

THE DUQUESNE CLUB—HOUSE, PITTSBURGH, PA.



PRICE 15 CENTS.

CONTENTS.

EDITORIAL SUMMARY.
AMSTERDAM FIRE CONGRESS, 1895.
LETTER FROM CHICAGO.
HEAT INSULATION.
EXHIBITIONS.
NOTES AND CLIPPINGS.

ILLUSTRATIONS.

THE DUQUESNE CLUB-HOUSE, PITTSBURGH, PA.
[Gelatine Print issued with the International and Imperial Editions only.]
PLANS AND ELEVATION OF THE SAME.
HIGH-SCHOOL, EMPORIA, KANSAS.
DESIGN FOR FREE PUBLIC LIBRARY AND INDUSTRIAL TRAIN-
ING SCHOOL, HOBOKEN, N. J.

THE OLD GOVERNOR BROOKS HOUSE, MEDFORD, MASS.

Additional Illustrations in the International Edition

THE ENTRANCE-HALL: DUQUESNE CLUB-HOUSE, PITTSBURGH, PA.
[Gelatine Print.]
LADIES' DINING-ROOM IN SAME BUILDING.
[Gelatine Print.]
MAIN DINING-ROOM AND ASSEMBLY-HALL IN THE SAME BUILDING.
[Gelatine Print.]
ENTRANCE FRONT: ST. KEVERNE, HARROW-ON-THE-HILL, ENG.
GARDEN FRONT OF THE SAME.
DESIGN FOR A CREMATORIUM.

SANITARY EXPERTS,

Urged on by a thoroughly aroused public opinion, are calling attention anew to the disgraceful condition of School Sanitaries in all parts of the country.

In the reform that is to come, the architect will play an important part. We call the attention of the profession to the *Sanitas School-Closet* made especially for Ventilating purposes, with double ventilating horns—4-inch capacity—leading to a ventilating outlet of the same size, and connected with an exhaust flue. The *size* of the ventilating horns, their *wide opening*, and *direct* connection with the exhaust flue ensure a rapid and thorough removal of all odors while the closet is in use, and a continuous ventilation of the room at other times.

Send for special circular. See cuts in previous numbers of "American Architect."

SANITAS MANUFACTURING COMPANY,

SMITH & ANTHONY COMPANY, Proprietors, - - 48 to 54 Union Street, Boston, Mass.



W. R. OSTRANDER & CO.,
204 Fulton Street, New York.

Manufacturers of

Speaking-Tubes, Whistles, Oral, Electric, Mechanical and Pneumatic Annunciators & Bells. Complete outfits of Speaking-Tubes, Whistles, Electric, Mechanical, and Pneumatic Bells. A full line always in stock. Send for New Catalogue. Factory, De Kalb Ave. near Kliekerbocker, Brooklyn, N. Y.



DIXON'S AMERICAN GRAPHITE PENCILS

FOR DRAUGHTING.

By mentioning *American Architect and Building News*, and sending 16 cents in stamps, you will receive an assortment of draughting pencils worth double the money, and unequalled for smooth, tough and uniform leads.

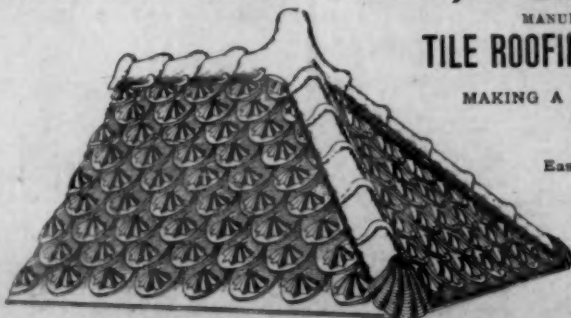
JOSEPH DIXON CRUCIBLE CO. - - JERSEY CITY, N. J.

W. H. MULLINS, 107 DEPOT STREET, SALEM, OHIO.

MANUFACTURER OF

TILE ROOFING IN SHEET METAL,

MAKING A VERY HANDSOME AND DURABLE ROOF.



Easily and quickly applied.
Guaranteed Storm-proof.

Send for Catalogue and prices.

Eastern Office:

108 Chambers St., New York.

"ATLANTIC SHELL TILE ROOFING. Patented, March 5, 1895.

VAILE & YOUNG'S Patent Metallic Skylights.



Without Putty.

Construction adapted to all forms and styles of Skylights. Thousands of feet in use have proved its superiority. Particularly adapted for Depots, Mills, Factories, etc., where large and continuous lights are required.

Send for Illustrated Catalogue.

216 N. Calvert St., Baltimore, Md.

DE FOREST PATENT SKYLIGHTS.



NO Putty ALL Metal & ALL Glass

Full information, estimates and references to work erected furnished on application.

If you want the
WHITE
THE METALLIC GLAZING CO.,
253 N. 7th St., N. Y. C.

G. BICKELHOUP, PATENT



METALLIC SKY-LIGHT WORKS.

242 and 245 West 47th Street, New York.
Telephone: 675 29th St., a few doors west of Broadway.
Send for Catalogue.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. L.

Copyright, 1895, by the AMERICAN ARCHITECT AND BUILDING NEWS COMPANY, Boston, Mass.

No. 1039.

Entered at the Post-Office at Boston as second-class matter.

NOVEMBER 23, 1895.



SUMMARY:—

The Burning of the Manhattan Bank Building in New York.	
—The Odds against the Fireproof Building.—The Justification for using the Protected Steel Skeleton.—The Duty of Competitors towards the Expert Adviser.—The House-smiths' Strike in New York.—An Art Commission for Baltimore.—The Supervising Architect accused of Favoritism.—Some Reasons for rejecting the lowest Bidder.—Is Work to be done on Sunday nowadays?	85
AMSTERDAM FIRE CONGRESS, 1895.—I.	87
LETTER FROM CHICAGO.	88
HEAT INSULATION.	90

ILLUSTRATIONS:—

The Duquesne Club-house, Pittsburgh, Pa.—Plans and Elevation of the Same.—High School, Emporia, Kas.—Design for Free Public Library and Industrial Training School, Hoboken, N. J.—The Old Governor Brooks House, Medford, Mass.	
Additional: The Entrance Hall: Duquesne Club-house, Pittsburgh, Pa.—Ladies' Dining-room in Same Building.—Main Dining-room and Assembly-hall in the Same Building.—Entrance Front, St. Keverne, Harrow-on-the-Hill, Eng.—Garden Front of the Same.—Design for a Crematorium.	90
EXHIBITIONS.	91
NOTES AND CLIPPINGS.	91

THE fire of last week, which destroyed the Manhattan Bank Building in New York, has excited a great deal of discussion among architects, insurance-men and fire-engineers. Mr. Bonner, the chief of the New York Fire Department, has, as is usual with him, expressed, clearly and sensibly, views which will be approved by most architects. The conclusion at which observing architects arrived some time ago, and which has been repeatedly set forth in these columns, that a high building, mainly of steel or iron, may easily be made safe against fire originating within it, but that it is extremely difficult to protect it against the effect of conflagrations near to it, is just that which Chief Bonner most insists upon; but he adds, from observation, some very instructive details. It seems that the Manhattan Building was a rather favorable specimen of the fireproof construction of fifteen or twenty years ago, the ironwork being to a certain extent protected, in a manner which was then unusual. The fire originally started in a building of the ordinary sort, thirty feet away from the Manhattan Building, and it was with astonishment that the firemen saw the latter take fire from a blaze so far off. Not only did it take fire, but the effect of the fire upon it was extremely destructive. The columns and girders soon twisted away from their connections, letting the floors fall, and the fall of these involved the ruin of the walls. So energetic was the action of the heat in tearing the structure to pieces that a large number of firemen were injured before they could escape, and Chief Bonner is said to have declared that he would never again send a man into a blazing fireproof building.

THE Manhattan Building was only nine stories high, and it is interesting to consider how a twenty-story structure of the same sort would behave under similar circumstances. According to Chief Bonner, most of the modern fireproof buildings would suffer the same fate, and the rapidity of their destruction would be in proportion to their height and the consequent rapidity of the upward current that the fire would establish in them. So far as the structures themselves are concerned, he thinks that a modern fireproof office-building is safe against fire originating within it; but that buildings of the same class, if used for mercantile purposes, or for storage, and filled with combustible goods, will succumb to the intense heat generated by the blazing column of fuel, and, in the same way, are exposed to destruction from the influence of a conflagration in the immediate neighborhood. That this opinion is well-founded, all architects understand, and, so far as we know, no architect pretends that a steel structure, however protected, will act as a fortress against a conflagration outside. If any one makes such a claim, it is more likely to be the agent of some patented system of fireproofing than an architect; yet the newspapers talk as if the architects of New York were in some way to blame whenever any fireproof structure succumbs to forces which it was not expected to resist. The fact is that,

as every architect and builder, and every sensible owner, knows, it is impossible, in a city, three-fourths of which is occupied by buildings mainly of wood, to construct a building which will resist fire from the outside as well as the inside, without making sacrifices of light, floor-space and money, which are disproportionate to the advantage gained; and the problem placed before architects, which they have solved in this country, on the whole, with brilliant success, is to design structures which shall be light and strong, and shall be out of reach of danger from small fires. It is in the solution of this problem that the cased steel construction has been developed. Apparently, the newspaper reporters imagine that this sort of structure was designed as an advance in fireproof construction; whereas, as every architect knows, it was devised as a means for obtaining increased rentable floor-space in buildings on valuable land, without sacrificing too much in solidity and fire-resisting capacity. No architect pretends that the cased steel walls are as secure against fire as the thick brick walls which they supersede; but, as they can be built thin, and thus save to the owners a large annual sum in rent, it is financially profitable to owners to build them; and the architects who have perfected them have simply fulfilled a requirement of the first importance, at a sacrifice of security which they have tried, and tried successfully, to make as small as possible.

AS we have often said, any one who wishes to have his building, before all other considerations, fireproof, can get what he wants from any architect of reasonable skill; but he must understand, as the architect will tell him, that he must take the Pyramids of Egypt as his model. To pile up thick walls of brick, with few and small openings, floors vaulted in brick, and stone stairways, enclosed in brick walls, is easy enough for the architect, but no owner would ever accept such construction. What owners want, and must have, in order to be able to rent or use their buildings profitably, is light and slender construction, with large openings. These are the prime requisites, and such fireproof quality only is admissible as can be obtained without sacrificing them. The problem set before our architects has been, therefore, to improve the fire-resisting quality of a system of construction which is in itself very vulnerable to fire, but which, for quite sufficient reasons, they are not allowed to change. No fair-minded man can deny that, in the solution of this problem, our architects have been extremely successful. The science of protecting structural ironwork against fire, of building light masonry floors and roofs, of lining walls with damp-proof and fireproof furring, which has modified the art of construction throughout the world, is the product mainly of the observation and ingenuity of American architects, and has been developed with very little sympathy from their clients or the public. To show how little thought is taken by any persons except architects and underwriters about security against fire, it ought to be sufficient to refer to the latest fashion of construction, which consists in building walls of steel, cased with brick. No architect would advise a client to use such construction on cheap land, or would say that it was as fire-resisting as solid brick masonry; but where land is worth two hundred dollars a square foot, and the walls of a ten or fifteen-story building may, by using it, be made sixteen inches thick, instead of three feet, the saving in rentable space inside the building is so great as to outweigh all other considerations, and the architect must accept it, and do the best that he can with it. No one pretends, least of all the architects, that such a structure will withstand a conflagration, but it will resist the effect of fire, either from the inside or the outside, far better than any structure with such large floor-space and ample windows ever built before, and this quality has been conferred upon it by the science and skill of American architects.

