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ARCHITECTURE

ENGINEERING

DECORATION

CONSTRUCTION

211 TREMONT ST.

BOSTON MASS.

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ILLUSTRATIONS.

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS

THE bill before the Massachusetts Legislature, providing for a subway under Tremont Street, with, perhaps, branches in other directions, has been disposed of, apparently in deference to the opinion of some twelve thousand citizens and tax-payers, who joined in an earnest protest against the scheme. Unfortunately, however, as it seems to us, the Legislative Committee has joined with its unfavorable report on the subway plan a strong recommendation in favor of granting extensive franchises to a corporation using a new sort of single-rail elevated structure, and allowing it financial privileges which seem very little in accord with ordinary prudence. Concerning the Tremont Street subway scheme, our opinion has always been that it contemplated the expenditure of an amount of money quite inadequate to the results to be accomplished. Of all routes in Boston for an underground passageway, the line of Tremont Street is perhaps the least suitable. In practice, there would be only three points on the line where passengers could alight and climb to the upper air. One of these would be at Warrenton Street, one at West Street, and one at Scollay Square. Between those points, the tunnel could just as well be in the depths of the sea as under Tremont Street, and both Scollay Square and Warrenton Street are places which have no importance in themselves, except as being points where several converging surface lines meet. Of course, the idea of connecting these meeting points is the fundamental one of the subway, but why they should have to be connected by a route under a crowded street is not so apparent. No doubt, at certain hours of the day a large percentage of the passengers, coming in either direction, would alight at West Street, but these might just as well reach West Street, from Bowdoin Square or the Northern stations, and from Warrenton Street or Park Square, by a tunnel built under Beacon Hill and the Common, where it would neither disturb or undermine anything on the surface, nor be itself obstructed by sewers and pipes, as by one cut through the infinite maze of sewers, gas, water and electric conduits in under Tremont Street, at the risk of undermining and destroying many million dollars' worth of buildings along the route.

HOW far an elevated railway will prove preferable to the proposed subway remains to be seen. While we think that a tunnel under Beacon Hill, from Causeway Street to Park Square, with a station at the West Street gate of the Common, would, while a very inexpensive affair in comparison with the subway, be of immense benefit to the city, there is no doubt that more rapid communication on what may be called radial lines, diverging from Park Square and Causeway Street, will soon become also necessary, and, as tunnelling for these lines would be impracticable, an elevated road furnishes the only other available solution of the problem. Our own prejudices tend rather strongly against the Meigs system. This employs a single line of posts carrying three rails. Two of these run at the sides of the posts, one line on each side, being thus separated by a distance of five or six inches. The wheels of the locomotive, or other motor, are set at an angle with the horizon, forming nearly a V, and, of course, running on these rails. On the top of the posts, between the upper portion of the arms of the V, is another rail, which is gripped by small horizontal driving-wheels. These driving-wheels are pressed against their own rail by hydraulic power, or some similar force, which take the place of dead weight in securing the adhesion of the drivers to the rail; and the car, the body of which runs above the upper rail, is thus towed along by the movement of the driving-wheels on the upper rail, and kept from falling over on either side by the inclined wheels running on the lower rails. Although the equilibrium of the car, under unfavorable circumstances looks to the uninstructed eye doubtful, the system has the great advantage that the posts and rails would cast almost no shadow, and occupy an almost inappreciable space. As compared with the broad and ponderous structure of the New York elevated roads, the Meigs railway would be hardly visible, and we agree with the Legislative Committee in thinking that the damage inflicted on estate bordering on the line would be nothing in comparison with the increase in their value for business purposes.

AMERICAN INDUSTRIES, for April 21, which is a journal, seemingly, more devoted to politics than to any other form of American enterprise, contains an article on the designing of our public buildings, which has the outward air of being an "inspired article," since it is accompanied with a large portrait and a biographical notice of the present Supervising Architect. The writer, whose text is that private architects are simply agitating the matter because they selfishly wish to pocket the fees, asserts that he has made a "thorough examination of the history and practice of the Supervising Architect's bureau" and declares that "the figures at the close, showing that the cost to the Government has been less than five per cent of the cost of each building, make a very strong argument in favor of continuing the old arrangement." Naturally, we turned with much interest to the "close" of the article, but found there only these words: "The records of the office show that the amount paid for said services never exceeds five per cent on the cost of the buildings erected." Curious *proof* this! If Mr. Glenn Brown's statements and deductions are to be overset, in can only be done by producing the proof and the figures that support it; they cannot be overset by bold, unsupported assertion. Until, then, a trustworthy contradiction is furnished, it may be taken as proved by ample evidence that, far from being erected at a cost of five per cent for architectural service, the service provided by the Supervising Architect's office costs the country nine per cent of the nominal cost of each building, while the cost of the building is so inflated by delays, bad methods and political exigencies that the cost to the people of architectural service on each building is equivalent to fifteen per cent on what the cost of such a building would have been if it had been under the charge of a competent architect in private practice. Add to this the sums paid for office-rent, for the difference in time between the completion of the building by one method and by the other, and it is found that instead of the one-twentieth portion that a private architect requires, the Government bureau is found chargeable with nearly one-fifth of the huge sums which the people pay for public buildings, largely to enable certain Congressmen to draw comfortable salaries and stay away from the work they are supposed to be paid for attending to.

MR. JOHN LYMAN FAXON, of Boston, has conceived the very commendable idea that it would be advantageous to the pupils of the public technical schools, including the evening-schools in which mechanical drawing is taught, to

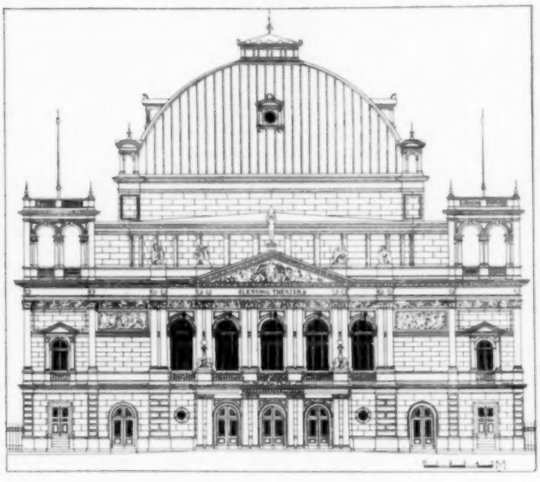
have better examples of such drawing put before their eyes than the copies now commonly used; and he proposes that architects, most of whom have plenty of drawings stored away which would never be used again, should present such examples of plans, elevations, sections and detail-drawings as they think would be useful to schools of the sort. He proposes to make a beginning in Boston, by calling upon the architects of that city to make contributions, to be delivered at his office, 7 Exchange Place, on or before Saturday, May 19, and has arranged with the School Committee to have such contributions permanently hung on the walls of the new Mechanic Arts High School. It is much to be hoped that his appeal will meet with a hearty response. Besides the city schools, nearly every town now supports evening-schools, where what purports to be architectural drawing is taught. Many architects have seen, and laughed over, the pitiable examples which are presented to the pupils in such schools as models of architectural drawing, but it does not seem to have occurred to any of them, before Mr. Faxon, that the architects themselves, by supplying better models, could greatly increase the value of the instruction given in the schools, and render an incalculable benefit to the poor, but ambitious boys who frequent them. We print Mr. Faxon's letter in full in another column, and again commend it to the attention of our readers generally, and of Boston architects in particular.

