted intrusions and undue operating losses; and that will eliminate the uncontrolled employment of labor and machines, in order that we shall not be led again to all the old evils of bad housing and unemployment.

Such leadership must eventuate out of our present trials if our machine-capitalistic scheme is to be preserved. It is the present opportunity of the architects to provide this leadership for the building industry. The architectural group is most fitted to assume such leadership by reason of the imagination and the training of the architect and his background of altruism and idealism which he must infuse into the industry.

The building industry has never had a leadership. A certain control has been exercised by the entrepreneurs who furnished the money for the enterprises; a control that has been so unwise in so many instances that its breakdown has forfeited public confidence in building loans. Money has been furnished for land subdivisions and for buildings either criminally conceived or valued, or totally unwarranted by any need, in order to provide profits for everyone concerned except for the ultimate buyer, resulting in the pyramiding of land values and in the destruction of the values of competing buildings. Public confidence in the building industry must be restored.

The leadership must ensure that the flow of money into building projects shall be protected and conserved, and that investments in unnecessary, untimely, and wasteful buildings shall be avoided. It must ensure that each group of the industry shall perform its distinctive function for the industry, that the efforts of all such groups shall be coordinated and combined to effect joint and collective efforts, and that no group shall undertake activities not within its understanding and sphere, nor duplicate or overlap the activities of any other group. Such leadership must ensure that labor shall perform its function efficiently and economically, during such periods as will ensure a competency for all, and that labor shall be given a reasonable assurance of continuous employment by the wise regulation of the industry and of the flow of labor.

The addition of orderliness, proportion and distinction to a structure has been and always will be the distinctive contribution of the architects to the building industry. But they must now undertake a further responsibility and assume this leadership and guidance of the building industry. Then they will emerge from this morass of adversity as a solidified and strengthened profession, conscious of a new power within itself.

CHANGING RELATIONSHIPS AND PRACTICE

BY

A. P. GREENSFELDER

IT WOULD seem timely, in view of the continued recurrence of economic depressions following uncontrolled booms, that architects might well consider the broadest phases concerning the needs of our citizens. Planning the lives of our citizens should precede the preparation of detail plans for structures erected for them.

The rapid growth of city planning indicates the need for community planning. Americans are gradually realizing that in populous areas they are more and more dependent upon each other and, therefore, can be less independent in their structural demands. Zoning, which includes regulation of use, area and height of structures, is now thoroughly implanted in law and equity. Architectural "Commissions, with power to pass upon plans, may be the next logical step to insure harmonious architectural treatment which will preserve neighborhood and individual building values and guard against too rapid depreciation.

The defaulting experience in first mortgage bond issues for apartments, hotels, office buildings and the like indicates the need of review of such projects before permitting their sale to the public. It does not seem unlikely that certain future requirements before the investing public will invest, such as "Certificates of Necessity or Convenience," will be required from competent boards in advance of financial offering to the public. Recent developments also indicate the need of sound appraisals by competent designers and constructors who shall certify as to the true value of the construction project.

Since consolidation seems to be a tendency of the times, perhaps architects may find it to their interests to form architectural groups in various centers. This has been recently exemplified in Los Angeles and St. Louis. Such consolidations of architects and engineers with specialized talents could perhaps afford better reference libraries, specification data, and supervision service, with the least expense and the greatest comfort to the incorporators.

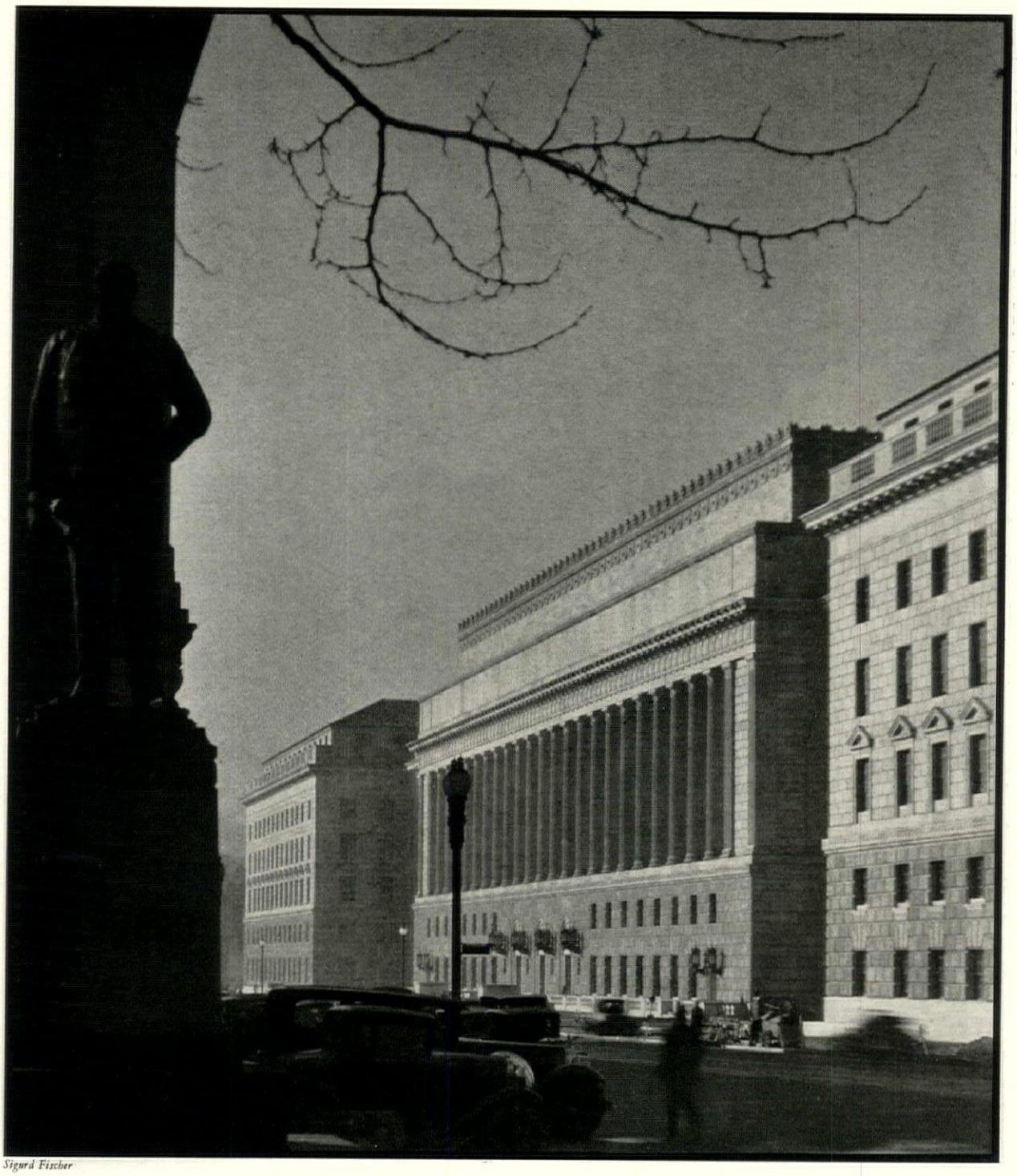
The constructor needs the guidance of the designer who can dream new designs, and the designer needs the assistance of the constructor who can make his dreams come true. The designer and constructor must realize more fully the value of continuous cooperation

There is an outstanding need for a more equitable form of contract, and the sooner this need is met, the less confusion and intimidation will result. Since the business of the contractor is to assume the financial responsibility for the completion of a structure containing certain definite quantities within a stipulated time at an agreed price, and the professional code of the architects does not admit their assuming this financial responsibility, then the tendency should diminish toward applying the segregated contract system. It seems elemental that the construction industry should adopt a "single price" system from top to bottom, the same as other industries have done.

The increasing use of the sliding fee by general contractors with a guaranteed maximum cost, raises the question whether this form of fee might not occasionally be desirable also for the designer. While professional ethics may exclude this for the moment, such ethics are changed with the times. The sliding fee form of contract insures cooperation between the designer, constructor and owner, permits starting of work without waiting for full completion of detail plans and instructions, and the selection of the general constructor perhaps at the same time as the designer is chosen. If through his ability and willingness to cooperate, the constructor is awarded a percentage of savings, would it not be equally proper that the designer should likewise share in the savings?

The trend of the times is toward reduction in unit cost by whatever means possible. Convenience ultimately wins over custom. If the tendency to prefabricate materials is any indication along this line, then it would seem that architects should design these units in order to secure harmony of color, texture and comfort. It is not sufficient that manufacturers should agree among themselves regarding standardized dimensions, but should obtain architectural guidance.

I am convinced that the coming generation will demand more building than ever before. There is a continuous need for more schools for higher education, more libraries, hospitals, finer public buildings, *ad infinitum*. The future holds a brilliant prospect for the many architects of talent and genius who are willing to fall in with the trend of the times and demonstrate the leadership inherent in the profession.



Sigurd Fischer

This building, the result of a nation-wide competition and part of the comprehensive development of Washington, D. C., was designed to harmonize with the other Federal buildings and still provide the maximum of efficiency for governmental activities. Preliminary perspectives and plans were shown in THE ARCHITECTURAL FORUM for September 1931

DEPARTMENT OF COMMERCE BUILDING

WASHINGTON, D. C.

YORK & SAWYER, ARCHITECTS

Sigurd Fischer

DEPARTMENT OF COMMERCE BUILDING

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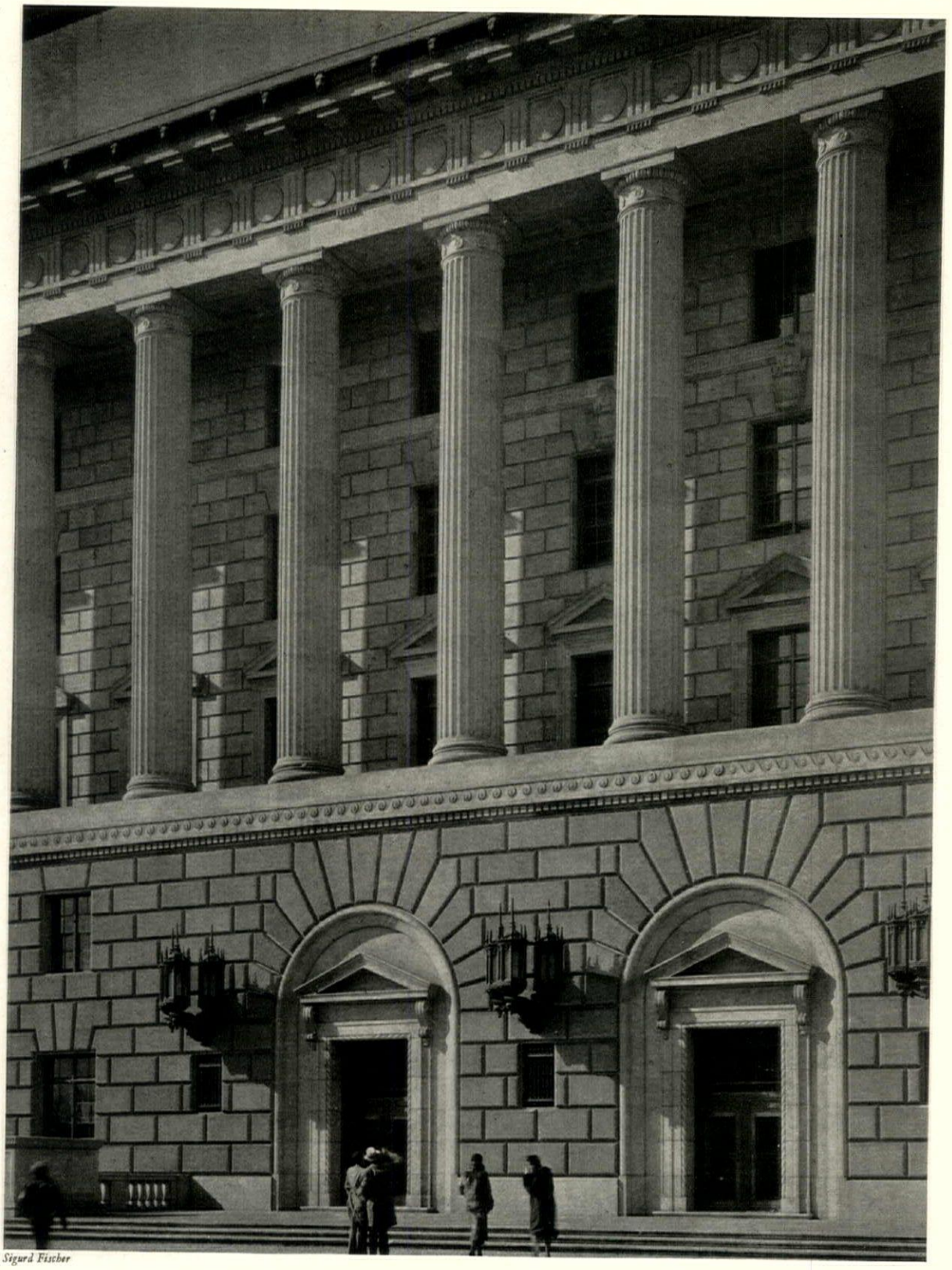

Sigurd Fischer

DEPARTMENT OF COMMERCE BUILDING

WASHINGTON, D. C.

YORK & SAWYER, ARCHITECTS

Sigurd Fischer

THE CONFERENCE ROOM

OWING to its great lateral size, the Commerce Building was planned in three units which are in effect three different buildings. The whole covers a space formerly occupied by three city blocks and is pierced by two sets of triple-arched gateways, two stories high. These give direct access to the building and to the interior courts which are placed on the axes of C and D Streets. Flexibility in working space was a major consideration of design. All the working offices in the building are standardized and so arranged that they may be used either as single offices 15 ft. wide or as long working spaces from 200 to 300 ft. long. As few structural partitions as possible have been used. Where partitions are necessary they have been installed in interchangeable units of glass and steel. As a further aid to the building's interior efficiency, the most up-to-date mechanical devices for communication, ventilation, sound absorption and lighting have been installed.

On the exterior, the base course, which is two stories high, is faced with granite, laid in an ashlar pattern with rusticated joints. Granite is used also in balustrades, copings and approaches. The upper portion of the exterior is limestone with a smooth, sand rubbed finish. The interior, with the exception of the special rooms is finished as a commercial office building. A notable exception is the Conference Room which is two stories high and has a seating capacity of 1,160. In this room the wainscoting is of walnut and the ceiling, although actually of plaster, is coffered and beamed and painted to simulate wood. The decoration in this room as well as that throughout the entire building was done by Barnett Philipps

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DEPARTMENT OF COMMERCE BUILDING

WASHINGTON, D. C.

YORK & SAWYER, ARCHITECTS

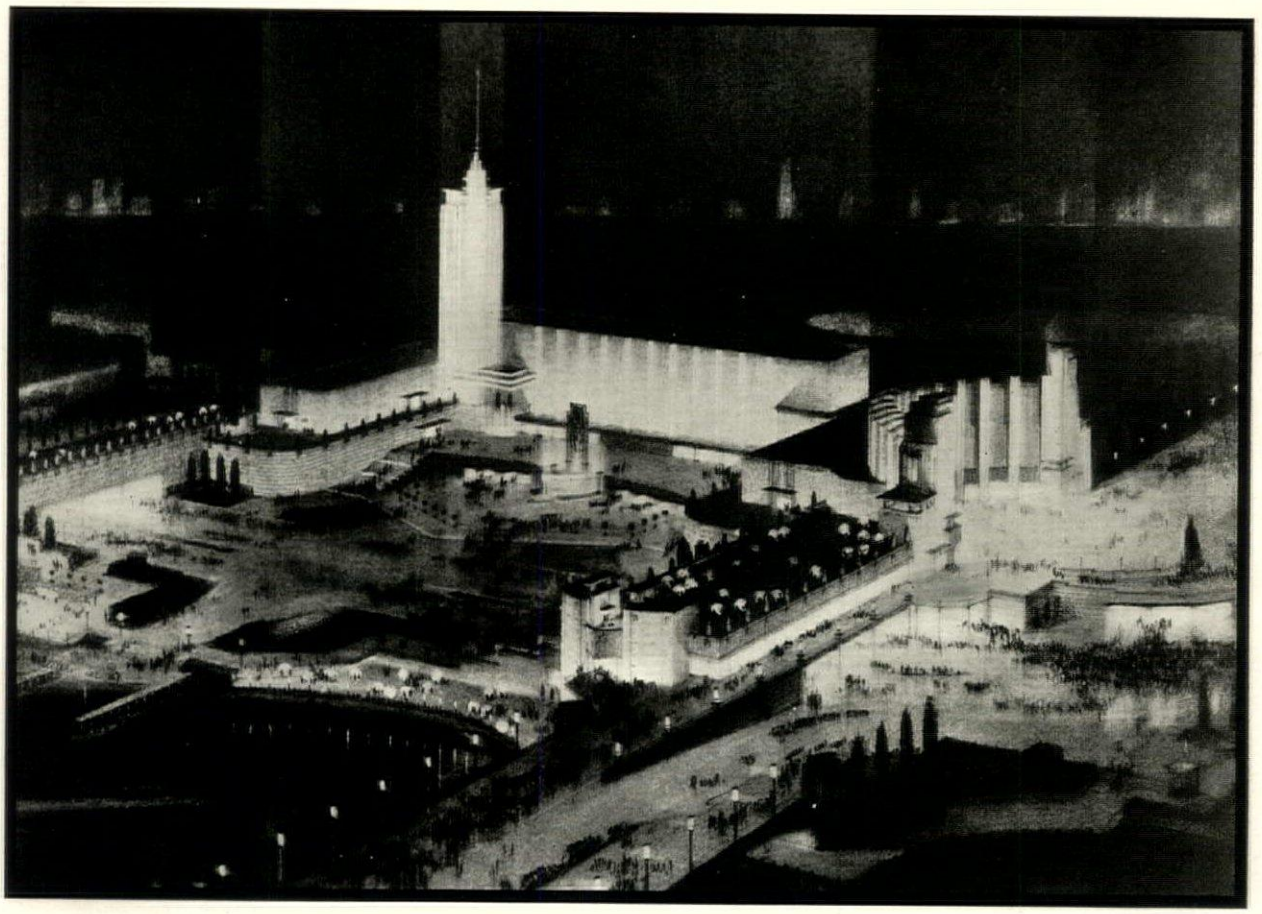
Sigurd Fischer

MAIN ENTRANCE LOBBY

DEPARTMENT OF COMMERCE BUILDING

WASHINGTON, D. C.

YORK & SAWYER, ARCHITECTS



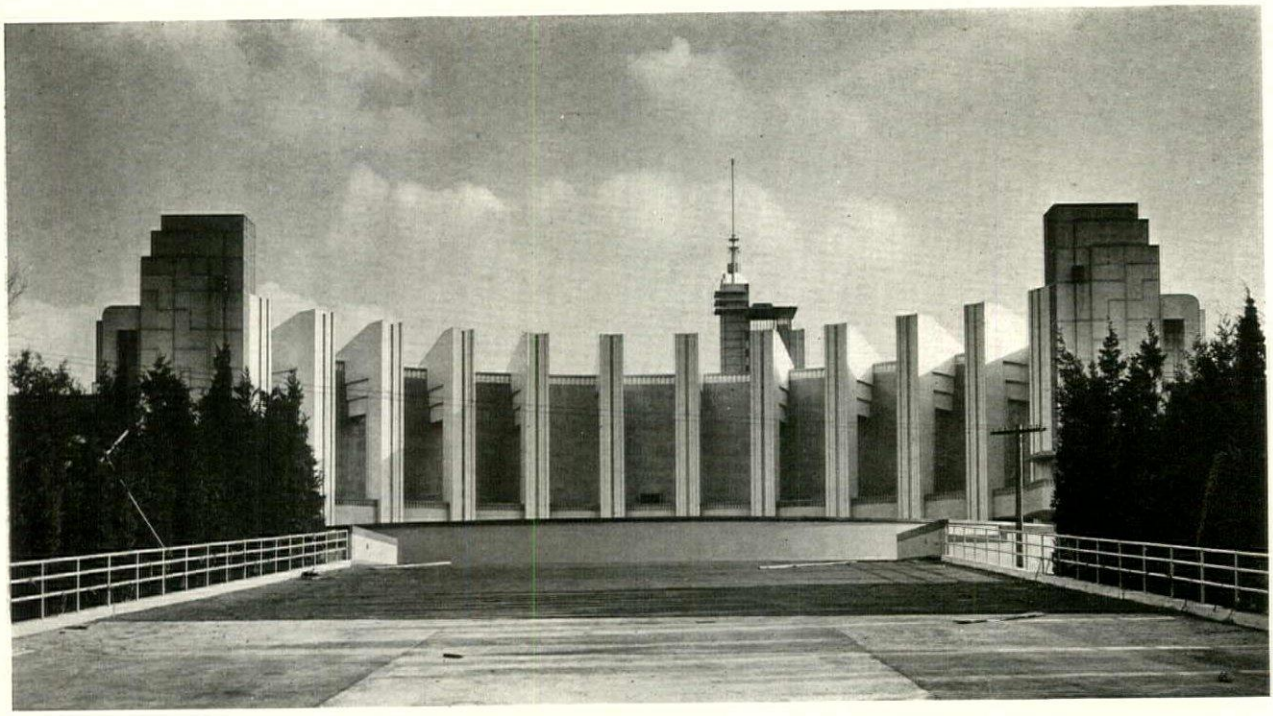
THE Hall of Science is one of the most important buildings of A Century of Progress Exposition, to be held in Chicago in 1933. It occupies a dominant position in the plan of the exposition and has been built in the shape of a great "U" planted over Leif Eriksen Drive with the two arms reaching toward the lagoon. The space between them will constitute a great court covering 130,000 sq. ft. and planned to accommodate many thousands of people at open-air festival ceremonies. The various spaces of the interior will be devoted to dramatic exhibits portraying the development of the pure sciences and their application to art, industry and commerce. The Hall of Science is not yet entirely completed and the illustrations herewith are merely an introduction to a more complete presentation and description of the building which will appear in the October issue of THE ARCHITECTURAL FORUM. Already completed for A Century of Progress Exposition are the Administration Building, published in THE ARCHITECTURAL FORUM for August, 1931, and the Travel and Transport Building, published in the October 1931 issue. In the process of erection now are the Electrical Group, the Chrysler Building, which was announced in the May 1932 issue, and the various housing exhibits

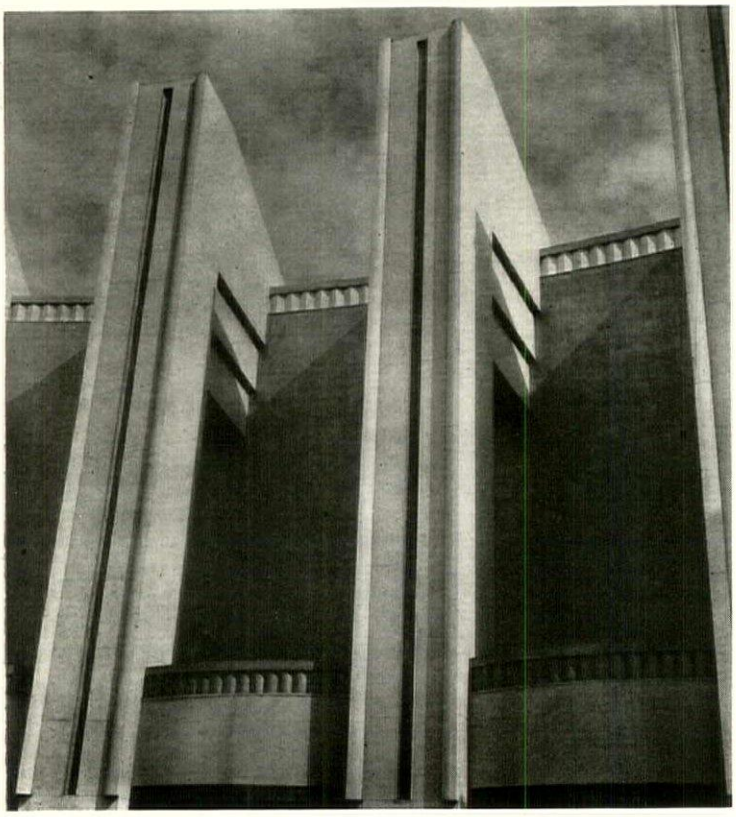
THE HALL OF SCIENCE

A CENTURY OF PROGRESS EXPOSITION

CHICAGO, ILLINOIS

PAUL PHILIPPE CRET, ARCHITECT





THE two illustrations on this page are a general view and a detail of the ramped approach to the building from Leif Eriksen Drive. The space between the buttresses will be filled with a series of flat, decorative bas-reliefs, symbolic of scientific progress. On the opposite page is the other entrance from Leif Eriksen Drive, and on page 106 is a view of one of the entrances from the huge quadrangle court

THE HALL OF SCIENCE

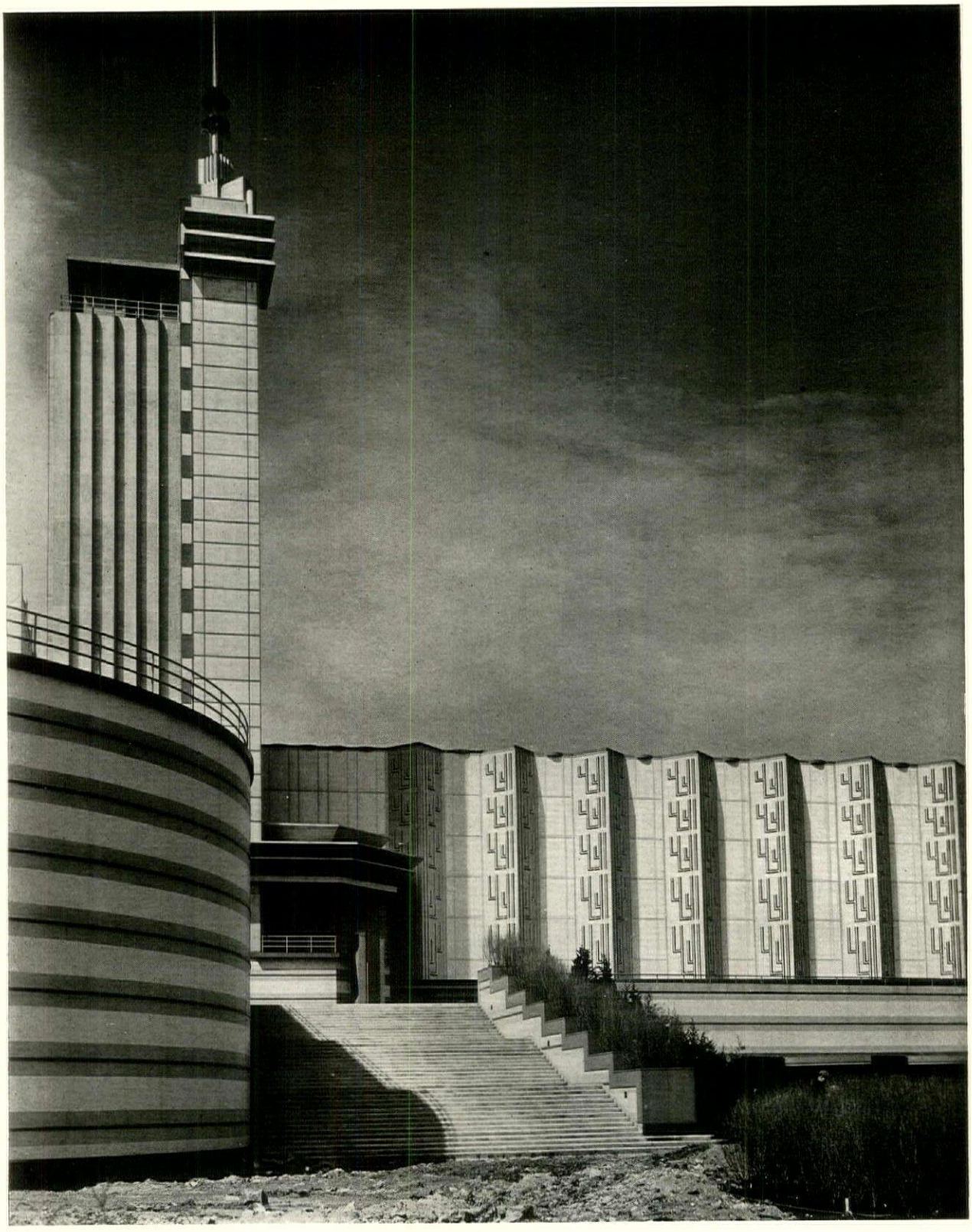
A CENTURY OF PROGRESS EXPOSITION, CHICAGO, ILL.

PAUL PHILIPPE CRET, ARCHITECT

THE HALL OF SCIENCE

A CENTURY OF PROGRESS EXPOSITION, CHICAGO, ILL.

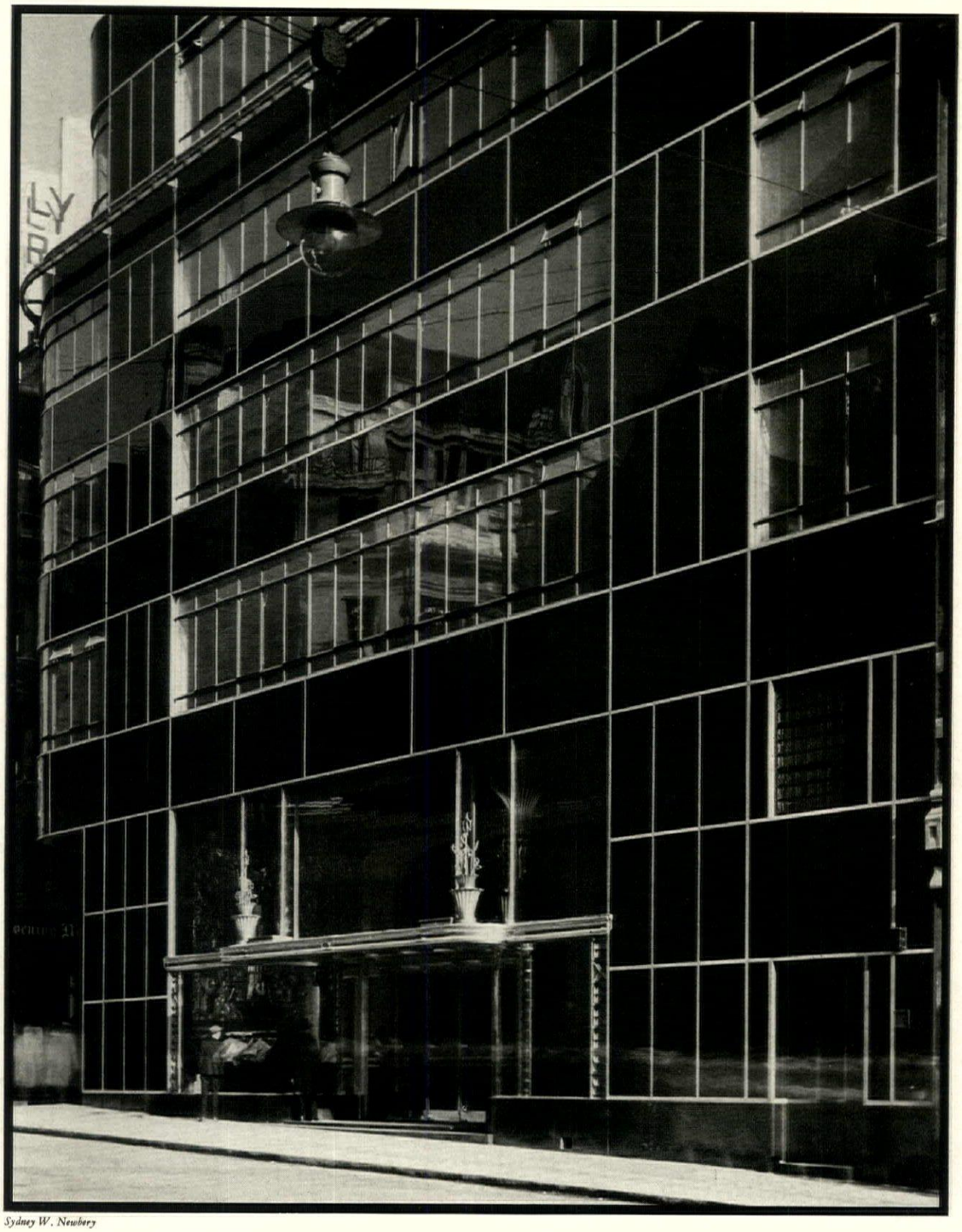
PAUL PHILIPPE CRET, ARCHITECT



THE HALL OF SCIENCE

A CENTURY OF PROGRESS EXPOSITION, CHICAGO, ILL.

PAUL PHILIPPE CRET, ARCHITECT



Sydney W. Newbery

"THE DAILY EXPRESS" BUILDING

LONDON, ENGLAND

HERBERT O. ELLIS & CLARKE, ARCHITECTS

Sydney W. Newbery

"THE DAILY EXPRESS" BUILDING

LONDON, ENGLAND

HERBERT O. ELLIS & CLARKE, ARCHITECTS

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"THE DAILY EXPRESS" BUILDING

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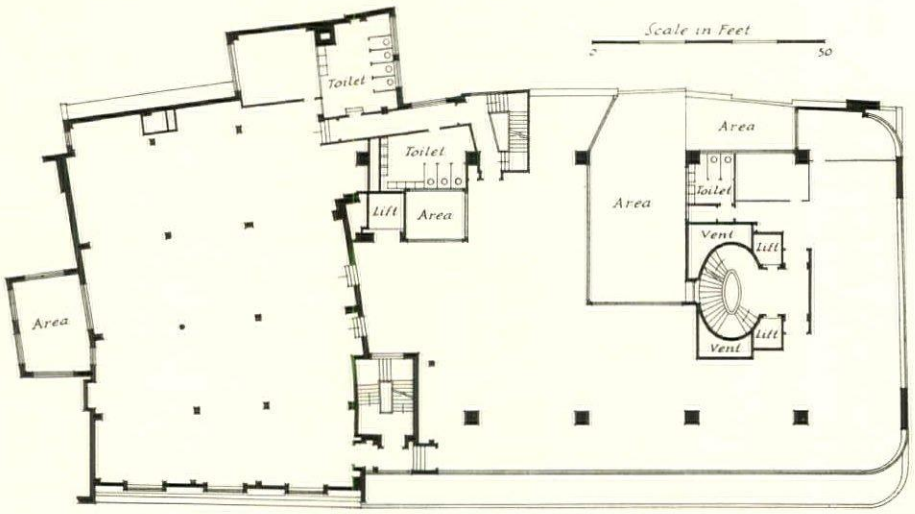
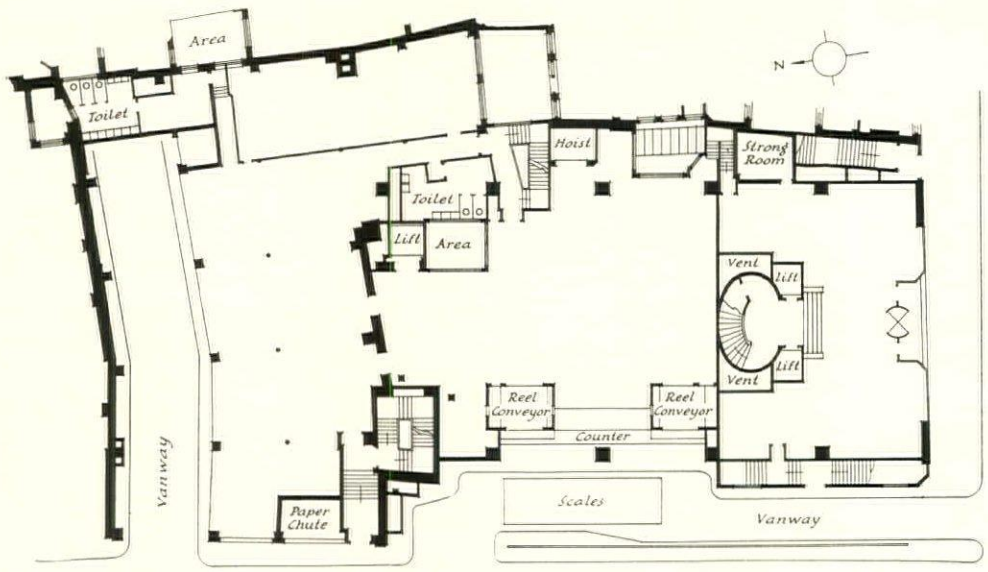


FOURTH FLOOR PLAN

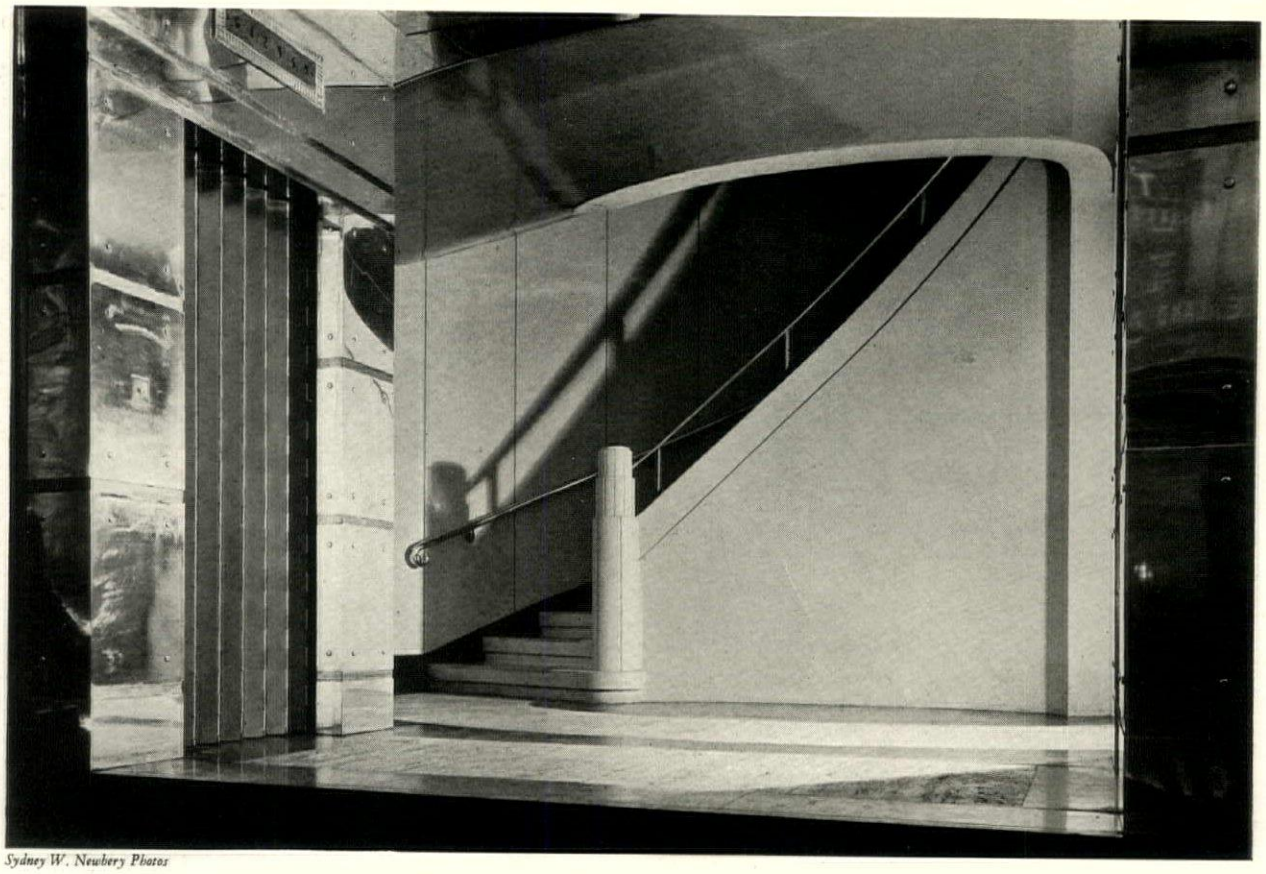


FIRST FLOOR PLAN

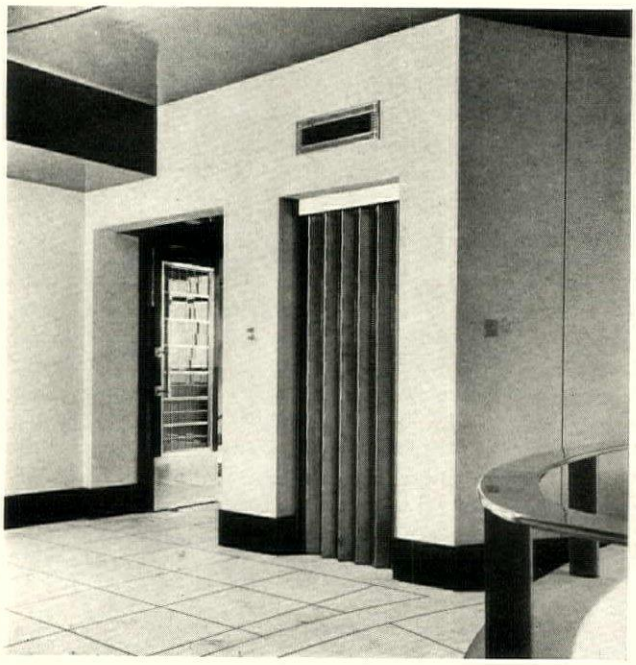
"THE DAILY EXPRESS" BUILDING

LONDON, ENGLAND

HERBERT O. ELLIS & CLARKE, ARCHITECTS



Sydney W. Newbery Photos

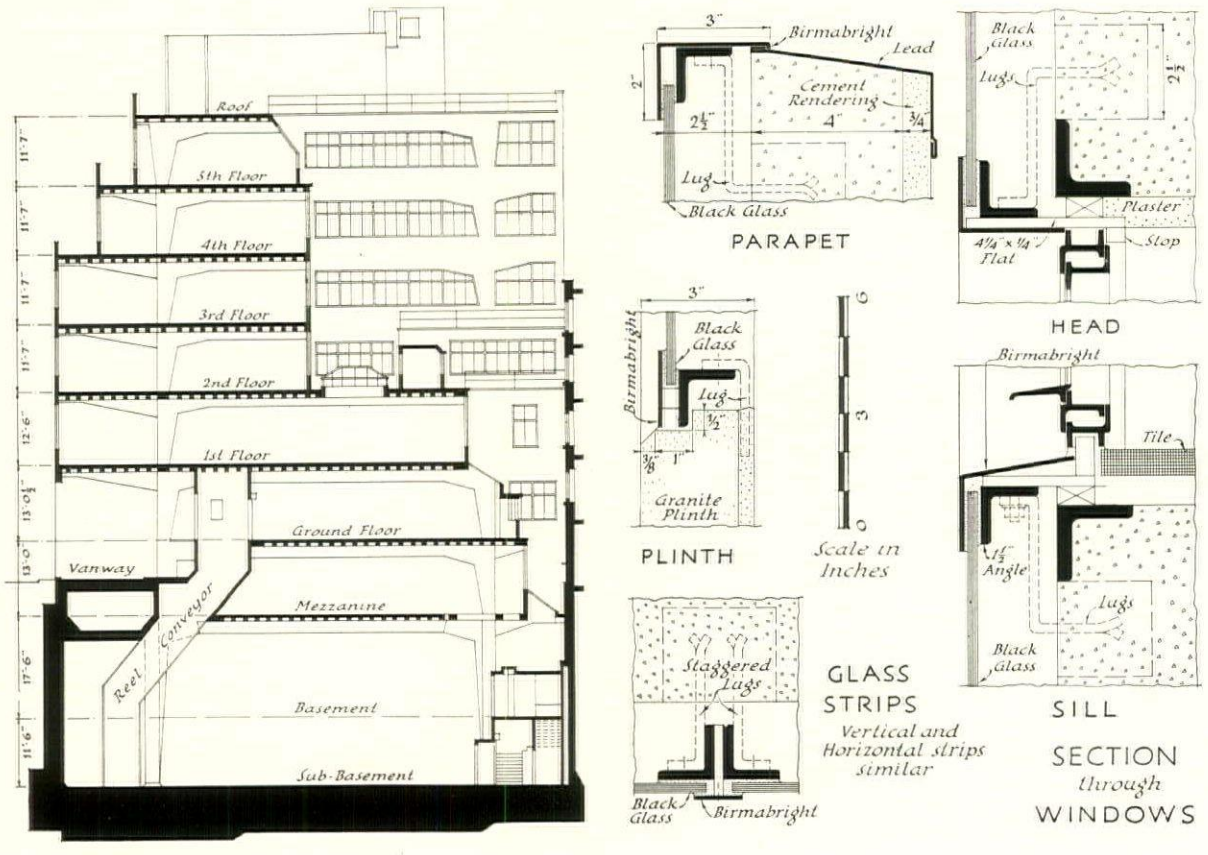


THIS building houses one of London's popular daily papers and has been planned in every detail to utilize the most modern equipment. The illustration on page 107 is the main entrance on Fleet Street. At the west side of the building the second story is cantilevered for its entire length, thus providing a canopy for the trucks using the vanway. The illustrations on pages 108 and 109 are of the entrance hall. The walls are plastered and painted in a multi-colored blend. The dado is of ebony and the coffered trim is of polished aluminum alloy. The illustrations on this page are of typical elevator lobbies. The one above is on the first floor just off the entrance hall and shows the beginning of the main stair. At the right is a corridor on the fourth floor. The elevator enclosure doors are of an unusual construction. They are made of polished aluminum strips, hinged at both sides, and operate on the principle of an accordion fold

"THE DAILY EXPRESS" BUILDING

LONDON, ENGLAND

HERBERT O. ELLIS & CLARKE, ARCHITECTS



THE rough construction throughout the entire building is of reinforced concrete, including the retaining walls below the first floor which enclose the printing presses, the foundry, the switch rooms and the power machinery. The paper rolls are located on the ground floor. They are easily unloaded from trucks in the vanway and are conveyed from the storehouse to the printing presses by two automatic conveyors. The first and second floors of the building are occupied by the business and editorial offices of the newspaper. The composing room is also located on the second floor, but above this level the entire space is devoted to commercial office accommodations. The exterior of the building is faced entirely with polished black plate glass held in place by strips of aluminum alloy which are fastened to metal lugs secured to the reinforced concrete wall. The space between the concrete and the back of the glass is filled with insulation in the form of a light-weight, pumice concrete. The building is heated throughout by a panel heating system, the pipe coils being set in the concrete ceilings at the time the concrete is poured. All the floors are insulated with a 2 in. thickness of cork placed directly on the rough concrete. The building does not contain a complete air conditioning system, but all the mechanical departments are artificially ventilated with warmed, washed air. The ventilating plant is located on the main roof

"THE DAILY EXPRESS" BUILDING

LONDON, ENGLAND

HERBERT O. ELLIS & CLARKE, ARCHITECTS

THE EDITOR'S FORUM

HOUSING is without doubt the most important of the "self-liquidating" projects contemplated by the present government relief bills, as far as the architect is concerned. It is imperative that housing be properly controlled and this is only possible through state and municipal laws and regulations. Because so few states have housing laws or housing commissions, it is the duty of the individual architect and the architectural organizations throughout the country to initiate and support proper laws. In order that this may be done, we are printing in full the report of the Sub-Committee on Housing Laws which gives recommended principles for the framing of safeguarding legislation.

