

THE AMERICAN ARCHITECT

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AUDITORIUM

BUSHWICK HIGH SCHOOL, NEW YORK CITY

By C. B. J. SNYDER, F.A.I.A.

ARCHITECT AND SUPERINTENDENT OF BUILDINGS, BOARD OF EDUCATION, NEW YORK CITY

THE educational authorities of New York City have recently completed and placed in operation another manual training high school. This is the second to be located in the Borough of Brooklyn, which borough will also soon have a vocational school.

We thus have another instance of the rapidity with which manual and technical instruction is being provided for in secondary schools in New York, where but a few years ago they were principally planned for classical studies.

The physical limitations of the site upon which the new Bushwick High School is located necessitated the planning of a compact building, a portion of which is five stories high, that section in which the lunchroom is located being six stories, exclusive of the cellar.

The total accommodations afforded are for upwards of 1,750 students.

One of the problems was that of the complete isolation of the shops, from some of which, particularly that for sheet metal work, the noise at times is not only con-

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siderable in volume, but peculiarly penetrating in character.

By reference to the plans it will be seen that this has been accomplished through the placing of the shops in the rear wing, readily accessible by means of connecting corridors, and safeguarded by two double stairways.

The windows of the classrooms face away from the shops.

This plan permits of heavy construction. Some of the shop floors provide for live loads of up to 250 pounds per square foot—being all localized, with resulting economy in construction.

The placing of the auditorium on the first floor, readily accessible from the streets, making it available to the public as well as to the school, is in accordance with the fixed policy which the Board of Education of the City of New York has been following for a number of years. This applies as well to elementary schools.

The 1,250 sittings in the auditorium are divided between the main floor and the gallery. These are of the fixed opera house type, the floors being inclined to afford proper lines of sight.

The stage or platform will seat nearly 100 back of the line of the proscenium arch.

Preparation has been made for the carrying on of extensive experiments in conjunction with lectures and demonstrations.

There has been placed in the floor of the stage, very near the front, a large pocket, covered by a trap door, in which are arranged gas, electric, steam and water connections, together with drainage facilities, adapted for ready extension to the demonstration table. This table is fully equipped, is mounted on wheels, and when not in use is kept in the preparation room at the rear of the stage.

When required for lecture purposes it is rolled into position at the front of the stage, and connection quickly made with water, gas, electricity or steam as may be required.

Another feature of standard equipment is the fireproof booth and the screen for moving pictures, now an important part in educational work. Opaque screens are provided to shut out the natural illumination of the room when desired.

The lowest story, which, although marked "cellar" on the plans, is really a basement,



GYMNASIUM



DOMESTIC SCIENCE ROOM, ARRANGED FOR INDIVIDUAL INSTRUCTION

accommodates the locker rooms, shower baths and toilets, a complete equipment of which is placed on either side of the building, one for the boys and another for the girls; a receiving room, storeroom, mechanical laboratory, generating and power plant, and covers the entire area of the building, which is about 175 feet square.

So also does the basement, which, through a change in the grade of the street, really has become all above the street level, and is, in fact, the first floor.

Here are placed the main entrances and halls, the auditorium, gymnasiums, one each for boys and girls, class and other rooms.

The floor above is the same area, containing the upper part of the gymnasiums and auditorium.

Above this the plan is that of a court enclosed on three sides, thus admitting an abundance of light and air to all of the rooms facing thereon.

This is important inasmuch as the wings have a double tier of rooms, with a corridor in the center, the laboratories being placed in the ends of the wings at the front, thus insuring light on three sides. Attached to these are the necessary preparation or other rooms.

Lunchrooms for boys and girls are placed above the shops, on what is practically the sixth floor.

The balance of the building being a story lower, made it possible to provide outdoor recreation space of some 12,000 square feet, through the paving of the roof of the lower portion with tile, laid in Portland cement.

The distribution and use of the various rooms throughout the building, as shown by the plans, has much in common with other schools of the type, and may, therefore, be not particularly interesting.

A consideration of the principle upon which stairways, exits and other features are planned, together with the all-important

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question of safety from fire and panic and the reduction of fire risk, is not so obvious, and may, possibly, be more pertinent at this time.

In planning the corridors or hallways consideration is given, not so much to width for appearance sake, but width as being necessary for the maximum number of students who may use same at a given moment.

but it has been found that greater convenience of administration is made possible by continuing all stairways through to the top floor.

The maximum width of stairways for the regular use of students of secondary schools, such as this, is five feet.

Exits are planned on the basis of fifteen feet in width for the first 500 students, six inches additional width being pro-



FOURTH FLOOR CORRIDOR

This is based upon the capacity of each floor, as represented by an allowance of one student for each fifteen square feet of floor space of all rooms. While there may never be so many occupants, provision is made for the maximum.

This, in turn, fixes the number of stairways, on the basis of a minimum width of four feet for the first fifty students, and one foot additional width for each additional 100 students. This rule applies to the stairways of each story.

The lower stories may thus require more stairways than the upper stories,

vided for each 100 additional students.

This rule applies only for exits that are regularly in use, and does not include the rear exits for the assembly room or similar outside doors.

The rule underlying the principle of the proportioning of exits, stairways and corridors, is that they shall be sufficient to permit of the building being vacated by its occupants, in an orderly manner, within three minutes of the sounding of the alarm signal system, with which each building is equipped.

This limit of time is that agreed upon by

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the Committee on Fire Prevention of the Public Schools of the City of New York. It consisted of a chief from the Fire Department, an engineer from each of the five Borough Building Departments, and the architect of the Department of Education, who acted as chairman.

The investigation was most thorough, and extended over several months.

It was felt that the first point to be settled was the fixing of some rule by which a school building might be readily tested as to its having a sufficient number of stairways and exits.

After considering the number of pupils which would pass out in double line at the foot of the regulation four-foot stairway, in one minute, and the time required for the fire apparatus to reach the building after the alarm has been sent in from the fire alarm telegraph box, with which each building is equipped, it was decided that "each building shall have a sufficient number of fireproof stairways and exits to permit of its occupants vacating same in not more than three minutes in non-fireproof and not to exceed three and one-half minutes in fireproof structures; that all stairways of all school buildings shall be enclosed on each floor with fireproof partitions and self-closing fireproof doors."

"All classroom doors to open into the rooms. All stair doors above the first floor and basement where exit is had shall open into the stairway following the line of flow of the pupils and out at the first floor or basement toward exits. All exit doors to open out."

Another important point was the determination to eliminate all direct connection between the main floors and boiler, engine or storerooms in the cellars. This is provided for by fireproof stairways and passageways, at either end of which are placed fireproof doors made to close automatically, one of them being the standard fireproof door with fusible link.

The thickness of the floor system of the Bushwick High School, in common with the other fireproof school buildings of New York, together with the clear story heights of fourteen feet three inches, makes possible a system of double stairways.

These are of fireproof construction and are enclosed on each floor with wire glass

set in steel frames with metal self-closing doors. Metal is also used for all trim and doors for shops, storerooms, closets, elevators, dust chutes and in and about all portions of the heating and ventilating apparatus.

All floors and corridors above the auditorium level, together with some of the toilet storerooms, are paved with asphalt. Cement is used for the shops, lunchrooms and some storerooms. The floors of all laboratories are tile.

The fire risk is, therefore, reduced to a minimum, especially when the character of the occupancy of the building is taken into consideration.

The further use of metal for interior trim and equipment is anticipated just as soon as the educational authorities can be insured against a repetition of their experience of some years ago, when they were forced to abandon the use of metal wardrobes, bookcases and other equipment because of an increase in price of something like 300 per cent.

It will be noticed, perhaps, that there is an absence of stand pipes, tanks and fire pumps as a special fire fighting equipment.

Provision is made on each floor and in the shops for the installation of three gallon liquid fire extinguishers, together with fire hooks and axes. This equipment could be increased at the pleasure of the Fire Commissioner, but the authorities have agreed that in the event of fire it is the duty of the principal to see that the alarm is sent in from the fire alarm telegraph box and that the building be immediately vacated by both teachers and pupils, the extinguishing of the fire to devolve solely upon the Fire Department, and that there shall be no overlapping of duties.

In no other way is it possible to provide against the occupants of the building attempting to extinguish a fire which, in so many instances, is unsuccessful, while the time wasted is that which should have been utilized in summoning the Fire Department and in vacating the premises.

Few people seem to realize that much better progress could be made in fire extinguishing if the building be vacated of its occupants and the street cleared for the arrival of the fire apparatus.

A VISIT TO RODIN

By CLYDE HUNT

Having received an invitation from Rodin to visit him at Meudon, I took the train from the Gare Montparnasse, Paris, and in fifteen minutes arrived at a little station overlooking the valley of the Seine. Monsieur Rodin's red brick villa was pointed out on an opposite hill half a mile away. On nearer approach, Mount Valerien (where rests the great fortress erected for the protection of Paris) reminded me of the Acropolis at Athens. Passing along an avenue bordered with trees, I arrived at a small gate in the rear of Rodin's house and, after ringing the bell, a man servant, wearing a blue apron, came out and took my card to the master.

The servant soon returned and as we talked, a jovial robust man of seventy-four with a white beard and wearing a black velvet bérét and long dressing gown and

tippet in place of a coat, came around the corner of the house. It was the master, who most graciously welcomed me. I admired the view and asked him if it did not remind him of the Acropolis. He said he had never been to Athens, whereupon I, of course, remarked, "You



ADAM



EVE

have a modern Athens here with your great works."

The master then took me to his museum of antiquities where there was a beautiful Greek marble torso and legs of a man. Rodin called my attention to the wonderful modeling from all sides. One could see the bones under the flesh and he said, "It almost walks." Then we admired a large marble head of the early Renaissance period, which he said was almost as fine as the Greek antique. The moment had arrived that for several years I had been looking forward to—"A Visit to Rodin's Atelier." A few steps from the museum

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brought us there. The atelier is the one that was built for Rodin's works at the exposition in 1900. He had it re-erected at Meudon. As we entered the large building we could see all the statues that fill it, covered with white cloths, excepting a few casts and the great Balzac which illuminated one corner and which is still in the original plaster form as when first shown. I believe it to be the greatest statue to a modern man, and yet it is not in marble or bronze. Rodin uncovered a small and delicate marble of three nude figures composed of a young man with two figures floating over his head—"Inspiration," I think he called it.

The master asked to be excused a moment as he went to get his assistant. There I was alone, surrounded by the great works of the greatest sculptor in the country. Soon they returned, and the assistant, who turned out to be his modeler, and has been with him for fourteen years, was sent to get a portfolio of his etchings,

and photographs of some of his latest works that were in his Paris atelier in the Rue de Varenne. After we were seated he showed me the photographs of the new busts and some beautifully executed dry points.

I said I had remarked several new things of his in the Luxembourg. He said,



ST. JOHN



THE BRONZE AGE

"Yes, but they have over thirty and only part of them were exhibited." I told him I had often admired his works in the Metropolitan Museum in New York City, and he asked me how they were placed. I said they were placed very well and told him where. I remarked that some day they would undoubtedly build a room to hold his works. He said that if they did he would send them others. He had his assistant uncover two nude female figures; one on her back floating downward and the other apparently kneeling on the former with her hands and head on her breast. Rodin kept turning the figures until he had them in just the right light, and then told me to look at the beautiful shadows and lines they made. Next he uncovered a

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small female figure with the arms and legs in such a position that it reminded me of an exquisite shell. I told him so and he said, "What do you mean?" I repeated that it reminded me of a mother-of-pearl oyster shell, as one could almost see the color and form of the shell. He said, "Good idea." Taking out of his vest pocket a stub of a pencil, he wrote on the base of the statuette "*Coquille de perle*."

We next looked at one of several designs he made for the Victor Hugo statue before deciding on the one now placed in the Palais Royal Gardens. It stands in a grotto, and at the feet are several small nude figures representing Poetry, etc. Next he had uncovered a statue which he called "Immortality"—representing a dead poet in a grotto lying prone with only his head raised and floating close to his brow are several nude figures. He had uncovered the "Bronze Age" and turning to me said, "Never mind, I suppose you know that one." I replied that I did know it and asked when he had done it. He answered, "About fifteen years ago." I asked him when he made the St. John and he said about the same time. Many stories are told about this, and most people think it his greatest statue. Someone had said that he could not carry out the detail of a figure, and when the St. John was produced it was so perfect that he was then accused of moulding it from life. I understand he received only the third medal in the salon the year it was exhibited.

We passed a large model designed to commemorate labor. It is a graceful tower with a winding stairway and bas-reliefs all the way to the top. It reminds one very much of the leaning tower of Pisa.

Rodin is a modeler of perfection—a poet with a big heart who understands the value of masses, shadow and large form.

NOTABLE AWARD TO MARY CASSATT, PAINTER

The Gold Medal of Honor of the Philadelphia Academy of the Fine Arts, the highest award in the gift of that institution, and among the most valued of the art trophies awarded in this country, has been given to Mary Cassatt, of Philadelphia.

QUANTITY SURVEYING IN AMERICA AND ENGLAND

A COMMUNICATION

To the Editor, Sir:

I have only recently had sent me your issues of November 19th and November 26th last, containing Mr. G. Alexander Wright's article on "Quantity Surveying, A Necessity for Better Estimating Methods," which I have read with great interest.

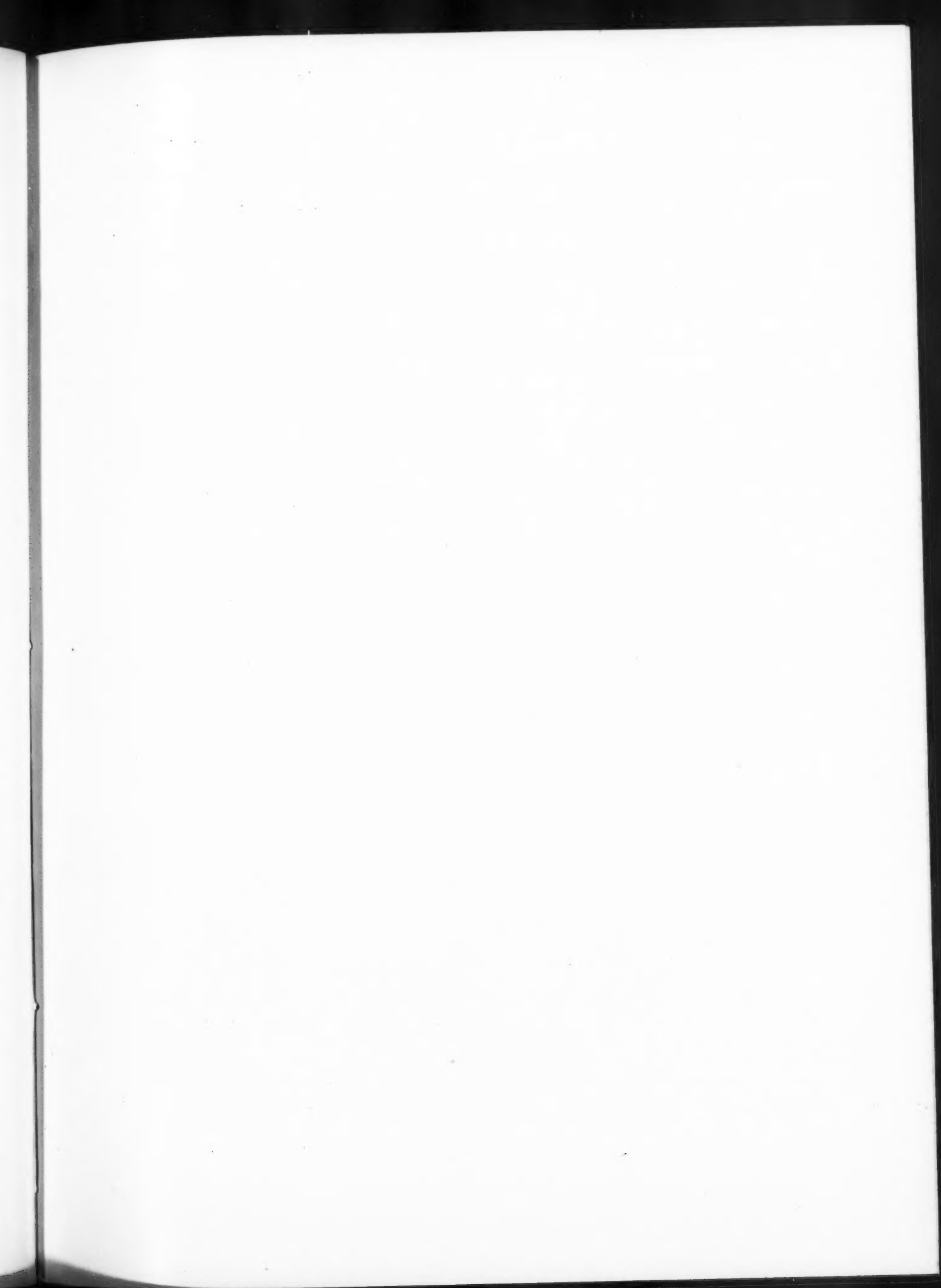
All Mr. Wright says is indisputable, and more might be added. The extreme speed and despatch with which building operations are conducted in America certainly makes the employment of the independent quantity surveyor an even greater need there than in England, if competition is to be conducted fairly. The employment of the surveyor would relieve the architect of much work and responsibility with which he is now burdened, and both the Client and the Contractor would be assured of fair treatment in the final account measured and adjusted on the original priced quantities in the proper manner.