THE daily papers are taking an unusual amount of interest in insurance matters just now, and it may be hoped that the results will be valuable. The Boston *Herald*, after pointing out that the number of fires due to playing with matches, allowing stoves or furnaces to become overheated, or dropping lighted cigars, or pipe-ashes, into inflammable material; or, in other words, to gross carelessness, has increased enormously within a few years, repeats the well-known suggestion that this evil might be diminished by restricting insurance to 80 per cent of the value of the property insured. The *Herald* is very good authority on insurance matters, but it has never seemed to us that this restriction would have the desired effect. In cities and towns, where most of the destruction by fire occurs, the loss seldom amounts to 80 per cent of the full value of the property insured, and people who liked to be careless with matches could reckon with confidence that the salvage effected by the efforts of the firemen and insurance patrol would amount to 20 per cent on the amount of the policy, so that the indemnity would really cover the loss; while people in the country, who rarely have full insurance, in any case, would think much more of the inconveniences of being turned out of their dwellings than of such a paltry amount as the *Herald's* plan would employ for teaching them to be careful. To our mind, a much more effectual remedy against carelessness, and one which would find its application just where it is most needed, is that which we have often advocated, and which has made Paris, Berlin, Vienna, Madrid and Rome proof against extensive conflagrations, — namely: to hold every property-owner responsible to his neighbors for losses caused them by fire spreading from his building to theirs. The growing necessity for some such regulation, which, we venture to say, will be generally adopted before many years, after we have spent a thousand million dollars or so more of our hard-earned money in demonstrating the importance of it, is well shown by a story from the Cincinnati *Commercial*. According to this journal, a mercantile building was recently burned in Ohio, with a loss of $75,000. After the fire, it was found that the building had been nearly saturated with petroleum. Strips of cloth, soaked in kerosene, had been laid on the stairs, to conduct the fire from floor to floor, and a barrel of oil had been placed on top of the elevator car, which had been stopped halfway between two stories, for convenience in setting fire to both. Naturally, the Underwriters will object to paying the loss, and the circumstances would certainly justify a suspicion that the stock had been over-valued, as well as purposely destroyed; but, under the contract of insurance, the Underwriters cannot demand a valuation or examination until a claim for loss is made, and meanwhile, the owner is said to be, at his leisure, collecting the salvage, and destroying the rubbish, and with it, as the Underwriters fear, the evidences on which they must rely to prove either over-valuation or incendiarism. Whether the suspicions of the companies are justified in this case or not, there is no doubt that vast sums are contributed by premium-payers, and applied by the insurance companies, to pay for property destroyed by fire which the owner is glad to have out of the way, and sells to the Underwriters, that is, to the people who pay the premiums, with much rejoicing. Arrests for incendiarism, even if the owner's willingness to dispose of his property to the companies has gone as far as this, do not avail much in a community always prejudiced in favor of the individual, against the corporation; but a great deal might be done by the knowledge, on the part of the owners inclined to toss their cigar-ends among their bales of unsalable goods, that a fire carelessly set on their premises might bring upon them ruinous demands from the owners or insurers of adjoining property. Even if a man were well-meaning, but careless, the knowledge of his responsibility would do much to sharpen his perceptions in regard to the prudent use of fire by himself and his subordinates; and it is certainly due to the conscientious people who take proper care of their premises to provide some remedy against the perils to which they are exposed through the recklessness of their neighbors. Concerning the influence which such responsibility, which was a part of the law of every civilized country, until abolished in England, by special statute, within comparatively recent times, would have on building methods, we have already written at length; and it might be well to remind the insurance companies, in whose hands the matter really rests, that the present is the most favorable time that the present generation has ever seen for introducing building-reforms. Not only is structural iron, the foundation of fire-resisting construction, much cheaper in this country than it has ever been before, but the stagnation of building business gives an unusual opportunity for the discussion of improvements, which can be put in shape for general adoption when the revival comes, which is surely on its way.

SEVERAL of the more thoughtful technical and real-estate journals have lately expressed serious doubt whether the enormously high office-buildings now fashionable in our cities will prove, in the end, profitable investments. In Chicago, where they have had a longer trial than elsewhere, their construction has been abandoned, nominally through statute prohibition, but really, it cannot be doubted, with the acquiescence of the people most interested; and it is said that several of the Chicago "sky-scrapers" have never yet been profitably rented. In New York and Boston, where land is very costly, two hundred dollars a square foot having been paid for lots in a good location, there is some excuse for multiplying stories, but it may be doubted whether the practice will prove profitable even there, particularly if it should be extensively followed. Where two buildings, sixteen or eighteen stories high, occupy opposite sides of a narrow street, like those in the business part of Boston and New York, the light in the lower stories is none of the best, and it has been found, in nearly all buildings of the sort, that the upper offices rent first. Originally, the rents charged diminished as the height above the ground increased, and this was supposed to account for the greater popularity of the upper floors; but it is now the practice to charge more for the upper offices, and, even then, they are apt to be rented first, the abundant air and light proving an irresistible attraction to tenants. This state of things will probably last until an earthquake shock, such as is due in New York once in twenty years or so, throws down the upper portions of some towering structure, or, what would amount to the same thing, makes the tenants think that it may do so. Then, offices fifteen stories above the ground will cease to command a premium, and tenants will look for rooms where they can get good light and air, within six stories above the street. When this happens, the "sky-scrapers" will have to be rented for storage, as some of them are said to have been already. If provision is made for this at the outset, no great harm would be done, as such buildings, being fireproof, well supplied with elevators, and conveniently situated, make excellent storage-warehouses, and would always bring in a moderate rent in that form; but many of them are designed only for light office loads, and could not be utilized for storage without great danger, unless entirely reconstructed; so that it is certainly the part of prudence for owners and architects, as well as Inspectors of Buildings, to see that sufficient strength is given them for all contingencies.

THEATRES. — II.

LESSING THEATRE, BERLIN.



Lessing Theatre, Berlin, Prussia. Von der Hude & Hennicke, Architects.

IN the preparation of these articles I have thought it advisable and expedient for various reasons to alternate the consideration of the plans of the theatres of the English speaking countries with those of the Continent. I am, therefore, presenting to-day, through the help and intervention of Mr. Edwin O. Sachs, some drawings of the new "Lessing" Theatre in Berlin, of which Messrs. Von der Hude & Hennicke were the architects.

Of this firm of architects Mr. Hennicke died some two years since and it is through the permission of Mr. Von der Hude that the plans are now reproduced. When the plans have been carefully studied by those who follow this subject with any previous knowledge of the great difficulties to be overcome before designing a satisfactory theatre plan, I think they will express surprise in hearing that this plan was produced by architects who were not theatre specialists, and that this was their first building of this class.

This theatre, which is the private property of Dr. O. Blumenthal, was begun in 1887 and completed in September, 1888, and is, therefore, one of a class of recently erected Continental theatres, built, however, prior to the passing of the new Berlin regulations, which were passed in December, 1889. The site is an isolated one, allowing of exits on all sides, and the plan is a symmetrical one, one side of the theatre being planned exactly like the other, with corresponding exits and passages on either side of the house. This is an admirable and safe arrangement, as the audience soon become aware, with a simple and symmetrical plan, that whichever side of the auditorium they enter, there is an exit in the same position on the other side; there is, therefore, no feeling of fear in being seated away from the entrance door, as the farther from the entrance door one is, the nearer he comes to the exit — which corresponds to that entrance.

This theatre was built for comedy, and occasional opera performances. The study of these plans and those of Daly's Theatre, produced in the *American Architect* for April 14, will give an interesting comparison of the varied arrangement between English and Continental theatres.