It is only by the whole-hearted cooperation of the architect with the other interests in the building field which are looking toward a real solution to the housing problem that full usefulness can be made of the relief legislation now pending. Such cooperation means the active advocacy of laws embodying the principles set forth in the following report of the Sub-Committee on Housing Laws, Committee on Economics and Site Planning of the American Institute of Architects, entitled "Principles which It Is Recommended Should Be Embodied in a State Housing Law."

Kenneth K. Stowell

PRINCIPLES OF STATE HOUSING LAWS

FOREWORD

AT A meeting of the Policy Committee of the Construction League of the United States held in St. Louis in March the delegates of the American Institute of Architects were asked to prepare, for the other members and for general distribution, a draft of a model law for a State Housing Commission. In view of the variations in the form of such legislation which would be necessitated by the basic laws of the several states the Committee which prepared the attached document preferred to draft not a "model" housing law, but a list of the major features which such a law ought to incorporate.

This report would appear to be timely. In view of the inquiries being received now from all parts of the country from those who believe that many of the States will wish to avail themselves of the help afforded by the provisions of pending Federal "relief" legislation, it should also be suggestive and helpful. This draft has not received the official approval of the Institute of Architects, nor (because of the urgency) of its entire Committee on the Economics of Site Planning and Housing, though issued in its name.

Since New York had the longest experience with the actual workings of a State Housing Commission the Committee drew largely on that experience and was fortunate in securing for the Committee's work the leadership of Mr. Carl Stern, Counsel, and Mr. George Gove, Secretary of the New York State Housing Board. The other members of the Committee were Clarence S. Stein, A.I.A., former Commissioner of Housing and Regional Planning, New York State, Dr. Carol Aronovici, City Planner, and Robert D. Kohn, Past-President, A.I.A., and Chairman, Construction League of the U. S.

PRINCIPLES TO BE EMBODIED

THE purpose of the law is to obtain substantial housing, at the lowest possible rentals, planned, constructed, financed and operated by public utility housing corporations under state regulation.

The low rentals are secured by: efficiency of design, prevention of excessive land costs, large scale building operations, elimination of waste, reduction of financing charges, exclusion of speculative profits and the regulation of overhead expenses.

Sound values, sanitary construction and adaptation to environment are secured by the requirement for the approval, supervision and control of a State Commission as to the plans, specifications, construction, financial set-up and operation of the projects.

THE COMMISSION OF HOUSING AND PLANNING

Structure. There should be not over nine members. The members should serve without pay, but should be entitled to their expenses, including a limited amount of travel outside of the state to obtain familiarity with existing projects. The terms of the members should overlap. The terms should preferably be not less than five years.

The membership should include an architect, an engineer with building experience, a person interested in the financing of public and private construction, a person experienced in social service, having a knowledge of housing conditions, and a representative of organized labor.

Technical Staff. The technical staff should include: (1) A director familiar with housing and community planning. (2) A statistician. (3) A supervising architect to pass on plans and supervise

construction. (4) Accountants. (5) An experienced counsel. (6) Clerical staff.

Three, four, five, may be employed on a part-time basis or on a *per diem* basis when needed. It may be sound policy to charge against the respective projects an inspection and supervision fee.

The Commission, including counsel, should be independent of other State Departments.

Functions. The investigation of housing needs and conditions, and the distribution of population in relation to location of industry throughout the State.

Devising of ways and means of improving housing and housing conditions and of securing economies in construction. The replanning and replacement of areas that are a social or economic liability.

The collection and dissemination of information relating to housing and, specifically, the education of the public with reference to sound housing and planning standards. Cooperation with local housing and planning boards.

The promotion of low cost housing projects. The passing upon the applications to construct such projects submitted by public utility (limited dividend) housing corporations. The supervision and regulation of the construction and operation of such projects, including: (1) Passing upon architectural and engineering plans. (2) Consideration of financial structure and feasibility of the project. (3) Supervision of construction of buildings. (4) Supervision of operation, management, and of operating expenses. (5) Fixing of rents.

Powers. The Commission should have full powers of investigation, inspection and examination, including the power to subpœna and require the attendance of witnesses and the production of papers.

The Commission should be authorized to exercise these powers through a single member or the executive officer of the Commission.

The Commission will be specifically empowered to do everything necessary to enable it to carry out the functions heretofore described in connection with the approval and operation of projects, including the right to issue orders and make rules and regulations and enforce obedience thereto by application to the courts.

HOUSING PROJECTS

General. All housing projects should be large scale developments preferably forming a complete integrated neighborhood community. They may be for groups of single-family houses or multi-family dwellings, or both.

Because of the difficulty of control, they should be rental and not sale projects. Tenant ownership may be achieved by the ownership of stock in the housing corporation.

The projects must conform to proper standards with regard to land coverage, light and air, suitable and efficient construction, and must conform to the general plan of the locality.

The projects designed primarily for housing may benefit by permitting a strictly limited portion of the buildings or, in the case of a group of single-family houses, a strictly limited portion of the area, to be used for stores, offices, commercial, cooperative or professional purposes. (Under the New York Housing Law such uses are permitted on the ground floor and below and on the roof.)

The rentals for the commercial portions may be fixed on the basis of current market rates, enabling thereby a corresponding reduction in the rentals applying to residential use.

Rentals. The law should specify an *average* maximum rental. An *average* rental is suggested because certain apartments must of necessity be more desirable than others. The exact rent schedule within the maximum specified by the law should be fixed in each instance with the approval of the Commission.

The maximum rental may be higher in certain locations than in others. It may be deemed advisable to vest in the Commission the power to fix higher maximum rentals in congested areas where it may be desirable to operate but where land costs are higher than in outlying areas. (The rental basis adopted under the New York State Housing Law is a maximum average per room per month.) Any excess earnings, after expenses, amortization, proper reserves, dividends and a reasonable transfer to surplus, should be used to reduce rentals.

Financial Structure. There should be a minimum requirement with respect to the amount of equity represented by stock of the corporation.

Mortgages on a sufficiently conservative basis may be made legal for savings banks, insurance companies and trust funds.

Returns should be limited:

(a) The interest charges on senior financing should be limited to five per cent or six per cent.

(b) The rate of return to the stockholders should be limited to the amount fixed in the certificate of incorporation — not more than six per cent, and the dividends should be made cumulative.

(c) Overhead, supervision and financial charges should be subject to the approval of the Commission and reduced to a minimum. To this end arrangements should be made for the disclosure of any possible affiliation of companies making contracts with the housing corporation.

(d) If there is a liquidation of the housing corporation or if the corporation is permitted by the Board to sell its property to a purchaser other than a public utility housing corporation, any surplus over a return to the stockholders of their investment plus the limited dividend should be divided between the state and the municipality.

Selection of Tenants. Provision should be made under the regulations of the Commission, so that the tenants are selected from families with modest in-

comes. This requires investigation of the applicants.

Land Costs. Speculative profits on the land are avoided and excessive land costs checked by requiring the appraisal of the Commission, and in addition, by conferring the power of eminent domain after the issuance by the Commission of a certificate of necessity. (See further discussion of eminent domain.)

Use of City Lands. Provision may be made for the lease or sale of lands not needed for municipal purposes to public utility housing corporations.

Where lands are leased to housing corporations, the buildings should become the property of the city subject to the provisions of the lease. The city should be empowered to permit the corporation, under due safeguards, to mortgage the land and buildings in order to obtain financing on a conservative basis.

To safeguard the city, there should be the right of recapture at all times on the payment of a sum sufficient to retire the investment at the then amortized cost plus six per cent and the expenses of liquidation. All profits in liquidation or sale, over and above the return of the investment, plus six per cent, should go to the city.

PUBLIC UTILITY HOUSING COMPANIES

These corporations may not be organized, except with the approval of the Commission in connection with a project approved by the Commission. Their directorate must include a member appointed by the Commission. They must at all times act subject to the law and regulations and orders of the Commission. The stockholders may not earn more than the limited dividend specified in the certificate of incorporation.

Any surplus on the sale or dissolution of the corporation after repayment to the stockholders of their investment plus the authorized dividend and any accumulations thereof should be divided between the state and municipality.

The companies may not sell or lease their properties except with the approval of the Commission and subject to the regulations imposed by the Commission, nor may they dissolve or be reorganized without such approval.

The company's salaries and overhead expenses, its contracts, obligations and securities are subject to the control of the Commission.

COOPERATION WITH LOCALITIES

Arrangements consistent with the administrative law of the particular state should be made for the cooperation of the State Board with localities, so that the projects may be worked out with due regard for street openings and closings, alteration of the city plan, establishment of schools and kindergartens, maintenance of parks or playgrounds and day nurseries.

EMINENT DOMAIN

The companies should be invested with the power of eminent domain where the Commission certifies to the necessity thereof.

It may be deemed advisable to have the power exercised for the housing corporation by the municipality in which the project is situated upon suitable indemnification by the housing corporation.

Unless the law of the state otherwise provides, the eminent domain powers should permit the immediate taking possession of the property upon payment into court of a sum deemed sufficient by the court to cover a possible award, or in the alternative, if consistent with the provisions of the State Law, by the filing of an appropriate bond. (*Note:* The foregoing is sufficient in relation to housing projects. For slum clearance projects, where it may be desirable to use part of the cleared areas for housing and part for other purposes, legislation should permit the condemnation of areas which are largely unsanitary, for replanning.)

STATE OR MUNICIPAL ASSISTANCE

The effectiveness of legislation of this type is largely dependent on the character and extent of assistance offered by the state or municipality. The state or municipality may offer one or both of the following inducements in an effort to attain the lowest possible rentals in housing projects.

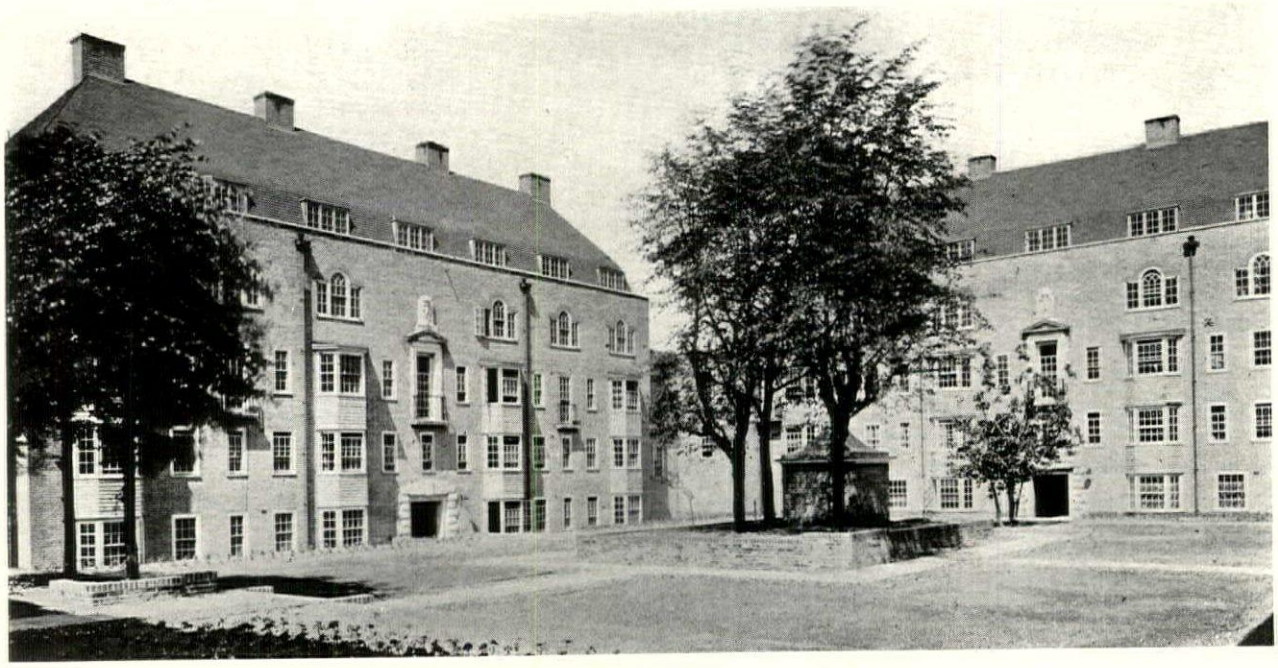
1. Use of government credit at approximately the same rate of interest paid by the state or the municipality plus cost of operation of the fund.
2. Tax exemption in various forms. In other countries public moneys are made available for low cost housing.

New York State does not offer any direct subsidy nor does it authorize the use of public funds or credit for housing. In New York, under the State Housing Law, there is granted exemption from various state taxes, e.g., franchises, organization, income, mortgage recording and other taxes and fees to the state or its officers, and municipalities are authorized to exempt from local taxation.

Under this authorization, New York City has exempted buildings but not the land from taxation, for a period of twenty years. The value and effect of tax exemption on improvements is discussed in the 1932 annual report of the State Board of Housing.

THE DRAFTING OF THE LAW

Many of the features referred to in this outline are embodied in the New York State Housing Law, to which reference may be of value in the actual drafting of the law. The law should contain findings of the legislature as to the reasons for its adoption, similar to that incorporated in the New York State Housing Law. These findings are of importance in the statutory and constitutional interpretation of any law.



AN ENGLISH HOUSING DEVELOPMENT

LOUIS DE SOISSONS AND G. G. WORNUM, ARCHITECTS

BY

HAROLD DONALDSON EBERLEIN

THE Larkhall Estate Flats at Clapham, a suburb of London, England, offer a significant solution for part of the housing problem that sooner or later besets every large city. While the development was devised to meet a definite want in London, the scheme has a far wider application than the fulfillment of the immediate need that inspired it.

The site of the Flats was previously a residential neighborhood, planned without sufficient thought to the future. Part of it had already lapsed into hopeless shabbiness and decay; the rest was a potential slum. The area was covered with two- and three-story houses with unusually large backyards, owing to the suburban character of the district when the houses were first built. The site, within 20 minutes of downtown London by subway, bus or street-car, was growing more valuable yearly, but contained much waste space, unprofitable either to the owner or to the changed class of tenants.

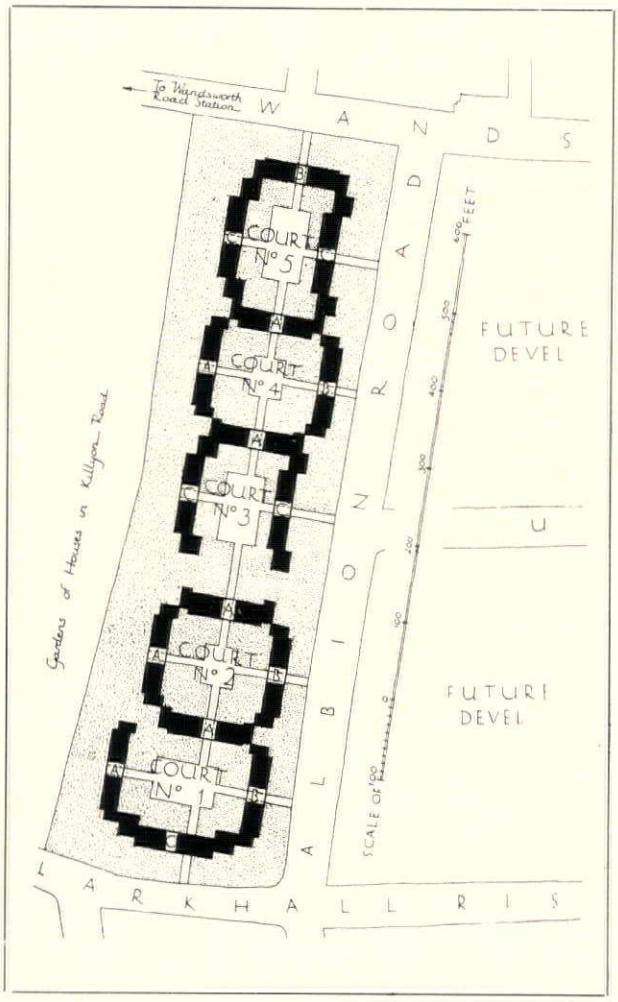
The rehabilitation of the area has been largely due to the initiative of Sir Thomas Chambers, K.B.E., Chairman of Welwyn Garden City, and the first part of the undertaking has been sponsored and financed by the London City Council. The plot plan on the opposite page shows the extent of this operation. It includes 16 blocks of buildings, arranged about large garden quadrangles, carefully planted and containing ample cross-walks. These areas are maintained by the management of the estate. The blocks are so planned that many of the living rooms have a southern exposure and all of them have sunshine during some part of the day. Generally the ground floor of the units contains flats. The second and third floors contain a tier of "maisonettes," as do the fourth and fifth floors. Each flat has a separate entrance and so has each maisonette. The entrances to the latter are reached by the external galleries that traverse a side of each block at the second and fourth floor levels, the access to these galleries being from the central staircase inside each block of the group. The upper, end maisonettes include small individual roof gardens. Each maisonette has its own interior stairway.

The rooms have been so arranged that only the kitchen or bathroom windows of the maisonettes open directly upon the external approach galleries, a thoughtful provision for privacy that satisfactorily overcomes one of the objections often made

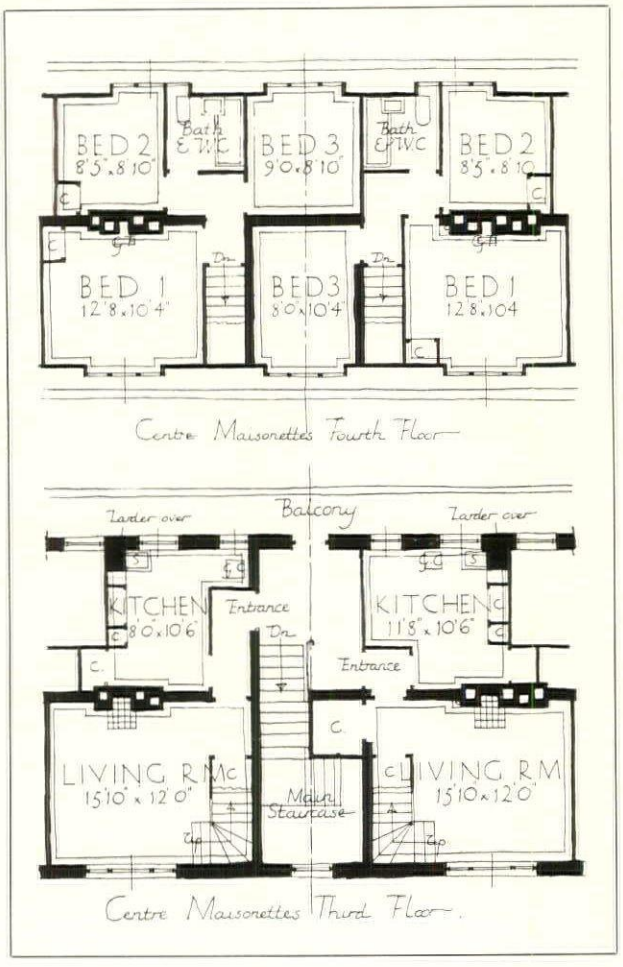
against any sort of communal dwelling. The dimensions of the rooms in both flats and maisonettes are comfortable. Though not large, they are sufficient for their purposes and contain ample closet space. The natural lighting in every room is exceptionally good. Electric radiators supply heat in all the rooms and the living rooms are provided with fireplaces as well. The inclusion of coal-burning fireplaces was an amendment to the original plan, and though some difficulty was experienced in locating the necessary flues, it was accomplished with remarkably little waste of living space.

Special care has been exercised in the appointment of bathrooms, kitchens, and sculleries. There is adequate cupboard and larder accommodation, and beside the usual convenient appliances, gas stoves may be used in the kitchens, where desired, instead of coal ranges. An ingenious device for preventing hot water waste is a special anti-waste tap, installed at each kitchen sink. This can be adjusted to give three gallons at a time. Then the water ceases to flow and the tap requires turning off and on again to renew the flow. A central, oil-burning, hot water plant supplies a constant and unlimited flow of hot water to all flats and maisonettes at all times. In each block of the group are two fully equipped laundries available to the tenants upon an hourly rental basis.

The rentals of the Larkhall Estate Flats are very moderate. One charge is all-inclusive, and covers not only the actual space rental, but hot water service (usually considered as an extra), porter service, and all the estate services, such as gardening, rubbish



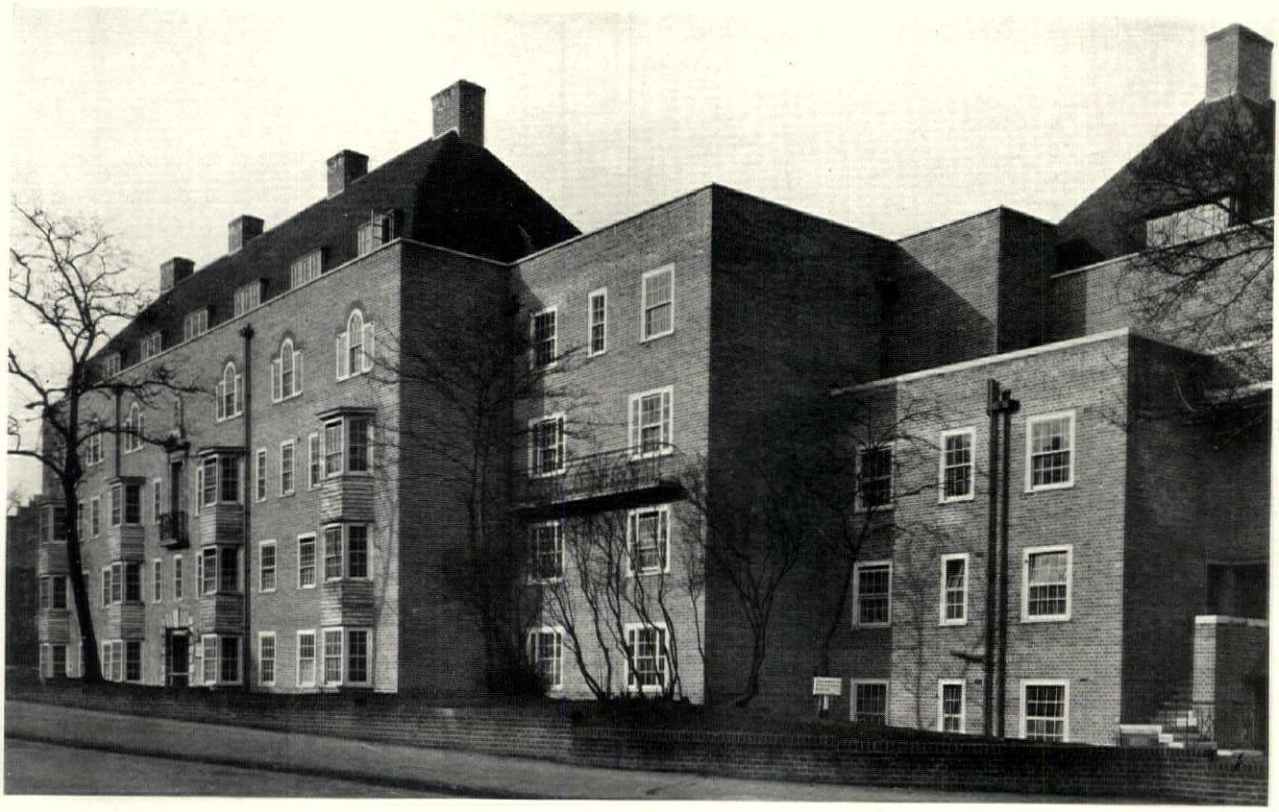
On the opposite page is a general view of the Larkhall Estate Flats. Above is a portion of the plot plan of the entire development, and the picture at the right is of the East and South blocks, taken in Court No. 2



removal and general maintenance and repairs. Eventually a number of tennis courts will be provided, as well as several garages, an unusual provision for an English project of this type.

All the blocks of the group are built of mottled red, machine-made Holland bricks, laid with joints of white cement mortar. The trim is of artificial stone, and the roofs are covered with red tiles. Unpainted elm weather-boarding is used to sheathe the window bays. One feature of the design is significant . . . there are no unprepossessing "back elevations," and none of the objectionable details that too often indicate the working zone and disfigure one side of a building. From every aspect the buildings are uniform in their attractiveness, and for this achievement great credit is due the architects.

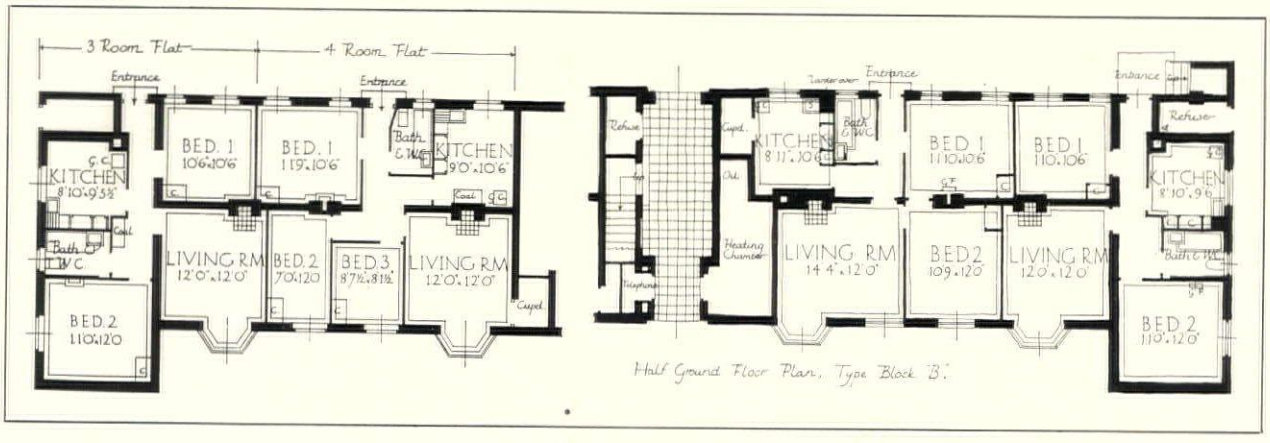
Mr. de Soissons has had wide experience in housing developments and has been the architect for Welwyn Garden City, while Mr. Wornum is the architect for the Earl Haig Memorial Homes to be built in various parts of England in memory of the late Field Marshal. The problems with which they had to cope in the development of the Larkhall Estate Flats were, in many ways, exceptionally difficult. They have, nevertheless, commendably succeeded in fulfilling all the necessary physical requirements of the problem in creating a straightforward, economical composition, and at the same time have given due consideration to the architectural amenities. After the precedent of the old



The illustrations on the opposite page show the plans of a typical maisonette and the outside balcony from which they are entered. On this page is a view of the south road frontage with plans of typical flats on the ground floor

London Inns of Court it is easy enough for those with abundant means to plan and build great establishments about garden quadrangles. It is quite another thing to carry out successfully a scheme in which every phase of the economic element has to be carefully weighed. In the one discussed here decent and comfortable living conditions, an attractive appearance and low rentals with a minimum maintenance expense had to be assured in the final result.

The principles embodied in a development of this kind deserve not only close study on the part of the architect, but likewise from the social economist and political administrator. More open-minded thought and more courageous action might spare us an increase in the number of those deplorable neighborhoods in which the ignorant, selfish and rapacious builder delights to display his genius for creating the sheer ugliness of the suburban Saharas of bricks and mortar. A housing scheme such as the Larkhall Estate is capable of sheltering from three to six times the population of a similar area occupied by dreary rows of two- or three-story houses. At the same time it assures light, air, and beauty.



ONE OF THE COURT ENTRANCES

LARKHALL ESTATE FLATS

LONDON, ENGLAND

LOUIS DE SOISSONS AND G. G. WORNUM, ARCHITECTS

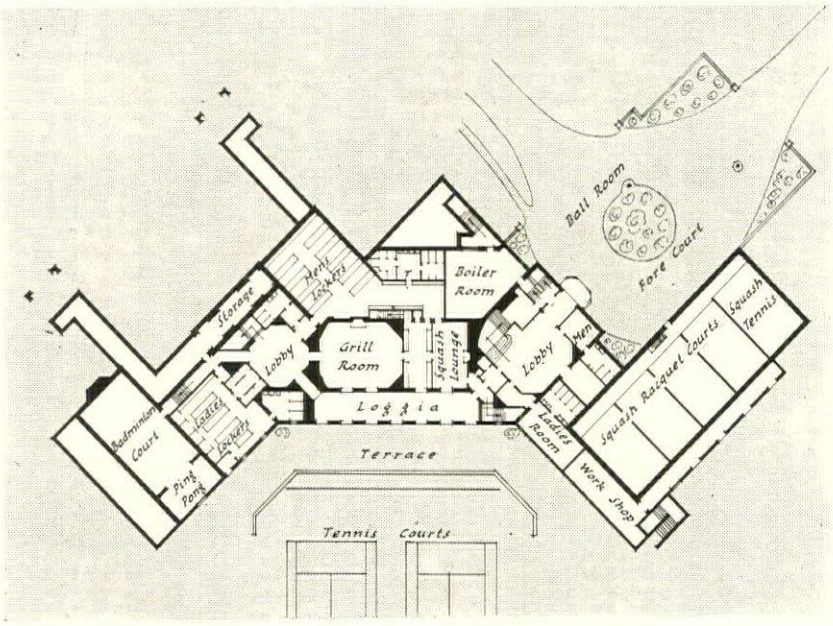
THIS club building, while designed especially for tennis, is unusually well planned for flexibility in its social uses. The plans on the following pages therefore merit special study. Distinction and character are obtained directly and simply, using as few materials as possible and relying on proportion, arrangement of elements, scale, color and detail for the effect. The exterior is of light brownish-red Connecticut brick and the roof is of Vermont slate, generally purple in color. The terrace pavement is also of slate. Windows, doors, etc., are of wood and the cornices are painted metal. . . . Floors of main club areas are terrazzo with brass strips, except in the ballroom, dining rooms, members' lounge and bedrooms where they are of wood. . . . The walls are of brick and hollow tile, supporting pan system reinforced concrete floors. Limestone trim was used on the exterior. The roof is of frame construction. The heating is by steam, vacuum system and there is fan exhaust ventilation where necessary. The gross cubage is 662,000 cu. ft., built in 1931 and cost $298,000, exclusive of furnishings, or approximately 45¢ per cu. ft.