WE have again and again expressed our want of sympathy with unsuccessful competitors who have taken part in one of the old-fashioned scrambles called "open competitions." Now we will declare that we have as little sympathy, and less respect, for those who, having taken part in a properly conducted competition, are willing to show their inappreciation of normal propriety of behavior by impeaching the fairness of the man, or men, who have decided a competition in their disfavor. No expert adviser pretends to be infallible in judgment, and it is always possible that, in a matter where taste and

personal bias in the matter of style must always count for something, he may be unconsciously influenced in his decision by his own predilection in favor of what nearest approaches his preconceived idea of what should be the treatment of the problem. This difficulty is inherent in the situation, but it is not a very serious one, and certainly is not enough to weigh against the judgment of a man of known rectitude and ascertained education in architectural matters. But every expert, it seems to us, has a right to expect from those who willingly and wilfully submit their designs to his consideration, at least, the courteous treatment that one gentleman accords to another. A member of the bar, who in the public prints criticizes a judge's ruling, and assails his judicial character with innuendo and allegation, can, we believe, be punished for contempt of court, and perhaps the time may come when some similar protection can be afforded to the judges in architectural competitions. Until that time does come, however, it seems to us that it ought to be understood that any unsuccessful competitor, in a properly conducted competition who publicly attacks the decision and character of the judges should be consigned by right-feeling architects to the limbo of professional Coventry.

THE Housesmiths' Union, of New York, which is celebrated for the assaults that it has made upon building interests in that city, and the multitudes of men that it has thrown out of employment, has entered upon another campaign of wanton mischief. There are said to be about twenty-five hundred of these men in the city and suburbs; and, as all building-operations have to stop as soon as they drop their tools, they have their unfortunate comrades at their mercy. The ostensible purpose of their strike is to extract by force from the community an addition of fifty cents a day to their wages; and they consider the present a very favorable time for their operations, because a great deal of building is going on, and is being hurried, to escape the unfavorable winter weather, while their fellow-mechanics, who have to pay the piper for the housesmiths' dancing, are particularly anxious at this season to keep at work, so as to save up something to carry their families through the winter, when employment is hard to find, and shoes and stockings, mittens and coal and blankets, must be bought and paid for. Already, twenty thousand building workmen are said to be idle, waiting until the housesmiths permit them to resume their tasks; and the Central Labor Union, which, as usual, has "exhausted every means" to prevent the housesmiths from striking, is said to be on the point of calling out sixty thousand men to show its "sympathy" with their performances.

BALTIMORE has followed the example of several other large cities, in appointing a fine-art Commission to regulate the admission of statues and monuments to the public parks. The Commission consists of the Mayor of the city, and Messrs. Mendes Cohen, as representative of the Maryland Historical Society; James L. McLean, representing the Johns Hopkins University; Joseph M. Cushing, representing the Maryland Institute; J. B. Noel Wyatt, representing the Architectural Club; David L. Bartlett, representing the Park Commissioners; and Joseph E. Sperry, representing the Charcoal Club. The ordinance creating the Commission provides that no statue, ornamental fountain, arch, gateway, monument or memorial of any kind shall be erected, or any change made in those already erected, in any public street, avenue, square or park, or in any municipal building, unless the design and site of the same shall have been approved by a majority of the Commission.

THE hostilities against the Supervising Architect of the Treasury Department, which, apparently, are periodically revived by disappointed contractors, are, it is said, to be renewed in Congress at the next session. The regular charge made is that "favoritism" is shown, in awarding contracts to persons or firms other than the lowest bidders; and the contractors who feel themselves aggrieved by such action are said to be ready to take their revenge at the first favorable opportunity. As we have always maintained the principle that the fact of being the lowest bidder is only one of the points to be considered by architects and owners in deciding whether to award a contract to a particular contractor, we are quite willing to believe that the "favoritism" alleged against the Treasury officials was exercised for the best interest of the public. The Philadelphia *Press* relates as an example of the methods

complained of, that, in September last, bids were invited for the structural ironwork for the eight upper stories of the Appraisers' warehouse in New York, two stories of which had already been built. The lowest bidder for the upper stories was the firm of Post & McCord, the next being Michael Giblin, the contractor for the two stories already erected. Giblin's estimate was about eleven thousand dollars higher than that of Post & McCord. The latter, according to the *Press* account, had made it known that they would procure their stock from the Carnegie Company, of Pittsburgh. Naturally, Post & McCord, against whom no objection could possibly be brought, expected to receive the contract; but, on November 1, they, with the other bidders, were notified that all the bids had been rejected, and that new ones would be invited.

WITHOUT knowing anything of the merits of this particular case, we say without hesitation that any architect might have many good reasons for pursuing the same course as the Treasury officials. If he thought that all the bids were too high, he would be quite justified in rejecting them, and calling for new ones; and, in many cases, the advantage to the interest of the owners in other respects of having the same contractor who had completed two stories of a building go on with the rest of it would be worth much more than the difference of less than three per cent on the total amount of the contract which appeared between the Giblin and Post & McCord bids. Moreover, the announcement of Post & McCord, supposing it to have been really made, that, if the contract should be awarded to them, they would order their steel from the Carnegie Company, was certainly an important element in their proposal. All architects know that in the last few months the Carnegie mills have been overwhelmed with orders for structural steel, so that, as has been reported, they would not accept contracts with a stipulated time for delivery. For many private undertakings, and, presumably, for some public ones, this would be a serious matter; and a contractor who could show that he could secure his materials within a specified time might justly be preferred, even if his bid were not the lowest. Undoubtedly, any private or public architect would be glad to have such work, under his charge, constructed out of Carnegie steel by such a firm as Post & McCord; but circumstances often arise which necessarily modify an architect's decision. Some years ago, one of the New York papers, anxious to make a political point against the Commissioner of Public Works, raised a terrible outcry, charging him with favoritism, not to say corruption, because he had invited bids for a large amount of granite work from what seemed to it a suspiciously small number of contractors. All the architects who read its "revelations" probably laughed, for the simple reason that the list of the invited contractors included the names of all the principal granite-dealers in that part of the country, and the only ones, probably, who could have furnished the required amount of good and uniform stone; yet this paper chose to hold up a citizen in high office for a considerable time to the scorn and indignation of his fellow-men, without taking the trouble to ascertain whether there was any foundation for its reproaches; and, in the same way, every contractor who has a grievance against an official who has simply used his lawful discretion, in a way displeasing to the contractor, seems to find some newspaper ready to disseminate his mean insinuations without making any effort to ascertain the truth of them.

THE Pittsburgh Director of Public Safety, Mr. J. O. Brown, recently stopped Sunday work on a large office-building, on the ground that the riveting and hammering on the steel frame disturbed the church services held in the neighborhood, and annoyed citizens. In order to make sure that his orders were obeyed, he stationed policemen at the building, with directions to arrest any one who should attempt to work in it. As it happens, the contracts require the structure to be completed by April 1, and work is being carried on night and day to enable the contractor to fulfil his agreement; while the owners are also held by contracts with tenants, to whom they have promised to give possession of their rooms on the first day of April; so that the courts will probably be called upon to say whether the work must be interrupted on Sundays. Meanwhile the Christian Endeavor Society has, by threat of prosecution, stopped Sunday work on a new water-main which is being laid through the streets, and is said to have in mind further measures of a similar character.

AMSTERDAM FIRE CONGRESS, 1895. — I.



Monument to the French Republic, Lyons, France: M. Blavette, Architect; M. Peignot, Sculptor. From *La Semaine des Constructeurs*.

FROM September 24th to September 28th, there assembled in Amsterdam, fire-experts, architects and engineers from all parts of the world, called together on the invitation of the Committee of the Amsterdam International Exhibition to discuss all matters relating to fire-prevention, fire-extinction, salvage, construction and planning of buildings in respect of danger from fire.

The papers which were read were of unusual interest to architects, as they embraced the following subjects, under three sections:

SECTION 1.

1. Storage of inflammable merchandise.
2. Construction of ovens, fireplaces, furnaces, chimneys, etc.
3. Spontaneous ignition, and its prevention.
4. Constructing lamps, stoves, electric-light installation, lightning conductors.

SECTION 2.

This section was devoted to the extinction of fire, and salvage, and numbered among other papers those devoted to the following topics:

1. The organization of the fire-service.
2. The best system of fire-alarms in large and small towns and villages.
3. The employment of water-mains for extinction.
4. The construction of fire-engines and smaller fire-appliances.
5. Design and arrangement of the interior of the fire-stations, which subject was of special interest to the members of the congress, as a paper was read by Mr. Thomas Blashill, F. R. I. B. A., the superintending architect of the London County Council, illustrated by drawings of some of the most recent fire-stations erected in London from his designs.

It is believed by many fire-experts that the London fire-stations are the best in the world, and whatever may be said as to the superiority of the organization of fire-services abroad, the advancement made in the perfection of the arrangement of the stations themselves, and the accommodation for the men, has been greater in London than in any other city.

6. A paper dealing with the means of lessening damage caused by fire was read by Mr. Edwin O. Sachs, the Honorary Secretary in London of the Congress. This paper dealt with the subject in a manner which satisfied the views of the insurance delegates.
7. Life-saving apparatus for fire-brigade use and help was also discussed.

SECTION 3.

But the third section undoubtedly was the most interesting to the architects who attended this congress, for it included papers upon:

1. Fireproof materials and construction, the construction and interior arrangement of houses.
2. The planning and construction of theatres, assembly-halls, hospitals, factories, workshops and warehouses.
3. A paper on the protection of theatres from fire was contributed by Mr. Ernest A. E. Woodrow, A. R. I. B. A., whose name is familiar to the readers of this journal in connection with the articles now appearing on "Theatres."

Other papers were read from various specialists abroad, for instance, Mr. F. C. Dufour, the engineer of Amsterdam, contributed an essay on electric-light installation, from the point-of-view of danger from fire, while Mr. M. P. Grebel, of Siemens & Halske, of Berlin, opened a discussion upon the perfecting of the system of electric-furnaces.

Mr. I. E. G. Noordendrop, architect of Bussum, read a paper upon the experience he has acquired of the relative resistance of wood and iron in the case of fire, and the best means of protecting these materials against the action of fire. Mr. Prinz, chief of the fire-brigade

of Altona, gave his views upon fire-resisting materials. Mr. G. A. Huygen contributed an article upon the caution to be enforced in installation of ventilating and heating systems. Mr. Edwin O. Sachs opened a discussion upon the safety of audiences in theatres.

Mr. J. H. Neizen, director of public work of Rotterdam, gave his notes concerning the construction and measures of safety in buildings, having reference to the danger arising from fire.

There were many other papers in the programme, which do not so readily appeal to the mind of the architect and which we have not therefore mentioned here.

Such an assembly as this gives an opportunity of discussing and airing the views of experts from various countries, enables them to compare their experiences and give their opinions upon many technical matters, which are of the greatest service as the means of saving life and property. The prevention of fire is undoubtedly one of the most important duties of the architect, who, indeed, has more power by the manner in which he designs his plans to overcome this enemy, and to provide for the safety of life, than any other profession or body.