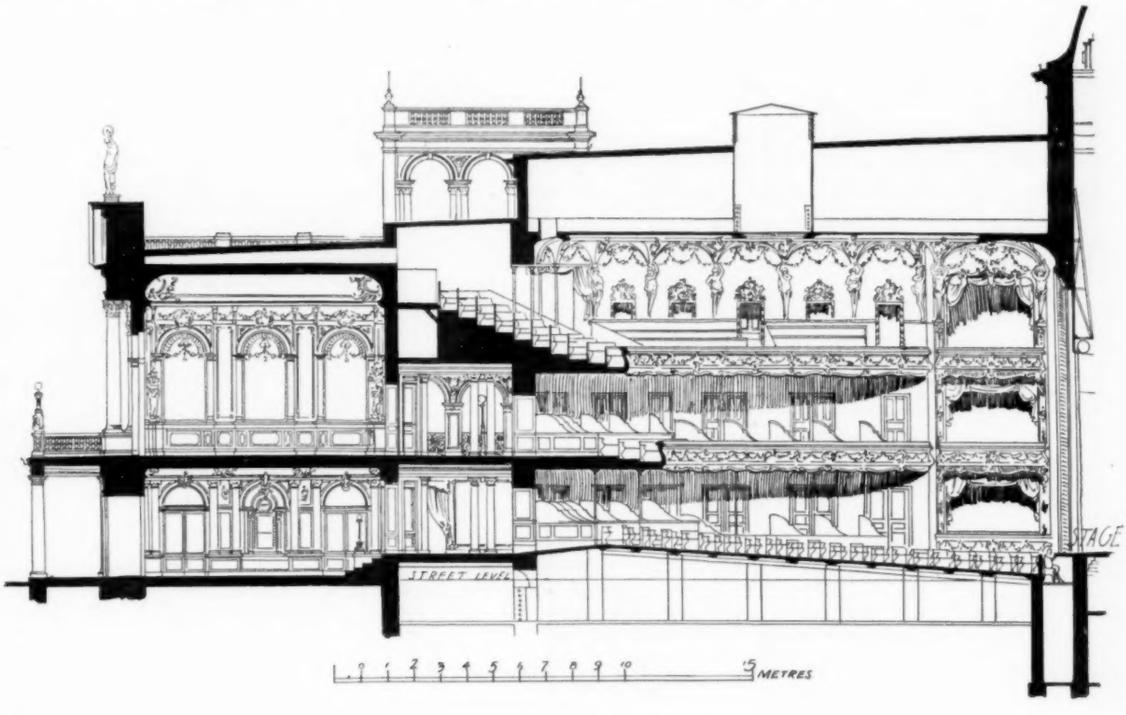
The main entrance to the Lessing Theatre is by a vestibule on the ground-floor level, which is also the level of the parquet or stalls. From this vestibule, right and left, are staircases leading to the second tier, while inside the main walls are again to be found two separate staircases, right and left, leading to the first tier.

The special features about the arrangement of these staircases is this, that they all have one common entrance through the vestibule, so that no matter what part of the house your seat may be in, you can alight from your carriage at the main entrance and reach the part of the auditorium from whence you are to witness the performance, by passing through the vestibule. Now it would be said, if reference were not made to the plans, that this arrangement of all staircases leading to one common vestibule was most objectionably dangerous in case of a sudden rush towards the exit, and that at any time it would create an unmanageable crowd in the vestibule after the performance, but the architects of this theatre have been far too thoughtful of the comfort and safety of their audience not to overcome this, and have cleverly provided a direct and separate exit from each staircase into the open air, without entering the vestibule at all.

The seating capacity of the house is eleven hundred. On the main floor of the house there are four hundred and thirty stalls, while provision is made for one hundred and twenty-eight in the stage-boxes and private boxes on the parquet level. The arrangement of the stall seating and the gangways and extra exits, one on either side of the house, are so clearly defined upon the plans, they need no further reference from me. The disposition of the private boxes behind the stall seats is one more frequently adopted in opera houses.

On the ground-floor plan is shown the stage, which is nearly square, being sixty-two feet seven inches wide by fifty-nine feet two inches deep, with a proscenium-opening of twenty-nine feet nine inches in width; at the back of the stage is an ample scene-dock which is divided therefrom by a solid wall.

The dressing-rooms, it will be seen, are situated on either side of the stage and are separated from it, not only by substantial brick-walls of great thickness, but by a passageway. Each section of dressing-rooms has a separate staircase with a direct exit into the open air. I would draw attention to the location of the sanitary and lavatory arrangements, both before and behind the curtain, and

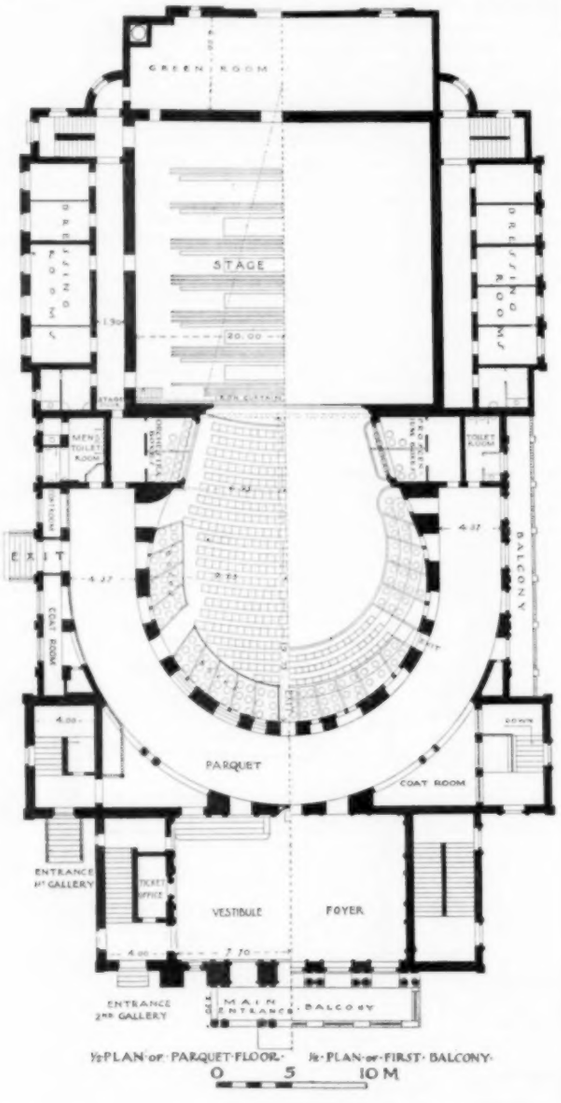


[1] Continued from No. 955, page 20.

the clever way in which they are planned, so as to be placed in two groups next to outside walls, affording perfect ventilation and economy in arrangement.

The first tier is provided with two hundred and fourteen seats, divided between three rows of "circle" seats and a series of private boxes. The wide corridor which surrounds this tier, as well as on the parquet level, is a special advantage to the theatre, as there is sufficient room, and to spare, in these corridors for the occupants of the seats on the tier.

Over the vestibule is the Grand Foyer, the architectural treatment of which can be gathered from the section which is given herewith. It will be noticed that the angles formed by the square walls of the building and the circular walls of the auditorium, are adapted for the use of cloak-rooms. On this tier on either side of the house are provided outside balconies, affording pleasant retreats in hot weather, and additional safety to the audience in case of fire,



for from these balconies people can be easily reached by fire escapes, and here they are safe from the asphyxiating effects of smoke.

The arrangement of the second floor of dressing-rooms is similar to that described for those on the stage level.

The second tier, or gallery, seats three hundred and twenty-eight people; with the exception of the proscenium private boxes, all the seats on this level are stall seats, and they represent what are known in the English Opera House, Covent Garden, as the amphitheatre stalls and gallery. The lavatories and dressing-rooms follow the lines of those below. Two refreshment-rooms are planned on this level.

The construction of the building is almost entirely of fire-resisting material, so-called, fireproof wood having been used only for the stage flooring, the box partitions and the lathing of the cupola. It seems, however, a pity that the two last details were not carried out in fire-resisting materials. The floors of the house are mostly vaulted, some few being in sheet-iron.

The total width of the exit doors as compared with the numbers the house will hold gives a proportion of about three feet for every eighty persons.

Some of the chief measurements of the theatre are as follows:

Width between main walls of auditorium	59 ft. 3 in.
Depth from back wall of auditorium to proscenium	62 " 6 "
Depth from first tier box front to proscenium	48 "
Depth from second tier box front to proscenium	52 " 6 "
Depth from back wall of gallery to proscenium	82 "
Width of proscenium opening	29 " 9 "
Width of stage	62 " 7 "
Depth of stage	59 " 2 "
Width of main corridor	13 " 3 "
Size of vestibule	49 ft. 4 in. by 29 " 9 "
And the size of foyer about the same size as the vestibule...	
Width of staircase between containing walls	13 " 1 "

All the scenic and technical apparatus is said to be quite up to date, and the fire-protecting appliances most sufficient, with high-pressure hydrants supplying the whole of the house.