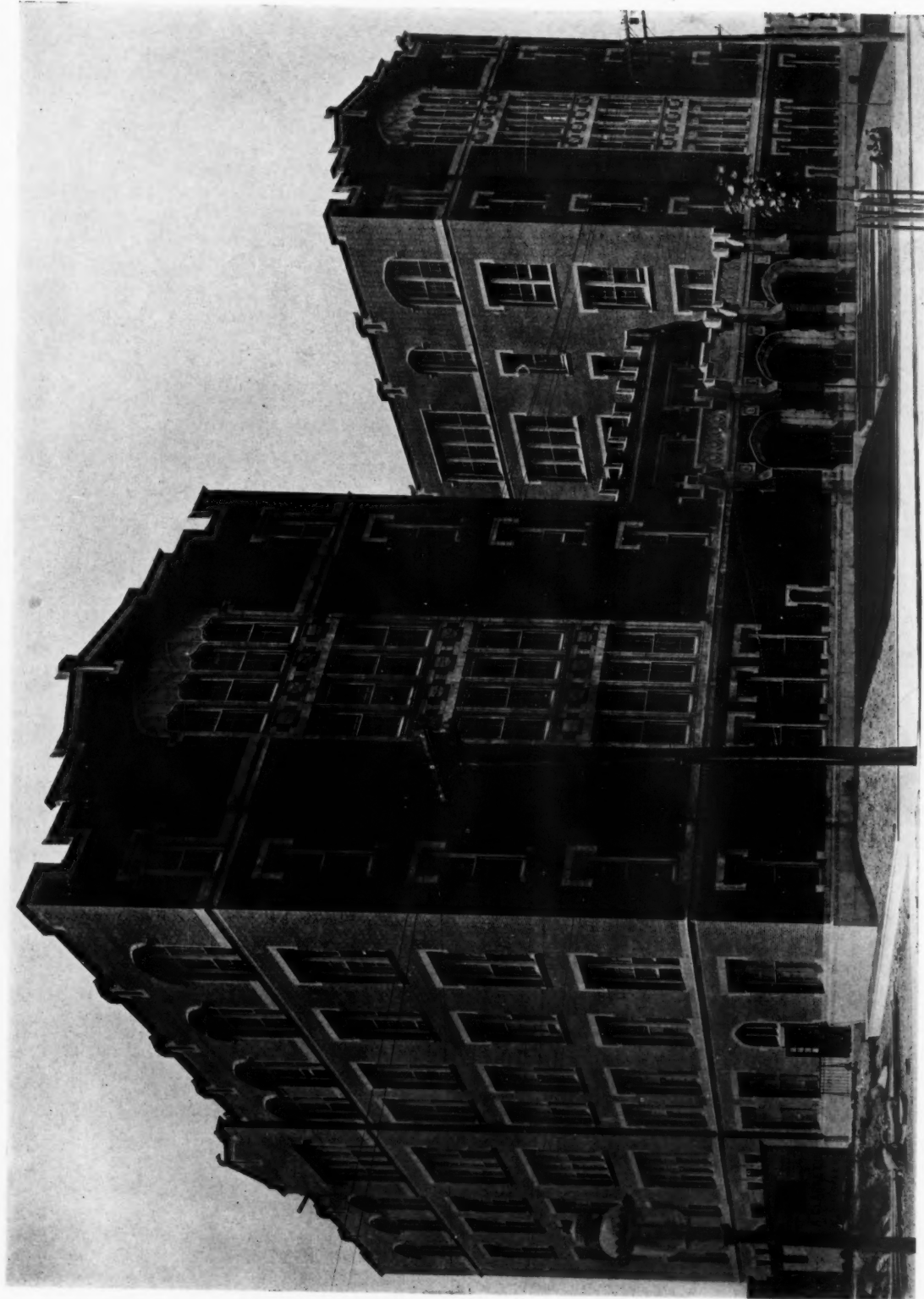
The Contractor would also be relieved of the heavy cost of a large part of his present measuring and estimating staff for which he must, under the existing conditions, reimburse himself in his tenders.

I venture to think, however, that the introduction of a system of quantity surveying into America is not quite so simple a matter as it would appear; otherwise, unless there be some influence working against it, it would have been in operation long before this. Even as I write I note that, according to the footnote on the front page of Mr. Wright's article, seventeen years have passed since the matter was first raised in your paper!

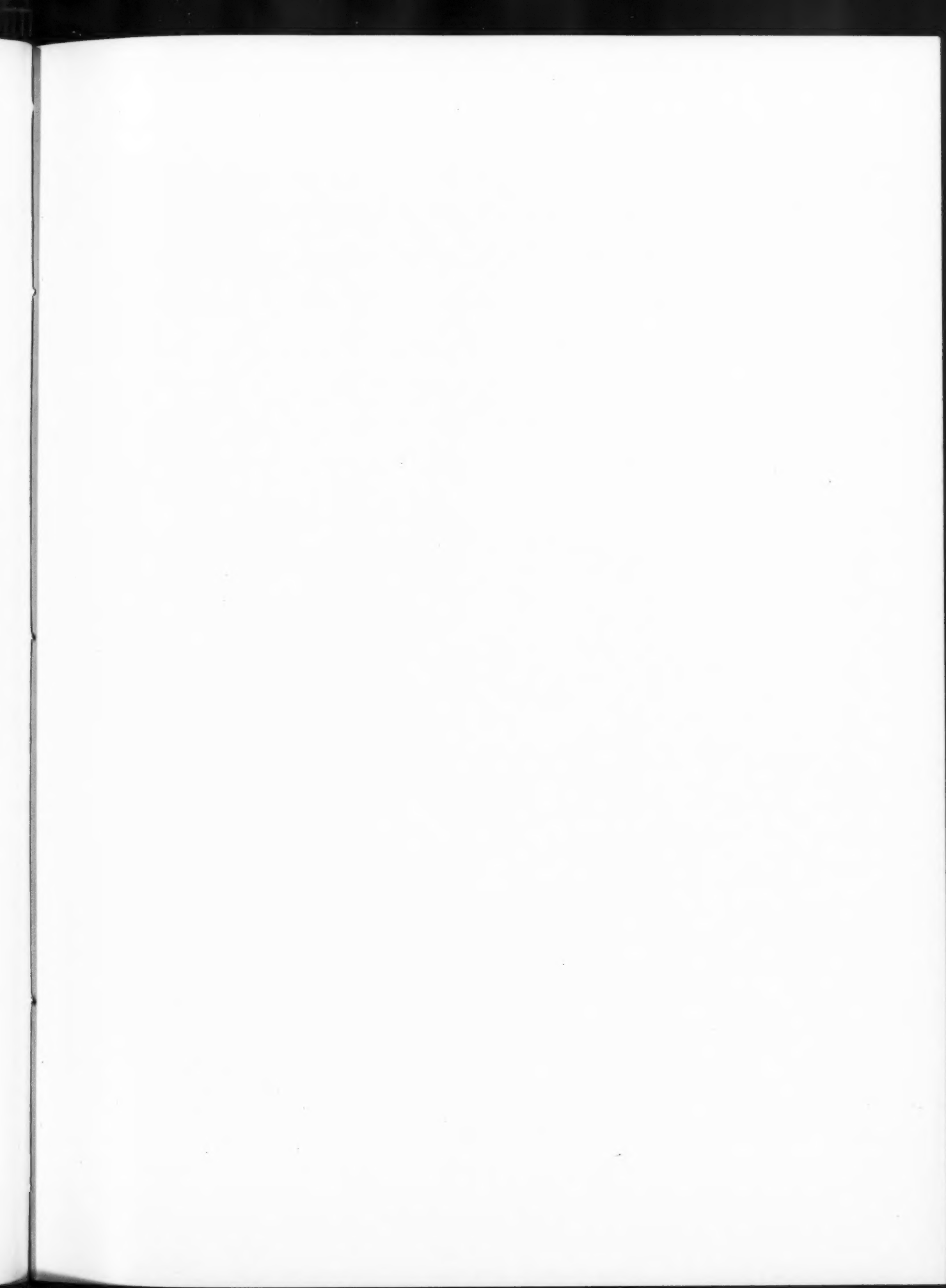
I am not able to ascertain that there is any influence working against the introduction of a suitable method, though it is strange that with a need so obvious no movement, either concerted or independent, has yet been made. One would have expected that a system of procedure in building works, based on the experience of the older countries, would have been in operation long ago in America, where improved systems in every business are

(Continued on page 207)





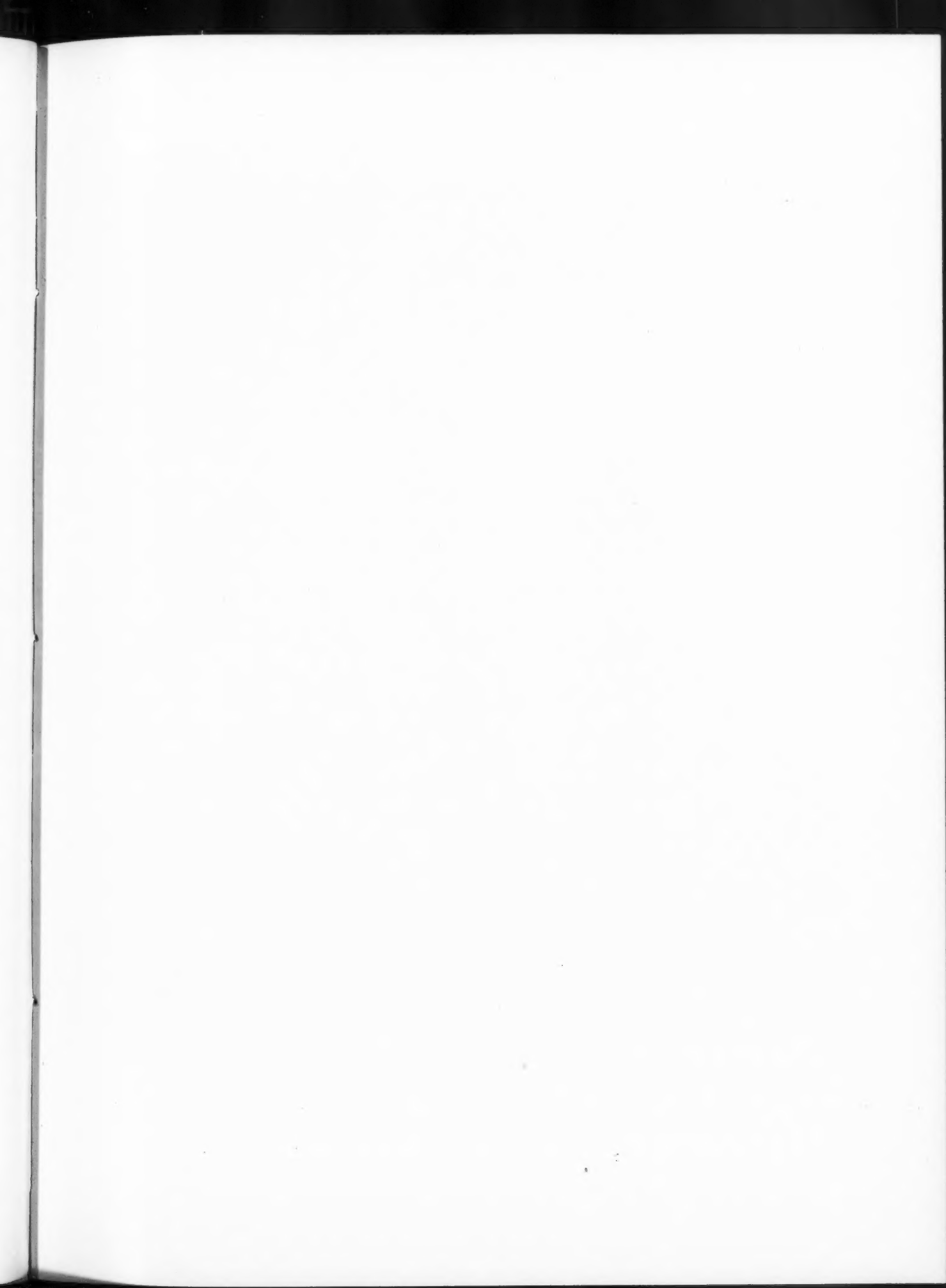
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FOYER