We may hope in a future number to give some extracts from several of the foreign papers, at the present moment we will confine our remarks to those contributed by Mr. Thomas Blashill, the architect to the County Council of London, Mr. Sachs, the English Secretary of the Congress, and Mr. Woodrow, late of the Theatres Control Department of London.

In the paper by the architect to the Council we learn that the fire-brigade under the London County Council, has fifty-seven land fire-stations, besides four floating stations upon the river Thames. The land stations accommodate more than nine hundred men who are exclusively employed in the service of the fire-brigade. There are also ten small portable stations in the streets, which each accommodate two or three firemen; and two hundred fire-escape stations.

The fire-stations vary greatly in their arrangements, some being more than thirty years old. These are likely to be superseded within a few years.

The paper describes the more recent kind of fire-station now being erected in London at the rate of about four new stations per annum. In the design of a fire-station, Mr. Blashill states that it is essential that the architect should be in close touch with the chief officer of the fire-brigade. During many years past, all stations have been designed after the most careful consultation with the late chief officer, Sir Eyre M. Shaw, K. C. B., and the present chief officer, Mr. J. Sexton Simonds, and their advice has always been placed at the service of the fire-brigade committee.

The main objects in the design of a fire-station, the author proceeds to say, are the proper accommodation of the firemen and fire appliances, and to insure that upon the receipt of an alarm of fire the engine and other appliances, with their complement of firemen and horses, can be dispatched in the shortest possible time. All the arrangements are directed towards this end. A satisfactory fire-station of the ordinary kind can be built upon a site which is 50 feet wide and 100 feet from front to rear. Stations have been built of less dimensions than these, but the sites of some of the larger stations measure considerably more.

Brompton station measures 52 feet across and only 58 feet from front to rear. The New Cross station measures 120 feet in width and 170 feet from front to rear. This last is the main station in one of the five districts into which London is divided.

It is desirable that the station should be placed on a corner site, so that it may have two faces fronting the streets. It is sometimes possible to find a site with three faces to the streets, but there are stations, of which Brompton is an example, where the front and rear only face streets.

The chief part of a fire-station is the engine-room, which should be about 27 feet wide and 34 feet from front to rear; this will accommodate two fire-engines, standing side by side, and leave sufficient room for passing between. Wherever it is possible, the stable is placed immediately behind the engine-room into which the doors of the stable open. The horses, which it is thought necessary to keep ready for duty, stand with their heads facing the engine-room, but there are generally one or two spare stalls of the ordinary kind where the horses may rest.

The watch-room is a front room adjoining the engine-room and is in telephonic communication with the chief stations, and with many of the larger public and private buildings, as well as with many fire-alarm posts placed in the streets.

In the larger fire-stations, the engine-room contains one steam fire-engine and one manual fire-engine, but as fire-hydrants are now being placed at short intervals all over the metropolis (nearly 20,000 having already been fixed) it is not necessary to use so many fire-engines, and in the smaller stations the place of the manual engine is now occupied by a truck with escape-ladder and other fire-appliances.

With regard to the accommodation of the officers and men, it is now the practice to provide in each station a recreation-room, where the men can spend their time when waiting their turn on duty. The single men, if any are accommodated, have their own mess-room and dormitory. Each of the married men is provided with a kitchen, a bed-room and a scullery. The engineer in charge of a small station has one additional room, and the superintendent in charge of a district has two additional rooms, besides an office and a

bath-room. The London County Council has increased the accommodation of the firemen by adding the recreation-rooms and the sculleries.

It has been the practice to provide the entrances to the quarters of each married fireman from a passage in the main building, but recently these entrances have been made as far as possible from open galleries, so that each man has practically a separate house, to which access is gained directly from the open air.

The stations are usually built four or five stories above the ground level, according to the situation and the accommodation required. There is only one entrance to the station, and that is through the engine-room, so that when a man enters or leaves the building he can leave notice at the watch-room.

A shaft for drying fire-hose is enclosed in the staircase and is about 56 feet high. Over the staircase is a look-out tower, which is generally about 80 feet high.

Drying-closets, for drying the men's clothes, coal-stores, wash-houses, bath-rooms, etc., are also provided; also lifts, to take coals, etc., to the upper floors.

It is hardly necessary to say that a fire-station should be so placed that the horses may safely be driven out at a good speed; for this purpose it is desirable to have a wide road in front of the station, and to set the station back a few feet from the footway.

Details of two important stations were given by Mr. Blashill, as follows:

BROMPTON FIRE-STATION.

This station was designed to accommodate the following men, horses and appliances: one engineer, ten married men, one married coachman, two horses, one steamer, one manual, one hose-cart.

The engine-room is in the centre of the building and measures 24 feet by 34 feet and is 13 feet 6 inches high.

The watch-room is on left of engine-room and measures 14 feet by 12 feet. The stable in this case opens into the yard. The coachman's quarters are on the ground floor to the right of the engine-room. The basement contains a large wash-house with stores of fuel for the use of the engine, and for use in the firemen's quarters, each man being supplied with a separate coal store.

There is one bath for the use of the firemen, as it is necessary that they should have a hot bath upon returning from a fire.

Upon the first, second, third and fourth floors are the quarters of the engineer and firemen. The usual size of each room is about 14 feet by 12 feet and 9 feet high.

The architect's estimate for the erection of this station was £6,600.

NEW CROSS STATION.

This is a superintendent's station of the largest class. It stands at the angle formed by two roads, and was built to accommodate one superintendent, one foreman, eight married men, eight single men, two coachmen, four horses, one steamer, one manual, one hose-cart, four escapes, one hose van, one long ladder on van.

The engine-room is 27 feet by 34 feet and 13 feet high, with additional space at the rear.

The watch-room and foreman's office are upon the right of the engine-room, and the recreation-room is upon the left.

The single men's mess-rooms and dormitory are placed behind the recreation-room, and there are quarters for two married coachmen at the rear.

The yard contains stores for fuel, etc., and shed for long ladder.

The basement contains a workshop with stores of various kinds.

Upon the first floor are the quarters of the superintendent and the foreman, and married firemen are accommodated upon this floor as well as the second and third floors. The rooms generally are about 14 feet by 13 feet 6 inches and 9 feet high.

There is a wash-house with drying-room over the long ladder shed in the yard.

The estimated cost of this station was £16,000.

[To be continued.]



THE RECENT EARTHQUAKE.—A SUDDEN CESSATION OF ELECTRIC-LIGHT AND POWER.—ELEVATING THE RAILROAD-TRACKS.—THE ANNUAL EXHIBITION OF AMERICAN ARTISTS.—ANNUAL REPORT OF THE ART INSTITUTE.—THE FIELD MEMORIAL ROOM.—ATTENDANCE AT MUSEUMS OF FINE ARTS.—THE LINCOLN MONUMENT AT SPRING-FIELD.—THE YERKES TELESCOPE.

THE last month, to vary the meteorological monotony arising from weeks and weeks of successive pleasant days, Chicago has indulged in a little earthquake. It occurred in the small hours of the night or, rather, morning, when the majority of the inhabitants were unconscious that their beds were shaking beneath them. Some of the ever-wakeful ones heard furniture rattle and saw lighter things tremble. In certain localities doors were seen to sway back and forth. The trembling sensation was felt very generally in all lightly-constructed buildings, and even in some heavy ones the shock was apparent, though as the higher stories were reached the tremb-

ling was changed to a swaying. In one, the Western Union Building, where the night-operators were at work, the large plate-glass windows are reported to have rattled ominously. The Auditorium, the Title and Trust, the Stock Exchange, Chamber of Commerce Building, the Fort Dearborn, the Reliance, the Woman's Temple and Masonic Temple were among those which felt no effect of the shock, while the Great Northern Hotel, the Association and the Columbus Memorial Buildings were among the few large structures in which the oscillations were perceptible. If we are to cultivate earthquakes as a regular thing, they will probably put a limit to the number of stories to be used in the large buildings of the city more effectually than any building ordinance could. This poorly-developed quake was productive of no damage in any part of the city or suburbs.

A curious accident happened only a few days ago in the late afternoon, which had it occurred at the time of the earthquake might have created wide-spread dismay and consternation. This little side-show sensation was the going out of fifty thousand incandescent lights in the down-town portions of the city. Many of the elevators in the hotels and big stores were run by the same power and, of course, these promptly ceased to work. Some of the cash-railroads in the retail stores were also run by the Edison Company's electricity, and as the boxes containing change were stopped in mid air, customers were obliged to leave in the dark minus their money. In the jewelry stores excitement prevailed, as it was at first thought to be a scheme for a wholesale robbery. The official reason for the cause of the trouble was a "derangement of some of the heaviest feeders" and if this electrical dyspepsia is likely to occur often, another lighting power would be more to be desired. The consulting engineer explained the trouble thus: "The lights are supplied from a network of triple wires, which are carried through the streets in wrought-iron pipes. These mains receive currents through underground cables called 'feeders.' Of these feeders there are thirty or more in the city district. The feeders take their current from a switch-board in the Adams Street main office and the switch-board gets its current from the power-house some distance away.

"The excavations made for the elevated roads along the courses of the mains caused settling of the bed on which the feeders rested.

"Electricity, like any other force, seeks the lines of least resistance, and at the places where the strain occurred leaks were established and finally short-circuits were established between two or more feeders through the ground. This at once increased the pressure on these feeders with the results that they 'blew out,' or melted. The next result was the 'blowing-out' or melting of the safety-fuses at the switch-board, thus incapacitating other feeders."

The passing of the Lake-front ordinance, before referred to in these letters, and the acceptance of the same by the Illinois Central Railroad Company, has during the last month made it an assured thing that this part of the town will, at last, no longer be the eyecore it has been heretofore. That the plans for its beautification as laid down by the Civic Federation will be carried out has not been decided, but the general laying-out of the place will permit of improvements on a grand scale, and will do more to create a fine feature for the city than almost any other change would. The city is working hard either for the depression or elevation of its railroad tracks. In fact, we are growing out of the village stage and as the fact is forced upon us, mammoth work has to be accomplished to give us the setting which belongs to a great city. The Chicago & Northwestern has already nearly two miles of its tracks on one of its divisions raised and the work is still continuing. The Rock Island and Lake Shore roads have one of the largest undertakings in elevating the tracks and have not time to accomplish things so rapidly as has the smaller undertaking. The work was begun a year ago last August and has progressed as far south as Thirty-eighth Street.

Thirteen bridges have been built across streets. These bridges are the kind technically known as "through-girder" bridges. They are of steel resting on abutments of masonry built upon concrete foundations. The subways at all streets over which the bridges pass have been lowered several feet on account of the trolley-cars which must pass under the bridges. The subways are paved with concrete and bricks and with the exception of Twenty-second Street, where a valuable brick building necessitated the leaving of the sidewalks at the original level, the walks have been placed even with the present level of the streets. Retaining-walls have been built at intervals when needed, rising in places as high as sixteen feet. All this work with the unloading of sand and gravel and laying of tracks has been accomplished without any interruption to traffic.