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

Amemiya



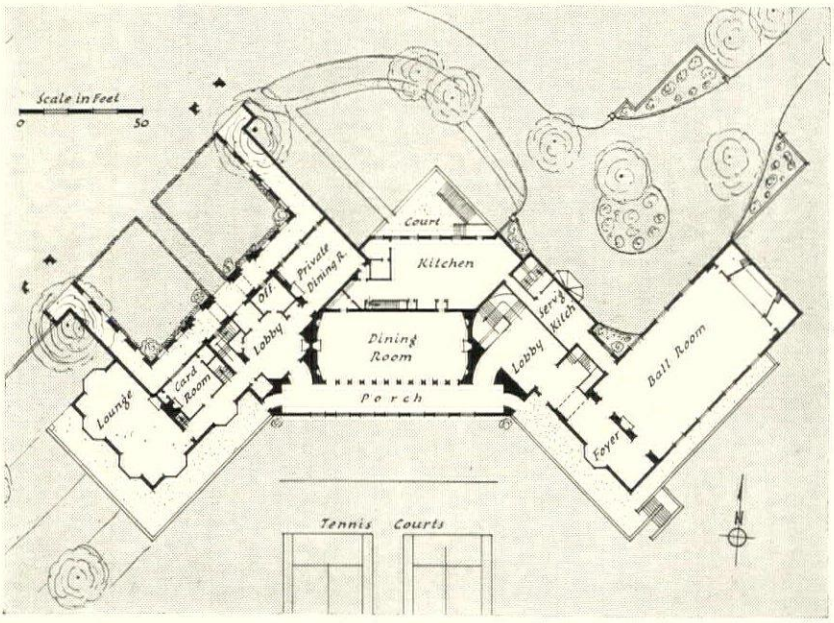
THE selection of the site for the club was particularly fortunate, and full advantage of the contours was taken in the planning. The athletic facilities, lockers and grill are grouped on the lower level in close proximity to the tennis courts. A broad terrace overlooks the tennis courts as does also the loggia on the upper floor

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

Amemya

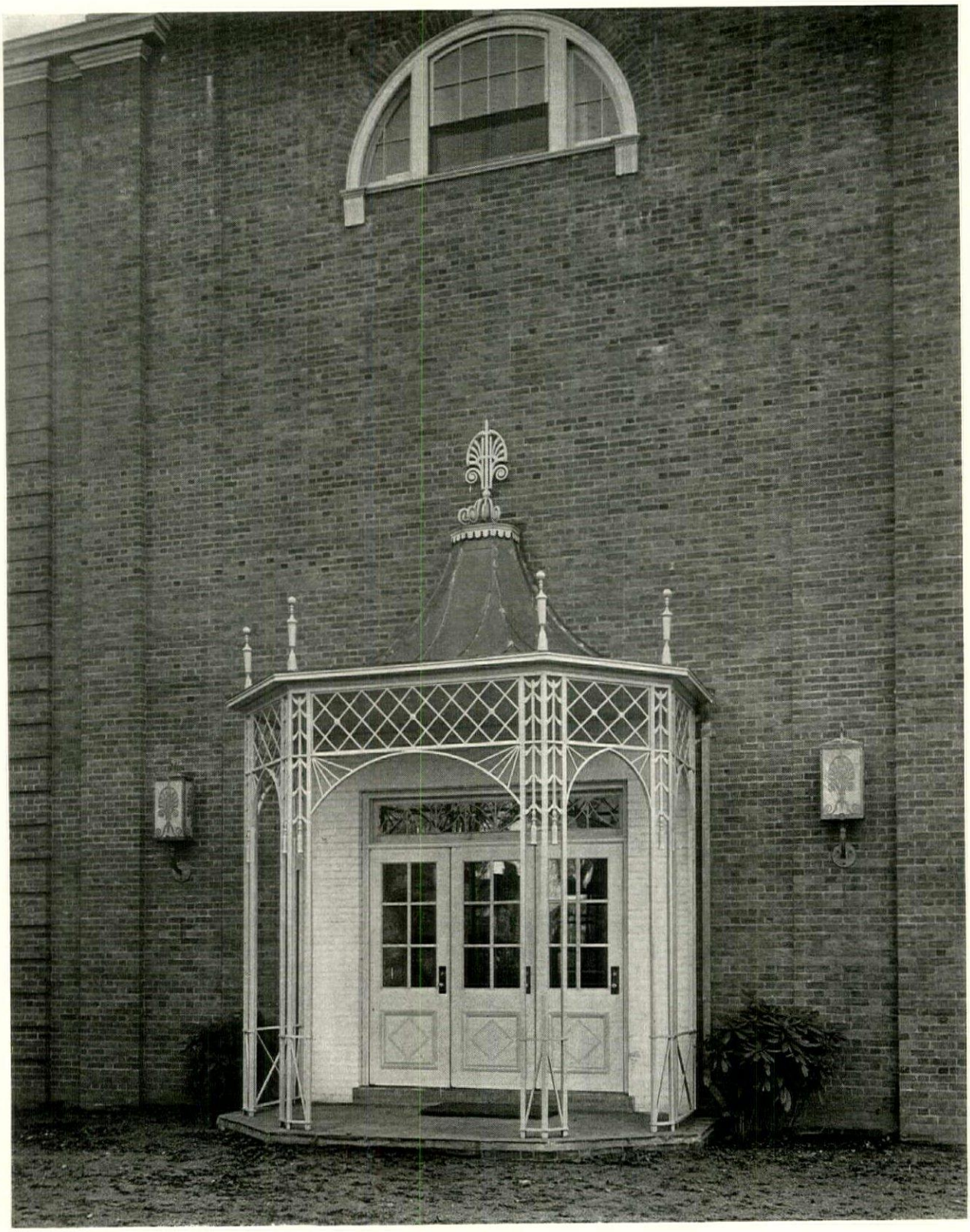


THE upper level (that of the main forecourt) is particularly well arranged for both formal and informal social functions. The separate forecourt for the ballroom makes possible the use of this wing for dances, etc., without in any way interfering with the normal use of the other portions by the regular club members

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT



Amemya

ENTRANCE FROM THE BALL ROOM FORECOURT

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

Amemya

CENTRAL ARCH OF THE MAIN ENTRANCE

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

Simonds

THE MEMBERS' LOUNGE

Amemya

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

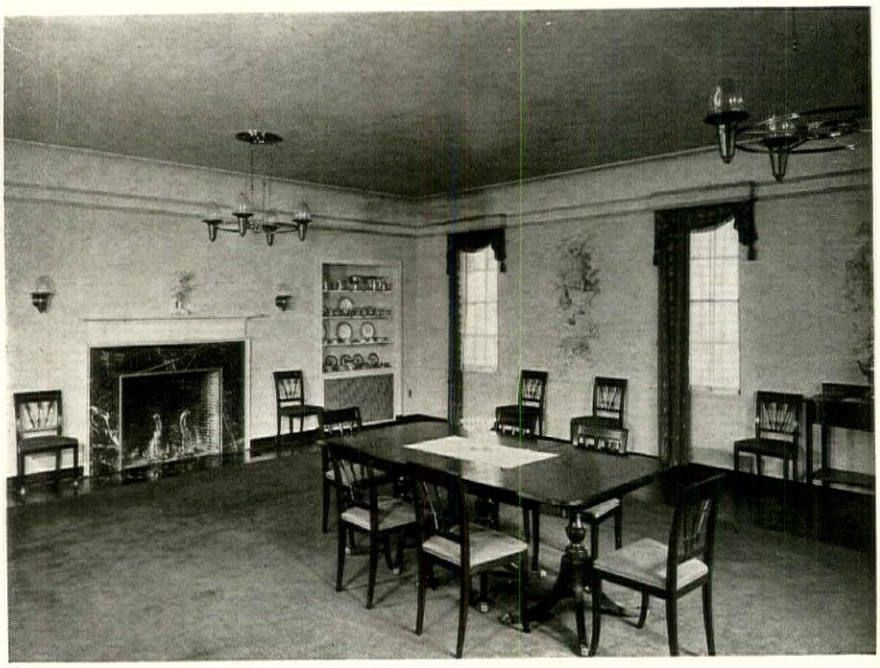
Simonds

THE ballroom, a portion of which is shown above, has been so placed with its lobby and services as to make possible the renting of this portion of the club for outside social functions. It is possible to include the main dining room en suite by merely closing doors, thus leaving the rest of the club's facilities entirely free for the regular activities of members. Such flexibility of plan has obvious advantages to the club. . . . The ballroom color scheme is white, silver and green, — the painted walls oyster white, stars and comets and mirror frame in silver. The hangings are of green brocade and the benches are covered with red velure. . . . The members' lounge, shown on the opposite page, has walls of knotty pine with a painted frieze. The hangings are of linen with designs in tomato red and green which is recalled in the cretonnes of the furniture. The rug is a plain sage green

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT



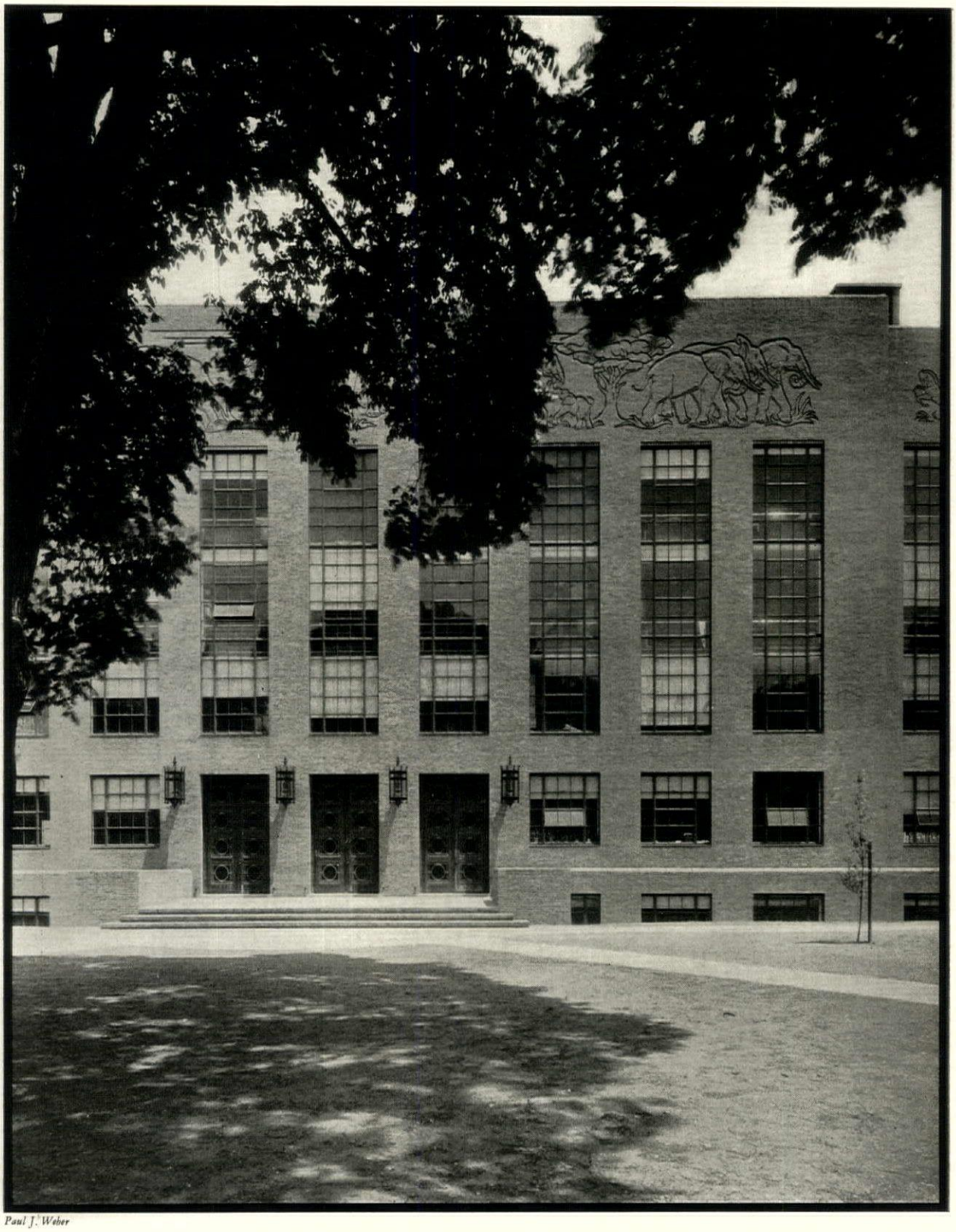
Amerman

THE main dining room (above) has a color scheme of warm grey and gold, the walls and ceiling being painted. The mirror frame is gold above the Siena marble facing of the wood mantel. The wood floor is stained black and the effect is one of quiet richness. . . . The private dining room (left) is decorated with Salubra panels. The rug is plain, of a raisin color harmonizing with the dark wood floor, the Belgian black marble fireplace facing and the window hangings

NEW HAVEN LAWN CLUB

NEW HAVEN, CONNECTICUT

DOUGLAS ORR, ARCHITECT

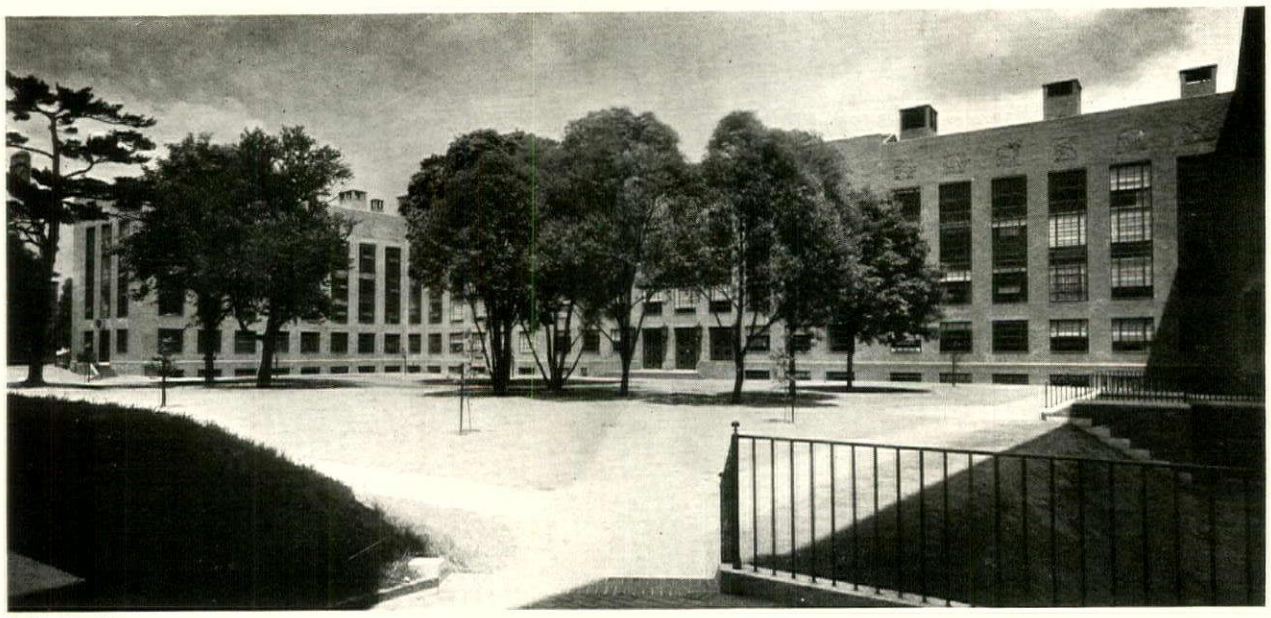


Paul J. Weber

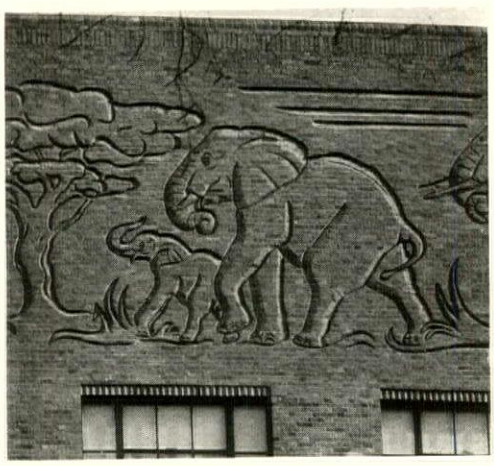
BIOLOGICAL LABORATORIES, HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS

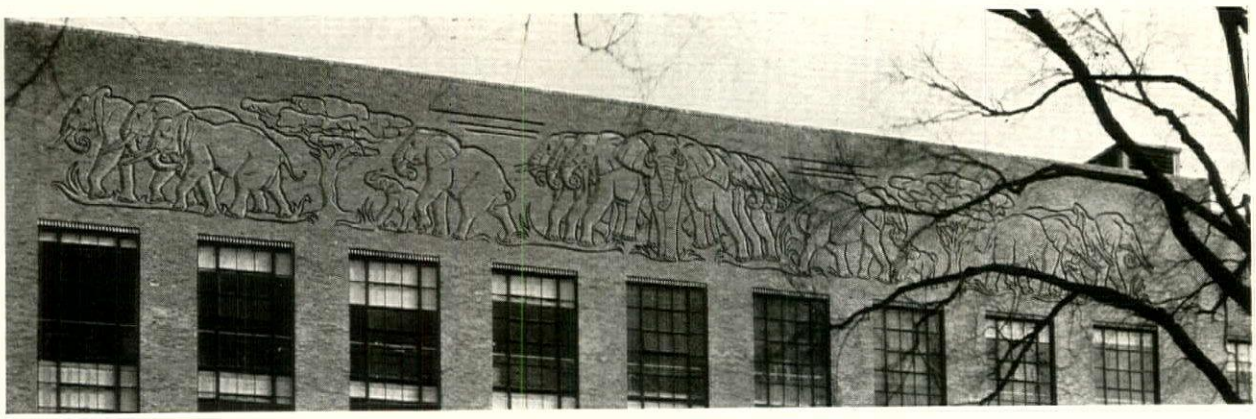
COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS



Paul J. Weber Photos



WHILE the Laboratory Building is in itself an example of straightforward and efficient design and construction, the effectiveness of the decorative relief is especially noteworthy. The idea of the architects was developed by Katharine W. Lane who made models of the carving at one-third full size from the architects' sketches. Enlarged stencils at full size were made and transferred to the brick where the actual carving was done by the George K. L. Loeser Company, using pneumatic tools. The widths and depths of the cutting were adjusted as the work progressed, and it was found that the carving was even more visible on dull days than in the bright sunlight. No special brick for bonding was used as the deepest cut does not exceed two and one half inches. The cost of the brick carving, including the scaffolding, did not exceed the cost of a copper cornice which was part of the original design, and the builders, the Hegeman Harris Company, cooperated in making this successful change to a type of decoration most appropriate to the character of the building



BIOLOGICAL LABORATORIES, HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS

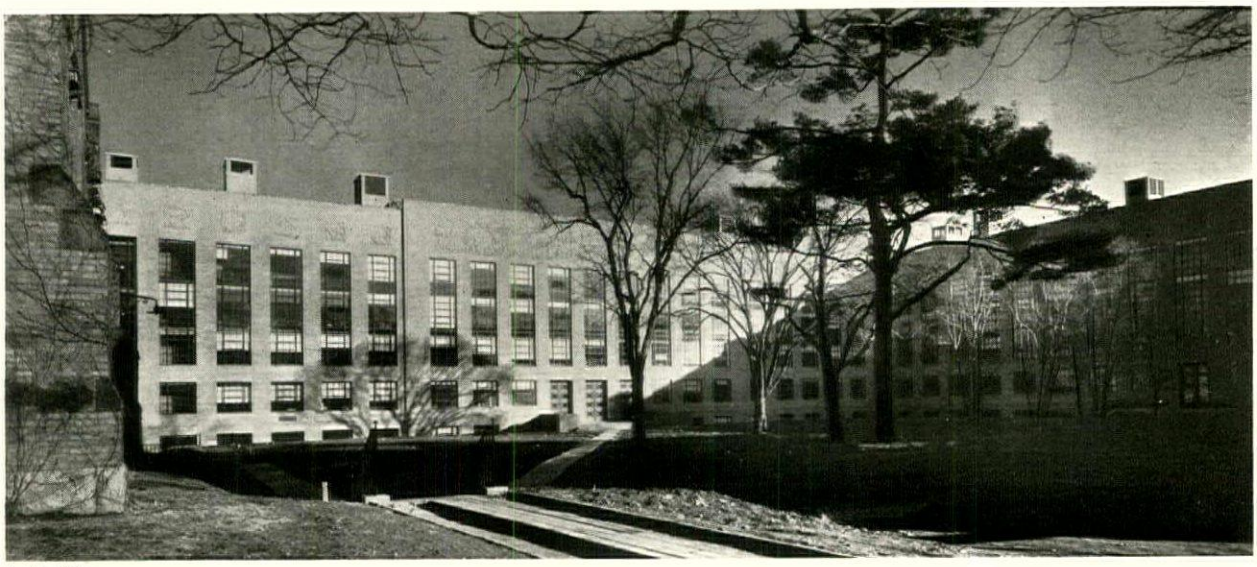
COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS

Paul J. Weber

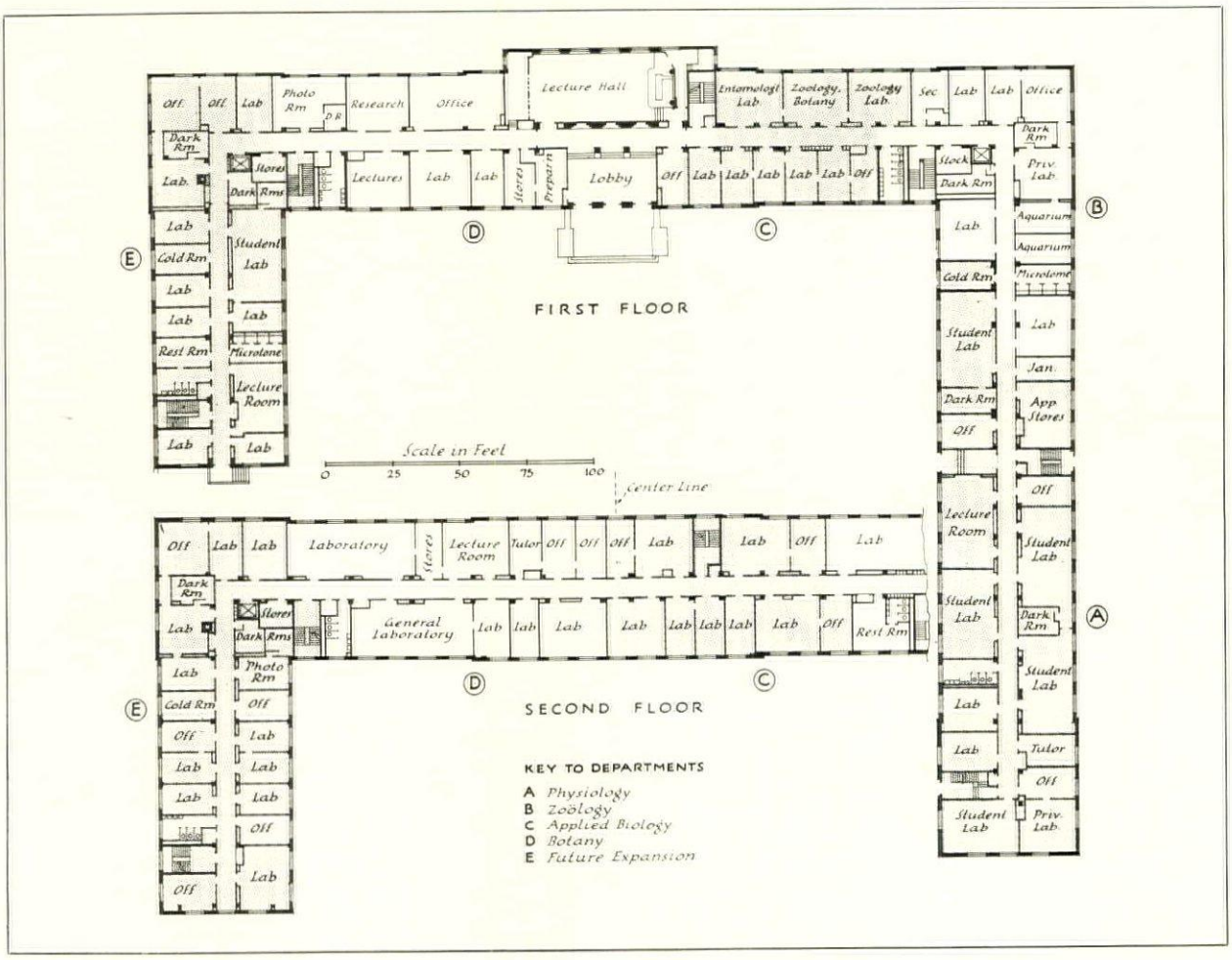
BIOLOGICAL LABORATORIES, HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS



Paul J. Weber

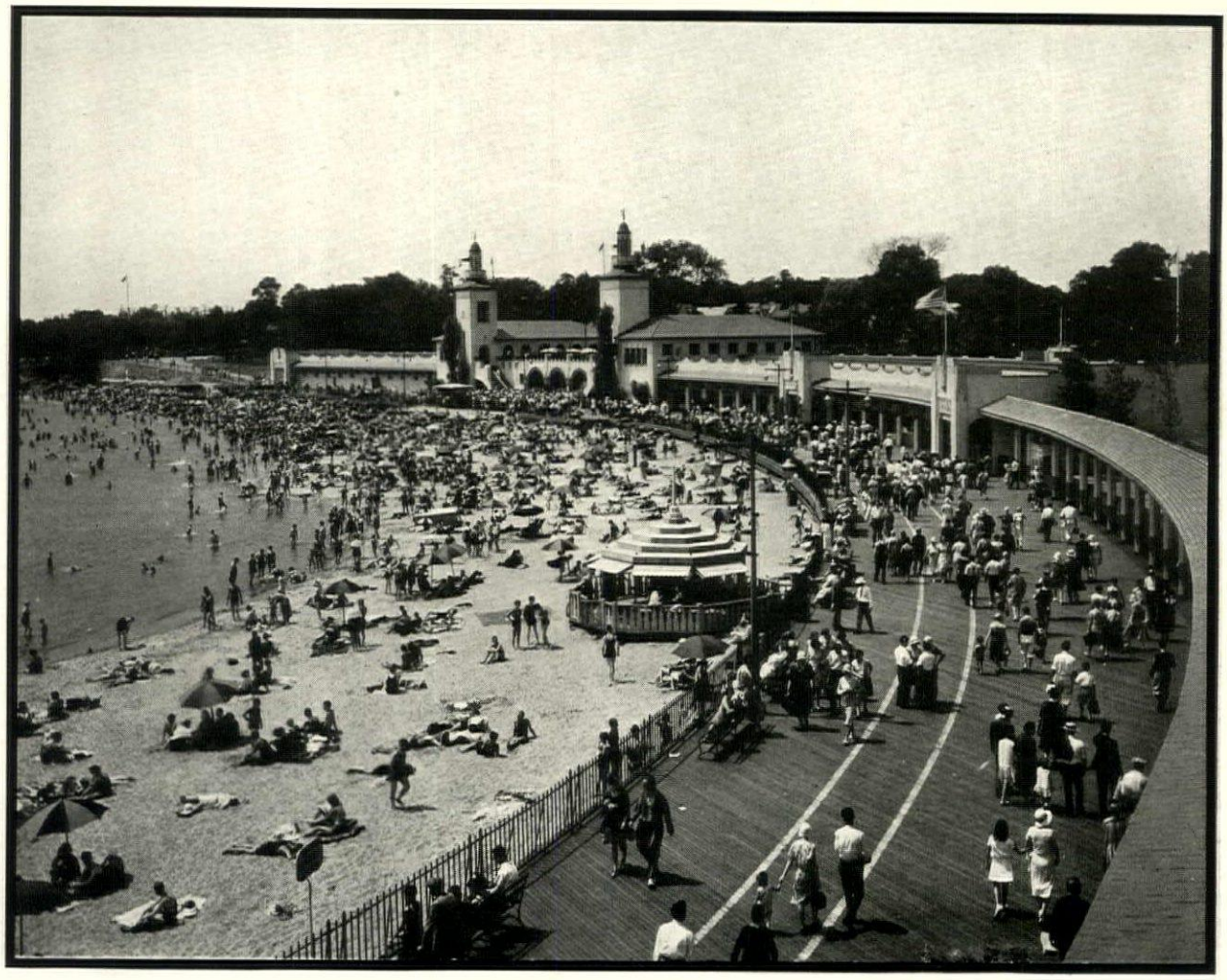


BIOLOGICAL LABORATORIES, HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS

THE FORUM OF SMALLER BUILDINGS



THE BEACH AND BATH HOUSE

PLAYLAND, RYE, NEW YORK

WALKER & GILLETTE, ARCHITECTS

GILMORE D. CLARKE, LANDSCAPE ARCHITECT

BATH PAVILIONS AND BEACH CLUBS

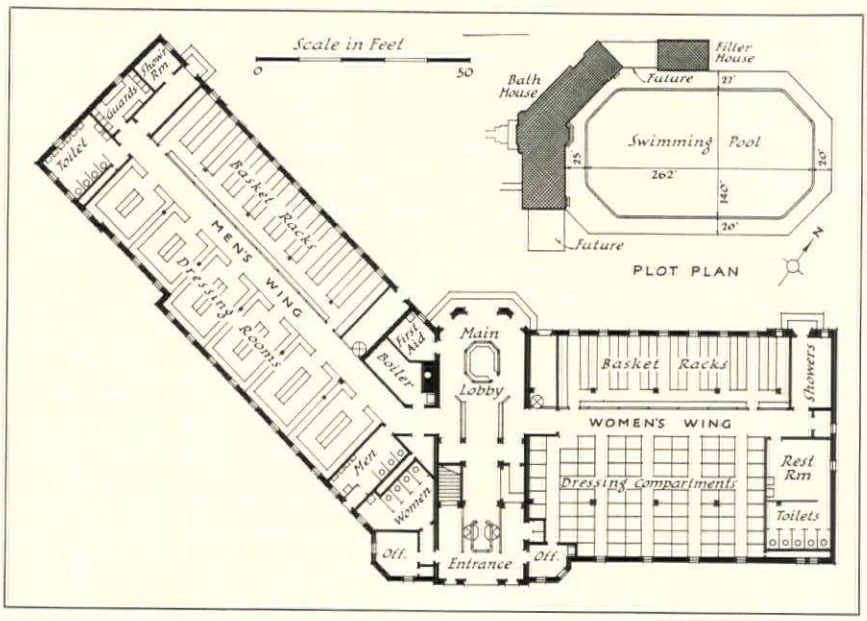
The following series of plates illustrates several types of buildings planned for beach and pool bathing facilities. An article on the planning and equipment of bath pavilions and beach clubs, together with a number of graphic details will be found on pages 175 through 184

THE TERRACE RESTAURANT

PLAYLAND BATH HOUSE

RYE BEACH, NEW YORK

WALKER & GILLETTE, ARCHITECTS, GILMORE D. CLARKE, LANDSCAPE ARCHITECT



THIS small bathing pavilion has been planned and is administered by the Westchester County Park Commission. Like many other publicly owned recreational swimming centers the basket system of checking clothing is employed exclusively. The plan is well adapted to the use of a comparatively small number of people and fits admirably the unusual contour of the wooded site. The second floor over the men's wing contains a large lounge with open balconies on either side

WILLSON WOODS PARK BATH HOUSE

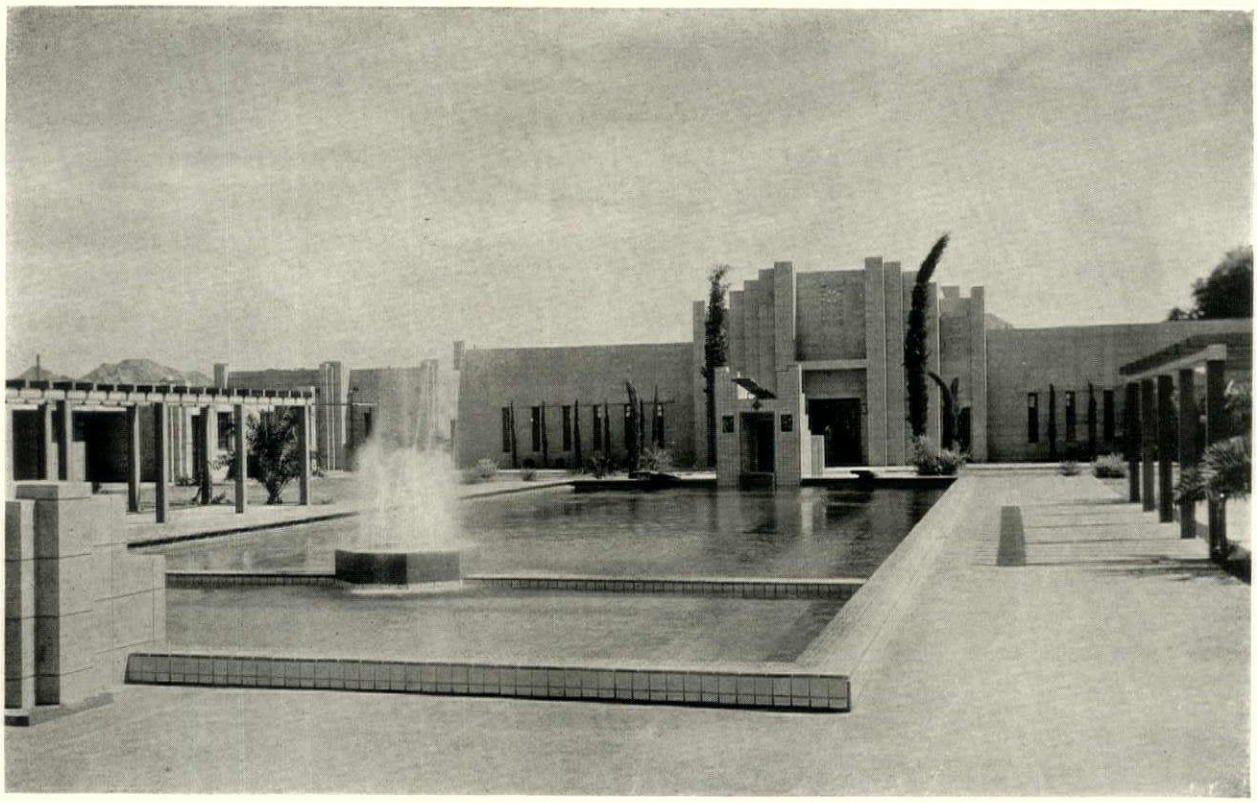
MT. VERNON, N. Y.

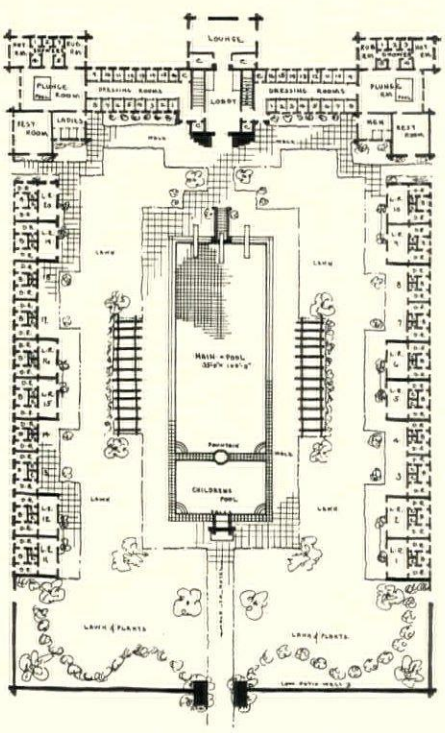
GEORGE W. BARTLETT, ARCHITECT, GILMORE D. CLARKE, LANDSCAPE ARCHITECT

WILLSON WOODS PARK BATH HOUSE

MT. VERNON, N. Y.

GEORGE W. BARTLETT, ARCHITECT, GILMORE D. CLARKE, LANDSCAPE ARCHITECT



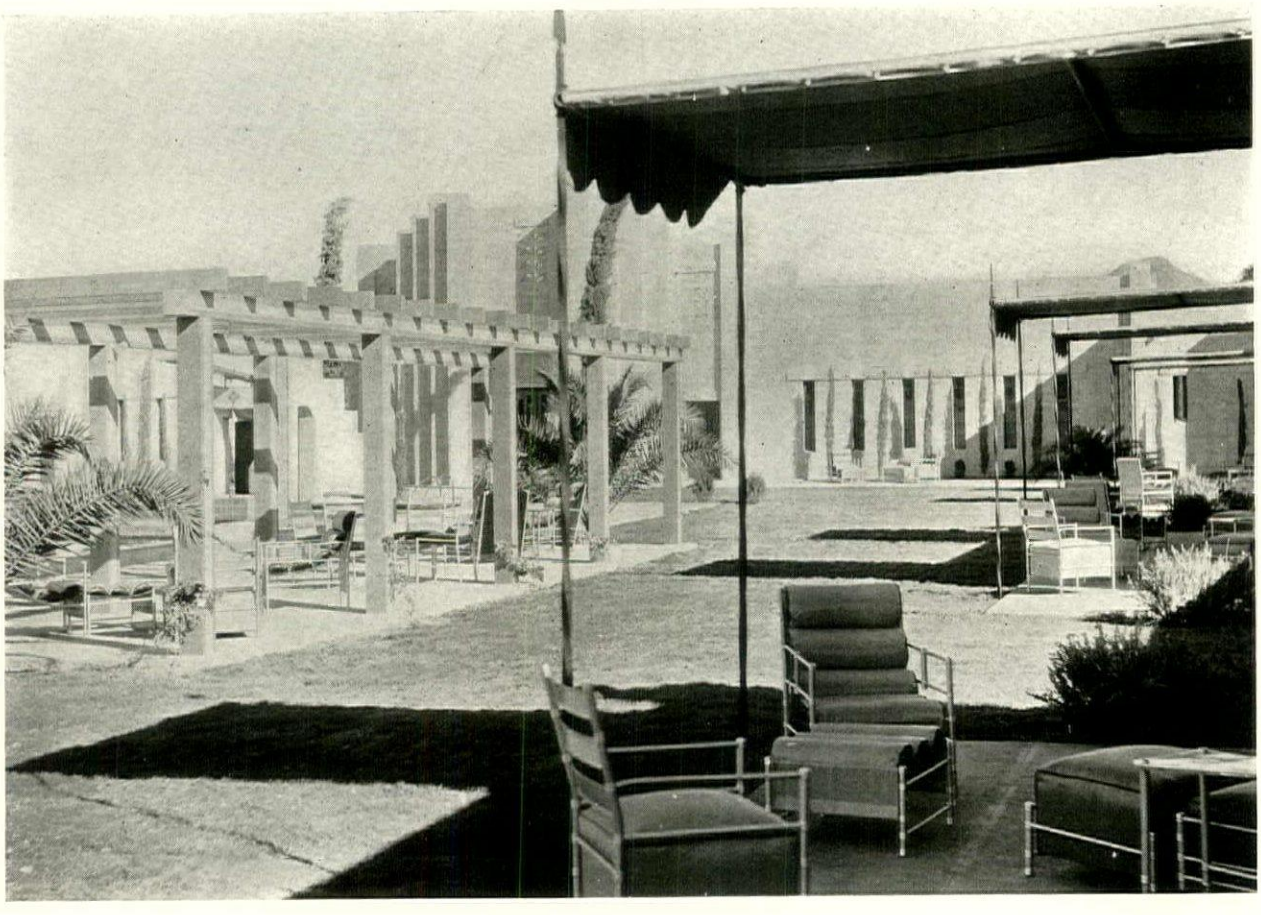


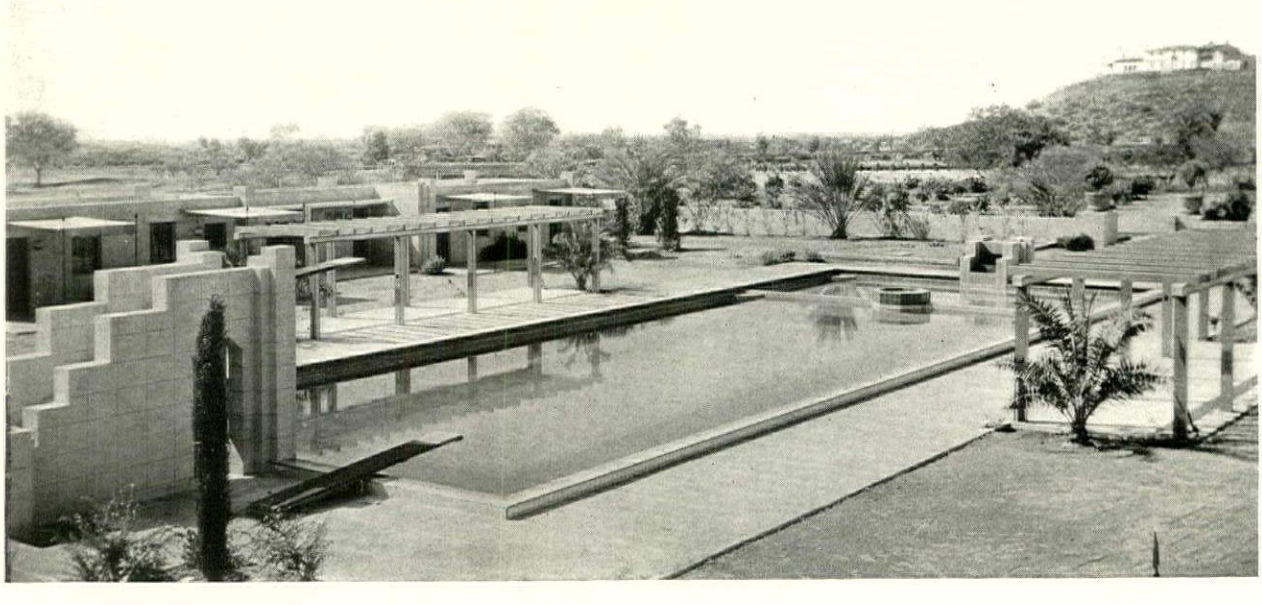
NOTEWORTHY in this plan is the location of the bath house and the unusual type of cabanas on either side of the pool. The entire development is a part of the Arizona Biltmore Hotel and takes the place of the bathing facilities now usually offered by hotels located near a natural body of water. The climate is dry, very hot during the summer months, and the pool with the adjacent buildings is a popular part of the hotel's recreational facilities. The cabanas and bath house are built entirely of adobe and tile, the adobe being plastered on both the exterior and interior of the buildings. The pool itself is faced with a tile mosaic in various shades of blue, and is lighted with a submarine system installed on all four sides

ARIZONA BILTMORE POOL AND BATH HOUSE

PHOENIX, ARIZONA

ROBERT T. EVANS, ARCHITECT

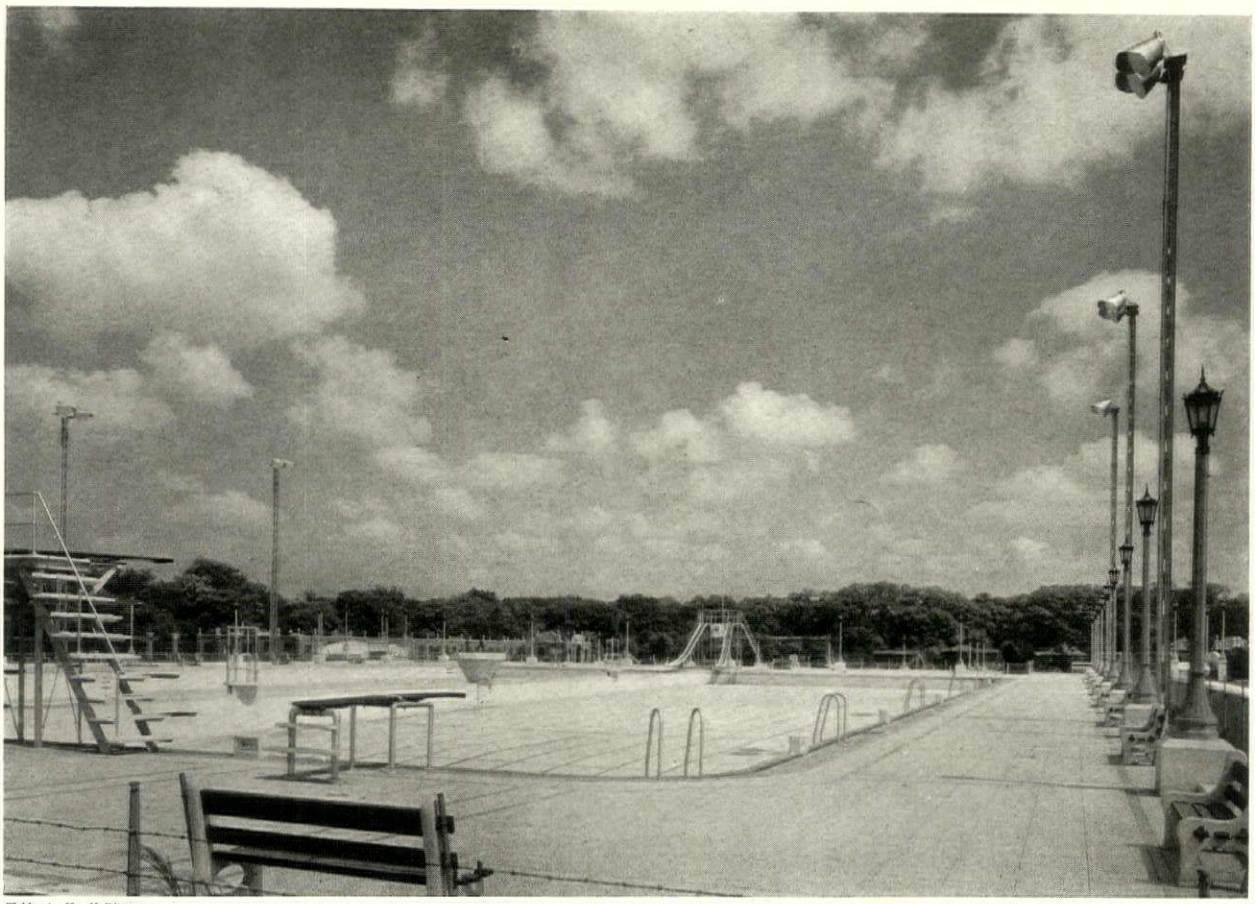




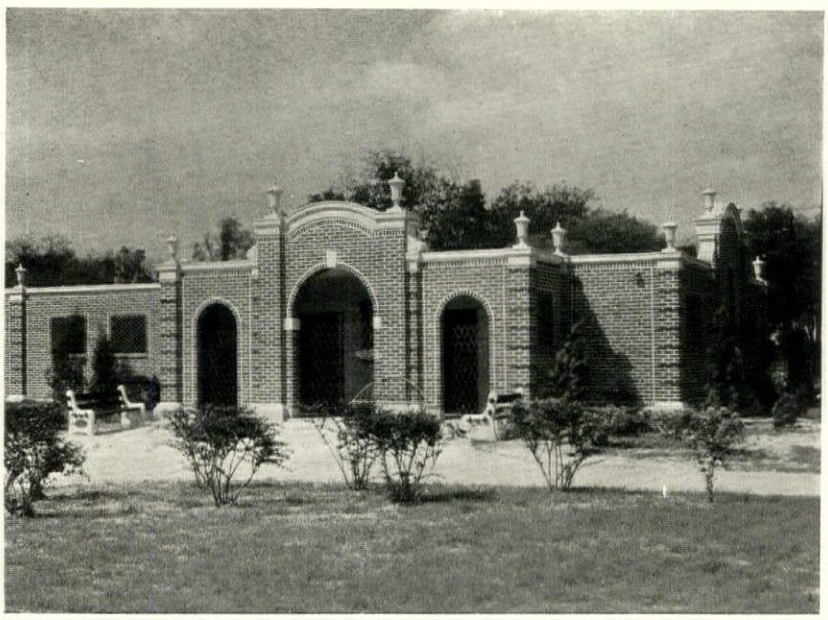
ARIZONA BILTMORE POOL AND BATH HOUSE

PHOENIX, ARIZONA

ROBERT T. EVANS, ARCHITECT



Tebbs & Knell Photos

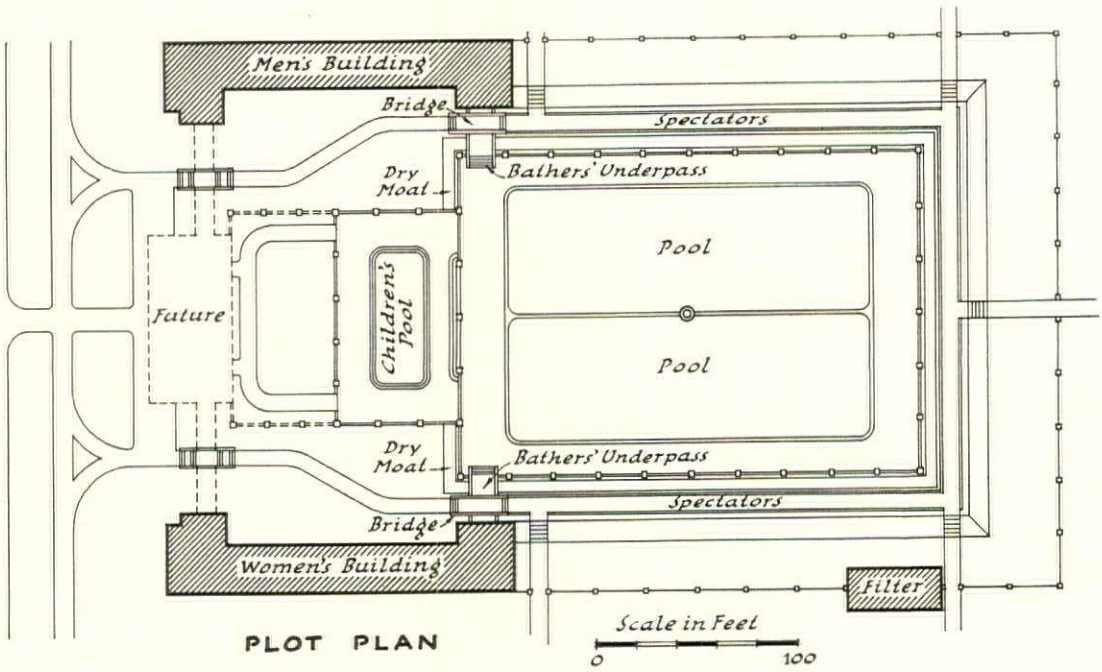


THIS development, which cost approximately $250,000 including the pools and the accessories, is an interesting public project. The twin pools, separated longitudinally, are each 75 x 225 ft., and the entrances to them from the locker, dressing and shower rooms are by walks passing under the spectators' concourse which is separated from the bathing area by a woven wire fence