The stage is divided from the auditorium by an iron curtain made in two sections and moving from the sides on rollers, not lifting as is the usual method adopted for moving the "fire" curtains. The flies are of iron with boarded floors and the stage bearers are of iron. There is nothing very special in the form of construction to call for particular description.

The decoration of the auditorium is carried out in white and cream-color, with a small use of gold, the relief being obtained by the rich, blue plush upholstery of the chairs and hangings.

The site covers 2,300 square metres and the cost of the building about £50,900.

The theatre, at the time of its erection, was the first private theatre to be built in Berlin, after a lapse of twenty years.

[To be continued.]

THE CHURCH ORGAN, ARCHITECTURALLY AND ARCHÆOLOGICALLY CONSIDERED.[1]—I.

Relief on Bach's Monument, Eisenach Germ.
by Prof. Donndorf

AMONG all the elements connected with the modern revival of liturgical propriety and artistic beauty in the Church of England, few matters of detail should have more interest for the architect than the treatment of the organ. In the first place the arrangement of this necessary and bulky piece of church-furniture is of much importance to the architect as a professional man; and secondly, as a churchman, and, let us hope, an artist, it affords him a subject worthy of his best talents in so far as relates to its external appearance.

There is nowhere to be found an instrument which creates so much enthusiasm among players as the organ. And the reason is simple. The organ, in its various capacities, far outstrips any single instrument of the modern orchestra. The enormous tonal compass from the grave thunder of the 32-feet pedal to the highest ranks of the mixtures; the majesty of its full power and the delicacy of its soft stops; the beauty of its mechanical contrivances, and last though by no means least, the architectural magnificence of the ancient examples which remain in many parts of Europe, all combine to make the organ a fitting object for admiration for every lover of music and archæology.

I do not propose this evening to say much about the strictly musical characteristics of the organ, because such would be more fitting in an address to an audience of musicians, but I propose to call attention more particularly to the archæological history of this grand instrument, showing how the workmen of the Middle Ages treated it as a necessary piece of church furniture, and how they lavished upon it, as upon all things, the highest arts of architecture, painting and sculptured decoration.

It is very remarkable that, of all objects in a modern church or music-room, the organ is nearly always the most ugly and meagre in its external appearance. Large sums are necessarily paid for fine instruments, but the smallest possible amount is expended upon the case or woodwork enclosing it, while most organists would, I fear,

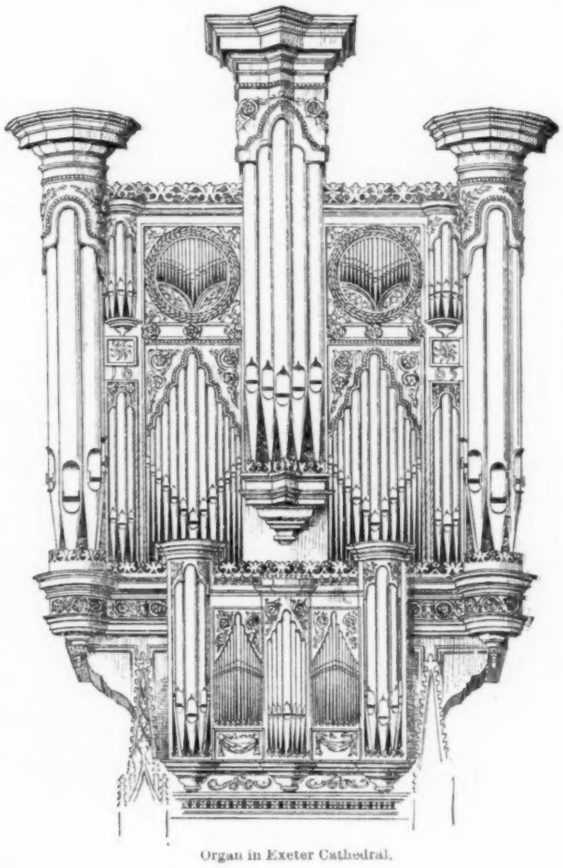
[1] A paper read by Arthur G. Hill, M. A., F. S. A., at the meeting of the Society of Architects, on December 11, 1893.

willingly go without a case, if such loss would allow of an extension of the musical resources of the manual or pedal organs. Thus most modern instruments possess nothing at all which can honestly be called a case; while on the other hand, where exceptions occur, the architectural treatment of the woodwork is so utterly bad, that those who have studied the external features of ancient organs see nothing but the most painful vulgarity, or the most ludicrous embellishments, in an object so grandly treated by the craftsmen of old.

This age, in all matters of art except music, is essentially revivalistic. The finest modern churches or other buildings are those which are the most like ancient examples; the greatest painters strive to reproduce the style of some particular master of past times and we are forced to acknowledge the unpleasant fact that we have reached a period when traditional art has practically died out. Music appears to go on developing, but unfortunately it is not so with architecture and the kindred arts. We have absolutely no traditional style extant. With the dying out of the Byzantine influence in the twelfth century came the strict Gothic art which produced the noble cathedrals and other buildings of the thirteenth and two succeeding centuries; then followed a revival — the Italian Renaissance, which produced, in Gothic outlines, the classically clothed works of Bramante, Michael Angelo, Wren, Inigo Jones and Gibbs. This influence was of comparatively short duration; it was fast dying at the close of last century, and in the year 1893 we see the last link with the past in matters of architecture broken, perhaps beyond repair, and an indiscriminate revival of all past styles, of all centuries and of all countries, takes the place of arts which ought to be the true offspring of the particular age in which we live. The result is that what is really original in modern architecture is almost always exceedingly bad in everything except construction, while the absence of tradition makes the designer in ancient styles fail in all cases except where a very close and artistic study of original examples has been made, and this is but rarely attained.

Being in this position, the best we can do is to study with the greatest care the works of past times, and by applying them, and adapting them to modern requirements, strive to develop a new school of architecture and decoration more beautiful than the vast majority of the works which are day by day manufactured, so to speak, by the yard or by weight, and which are artistically valueless.

To this end I bring to your notice the collection of drawings of ancient organs which is exhibited here to-night, either by the lantern or by the lithograph reproductions. These have been executed by my own hand during the various travels I have made in different parts of Europe, and though all of them are published in my large work on this subject, this latter is not, I fear, accessible to all. It will be seen that out of this collection of some sixty examples, very few are English, and these belong to the seventeenth century. Most unfortunately, a really Mediæval organ does not remain in this country. A very early Renaissance example is to be seen at New Radnor, in Wales, and the Duke of Athole informs me that he possesses what is apparently one of the little portable organs with hand-bellows at the back, and which, though much altered in later times, may originally have been made so far back as the days of Henry VI; but with these exceptions, and a few others of doubtful character, we have nothing of earlier date than the time of Charles II.