The Art Institute is at present holding its Eighth Annual Exhibition of oil painting and sculpture by American artists. The exhibition is full of interest, the work being generally fine and strong with less of that morbid affectation shown in the work of many of the European schools of to-day, while to see how far American artists have strayed from the old traditions of art, as they existed amongst us from ten to fifteen years ago even, you have only to look at some of the excellent examples here shown of the work of such men as Smillie, De Haas, the Morans, etc. Especially do we see in Smillie's fragrant breathing landscapes, in Francis Murphy's dreamy mistiness a change from the work of the new school of younger men who see things with different eyes. Each is well in its way, and one is glad one need not choose between the two. In the painting of the human figure, no manner can seem so excellent as that of the new man.

Gari Melchers has four or five superb creations. One, entitled "The Family," aside from its artistic excellence, is fascinating in its realistic touches, pathos and humor going hand in hand as in real life, without affectation or desire to render themselves impressive. Especially is this noticeable in the picture, entitled "The Wedding," a splendidly painted canvas of a marriage in low life. The technique is fine and the humor of the scene irresistible, even to the tears of the women, which are supposed always to be shed on such occasions.

Mary MacMonnies has a very decorative panel, entitled "The Breeze," which is excellent in treatment, though one might take exception to the muscular power of the diaphanous creature. There certainly is a breeze and a stiff one, too.

One feature which is noticeable in this exhibition, as it is in many other collections of paintings from the brushes of our American artists of to-day, is the presence of the Indian as a favorite model. Being a purely American subject it is to be welcomed as a good feature, and doubly so, as it offers a degree of picturesqueness quite as apparent as the Holland or French peasant. The Indian seems especially to lend himself with a picturesque grace to the sculptor's treatment, and the day when the noble red man was chiefly given over to that branch of art which was devoted to the doorsteps of cigar stores seems to have passed by.

The display made by the sculptors in no way comes up to that made by the painters in the degree of its excellence. A bust by Lorado Taft, of Hamlin Garland, has more of the touch about it which one is looking for than almost any other work in the catalogue. Apropos of Mr. Garland, who is so anxious to bring out an American school of painting in all its strength of beauty, one is reminded of the report that a set of Chicago sculptors and painters are going to form a summer settlement at Bass Lake, Indiana. The country round about is reported attractive, and from the "Indianapolis Group," which has of late grown into the "Hoosier School," we may expect even better results than heretofore. Mr. Taft is contemplating building himself a lodge in this vast wilderness and joining the band, while three or four other artists already have their log-cabin studios under way.

The sixteenth annual report of the Art Institute has just been published, and it is interesting and encouraging to note the valuable acquisitions that it has gained during the last year. At the time of its completion, the Field Memorial Room, as being the work of the Tiffany Company and something really artistic in character, was mentioned in these letters. Seeing in the report the list of rare pictures which are in this room, one realizes more than ever that it was a princely gift. Three canvasses from the brush of Jules Breton head the list, one of them being the beautiful "Song of the Lark." Next to these come four by Cazin, while three Corots come close upon them. These pictures by the great masters are not mere poor examples which one feels ought to blush to bear the illustrious name, but excellent specimens of his best work. Daubigny, Detaille, Dupré, Fromentin, Millet, Rousseau, Troyon and Van Marcke add their names to list with works which, like those of Corot, are no discredit to the illustrious names they bear, making in all a wonderful little collection in point of quality.

The Society of the Antiquarians brings many additions to the rooms of the Institute in the shape of rare textiles, laces and jewelry. Indeed, the growth of such collections now found in this part of the Museum is most encouraging. Chicago, in fact, takes kindly and enthusiastically to the Institute, and the attendance during the last year as compared with the attendance at museums in other large cities is most encouraging, considering the immense proportion of the uneducated foreign element in our population. The Metropolitan Museum in New York with five free days had a showing of 511,881. The Academy of Fine Arts of Philadelphia footed up nearly 100,000 visitors with only two free days. Cincinnati's Art Museum with no free days had a showing of 31,471 visitors, while the Boston Art Museum with two free days showed a figure of 265,112. Chicago's figure was 489,127 with two and one-half free days.

One of our promising young women artists whose specialty seems to be fast growing to be the painting of the "Mother and the Child" has added one more leaf to her laurels, by a poster which she has just prepared for the "woman's edition" of one of the evening papers, whose profit was to go to the Children's Aid Society and the Maternity Hospital. The poster, which is successfully simple in treatment, as such things should be, is simply a group of a woman and a child, but is good in coloring and far from much of that affectation which characterizes much of this class of work. It would seem that such a composition might be a relief to collectors from things like the Gayety Girl and the whirl and twist of much of Beardsley's and Bradley's work, or even much of the *chic* wickedness of the work of men like Cheret.

Whether Lincoln Park is to have an addition to its works of art, or gain some more material for a future chamber of horrors, time alone will show. Dr. Benjamin Franklin is destined to watch the electric light and to be gazed upon with patriotic emotions by those who frequent this very popular pleasure-ground. Dr. Franklin is to stand nine feet high, and having been modelled by the sculptor, Richard H. Park, of this city, will be cast in bronze and placed on a granite pedestal. Dr. Franklin will be too large to be conveniently hidden, so let us hope for the best till we know the worst.

A so-called work of art which was imposed upon an unsuspecting

public about twenty years ago is the Lincoln Monument at Springfield. In October, 1872, this monument was completed at a cost of \$206,500, all the money coming as contributions from children. It is now simply falling to pieces as it was from the first a sham and disgrace — a huge brick pile covered with a three-inch veneer of granite — which has of late become so unsafe that a thorough inspection has been ordered. The monument has been turned over to the State and an appropriation has been made of \$30,000 to put it in repair. The Governor, the State Treasurer and the State Superintendent of Instruction have been appointed as a Board of Trustees to care for it, and upon investigation this Board has found the monument such a wreck that it has advised that it be torn down, as all money spent in repairs would be simply thrown away. It is a comfort to think that this folly was perpetrated twenty years ago, and that there is a better understanding of matters artistic in America, and especially in the West, to-day than then, but such an outrage on good taste and decency makes one blush, and especially is it to be deplored that such a sham should have been erected in memory of a man whose crowning glory was his honest uprightness.

Apropos of the subjects of memorials, there is at present a most amusing discussion going on in Chicago over the to-be or not-to-be of memorial tablets in Jackson Park to mark the former resting-place of the great World's Fair buildings. To many it seems hard to imagine anything much more senseless or uninteresting than such tablets, and it is probable that the Park Commission will not encourage this final attempt to sentimentalize over the departed grandeur of ninety-three. It is somewhat surprising that one of the architects who helped create the beauty of the Fair should put himself on record as not in favor of the tablets, but as approving of the placing in the centre of the area covered by each building, of a "monumental Corinthian column, each on a pedestal." He further says, "This would give a straight row of four of these columns, marking the sites of the Transportation, Mines and Mining, Electricity and Manufactures Buildings, one in centre marking the Administration and two at the other side designating the sites of the Machinery and Agricultural Halls."

The whole plan seems most humorous, not to call it absolutely useless.

Another paltry three millions has been placed within the reach of the Chicago University. This is the largest sum ever pledged by one man for any educational purpose and makes a total of \$7,425,000 given by Mr. Rockefeller to this institution. One million is given outright and unconditionally, while the remaining other two millions are given on condition that the University raise a similar sum between now and the year 1900. Most decidedly the Chicago University will not suffer for want of endowment, but it is a very different matter to start from the foundation with a library, museum, observatory, laboratory, etc., rather than that these things should grow as there was a demand for them. Time will be necessary to mellow these gifts, and that Mr. Rockefeller cannot give; we must wait for that.

The lenses for the wonderful Yerkes telescope, destined for the observatory of this institution, are now completed. The building is to be situated at Geneva Lake, one of Chicago's summer suburbs, as it affords high land as well as a clear atmosphere. The refractor is the largest in the world, the object-glass being forty inches. Three years have been necessary for the casting of suitable glasses for the two lenses, many attempts being made before one was produced without flaws. The lens for the Lick observatory was thirty-six inches in diameter, and as large lenses bend with their own weight every inch adds to the difficulty of casting them. Since the glass was obtained in perfect condition, it has taken three more years to make it into lenses, it being first rough ground into the required shape and then further reduced by polishing. This was not rough labor suited to any rough hand and so a skilled optician has performed the greater part of the work. An aluminium tool was used; the surface covered with wax.

It was in the yard of the Cambridge workshop that the lenses were put in place and tested by two astronomers. They have been found to be perfect, with no bubble or flaw, with all the curves conformed to equations worked out before the work on them was ever commenced. They are to be packed and made ready for shipment on a sleeping-car, as the springs of a sleeper would ensure a safer journey than those of an ordinary car. One lens is of flint and the other of crown glass, as the two kinds used together are said to correct one another's defects.

The observatory is nearing completion. The building is in the form of a Latin cross, with three domes and a meridian-room at the extremities. The dome for the telescope is at the long arm of the cross at the western end of the building. This dome is ninety feet in diameter, while the tube of the telescope is over sixty feet long. The floor and dome will be moved by electric motors. Two small telescopes will occupy the two other smaller domes. The building is of gray Roman brick and will probably be completed before next spring.

Mr. Gathman, of this city, has long had the belief that a sectional lens telescope was the only practical system on which to build large telescopes. Accordingly there is some talk of putting this theory to the test in an instrument for an observatory at Mount San Miguel, Cal. If this should be successful, the result would be a telescope five times as large as the one at the Lick observatory and four times the size of the Yerkes instrument.

HEAT INSULATION.¹

ONE of the curiosities of heat insulation is the fact that many good non-conductors resemble snow in general appearance, wool and cotton for example.

Among artificial non-conductors (I shall call these artificial non-conductors) asbestos fibre, mineral-wool, pure infusorial earth, lime, magnesia, pure wood-pulp and many others resemble snow in appearance. A white surface radiates less heat than most colors, hence, all other things being equal, white seems the preferable color, at least for the outside surface of a non-conductor of heat. . . .

We to-day build most of our residences with the full knowledge that with the thermometer at zero on the outside, it will be comparatively few minutes until it will be zero in the inside unless we have big fires. I believe it perfectly practicable, and much more economical in the end, to so construct houses that extremes can easily be avoided both winter and summer.

If architects will demand heat-insulating bricks for the inner portion of walls, and non-conducting plastering and windows, that will largely prevent the passage of heat, they can easily be furnished. Mineral-wool filling is very efficient in frame houses.

For preventing water-pipes from freezing, for insulating ammonia pipes, etc., in refrigerating plants, and for all similar low-temperature work, materials made of animal or vegetable fibres are, except in special cases, more efficient and satisfactory than any mineral substance. They are cheaper, easier to manipulate and being not so easily broken, they are at low temperatures, usually more permanent than mineral coverings. . . .

As already hinted, the first attempts at clothing steam-heated surfaces were by trying upon them the same kind of materials used in our clothing; it was soon found that when animal or vegetable fibre is applied direct on such surfaces the heat gradually chars and destroys them; this drove parties, both in this country and Europe, to attempt the use of mineral substances only, and many patents were taken out on various applications of clays, lime, etc. These were unsatisfactory, and the next step was the mixing of hair and vegetable substances with these minerals, and a large number of patents were taken out on these combinations.

These were a great improvement, but the fibre burned out, and the need of a fibre that would not burn caused resort to asbestos, and a half hundred or more patents were taken out in this country on different combinations of asbestos cement alone. The next step was the plan of John Ashcroft, of New York, of forming an air-space next to the hot surface; this, while it adds to the permanency of asbestos cement work, is not so good a non-conductor as is generally supposed; one inch of air being to an inch of hair-felt about as thirteen to one hundred. The principal office of air strata or cells is to interrupt the heat waves, and as small strata or cells as can be conceived of do this almost as efficiently as a much greater thickness of air.