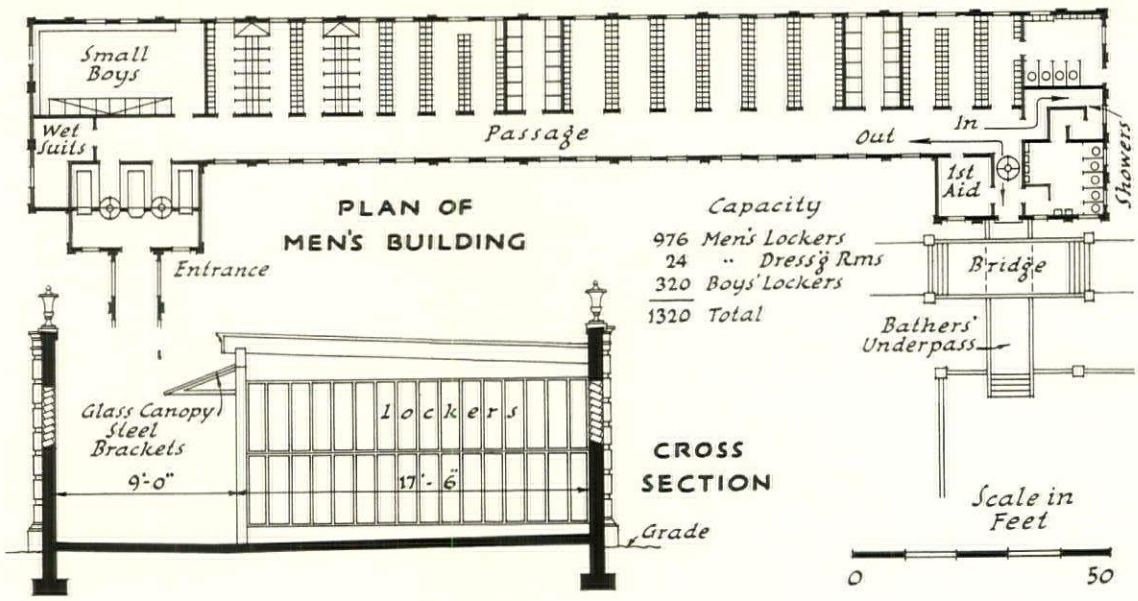
AUDOBON PARK NATATORIUM

NEW ORLEANS, LOUISIANA

SAM STONE JR. & CO., ARCHITECTS



PLOT PLAN



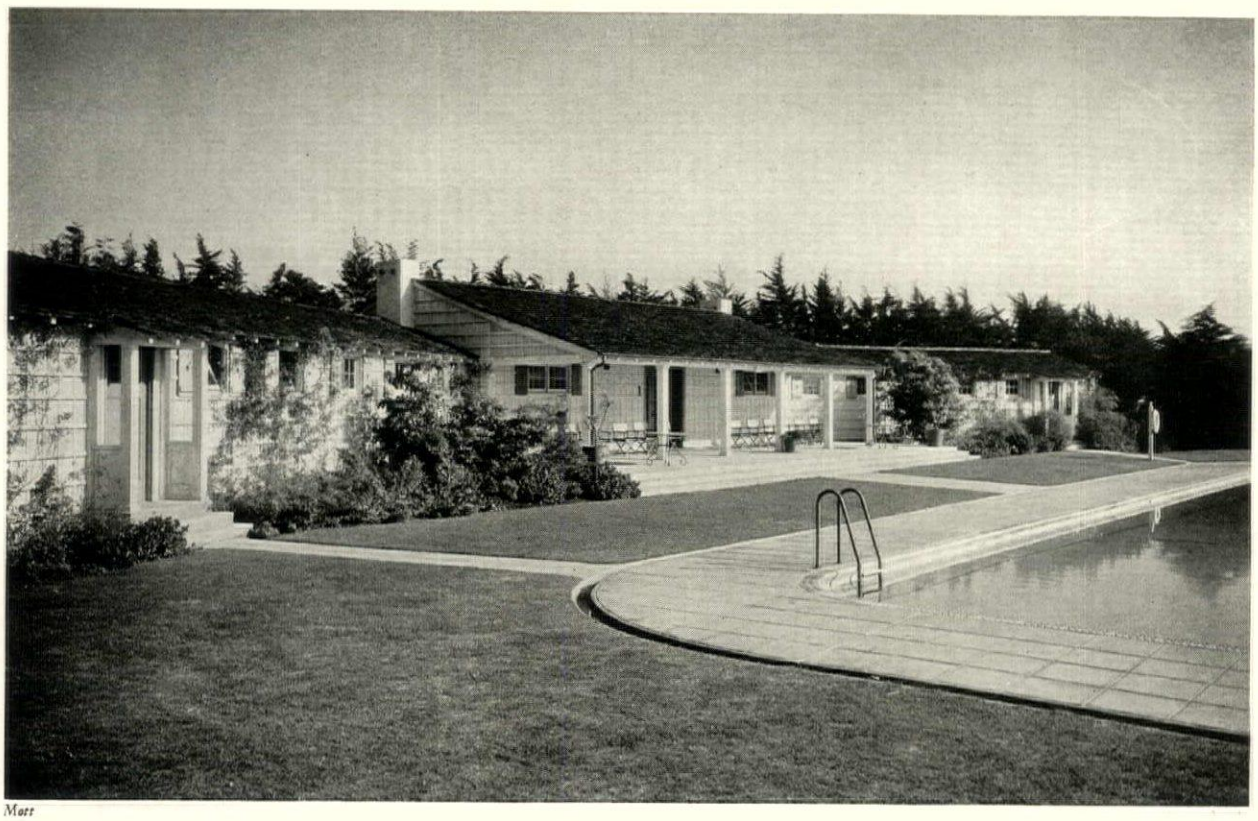
CROSS SECTION

THE plot plan above shows the entire development which in addition to the two large pools, includes a children's wading pool, 40 x 80 ft. in size. The buildings containing the lockers, dressing and shower rooms are, in effect, merely walls, vented at intervals. They are roofed only over the areas occupied by the lockers and the entrance and exit wings. Entrance to the pools is only possible from the shower rooms or directly from the corridors of the dressing rooms. The pools themselves are built of reinforced concrete. The exposed surfaces were rubbed smooth, to remove form marks, and painted white

AUDOBON PARK NATATORIUM

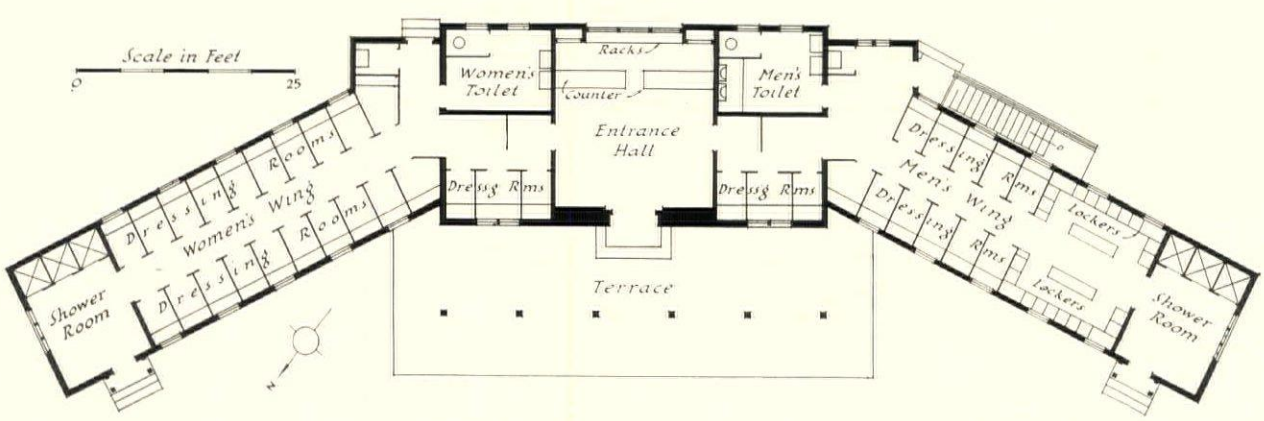
NEW ORLEANS, LOUISIANA

SAM STONE JR. & CO., ARCHITECTS



Mott

THIS pool and bath house is privately owned and its use is confined to the guests of the Santa Barbara Biltmore Hotel. The need for any office space other than a key rack and shelves for suit storage is not present. Also such a building usually contains no facilities for any other form of recreation. Note, however, the large lounging terrace and the well-kept grounds. The construction of this bath house is a simple frame type. The walls are painted white and the roof is covered with stained shingles

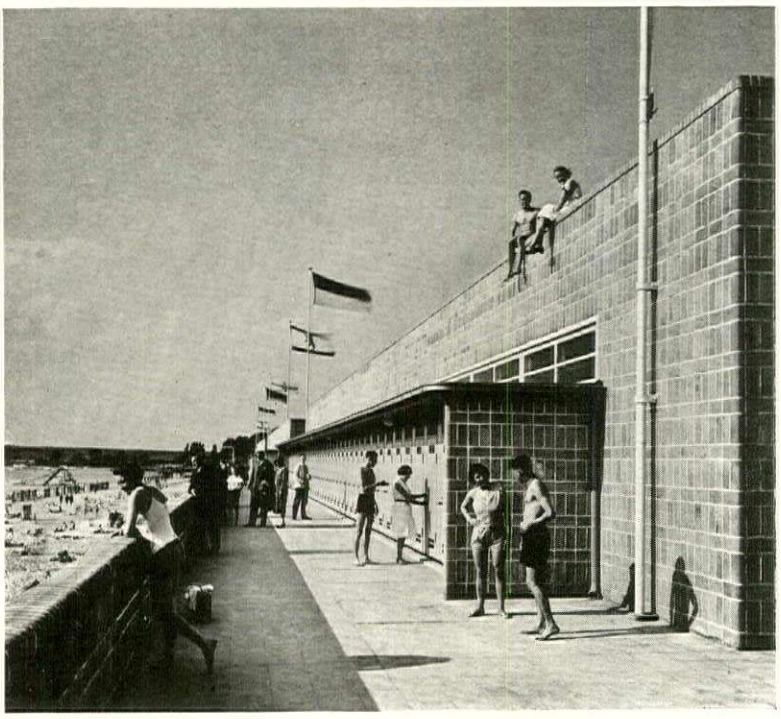


SANTA BARBARA BILTMORE BATH HOUSE

SANTA BARBARA, CALIFORNIA

REGINALD D. JOHNSON, ARCHITECT

Arthur Köster



FACILITIES for outdoor bathing are very popular in Europe, especially in Germany, where many large establishments have recently been constructed. Most of them are open to the general public, and a small entrance fee is charged. Most of them, also, have been planned and built by the local governments and are administered by the city near which they are located. The two pictures on this page illustrate the simplicity of form and material that characterize the bath houses. The building shown at the left is built of brick-colored tile with a hard-burned, clinker surface

MUNICIPAL POOL AND BATH HOUSES

WANNSEE, BERLIN, GERMANY

DR. MARTIN WAGNER, ARCHITECT

THIS pool with the attendant bath houses is built of reinforced concrete. The concrete of the pool has a smooth-finished surface; that of the buildings is left as it comes from the forms, and where it is exposed, it is painted. The plan of the bath houses themselves, though simple, is noteworthy for its simplicity. The dressing rooms are arranged in two tiers, the floor of the second tier being cantilevered to form a balcony and a protected terrace. The doors of the dressing rooms slide on simple tracks and the space above them serves as an outlet for a system of natural ventilation

MUNICIPAL POOL AND BATH HOUSES

UNTERTÜRKHEIM, STUTTGART, GERMANY

P. BONATZ & F. E. SCHOLER, ARCHITECTS

Othmer, Angenendt & Co.

A BEACH HOUSE FOR HOTEL GUESTS

HENGSTEYSEE, GERMANY

HANS STROBEL, ARCHITECT

TOWARD THE RECONSTRUCTION OF NEW YORK'S LOWER EAST SIDE

PART II: THE DEVELOPMENT OF A NEIGHBORHOOD UNIT

BY

JOHN TAYLOR BOYD, JR.

THE two plan designs shown herewith are products of an investigation to determine the most economic type of building development for the reconstruction of the Lower East Side of Manhattan. They form part of the city planning and economic research developed by Harland Bartholomew and Associates for the Lower East Side Planning Association and described by Mr. Bartholomew in the previous issue. They are the work of the writer in association with the Bartholomew organization.

This type of investigation should be undertaken in other towns and cities. It is not merely a question of slum clearance. The prosperous areas of cities likewise need protection against decline in the character of ownership or of tenants, or against changes in land use which often create havoc with real estate values. It is essential to establish some sort of control over any homogeneous area. A practical way to do this is to formulate a sound policy of mortgaging land for a scientific planning of the area.

At the start of the work it was decided that the development should be a very large scale apartment house community of moderate rentals. The reason for this was that the Lower East Side is a logical location for homes of office workers of Manhattan. Also, in general, the land in the district cannot well be used for other types of structure. Large scale was decided upon because experience had shown that builders felt that tenants would not rent single new buildings erected in the midst of such unfavorable surroundings.

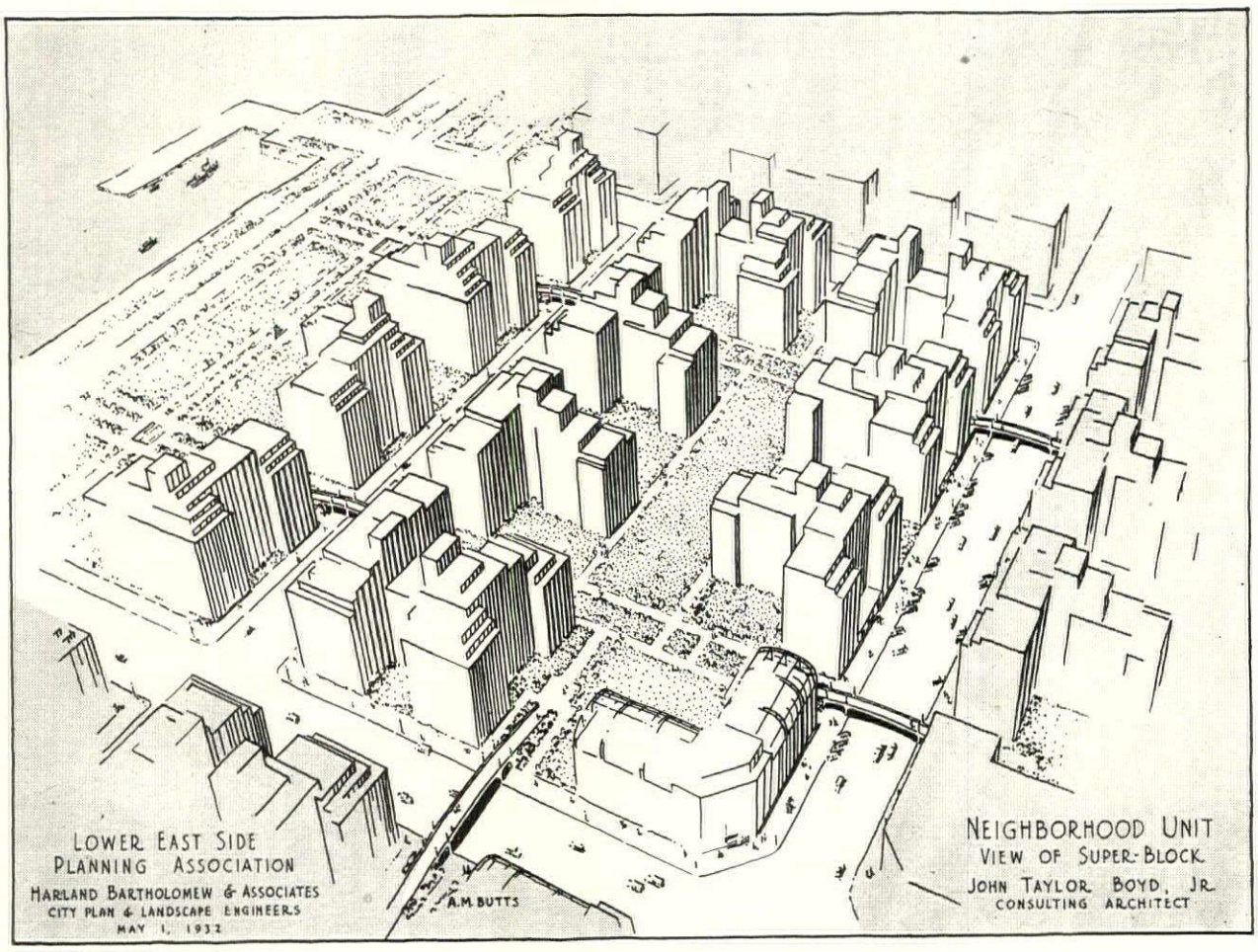
A "major operation" (as Mr. Orrin C. Lester, president of the Lower East Side Planning Association, well expressed it) is necessary for the reconstruction. That means, among other essentials, an operation large enough to change the environment completely in a short space of time, thus creating an entirely new neighborhood or district.

There was also a broader purpose behind the designs. That was to make the plans, large as they were, an integral part or detail of a plan for the entire Lower East Side. The "district" plan of the Lower East Side, in turn, is conceived as intimately related to the plan of Manhattan, to the plan of New York City and to the plan of the Metropolitan region. This far-reaching conception of planning should be regarded as basic. It is essential not only to make the projects themselves successful but also to prevent disasters to the city plan, to the trend of the city's growth, and to the real estate market.

In other words, such large projects should be located in an area of the city where they will improve, and not unsettle property values; and where they supply a type and quantity of rental space for which a real economic need can be shown. Where they replace obsolete structures, as in cases like this, they accomplish even greater good.

Historical Background. This too should be a basis for neighborhood planning. Neighborhood planning goes beyond the ordinary technique of architecture and finance. These designs may be regarded as the latest step in a long series of proposals on the East Side — legislative and sociological surveys, legislation, housing studies and experiments — which date back nearly a century. Only in recent years have such proposals passed into the stage of planning. The New York State Board of Housing from the time of its inception in 1926 has considered housing projects in this area for several years. The Board's first studies were undertaken on the Lower East Side, made by Holden, McLaughlin and Associates as consulting architects. These were followed by the building of three housing projects, each one a block or less in size.

The District Plan for the Lower East Side. In 1929 the writer became connected with the newly formed East Side Chamber of Commerce, and a survey of the district, covering city planning, economic and housing recommendations for the reconstruction of the area, was prepared for the Chamber.



Perspective of one of the four "super-blocks" showing the river front apartments and the park

A "Key Plan" or city plan for the area was first published in the spring of 1930.*

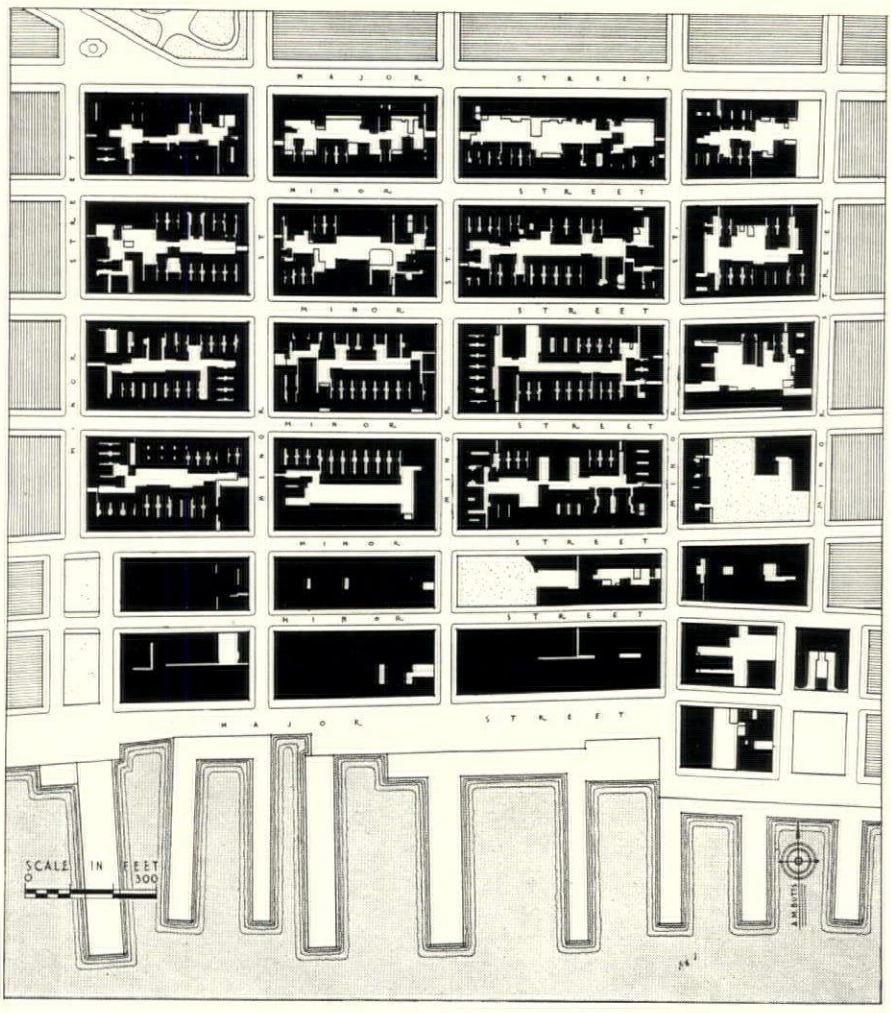
A year later the Regional Plan of New York published an outline of a plan for public improvements and an economic report of the Lower East Side. The Regional Plan adopted most of the conclusions and features, as well as the parti, of the Chamber Plan and Survey.

Area Selected for Reconstruction. The specific area selected for investigation is located on the waterfront of the East River. It forms one of the "islands" bounded by major traffic streets in the district plan of the Lower East Side, and is most typical of conditions on the Lower East Side. It contains 1,592,918 sq. ft. or 36.57 acres of private and tax exempt property, and 22.75 acres in streets, a total of 59.3 acres. The area is a rectangle, nearly square, consisting of 25 small blocks and narrow streets, generally 60 ft. wide, and some only 50 ft. wide. It is extremely flat, sloping very gently down to the river. The obsolete character of the buildings is stated in the caption for "Map of Existing Conditions" on page 155.

Mr. Platzker, the Secretary of the East Side Chamber of Commerce, made a special survey of economic conditions in this area, from which the following data are taken:

"The area contains 391 'old-law' tenements (built prior to 1901) of which 26 are vacant and boarded up, 21 'new-law' tenements, and a number of old commercial buildings. Sixty per cent of the tenements are 'cold-water' flats. The tenements which are occupied have 5,684 apartments of which 1,107 or 19 per cent are vacant. The average rentals are $6 per room per month, ranging from $2.50 or $3 a room up to $12, the latter figure being for completely 'modernized' apartments. The store vacancies were approximately 18 per cent on January 1,

* This plan, known as the "East Side Chamber Plan," was the work of the writer in association with Holden, McLaughlin and Associates as consulting architects for the Chamber. Social and economic studies made by Joseph Platzker, secretary of the East Side Chamber of Commerce, formed an important part of the investigation. A short account of this work will be found in *The Architectural Forum* for March 1932, Part II, entitled "Rebuilding Blighted Districts," pp. 295 to 298. Illustrations of the "Key Plan" itself were printed in *The Architectural Record*, February 1932, entitled "Facing Realities in Slum Clearance," by Arthur C. Holden, pp. 75 to 82.



Existing conditions in the area redesigned as a Neighborhood Unit. The two rows of blocks along the waterfront are mostly low, industrial buildings, chiefly garages and warehouses. Remainder are mostly "old-law" tenements, five stories high, covering most of the block area. They were built prior to 1901. Population, 15,200 in 1930. The area runs about 1,300 ft. back from the river street, and about 1,600 parallel to the river between the bounding streets

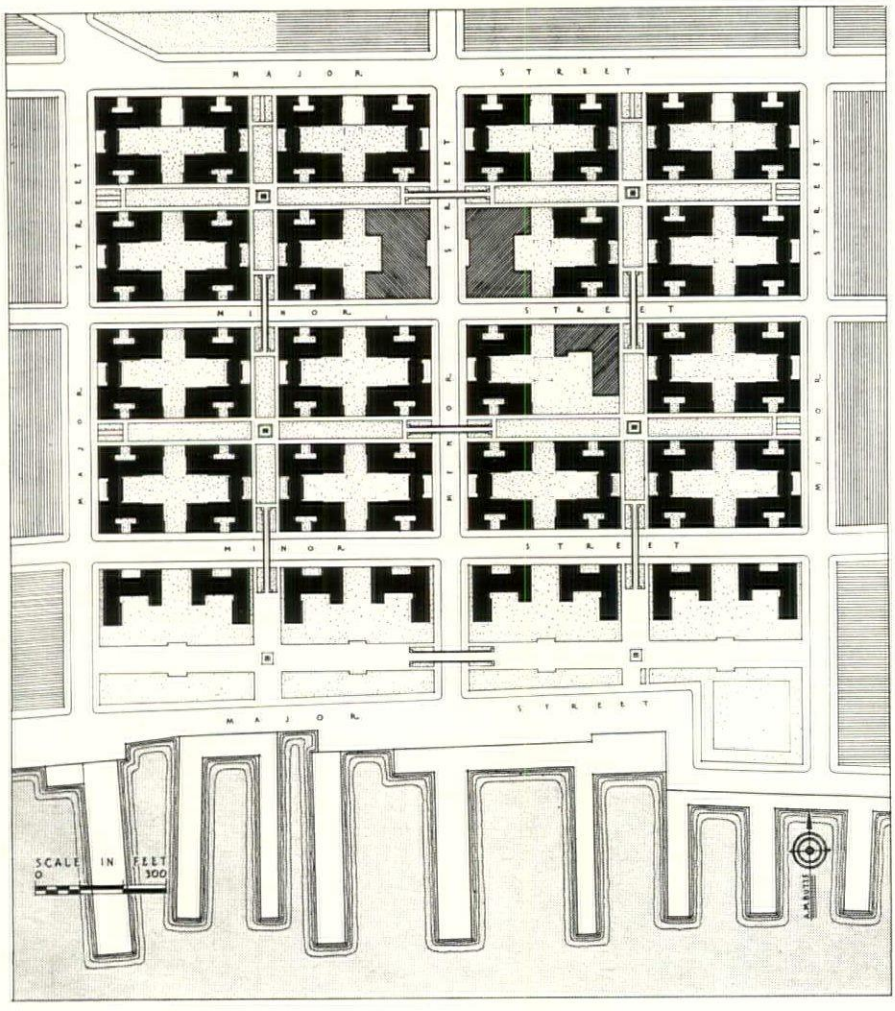
1932. Stores rent from $20 to $100 a month with an average of about $50."

Method of Study. It was assumed that this area was to be reconstructed with modern apartment buildings at moderate rentals, under a single owner. The land cost was figured at $11.25 per sq. ft., which is the average of the assessed 1931 valuation of the area. This figure was raised to $12 by the cost of demolishing the existing structures, and was adopted as the "base land cost" for the financial statement.

After many preliminary studies, complete typical floor plans of four typical unit buildings which could be applied to the area were developed. The six-story unit was planned two rooms deep, with a high degree of cross-ventilation. The three fireproof units also embodied these principles to a large extent.

A financial set-up was prepared, based on authoritative data as to existing costs of construction, operation of the buildings, and shop rentals. The New York State Board of Housing and Mr. Barnard Raymond, building expert of the Amalgamated Housing organization and others, supplied valuable data on construction and operating costs. Mr. Orrin C. Lester, president of the Lower East Side Planning Association, advised on finances. Mortgages were figured as 60 per cent of the total cost, with 5 per cent interest and 2 per cent amortization, and the remaining 40 per cent as equity, returning 7 per cent. The real estate firm of Brown, Wheelock, Harris & Co., through Mr. Robert W. A. Rodger, supplied data on shop frontage and rentals and also advised as to the commercial aspects of the designs. The Bartholomew organization kept constantly in touch with the architect, furnishing statistical and city planning data.

The Question of High or Low Buildings. To decide this mooted question two schemes were made — "Scheme A" and "Scheme B." Features common to both were: (1) The average room sizes, averaging 247 sq. ft. gross area per room. This is the standard of the Amalgamated-Lehman-Rabinowitz-State Housing Board block on the Lower East Side, and is likewise typical of moderate and medium rental projects in the Bronx and Brooklyn. (2) Completely modern apartments, generally three and



Scheme B. Block plan of a Neighborhood Unit development of six-story, non-fireproof, elevator apartment houses, with fringe of 12-story, fireproof apartments along the waterfront. It includes community buildings, shops, garages and park, and houses over 14,000 people at moderate rentals. Street pattern remains unchanged except for widening the boundary streets and two of the interior streets and closing one street parallel to the river front. Alternate remaining streets are restricted to pedestrian use and are bridged over vehicular thoroughfares

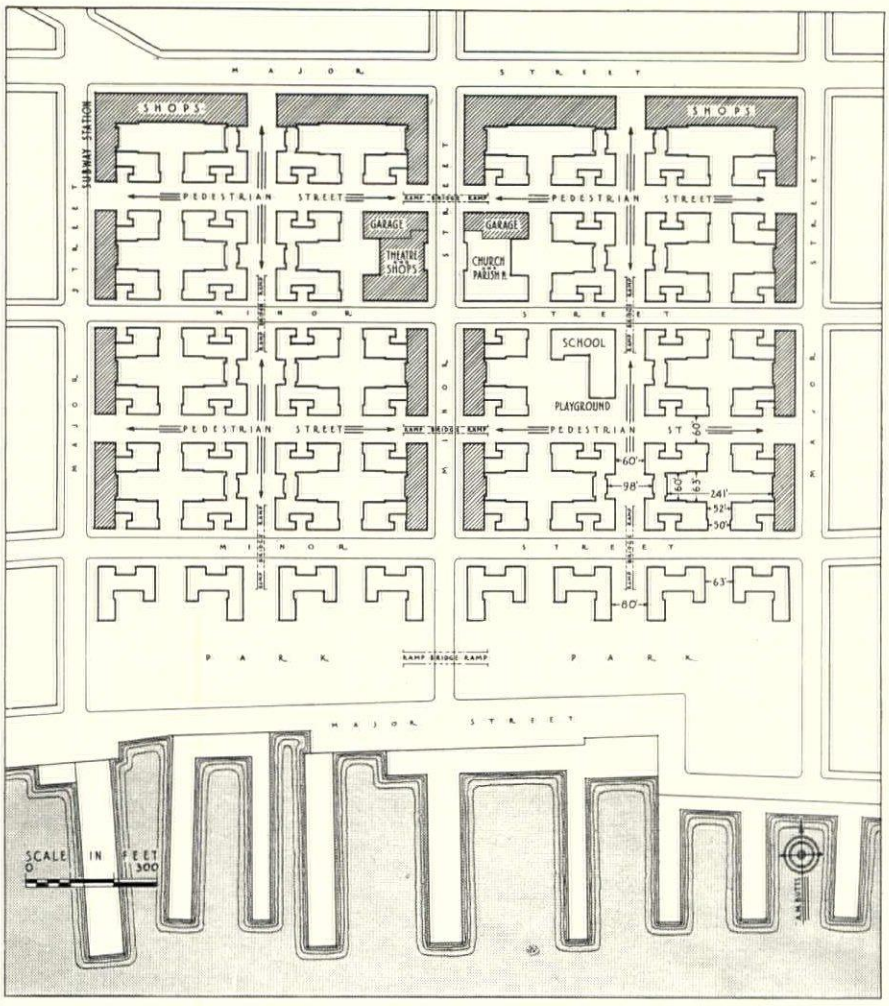
four rooms, with small proportion of 2's and 5's. (3) A row of tall, fireproof structures along the waterfront blocks. (4) General type of community buildings, including garages, church sites, motion picture theater, public grade schools with playgrounds, waterfront park, shops and pedestrian circulation through the area. (5) Cooperation by the city in widening and closing streets. It is assumed that the city will widen streets to 80 ft. for traffic needs. The unit pays for additional widening of streets to 100 ft. in Scheme A, to benefit shopping sites and to make wide streets for tall buildings. The city pays for parks and it exchanges school sites to provide new, modern school building in place of existing obsolete structures.

Scheme B. Scheme B differs from A in being a project for six-story non-fireproof elevator apartment buildings, except for the line of twelve-story buildings along the waterfront, and also making slight change in the street pattern. One street parallel to the waterfront street is closed. Two cross streets and the bounding traffic streets are widened, but the alternate interior streets are restricted to pedestrians in order to provide a system of pedestrian circulation crossing over the traffic streets in bridges. The cost of the land and buildings for the apartments is figured at approximately $34,000,000. Community buildings and the parks are not included in this figure. The new population would be about 14,000.

The average coverage of land by the apartment buildings, after allowing for the street widenings, is 57½ per cent. This insures a light angle of 45° or better among the buildings.

Scheme A. Scheme A is a distinct advance on Scheme B. It is a project for high, fireproof buildings, free-standing, spaced 50 to 60 ft. apart and more widely along the waterfront. It covers 47.9 per cent of the site area, allowing for street widenings but not for street closings If the area in the closed streets is included, the coverage drops to 35.4 per cent. The closing of the alternate interior streets permits four of the small blocks to be combined into a single super-block, with the buildings grouped around a center garden.

Financial computations were made for average



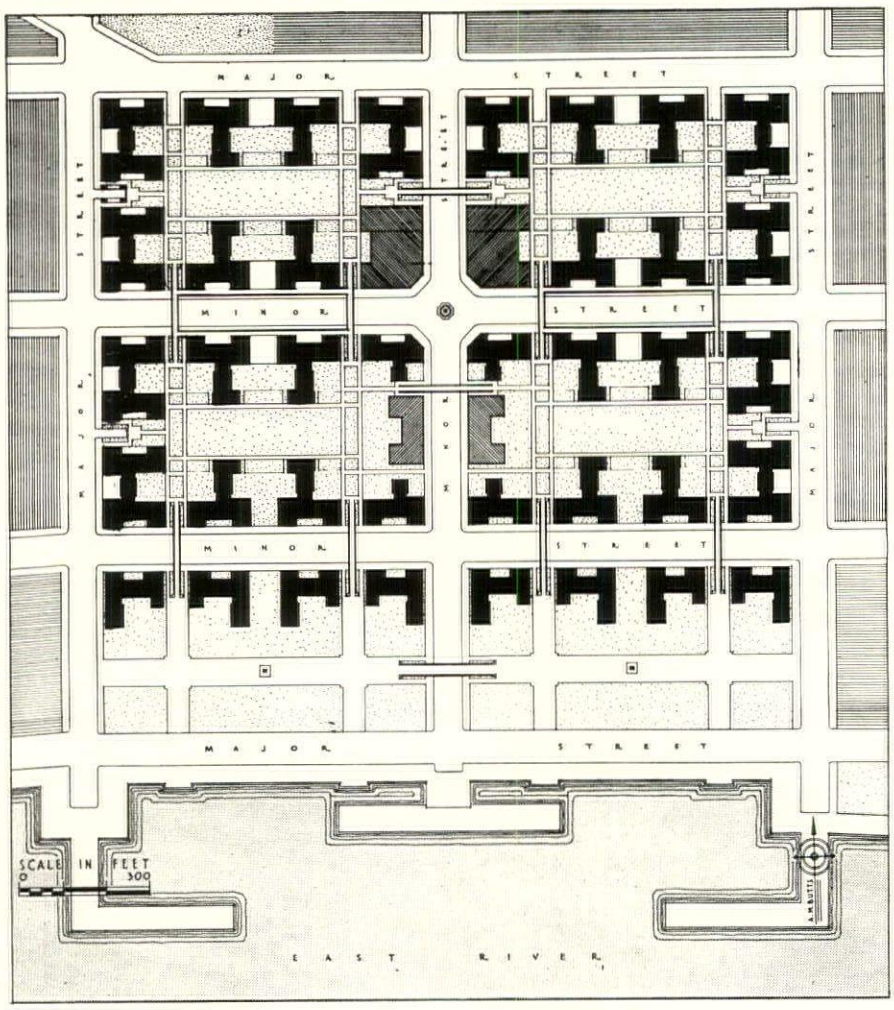
Scheme B. Ground floor, showing location of community buildings and shop frontages. The concentration of the community structures in a center is to some extent diagrammatic, since probably it would be more practical to distribute them among the blocks to a greater extent. They are purposely eliminated from the blocks in order to facilitate improvement in the block arrangement

heights of twelve and eighteen stories. The population at twelve stories would be about 17,000, and 23,000 for eighteen stories. Since eighteen stories is probably an extreme height, involving the crowding of too many people upon the land, and since the rentals were only slightly lower, twelve stories may be taken as approximately the most suitable height for the project. It is interesting that the rentals for the six-story Scheme B are slightly lower than for Scheme A with twelve stories. The higher construction cost per cubic foot and the lower coverage of Scheme A offset the advantage of its greater height.

Community Facilities. Rather complete provision was made for shops, garages, grade schools and playgrounds, amusement and recreation. It was assumed that many of the minor community needs could be accommodated in the ground floors of the apartments, with entrances separate from those of the apartments. In practice it might not be possible to concentrate the religious activities and organizations on one large site. To this extent the arrangement of the community buildings is somewhat diagrammatic, and was adopted in order to facilitate the planning of the apartment groups.

In fact, this problem of community facilities is an intricate one indeed. The matter of shop frontage and rentals proved troublesome. Frontages averaging 60 to 70 linear feet per 100 population were discovered in a survey of shopping districts in a number of cities, and this proved to be the case on the Lower East Side. However, an allowance of 25 ft. per 100 people housed was adopted, because it was felt that a more efficient and intensive use of shopping space characterized New York's apartment districts, as compared with less intensively built cities. Higher rental figures than average were established to offset the lower allowance for shop frontage.