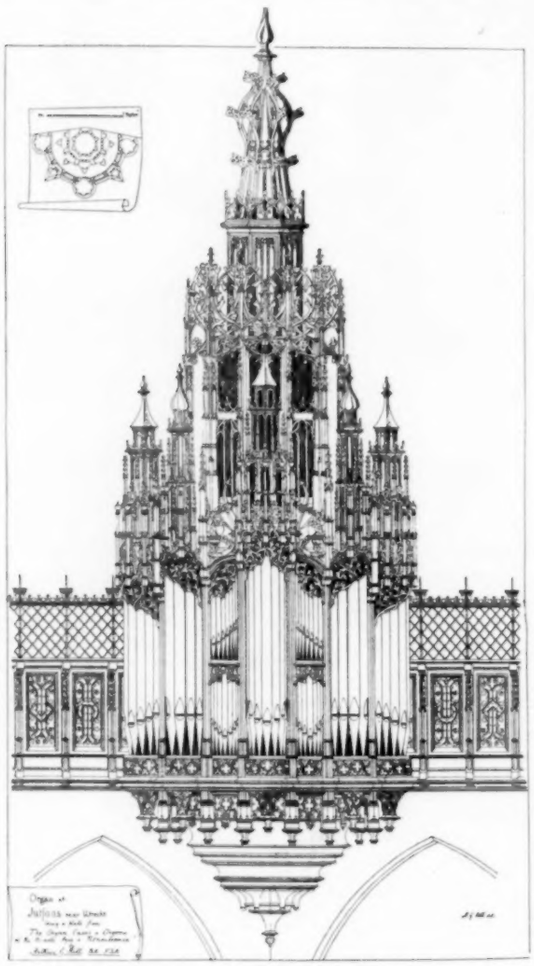
Organ in Exeter Cathedral.

Organ in King's College, Cambridge, Eng.

It is tolerably certain that we never at any time possessed organs which could in any way compare with the magnificent instruments of the continent of Europe, and even we of this generation can almost remember the time when there was not really an efficient organ, judged by modern standards, in any cathedral or church in this country, so far behind our neighbors were we in this respect. The large and independent pedal-organ is a modern thing in this country, while at the beginning of this century the use of the pedal was unknown to English organists, and the compass of the keyboards varied absurdly. The first pipes of 32 feet pitch were made only some sixty years ago for York Minster, under the direction of my grandfather, and were considered marvels at the time, though now common enough even in England. But all these things were well-known generations before by the Continental organ-builders, and I shall draw your attention presently to more than one old foreign organ with 32-feet pipes made four centuries ago.

We should be glad enough, nevertheless, to possess some specimens of our English Mediæval instruments, however inferior in capacity, but the destruction and desecration of our churches during the great Rebellion was so terribly thorough that a clean sweep seems to have been made of these most interesting objects which gave such offence to the unreasoning fanatic of 1642. I will not here trouble you by quoting from old authors who describe the barbarous outrages of those times, because you can read such for yourselves in any good library, but a particularly interesting narrative relating to the destruction of the organ and other articles of church furniture in the English cathedral-churches is given by Dr. Bruno Kyres, dean of Windsor at the time, entitled "*Mercurius Rusticus, or the Country's Complaint of the Barbarous Outrages begun in the year* 1642, *by the Sectaries of this late Flourishing Kingdom,*" and should be brought to your notice as especially relevant to our subject. This work accurately describes the demolition of the organs at Canterbury, Rochester, Exeter, Westminster and elsewhere. Thus at the Restoration of Charles II there were so few organs left in this country and the demand for new instruments was so great, that the celebrated Bernard Schmidt and Renatus Harris were invited to settle here and help to replace by fresh organs the many valuable examples which had fallen before the axe and hammer of the destroyer. It is not to be supposed, however, that every ancient organ here perished at the time, for we know that those in the cathedrals of Durham, York, Lincoln and St. Paul's; St. John's and Magdalen Colleges, Oxford; Christ's and King's Colleges, Cambridge, besides others in more obscure places, escaped the

general demolition. Most of these, in their turn, disappeared in the tasteless days of the Georges, when archæology had little reverence for objects of this nature. As late as 1789 a small Mediæval organ existed at Tong, in Shropshire, as is evident by the description in the *Gentleman's Magazine* of that date. It also has now disappeared.



Organ at Jutfaas, near Utrecht, Holland.

It is thus evident why so few ancient organs remain in our own country.

In order now to point out to you the various peculiarities of ancient organs, as regards their antiquarian and architectural character, it will be better to take the examples of which we have drawings in their chronological order. The first point to be considered is the position of the organs in our churches. It was the universal custom of the organ-builders of the Restoration, and usually of the older Mediæval builders, to place the organ upon the choir-screen, or in a western or side-gallery. Nearly every cathedral in England, and many on the Continent had, at the beginning of this century, an organ upon the choir-screen, which gave great acoustical advantages to the instrument, and moreover, afforded an opportunity for the display of a fine case. But latterly there has been a craze for "vistas," and a notion prevails that a complete view should be obtained of the whole interior of a church from east to west, so that nothing of the end windows should be hidden. This is a most absurd and erroneous idea, and which is precisely contrary to the principles acted upon by the old architects, and particularly in England, where in a great number of important cases the choir-screen forms a very marked break in the interior view. At York, Exeter, Gloucester, Wells, King's College, Cambridge, and elsewhere, we find that organs thus arranged on the screen have a most excellent appearance, especially when the old cases remain. No old church-organ in the country is more picturesquely placed than at Exeter, where the fine seventeenth-century case harmonizes most delightfully with both its older and modern surroundings, although it has lost the company of its two exceedingly imposing and quite unique towers of pipes, which the late "restoration" swept away, and which till then stood at the two extremities of the screen against the tower-piers. The "vista" party in Westminster Abbey, also, prevented the placing of a small choir organ-case on the screen, which would have been a great feature in the church.

The destruction of screens has been even worse on the Continent, and has resulted in the ruin of many a grand church and the sweeping away of much magnificent work. At Münster, in Westphalia, I found the stone-screen of the fifteenth-century had been entirely demolished and broken up, and I hear that those at Bruges and Tournai are likewise threatened, with the sanction of that terrible product of modern times, the "restoring" architect.

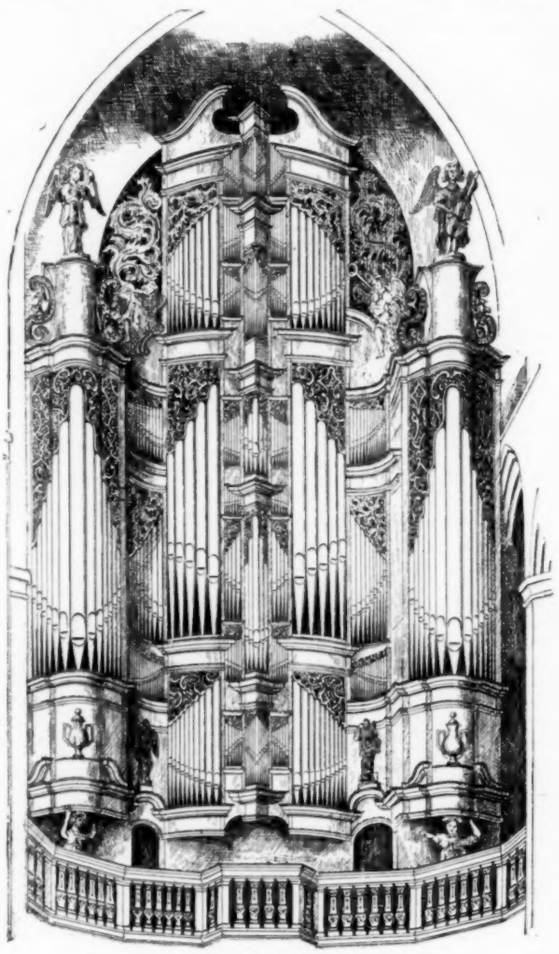
Not many years ago the choir at Norwich Cathedral used to sing from the screen, retaining till then the old usage. The French term "jubé" signifying the loft, is taken from the words of introduction to the service of Compline, "Jube, Domine benedicere."

Almost every organ, in old times, stood in a gallery of some kind, and not upon the floor of the church, as is now the general rule. This latter plan is, unfortunately the only resource in the majority of modern churches, but galleries or elevated sites are far better if they can be adapted to the building. The old galleries were placed either over the west door or at the extremity of one of the transepts; or, lastly, corbelled out in some peculiar manner from the triforium or other portion of the church above the main arcade. The west end arrangement, however, was by far the most common, and is still the usual situation in foreign churches, except in Spain, where the organs are almost invariably placed over the stalls, on one or both sides of the *coro*.