To Mr. John C. Reed, of this city, now superintendent of the Standard Manufacturing Company, belongs the credit of, in 1875, first originating a practical sectional covering.

Almost all the coverings now being made by reputable manufacturers are good non-conductors, and the question of their relative non-conducting power is not nearly so important as is the question of permanency.

In addition to the reputed tests so largely advertised, experiments have been carried out in the engineering department of a number of our leading colleges, to determine the heat-insulating power of different classes of coverings, and the results announced have been very conflicting. Most of the tests have been by condensation, in substantially the same manner as follows: from the main pipe there branches a number of smaller pipes of the same size and length, each insulated with a different covering; the free end of each pipe is lower than the main, and the water is drained from each and weighed to determine the relative condensation in a specified time, the condensation in the main pipe being drained off separately. A carefully conducted test at the University of Michigan, under the direction of Professor Cooley, showed in favor of hair-felt. A similar test at our Pennsylvania State College showed mineral-wool to be the best non-conductor; and while I have not the report I have been credibly informed that a test at Cornell University showed wool-felt lined with asbestos paper in a favorable light. In some of these tests asbestos coverings have come out ahead, and magnesia in others.

Many of these tests have been conducted by gentlemen of reputation and honor, and were doubtless thoroughly honest. My experiments have shown that different pipes, all insulated with the same material, will at times show, by condensation tests, almost as varied results as the college tests have shown in pipes covered with different materials. More water may be carried from the main with the steam into some pipes than into others, and there are many things that may modify the result of such tests.

The average results of all these experiments, coupled with my continuous experience in the business these many years, and with twenty-five or thirty different varieties of material, convinces me that coverings can be made either of hair, wool, asbestos, wood-pulp, mineral-wool, infusorial earth, carbonate of magnesia, chalk, gypsum

and compounds of these and other materials, that will all be so nearly alike in non-conducting power that a slight change of condition will turn the scale for or against either.

While there is question what particular covering may save a few heat units more than some other covering, there is no question about the great difference in loss from a bare boiler as compared with an insulated one.

The experiments of Peet give the following as the conducting power per square foot of four materials, difference of temperature 1° Fahrenheit:

Copper.....	515,000 heat-units per hour.
Iron.....	233,000 " " " "
Ordinary stone.....	13,640 " " " "
Powdered chalk.....	.869 or less than one heat unit.

Hence, copper conducts 593 times as much heat as the chalk, iron 268 times as much, and even ordinary stone 15 times as much; hence, why should covering manufacturers quibble so much about a half-dozen heat units of difference when the difference between the covering and the iron steam-pipe is counted by hundreds of heat units; of course, poor non-conductors must not be used, as their necessary thickness will so increase the radiating surface as to neutralize their non-conducting power. I purposely used chalk in illustration, because it is very similar to the three materials that are being most largely used in combination with asbestos in making high-temperature coverings—these are infusorial earth, carbonate of magnesia and gypsum, each dependent for its strength largely upon the asbestos incorporated with it.

Porosness is one of the necessary qualities of good non-conductors, and this porosness necessarily tends to weakness, hence clothing for steam-pipes, like the clothing we wear, is liable to wear out. Means for counteracting this natural weakness and for making coverings permanent, is the one thing now needed. I am thoroughly convinced that there is only one practicable way to render coverings really permanent, and that is to strengthen them by reinforcing with iron. Iron can be so incorporated in the body of the covering that the atmosphere cannot reach it; the life of iron thus protected from the atmosphere is almost unlimited, and thus situated it will hold the covering in place indefinitely, making it really permanent.

I have known this a long while, but I have never been able to introduce it to the public on account of the largely increased cost; when I increase my price enough to justify this improvement, other parties get the contracts, but the paying of this additional cost is, in the end, the very best of economy, for coverings thus strengthened with iron will last five or six times as long as any of the coverings now in general use. The iron, being protected as indicated, need not be of sufficient thickness to affect the non-conducting qualities of the covering.

A high degree of permanency is attained by using one-inch thick of any of the well-known mineral coverings, and outside of this from a half-inch to an inch of wool-felt paper, made into solid tubes and securely fastened over the mineral coverings.

Felt-paper pipe-coverings, while excellent non-conductors, have heretofore failed of permanency because they were placed so near the hot pipes that they were gradually burned up. With an inch of good mineral insulation next to the pipe, this charring weakness of the felt paper is entirely overcome, and the paper tubes being very strong will, if properly fastened, hold the magnesia, asbestos, or other mineral covering in place two or three times as long as it would otherwise remain.

Less than an inch of mineral under the paper will not protect it, hence this plan means substantially two coverings and adds materially to the cost, and I do not believe it is possible to make heat-insulating coverings permanent without making the first cost more than it has heretofore been, but by increasing the cost they can be made permanent.

If, gentlemen, I have convinced you that it will pay to increase the first cost and make heat-insulating coverings permanent, I will have benefited all parties concerned.



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

THE DUQUESNE CLUB-HOUSE, PITTSBURGH, PA. MESSRS. LONG-FELLOW, ALDEN & HARLOW, ARCHITECTS, BOSTON, MASS.

[Gelatine Print issued with the International and Imperial Editions only.]

PLANS AND ELEVATION OF THE SAME.

HIGH SCHOOL, EMPORIA, KAS. MR. HARRY W. JONES, ARCHITECT, MINNEAPOLIS, MINN.

DESIGN FOR FREE PUBLIC LIBRARY AND INDUSTRIAL TRAINING SCHOOL, HOBOKEN, N. J. MR. JAMES ROSS, ARCHITECT, YONKERS, N. Y.

¹ Extracts from a paper by Mr. J. A. McConnell read before the Engineer's Society of Western Pennsylvania, September 19, 1896.

THE OLD GOVERNOR BROOKS HOUSE, MEDFORD, MASS. MEASURED AND DRAWN BY MR. A. C. FERNALD, BOSTON, MASS.

[Additional Illustrations in the International Edition.]

THE ENTRANCE HALL: DUQUESNE CLUB-HOUSE, PITTSBURGH, PA. MESSRS. LONGFELLOW, ALDEN & HARLOW, ARCHITECTS, BOSTON, MASS.

[Gelatine Print.]

LADIES' DINING-ROOM IN SAME BUILDING.

[Gelatine Print.]

MAIN DINING-ROOM AND ASSEMBLY-HALL IN THE SAME BUILDING.

[Gelatine Print.]

ENTRANCE FRONT, ST. KEVERNE, HARROW-ON-THE-HILL, ENG. MR. ARNOLD MITCHELL, ARCHITECT.

GARDEN FRONT, ST. KEVERNE, HARROW-ON-THE-HILL, ENG. MR. ARNOLD MITCHELL, ARCHITECT.

DESIGN FOR A CREMATORIUM. MESSRS. TARBOLTON & TUGWELL, ARCHITECTS.

This design was prepared for a sloping site, and the crematorium proper is therefore placed below. The coffin or asbestos shell rests on a marble bier in the centre of the chapel, and from this is carried to the chamber on the left, which is shut off completely by double self-closing doors. An attendant at the head of the secret stairs allows the body to slide direct into the furnace, where all fumes and gases are twice burned, rendered transparent and permitted to escape from the *fleche*. The ashes of the body are collected and at a given signal taken from the chamber. By placing the furnace below and shutting it off completely (by means of fireproof construction), the possibility of fumes entering the church is obviated. The mortuary is provided to meet the case of two bodies being present at one time, and the ecclesiastical character of the building is to permit of a religious service being performed.



ATLANTA, GA.—Cotton States and International Exposition: September 18 to December 31.

BOSTON, MASS.—Loan Exhibition; Gobelin Tapestries; Japanese Paintings; Line Engravings, Mezzotints and Etchings by Rembrandt: at the Museum of Fine Arts.

Triennial Exhibition of the Massachusetts Charitable Mechanic Association, including Art Exhibition and Special Poster Show: October 2 to November 30.

Paintings from the Paris Salons of 1895: at the Jordan Art Gallery, 450 Washington St. opened October 14.

Photographs of the Work of Burne-Jones: at Walter Kimball & Co.'s Gallery, 9 Park St.

Egyptian and Venetian Sketches, by Hamilton Emmons: at J. Eastman Chase's Gallery, 346 Boylston St., November 19 to December 3.

Drawings made for the "Ladies Home Journal": at the Boston Art Club, November 16 to 28.

Vinton's Portrait of Archbishop Williams: at Williams and Everett's Gallery, 190 Boylston St.

Annual Exhibition of the Boston Art Students Association: at the Grundmann Studios, Clarendon St., November 19 to 27.

BRIDGEPORT, CONN.—Exhibition of Artistic Posters: at the Public Library, November 9 to 30.

CHICAGO, ILL.—Eighth Annual Exhibition of Oil-paintings and Sculpture: at the Art Institute, October 22 to December 8.

NEW YORK, N. Y.—Twenty-ninth Semi-annual Exhibition, including Loan Exhibition of Early American Paintings, Old English Paintings, and the Cullum Collection of Classic Sculptures: at the Metropolitan Museum of Art.

Turner's "St. Mark's Place, Venice," also, Paintings by other English Artists: at the Avery Galleries, 368 Fifth Ave.

Loan Exhibition of Portraits: at the National Academy of Design, October 30 to December 4.

Sixth Annual Exhibition of the New York Water-color Club: at the Galleries of the American Fine-Arts Society, 215 West 57th St., November 11 to 23.

Flowers in Water-color, by Paul de Longpre, also, Butterflies of all Nations: at the American Art Galleries, Madison Square South, opens November 28.

PHILADELPHIA, PA.—Autumn Exhibition of the Philadelphia Art Club: opened November 18.

Works by Swedish Artists: at the Pennsylvania Academy of Fine Arts.

PITTSBURGH, PA.—Loan Collection of Paintings: at the Carnegie Library, during November.