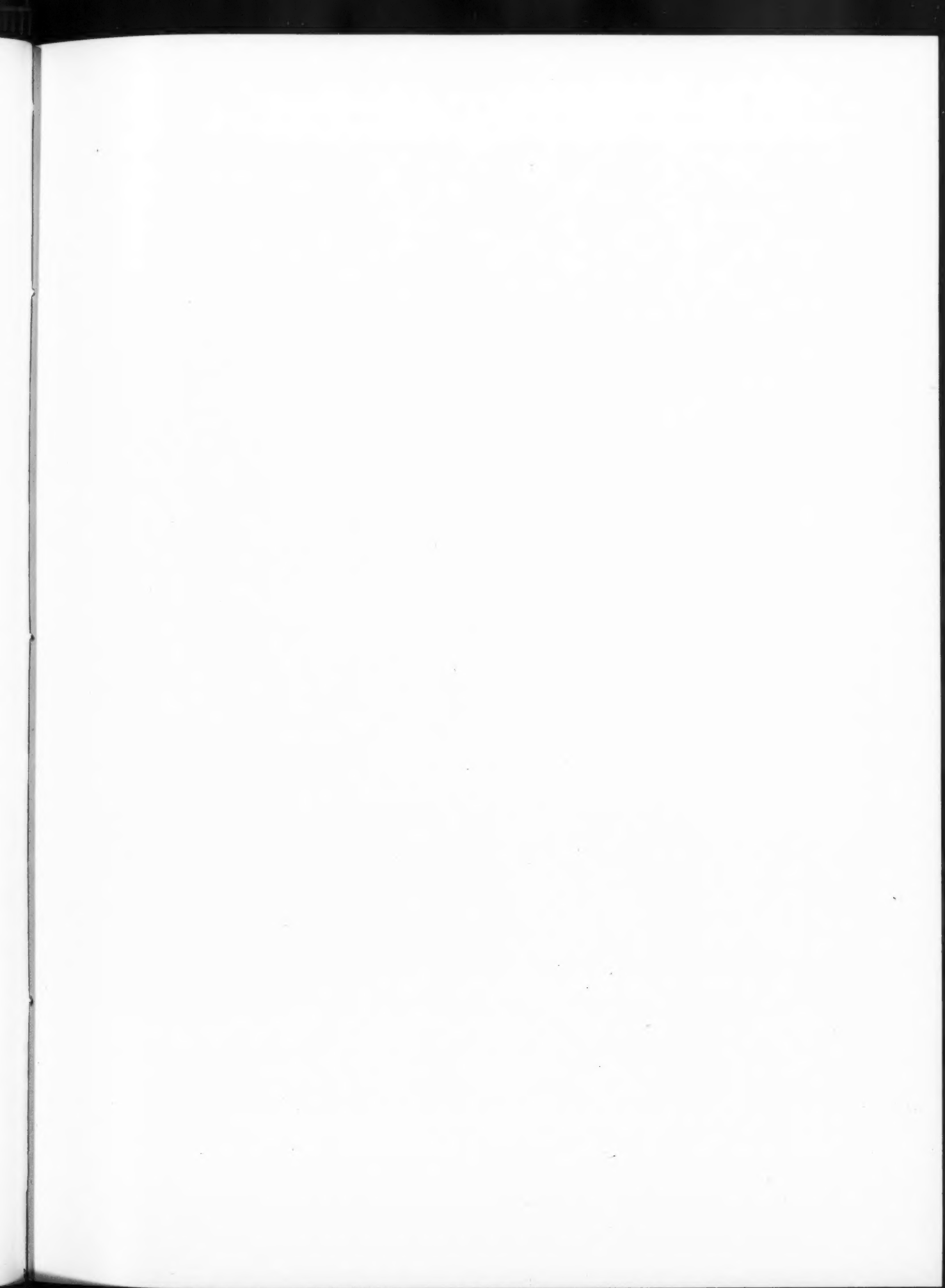
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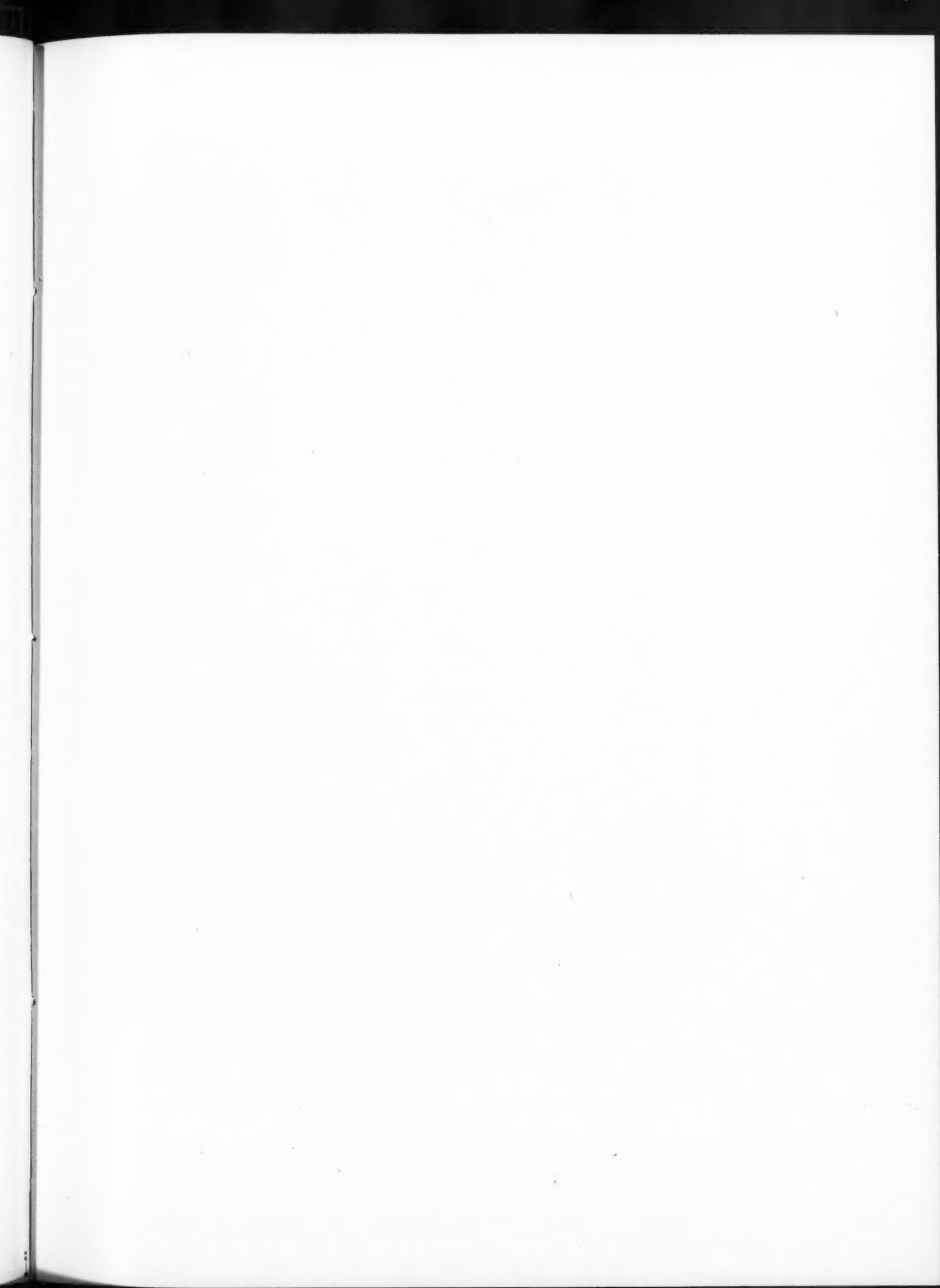


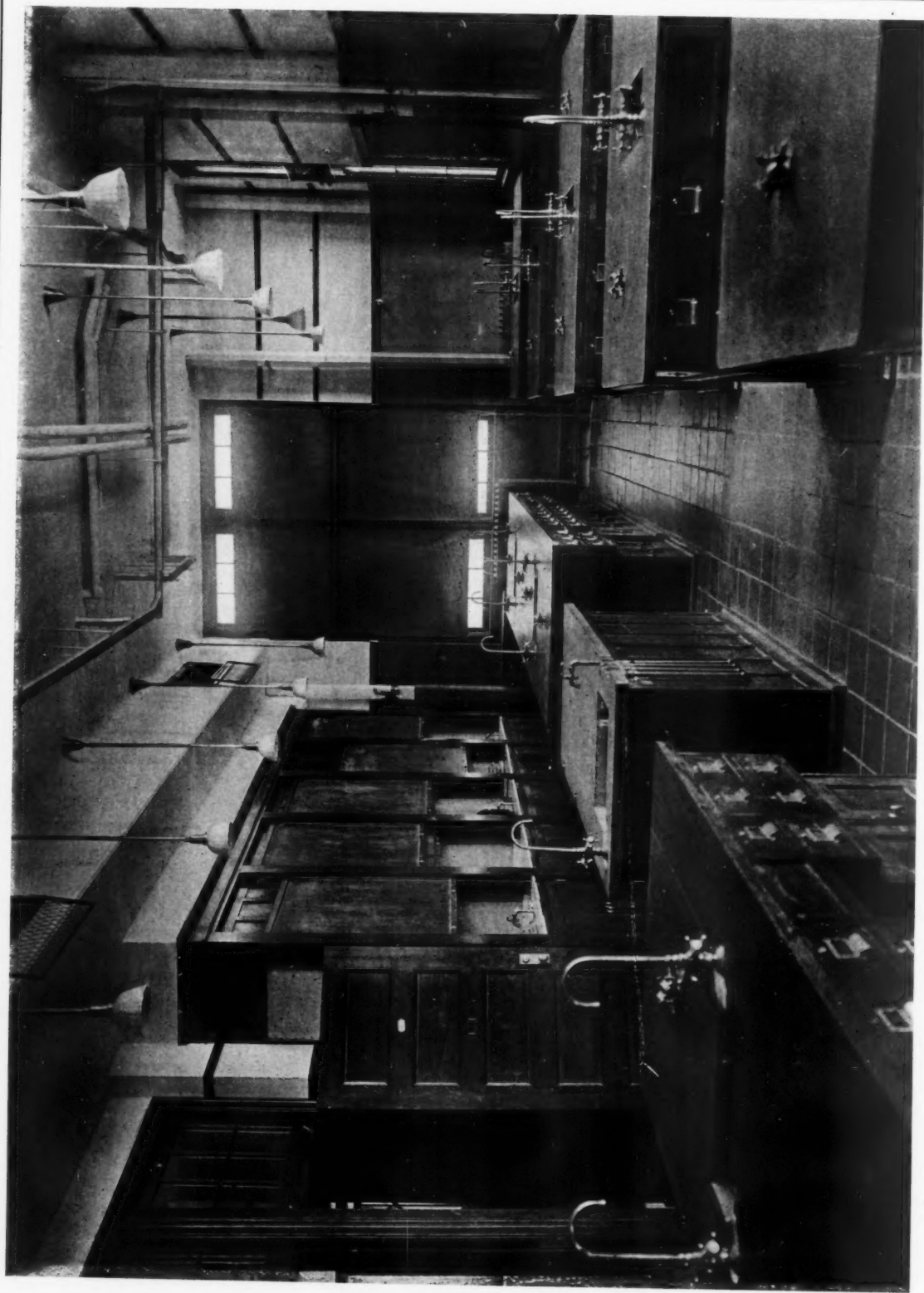


ONE OF THE LUNCH-ROOMS. LIGHT AND AIR ARE PROVIDED BY THE WINDOWS AT THE SIDE AND REAR. SEE PLANS

BUSHWICK HIGH SCHOOL, BOROUGH OF BROOKLYN, NEW YORK

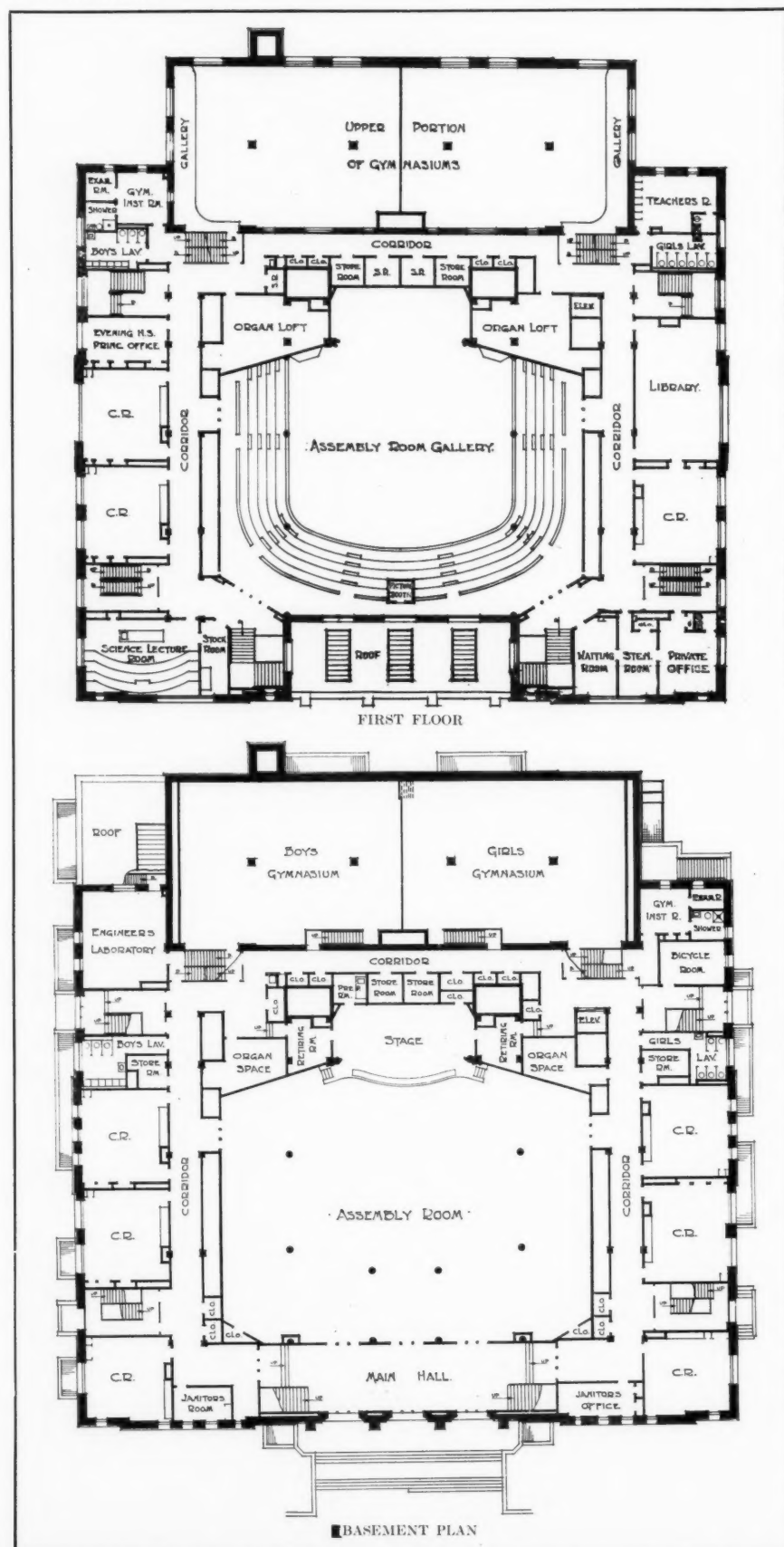
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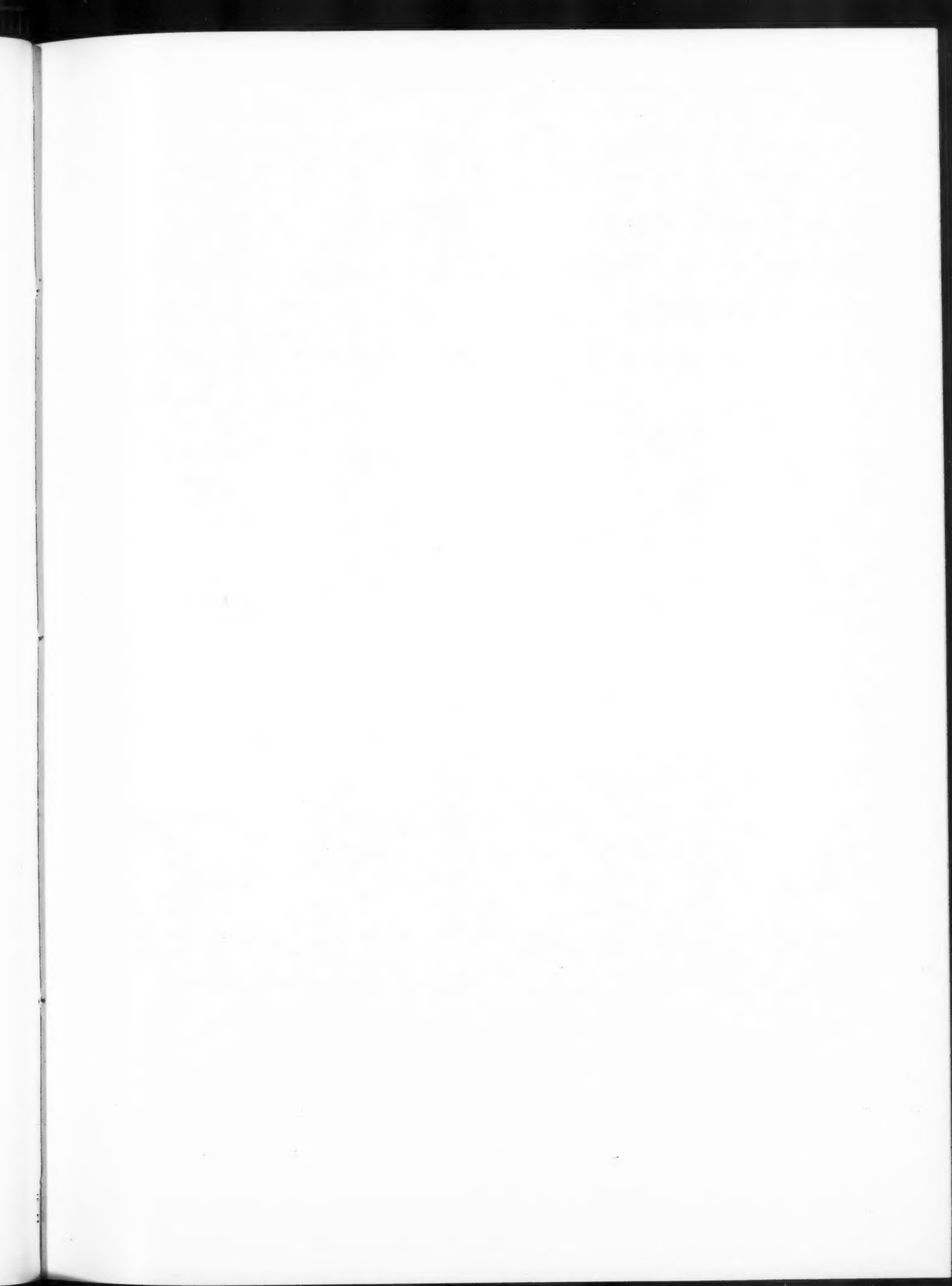