There are great advantages to be gained if the great organ can be placed in the western gallery, and a smaller one used for accompaniment in the choir.

Among the many interesting examples of west end organs — by which I mean those of fine architectural design — may be mentioned those at Sion, in the Valais; Amiens Cathedral; Hombleux, near Amiens; Jutfaas, near Utrecht; St. Bertrand de Commingos, in the Pyrenees; the magnificent organs in the five great churches at Lübeck; Augsburg, the two large churches; Constans cathedral church; Stralsund, on the Baltic; and St. Bavon, at Haarlem, all of which are illustrated.

The ancient lofts, minus their organs, remain at St. Stephen's,



Organ in Church of St. Nicholas, Stralsund, Germany.

Vienna; Ulm, Liège, the Carmelite church at Boppard, Ochsenfurth, St. Pantaleon at Cologne, and elsewhere. The so-called "minstrels'" gallery at Exeter, though not at the west end, is no doubt an ancient organ-gallery.

In the abbey church of Cornelismünster, near Aix-la-Chapelle, is

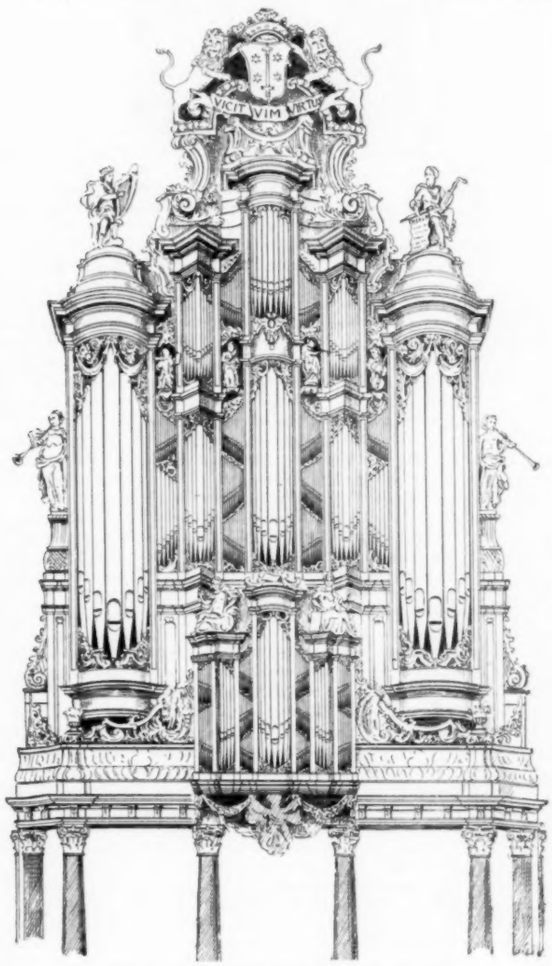
a most remarkable west-end organ-loft, furnished with stalls and every arrangement for a choir of singers, while there are other instances at St. Maximin, at Trèves, and the Abt Pfarrkirche, at Ratisbon, which I have examined. In Italy the organs invariably stand in galleries.

Amongst old organs placed in galleries placed elsewhere than at the west end, I may mention those at Chartres Cathedral; Freiburg, in Breisgau; La Forté Bernard, France; the Marienkirche, at Dortmund; and Strasburg Cathedral, all of which are bracketed out from above the nave arcade in a most charming manner. When this manner is adopted, a pendant gallery, or *cul-de-lampe*, is required, in which the organist sits, as in the splendid examples of Strasburg and Chartres. This latter organ is a structure 40 feet wide, spread out high above the pavement. The greater part of the work dates from 1512. Among modern organs that of Ely is similarly placed with charming effect; while the new organ at Peterborough Cathedral, for which I have myself designed the case, projects from the triforium above the stalls.

As mentioned before, the Spanish custom is to place the organs over the stalls, though there are exceptions to this rule, and I have pleasure to show you on the screen my drawings of the instruments in the cathedrals of Zaragoza and Tarragona, which are so placed, together with those at Barcelona and Salamanca, which are differently arranged. It may be taken that the earlier and smaller organs were usually in galleries.

The organs in Old St. Paul's and Westminster Abbey were placed over the stalls, as appears by Hollar's views. The two great instruments in Milan Cathedral are situated over the stalls, on either side, at the entrance to the choir. They are provided with folding shutters or doors, painted and decorated on the inner side, a very fine treatment to which we shall refer presently. At Ratisbon Cathedral is the curious instance of an organ placed behind the high altar.

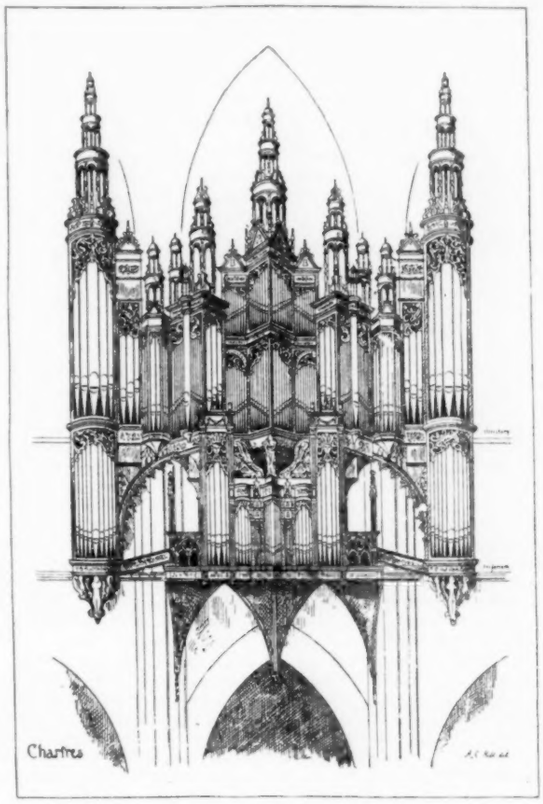
Having sufficiently discussed the ancient customs regarding the



Organ in Church of St. Bavon, Haarlem, Holland.

position of old organs, I need not trouble very much to condemn the modern "organ-chamber," a very unfortunate modern creation usually fatal to both the acoustic and architectural effect of the instrument; while many old churches have been greatly injured by the throwing out of these awkward excrescences.

We now come to speak of the organ case itself, which is a matter of large importance, I take it, to the present audience. The architectural woodwork which enclosed the organ was treated by the workmen of old times with a skill and vigor worthy of the instrument and of the artist himself, so much so, indeed, that the organ



Organ in Chartres Cathedral.

was frequently the most imposing and magnificent of all the fittings of the church in which it stood. The French call the case the *buffet d'orgue*, and the Germans *Orgel Gehäuse*. The examples which we have here depicted to-night will fully illustrate this branch of decorative art from the fourteenth century to recent times.

The two earliest organs I have discovered are those in the old cathedral at Salamanca, in Spain, and in the conventual church of St. Catherine at Sion, in Switzerland, both dating from the closing years of the fourteenth century, nor do I believe there are any other remaining examples of this period. These are both of comparatively small size, both stand in galleries and both have painted doors or shutters. As in all early specimens, the impost, or face line of the case, is straight and unbroken on plan by the towers and projections seen in later times. In addition to these two valuable examples we have the following organ-cases left to us, all of which belong to the Gothic style, and this list is, I believe, a fairly correct one of all that remains to us in Europe of work of this class, and has been compiled after much research in the churches of the Continent:

Salamanca, Cathedral Vieja	c. 1380	Strasburg Cathedral	1497
Sion, St. Catherine	c. 1390	Hombleux, Picardy	c. 1500
Zaragoza Cathedral	1413	Lübeck, Jacobikirche (second organ)	c. 1500
Zaragoza, San Pablo	c. 1420		
Amiens Cathedral	1429	Lübeck, Marienkirche (second organ)	c. 1500
Palma, Majorca	c. 1430		
Alcala de Henares, Spain	c. 1450	Jutfaas, near Utrecht	c. 1500
Nordlingen, Bavaria	1466	La Forté Bernard, France	1501
Bologna, San Petronio	1470	Lübeck, Marienkirche (great organ)	1504
Dortmund, Marienkirche	c. 1480		
Sekkau, Austria	1480	Lübeck, Jacobikirche (great organ)	1504
Embrun, Dauphiné	c. 1480		
Perpignan, French Pyrenees	c. 1490	Tirlemont, Belgium	c. 1505
Wissel, near Cleve	c. 1490	Chartres Cathedral	1513
Butzory, near Rostock	c. 1490		

I have records of other Gothic organs which have disappeared only within recent years, such as that formerly in the church of Rhenen, near Utrecht, of which I fortunately possess a drawing. There are also many prints extant showing fine organs in the churches of Nuremberg and elsewhere, which have now been demolished.