PORTCHESTER CASTLE.—It was not without emotion that we thus steamed through the wooden and the iron walls of England to reach the picturesque ruins of those old stone walls that stood in bold relief before us. These walls form a square enclosing rather more than eight acres of ground. Part of the moat and places outside the wall still remain, but a good deal of it has been swept away by the tide. They were built, for the most part, of flint stones set in frames and held together by hot cement, which, on cooling, became harder than stone. The small Norman gateway, which faces the water, seems to have been inserted into a larger Roman entrance. At another, the western entrance, there are traces in carved stone of a cock, a cat, an owl and a bat. Now these animals are all sacred to the goddess Minerva. They typify watchfulness, sagacity and foresight. Where, within the castle walls, now stands the church, stood a Roman temple, though there is no evidence to show to what god the temple was dedicated. Doubtless, the Druids had previously worshipped where the Romans built their temple. Thus for more than two thousand years has poor humanity, "the child of doubt," prayed on this spot, first according to one creed and then according to another creed. This church is well worth careful contemplation. We do not know the exact date of its construction, but we know that it was in existence in 1133, because at that date Henry I founded a priory of Augustine canons within the castle. Nothing of the priory now remains save the trace of the doors in the wall of the church by which the monks could enter without mixing with the general congregation. Also the church is built according to the style of the early Christian architects, which preceded the introduction into England of the pointed Gothic style. The western door is especially remarkable with its circular arch and mouldings. From four short pillars start several circles. They rest on Ionic or Composite capitals, and are thoroughly characteristic. Within the church there is an opaque marble font of great archaeological interest, and some more very well-preserved specimens of Norman columns and arches. As a curiosity, there is the marble bust of Sir Thomas Cornwallis, Knight, groom-porter to Queen Elizabeth and James I, who died in 1618. The sculptor seems to have forestalled the colored muslin or other material with which flowers and other objects are made to-day, and that foretells the weather by changing color. He painted the face of the bust a sort of red, and this in such a manner that the paint was rendered permanent; but the color is more or less intense according to the dampness of the weather. Thus the good folks of the congregation have only to watch the complexion of the statue to tell whether it is going to rain. The citadel and the baronial residence are on the northwest angle of the fortress. The roofs have all disappeared save that which covers the citadel. These ruins are, however, very picturesque, and there is much to interest architect and archaeologist. Windows and doorways, battered and shattered, some half filled up with earth, still retain much of their former ornamentation and beauty. Nature, by shielding a portion of the walls with an abundant growth of ivy, adds a rich, sombre, green coloring to the scene. Enough remains to give a very clear idea of the fortress, such as it used to be when it was one of the defences of the country. The importance of the place may be gathered from the fact that it was part of the dowry given in 1291 by King Edward, of England, to his wife, Margaret, the sister of Philip le Bel, of France. There is record of the various constables appointed to govern the castle by different kings of England; and it was at the priory, within the castle, that in 1445 Henry VI of England married Margaret of Anjou. In 1539, however, when monastic institutions were dissolved by Henry VIII, the estate around and belonging to the castle was granted or sold to a certain John White, Esq., and became by inheritance private property, first of the Whitehead family, then the Nortons, and finally the Thistlewaytes. Queen Elizabeth caused, however, the fortress to be repaired, held her Court there on several occasions, and her coat-of-arms is still preserved in the church. It was only after Elizabeth's reign that the castle itself, being judged no longer of any use for defensive purposes, became private property. The State has, however, on several occasions, hired the castle to convert it into a place of retention for prisoners of war. As many as 7,000 French prisoners have been confined in these antique buildings: the great Tallien himself was conveyed a prisoner to Portchester Castle when he was captured on returning from Napoleon's Egyptian campaign, as also Gen. Baraguay d'Hilliers, one of Napoleon III's most esteemed officers. In 1814 the castle ceased to be a military prison, and now it is the scene of many a picnic and pleasant holiday. Where Briton, Gaul, Celt, Roman, Saxon, Goth and Norman fought, where French and Dutch prisoners languished for years, now the children of numerous school treats come and play amid

"The gray but leafy walls, where ruin greenly dwells."

—Adolphe Smith, in the Philadelphia Telegraph.

PLACES FOR PRAYER.—The late Dean Stanley used to relate that a gentleman once called to tell him that he had been into the Abbey, and had knelt down to pray, when the verger had come up to him and told him he must not kneel there. On asking why not, the verger said: "Why, sir, if I was once to allow it, we should have them praying all over the place." This recalls the gentleman visiting a church, and asking the sexton whether people ever used it for private prayer, to which he replied: "I ketch'd two of 'em at it once."—Argonaut.

LIQUID AIR IN COMMERCE.—An interesting illustration of the rapidity with which purely scientific discoveries frequently become the starting point of new industries is furnished by the case of liquid air. It is no long time since liquid air was produced for the first time in quantities great enough to admit of its application for purposes of research; yet steps are already being taken to treat liquid air as an article of commerce and to turn it out upon a large scale. As in most cases of the kind, laboratory methods require modification to suit the needs of wholesale production. Patents are being taken out for machinery which, though constructed upon the principles of that used for purposes of research, will attain the desired end with greater directness and with the omission of several intermediate steps. The necessary reduction in temperature to the critical point of air has hitherto been affected by the successive employment of liquefied gases boiling at lower and lower points on the scale. But the final decrement of heat has been won by the cooling effect due to the rapid evaporation of the product itself. The new apparatus dispenses with the use of these intermediate cooling agents and relies entirely upon initial compression by powerful engines and subsequent partial expansion of the compressed air under carefully regulated condition. Most people probably have seen at one time or another the familiar lecture-room experiment of forcing a piston suddenly down a cylinder, and showing the ignition of a scrap of touch-paper by the heat thus produced. If while the compression is maintained the cylinder and its contained air be cooled to the original temperature, then, on suddenly withdrawing the piston and allowing the air to regain its original volume, there will be a fall of temperature corresponding to the rise on compression. If now the cooled air could be used to reduce the temperature of a second quantity of air before expansion, it is evident that, starting from the lower point than the first batch, the second would on expansion reach a lower point. This is the principle of the new liquid-air apparatus. A powerful engine compresses air, which is cooled as far as possible by ordinary refrigerating methods, and passed into a spirally coiled pipe, over 100 yards long. This pipe is enclosed in a second spiral. By means of a throttle-valve at the end of the inner spiral a certain proportion of the compressed air is allowed to expand in the space between it and the outer pipe. Thus the stream of compressed air from the pump is cooled by that portion which has been allowed to expand, and arrives at the throttle-valve in a colder state than the portion that preceded it. Consequently it reaches a still lower temperature on expansion, cooling yet more powerfully the advancing stream in the inner tube. By carrying this cumulative cooling effect sufficiently far, the circulating air is at last brought down to its critical point and liquefies, after which a continuous stream of liquid air is merely a question of engine power. It is impossible without the aid of diagrams to explain clearly how the continuity of the process is maintained, but the cycle of operations can be readily apprehended. There is compression, expansion in a closed chamber, and utilization of the cold thus produced to repeat the cycle from a lower initial temperature. The inventor, Herr Linde, who is a man of great experience in refrigerating machinery and methods, believes that a large demand will shortly arise for this most powerful of all refrigerators. In the meantime his apparatus produces with the greatest ease a substance for which there is already a large industrial demand—oxygen gas. During the process just described the air becomes steadily richer in oxygen until that gas forms some 70 per cent of the product. This relatively poor oxygen is sufficiently good for certain purposes, and it may be further purified from nitrogen if desired. The price of oxygen gas thus obtained compares favorably in respect of cost with that produced by the methods now in use. It would have been gratifying to have been able to announce that this commercial application of recent scientific ideas, so closely associated with the Royal Institution, had been made in England. But, unfortunately in this, as in so many other cases, it has been "made in Germany," where there is at present far more alertness and a far higher standard of technical knowledge than among ourselves. It is obvious from what has been said that this process is an affair of engineering far more than of chemistry. This remark applies to many of the most important and lucrative manufacturing processes of the day, and, unhappily, engineering chemistry, or chemical engineering, is just one of the things in which the Germans are conspicuously superior. — *London Times*.

M. NENOT, MEMBER OF THE ACADEMIE DES BEAUX-ARTS.—The Académie des Beaux-Arts has just elected M. Nenot, architect of the new Sorbonne, to a chair in the Section of Architecture, left vacant by the death of M. Ancelet. The honor was warmly disputed by four candidates, well known as distinguished architects, MM. Nenot, Guadet, Sédille and Dutert. Despite the first series of votes in favor of M. Guadet, the final result was carried off by M. Nenot by a majority of three votes. The new member of the Academy is young for the distinguished position which has been conferred upon him, being only 42 years of age. Entering the École des Beaux-Arts at the age of 17, his studies and talent enabled him to carry off the Prix-de-Rome in 1877. In 1882 M. Nenot obtained the first prize in the competition opened by the Italian Government for a monument to Victor Emanuel; but the monument remained unexecuted owing, it is said, to the jealousy of the Italian Government against a Frenchman carrying off the first prize. But several months later this young architect, at the age of 29, obtained the first prize in the competition for the reconstruction of the Sorbonne, and was intrusted with the work of executing what is now one of the finest monuments at Paris. Unfortunately, a thoughtless youthful exploit at the commencement of his career was nearly the cause of spoiling his future, and was for a long time the source of much trouble to the rising architect. Returning from a hunting party, he thoughtlessly discharged his gun at an old cross on the border of the wood; an eye-witness accusing him of sacrilege was the cause of a condemnation to two months' imprisonment, his discharge from the army, and the loss of his military medal which he had won by exceptional deeds during the siege of Paris. The condemnation gave rise to much noise, and the Government, admitting it to be

excessive, at length reduced the punishment to a simple fine; but the fact of the condemnation weighed heavy, and was for a long time the source of much disagreeableness and difficulty with the various administrations of fine arts. The young architect's courage and talent, however, at length won him great favor, and the Government decided to decorate him; but the condemnation of the Tribunal of Chartres remained an obstacle to this honor, the military rehabilitation not having been made. However, in 1885, a special order was made for rehabilitation, and M. Nenot was decorated with the Légion d'Honneur. — *Building News*.

THE PHONOGRAPH AND DEFECTIVE MACHINERY.—An interesting instance of the diversified uses of which the phonograph is capable is afforded in a recent experience by the Knowles Steam Pump Works, of New York City. The company had put up one of its large pumps for the Ricks Water Company at its pumping station at Elk River, Cal. After several years of use something evidently went wrong with the pump, and in a letter of advice to the works regarding the trouble, which took the form of a phonograph cylinder, advantage was taken of the cylinder to record the sounds of the pump in running, precisely as the stethoscope is used by the physician in examining the action of the heart or lungs of the human body. The manager of the water company spoke into the phonograph receiver, describing the symptoms of the ailing pump, and then moved the receiver so that the pulsation of the pump would be recorded on the wax roll. When the cylinder is put into the machine in New York the voice of the Californian is heard first, giving in a clear, precise and distinct way the symptoms of the pump, and then he asks the listener to pay attention to the pump's action. The experiment proved absolutely successful, and by means of the roll the disease was diagnosed. The proper remedy was suggested, and the pump is running once more, and the time and expense of sending an expert from the works to California was saved. — *Philadelphia Record*.