Redesigning the Street System. One of the outstanding principles of the design of Scheme A is that both streets and buildings are designed as a whole. This principle is likely to have universal application in the future because the evidence is growing that our early nineteenth century street patterns are obsolete for modern buildings. Indeed, anyone who



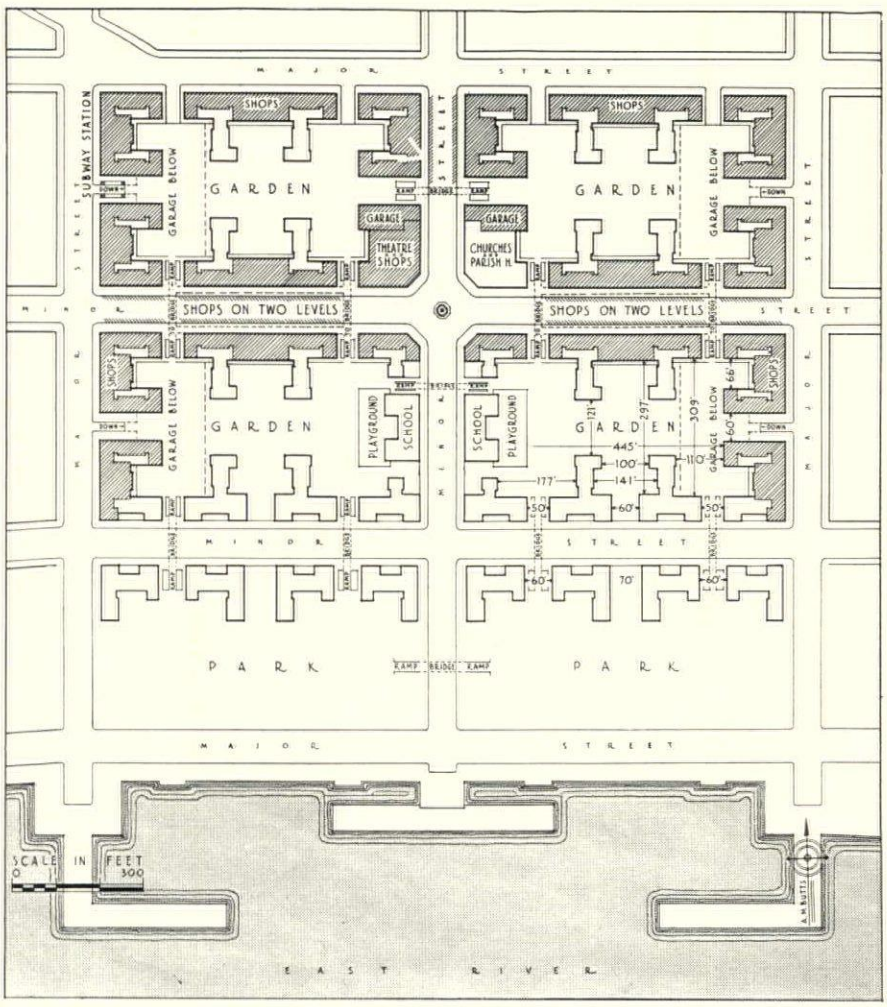
Scheme A. Block plan of area with fireproof apartments, averaging twelve stories in height, to house about 18,000 people. Fundamental alterations are made in street pattern, involving (1) alternate interior streets closed and the space covered by them and by four blocks combined to form a single "superblock," (2) the boundary interior streets widened to form shopping avenues, and (3) system of pedestrian circulation created, as in Scheme B. Apartment rooms average 247 sq. ft. gross area, as in Scheme B. Buildings cover 47.9 per cent of the site area of the private property after the streets are widened. If the space in the closed streets is included in the site area, the coverage reduces to 35.4 per cent

erects a new structure on an obsolete street system, no matter how fine the location or the design, or how sound the financing, is in danger of seeing the building grow rapidly obsolete in a few years. It may lose value both by reason of better competing locations that are created on a reconstructed street pattern, and by reason of the competition of large-scale operations, either of a residence or business type.

The writer had previously come to the conclusion that many of the streets in the Lower East Side were superfluous and that they could be closed with profit to all concerned, including the city. There was a crying need of open space in that congested area. This surmise was proved correct by the analysis of traffic conditions made on all the streets of the Lower East Side by the Bartholomew organization. It proved that the widened streets are more than sufficient to care for needs of vehicular traffic in the area.

The Problem of Land Acquisition. Although this crucial factor in large-scale development was ruled out of the investigation, it naturally has been much discussed. The discussions point strongly to condemnation as the logical way to deal with the land problem. For this reason the writer is inclined to modify his opinion, expressed in the March article of THE ARCHITECTURAL FORUM, "Rebuilding Blighted Districts," Part II, pp. 295 to 298, to the extent of believing that farsighted opinion in real estate circles may be more ready to accept condemnation than he had thought. The neighborhood unit idea appeals powerfully to practical men who are now alive to the hazards of piecemeal, speculative building enterprises. Projects, considered to be of the soundest character, lose value rapidly through causes over which their sponsors had no control. Overproduction of the market for that particular type of structure or deterioration in the neighborhood were the causes. By contrast, the Neighborhood Unit, establishing control as it does over both the quality and quantity of building production in a large area, appears to offer better protection against such loss of value. Condemnation, under proper safeguards, then seems quite reasonable as an essential means of maintaining property values.

The City's Cooperation. This other obstacle to the practical adoption of the Neighborhood Unit is



Scheme A. Ground plan, showing location of buildings and shop frontages. Community center is somewhat diagrammatic, as in Scheme B. Apartment buildings that have ground floor shops are entered from the "super-block" garden, separate from the shop entrances. The waterfront park, as in Scheme B, is intended to be part of a large waterfront park around the bend of the East River, and is part of the East Side Chamber of Commerce "Key Plan" for the whole Lower East Side, prepared by John Taylor Boyd, Jr., Holden, McLaughlin & Associates in 1930. Most of the main features of the East Side Chamber plan were adopted by the Regional Plan of New York in the following year

likewise exaggerated. The advantages to the city of Scheme A are manifest — particularly by the fact that assessments, now falling in the area, will be doubled or trebled. The widening of the streets for traffic needs is reasonable for the city to undertake, so is the provision of a small park or playground space. The low coverage and monumental grouping of the buildings provide needed open or "breathing" space to which the city can well afford to contribute the area in the closed streets, relieving it of the expense of providing small parks in the area.

From a broader viewpoint, the condition of the city's finances is improved by this operation. The burden on the city's rapid transit system is lightened by the construction of residence buildings in "walk-to-work" locations; the tax deficit in the blighted areas is turned into a surplus; the burden on the municipal administration grows easier. The city need make less outlay for improvements in new districts in order to take care of population growth. Instead it can salvage at comparatively low expense its heavy investments in the older areas, in improvements and in public facilities. Lastly, the social benefit is enormous.

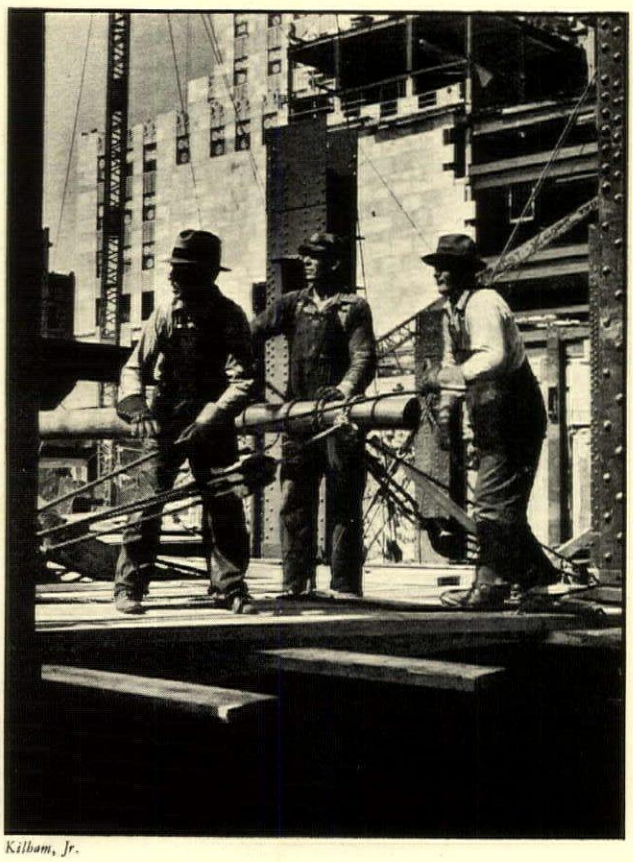
General Results of the Investigation. These are demonstrated as economy in land utilization, in design, in construction, in overhead and in operating costs; in the conservation to the project of the added value of *all* shop and commercial sites; and in low rate of depreciation and obsolescence. The financial solidity of the enterprise should be greater than in the case of piecemeal operations, particularly as regards investment value, mortgage risk and competitive strength. City nuisances are greatly diminished or are eliminated. Particularly important are the solutions of the problems of traffic movement, parking, garages and pedestrian safety. Almost suburban living conditions are introduced into the heart of a congested city, at rentals that competing piecemeal operations cannot match. The orderly grouping of buildings along the street and on a super-block opens new possibilities for the improvement of the architectural mass of city building. Better social organization of the community is possible. Neighborhood Unit planning provides a framework for the growth and full fruition of the intricate human organization of the neighborhood. Out of a mob it creates a social unit.

Irving Browning

THE EAST SIDE OF YESTERDAY

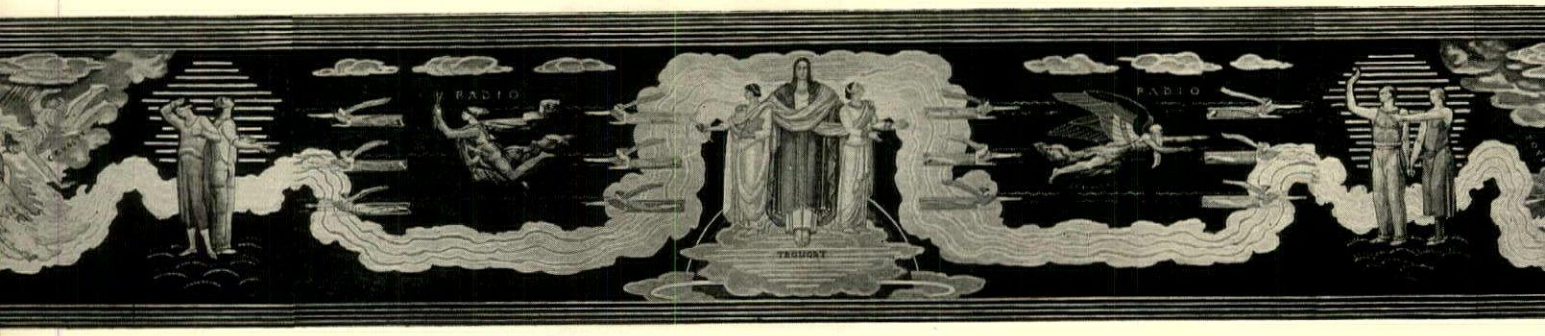
New York's famous slum district is the subject of intensive study looking towards its reconstruction. The article by Mr. Boyd on the preceding pages describes a possible solution for the reclamation of this area

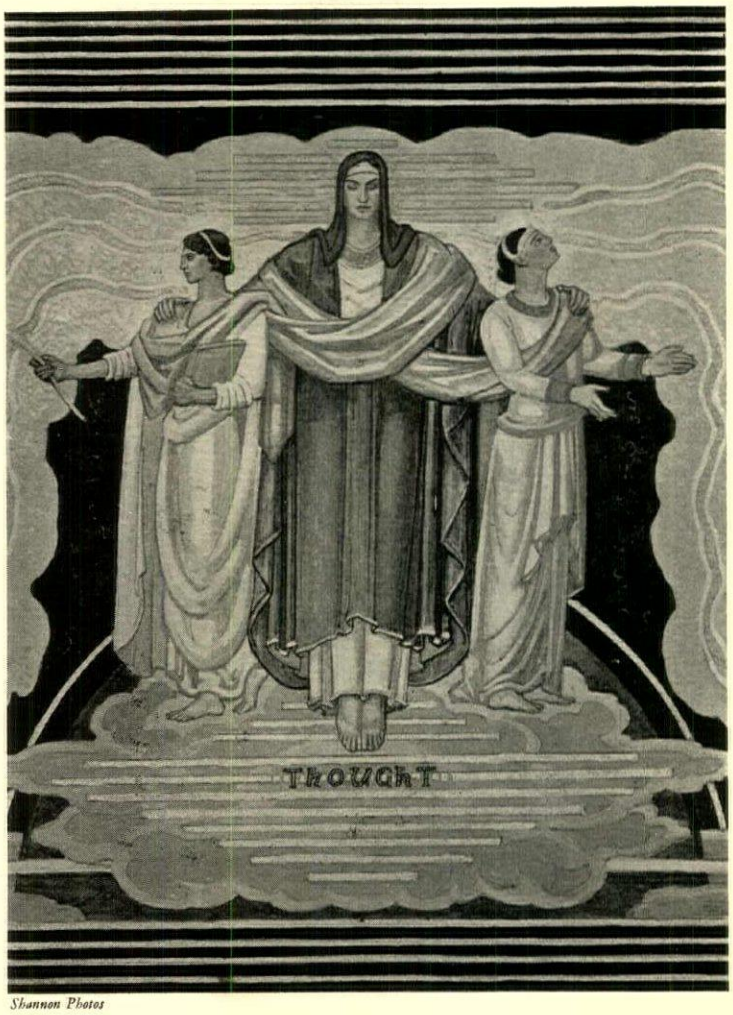
ENGINEERING & BUSINESS



Kilham, Jr.

THE STORY OF ROCKEFELLER CENTER, PART IX . . . N. B. C. STUDIOS . . . STUDIES IN SUPER-BLOCK HOUSING . . . AN INTRODUCTION TO METHODS OF AIR CONDITIONING . . . PLANNING FACILITIES FOR OUTDOOR BATHING DEVELOPMENTS . . . ARCHITECTURAL FORUM DATA AND DETAILS OF BEACH CLUB EQUIPMENT

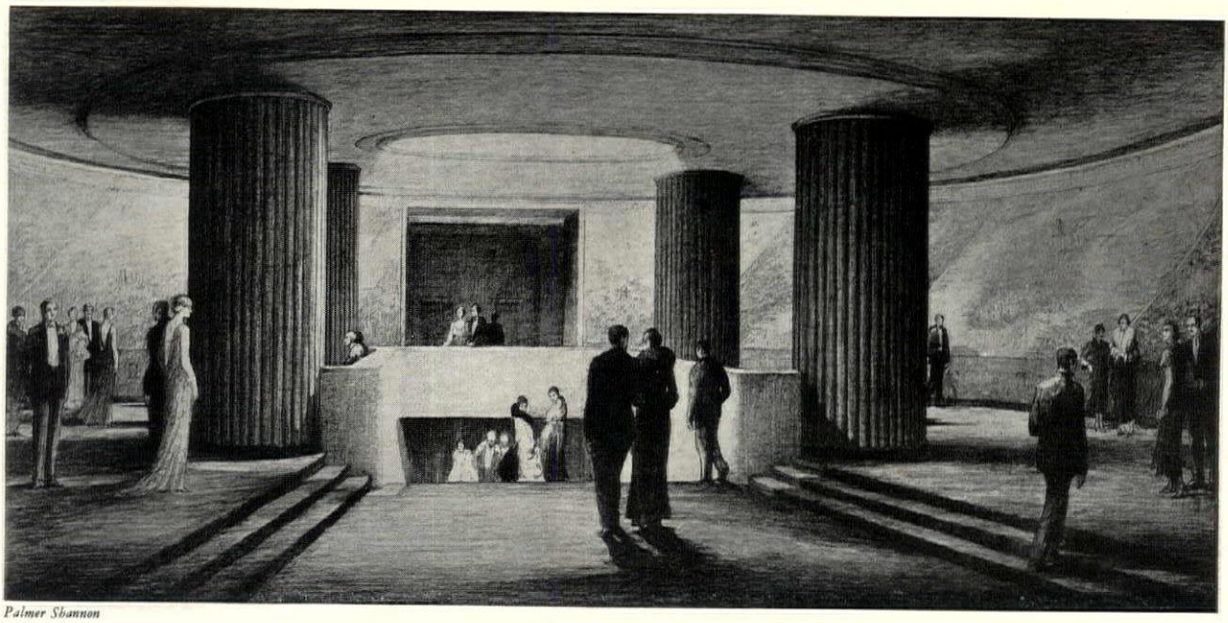




Shannon Photos

MOSAIC FOR RADIO CORPORATION BUILDING
ROCKEFELLER CENTER
DESIGN BY BARRY FAULKNER

THOUGHT is the central figure standing above The World. On either side, are her articulate manifestations; — Spoken Words and Written Words. From Primal Thought the specific Thoughts fly by Radio to Man and free him from the terrors of Ignorance, Cruelty, Poverty and Fear. A current of Thought Energy flows through the Universe from the head of Primal Thought and bursting into flames destroys the enemies of Man. The specific Thoughts carried by Radio divide themselves between the headings of Art and Science; and are Religion, Music, Drama, Politics, Physics, Poetry, News, Chemistry, Sports, Biology, Advertising



Palmer Shannon

Perspective of Main Foyer

THE STORY OF ROCKEFELLER CENTER

IX. THE PLAN AND CONSTRUCTION OF THE NATIONAL BROADCASTING COMPANY STUDIOS

BY

O. B. HANSON, CHIEF ENGINEER

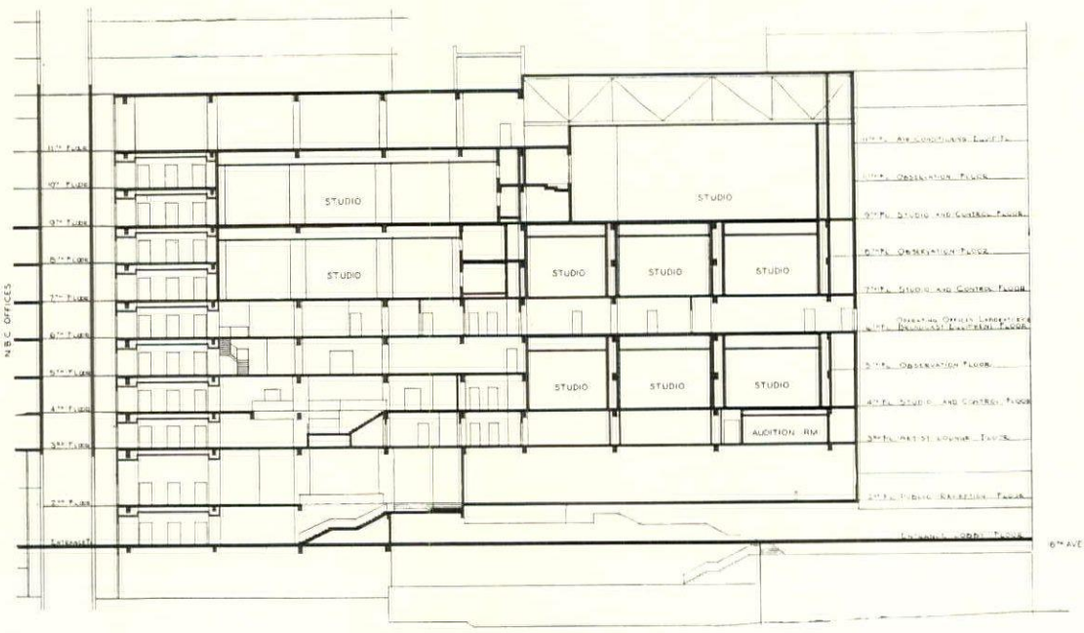
NATIONAL BROADCASTING COMPANY

THE studios for the National Broadcasting Company, which are to occupy eleven stories in the 70-story office building of Rockefeller Center, form one of the most interesting units in this multi-purpose building development. Because a broadcasting station is a new type of architectural problem, the method of solution for this, the largest studio group in the world, should be unusually interesting to the profession.

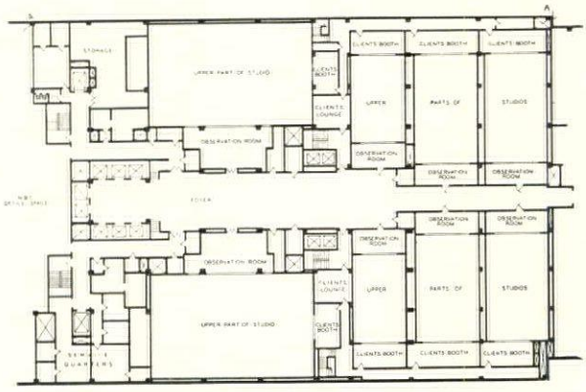
Due to the large spans necessary in a building designed to house broadcasting studios it was impractical to support a tower seventy stories high directly over the broadcasting studios. Therefore a section of the building devoted to studios has been designed in the lower floors just back of the tower, a maximum height of twelve stories. The studios have been placed to avoid interference with this massive steel supporting the weight of the tower, which is primarily the office section of the building. The NBC offices are to be located on the lower floors (third to eighth), adjacent to the studio section and served by the regular office elevators.

In planning this project, it has been estimated that 27 studios, 6 audition rooms and other appurtenant rooms will be required, and that to house these studios and offices, approximately 500,000 square feet would be needed and approximately 370,000 required for the studio section alone. In planning the layout, certain fundamental principles underlying the engineering and traffic problems of broadcasting studios have been adhered to.* A method of centralized control has been applied to this project. Although in all previous studio layouts based on centralized control, the studios were located on a single floor, this principle has been modified here, as it has been necessary to place the studios on three different levels, the 4th, 7th and 9th floors, the whole project occupying from the 3rd

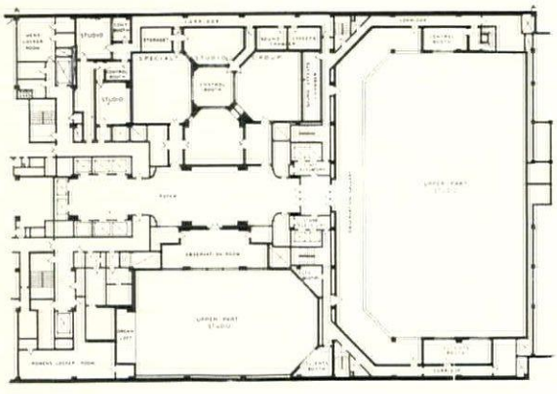
*See "The Design and Construction of Broadcasting Studios," by O. B. Hanson in Proc. IRE, January, 1931.



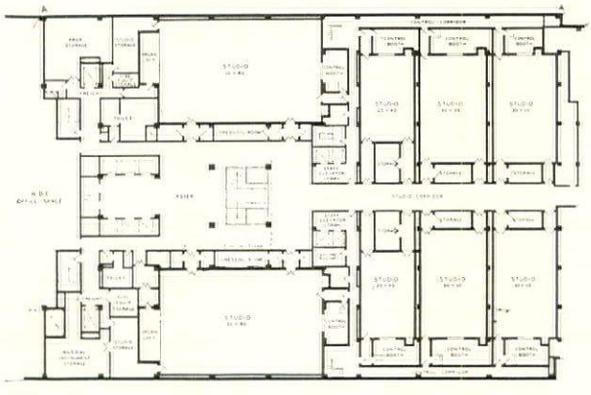
LONGITUDINAL SECTION THROUGH STUDIO UNIT



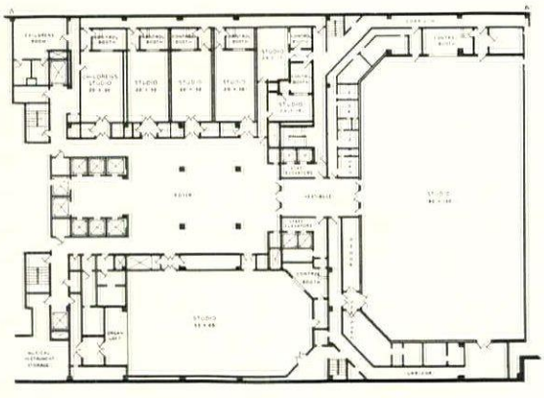
FIFTH AND EIGHTH FLOORS



TENTH FLOOR

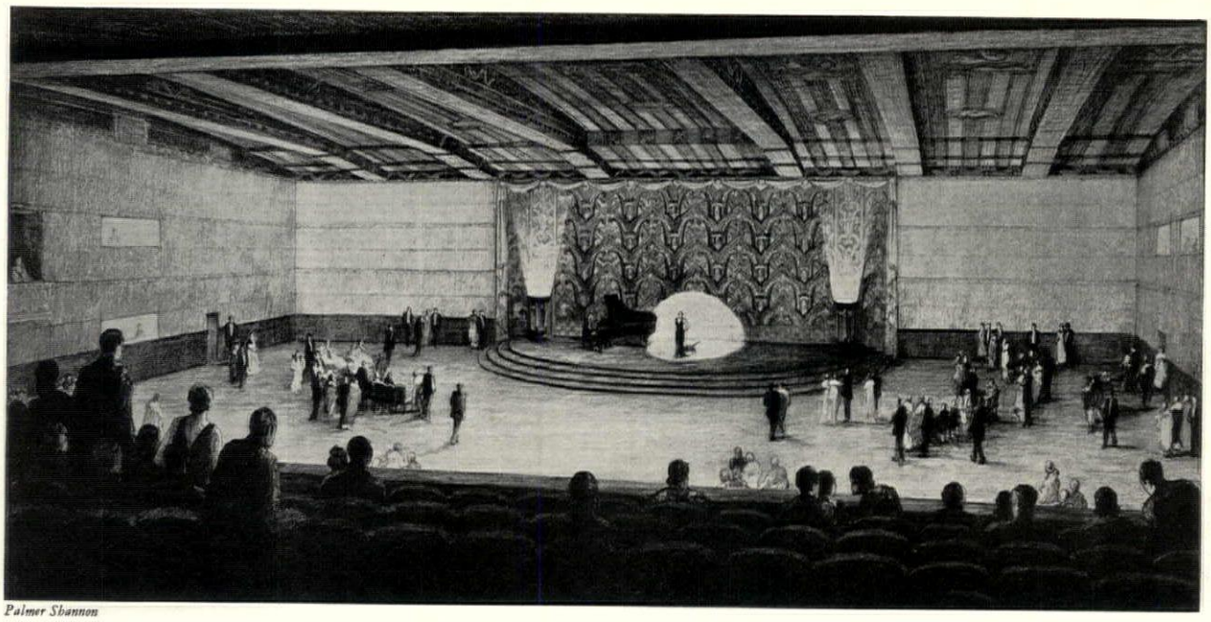


FOURTH AND SEVENTH FLOORS



NINTH FLOOR

SECTION AND FLOOR PLANS
NATIONAL BROADCASTING COMPANY STUDIOS



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Proposed treatment of the three-story studio, which is to be the largest broadcasting studio in the world, 80 ft. wide and 130 ft. long. This view shows the studio proper as seen from the observation gallery, which opens into the studio

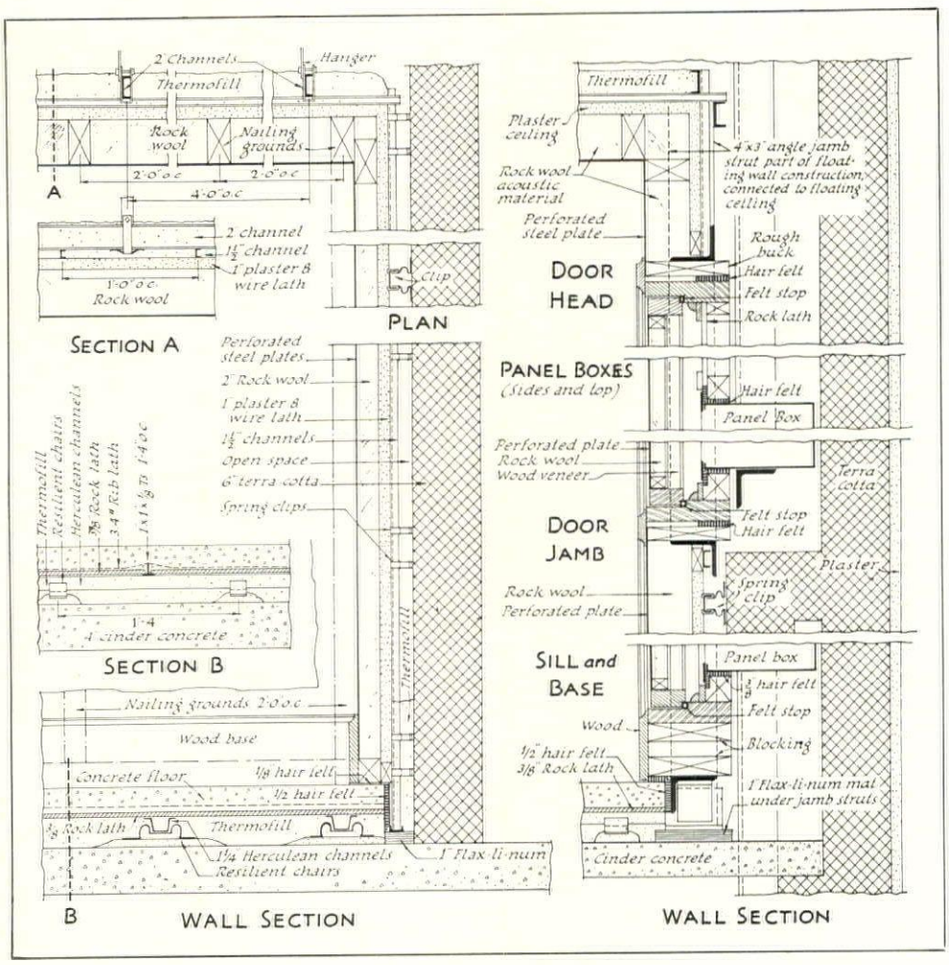
to the 11th floors. The longitudinal cross-section through the building, shows the locations of the studio floors with respect to each other and with respect to the main control room, the latter being located on the 6th floor, sandwiched between the two main studio floors.

It will be observed that all the studios on the 4th and 7th floors are two stories in height and that on the 9th floor there is one studio planned to be the largest in the world, which will be more then three stories in height. By reference to the plan showing the fourth floor or lower studio bank, which is again duplicated on the seventh floor, it will be observed that the studios are symmetrically placed and that the entrances thereto open into a large foyer which provides the communications for the artists, performers, and musicians. The main lobby and the main studio elevators occupy that part of the building which falls directly beneath the mass of the tower, because the steel in this area is necessarily heavy and no large spans can be provided. The building directly over the studios themselves is but twelve stories in height.

Heretofore in designing studio layouts wherein the studios were all on the same level, the engineers and production staff, together with the control rooms and main control room have been centrally located with the studios around them, and the artists' approach to the studios on their extreme outerside. In this project it was impossible to carry out that scheme because the main approach to the studios is centrally located itself. However, the plan has been carried out vertically rather than horizontally. By reference again to the longitudinal section, it will be noticed that the central main control room, the main apparatus and equipment room, power supply, and offices of the operating staff, production staff, and traffic department have been centrally located on the sixth floor. Ready access can be obtained from this floor to the three studio floors by means of private elevators operated for the sole use of the operating and production staffs. On each of the typical studio floors, elevators open into private corridors which communicate directly with the individual control and monitoring booths of each studio. They are so laid out that at no time is it necessary for any of the production staff to enter upon the communicating corridors and the lobbies provided exclusively for the artists, performers, and musicians. It will be further noted that artists and performers coming from the main studio elevators can, at a glance, see the entrances to all studios on the floor and that a point of control for each floor is placed directly in front of the elevator lobby. As a result, musicians and performers have ready ingress and egress from one studio to another through the main foyer, without crossing the communication corridors of the engineering and production staffs.

It is anticipated from past experience in the handling of musicians and guests that several thousand people will be present in this studio block at the same time, and for this reason a serious traffic problem must necessarily be solved in the plan.

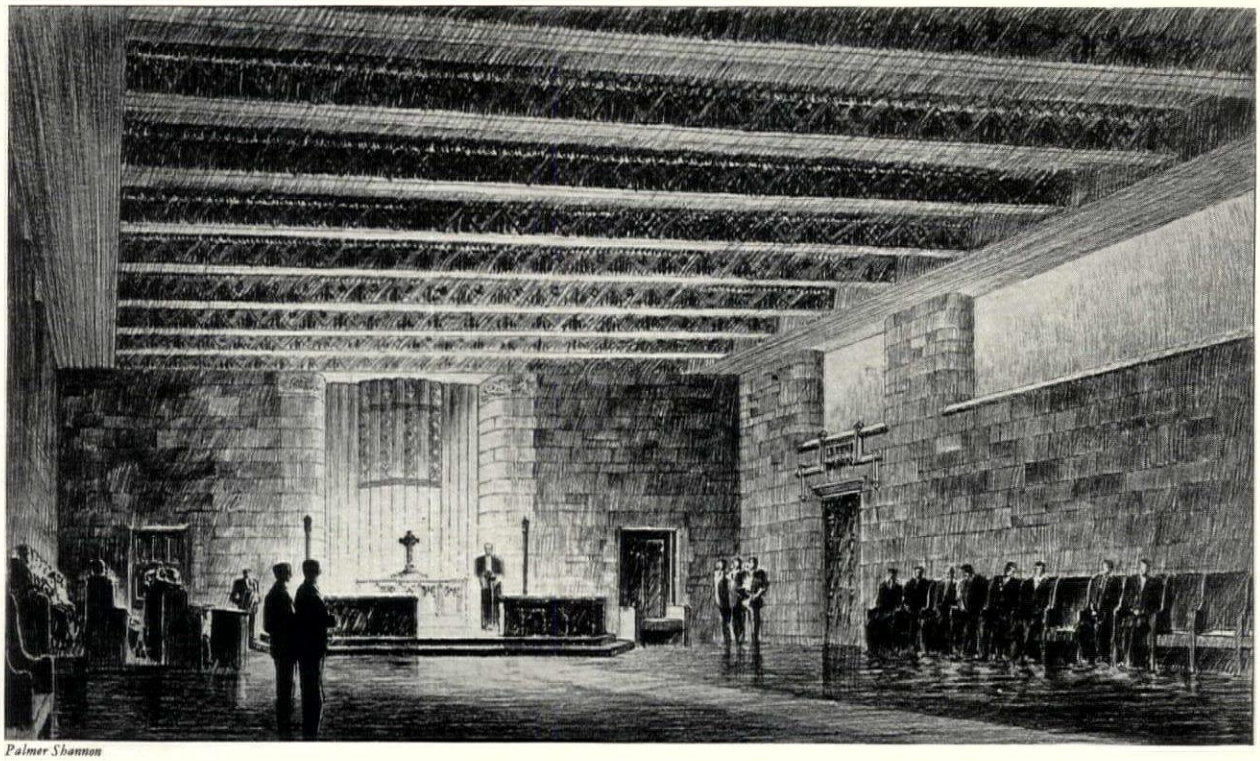
A logical question no doubt arises as to why so many studios are required for the operation of a dual network broadcasting system such as is now operated by the NBC when it is necessary to keep only



Details of the floating construction which has become almost standard for broadcasting studio construction. Walls, floors, and ceiling are isolated from the building structure, for soundproofing purposes, by the use of spring clips. An unusual feature is the wall construction, perforated steel plates backed by rock wool on plaster

two programs on the air simultaneously. Our statistics show that on the average, four hours of rehearsal are required for every hour of actual broadcasting. This means that when one broadcasting studio is on the air, four others are being occupied by rehearsals, and a sixth is in preparation for the following program. However, as productions vary in size and type, a variety of different size studios must be provided to meet adequately the needs of the various productions. Further, when dual channel operation is encountered, a minimum of twelve studios must be provided to permit choice of size to suit simultaneous broadcasts. It is necessary to provide three or four audition studios which are in continuous operation by the program staff in their search for and selection of new talent. In our present quarters at 711 Fifth Avenue there are nine studios and three audition rooms, together with two small rooms used for the purpose of monitoring outside pickups and out-of-town and foreign broadcasts, which gives the equivalent of the apparatus of a fourteen-studio layout for the operation of two channels. Even under these circumstances, we are hampered by lack of choice of proper size studios to fit all cases simultaneously. In network broadcasting it is frequently necessary to split networks and transmit four programs simultaneously, which further complicates the studio problem. With this explanation, and allowing for the natural growth of the industry, it can be readily appreciated that the 27 studios planned for Radio City are not too numerous, as it would appear at first.

In addition to the needs of musicians and performers, who will be passing in and out of the building, it is planned to accommodate adequately the clients and guests of the company. Considerable space is being provided for adequately receiving and entertaining visitors. On floors 2, 5, 6, 8, and 10, public reception rooms and observation galleries to practically all the studios are provided. In the larger studios, the observation galleries are planned with theater seats so that the guest may be comfortable while watching the progress of a broadcast



Palmer Shannon

A studio used as a chapel from which religious services are to be broadcast. The acoustical treatment offered peculiar difficulties, which have been solved by the use of a new type of acoustic clay tile, similar in appearance to stone

production. In nearly all cases observation galleries are separated from the studios by sound-insulated, transparent partitions but in some instances the galleries are opened into the studio. It will also be noticed on the plan for the fifth and eighth floors that private observation rooms are provided for the sponsor of programs and his staff of assistants, critics and guests. Every available inch of space has been put to use and the plan is dovetailed symmetrically.

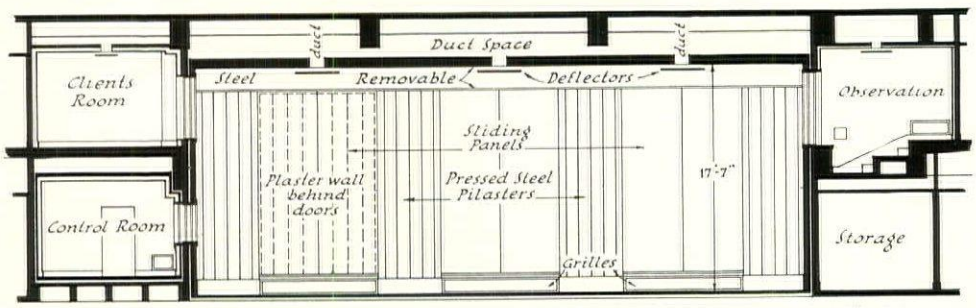
As many studio guests are interested in the technicalities of broadcasting, an observation room has been provided on the sixth floor, directly in front of the main elevator lobby separated from the main control room by plate glass windows so that these visitors may see the technical apparatus and the staff in operation.

In addition to the large studios shown on the fourth, seventh, and ninth floors, there are a number of small studios on the ninth floor especially designed to handle speakers and small productions. In view of the increasing number of child artists a special reception and lounge room has been provided for them on the ninth floor, together with a suitably arranged studio for children's productions.

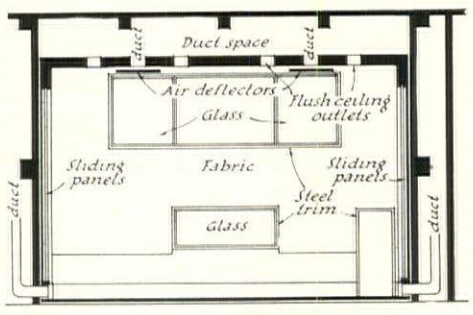
Studio 9-H, the largest studio of the group, has floor dimensions of 80 x 130 feet, with an average ceiling height of 38 feet, and is equipped with a balcony on the tenth floor which will seat approximately five hundred visitors. The balconies in this case open into the studio. Studio 9-G, on the ninth floor, is the second largest studio and is being constructed for the production of dramatic and other productions of this sort, which require a stage and a local audience. If and when television reaches a point where its operation is comparable to the making of motion pictures, these two studios would prove invaluable because of the large floor area available.

On the tenth floor there are provided four studios grouped around a central control room for the purpose of producing dramatic productions for simple television broadcasting. The various scenes can be set up in these studios, arranged in proper sequence so that the television camera or scanner located in the control room can be rotated and focused on any one of the four studios, in proper sequence. This group of studios can also be used for the production of drama without vision, wherein it is necessary to place the orchestra in one studio, the principal actors in another, crowd scenes in another and sound effects in the fourth, mixing these four pick-ups electrically in the common control booth to obtain the desired effect. This setup is not necessary in all productions but it was felt that one such group should be provided to handle certain complicated productions.