The organs at Lübeck are a special feature of that intensely interesting town. I know of no city in Europe (except perhaps in Spain) which is so little altered from its original condition, as created in the fifteenth century, as this delightful member of the old Hanse League. Here are six gigantic churches of brick, all save one possessing towers of enormous height, surmounted by spires of

copper, green with the storms of four or five centuries. St. Mary's Church is the crowning glory of the Baltic style, built entirely of brick, with an internal height of 130 feet to the vaulting, and western spires each rising upwards of 400 feet. The great organ projects out at the west end, at a distance of 30 feet above the pavement, and, extending the whole width of the nave, rises to the vault of the church. The great size is most impressive, and the 32-feet pedal pipes of metal, which stand in the centre compartment of the case, seem comparatively small. The case is pure Gothic, of late German type, richly carved, painted and gilded. It was erected in 1504, but the interior is chiefly modern, the work of Schultze in 1853. The original inscription on the base of the great gallery runs

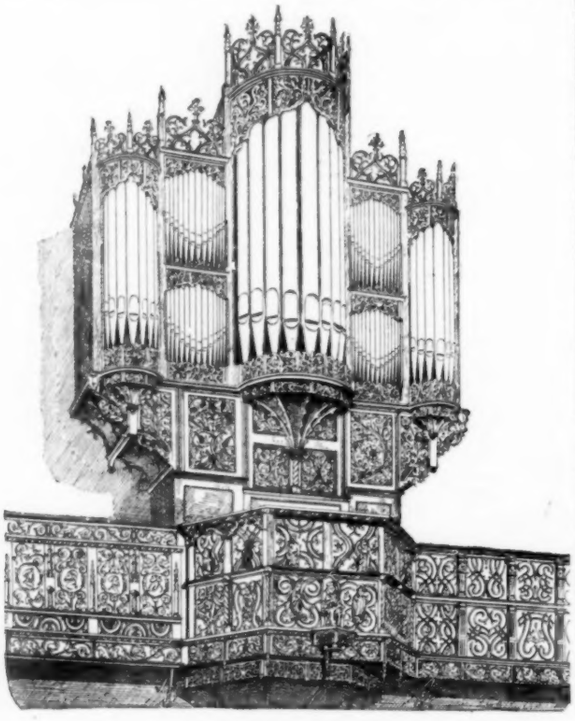
Hoc opus renovatum anno Christi Salvatoris 1598, amplissimis clarissimisque viris D. Gothardo de Hovellen Consule et Georgio a Stiten Senatore Provisoribus hujus Ecclesiæ.

There are also inscriptions showing that the instrument was internally modified in the years 1640, 1706 and 1782.

These early Gothic cases are nearly always flat in part, that is, without projecting towers such as are found in later work, but with the pipes grouped in divisions of different altitudes only. At first the woodwork was confined almost exclusively to the portion of the organ below the pipes, the latter being supported merely by a band of wood, as in the small portatives generally seen in representations of St. Cecilia, as in the triptych by Van Eyck, painted for the cathedral at Ghent, the wings of which are now at Berlin.

When organs become much larger in size, as they did later in the fifteenth century, this simple arrangement of the pipes was abandoned, and a far greater elaboration introduced into the design.

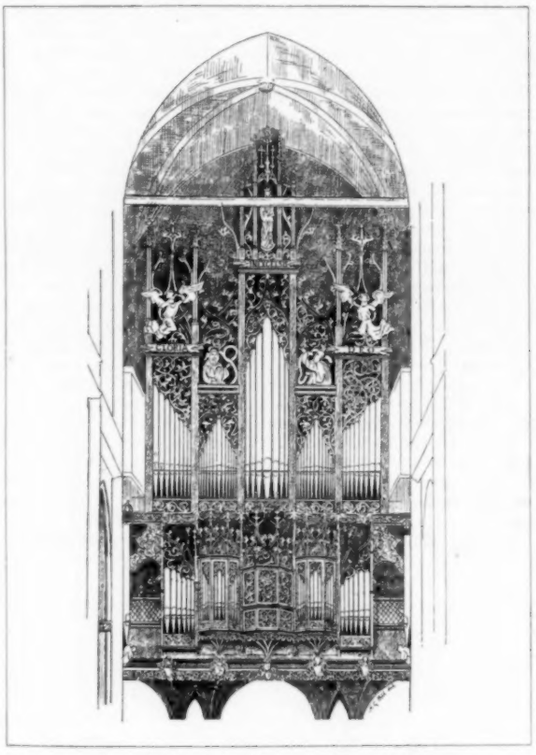
A very important feature in the design of all old organs is the carved woodwork, behind which the upper extremities of the pipes are hidden. These enriched shades are never absent in old organ-cases, and you must have observed them often enough at Exeter, Gloucester, Cambridge, Hampton Court, or in many of the city churches. These mediæval features have thus been preserved through the later Renaissance times until the death of traditional architecture in this country about a century ago. In the Lübeck organs the shades follow, at their lower edges, the natural rake of the pipe tops, which they are designed to conceal; or rather, these shades should be considered as a piece of ornament introduced to fill up the irregular space left between the tops of the pipes and the cornice or architectural woodwork of the case above. In the earliest examples the pipes do not quite touch these shades, but leave a small space between, with very picturesque effect, as in the organs



Organ in the Marien Kirche, Dortmund, Germany.

at Sion and Salamanca, and also in the grand later cases at Tarragona, and at the Carignano Church at Genoa. It will be seen that in not a single ancient organ of any size do the pipes themselves form the outline of the case, and this rule is, unfortunately, entirely set at nought by modern designers. The effect of rows of pipes without woodwork of any kind surmounting their upper extremities is exceedingly bad, and is the chief defect in modern organs.

There are three other Gothic organs at Lübeck, all of which I have drawn, and there is probably not another town in Europe which possesses four instruments of this early date, and few which

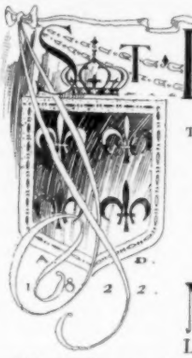


Organ in the Marien Kirche, Lubeck, Germany.

possess even one. The Churches of St. Mary and St. James each contain two organs, one at the west end and one in the aisle. These latter stand in galleries with receding sides and vaulted supports, and are admirably spirited compositions, well worthy of modern adaptation. These twisted pinnacles and great crockets are distinctive features of late German Gothic. These four Lübeck organs are important illustrations of what the best church instruments in Germany were like at the beginning of the sixteenth century. We have nothing in England of this date, and it is probable that we never at any time had works at all comparable with these in size and beauty, and they far surpass, even when regarded from the player's point-of-view, any organ erected in our country before this century was well advanced. You will notice one constant factor in the design of these instruments; the upper portion of the case invariably overhangs the base. This is due to the fact that the bellows and action occupy less space than the soundboards above, producing an element in the design which is highly satisfactory, and which is, in fact, almost a necessity of the composition. The great failure of modern attempts in the designing of organ-cases is the non-recognition of this important principle, which was carefully preserved in England by Father Smith and other builders of the Restoration, as you can see if you examine cases of this date.