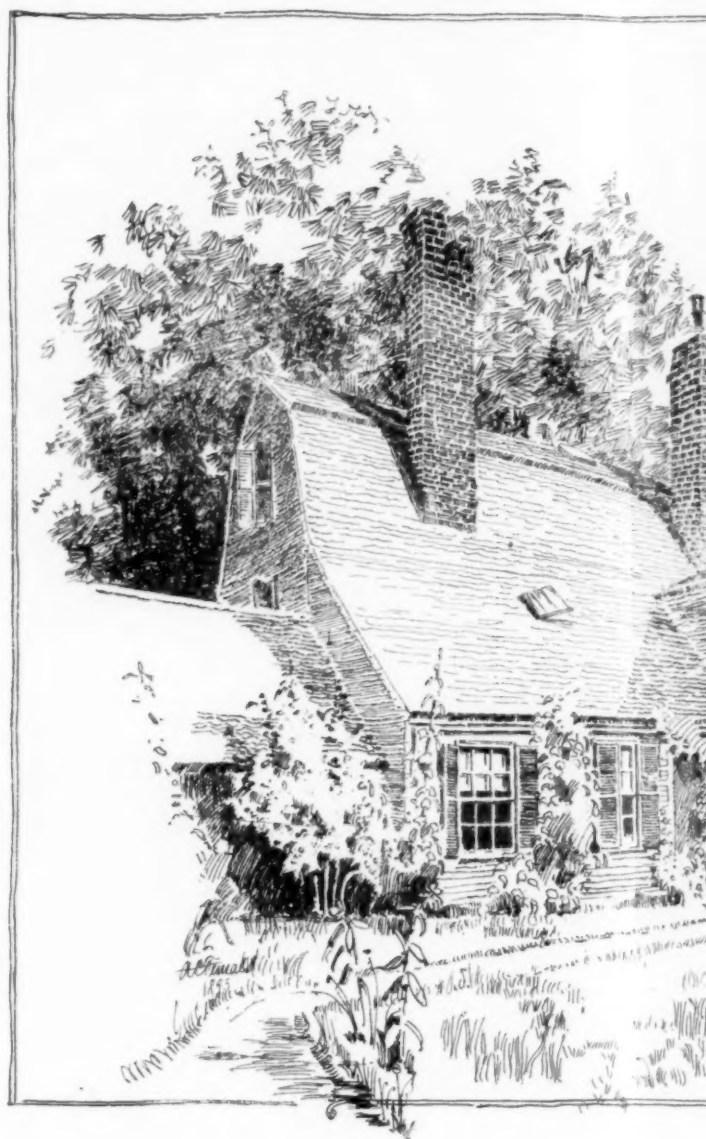
THE WORKING OF THE ORACLE.—A guide at the Washington capitol makes this suggestion: "I ain't much on mythology," continued the old guide, "but here is a yarn I sometimes tell to a parcel of school-ma'ams when I guide 'em through the capitol. It don't take with the average run of brides and bridegrooms, which is our support during the season. They ain't interested in ancient history; they're snoring up to date, right up to the hour. I've got on good authority that the old hall of Congress, what's now Statuary Hall, was copied from the sanctuary of one of the Greek oracles—probably the one at Delphi. This here oracle used to give out some very reliable information, which was just as good as gospel writ with the Greeks. A few of the old guides up here know a neat little trick about acoustics. They put a man on a certain stone a certain number of feet from the statue of Ethan Allen. Then they place another man in a certain position behind a pillar where the first man can't even get a glimpse of him. When the man that's standing behind the pillar begins to talk in a low voice the man on the stone will swear that it is the statue talkin'. It is simply a freak of the acoustics, but I reckon that's the way the oracles were worked." — *Washington Post*.

AN ENTIRE ROMAN HOUSE DUG UP.—Rome is really an inexhaustible mine to the lover of antiquity. Almost every day, says our correspondent there, new discoveries are announced, while almost any spot repays excavation. Lately, in Via della Sette Sale, near the Colosseum, and next to the ruins of the Baths of Titus, while digging was being carried on at some foundations, there came to light, at the depth of twenty-six feet, an entire Roman house with black and white mosaic floors, and with some remains of the subdued polychrome decoration for which the house of Livia on the Palatine is celebrated. The walls are frescoed with garlands of flowers, with cocks in the centre. It seems to be the remains of a residence of the Praefectus urbis, the situation of which corresponds to the locality in which the ruins have been discovered. Almost at the same time, in the vicinity of the Piazza della Carrette, near the Roman Forum, there have been unearthed, sixteen feet deep, some private baths of considerable extent, with passages paved with large pieces of basalt, similar to those of the antique Via Sacra. — *London Daily News*.

TIBERIUS PLEASURE GALLEY.—News comes from Nemi, near Albano, that by private enterprise two divers are exploring the bottom of the Lake of Nemi, where lies the pleasure galley which served as a retreat for the Emperor of Tiberius during his orgies. Our Rome correspondent says: "In the fifteenth century Cardinal Colonna, owner of the Castle of Nemi, now the property of the Orsini, tried to recover the galley, but without success. At the beginning of our century, the effort was again made and some large bronze nails were brought up from the lake. The present explorers have seen the galley, called the Palace of Tiberius, at about eighty feet from the bank, and, although damaged by age, it still appears much decorated with bronze, and mosaics. Heads of bronze, a wolf and lion, targets adorned with inscriptions, rings for docks, and other objects of immense archaeological value have already come to light." — *London Daily News*.

PROPOSED DISENTERMENT OF THE SCULPTOR DAVID.—David, the painter's body, lies buried in Brussels, where he was obliged to take refuge after the fall of Napoleon on account of his share in the Reign of Terror. It is proposed now to transfer the body to Paris, where his heart is already buried. — *Exchange*.

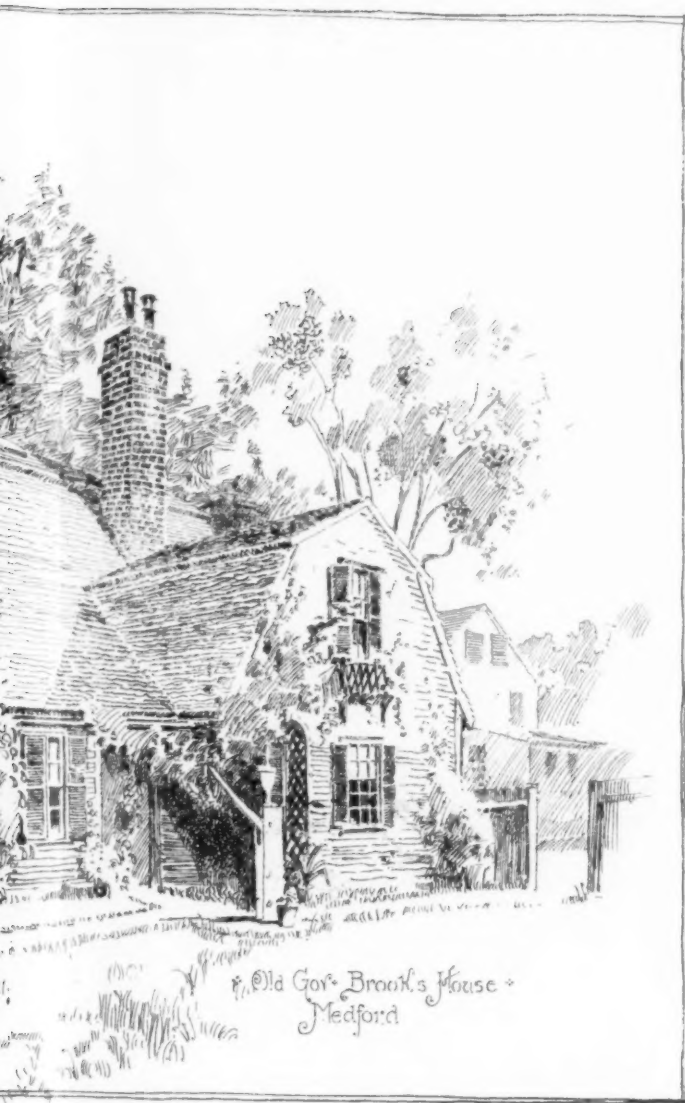
INJURY TO METZ CATHEDRAL.—The hurricane of the night of October 4 is said to have wrought great damage to the Cathedral of Metz. The sculptures were much injured, the pavement being strewn with fragments, and a considerable part of the copper roofing of the nave was torn off. — *Exchange*.



East Elevation

• Old Gov. Brook's
Medford, Mass.
Built About 1764

MEASURED AND DRAWN BY ALBEN



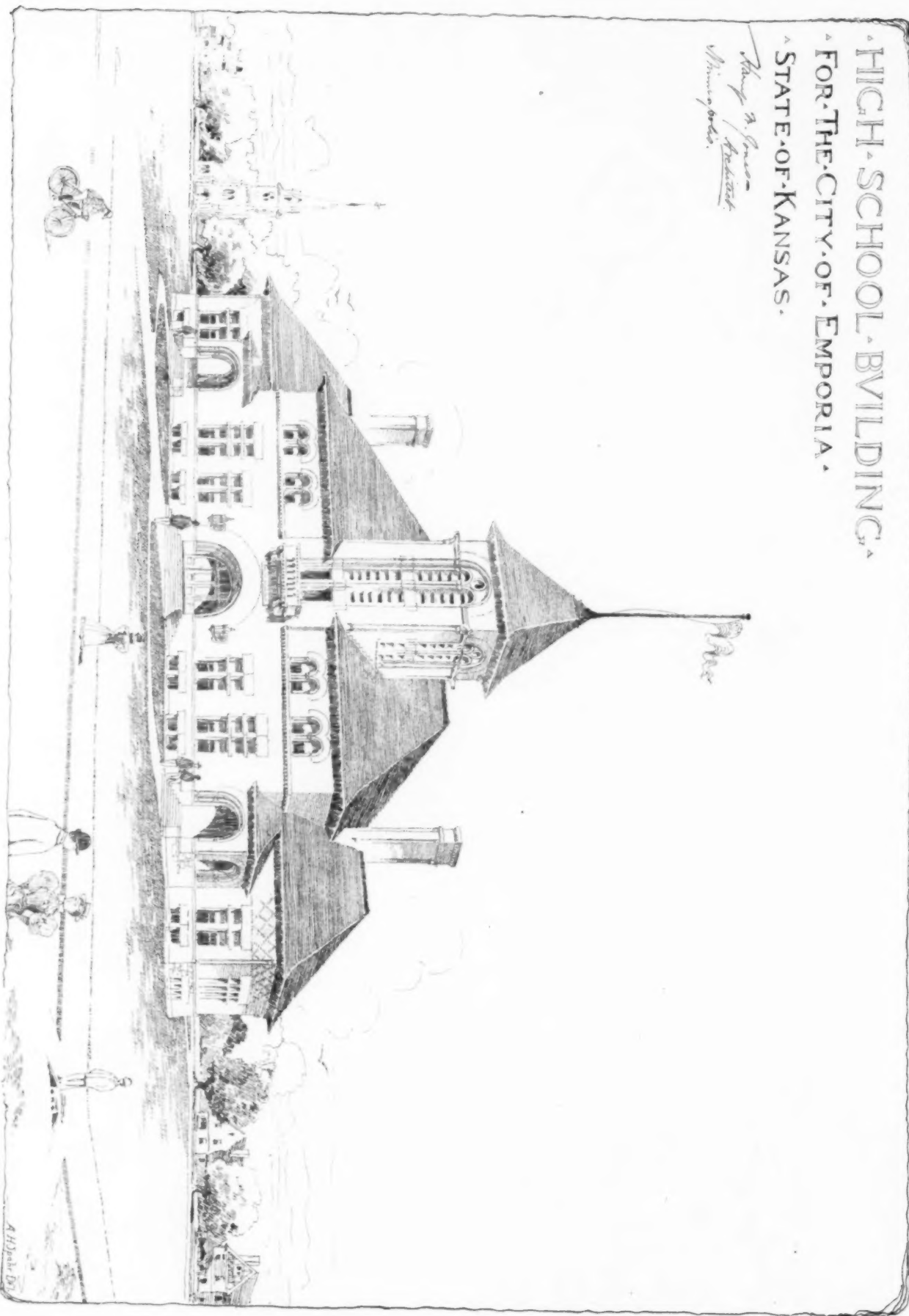
Gov. Brook's House +
Medford, Mass.
About 1764

DESIGNED AND DRAWN BY ALBERT C. FENNELL
1/4" = 1' SCALE

COPYRIGHT 1895 BY THE AMERICAN ARCHITECT & BUILDING NEWS CO.