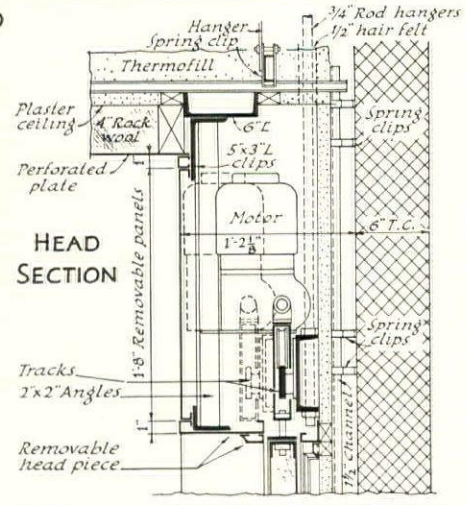
Sound insulation is of great importance in the design of all studios, and a system of soundproofing



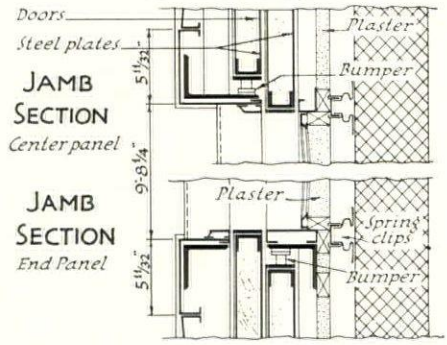
SIDE ELEVATION OF STUDIO



END ELEVATION
(opposite end similar)

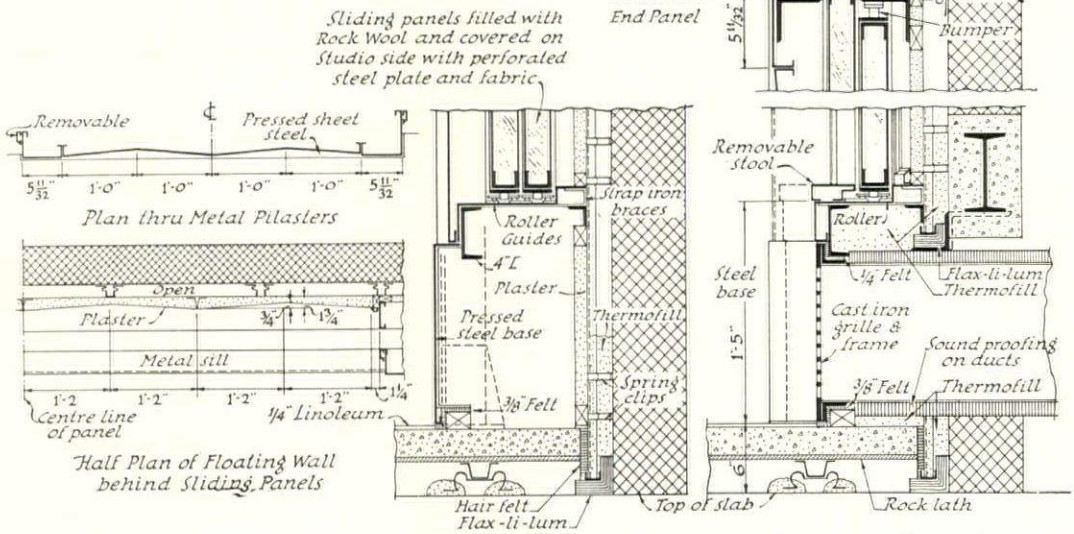


HEAD SECTION



JAMB SECTION
Center panel

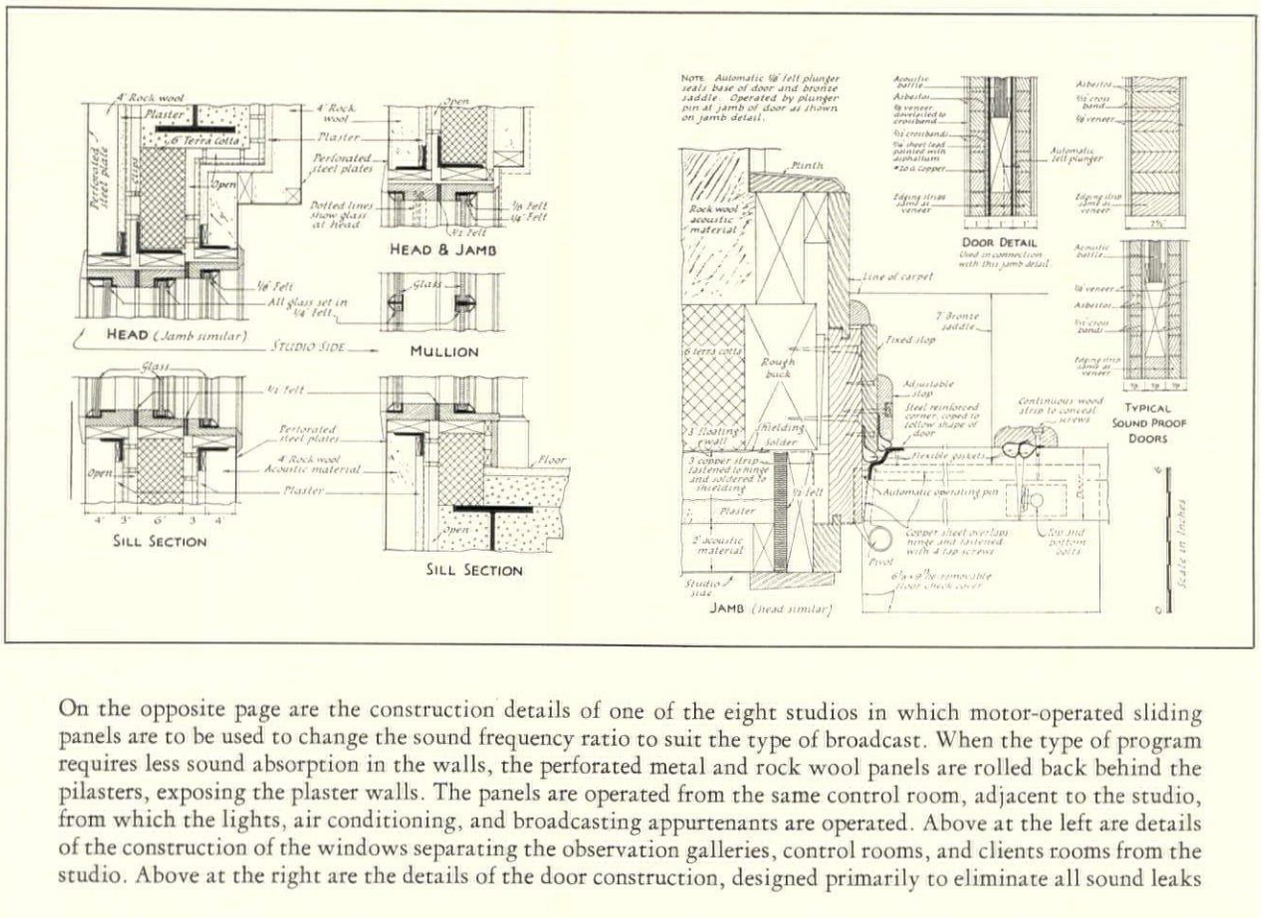
JAMB SECTION
End Panel



SECTION THRU METAL PILASTERS

SECTION THRU SILL AND BASE

ELEVATIONS AND SECTIONS OF A STUDIO TYPE
NATIONAL BROADCASTING COMPANY STUDIOS



On the opposite page are the construction details of one of the eight studios in which motor-operated sliding panels are to be used to change the sound frequency ratio to suit the type of broadcast. When the type of program requires less sound absorption in the walls, the perforated metal and rock wool panels are rolled back behind the pilasters, exposing the plaster walls. The panels are operated from the same control room, adjacent to the studio, from which the lights, air conditioning, and broadcasting appurtenants are operated. Above at the left are details of the construction of the windows separating the observation galleries, control rooms, and clients rooms from the studio. Above at the right are the details of the door construction, designed primarily to eliminate all sound leaks

similar to that which has been used in the New York and Chicago studios is planned. That is to say, the walls, floors, and ceiling of each studio will be floated free from the building structure. (See details on page 156.) This will also apply in the case of control rooms and other appurtenant rooms. Without such an insulating system it would be impractical to build studios in steel buildings because the steel framework provides an excellent transmission system for sound and mechanical vibrations.

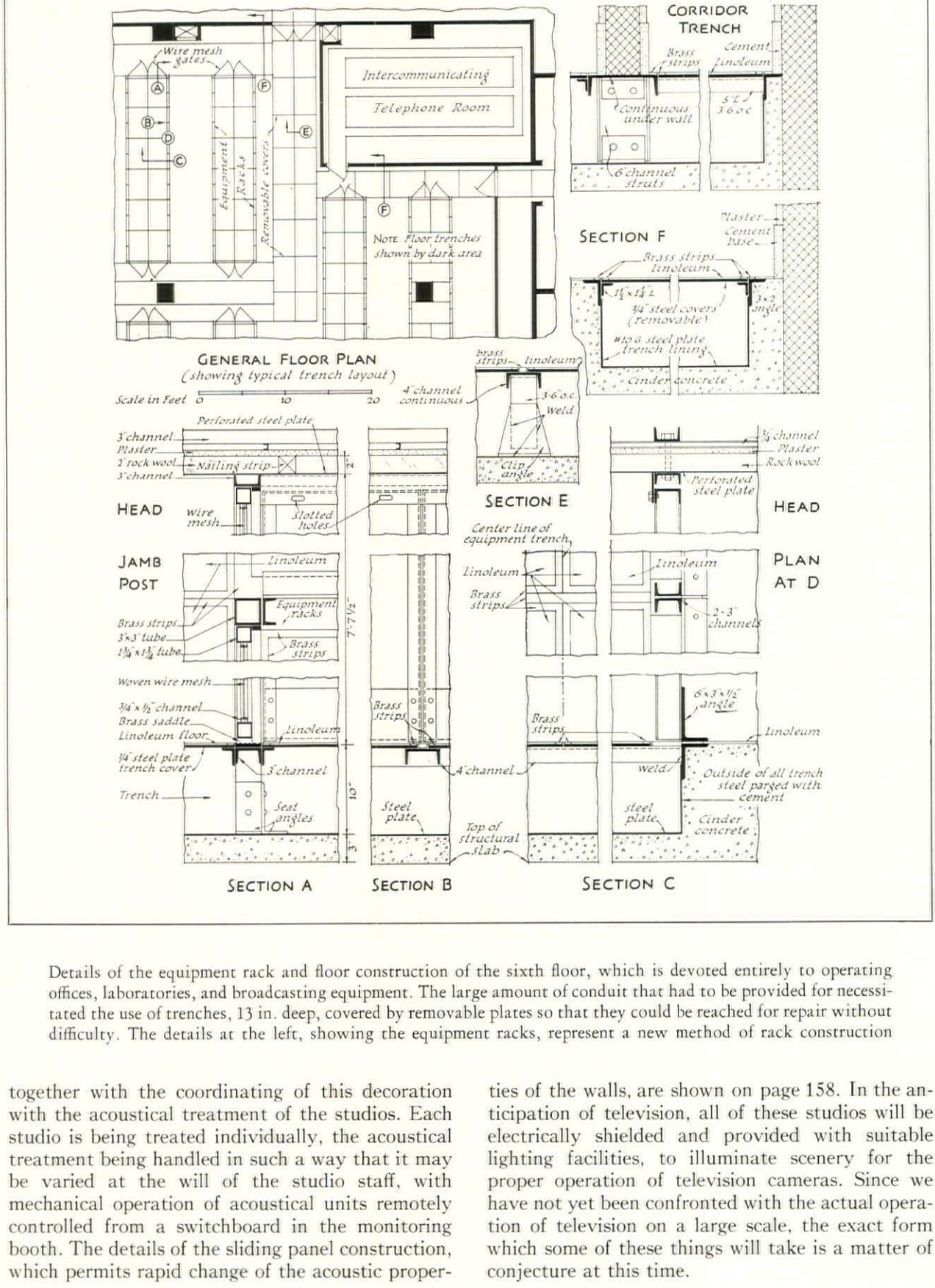
In the construction of broadcasting studios in Europe the engineers have barred the use of steel framework in the section of their buildings which are to house studios, because of the difficulty of sound control where steel is involved as a framework. The British and Germans have both been careful in this respect. In this country, however, the problem is forced upon us and we cannot avoid it. It has been successfully solved by complete isolation of each studio. With such construction, sound attenuation of the order of 60 db., is readily obtainable, and as each studio is similarly isolated, an attenuation of 100 db. or more between studio units can be obtained. No suitable apparatus is yet available that will measure accurately attenuation of this order with sound levels normally attained in the studios.

Every effort has been made to eliminate sound transmission through doors and through the windows separating the studios from the observation rooms. (See details above.)

Second in importance to sound insulation is air conditioning, without which studios would be inoperative. The air conditioning plant designed for the NBC Studios when complete will probably be the largest and most complicated plant in the world and will cost approximately a million dollars. It is planned to have ten separate units with individual control for each studio as well as automatic control for each unit. Obviously, special precautions have been taken to prevent the transmission of sound from one studio to another through ventilating ducts and the control of noise generated in the ventilating machinery itself.* Special streamline air supply outlets are being designed to reduce the air rush in the studios, the total noise from the air conditioning to be less than plus 8 db., sensation level. In some instances the air will be completely changed in the studios eight times an hour, which calls for handling of large volumes of conditioned air, complicating the problem of noise from air rush.

In addition to the foregoing, the problems of decoration to obtain proper psychological effect on the performers are being studied at the present time

*Details of the machinery and duct insulation will be found on page 174 of this issue.



Details of the equipment rack and floor construction of the sixth floor, which is devoted entirely to operating offices, laboratories, and broadcasting equipment. The large amount of conduit that had to be provided for necessitated the use of trenches, 13 in. deep, covered by removable plates so that they could be reached for repair without difficulty. The details at the left, showing the equipment racks, represent a new method of rack construction

together with the coordinating of this decoration with the acoustical treatment of the studios. Each studio is being treated individually, the acoustical treatment being handled in such a way that it may be varied at the will of the studio staff, with mechanical operation of acoustical units remotely controlled from a switchboard in the monitoring booth. The details of the sliding panel construction, which permits rapid change of the acoustic properties of the walls, are shown on page 158. In the anticipation of television, all of these studios will be electrically shielded and provided with suitable lighting facilities, to illuminate scenery for the proper operation of television cameras. Since we have not yet been confronted with the actual operation of television on a large scale, the exact form which some of these things will take is a matter of conjecture at this time.

STUDIES IN SUPER-BLOCK HOUSING

The possibility of reclaiming slum areas or blighted districts such as New York's Lower East Side has created an exceptional interest. This interest led a group of younger architects to make voluntary investigations of the problem, and the studies they present in brief indicate the results of months of their work.

THE two studies here presented, of possible rehabilitation of a portion of the Lower East Side of New York City, were made last winter at the New School for Social Research's "Architectural Workshop." The work was done by a number of young architects, with the advice and under the direction of practising men.*

A restricted portion of the Lower East Side was chosen in order that the study might be made more thoroughly, and also because the cheapest land was available in the area chosen.

The portion chosen is shown on the plans. It is particularly suitable for residential development because it is within easy access of the most densely developed commercial areas and is slightly off the main traffic arteries and is, therefore, quiet and undisturbed. Low price was decided upon because that is the greatest social need and the only type of building for which there is demand.

The source materials included the New York Regional Plan publications, the studies of the State Housing Board, publications of the East Side Chamber of Commerce, articles by Henry Wright, and conferences with Messrs. Clarence Stein, Arthur Holden, Leonard Cox and Harland Bartholomew, Joseph Platzker, Aaron Rabinowitz and Abraham Kazan.†

However, there is a startling lack of information on many important points, and disagreement among these various authorities on what are commonly regarded as facts.

Also, the tendency of most of the available material is to give detailed data on *existing* conditions, whether those conditions are right or wrong. These indicate that our real work of investigation started *after* consulting the presently available information. We have not found ultimate answers to these problems, but we feel that we have made a long start.

The *methods* of attack and of investigation, and the data gathered, were common to the whole group. From that point on, two sub-groups worked out solutions, one under Ralph Walker, and one under Albert Mayer.

It was decided, for sociological reasons, that the area should be subdivided on the basis of self-contained communities, only those streets that separate the communities to be through-traffic streets. Three factors determine the size of these communities: 1, the upper limit of size is determined by the necessity for enough dividing streets to provide adequately for traffic; 2, the desideratum that the community contain such a population that a grade school of desirable size (from 1,200 to 2,500 pupils), can accommodate the children without the necessity of their leaving the community to reach it; 3, that each community be practically self-contained so that if it is developed alone, it cannot be injured by adjacent developments.

To accomplish this, city planning studies were necessary to determine the expectable local and through traffic; to determine the amount of facilities required, such as churches, hospitals, high schools and junior high schools, moving picture theaters, department stores and other stores, garages, playgrounds, parks; and also to determine which of these features should be contained in each community, and which could be regarded as common to the whole area.

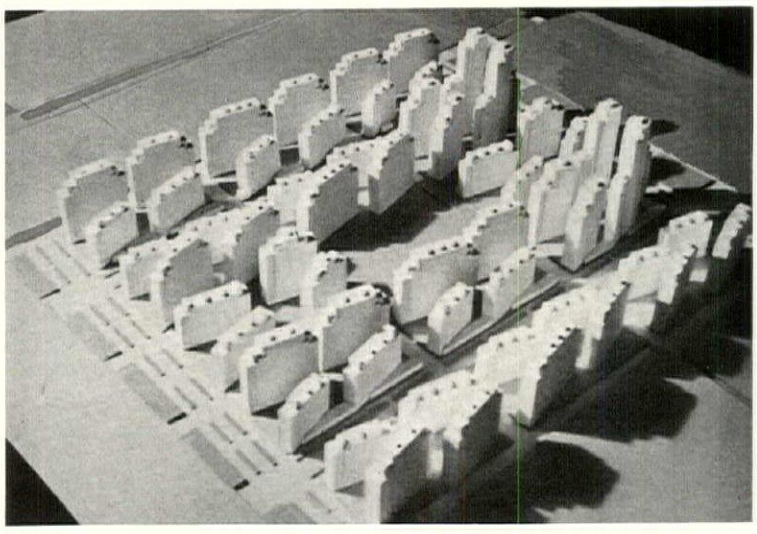
It was concluded that the so-called nine-block super-block formed the most desirable community. These communities do not disturb the existing street layout, with minor exceptions. In each scheme, it is hoped that the city will consent to the closing of the streets not required for traffic, but neither scheme is vitiated if this is not possible. Study "B" retains some of the suitable existing buildings, such as schools and hospitals; study "A" does not. The actual building studies, involving height, coverage, orientation, sunlight, costs, materials, were made separately by each group.

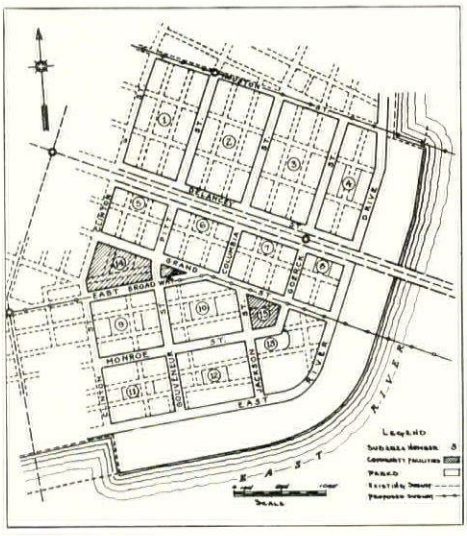
Both the groups plan to develop other schemes, one of which will disregard existing streets and utilities, as far as necessary, to see whether the advantages of the greater freedom thus obtained will outweigh the extra cost of providing new streets and utilities. Furthermore, while Study "A" is based on tall buildings and Study "B" on six-story buildings, both groups plan to study projects of differing heights.

* The advisers were Ralph Walker, Ely Kahn, Wallace Harrison and Albert Mayer. The group responsible for Study "A" consisted of John M. Gates, Geoffrey Platt, Charles Haines, Don E. Hatch, under the supervision of Ralph Walker. The group proposing Study "B" consisted of Robert Weinberg, Alfred Busselle, Jr., Robert B. Schell, Guenter Arndt, under the supervision of Albert Mayer and with the cooperation of Charles Herrick, engineer for the Bayonne Planning Commission.

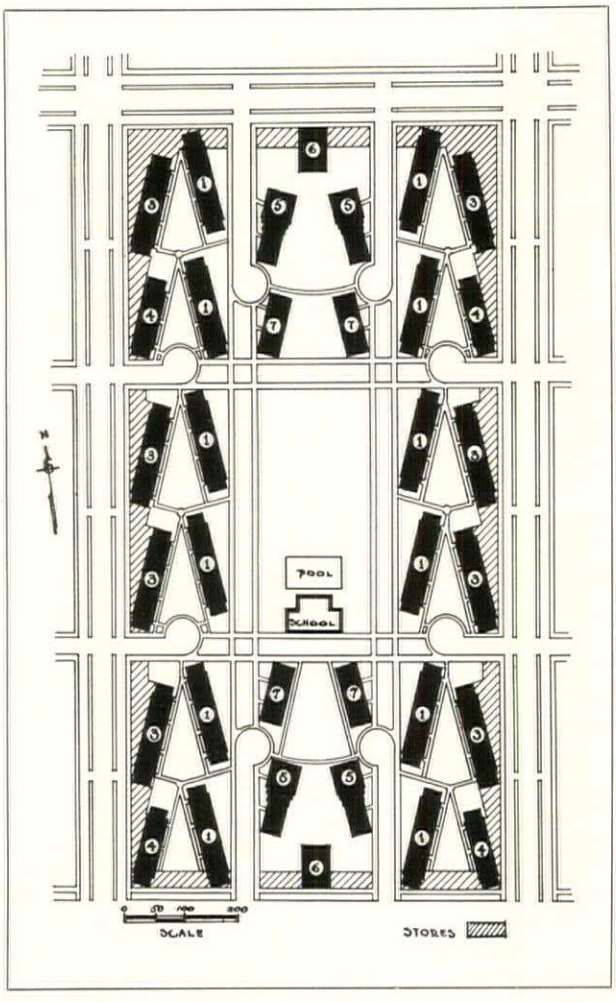
† We wish to make grateful acknowledgment of the cooperation of these gentlemen, without in any sense involving them in knowledge of or approval of the results we have reached.

STUDY "A", ILLUSTRATIONS

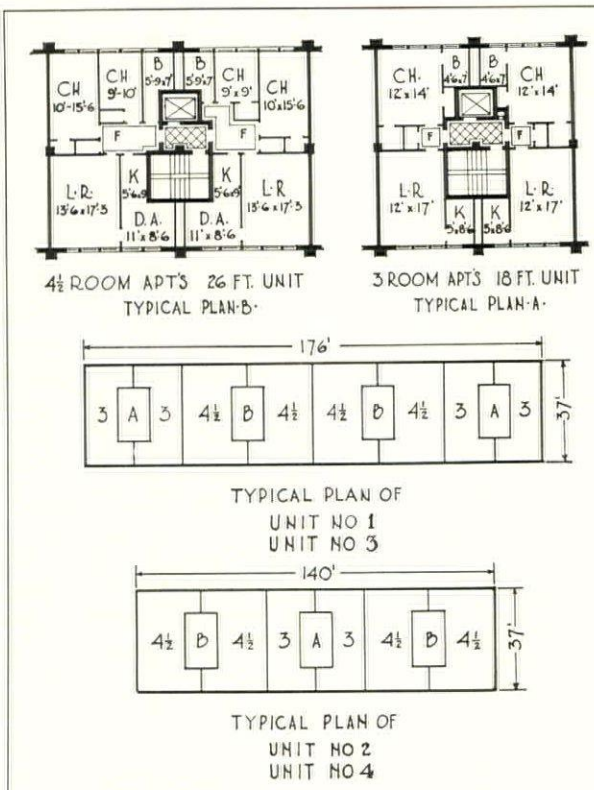




The model showing sunlight and shadow; and plan of the region



Super-block plan, Study "A"



Combinations of typical apartment plans illustrating formation of the four minimum rental units. Units Number 1 and 2 are nineteen stories while units Number 5, 6 and 7 (medium rental) are tower units planned in similar fashion with additional service and larger rooms

Typical apartment plans

Study "A", developed by John M. Gates, Geoffrey Platt, Charles Haines, Don E. Hatch

STUDY "A", DESCRIPTION

REHABILITATION of blighted areas is not accomplished by scattered renovation or by unorganized rebuilding of occasional blocks. A scheme for developing low-rental housing must be devised, involving not merely large-scale operation but standardizing the construction and design to the greatest degree compatible with an æsthetic solution.

Premises governing a design: minimum land coverage, standardization of building units, safety for children at play, grouping of play areas, noise abatement, long vistas with great variation, some sunlight for every room, cross ventilation for every apartment.

Region. The area was divided into sub-areas, each to be built financially independent. Two large centrally located sections are reserved for high schools, churches and other facilities necessary to the proposed population of 110,000 people. The suggested river front park would be for future development and not necessarily a part of the scheme.

Sub-area. Shops were placed on the perimeter, for the dual reason of forming a barrier to the noise of traffic and giving the merchants the opportunity of transient trade. The roofs of the one-story shops provide play space for small children as well as balconies for the adjacent apartments. The unique orientation (approximately north and south) with a coverage of 25 per cent attains the maximum sunlight for tall buildings. The herringbone formation enables the possibility of long vistas, similarly the lack of courts in parallel surfaces reduces sound reverberation and makes for greater privacy. This principle is used on each of the thirteen sub-areas, yet capitalized the river view where possible.

Building Units. There are seven different types: four are low rental ($10 to $11 per room per month); the other three are for medium rental ($19 to $20 per room per month). It was felt that a small proportion of this group would make for a more complete community. In every case the materials would be standardized (being largely factory-made) and labor costs and job difficulties would be reduced to a minimum. Gas heaters, sub-metered to the individual apartment, effect a considerable saving to the tenant.

Determination of Heights. From the experience of past developments it was assumed that the six-story non-fireproof building, while financially possible, would require too great a coverage to obtain the standard of living conditions implied in the basic premises. Twelve stories (the limit for self-operated elevators) was consequently accepted for a large

(*Continued on page 164*)

FINANCIAL SETUP

ESTIMATED COST

Land 647,500 sq. ft. @ $10.00 per sq. ft.		$6,475,000
Apartment Buildings, Total	$10,784,000	
Loss by Stores	136,000	
Total		$10,658,000
Stores 300′ x 30′ x 10′ @ 20¢ cu. ft.		$ 198,000
Clearing Costs 647,500 sq. ft. @ 37¢ per sq. ft.		$ 239,500
Architects' Fees @ 4%	$434,000	
Contractors' Fees @ 5.5%	597,000	
Disbursements 1st M. @ 3%	423,000	
Int. 1st M. During Const. @ 4%	564,000	
Disburs. Pfd. Stock @ 10%	720,000	
Int. Pfd. Stock D. C. @ 6%	432,000	
Brokerage Fees	150,000	
Renting & Advert.	25,000	
Contingencies	184,500	
Working Capital	100,000	
Taxes During Const.	100,000	
Total		$ 3,729,500
Grand Total		$21,300,000
Financing, 1st Mortgage	$14,100,000	
Pfd. Stock	7,200,000	
Total		$21,300,000

ESTIMATED INCOME

Apartment Buildings, Total	$ 2,374,000	
Loss by Stores	12,000	
Total		$ 2,362,000
Stores 3300′ @$200.00 per ft.		$ 660,000
Grand Total		$ 3,022,000
ANNUAL CHARGES		
Taxes	$402,000	
Int. 1st M. @ 5%	705,000	
Vacancy @ 10%	302,200	
Operating	531,900	
Depreciation @ 3%	639,000	
Int. Pfd. Stock @ 6%	432,000	
Grand Total		$ 3,012,100
SURPLUS		
Total Income		$ 3,022,000
Total Annual Charges		3,012,100
Balance		$ 9,900

portion of the building. Under the Multiple Dwelling Law the maximum height of 1¾ times the width of the street determines the next group at nineteen stories. Under the tower provision the height of the tallest buildings was fixed at 31 stories.

Minimum Rental Units. To obtain greater standardization, studies were made of a two-bay unit. This comprised a service unit (stair, elevator, incinerator, pipe chases) and two apartments. The two girder spans of 18 ft. and 26 ft. permitted the planning of the three room and the four and one-half room apartments respectively. These were typical, yet extreme flexibility was preserved, as in two abutting apartments almost any combination of rooms may be had. By combining these typical plans, buildings of 140 ft. and 174 ft. were obtained; thus the four minimum rental units consisted of only two typical floors, two being twelve stories and two being nineteen. On the sixth floor of the twelve-story building and the sixth and twelfth floors of the nineteen-story building, corridors are provided between the elevators.

STATISTICS OF STUDY "A"

REGION

Percentage Coverage 24.6
Original Land Area . . . . . 5,670,135 sq. ft. 131 acres
Proposed Land (including land gained by planting in interior streets) . . . . . 6,058,000 sq. ft. 140 acres
Total Play Area (including park area along East River) 6,850,000 sq. ft. 158.2 acres
Proposed Population 110,000
Number of People per Acre of Play Area 695

APARTMENTS

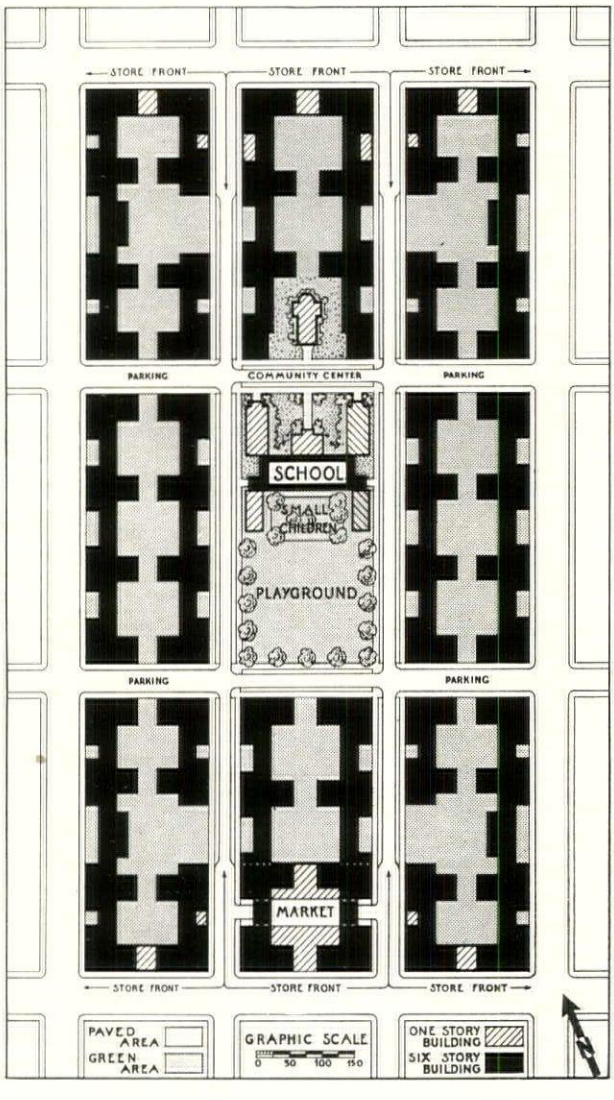
Total Number Apartments . . . 32,141
Average Size Apt. 3.3 Rooms

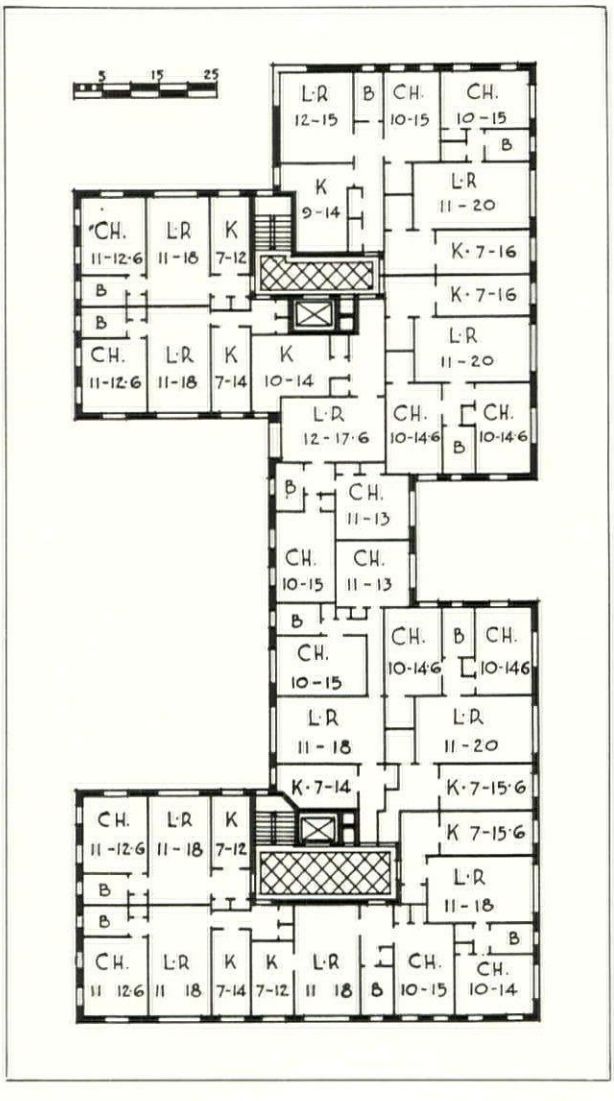
RENTALS

Percent of Rooms at $11.00 = 21.2
Percent of Rooms at $12.00 = 45.7
Percent of Rooms at $19.50 = 26.4
Percent of Rooms at $20.50 = 6.7

STORES

Total Front Feet — 25,705
Rent Average — $200.00

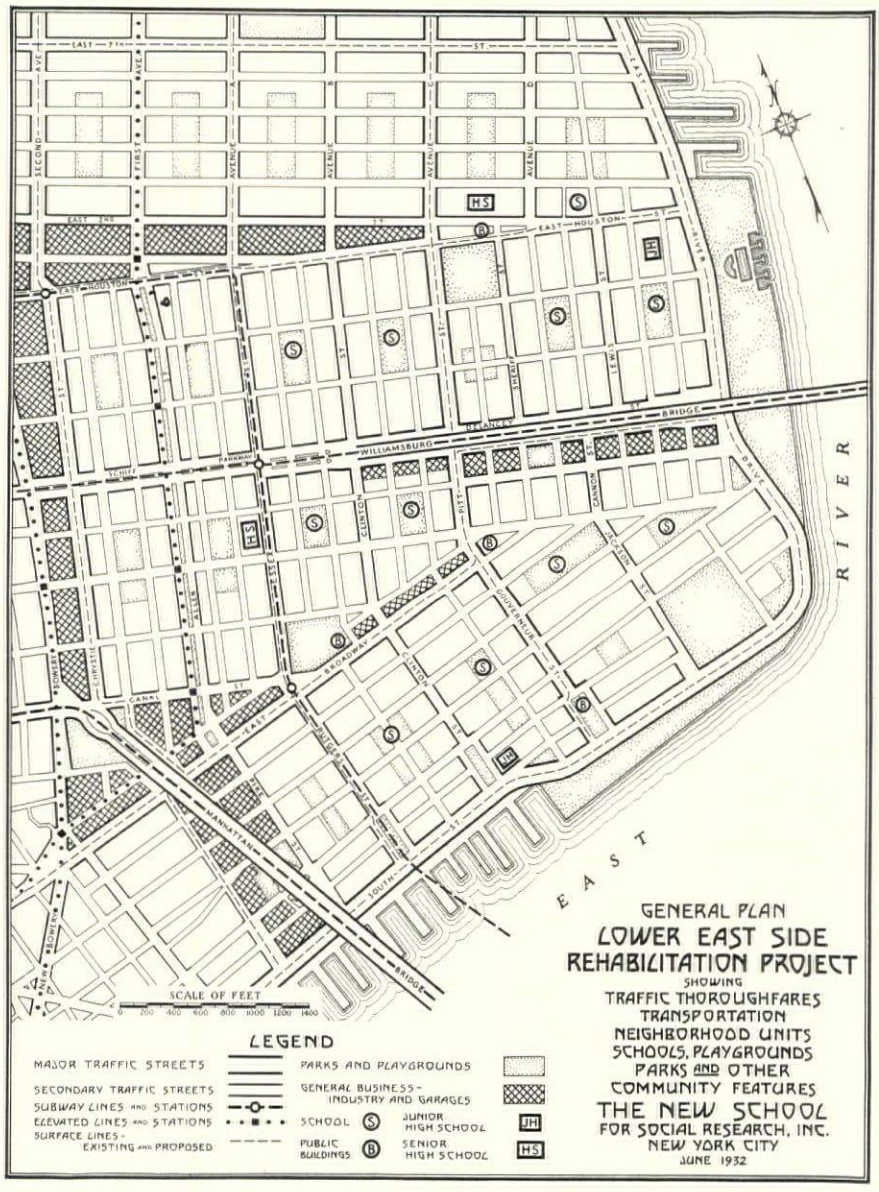




STUDY "B", PLANS

On the opposite page are shown the Super-block Plan of six story apartments (at the left); and a plan of a typical floor of one of the apartment units (at the right). Study "B", developed by Robert Weinberg, Alfred Busselle, Jr., Robert B. Schell, Guenter Arndt; Charles Herrick collaborating

The general plan of New York's Lower East Side as developed in Study "B" by a voluntary group of the "Architectural Workshop" of The New School for Social Research



STUDY "B", DESCRIPTION

AS THE general introduction covers the broad aspects of the development of the whole area, we here discuss chiefly the nine-block community unit in detail. The general map of the area shows its adaptation to the irregular areas.

By developing eight blocks with six-story elevator apartments covering 49 per cent of the net taxable land, it is possible to leave the entire ninth block free of housing. The intensity of coverage on the eight blocks is sufficient to insure financial security, while at the same time well ahead of the standard set by even the most progressive of existing housing projects on Manhattan. Buildings of this height cast shorter shadows and give practically the same amount of sunlight as taller buildings with less coverage. The interior courts, none of which is less than 62 x 96 ft., are open north and south to admit the prevailing breezes, and are laid out to provide recreation for the very young and for adults. Children of junior high school age and older have recreational provision outside of the unit, but within the district. Adults have the use of the community center, and the gymnasium and auditorium wings of the school building will be available evenings.

Playground for children of elementary age is ceded to the city on the center block where the city will purchase at a nominal fee (or exchange) its school site. Any private social or religious institu-

tion could arrange to use the auditorium, or if it wished to build in the unit would be advised to purchase a site facing the community center.

Land required to widen bounding streets is donated by the developers in return for the city's cooperation in reducing traffic *within* the unit by police control. By this arrangement children need not cross traffic going to school.

Provision for local shopping needs, at the ratio of 25 front feet per 100 population, can be restricted to an area zoned for "retail business" extending back only 150 ft. from each of the north and south bounding streets. By developing a small market or arcade, as shown, stores can be concentrated for convenience and safety, and the traffic arteries kept free of shoppers.

The perimeter and indicated interior places provide sufficient parking space for residents without using the streets surrounding the center block.* New York zoning laws prevent inclusion of garages in a residential or business zone, so these are placed in two concentrated central locations for the entire section.

Assuming not more than one person per room, the apartment buildings, containing about 1,000 rooms per block, provide for 8,000 persons in the neighborhood unit. Of these about 1,500 elementary school children can be expected.† A school of 400 cu. ft. per student is shown, with low wings to the south for primary department, nursery, and care of mothers and infants. Sixty thousand square feet of playground make 40 sq. ft. per child — necessarily below ideal standards, but far in advance of Manhattan practice.

The large-scale plan of one of the corner buildings shows apartments of two, three, four and five rooms with cross ventilation and a variety of exposures. It is the contention of this proposal that a development based on proved and tested practice could best secure the backing to proceed immediately. And the successful launching of the *neighborhood unit principle* would pave the way for the development of adjacent units on a similar plan, but perhaps more advanced structural and architectural lines.

Eight such units, of similar size and varying shape, make up the district studied, accommodating a total population in the area of approximately 60,000 people. Reference to the general plan on the preceding page will explain the relation of the units to each other, to the traffic and transportation system, and to those features and facilities that are common to the district as a whole. The entire area is so nearly the same as the existing assembly and aldermanic district, that the adjustment of the latter would give the project political as well as structural unity.

* Assuming one car per five families.

† This is an average of figures from four different sources. The individual figures varied widely from each other.

PRELIMINARY FINANCIAL SET-UP, STUDY "B"

Nine-block Unit — Six-story Buildings

FIRST COST: (Calculation is made for unit covering one block)

Land: 80,000 sq. ft. at $8		$ 640,000.00
Construction: 2,600,000 cu. ft. at 30¢		780,000.00
Landscaping, street changes, etc.		35,000.00
Architect's fees, legal, etc		30,000.00
Carrying charges —		
5% × $640,000 = $32,000		
2½% × 780,000 = 19,500		
		51,500.00
Taxes during construction		7,000.00
Financing, title, insurance, mortgage tax, etc.		20,000.00
Total first cost		$1,563,500.00
First mortgage		960,000.00
Equity { or equity and second mortgage / or equity and preferred stock }		$603,500.00

EXPENSES:

Maintenance: 1030 rooms at $40*	$41,200.00	
Uncollectible rentals	6,000.00	
Taxes (using State Housing Law's exemption)	18,000.00	
First mortgage interest at 5%	48,000.00	
Amortization and depreciation, 3%	28,800.00	
Vacancies 10%	15,000.00	
Net income to yield 6% on $603,500 must be	36,300.00	
Total		$193,300.00
Income from stores: 250 front ft. at $150** less 10% vacancy		33,800.00
Total yearly net rental required from apartments		$159,500.00

Total number of rooms (adjusted to allow ½ room extra for D. A., kitchenette, or bath, as allowed by State Housing Board) = 1,150

Required average rental per adjusted room =

$$\frac{\$159{,}500.00}{1{,}150} = \$138.69 \text{ per room, per year}$$

$11.56 per room, per month

* Average maintenance in this kind of building has been about $44 over a period of years. This is now down about 15 per cent due to drop in labor and material costs, but is probably up 5 per cent due to increased turnover, hence a net deduction of 10 per cent, giving a maintenance cost of about $40 per room.

** Store rentals are always a guess, even in established localities of established character. We have used $150 to be safe. To show what an effect artificially assumed store rentals would have, if $50 per front foot were added to the store value, it would mean that average room rentals could be $1 less per month, or $10.56 per room average.

AN INTRODUCTION TO AIR CONDITIONING

BY

JOHN CUSHMAN FISTERE

INTERPRETERS of public sentiment and analysts of commercial markets are almost unanimous in the opinion that air conditioning of buildings offers extraordinary possibilities for promotion during the next decade. So happily ominous are the signs of public acceptance that one prominent engineer fully expects the air conditioning industry to be "one of those movements which will do much to lift the country from depression by offering new channels for manufactured output, give work to an increasing number of installers and favorably affect many trades which are allied with or dependent on air conditioning for support."