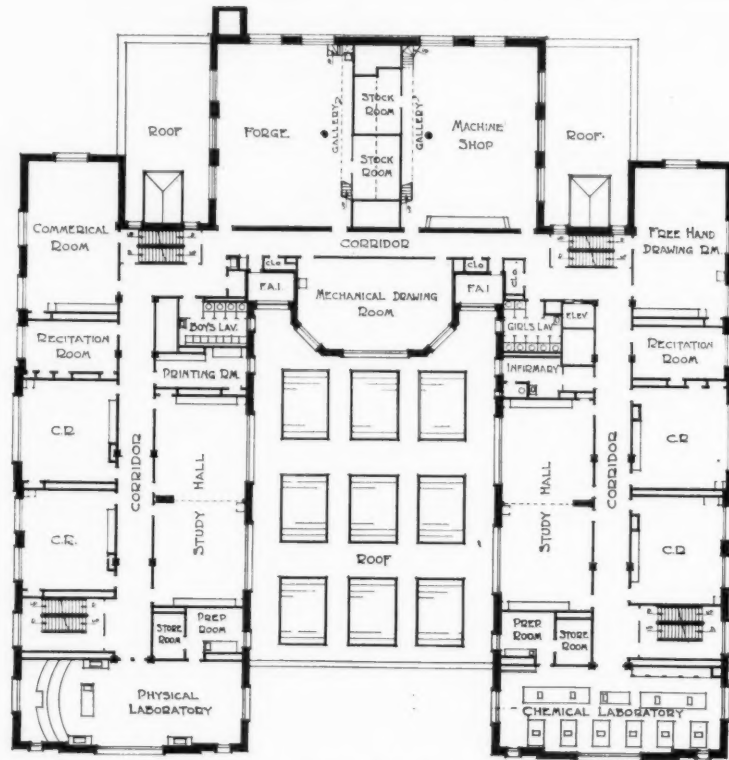
CHEMICAL LABORATORY

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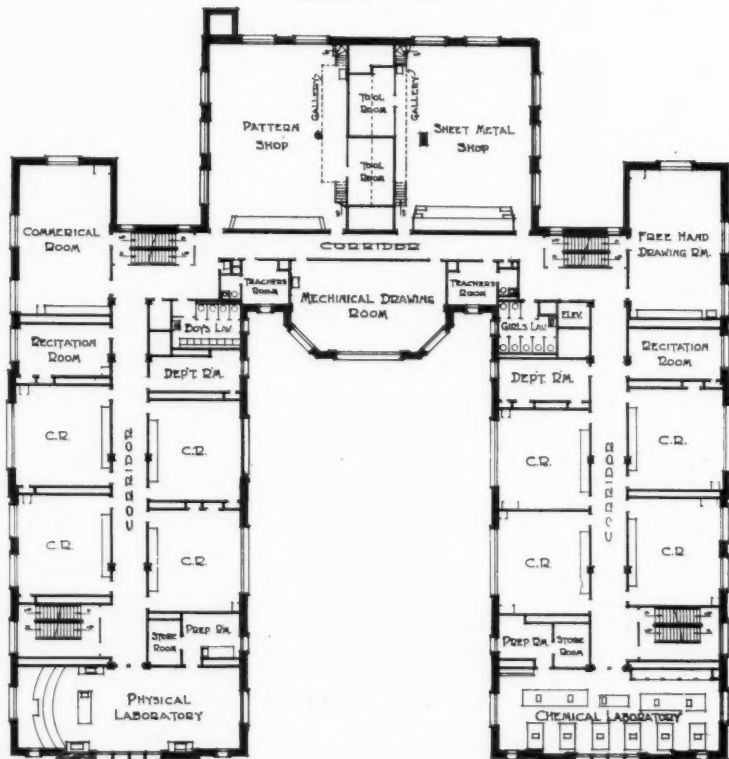


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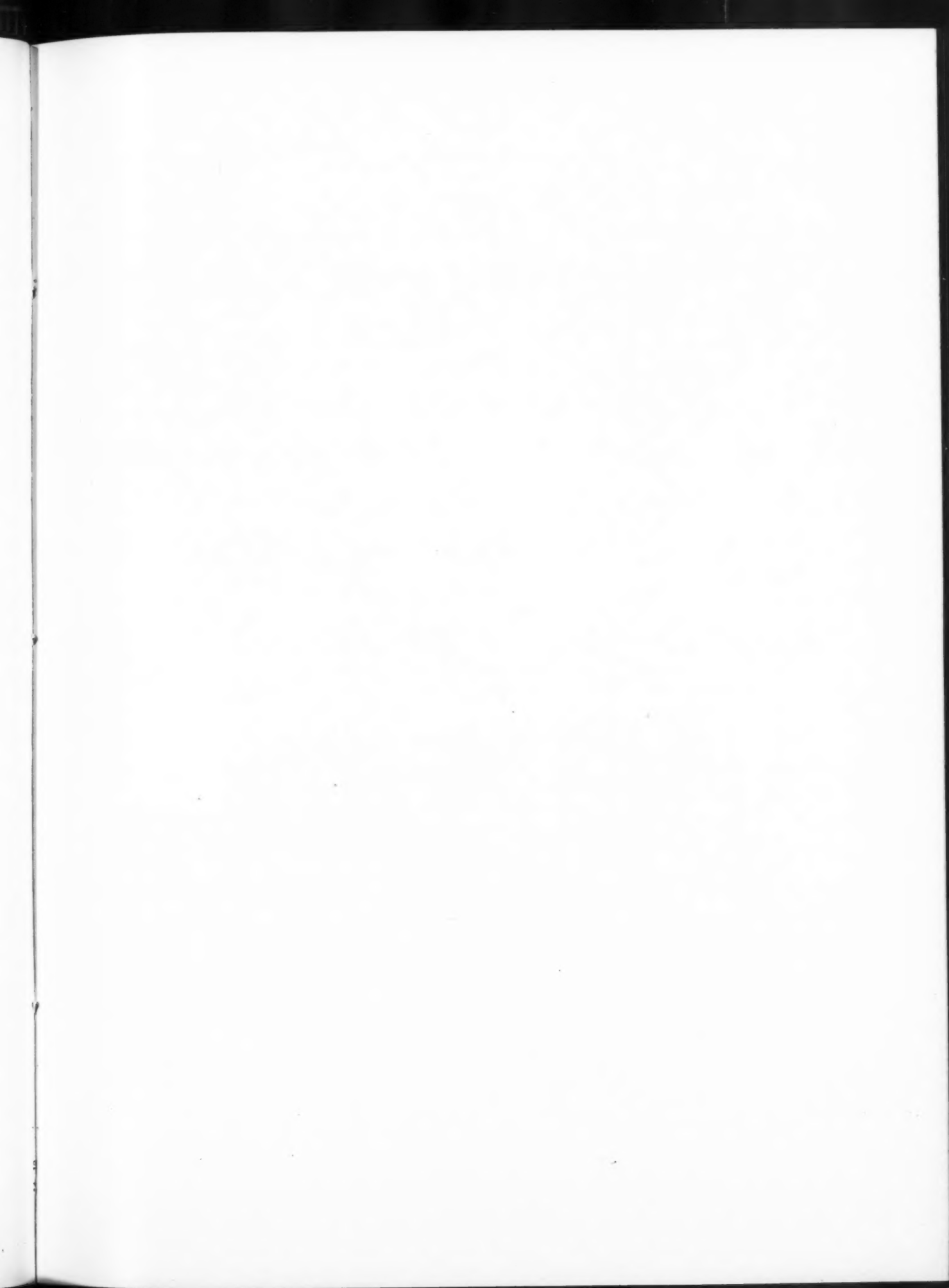
SECOND FLOOR

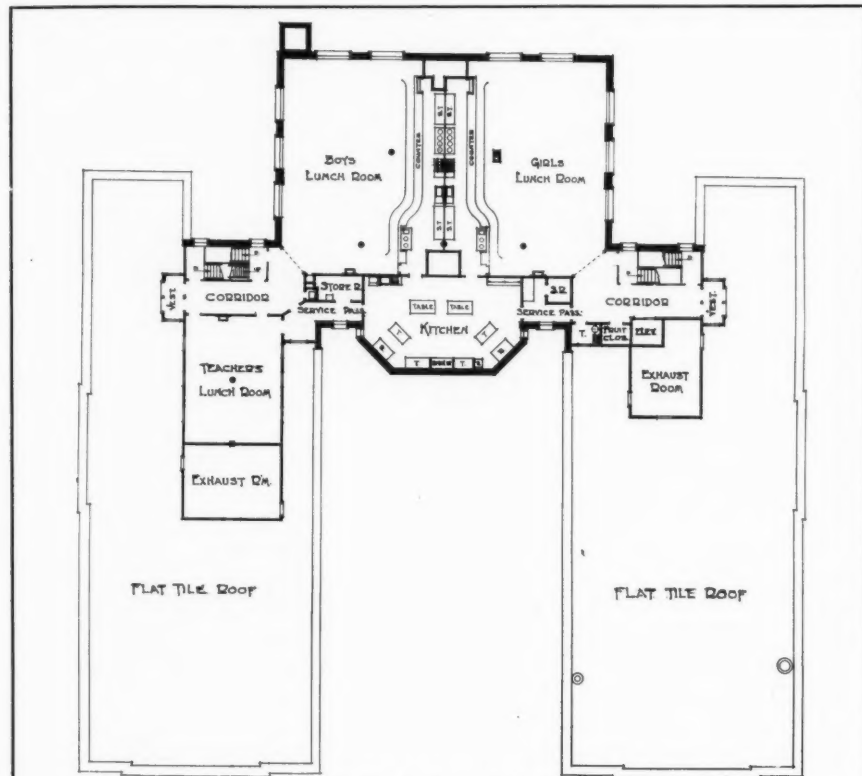


THIRD FLOOR

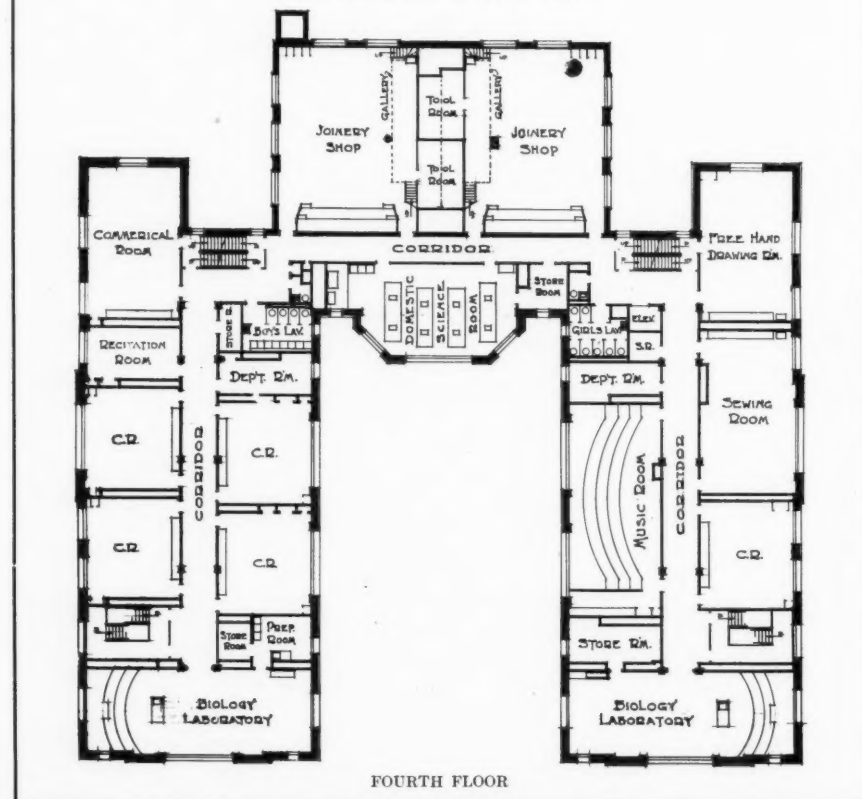
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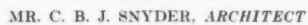
FIFTH FLOOR AND ROOF OF WINGS