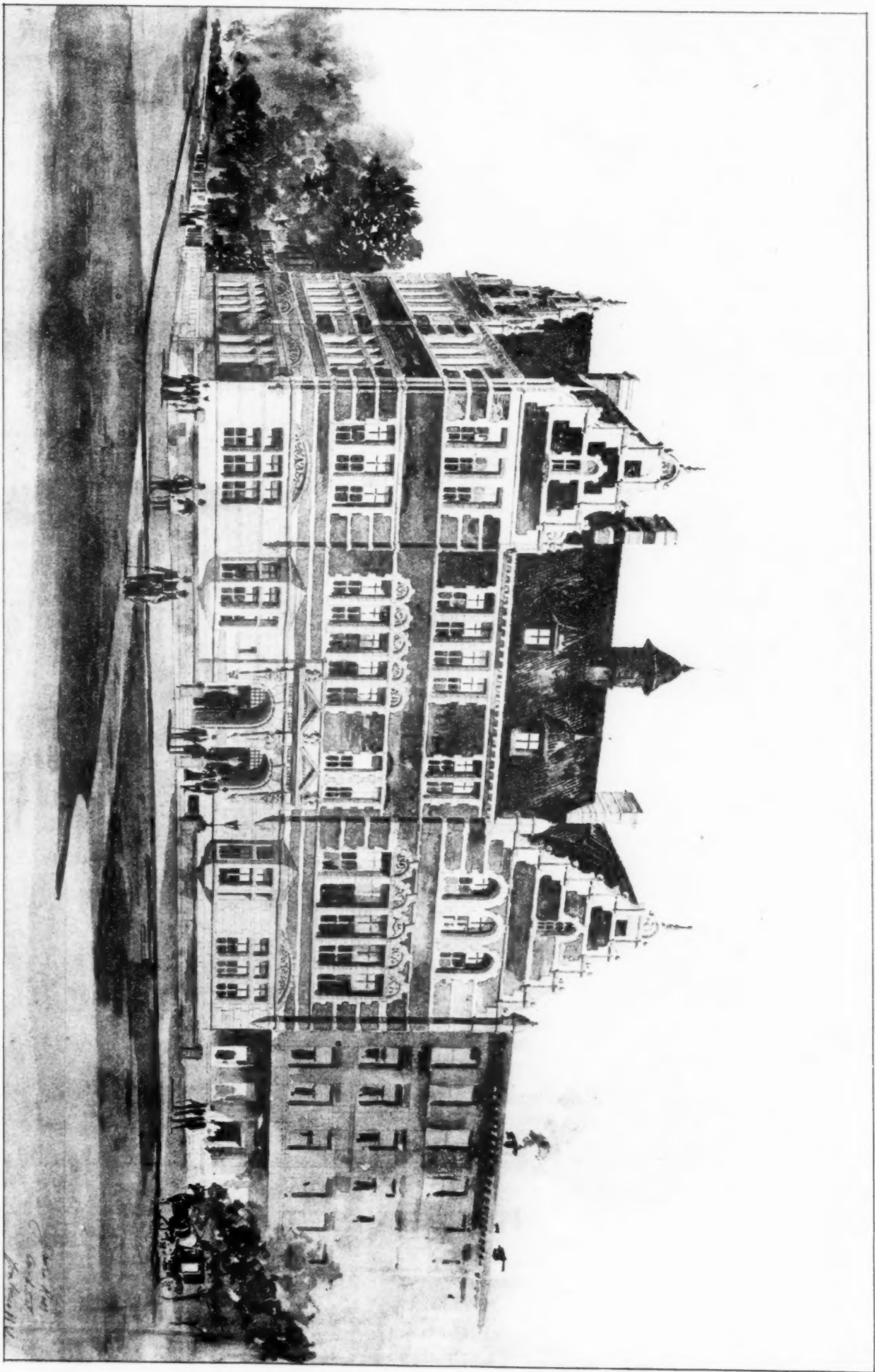
HIGH SCHOOL BUILDING,
FOR THE CITY OF EMPORIA,
STATE OF KANSAS.

By J. Ross,
Architect,
Emporia, Kansas.



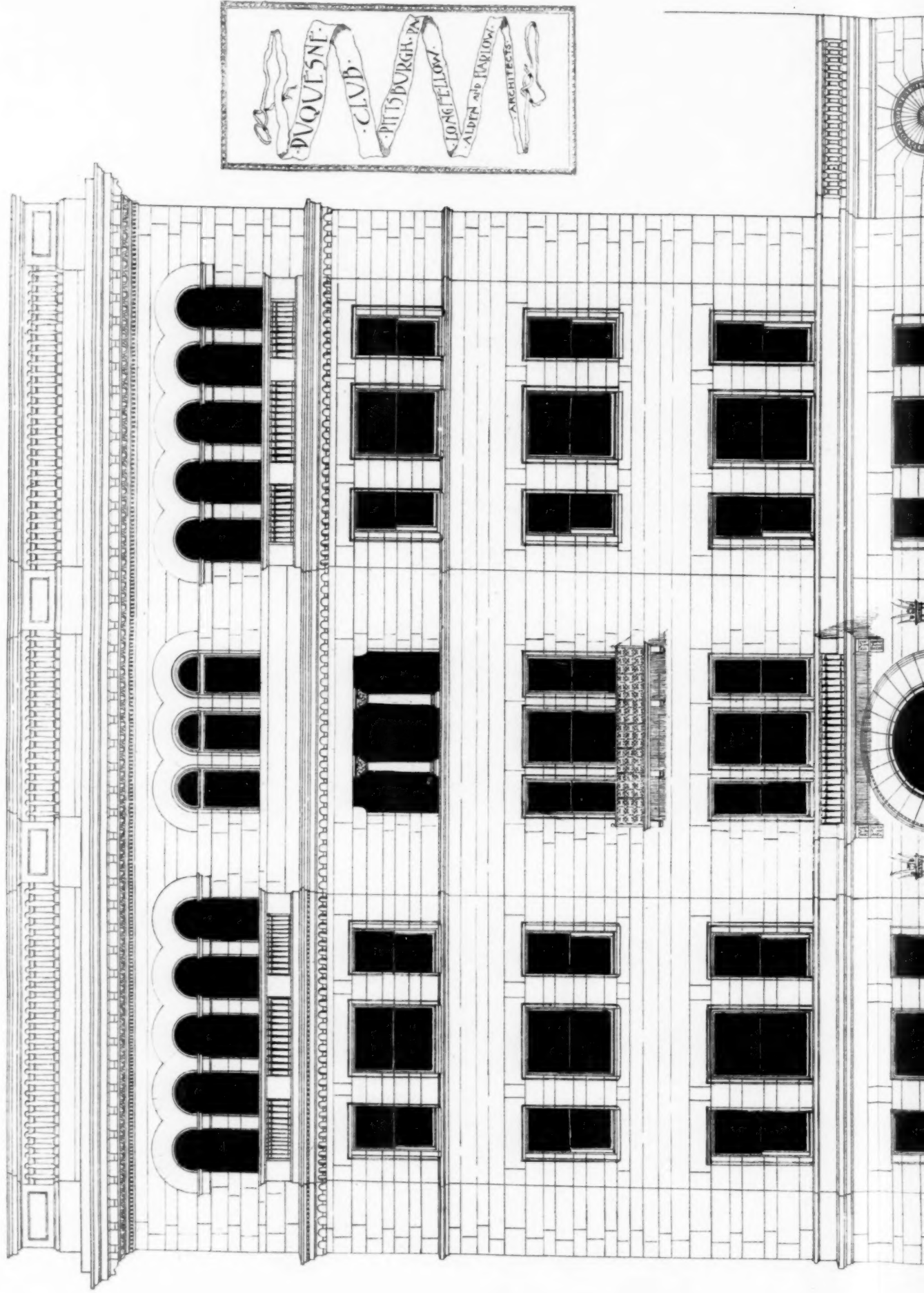
ALFRED J. HAYES, ARCHT.

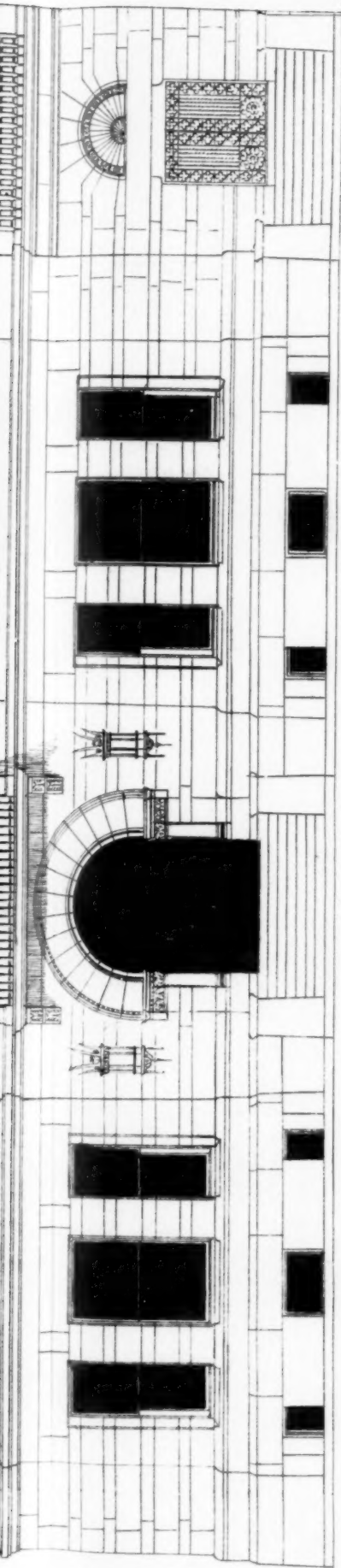
COPYRIGHT 1895 BY THE AMERICAN ARCHITECT & BUILDING NEWS CO.



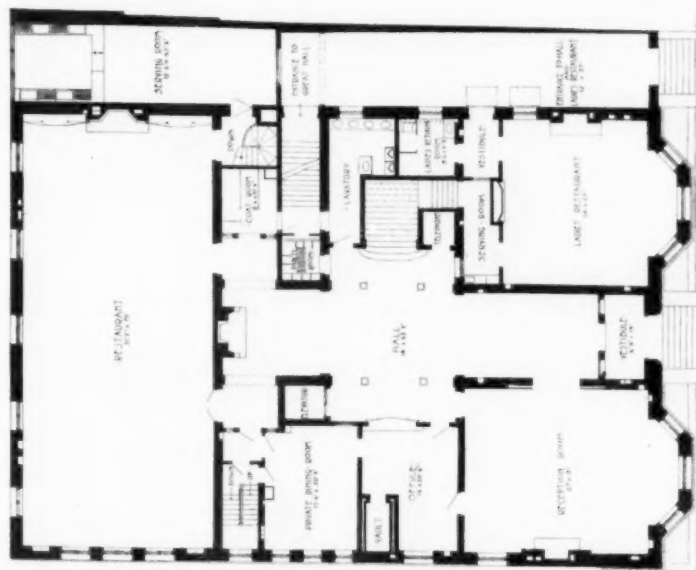
DESIGN FOR FREE PUBLIC LIBRARY AND MANUAL TRAINING SCHOOL, HOBOKEN, N. J.
JAMES ROSS, Architect.

REPRODUCED BY THE AMERICAN ARCHITECT & BUILDING NEWS CO.





BASMENT PLAN



FIRST FLOOR PLAN



FOURTH FLOOR PLAN