What Is Air Conditioning? The term air conditioning is so broad that considerable confusion has arisen as to what constitutes air conditioning in the strictest definition of the term. Reluctantly, but necessarily, two distinct definitions must be made for the purpose of this discussion. Air conditioning for large buildings, such as theaters, office buildings, department stores, public buildings, etc., is composed of four separate kinds of air treatment: (1) complete temperature control, including heating and cooling; (2) humidification and dehumidification; (3) cleaning; (4) distribution.

In the field of domestic and small building air conditioning, however, no such definition could be phrased, since there are, at the present time, producers of "air conditioning" equipment who offer any one of the following types of air treatment:

1. Warm air furnace with a blower and dry filter.
2. Warm air furnace with a blower and washer (or with a humidifier and dry filter).
3. Portable humidifiers that may be plugged into an electric socket.
4. Permanent type humidifiers that are attached to hot water or steam supply and return lines.
5. Room coolers, employing either mechanical refrigeration or manufactured ice.
6. Warm air furnaces with blower and washer, and which use spray and blower during summer.
7. Air conditioning systems which perform all the functions of the large-building systems.

Although it might seem illogical to group these various types of equipment under air conditioning, it appears less so after recalling that each of these methods of air treatment does have a positive effect upon effective temperature.

The Purpose of Air Conditioning. So much has been published on the comfort and health benefits of air conditioning that a brief review of that phase of the subject is presented here. In three simple statements, two of which are definitions borrowed from the American Society of Heating and Ventilating Engineers, the reason for air conditioning is immediately apparent.

Effective temperature is a relative index of the degree of warmth or cold felt in response to temperature, humidity, and air movement.

The range of effective temperatures over which the majority of people (50 per cent or more) feel comfortable is called the *comfort zone.*

Air conditioning is the mechanical control of one, two, or all three of the factors involved in effective temperature to produce an index that falls in the comfort zone.

Since the questions of heating and humidifying are familiar, this discussion will be limited to producing satisfactory effective temperatures in hot weather, which includes cooling, dehumidifying, cleaning, and air movement.

Cooling Methods. Cooling is accomplished by establishing a contact between the air and a cooling surface, which may be either a spray of cold water or coils through which a refrigerant is passed. If the former system is used, the cold water for the spray may be obtained from a natural cold water well, by melting ice, or from water cooled mechanically. Although there are some systems which depend upon tap water for spray cooling, it is thought by many authorities that the water must have a temperature of 40° F. or less to be effective as a cooler.

If the air is cooled by contact with cooling coils, one of two methods may be employed to provide the necessary frigidity in the coils. Cold water, brine, or some other liquid solution may be pumped through the coils, or one of the safe, harmless refrigerating gases may be circulated through the coil itself.

Methods of Dehumidification. The process of eliminating moisture from the air may be carried on

in any one of three different ways. Perhaps the most common is the spray method which is similar in operation to spray air washing, the only difference being that the water used in the spray is cooled before entering the spray chamber. Water vapor in the air is condensed by contact with the chilled water to the point of saturation at the temperature of the air leaving the chamber. Just as in spray air washers, the free moisture is removed by a series of baffles and eliminators. In the second type, the cooling coils and the spray are located in the same chamber so that the air comes in contact with the spray and the wetted coils. One advantage which the spray type is reported to have over the latter type is the higher efficiency of heat transfer between the spray and the air, which reduces the cost and size of refrigerating equipment by lowering the temperature head.

Entirely different in principle from either of these dehumidification systems is the practice of using a silica gel bed. Silica gel is a hard, hygroscopic substance, similar in appearance to sand, but of much more porous constituency. When moist air is brought in contact with silica gel, the pores absorb water vapor until they become saturated. The gel is then reactivated by heating.

Cleaning and Distribution. Although the processes of cleaning air are limited to filtering or washing, the methods of air distribution range widely, depending primarily upon the size and type of building. Filters are of two general types, dry and viscous. The former depends upon a screen of felt, cloth, cellulose, or similar material to impinge dust particles and other objects. The filtering media must be replaced occasionally, and they may usually be cleaned by vacuum cleaning or by shaking. Viscous filters, which employ coated surfaces to catch dust and other particles, are of two types, cell and automatic. The cell type must undergo periodic reconditioning by washing and recoating, whereas the automatic type, as the name suggests, cleans itself, by renewing the viscous coating automatically.

Air washers, as has already been suggested above, are similar to dehumidifiers. Air may be washed by (1) passing it through a spray, (2) passing it over wet surfaces, (3) a combination of these. According to tests made by the American Society of Heating and Ventilating Engineers, "the usual humidifying efficiency of a good air washer is 70 per cent, and the humidifying efficiency of air washers of the commonly termed humidifier type should range from 95 to 98 per cent."

In the calculation of the method and amount of air distribution, there is a wide range of opinion among leading engineers. For some types of buildings and under certain conditions, 10 cu. ft. of air per minute per person may be a satisfactory volume to be supplied and removed from any space. Under other circumstances, 30 c.f.m. might be required. At any rate, there has been a general tendency in cooling and air conditioning to examine the original practice of delivering 30 c.f.m. at a temperature 10° below the maintained temperature. In some cases, it is advisable to supply a relatively small quantity of air per person at a temperature 35° below the maintained temperature. Since the amount of delivered air has an important bearing upon the capacity of fans, motors, ducts, etc., and consequently upon cost, it is good practice to make a thorough study of all the possible combinations of temperature, humidity, and motion before agreeing to an arbitrary figure for any particular installation. Alternate solutions for each problem should be worked out and thoroughly analyzed.

Inevitably linked to the amount of air supplied is the method of distribution as well as the question of the difference in temperature between the entering air and the desired temperature to be maintained. There are three general methods of distribution, that is, in addition to distribution to small areas from a unit cooler: (1) downward flow, (2) upward flow, and (3) by the ejector system, which is the distribution of relatively small quantities of air from nozzles at high velocity. Each of these methods has its ramifications so that it is possible for almost any building to obtain uniform distribution, not in respect to floor space, but to the amount of heat to be absorbed in different parts of a room. Methods of distribution for different types of buildings will be discussed under the types of buildings.

Residence Conditioning. Referring to the number of systems that are termed "air conditioning" systems on the first page of this article, it will be understood why a discussion of residence air conditioning must of necessity have its limitations. Statements made in relation to one type might have no bearing upon another. Consequently, in discussing treatment of air in residences, it will be necessary to use the term *air conditioning* for systems which control humidification, and *cooling and air conditioning* for systems which cool and dehumidify. Although such distinctions may appear illogical, in view of the meaning of air conditioning in large buildings, there is really no other course open.

The development of unit coolers for residences, small stores, and individual offices has been rapid in the last few years. Many types are available — free standing units that resemble radios in appearance, others which are designed to replace radiators, and still others which may be suspended, or concealed in the wall just as radiators are concealed. There are three types of units, one which employs a cooling coil, another which uses a cold spray, and a third in which the air is drawn across ice. The spray type is usually confined to units that are concealed in the wall or in a room or closet space adjacent to the

room that is to be conditioned. It is particularly effective as an air washer as well as a dehumidifier. Usually, although not always, the washer type is used for greater heat loads than can be removed with the standard-sized coil or ice coolers.

Coil and ice coolers have the advantage of being less expensive to install as a general rule. Some of them, in fact, may be moved from one room to another on rollers, and plugged into an ordinary outlet. Portable coolers use ice as the refrigerant either directly or for the cooling of coils. If mechanical refrigeration is used, the compressor unit is generally located in a convenient closet, although it is possible, when necessary, to obtain units in which the compressor is an integral part of the unit. For unit coolers in which there is no provision made in the cooler cabinet for ice, the ice melting or water cooling tank is placed in the basement or a similarly convenient location.

There is a wide range in the capacities of room coolers, supplying air at rates varying from 200 to 600 c.f.m., and generating as much as 3 tons of refrigeration daily, which is equal to 864,000 Btu. One such unit is fully capable of conditioning adequately the air in a living room, office, or even a small store. It is common practice to employ two or three such units, all supplied from the same refrigeration source, to cool larger spaces. Although conditions may alter the decision, it is generally believed that a central system is to be preferred economically to a unit system if more than three units are required. One frequent use of unit or cabinet conditioners for residences is to install one in the living room for day and evening use and another in a bedroom for night use, operating both on the same source of refrigeration.

In addition to unit coolers, there are also unit conditioners, which as the previous reservation indicated, are principally concerned with humidity control. The most common type of self-contained unit humidifier is the direct type, by which a fine mist is discharged into the room and evaporated. Since heat is required in the evaporation of water, (e.g. one pound of water evaporated at 70° F. absorbs 1053 Btu.), the humidifier has a cooling effect.

Central conditioning systems for residences and other small buildings, that is, systems in which no attempt is made to cool the air by refrigeration, depend upon humidity control and air motion to produce comfortable effective temperatures in summer. The warm air furnace system, employing a blower and dry filter can be operated in summer to circulate the cooler cellar air. An air washer, or a humidifier with a dry filter, is often used with a warm air furnace system, and depending upon the temperature of the tap-water is partially effective as a cooler as well as for humidification and circulat-

TYPICAL CALCULATION OF COOLING LOAD

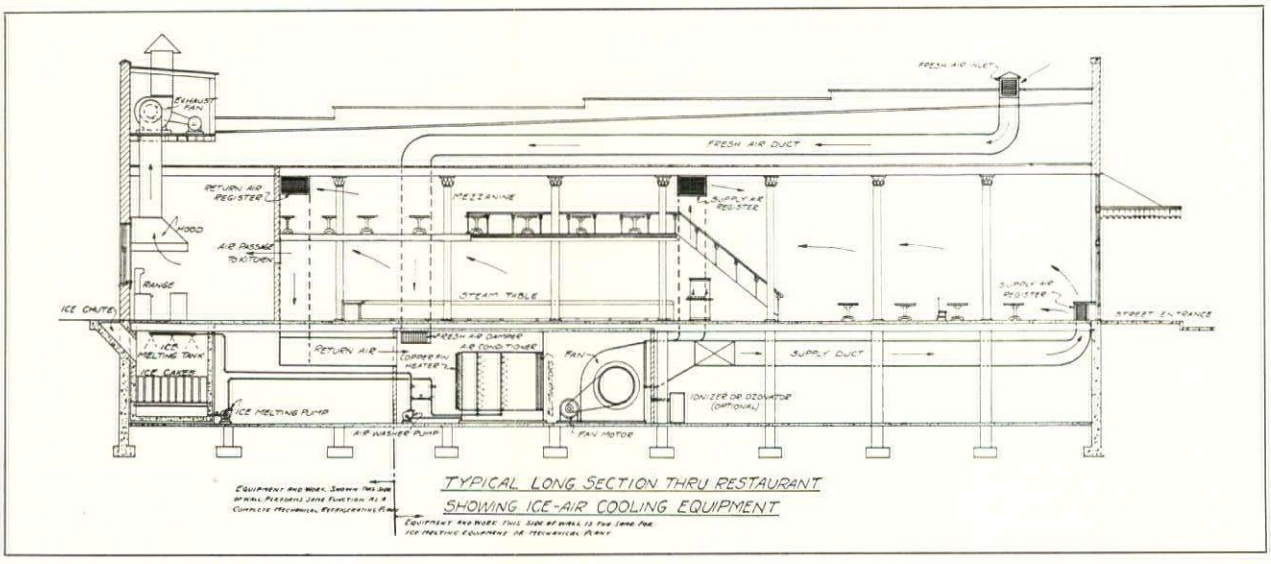
(Based on temperature difference of 15° F.)

Type of space to be cooled: *Office*
Size of space to be cooled: *Length 67 ft.; width 35 ft. 6 in.; height 12 ft.*
Material and thickness of walls: North *16 in. brick, ½ in. plaster;* south *16 in. brick, ½ in. plaster;* east *12 in. brick, ½ in. plaster;* west *12 in. brick, ½ in. plaster*
Area of windows, including sash: North *0;* south *84 sq. ft.;* east *63 sq. ft.;* west *63 sq. ft.*
Single or double pane window: *Single*
Floor construction and thickness: *1½ in. wood, 2 x 10 joist, plaster below*
Kind of floor covering: *None*
Ceiling construction and thickness: *½ in. plaster under open joist*
Number of floors in building: *Two*
Location of space to be cooled, which floor: *Second floor*
If space is under attic, give height of attic: *3 ft. to 4½ ft. under flat roof wood sheathing, built up roofing*
Which walls are exposed: North *No;* south *Yes;* east *Yes;* west *Yes*
Which walls shaded by other buildings: North *No;* south *No;* east *No;* west *Yes*
Which windows shaded by awnings: North *No;* south *Yes;* east *No;* west *No*
Maximum number of persons in space at any one time: *28*
Approximate number of persons entering during cooling period: *50*
Average time persons remain in such space: *20 for 7½ hrs.; 30 for 1 hr.*
Type of activity: *Sitting principally, general office work*
No. of electric lights: *14.* Average wattage: *200.* Total wattage: *2,800*
No. of electric motors: *8.* Average H.P.: ⅛. Total H.P.: *1*
List electrical appliances: *None*

	Btu/Hr.	Hrs.	Btu/day
North wall (not exposed)			
Brick (804 sq. ft. x 2.47)	1,988	8	15,904
South wall (exposed)			
Brick (720 sq. ft. x 3.41)	2,455	8	19,640
Glass (84 sq. ft. x 16.93)	1,422	8	11,376
East wall (exposed)			
Brick (362 sq. ft. x 4.61)	1,673	8	13,384
Glass (63 sq. ft. x 16.93)	1,069	8	8,552
West wall (exposed)			
Brick (363 sq. ft. x 4.61)	1,673	8	13,384
Glass (63 sq. ft. x 16.93)	1,069	8	8,552
Sun effect			
South wall only, west wall shaded			
Brick (720 sq. ft. x 6.00)	4,320	8	34,520
Glass, shaded by awning (84 sq. ft. x 10.00)	840	8	6,720
Ceiling			
2,378 sq. ft. x 4.08	9,664	8	77,312
Floor			
2,378 sq. ft. x 3.45	8,120	8	64,960
Human load			
Maximum (28 x 500)	14,000		
Average (50 x 500)		3½	87,500
Light and appliance load			
Lights (2,700 watts x 3.42)	9,576	8	76,608
Motors (1 H.P. x 2,550 x 0.5)	1,275	8	10,200
Infiltration			
1 air change per hour	14,218	8	114,144
1 x 28,536 cu. ft. x 0.5			
TOTAL LOAD MAXIMUM HOUR	73,362		
TOTAL LOAD MAXIMUM DAY			562,796

The cooling apparatus must be able to extract 73,362 Btu. per hour at capacity operation, and must be able to absorb 562,796 Btu. on the maximum day. Manufacturers' figures on capacities will indicate the equipment required to meet the conditions.

NOTE. The heat loss figures used are standard figures, available in any heating reference book.



Two-outlet system for restaurants. One supply grille, with the aid of an exhaust grille over the steam table, serves the ground floor, and the other supply grille cools the mezzanine, and also aids in the cooling of the first floor

ing. For hot water and steam systems, the humidifiers are located in radiator enclosures as part of the radiator unit. One successful unit of this type is supplied by fan with constantly fresh air from an intake grille located in the exterior wall.

Central cooling and air conditioning systems for residences are similar to the systems installed in larger buildings. The ice melting tank or mechanical refrigeration equipment, and all other parts of the equipment are located in the cellar, and conditioned air is supplied through ducts to the various rooms of the house.

Controlling Factors. Before entering into a discussion of air conditioning systems for large buildings it would be appropriate to outline the facts which influence the design of a system, and to explain the process of estimating by an actual example. The elements which contribute to the sensible and latent heat loads, and which must be figured accurately for each room that is to be conditioned are as follows:

1. Determination of the average maximum dry and wet bulb temperatures outside, and their relation to the required dry bulb temperature and relative humidity inside. The importance of this is obvious since the total heat increment on which the air quantities are based is decidedly influenced by the maximum outside dry bulb temperature, since refrigeration requirements are increased or decreased in accordance with the highness or lowness of the outside wet bulb temperature.

2. The actual cooling load is then determined for each room on the basis of heat transmission through the walls, roof, and sometimes floors, in accordance with the standard tables for heat losses for various types of construction. Complicating factors in this connection are the window areas, sun effect and building orientation (since south and west walls are affected to a greater degree by the sun than are the east and north walls), additional load required for spaces beneath setbacks, etc., and air leaks of various kinds.

3. Another important contributor to the heat load is the heat output by human beings which varies according to their activity. A man at rest, for instance, has a heat output of 300 Btu. per hour, whereas a man doing heavy labor or dancing has an output of approximately 700 Btu. Other sources of heat to be removed are electric lights, appliances, such as adding machines in offices, toasters in residences, motors, etc.

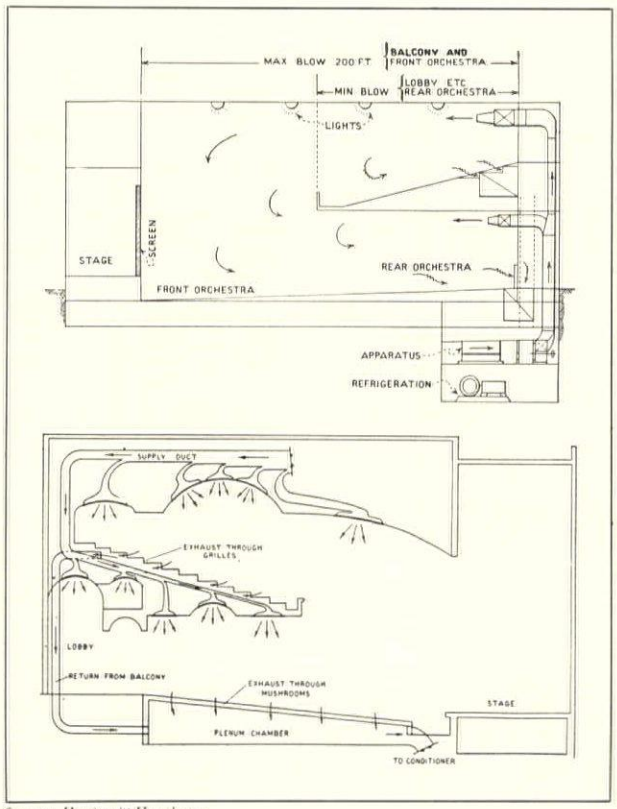
For residences, and other spaces of similar cubic content estimating the cooling load is a comparatively simple matter. After determining the total number of Btu., the selection of equipment to accomplish the work may be made upon tables of capacities for various types of units. A typical estimation of the cooling load for a small office building is reproduced on page 169.

Restaurants and Shops. Although there are important differences in the requirements of systems for restaurants and shops, they are similar enough in shape and size to be considered together. The chief difference between them is the increased load placed upon a restaurant system due to the presence of steam tables, coffee urns, electric grilles, etc. Furthermore, restaurants have only one or two peak human loads during the day, whereas shops have a fairly constant load throughout the day. Methods of distribution and air quantities, however, are somewhat the same. It is important in selecting equipment to consider, particularly in the case of

restaurants, that on a basis of system operation only 60 days during the year, with two peak loads amounting to 6 hours per day, an air conditioning system would be operating at full capacity only 15 full days a year. Consequently, first cost is very important under such circumstances.

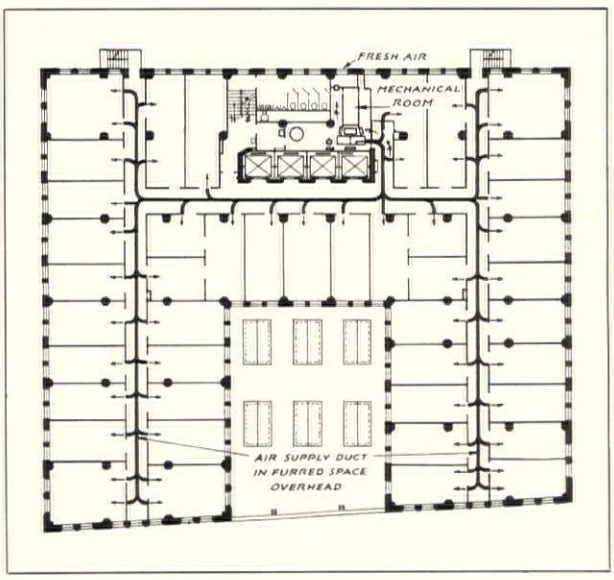
Choice lies between the unit system and the central system. Aware that circumstances alter conditions, it might be said that the unit system is better for existing buildings, and a central system better for new buildings. Costs of masonry work, supply lines, wiring for motors, loss of time, and other factors argue against central installations in existing shops and stores. In new buildings, space economy points to the advisability of conserving the floor space for the store or restaurant activities. Air distribution depends upon the size and shape of the space, and upon the character of the establishment. For lunch rooms and low-priced stores, diffuser type outlets, from one to five in number and placed where they would do the most good, would be sufficient. It is often possible to utilize the space over the entrance door for a self-contained unit with one large outlet. Other possible locations for outlets are: near dressing rooms, under counters, or depending upon the distance the air must travel and the height of the ceiling, in the walls. For higher class shops and restaurants, ceiling outlets of the drop panel diffuser type are to be preferred. Use of false ceilings, false beams, are common practice. A particularly successful type of treatment is shown on page 172.

Theaters. Although the conditioning of theaters is a subject which calls for more elaborate treatment than space permits here, and since the design of theater systems is generally limited to experienced air conditioning engineers, only a few of the features which relate specifically to architects can be mentioned. Central location of equipment, preferably in the basement, or sometimes in the truss space over the auditorium, is desirable in all instances. The early practice of scattering the heating, ventilating, and air conditioning equipment was often costly, and usually unnecessary. Not only is the first cost reduced by accessible, convenient placements of machinery, but maintenance costs are even more appreciably reduced. If mechanical refrigeration is used, the system should not be forced to depend upon one unit. Two and sometimes three, although necessitating an increase in first cost, will pay for themselves in the reduction of maintenance costs. An examination of the daily cooling logs of all the theaters in a large chain revealed that it was necessary to have all the units of the systems operating only 25 per cent of the cooling season, thereby permitting greater economies than would have been possible if the systems had had only one unit.

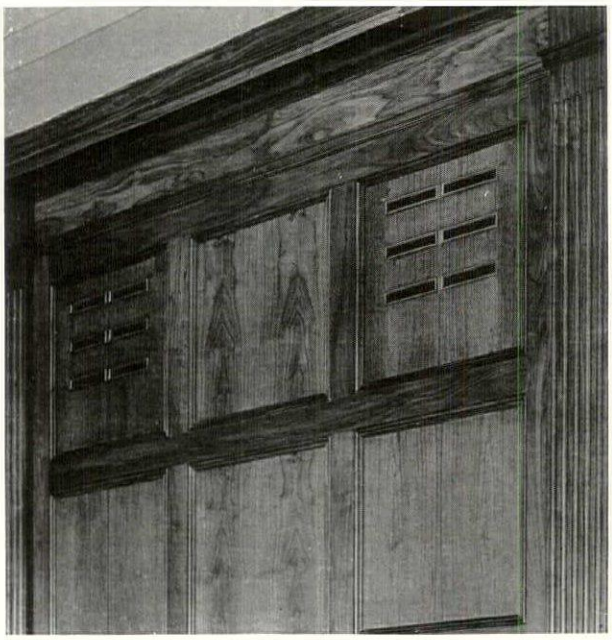


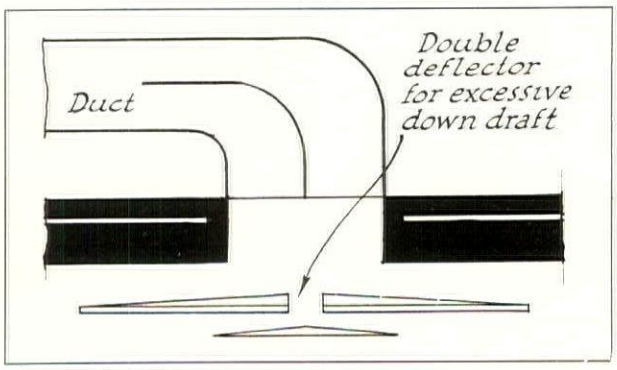
Courtesy, Heating & Ventilating

The two types of air distribution most commonly used in new theaters. Above is an ejector system diagram, by which cooled air is blown at high velocity from the two jets as shown. Below is a typical example of the downward flow method, in which ducts under the balcony and the plenum chamber serve to return air. Larger quantities of air are required for this type than for the above

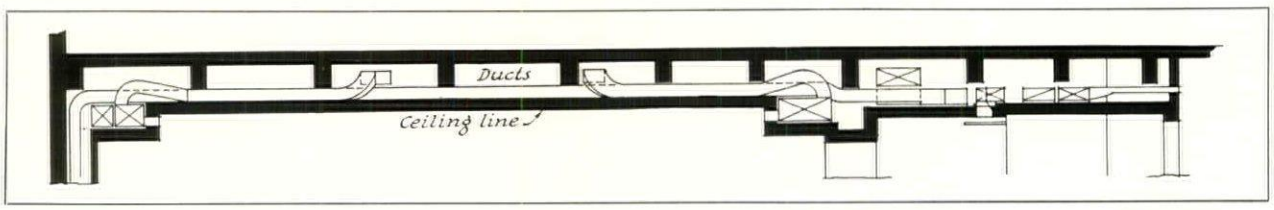


Floor plan and duct layout for the Milan Building, San Antonio, Texas. Air is supplied through grilles in the permanent corridor partitions and withdrawn through grilles in the doors. The corridors are return air ducts





Three different types of outlets, all of which are good practice. At the left is a photograph of one method of architectural treatment for the high pressure nozzle type of distribution. Directly above is a new development in the drop panel type, used when the area to be cooled is large and the air supply is being released at high velocity. At the bottom is a new method of distribution employed with false ceiling construction when it is inadvisable to install outlets in the ceiling itself



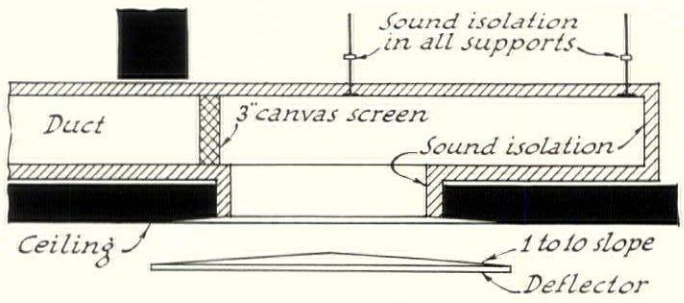
In laying out preliminary plans, consideration must be given, if mechanical refrigeration is used, to providing sufficient water for the condensors. If water rates are high, or if the city's supply is comparatively high of temperature, a cooling tower or spray pond must be provided. Since these are usually placed on roofs, the steel must be designed to bear the additional load.

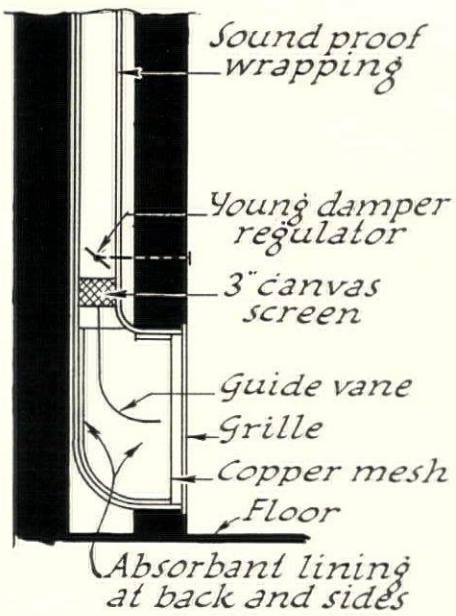
A general understanding of the methods of air distribution which serve different types of theaters best will enable the architect to avoid revisions after the drawings have been completed. Three principles seem to be agreed upon generally. They are: 1. Air quantity should be proportioned to seating distribution; (2) balcony and mezzanine circulation should be provided separate from orchestra space; (3) air should move toward the faces of the audience.

The upward flow system of distribution is confined to installations in old theaters, since the heating and ventilating of theaters was usually accomplished in this manner. This type of distribution requires an air quantity of from 25 to 35 c.f.m. per person and a maximum difference in temperature between entering air and the desired temperature of 15° F. If the downward flow system is used, supply outlets may be installed in the ceiling, side walls, or rear walls. If local ordinances do not place a minimum limit on air quantities, it is possible to employ less air by these methods. Air may be supplied through open flush type grilles or openings in suspended ceilings for the front part of the orchestra, and drop panels may be used for supplying the rear orchestra and mezzanines. In small houses a rear wall supply system is often an adequate solution. The same type of theater may be well served by outlets at the front of the theater. For narrow theaters, side wall distribution is possible.

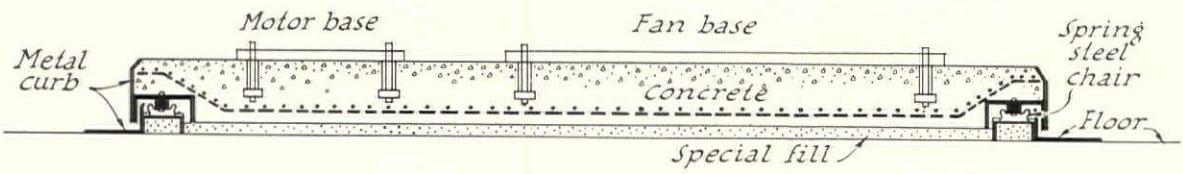
Use of an ejector system, employing small volumes of air, at extremely low temperatures, and delivered from ejectors at high velocity is becoming more common. According to Andre Merle, chief engineer for an important air conditioning corporation, "successful application has required first of all that there be a flat ceiling with no drops, beams, lights or columns directly in the path of the jet. The size of the auditorium is also a limiting factor, as blows of over 200 ft. should not be attempted. A minimum ceiling height of 12 ft. also seems necessary. Attempts to apply the method to space in which the height is out of all proportion to the length are also questionable at present."

Provisions for the return of air are provided either through outlets along the side and rear walls, or through mushrooms at the floor level and through ducts below the balconies.





Representative details of sound insulation and sound isolation employed in the air conditioning system for the National Broadcasting Company Studios in Rockefeller Center, where it was necessary to eliminate sound entirely because of the sensitivity of microphones. For ordinary practice, therefore, such treatment would be more than satisfactory. The floating platform construction for machinery is shown below. Above is a typical treatment for ceiling ducts, showing the type of hanger used for isolation. At the right is a section through a duct near an outlet, showing five forms of noise reduction



Office Buildings. The comparatively few installations in office buildings limit the available data for this division. Just as in heating installations, the building is usually divided into zones, with one unit serving each floor perhaps, or one unit serving each of the quadrant exposures of the building. How complicated the task of zoning may become is well illustrated in the air conditioning of the National Broadcasting Company studios in the Rockefeller Center development, for which 10 different units are planned to serve 11 floors. The zoning is based upon similarity of space conditions.

Important to the planning of the building is the location of equipment. It has been the practice of one engineering company to follow as closely as possible the following general rules for location. Dehumidifiers are placed on the same floor level, comparatively high in the building where clean air is available, with booster fans on each floor. Refrigerating equipment is placed in the basement, and conditioning equipment every fifteenth or twentieth floor, located, if possible, in the service artery.

The distributing points are, of course, affected by ceiling heights, location of permanent partitions, and the construction of the ceiling, whether it is beamed or hung. In the past, outlet grilles have usually been located in the permanent corridor walls near the ceiling line, with exhaust grilles placed in office doors, or in the walls near the floor, corridors serving as return air ducts. There is a tendency at present to place low pressure nozzle outlets under windows or in permanent corridor partitions. The general plan of the building will determine which of the two methods is preferable.

Large buildings consume a tremendous amount of water for condensing, a fact to which some designers blink their eyes. A cooling tower or spray pond in almost all large office buildings will be required, and the necessary structural provisions made.

Recirculation. One of the major problems which confronts the designer of any air conditioning system is that of air recirculation. Since it has an important bearing upon the size and capacities of equipment, and an important bearing upon maintenance cost, it should be thoroughly understood. In the early days of conditioning, it was general practice to introduce from the outside all air to be conditioned. Later, as an economy measure, the practice of using recirculated air mixed with outside air was generally adopted. There are, however, two general methods of using recirculated air as shown in accompanying diagrams. The simple arrangement of reconditioning both the outside air and the recirculated air is one type, and the split system, in which part of the returned air

is by-passed to the fans is the other. To offset the obvious advantage of reducing the air to be conditioned by the split system, there are significant advantages in the simple method of recirculation. The relative merits of the two systems is one of the heatedly debated subjects among air conditioning engineers. Each has its advantages, so that a choice between them is possible only in consideration of a specific problem.*

Insulation. The question of noise elimination in air conditioning systems is easily solved by the proper design of the duct system in relation to air velocities, the insulation of ducts, location of sound traps in the ducts, the isolation of the ducts from the building structure, and the soundproofing of machinery in the customary manner. Because of the unusual sensitivity of microphones to sounds which the ear cannot detect, the sound insulation of the National Broadcasting Company Studios is representative of the latest developments in air conditioning work. The details shown on page 173 illustrate a method that is as thorough in this respect as any system could be.

Cost. Because of the special conditions which invariably arise in the installation of any air conditioning system, there is little available significant cost data. Generalities are too broad and specific examples mean little in relation to other buildings.

Unit coolers for residences, offices, etc., vary in price from $400 to $800 installed, depending upon capacity and type. Unit conditions cost approximately $200 to $350.

Central conditioning systems for residences, not including cooling equipment, range from approximately $1,000 for small residences to $2,500 for 18 or 20 room houses. A conditioning unit alone, suitable for attachment to an existing plant, costs about $250. One manufacturer, admitting the inconsistencies of rule-of-thumb estimating, finds that $7 to $12 per Btu. covers most installations.

Complete cooling and air conditioning systems for residences are even more difficult to estimate. Information from a large number of producers fails to supply anything more definite than a range in price from $1200 to $3500. One manufacturer of conditioning but not cooling equipment gives the following cost figures for residences:

No. of rooms	Cost
10	$1200
12	1500
14	1800
18	2000

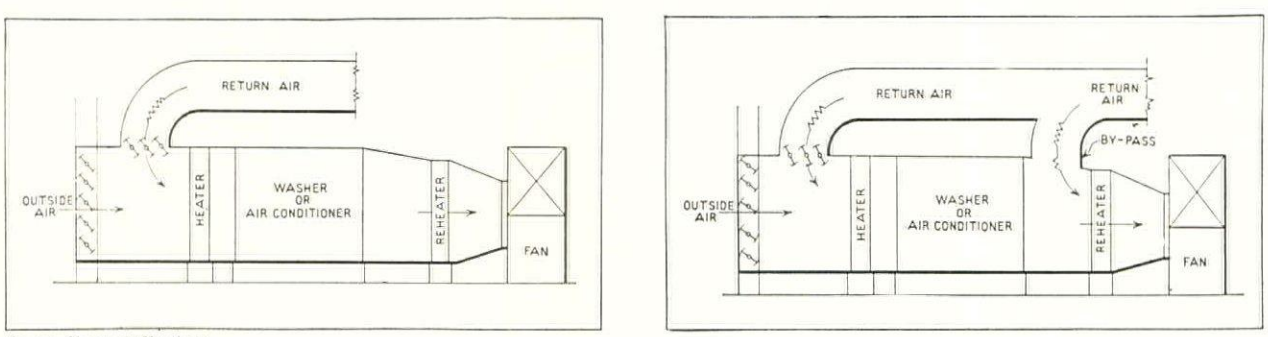
and suggests that from $200 to $1000 be added for the cost of cooling equipment.

Cost of installations for restaurants and shops is equally dependent upon conditions. A manufacturer of ice machinery equipment makes the following statement, with reservations, "Allow 12 cents per cu. ft. for medium-size restaurants as an average." Another manufacturer of mechanical refrigeration supplies facts on several typical installations for restaurants and shops which reach a slightly higher conclusion.

The cost of cooling and air conditioning theaters has been reduced tremendously in the last few years, and it is probable that costs on other types of installations will be appreciably reduced as the number of installations increases. Less than five years ago it was estimated by a large chain group of theaters that between $40 and $50 was the average cost per seat of a cooling and air conditioning system. Today the same chain estimates from $15 to $22 per seat, with an average of $17. One large producer of mechanical refrigeration equipment gave $18 per seat as an average cost for theaters.

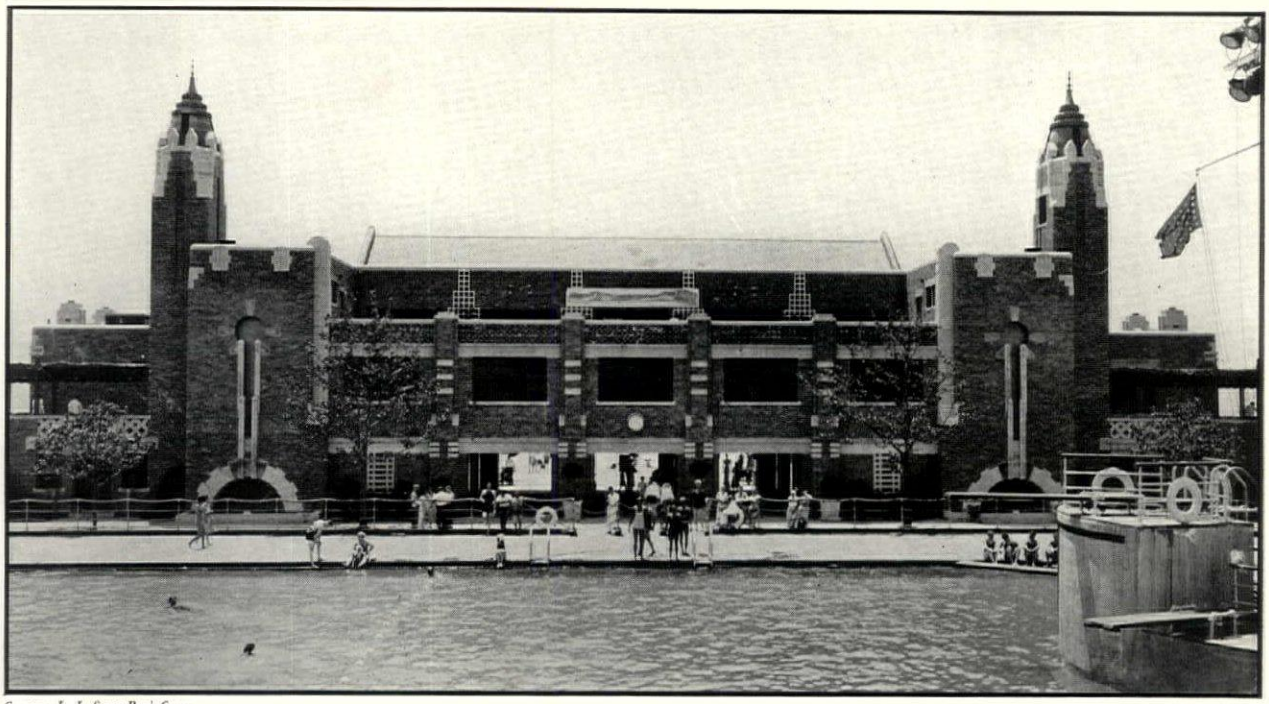
Office building installations, according to figures compiled for 7 large buildings, range from 90 cents to $1.50 per sq. ft. of usable floor area, and from 9 cents to 15 cents per cu. ft. One prominent engineer is responsible for the statement that 25 cents added to the square foot rental will pay for the first cost and maintenance of air conditioning for an office building.

* See "Air Quantities and Recirculation" by M. G. Harbula in December, 1931, issue of *Heating and Ventilating* for complete discussion of the two systems.



Courtesy, Heating & Ventilating

Diagrams of the two methods of air recirculation. At the left is the simple type, in which all the returned air is recirculated; and at the right is the patented method, in which part of the recirculated air is by-passed and the rest reconditioned



Courtesy L. I. State Park Comm.

PUBLIC BATHING PROJECTS

The development of outdoor bathing facilities as public or semi-public projects offers many business opportunities to an architect who will undertake their promotion and planning and is capable of outlining clearly the general requirements for their administration. This article points a few of the important points to be considered. Much of the information regarding the planning of public bathing projects was obtained through the courtesy of Herman W. Merkel of the Westchester County Park Commission and B. L. Van Schaick, Executive Secretary of the Long Island State Park Commission

THE average individual has no need of expert advice to point to the pleasure and healthful advantages of outdoor recreation. Nor does he need an artificial stimulus to make him use to the limit whatever facilities for such recreation may be available to him. That this is true, the overwhelming attendance at every public recreational center during its season will testify. The American public is living more and more in the open and is regarding physical exercise and outdoor recreation as a necessary and desirable part of its individual existence. Indulgence in it by the average man is limited only by the time which is available to him and the existing facilities near the community in which he lives.