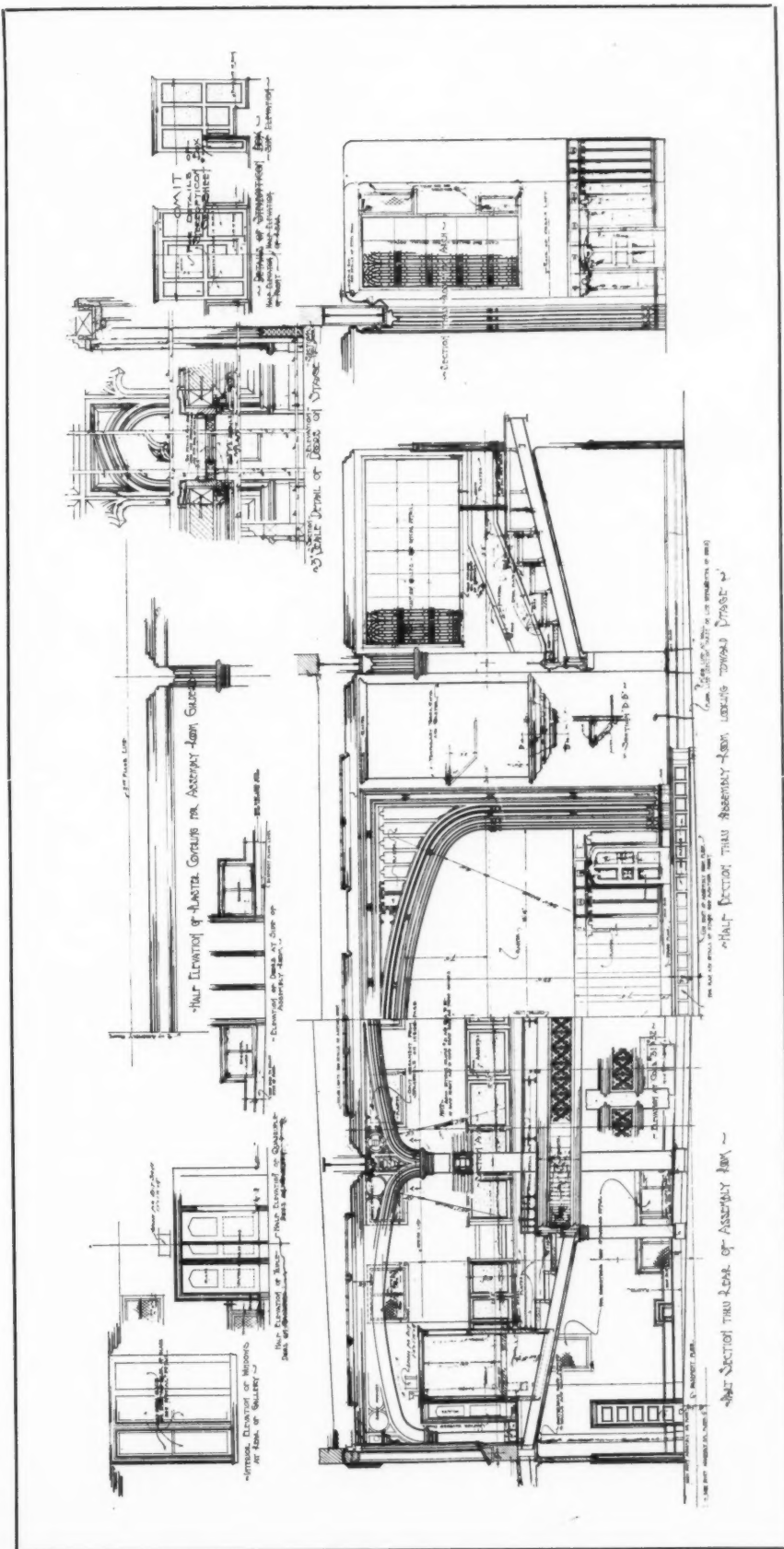
FOURTH FLOOR

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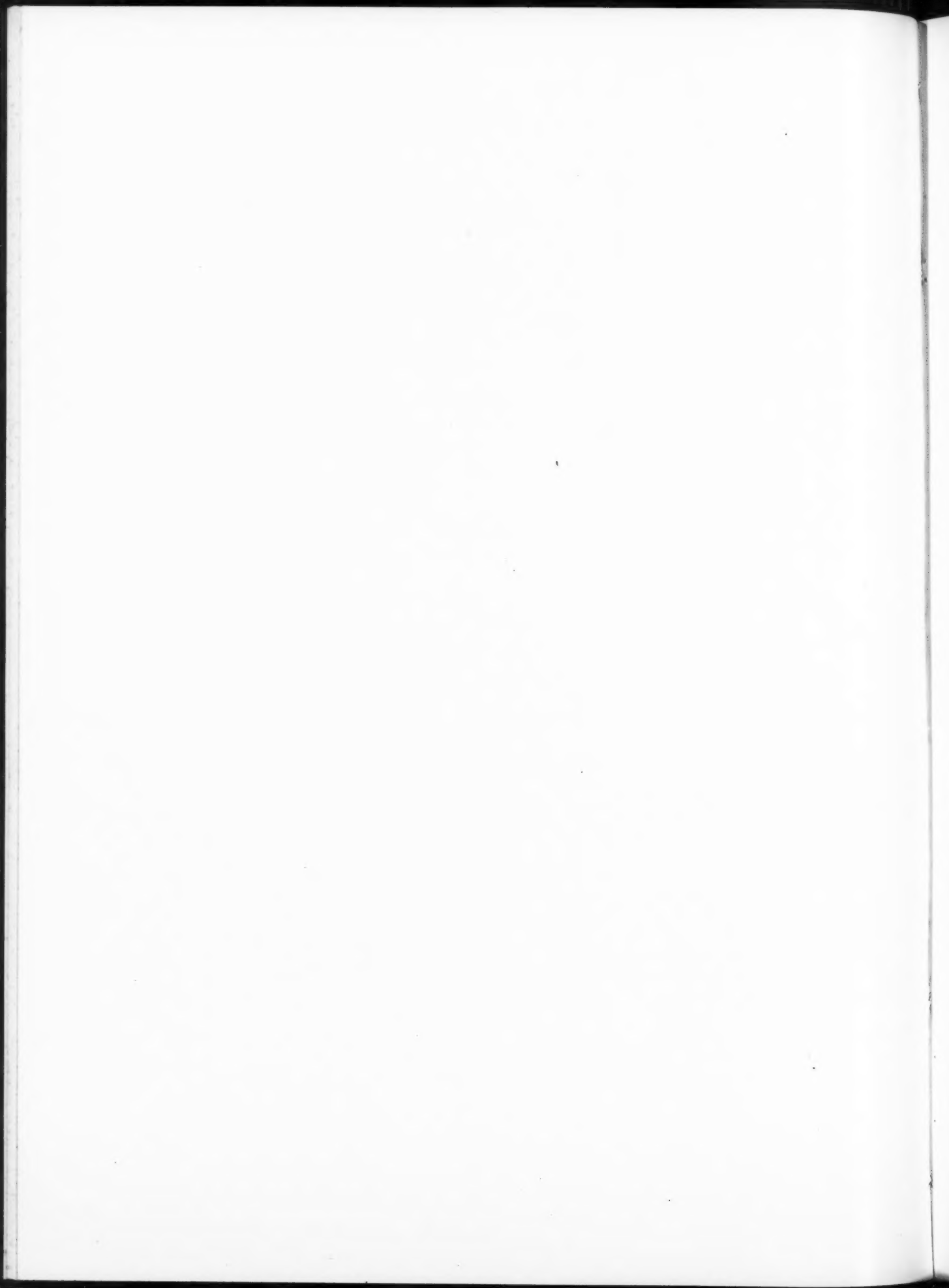


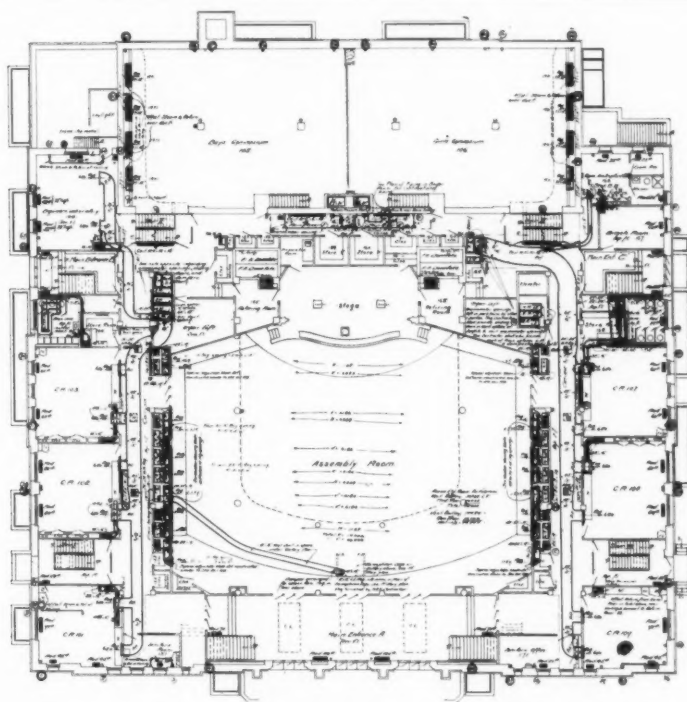




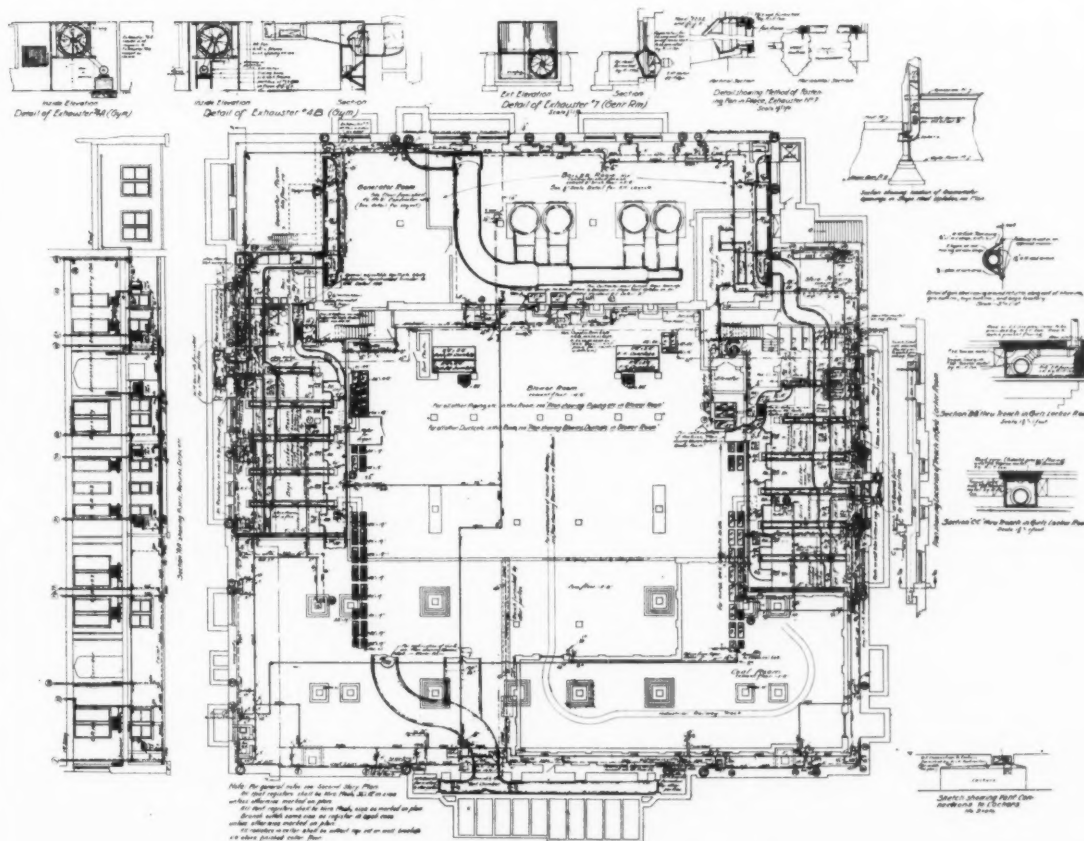
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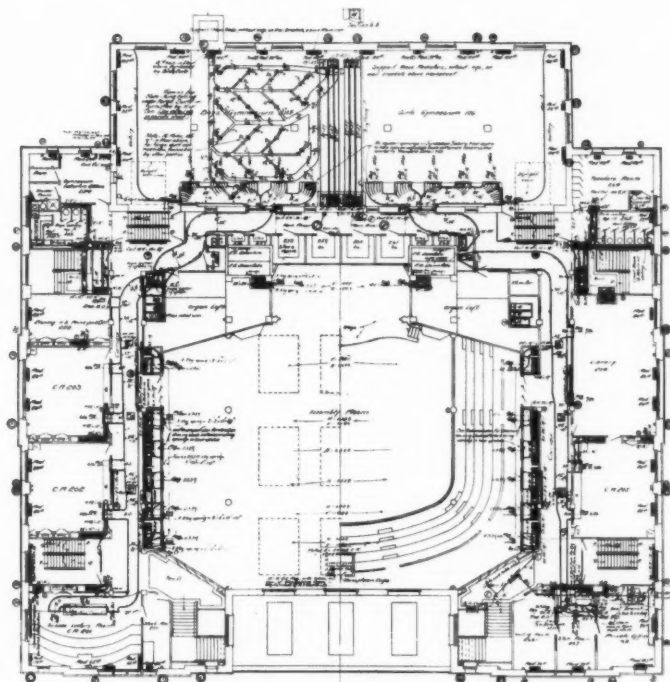
HEATING AND VENTILATING PLAN OF BASEMENT



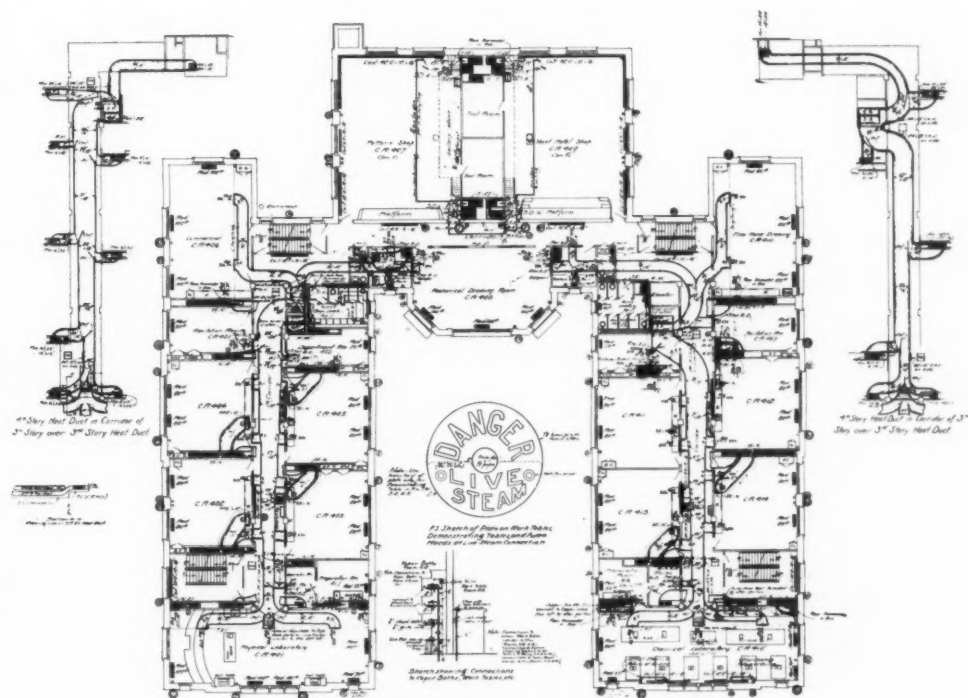
HEATING AND VENTILATING PLAN OF CELLAR

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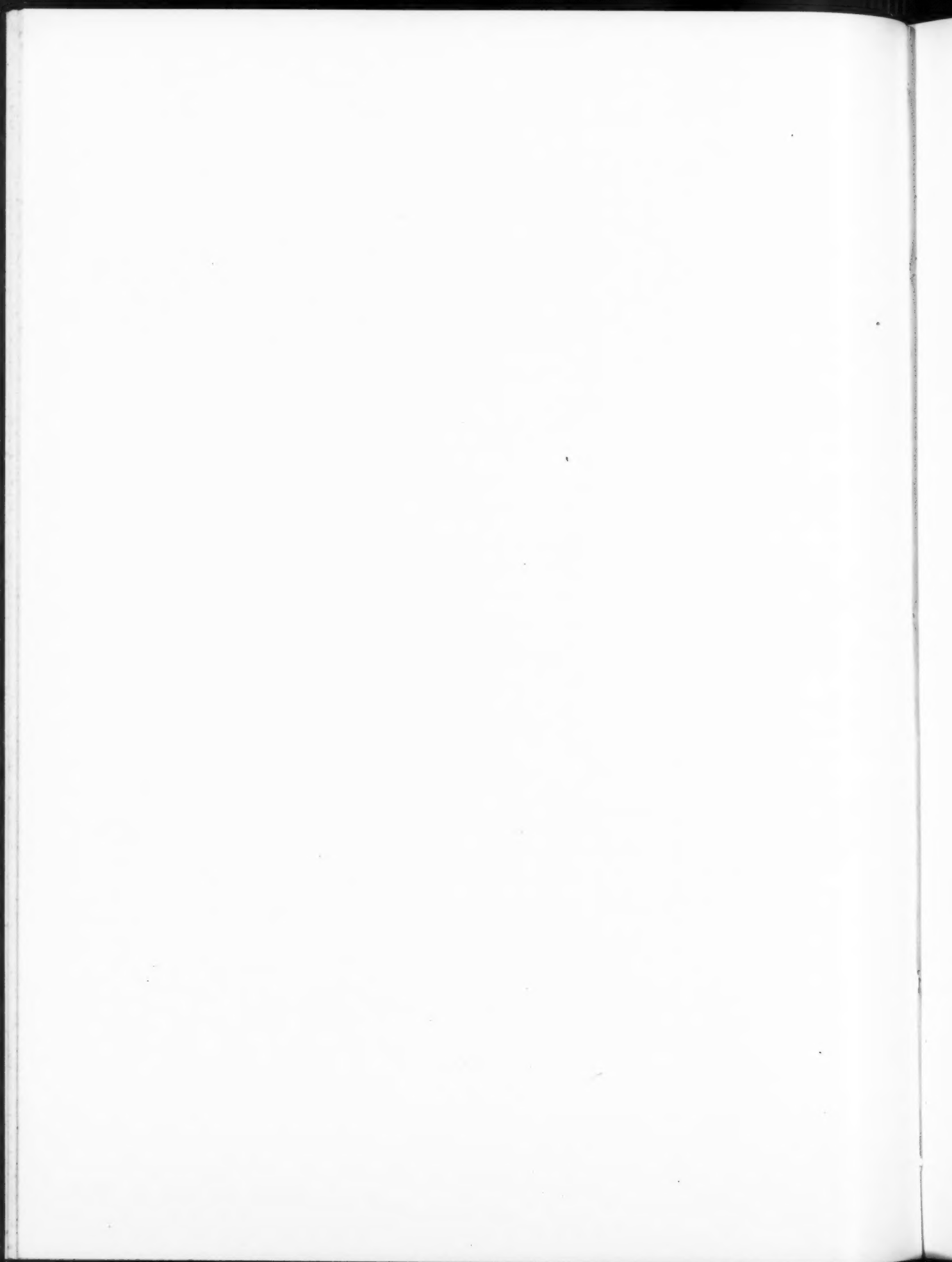
HEATING AND VENTILATING PLAN OF FIRST STORY

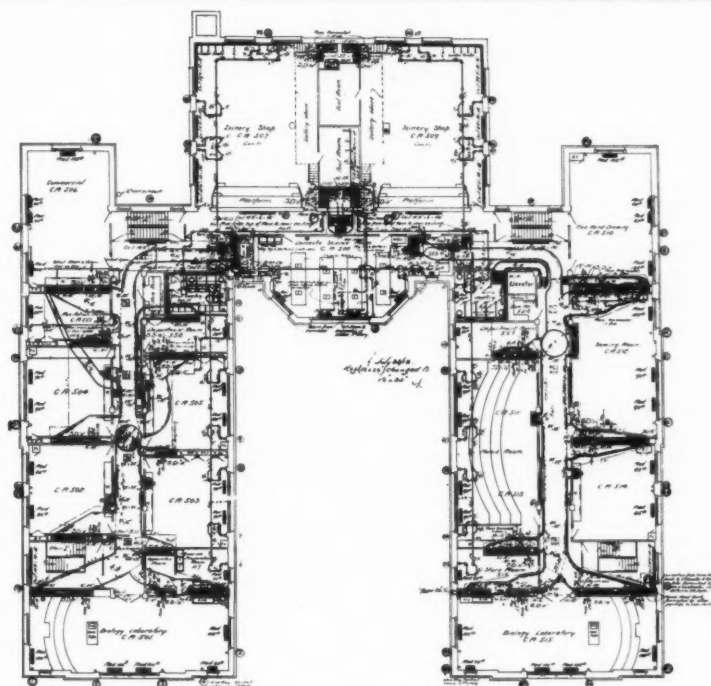


HEATING AND VENTILATING PLAN OF THIRD STORY

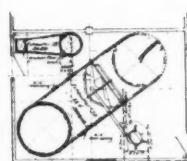
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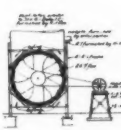