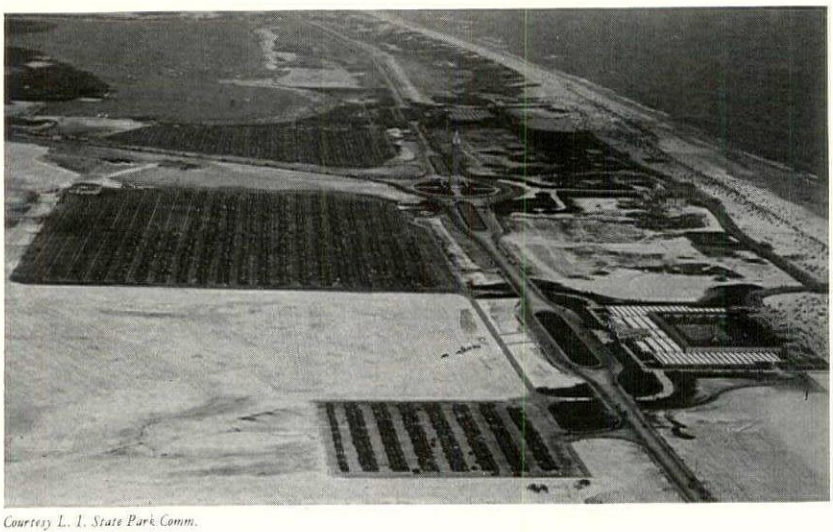
Public bathing projects are a comparatively new development of public health and recreational programs, and it has been only within the last few years that they have satisfactorily demonstrated their practicability to serve the public upon a financial basis which assures their self-supporting continuance. The undeniable success of outdoor bathing projects in Chicago, St. Louis, Kansas City, in several California localities, and notably in the State of New York has gained for this type of recreational development an official recognition of its practicability in promoting public health and morale and as a means of financial return to the municipality, county, or State which is responsible for its inception and administration.

From the standpoint of the architect such developments should have a threefold interest. In regard to design, there are many possibilities inherent in the initial planning and subsequent development of such projects, as the limitations of plan and design are elastic in the extreme. From the standpoint of social engineering, the possibilities for effective accomplishment are just as unlimited. In addition, a project of this type offers to the architect most attractive opportunities for the promotion of activity from the standpoint of his personal and professional business relationships.

Public outdoor bathing developments may be privately owned or may be publicly controlled by the municipality, county or State. With whichever organization the architect may concern himself, he has a certain responsibility as the promoter of the

Courtesy Westchester County Park Comm.

This much-published air view is of the bath houses and amusement park at Rye Beach, N. Y. Although this entire development was initiated and is administered by the Westchester County Park Commission, Walker & Gillette were the architects responsible for the planning and design of the buildings. This development is unusual from two standpoints. First, it contains county-controlled facilities for public amusement, in contrast to the majority of public beach developments, the objectives of which are public recreation. Secondly, the parking area is not large, as part of the patrons use water transportation



Courtesy L. I. State Park Comm.

An air view of the bathing project at Jones Beach near Wantagh, Long Island, designed by Herbert A. Magoon, architect, and owned and administered by the Long Island State Park Commission. Jones Beach is one of the largest bathing establishments in the East, having five miles of controlled bathing area, two large bath houses, and three very large parking areas, with a total accommodation of 12,500 cars. The revenue is obtained by charging for parking privilege in addition to the usual charge for the use of the bath house facilities

entire project. Increasingly he is being regarded not merely as an architectural designer or planning expert but as the coordinator of the several influences which are continually operative in the initiation of any commercial project, and public bathing developments must be considered as commercial projects.

Theoretically, a public project under municipal, county, or State control, should entail no expense to those who patronize it. Practically, however, the outdoor bathing developments are expensive to plan and to build and, demanding as they do a well-trained personnel for their administration, are equally as expensive to maintain. Properly executed, however, they are invariably well patronized and may be developed into highly successful projects from the financial standpoint as well as from those of public health and recreation. But their success cannot be predicated on theory. If they are to be self-supporting and in addition produce income which may be used to defray the expenses of some less successful public venture, they must be accorded the intense economic study which is necessary in any other type of commercial venture.

Chief among the controlling factors is location. There are many instances in which land, useless for any other purpose, has been adapted as the site of a successful ocean or lake beach development. In inland towns it is equally possible to use cheap land, removed from the high values of easily accessible locations, as the site of outdoor swimming pools and bath houses. In either case, transportation plays an important part in the success of the venture. Before a line is drawn on the actual layout, the cost, regularity and method of transportation should be ascertained and its continuance assured.

The site itself should be chosen for its particular adaptability to an outdoor development of this type, in particular relation to the adjacent community. It should be high enough so that drainage does not become a problem of major importance. It should be so oriented that the prevailing winds will not bring objectionable odors or smoke from the town. It must be adaptable in a large part of its area

to parking (space for three cars should be provided for every ten bath lockers), and the land itself must be firm enough to bear the buildings without difficult or costly foundation work.

The importance of these points as determining the preliminary layout and financial set-up of the development cannot be overemphasized. They are limiting parts of the architect's problem and should be determined by him, together with a tabulation of costs, before any steps are taken in the actual planning of the project. As in any commercial venture, an unforeseen item of cost may be ruinous to the successful operation of a bathing establishment and a preliminary program should carefully check every point before the architect submits his scheme to the park commission or other owner with which he will work. The following are some of the major points to be considered in a program of this kind:

LOCATION AND SITE:
Climate (*temperature ranges, number of days in bathing season, prevailing winds*). Topography (*flow and rise of tides, condition of beach and land, kind of soil or rocks, elevations of land, etc.*) Surroundings (*landscaping, parking areas, etc.*) Transportation (*land and water, distance, time, routes, and rates from city*). Utilities (*gas, water, oil, electricity supplies, sewage lines, etc.*)

PLANNING:
General layout (*including picnic areas, parking facilities, bathing areas, concession spaces, bath houses, service quarters, transportation stations or docks, etc.*) Details of scheme (*capacities of bath houses and concessions, of bathing areas, of parking spaces. Type of bath house system, kind of administration and supervision, class of patrons, etc.*)

CONSTRUCTION:
General scheme (*including grading, retaining walls, roads, jetties, sewage system, water purification systems, etc.*) Buildings (*type, and general structural plans, including the most important materials used. Extent of fireproofness. Relative permanence, and possibilities of alteration or addition*).

EQUIPMENT:
Recreational features (*board walks, bath houses, playgrounds for children, wading and swimming pools, restaurant facilities, types and number of concessions, picnic facilities, etc.*) Maintenance features (*purification machinery and chlorination plants, heating and ventilating plants, sanitary systems and fixtures, storage facilities, etc.*)

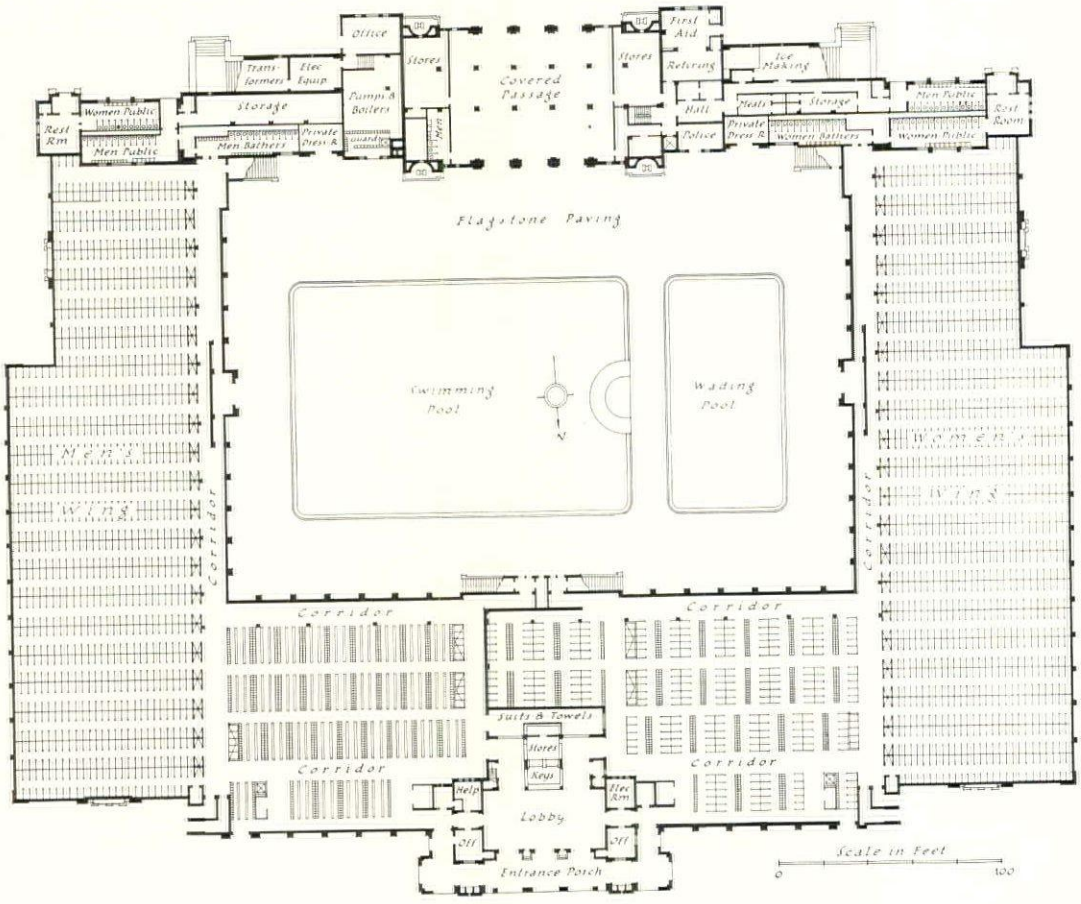
OPERATION:
Administration (*general type, such as private or public, with outline of organization and responsibilities of personnel*). Operation set-up (*skeleton financing program, general scheme for income and expenditure. Methods of publicity and control. Anticipated expansion or alteration possibilities*).

FINANCIAL SET-UP:
Estimated income (*including parking fees, possible transportation commissions, bath house charges, concessions, physical instruction classes, etc.*) Estimated expenditures (*including costs of operation, personnel, maintenance, interest, amortization, depreciation of equipment and buildings, expansion, etc.*) Estimated costs (*including rough work, such as grading, roads, etc., landscaping, pools, buildings, equipment, etc., fees*). Possible financing plans (*stock sales, bond issues, syndicate possibilities, popular subscription, cooperative ownership, etc.*)

Photos Courtesy L. I. State Park Comm.

The two illustrations on this page are of the boardwalk at Jones Beach which is over a mile and a half long and is an important part of the beach equipment

Types. Outdoor bathing developments may be roughly divided into two general headings. The first



The ground floor plan of one of the bath houses at Jones Beach, for which Herbert A. Magoon was the architect. It is one of the largest public bath houses in which the locker system is used. It has a capacity of 15,000 and is well arranged for efficient operation. Over the covered passage at the top of the illustration is a large restaurant which overlooks both the ocean and the pool. On either side of the dining room are dining terraces, and on three sides of the pool area are observation terraces for the use of non-bathers

will be located on the ocean or on the shores of an inland lake or stream. In the second, swimming pools replace a natural body of water and the size of the project is thereby somewhat restricted. The general principle of operation may, however, be the same in either case, for experience throughout the country has determined that either development is used in the same way and, within the limitations of its physical provisions, for the same purpose. In either case, also, the development as a whole resolves itself into two general components: the actual bathing area (whether it be a natural body of water or an artificial pool) and the bath houses which are used in connection with it.

In bath houses three general systems of administration are in vogue. The first, the system of individual dressing stalls, which, due to the expense involved, is losing favor. The second is the locker system in which clothes are stored in individual compartments. The third, recently adopted in all the Westchester Park Commission bathing establishments, is the basket system in which the bather stores his street clothing in a basket, which is then checked by an attendant. The most serious disadvantage of the locker system is the fact that in large establishments locker installations are difficult to keep clean. They offer a lodgment to dirt and, however well policed the bath house may be, are apt to become infested with vermin. From the administrative point of view this system also offers a difficulty in the matter of keys and tends to promote confusion and disorganization in bath house administration. Among the advantages, however, is the conservation of space which the use of lockers implies, with the possible increase in bath house capacity. Also, the system relieves the management of the direct responsibility for safe-keeping of the patrons' wearing apparel.

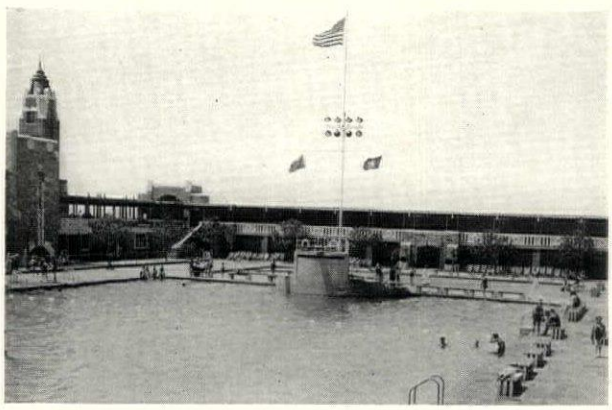
The basket system is much more cleanly and permits a more elastic arrangement in bath house layout, due to the fact that permanent storage space for the basket is not necessary except in a centrally located checking space. The responsibility for the safe-keeping of the baskets and their contents is placed with the management of the bath house, but due to the central location of the checking space supervision is more easily maintained. The basket system requires more space than the locker system, but where construction costs are low and where a compact plan is unnecessary to conserve land, this is not a serious disadvantage.

Planning. The problem here is one of circulation and control. From the standpoint of circulation, the most successful bath house is that in which large crowds of both sexes and all ages are handled with no confusion at entrances and exits, in which the bathers and non-bathers are segregated and in which the crowds congregate naturally in the space provided for them or are separated just as naturally by a well-planned circulatory system.

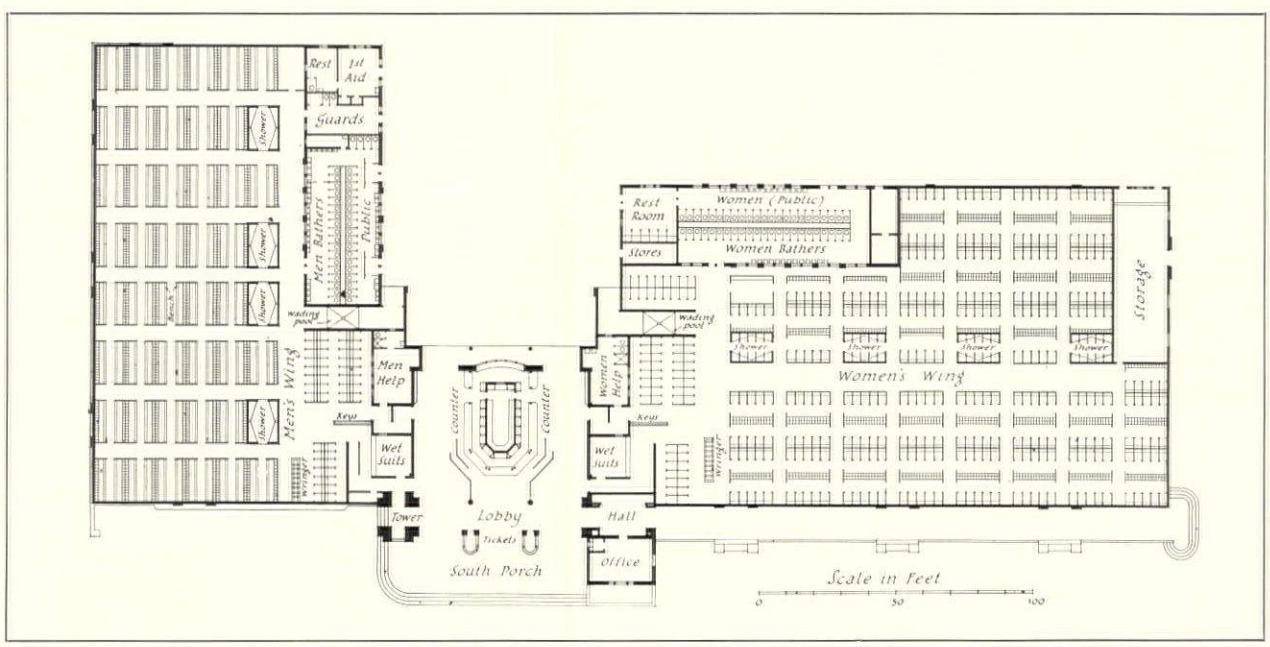
Entrances and exits must be planned for two types of patrons. The first come fully clothed and change into bathing suits within the bath house; the second are already clad in bathing suits and have no need of the dressing rooms. The two classes should be segregated and an entrance for the second class should open directly onto the bathing area, making it unnecessary to pass through any part of the dressing rooms on the way.

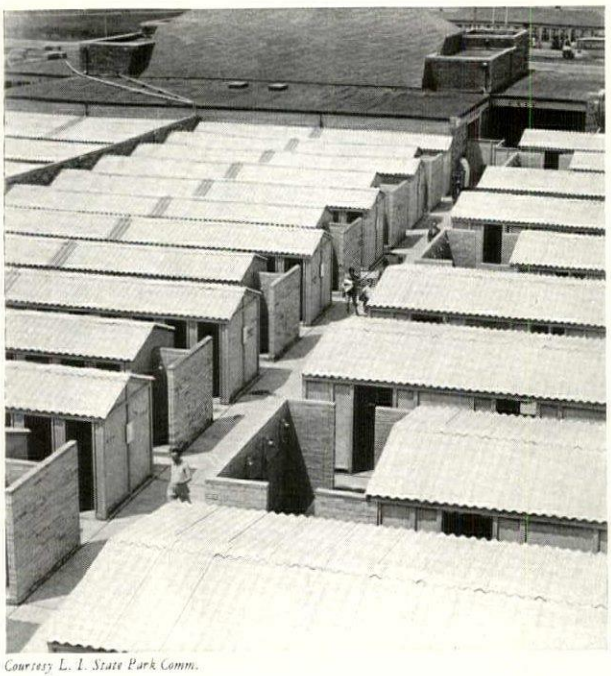
In the case of swimming pools, however, experience has shown it advisable to require a shower bath before entrance into the pool area. In every development of this type, where the entrance fee is small, entrances to the pool area should be through con-

Photos Courtesy L. I. State Park Comm.

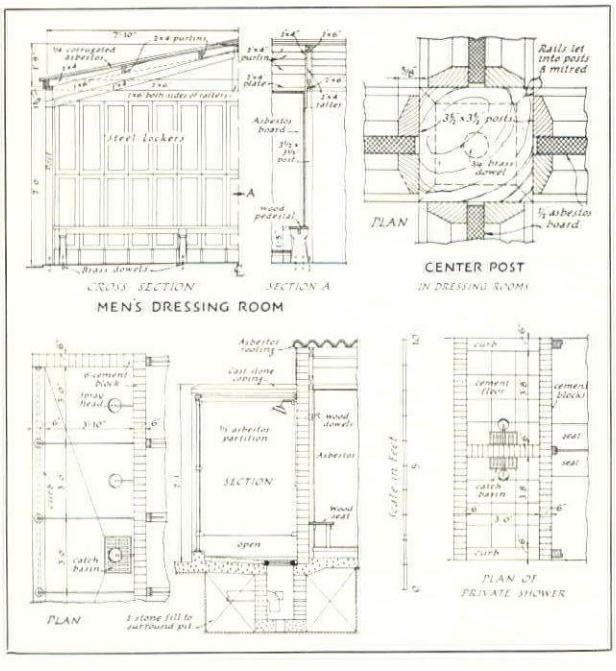


The two pictures above are illustrative of the two types of bathing facilities, both of them in this case being a part of the Jones Beach development. Below is a plan of the bathing house at Sunken Meadow Beach, Long Island, controlled by the Long Island State Park Commission. Herbert A. Magoon was the architect. This development is as yet incomplete and plans for its expansion include an additional bath house and a restaurant





Courtesy L. I. State Park Comm.



An illustration and details of typical dressing rooms and shower compartments at Jones Beach, Long Island. The plans on the opposite page illustrate typical dressing room layouts. Although the public dressing rooms are less expensive and therefore more popular, some private dressing rooms should be included in every large public bathing project

tinuous shower baths, 40 ft. in length and equipped with both overhead and wall fixtures.

For both classes of patrons, the ticket windows, check rooms, etc., should be planned in the simplest manner possible to develop the greatest flexibility in use. This means that a ticket window should be directly adjacent to the counters used for checking valuables. In the case of a small crowd, one attendant can easily handle the sale of tickets and the checking of valuables in the same booth. In the case of large crowds two attendants will be necessary at the ticket windows, one for men and one for women, and an additional one or two will be necessary within the same area to check valuables.

Entrances into the bath houses should be close to the ticket window but out of line of the bath house exit. The latter should be protected from unauthorized entrance by a baffle gate. The exits from the bath houses to the bathing area may, however, serve as entrances and in the case of swimming pool facilities should also be equipped with a continuous shower or a wading pool.

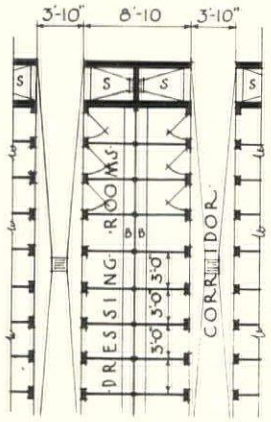
Individual showers should be provided within the bath house area and close to the entrance from the bathing beach. For salt water bathing two showers should be provided to every 500 lockers or baskets. In the case of fresh water bathing, the proportion may be halved, providing that the continuous shower baths mentioned above are used.

As far as the actual planning of the bath house is concerned, no definite rules for layouts can be set forth. On page 135 is illustrated a small swimming pool and bath house where the basket system is employed, and on page 140 is shown the layout of a pool development where the locker system is used. Common to both of them is a system of easy circulation, with an entrance through turnstiles and an exit to the bathing area through a shower compartment. On pages 178 to 179 are plans of one of the bath houses at Jones Beach and Sunken Meadow Beach, respectively, both of which have been planned under the direction of the Long Island State Park Commission.

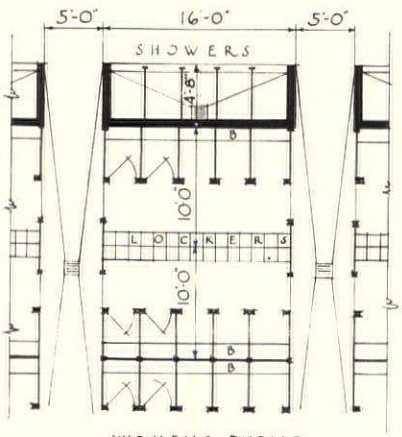
The two bath houses are not entirely comparable. At Jones Beach a bath house charge is made only for those who will use dressing rooms offered within the building. In the case of the Sunken Meadow development a small admission charge is made whether the bath house is used or not. Especially worthy of study is the entrance plan of this building and the manner in which the entrances and exits are arranged. Confusion is eliminated, because within the building bathers and non-bathers are segregated at all times. The entrance to the bathing area itself is gained from the bath house proper only through a wading pool, which in this building takes the place of the continuous showers already mentioned. Noteworthy also is the location of the shower baths in both the men's and women's wings. They are immediately accessible from the exit to the bathing beach, and the tiers of lockers and dressing rooms are so arranged that it is unnecessary to pass near the showers on the way out of the bath house.

BATH HOUSES

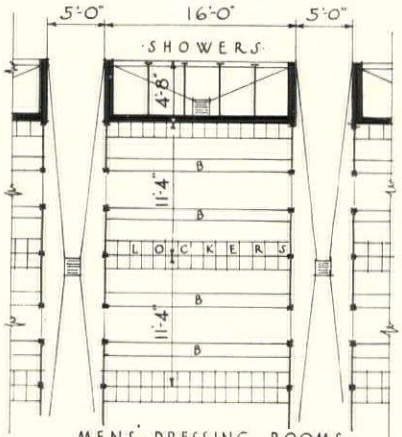
SCALE 0 5 10 15 20 25 30 FEET



MENS OR WOMENS PRIVATE DRESSING ROOMS

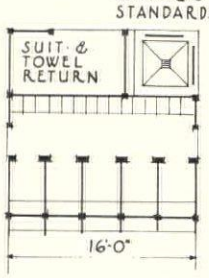


WOMENS PUBLIC DRESSING ROOMS



MENS DRESSING ROOMS

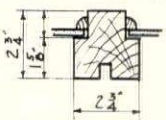
CABANAS



ABBREVIATIONS

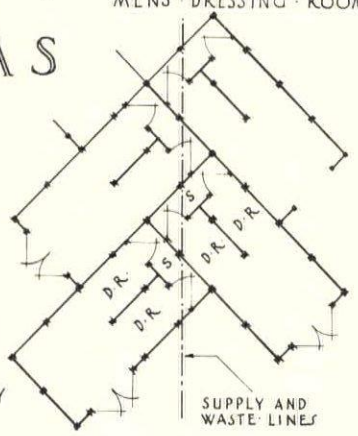
D.R.	DRESSING ROOM
S	SHOWER
B	BENCH
P	PORCH
C	CLOSET

POST DETAIL

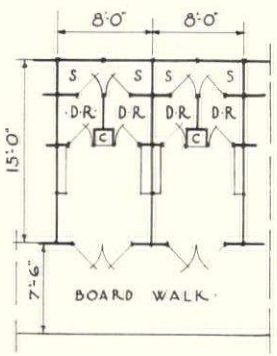


CONSTRUCTED OF STANDARD SHEETS OF TRANSITE 3/8"X48"X84" WITH CORRUGATED TRANSITE ROOFS

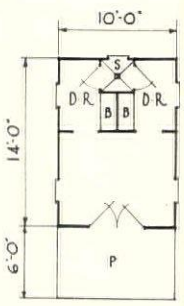
SHOWER COMPARTMENTS GENERALLY WITHOUT ROOF



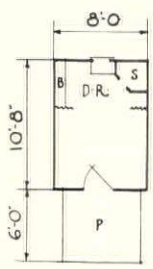
HERRING BONE LAYOUT



BOARD WALK CABANAS



SINGLE



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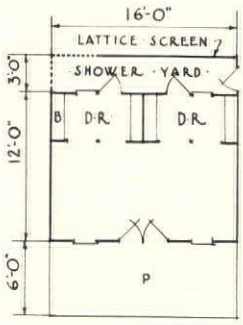
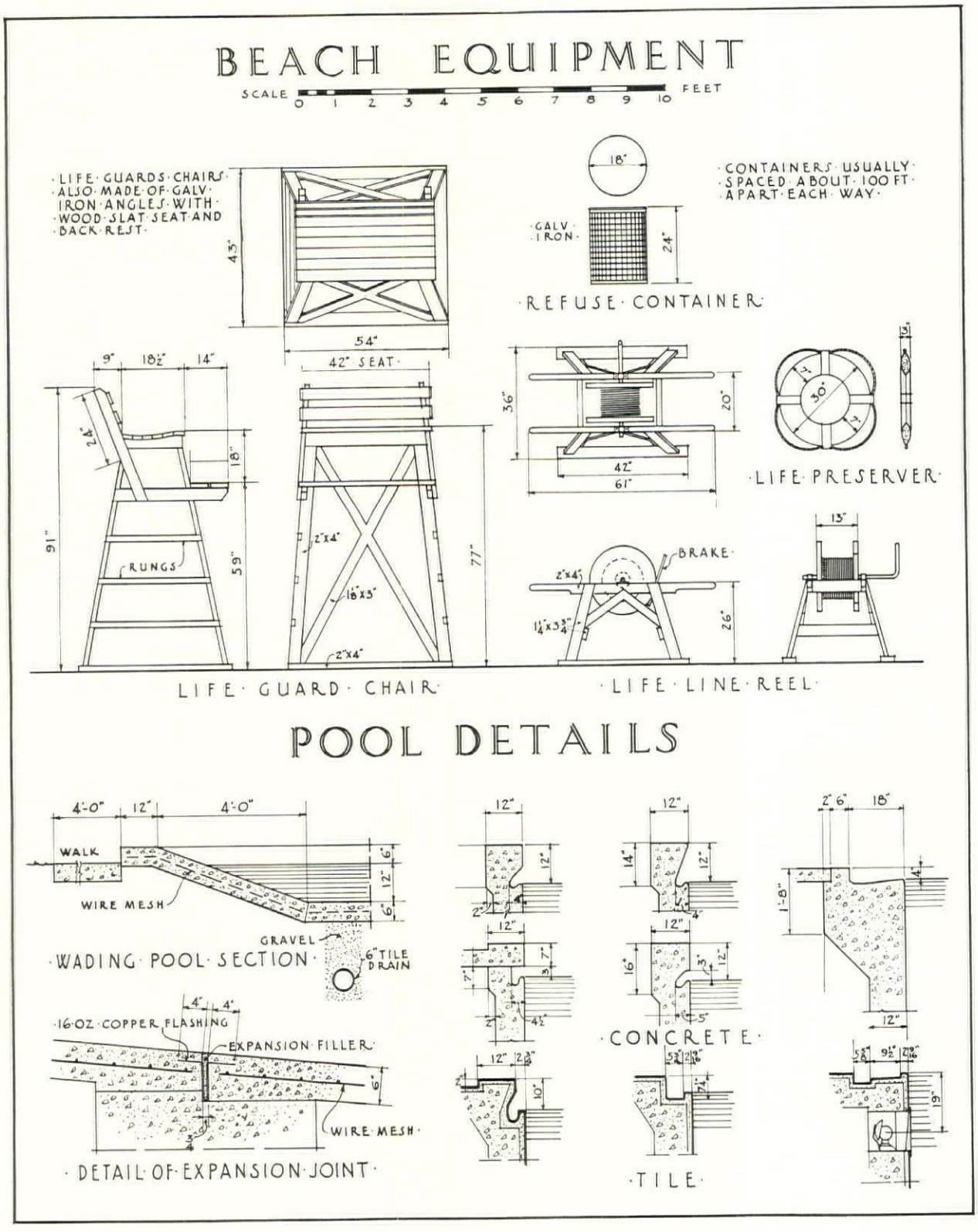


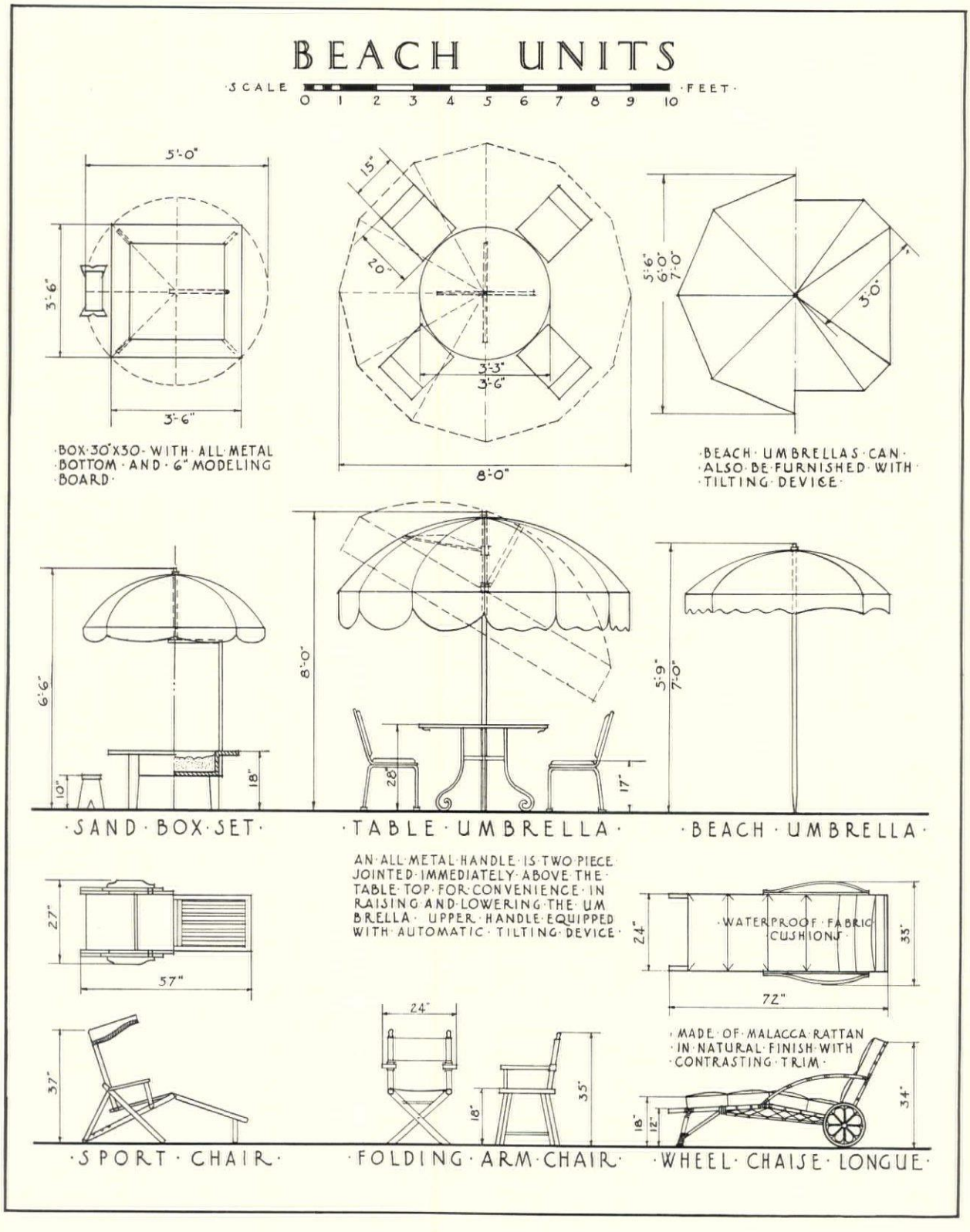
DOUBLE

PLATFORMS MADE OF 2"X3" MATERIAL WITH 3/8" OPEN JOINTS

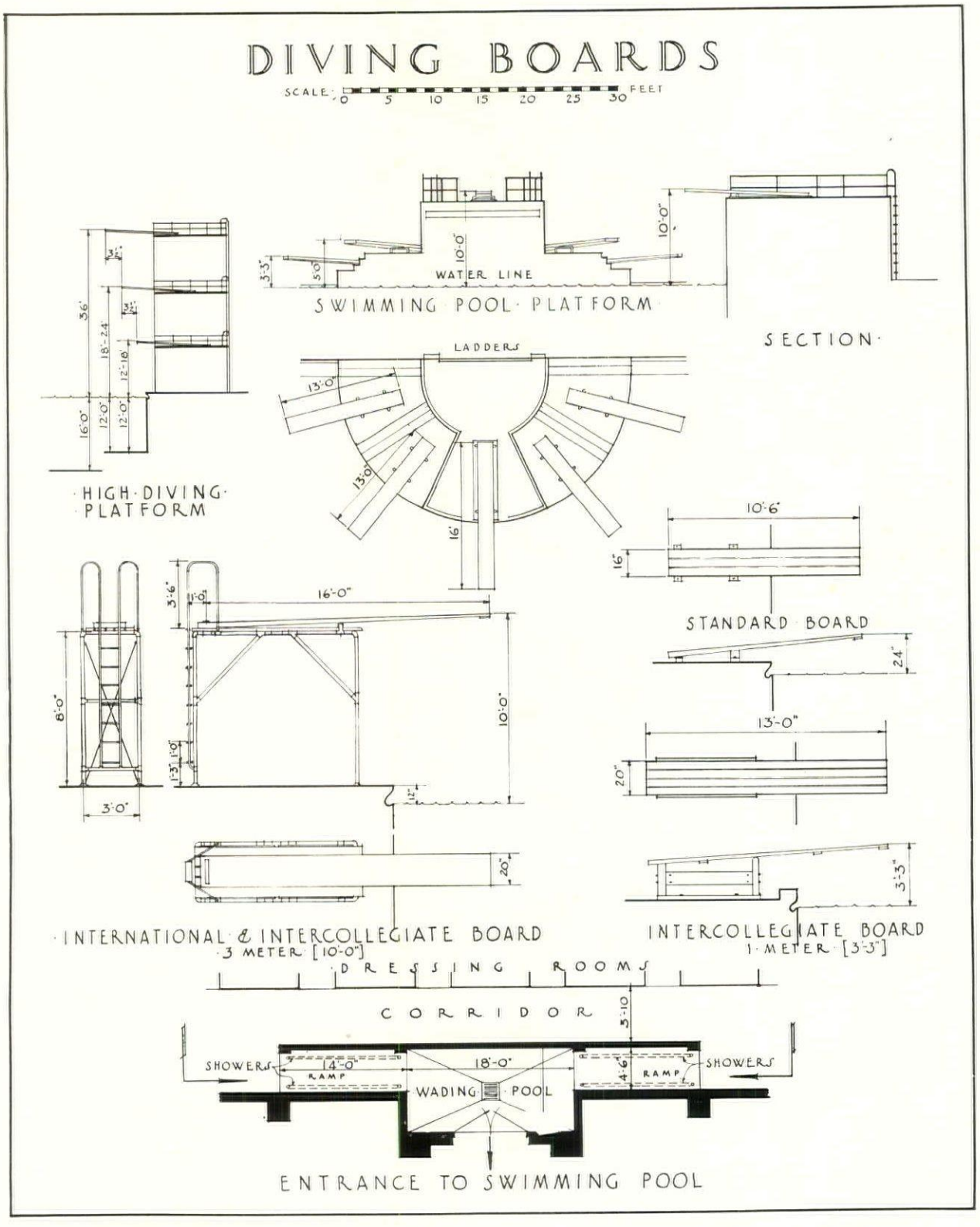
Although often the construction of a bath house or cabana is simple in the extreme, the planning of them in groups to give efficient service is the foundation of a successful beach project. Bath houses are usually associated with a development open to the public. Cabanas are provided at private beach clubs, but are sometimes rented at the public resorts also



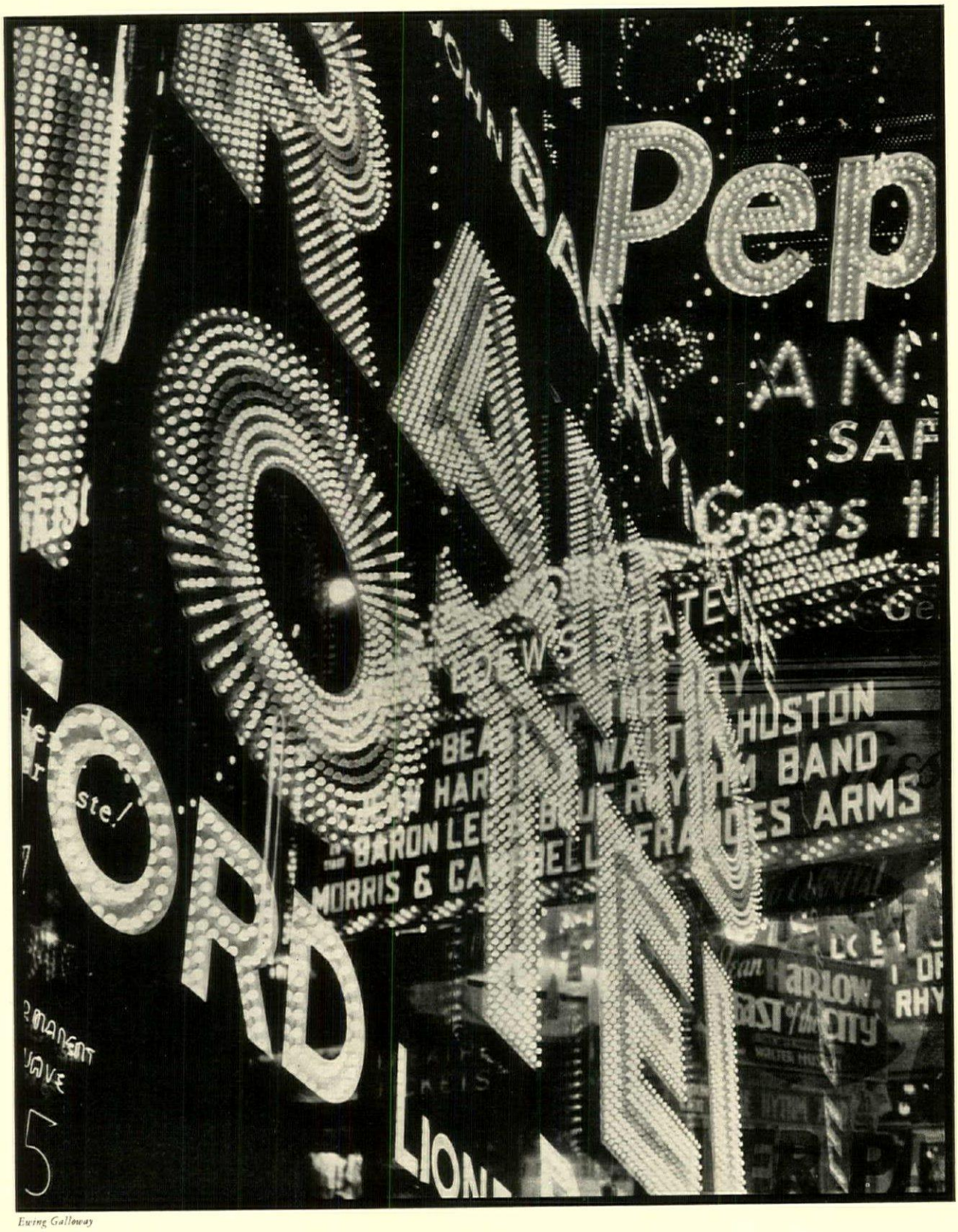
The items of beach equipment shown at the top of the page are necessary to any project of above-the-average size, and space for their storage should be provided in the plan of the buildings. The details below — reproduced at ¼ in. scale — show typical constructions in common use for outdoor swimming pools. Pools are seldom faced with tile in the case of public projects



Reproduced at ¼ in. scale, the sizes of these typical beach units may be taken directly from this sheet and used to determine storage requirements, clearances, etc., on working drawings. The increasing habit of sunbathing and outdoor lounging makes such equipment as this a necessary part of every beach development, public or private



Diving boards themselves have become pieces of standard equipment and may be obtained from several manufacturers. Their arrangement, however, depends largely upon the extent of the bathing facilities, the location of the pool in relation to the bath houses and type of activity for which the pool itself has been planned. Reproduced here are arrangements at ¼ in. scale



Ewing Galloway

"THE LIGHTS OF OLD BROADWAY"

The Architectural Forum