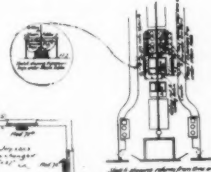
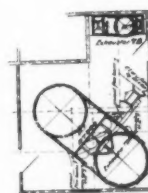
HEATING AND VENTILATING PLAN OF FOURTH STORY



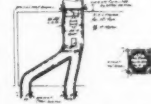
Plan of Extrawater 2A and 2B



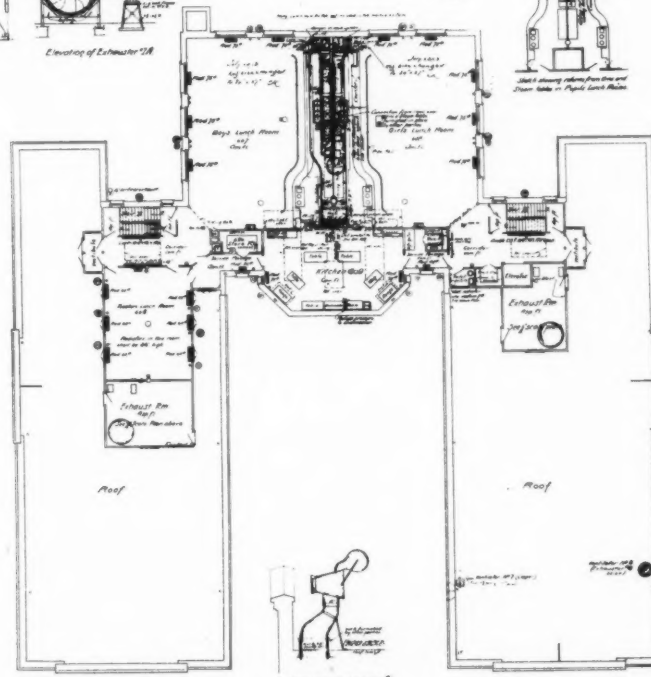
Elevation of Extracellular 2A

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Date of Extraction: 2/14/21

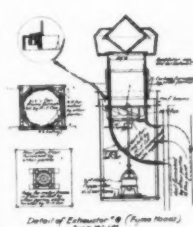


Elevation of Exhauster 7B.



PLAN OF FIFTH STORY AND ROOF OF WINGS.

HEATING AND VENTILATING PLAN OF FIFTH STORY



Detail of Exhaustor "B" (Flynn Model)

Note - For general rules see Second Story Plans
All test registers shall be size 10x12, size as
marked on plan.
All test registers shall be size 10x12, size as

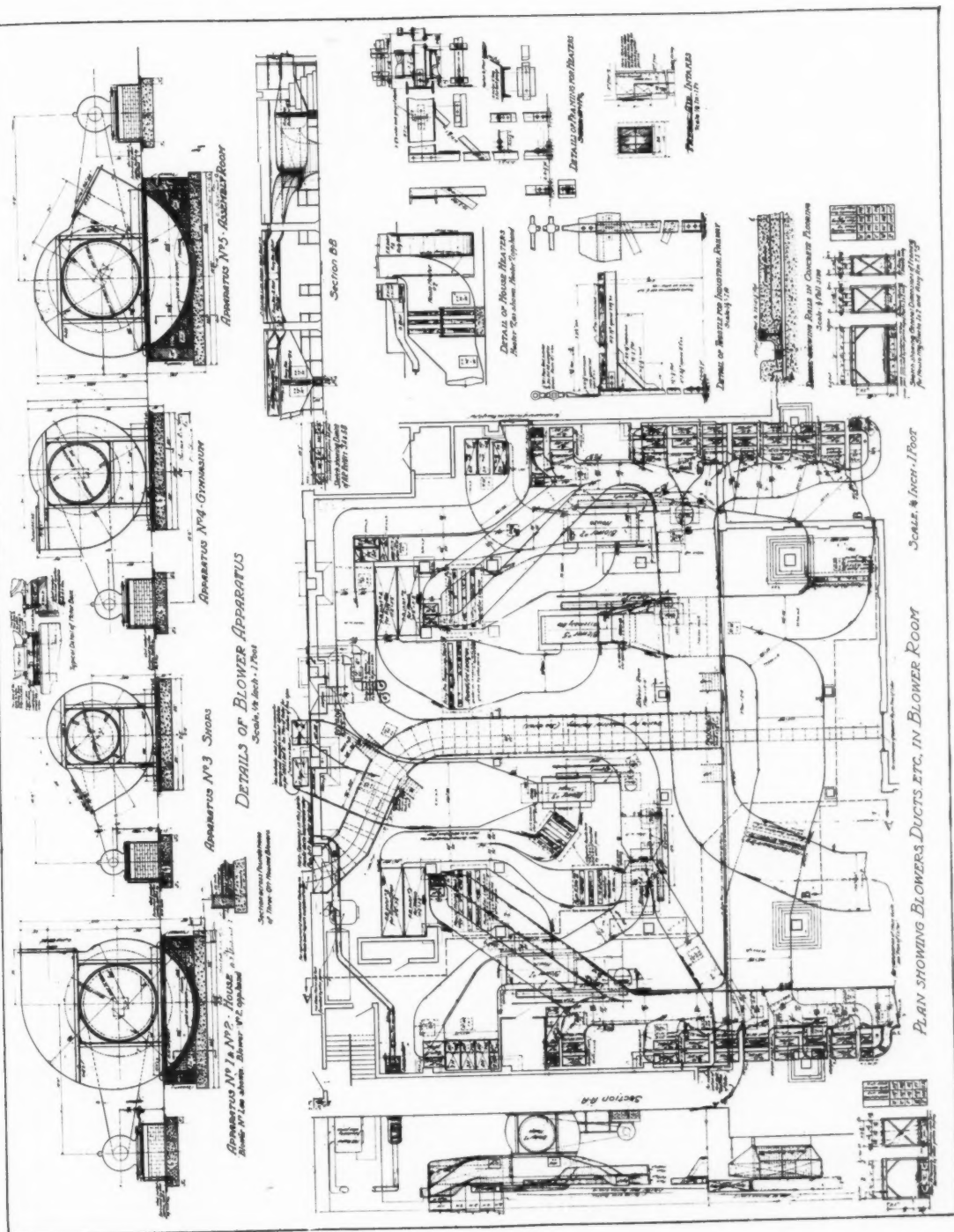
Sketch showing Ventilator
over Vent from Paper Bath
July 9-19

FIFTH STORY AND

BUSHWICK HIGH SCHOOL
BOROUGH OF BROOKLYN
CITY OF NEW YORK

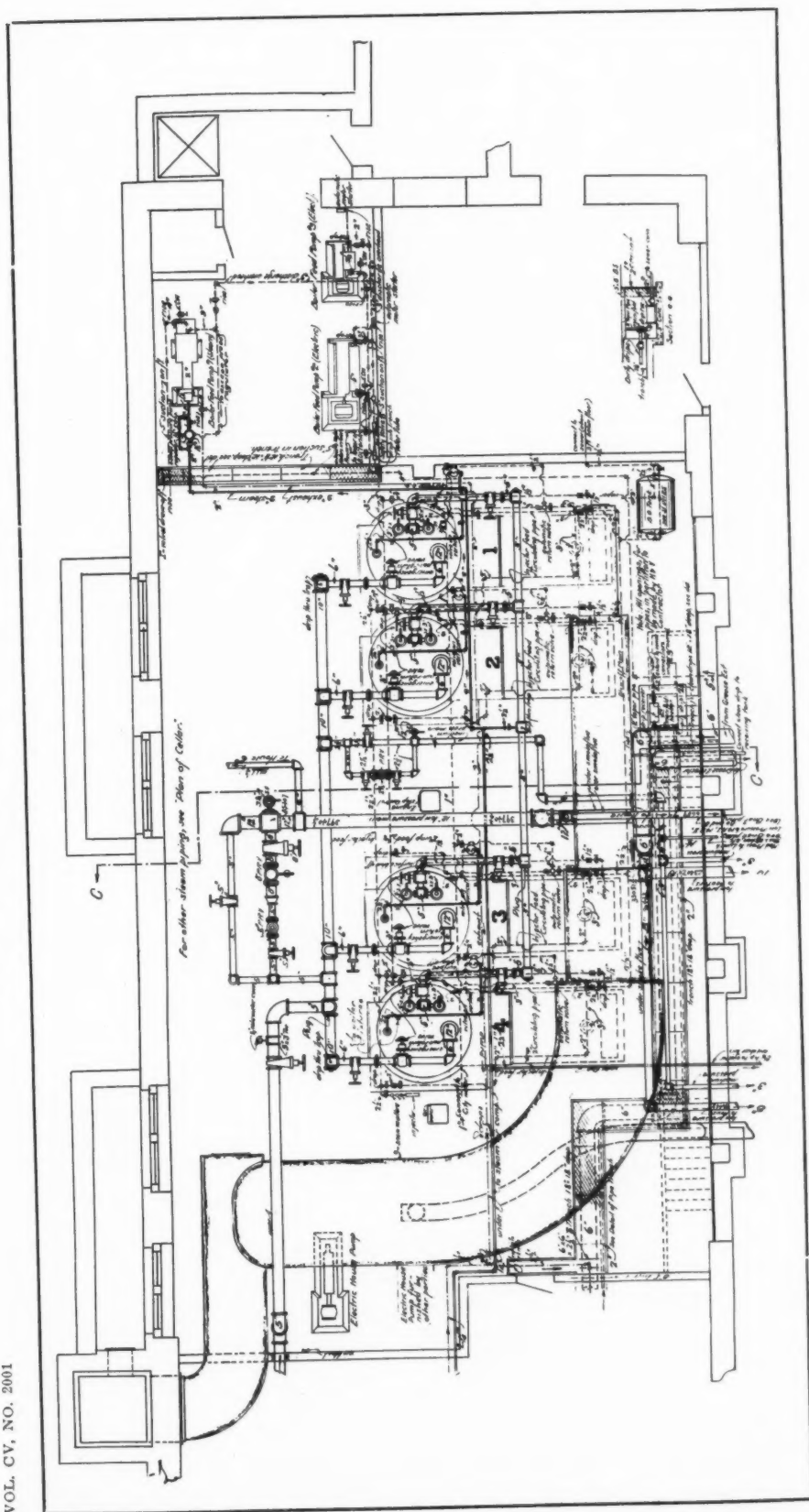
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PLAN OF PIPING IN BOILER ROOM

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VENTILATING AND HEATING DETAILS

BUSHWICK HIGH SCHOOL, BOROUGH OF BROOKLYN, NEW YORK

MR. C. B. J. SNYDER ARCHITECT

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THE OPPOSITION TO BILL-BOARD REGULATION

Whenever legal measures are proposed with the obvious intention of protecting the rights and safety of the public, there usually arises a howl of protest from selfish interests on the ground that the sacredness of property rights or of personal liberty is violated. This unpatriotic willingness to sacrifice public safety for private gain has been evident in the opposition to an ordinance for the regulation of bill-boards recently discussed before the New York City Board of Aldermen.

One section of the ordinance, which was vigorously opposed by a local real estate association, provided that there shall be no closed roof signs on any except fireproof buildings. The reason for this provision is obvious to those who are not blinded to a consideration of the public welfare by their own purely selfish interests. Certainly it was not merely æsthetic motives—important as these are—that recently impelled the city firemen to register a protest against sky signs. They claimed that the aerial structures seriously hampered their work in fire-fighting by making it

difficult or impossible to drag hose over the roofs. This objection is sufficiently serious to warrant attention, quite aside from the hazard of such signs falling in times of fire or heavy winds. That the provision referred to was intended solely to deal with the sky-sign as a fire-risk, a menace to public safety, would appear from the fact that closed signs are prohibited only on non-fireproof structures. Certain real estate interests, however, claim that there is no justification for this section of the proposed ordinance, and that it "is going a great deal too far in the restriction of property rights."

The interests which so loudly champion the sacredness of property seem to be unaware of their inconsistency. They appear to forget that the property from which they or their clients derive advertising revenue is surrounded by the property of other individuals or associations whose rights are entitled to as great consideration as their own. A gun-powder factory is not dangerous until an explosion or a fire occurs, yet society long ago determined that no one may jeopardize neighboring property by maintaining such a hazard even on his own land.

Combustible roof-signs on non-fireproof buildings, if securely placed, do not constitute a menace to neighboring property until a fire occurs, but in such an event they greatly increase the probabilities of loss to the entire community.

The property rights of the individual end where those of society begin. It is a false and grossly contorted idea of "personal liberty" on the part of many American citizens that accounts, in part, for our national fire loss being so many times greater than that of European countries.

MAINTAINING A COMMUNITY STYLE

St. Augustine, the oldest permanent settlement by Europeans in this country, seems likely to retain its prestige as a pioneer in establishing a precedent for the civic regulation of architectural style. Recently a portion of this picturesque old town was destroyed by fire, much to the regret of the throngs of Northern visitors who make annual pilgrimages to its sunny

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shores and supply many Spanish descendants with a part of their means of gaining a livelihood.

Almost immediately plans were considered for reconstruction, and seeing the danger that threatened the city's future through a mistaken desire for modernity, the commissioners of the Chamber of Commerce have issued to property owners in the burned district a request that they follow the traditional styles of the city in the improvement of their holdings. It is pointed out that however much the citizens of, and visitors to, St. Augustine desire modern conveniences and luxuries, the charm of the three-century-old Spanish and Moorish structures that have attracted the tourist these many years cannot wisely be sacrificed.

Of course the climate and unique historical associations of the locality provide a part of the attraction, but it certainly is

easier to appreciate the drama of the ancient Spanish adventurers if the background and atmosphere be in keeping with it, and so, if the prevailing style of buildings is not unsuited to their purpose and location, of which there seems to be no evidence, there is very good reason for maintaining it in the reconstruction of the city.

Throughout the country there are many communities whose practical and æsthetic value would be conserved or increased by the maintenance of a general standard of architectural style. Some well-known housing developments by private concerns bear eloquent testimony to the merits of civic harmony without monotony, and may serve as valuable object lessons to guide future regulation in other communities by public authority. The action of the Chamber of Commerce of St. Augustine is probably only the forerunner of a movement along that line.

RECENT LEGAL DECISIONS

DAMAGES RECOVERABLE BY OWNER FOR BREACH OF CONTRACT

The owner is only entitled to recover from the contractor such damages resulting from a breach of the contract by the latter as the owner could not have prevented by the exercise of reasonable care.

Pratt v. Dunlap (Conn.), 82 Atl. 195. (J. S.)

DAMAGES FOR FAILURE TO DELIVER MATERIALS CONTRACTED FOR

A contract was entered into for the lumber required by a contractor under a building contract. Lumber having advanced in price further deliveries were refused unless the contractor would pay the advance, which he refused to do. Action was brought for the unpaid price of lumber furnished under the contract. The defendant counter-claimed for breach of contract in failing to deliver lumber as demanded. It was held that the defendant's refusal to accept further deliveries did not preclude him from recovering, as damages for breach of contract, the loss from delay in obtaining the

lumber elsewhere. He was under no obligation to accept it from the plaintiff, under the conditions attached to their offer, which would have required him to waive the breach of contract.

Campfield v. Sauer, 189 Fed. 576. (J. S.)

PAROL MODIFICATION OF BUILDING CONTRACTS—"EXTRA ALLOWANCE"

A written contract for the repair of a building according to drawings and specifications made by an architect and annexed to the contract provided that no extra charges should be paid or allowed for extra work and that any allowance should be covered by a writing. It was held that the contract might be modified by a subsequent parol contract for extra work to comply with changes required by the building department. The contractor performing this extra work might recover therefor according to the oral agreement. The court held that any allowance should be covered by a writing applied only to alterations in the work, and did not relate to claims for extra work.

Derrico v. Muller, New York Appellate Division, 142 N. Y. Supp., 479.

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QUANTITY SURVEYING IN ENGLAND AND AMERICA

(Continued from page 204)

more readily adopted than in any other country. Quite a number of young men, quantity surveyors trained in the practice of one or other of our British systems, are now working in America in contractors' offices; they easily adapt themselves to the prevailing gamble Mr. Wright describes, and things go on as before. Now these young men, and many more who are most anxious to go, would be perfectly able to take up and practice an English system, adapted to American requirements, if only such a system were properly initiated.

I am a surveyor myself, and during the two years preceding and the year following the San Francisco earthquake my two eldest sons, both trained surveyors, were working in America as estimators for important contractors, one in New York and the other in San Francisco. At that time I was naturally much interested in American methods, and with particulars my sons supplied me, added to those I obtained for myself in a visit to America, I was enabled to examine the matter quite thoroughly.

I thought then that my sons would remain in the States, and set myself to arrange a system based upon our English methods in which I endeavored to meet American requirements throughout. Owing to the need of greater despatch and also largely to the sub-contracting system in use, our London method in its entirety, merely Americanized as required, was not adapted for American practice. I realized also that to be made acceptable the system must be one that could be easily understood and worked at once without any difficulty. I cannot give here details of my method of adaptation but I may say that it would give all the advantages of our English method in a manner so that no more time than is now required would be expended in obtaining your tenders. A carefully considered adaptation to American requirements I

believe to be of the highest importance, and I think that the want of such an adaptation has been the only real obstacle against the employment of the quantity surveyor in America in his proper capacity.

I discussed my scheme in outline with two or three professional men of position on your side, and I should have gone further with the matter, but at that time my sons were desirous of returning to work with me in England, and I, being always busy with my London practice, was obliged to let the matter rest, for the time being.

But I have given much time and careful thought to my proped system and I am still very desirous of initiating it in America, though not quite as a personal speculation as in 1906. Although I am fully occupied over here, I should be very willing if sufficient support could be assured me, to come and initiate the system myself, arranging for others to continue the working of it.

As an initial step, it appears to me it would be necessary to ensure that at least a number of the members of two representative bodies, corresponding say to our Royal Institute of British Architects and Master Builders' Association, should, after I have satisfied them as to the practicability of my proposals, agree to accept the method, possibly revised or modified in detail, as might be agreed upon in conference.

The movement being thus made, a concerted one would have the great advantage of establishing from the outset an uniformity of practice recognized by your leading associations, which would go far to prevent the growing need in America, giving birth as time goes on, to a variety of methods; which, if differing only slightly, might tend to some confusion.

Finally, I should add that I speak as a surveyor of thirty years' general practice in all parts of England, with sundry works abroad.

I am, dear sir,

Yours very truly,
JOHN B. LOFTING, M.Q.S.A.

ENGINEERING AND MECHANICAL DEPARTMENT

THE HEATING AND VENTILATION OF BUSHWICK HIGH SCHOOL, BOROUGH OF BROOKLYN, NEW YORK CITY

BY FRANK G. McCANN

Chief of H. & V. Division, Board of Education, City of New York

The heating and ventilating of a school building of this character, including as it does a manual training equipment, confronts the engineer in the design of a large power plant with many problems involving complexity and multiplicity of details.

This building is occupied by a day high school, with its manual training courses, requiring extensive shops with electrically driven machines, tools, etc., in addition to the usual Latin and commercial high school courses.

In the evenings similar high school and trade courses are given, but not all of the rooms are occupied. In addition, the assembly room, gymnasiums, etc., are used many times outside of regular school hours.

HEATING

The heating is, in general, cared for by direct radiation placed in the several rooms underneath windows, and automatically controlled by a system of thermostatic heat regulation. This radiation is figured upon a wall and window loss about double the usual German constants, to permit reasonably prompt heating-up of rooms before school sessions.

The heating lines and risers are divided into groups so that in mild weather about



BOILER ROOM

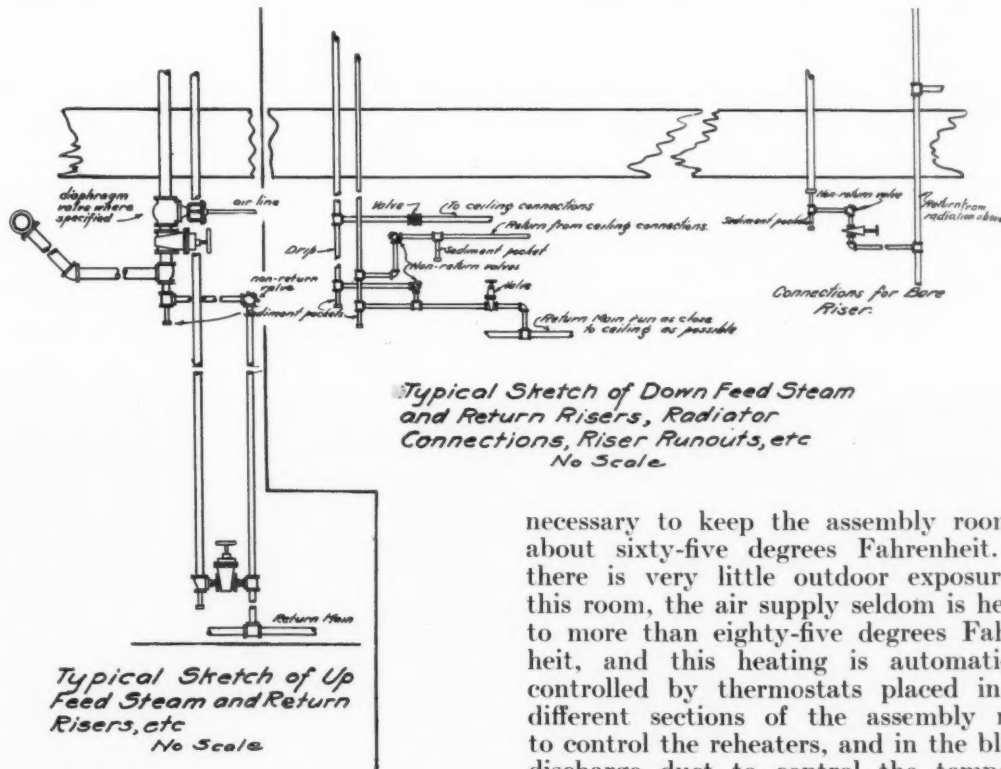
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half the direct radiation may be shut off, in groups arranged according to exposure of the several sections of building, merely by turning the handles of a few three-way cocks in air lines at a central control board in the generator room.

Also from the same control board and in the same manner, all direct radiation, except in main offices and toilets, may be quickly shut off so that steam will not be wasted when needed only in the indirects

for sixty degrees Fahrenheit, except when lectures are to be given to the pupils while in gymnasium costumes, in which case the temperature is raised to seventy degrees Fahrenheit.

The assembly room is both heated and ventilated by the fresh air supply, which is warmed to about fifty-five degrees Fahrenheit, by indirect radiators in tempering stacks, and is re-heated by the same type of indirect radiators, to the temperature



used to heat assembly room, at such times as that room is the only one in use.

A separate steam line supplies the main offices so that these offices may be warmed for occupancy after school hours and on Saturdays, and other school holidays, when it is unnecessary to keep the rest of the building fully heated.

The thermostats in classrooms are set to maintain about sixty-four to sixty-six degrees Fahrenheit, and in corridors and workshops they are set at about sixty degrees Fahrenheit. In gymnasiums the thermostats are adjustable, and the instructors are requested to keep them set

necessary to keep the assembly room at about sixty-five degrees Fahrenheit. As there is very little outdoor exposure to this room, the air supply seldom is heated to more than eighty-five degrees Fahrenheit, and this heating is automatically controlled by thermostats placed in the different sections of the assembly room to control the reheaters, and in the blower discharge duct to control the tempering stack.

VENTILATION

Except for the lunch rooms, situated in part story above the main part of the building, and having windows on all sides, every room, other than storerooms, is ventilated by means of plenum blowers and exhaust fans.

The fresh air supply, following the practice in all of the new schools of the city, is taken from a point about midheight of the building, and is thus equally remote from the dirt of the street and the foul gases from toilet vents, chimney, etc., liberated at or above the roof line.

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All the fresh air is warmed and humidified before entering blowers, and is then forced through sheet metal ducts into the several rooms, toilets, corridors, shops, gymnasiums, etc.

Except for the assembly room above described, the fresh air supply is heated only to sixty-five or seventy degrees Fahrenheit, according to the outdoor temperature, and automatically controlled to suit required conditions.

The amount of air for each classroom is based upon an allowance of thirty cubic feet of air per pupil, or upon six-minute changes of air in the room, whichever calls for the larger volume.

Laboratories, shops, gymnasiums, etc., are similarly figured, and thus have at least ten changes of air per hour.

As there are various activities in this building, requiring the ventilation of some parts of the building in the evenings, on Saturdays, Sundays, etc., when the entire building is not occupied, the venti-

lating equipment is divided up into several sections or units.

There are five blowers for ventilation, supplying respectively, east side house (classrooms, toilets and halls); west side house (classrooms, toilets and halls), shops, gymnasiums and assembly room.

There are ten exhaust fans for ventilation, two in connection with each of the so-called house blowers, one for shops, one for each gymnasium, one for assembly room, one for generator room and one for fume hoods in laboratories.

The exhaust fan from each gymnasium draws the vitiated air through the lockers, which are made throughout of perforated steel, in the locker-room adjoining the respective gymnasium.

One of the exhaust fans in connection with so-called house blower, draws solely from toilet rooms, thus preventing toilet room air from such toilet rooms entering by any chance into the classrooms.

Each classroom, except in the top story,



MACHINE ROOM

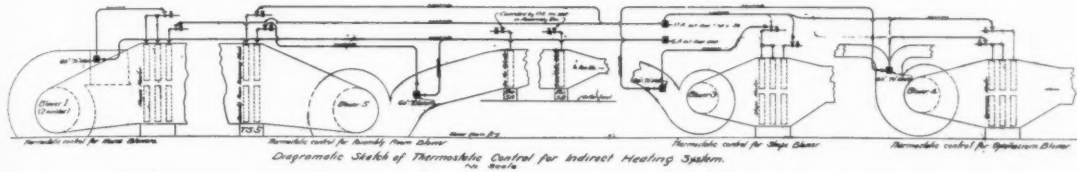
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has at least two fresh air inlets, placed on the corridor side about eight inches below the ceiling and discharging the fresh air across the room toward the windows.

The vitiated air from classrooms is forced out through wire mesh lower panels in the doors of the wardrobes which are

small, these motors are three-phase single speed alternating-current induction motors, to suit the existing street service lines. The small exhaust fan motors are variable speed, slip-ring type, three-phase motors.

To obviate the possibility of noise from vibration of motors in roof houses, two-



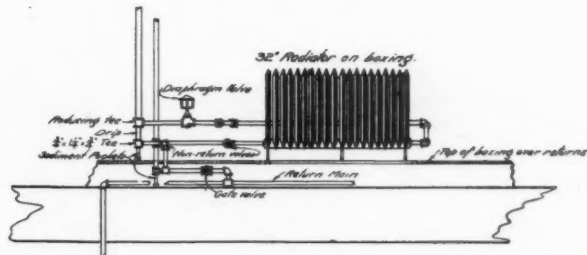
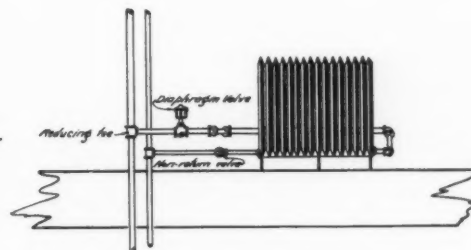
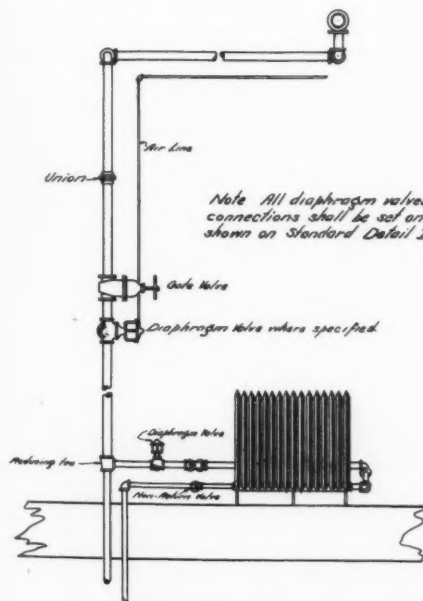
DIAGRAMMATIC SKETCH OF THERMOSTATIC CONTROL FOR INDIRECT HEATING SYSTEM

placed along corridor side of room for about two-thirds the length of the room, thus giving a uniform distribution of air current throughout the room.

In offices, top story classrooms, etc., where only one fresh air inlet is possible,

inch thick cork blocks are inserted under motor frame supports and fastenings to absorb the vibrations.

Motors were used for blower drives because of the intention and expectation that a complete electric generating plant



DETAILS OF RADIATORS

diffusing vanes or deflectors are used to distribute the air supply uniformly.

The average rate of inflow of air to each room is about 250 feet per minute through the register which is made of wire mesh.

The plenum blowers and the exhaust fans are all driven by electric motors, and except in a few cases, where they are very

would be installed in this building, capable of caring for the entire power and lighting load caused by manual training shops, etc., evening school, lecture courses, etc.

GENERATING PLANT

At present only one seventy-five-kilowatt engine driven electric generator supplying

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220 volts direct-current for driving electric elevator, variable speed lathe drives, feed pumps, etc., has been installed, but so far as practicable arrangements have been left for easy extension of plant to care for entire electric load of the school.

BOILERS

The boiler plant now consists of three 225-horsepower boilers, equipped with flat dumping grates having five-sixteenths-inch air spaces, and burning small No. 1 buck-wheat anthracite coal under natural draft on a 120-foot chimney. Space has been left for a fourth boiler of same size to be installed when full generating plant is completed.

The boilers are run under 125 pounds working steam pressure and were tested to 150 pounds steam and 200 pounds cold water pressure.

These boilers are encased with one-inch thick asbestos blocks wired directly onto boiler shell and moulded to two inches thickness of covering with asbestos cement and hard finish. Over the asbestos covering on vertical portion of each boiler a neat planished steel casing is installed, with brass bands to cover joints.

Each boiler is equipped with soot blower, two safety valves, surface and bottom blow-offs, feed water line regulators, triple-acting non-return valves in steam runouts to headers and mains (designed to isolate respective boiler from mains in case of

break in main or in such boiler), etc., etc., as is usual in highest grade boiler power plants.

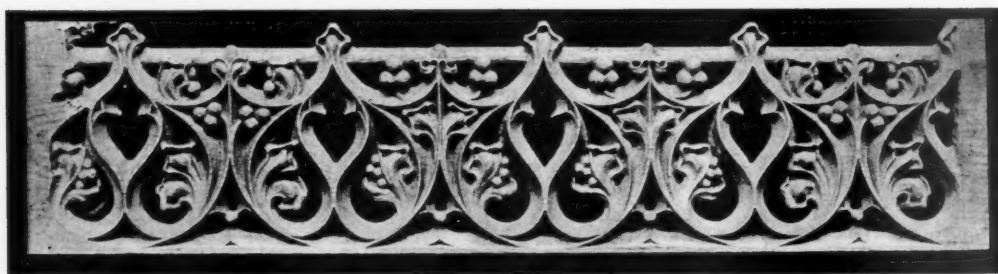
The boilers may be supplied with feed water either from a small electrically driven triplex power pump having capacity for one boiler, a similar pump with capacity for four boilers, or a steam duplex outside packed plunger pump of four-boiler capacity.

In either case the control is automatic to maintain constant water line in boilers regardless of pressure carried in same.

VACUUM SYSTEM

The exhaust steam from engine driving electric generator from steam feed pump, steam air compressor, etc., is cleaned from oil and is then used in the heating system, supplemented by live steam at about three pounds pressure supplied through pressure reducing valves.

To assure free circulation and full efficiency of all radiation at about atmospheric pressure, a vacuum system of heating is installed, with electrically driven vacuum pumps (duplicate units), and with non-return valves on every heating unit, riser drip, etc. About five inches of vacuum is carried on the return system and almost the same vacuum reaches every unit, as all return lines were tested to and made tight under fifty pounds air test, which is very much harder to withstand than 100 pounds water pressure.



CURRENT NEWS AND COMMENT

SIXTH NATIONAL CONFERENCE ON CITY PLANNING

The Sixth National Conference on City Planning will be held this year in Toronto, Ont., Can., on May 25th-27th. There will be an exhibition of city planning at Toronto University on the same dates. All sessions of the conference will be held in Convocation Hall of Toronto University, and with the exception of the business session will be open to the public.

Many important addresses are noted in the programme. Among the speakers announced are Mr. Andrew Wright Crawford of the *Public Ledger*, Philadelphia, Pa., Mr. J. V. Davies, of Brooklyn Rapid Transit Co., Mr. Lawrence Veiller, Director National Housing Association, and Mr. Henry V. Hubbard, Professor of Landscape Architecture, Harvard University. For programme and other information, address Mr. Flavel Shurtleff, Secretary, 19 Congress Street, Boston, Mass.

THE PASSING OF THE CHURCH STEEPLE

The dwarfing of steeples in city churches by surrounding buildings,—Trinity in New York City offering a good example, and the insistence on the part of building departments that they be made safe beyond all question is said to have had much to do with their omission in many designs of ecclesiastical structures.

In the earlier days when society was of a less peaceful nature than at present, the church steeple was considered to be a necessity. In times of peace it enabled the traveler to determine from afar the location of villages and in turbulent periods it served as a tower from which to scan the surrounding country and detect an approaching foe.

Dr. Parkhurst's church in this city was among the first important ecclesiastical structures to be erected without a steeple. But, remarks a writer in the *Cincinnati Times Star*:—"Present changes in ecclesiastical architecture are demanding more than the elimination of the steeple. Out in Los

Angeles a Methodist Episcopal Church has appropriated all the economies and conveniences of secular architecture. Its new building will be modeled along the lines of an office structure. The building will be nine stories high and its three lower floors will contain an auditorium that will be the latest thing in interior church decoration. The six upper stories, however, will be devoted to a men's hotel, containing 330 rooms with sleeping porches and shower baths. The roof garden idea has also been appropriated, the top of the building being arranged for the purpose of open-air services.

RESIGNATION OF RUDOLPH P. MILLER AS SUPERINTENDENT OF BUILDINGS

Rudolph P. Miller has resigned as Superintendent of Buildings for the Borough of Manhattan, in order to assist the Building Committee of the Board of Aldermen in a revision of the Building Code for the city.

It is not the purpose of the Building Committee to write an entirely new ordinance, but rather to revise the draft prepared by the Building Committee of the previous Board. Mr. Miller's efforts will be directed toward meeting, as far as possible, the objections and criticisms made against the pending measure when it was under discussion last year and those that may still be offered. In this work he is to act in consultation with the Superintendents of Buildings for the several boroughs. He will also be glad to receive from all interested parties and critics such suggestions as they may wish to offer. As far as possible, the public will be kept informed of all proposed changes in the draft published in the *City Record* of January 15th, 1914.

It is assumed that the draft under consideration, being the outcome of the work of several commissions and private committees, and following the lines laid down by these bodies after discussions at public hearings, represents the kind of an ordinance that the architects, builders and real estate interests feel should be enacted.

Mr. Miller is well qualified for the work for which his services are sought. He is a civil engineer of twenty-five years' experience. In 1895 he entered the Department of Buildings as special inspector, and

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served in that bureau as inspector, plan examiner and assistant engineer until he left in 1906 at the head of the engineering division. He was a member of the Building Code Commission of 1897—the first to attempt a revision of the present ordinance—whose report has served as the basis for all the later drafts. In 1910 he was appointed Superintendent of Buildings for Manhattan and was retained, on the recommendation of the architects and builders of the city, when he assumed his present office at the beginning of this year.

The office of the Building Committee will be in the Municipal Building.

BOOK NOTE

LE VATICAN ET LA BASILIQUE DE ST. PIERRE DE ROME. By Paul Letarouilly author of "The Edifices of Modern Rome." Reprint. Seventy plates, fourteen by twenty-two inches. J. H. Jansen, Cleveland, O. \$18.00.

The Church of St. Peter was founded by the Emperor Constantine in the fourth century to cover the grave of St. Peter. A thousand years later, the original Basilica having fallen into decay, Pope Nicholas V commissioned Bernardo Rossellino to draw plans for a new edifice. The work begun in 1452 was continued intermittently for nearly 200 years before the church was completed, and it was not until the middle of the nineteenth century that the group of buildings which constitutes the Vatican was entirely developed. The presentation in line drawings of this group, said to be the most valuable of any in existence today, and upon which such architects and painters as Bramante, Michel Angelo and Bernini bestowed their genius, together with drawings of St. Peter's, is the object of this collection of plates.

The first illustration is one of the Circus of Caius Caligula and Nero, first to fourth century.

Some nineteen plates are devoted to plans and drawings of various features of the Basilica of St. Peter, twenty-five to

the court of the Loggie, nine to the Chambers of Raphael, nine to the Pontifical Palace, six to the Villa Pia, and one to the Museum Pio Clementino. A wealth of decorative as well as structural suggestion is contained in the work, and its place in an architect's library cannot be readily questioned, nor can it be easily filled by other material.

PERSONAL

Mr. Israel J. Lehman, of the firm of Lehman & Schmitt, architects, Cleveland, Ohio, died on April 2d.

Mr. Albert S. Gottlieb, architect, New York City, announces his removal from 156 Fifth Avenue to 303 Fifth Avenue.

Mr. S. E. Perry, architect, Helena, Ark., announces that he has opened an office at 503 1-2 Cherry Street, where he will practice his profession. He desires to receive manufacturers' samples and catalogues.

Mr. Sidney Diamant, consulting engineer, has opened an office, where he will practice his profession, at 15 East 40th Street, New York City. He will give special attention to reinforced concrete design.

Mr. F. O. Adams, Jr., Class of 1907, Massachusetts Institute of Technology, has opened offices for the practice of architecture in the Citizens' Bank Building, Tampa, Fla. He would be glad to receive manufacturers' samples and catalogues.

Mr. J. C. Berry and Mr. W. R. Kaufman, architects, the latter formerly of the firm of D. P. Kaufman & Son, have formed a co-partnership for the practice of their profession, with offices in the Fuqua Block, Amarillo, Texas. They desire to receive manufacturers' samples and catalogues.

INDUSTRIAL INFORMATION

ATLANTIC TERRA COTTA

The April issue of Atlantic Terra Cotta Co.'s "house organ," published at 1170 Broadway, New York, illustrates a number of recently erected terra cotta structures devoted to the manufacture of food-products, in which Atlantic Terra Cotta has been used.

A large bakery on Long Island and service buildings for dairy companies in New York City and in Montreal, Can., are the principal subjects presented.

SPECIFICATIONS FOR CEMENT FLOORS

A pamphlet, entitled Specifications for hardening and densifying cement floors, has recently been issued by the Trus-Con Laboratories, Detroit, Mich.

This pamphlet has been prepared with the special purpose of making known the properties claimed for the Trus-Con Floor Hardener. The makers state that this hardener, when used as directed, produces a hard, dense surface that is dustless and wear resisting. So smooth and dense is the surface created, that it is claimed the friction of traffic does not abrade the surface of the floor and produce these inequalities that are objectionable features of cement floors. The hardener, the pamphlet states, is easily mixed with dry cement.

Specifications are given in detail, one set, where the wearing surface is laid continuously with the concrete base, and another when it is not.

The demand for a product of the kind here described is undeniable.

This pamphlet contains much valuable information on its topic and will be forwarded on request.

"CERESIT"

The Ceresit Waterproofing Co., 110 South Dearborn Street, Chicago, Ill., have issued a pamphlet entitled Water-proofing for Cement Houses.

It aims to direct attention to the safeguards necessary to effect complete water-

proofing of cement structures, advocates the use of Ceresitized Cement or stucco to secure the best results, and contains specifications prepared to meet the usual conditions of water-proofing houses constructed of cement or stucco.

The pamphlet will be sent on request.

CEMENT PIPE

The Lock-joint Pipe Co., 165 Broadway, New York City, are makers of the Meriwether System of Continuous Reinforced Concrete Pipe. In a pamphlet recently issued describing and illustrating this system it is stated that it provides for a continuous reinforced concrete pipe laid in sections, in which the joints between each section are so constructed as to insure freedom from leakage or obstacles to flow. The joints, it is further stated are equally as strong as the rest of the pipe. Pamphlet will be sent on request.

GRINNELL SPRINKLER BULLETIN

The Grinnell Automatic Sprinkler Bulletin for April, illustrates and describes features of recent disastrous fires, notably the Missouri Athletic Club in St. Louis, Mo., and College Hall at Wellesley, Mass.

An article, entitled, "How American business men calmly accept as inevitable a useless tax of millions," reviews and analyzes the fire loss during 1913, and urges those precautions that it is believed should govern wherever buildings are erected.

It seems impossible to comprehend a loss by fire of \$225,000,000, in view of the efforts that are constantly being made to provide efficient safeguards. These are the figures for the past year in the United States and Canada.

"UNION" GUARANTEED SEAT

M. P. Berglas Mfg. Co., Brooklyn, N. Y., has lately issued an attractive booklet illustrating and describing the "Union" Guaranteed Water-closet Seat.

The book, which will be sent to anyone upon application, is entirely devoted to this new product of the Berglas Co., exterior and sectional views of the seat being shown, together with an illustration of the manner of packing employed.

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ASBESTOS SHINGLES

The Asbestos Shingle, Slate and Sheathing Co., Ambler, Pa., describe in a pamphlet just issued, "Century" Asbestos Shingles, of which they are the makers and illustrate a number of important buildings of recent erection, on which these shingles have been used.

Reversing the usual methods employed to give publicity to a product, this pamphlet contains at the outset a number of reasons why, under certain conditions, asbestos shingles are *not* desirable—frankly states that for some types of buildings they do not harmonize, and then proceeds to point out how and where they may be used, in the opinion of the makers, to better advantage than any other roofing material.

This frank discussion tends to form in the mind of the reader the impression that the product is equally honest and straightforward in its quality.

THE SHINGLE PROBLEM

The Flintkote Manufacturing Company of Boston, Mass., New York City, Chicago, Ill., and New Orleans, La., has recently published a folder designed for free distribution, calling attention to what it terms "Rex-Tile" or the scientific shingle.

It is stated that this product possesses fire-resisting and waterproofing qualities necessary for the protection of property, coupled with durability, attractiveness, uniformity and permanance of color, all at a price that is within the reach of the average owner. In the description given of Rex-Tile, stress is laid upon the following characteristics of this substitute for wooden shingles.

In the first place, it has a thick butt-end designed to retain the architectural advantage of heavy shingles and square tile. Second, it is produced in two colors, red or slate, and these colors are said to be permanent as they become a part of the roofing itself. Rex-Tile is laid in single pieces the same as shingles. It is claimed that it will not warp, split or crack. That it is fire-resisting, requires no paint or stain, is of uniform size—preventing waste in laying—and for this reason can be applied

at less cost than can ordinary wooden shingles.

Rex Valley Strip is also produced for use with Rex-Tile, and is intended to take the place of metal valley lining. It is sold in a roll twenty-four inches wide, of same color as Rex-Tile. Strips of required length and width can be readily cut for valleys, gutters, flashings and ridge pieces.

Rex-Tile shingles are eight inches wide by eighteen inches long, the lower end being folded under two inches by a special process in their manufacture. This fold is for nailing and to give the thick effect at the butt-end.

Further and more detailed information concerning this product can be had upon application to the manufacturers.

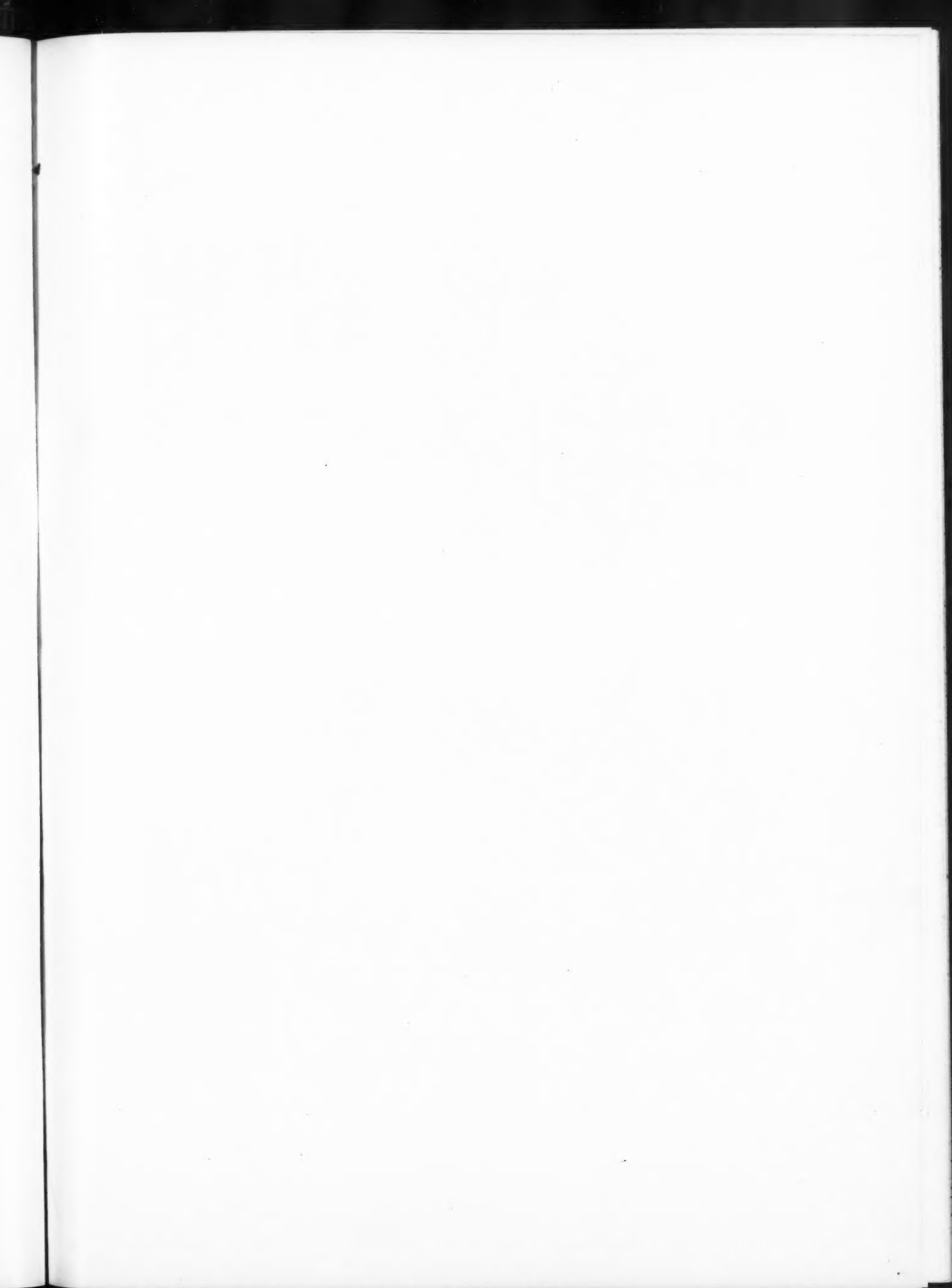
METAL REFLECTORS

Metal reflectors for the lighting of mills and factories are illustrated, and their method of application thoroughly described in a pamphlet recently issued by the Holophane Works of the General Electric Company, Cleveland, Ohio. This company also has branch offices in principal cities. The utilization of electric light to the best advantage has been made possible by the application of scientifically designed appliances. The reflectors described are made, it is stated, to meet all of the varying and intricate conditions that arise in the proper artificial illumination of mills and factories. Catalogue will be forwarded upon application.

PERSONAL

Beginning with April 15th, the Philadelphia office of the Pierce, Butler & Pierce Manufacturing Company will be located, as formerly, in the Abbott Building, on the corner of Broad and Race Streets, but will occupy offices 601-602 on the sixth floor.

The Asbestos Protected Metal Company, of Beaver Falls, Pa., announces the removal of their Pittsburgh office to 1611 Benedum-Trees Building.



THE AMERICAN ARCHITECT



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