In making this digression concerning Lübeck and its art furniture, I must call attention to the very magnificent organ in the Ogidienkirche, where it stands at the west end. This work dates from as late as 1675 and is most sumptuous in both design and execution, and altogether one of the finest I have seen. It is of oak, without colored decoration, but magnificently carved and enriched. You will notice that there is in the design a complete organ of itself, consisting of one semicircular and two pointed towers or projecting groups of pipes, while the central composition is flanked by two larger and almost detached towers of 16-foot pipes. There is a choir-organ or *Positiv*, which is a reproduction on a smaller scale of the main organ overhead. The gallery is a canted soffit, wonderfully elaborated. Though dating from 1675, this case is fully eighty years earlier in style than would be the case with a work of similar character in the south of Europe, when the new style or Italian Renascent school came earlier into vogue. While all the details of this case are Classic, yet the forms are strictly Gothic and all the true mediæval principles are maintained throughout. The turret-like erections on the summits of the towers are Gothic canopies Classically treated. It may, in fact, be said with regard to Renaissance architecture, that when all the Gothic spirit in it had died out the style lost all its artistic excellence.

(To be continued.)



THE UNION PASSENGER STATION. — VALUATION OF REAL AND PERSONAL PROPERTY. — PROPOSED NEW BOULEVARDS. — NEW EXHIBITS AT THE MUSEUM OF FINE ARTS. — THE POLLUTED WATER-SUPPLY. — NEW WATER-WORKS.

NOTWITHSTANDING the depressed condition of finance and trade throughout the country at the present time, St. Louis presents activity so far as matters architectural are concerned. There seems to be no cessation in the erection of new buildings, and the promotion of public improvements. A noticeable change, however, from the recent order of affairs, consists in the fact that comparatively few residences are being put up, in comparison with a year ago, while the number of flats and buildings of a public or semi-public nature is unusually large. Chief among these is the new Union Passenger Station, of which we have previously made mention in these columns and which is to cost, when completed, in the neighborhood of $5,000,000. This imposing edifice, that is to say, the head-building, is fast nearing completion and the nearer the time for the finishing touches approaches, the more its great size grows upon one. In itself, it is not an extraordinarily large structure, but is above the average size of railway stations. There are evidences throughout that no money has been spared to make this the finest and largest railway-station in the world. We think the Terminal Association has been successful in both these points. The writer, in making such an assertion, does not speak at random, because he has been fortunate enough to see all the finest and largest stations in both this country and in Europe. So far as size is concerned, the only station in the world that approaches the St. Louis structure is located at Frankfort, Germany, and this is little more than three-fourths the size of the former; St. Pancras Station, London, is the only one that can claim the distinction of being its peer as far as architecture is concerned. The German station is an architectural monstrosity consisting of three train-sheds, side by side, with a sort of semi-façade of cut-and-dried designs in architectural iron-work. It possesses no originality of design whatever. In the St. Louis station the head-building is the attractive feature, the train-shed being noted for nothing except that it covers thirty-two tracks in one span. The building is French Renaissance, a notable feature being the employment of the round arch to a great extent. The whole is built of Bedford stone, which gives it an unmistakable air of stability. Needless to say, the entire structure is fireproof, and the interior furnishings, which are now being installed, are the best that money can buy. Looking into the main waiting-room at an elevated position are to be three of, what are said to be, the largest stained-glass windows in the United States, representing allegorical figures of St. Louis, New York and San Francisco, St. Louis, of course, being in the centre. The Terminal Association was recently summoned before the mayor to make an explanation in regard to a *porte cochère* which is being built on the Eighteenth-Street side of the station, and occupying a portion of the sidewalk without permit. Fortunately for the east façade of the building, the matter was satisfactorily settled and the *porte cochère* will remain. The Terminal officers have several times endeavored to "bluff" the City and in one case threatened to stop work on the station if hampered in their work. At all times, however, matters have been settled to the satisfaction of both parties. The City has been very lenient with the Association, and we say this with some regret, for, station or no station, the City should not be dictated to and its laws and ordinances put to naught by railroad companies or any other corporation whatever.

Mr. A. H. Frederick, president of the State Board of Assessors, recently submitted an abstract of real and personal property in the city of St. Louis, which shows the following: —

Old Limits. — Lands, 1049.6 acres, valued at $2,046,450; town lots 70,162, valued at $204,514,920; personal property, $39,743,250. Total, $246,304,620.

New Limits. — Lands, 10,281.96 acres, valued at $5,562,940; town lots, 41,594, valued at $47,656,790; personal property, $4,594,860. Total, $57,817,590.

Old and New Limits. — Real and personal property, $304,122,210.

The assessed value of real and personal property is 55 per cent of the actual value, which is, in round numbers, $600,000,000. The tax rate is $1.40.

There has been a great deal of agitation recently concerning the general improvement of the down-town streets. Several meetings of prominent business men and citizens generally have been held at the Mercantile Club, looking toward the inauguration of a system of business boulevards. We think St. Louis is taking the initiative in such a scheme, so far as the United States are concerned. Of course, the idea is borrowed from the world-renowned boulevards of Paris. It is an urgent necessity that many of these streets be widened, that others be continued through property which cuts them off abruptly, and that suitable street-paving material be substituted for the noisy granite which is now the rule. There are great opportunities for improving Twelfth Street on an extensive scale. This thoroughfare, as we remarked sometime ago, is fast becoming the centre of the best retail trade of St. Louis. Plans have been submitted by various architects for its improvement, one of which was illustrated in the *American Architect* sometime ago. Mr. Julius Pitzmann, one of St. Louis' foremost civil engineers, recently submitted a plan to the Society of Architects for changing certain streets to boulevards, at a cost to the city of $2,000,000. His idea is to continue Twelfth Street, which is 150 feet wide between Washington Avenue and Market Street, northwardly in the same width to Cass Avenue and southwardly to Park Avenue, then westwardly to Lafayette Park and Jefferson Avenue, which is 120 feet wide; then by another ordinance establish a boulevard on Market Street from Twelfth Street to Jefferson Avenue by condemning the lots on the north side of Market Street extending to the alley, making a new boulevard 148 feet wide. The latter improvement would add greatly to the appearance of the new Union Station, which is now shut off from view by the buildings opposite, on Market Street, a very narrow thoroughfare at this point. This much being done, the foundation for the system could be considered well under way. The new city-hall with its public square around it, the Four Courts, and a fine viaduct over the railroad-tracks with abutments in the form of triumphal arches, would furnish interesting features and would make Twelfth Street for years to come the most available location for theatres, hotels and fine stores, not to mention the most coveted promenade in the city. It is also proposed to connect what is to be Market Street Boulevard with the famous Lindell Boulevard to Forest Park. Such a system of magnificient thoroughfares would undoubtedly prove a most valuable acquisition, and one for which the people would be willing to pay. But radical changes would have to be made, such as "boulevardizing," if we may use the term, more prominent thoroughfares than those above-mentioned, and which are the natural arteries of travel. It is evident the committee refrains from doing this on account of the enormous cost of taking the necessary property for widening the important streets. If unimportant streets are made boulevards, the very purpose of the scheme is defeated.

The St. Louis Museum of Fine Arts now has on exhibition in its galleries a collection of sculpture, paintings, book-bindings, and other works of art recently acquired by it. These include its acquisitions at the World's Columbian Exposition. The bronzes are of exceptional interest, being exact reproductions of the originals found in Herculaneum and Pompeii, and now reposing in the National Museum at Naples. They not only include statuary, but household utensils and various articles found in the ruins of these two buried cities. There are splendid reproductions of the "Drunken Faun," "Cupid with Goose," and "Winged Victory." The examples of bronze and silver plate, bowls and cups, are both unique and interesting, all possessing the originality and grace for which the Romans were noted. The collection of book-bindings is from the Danish Section of the Columbian Exposition. There are many curious designs cut into the gilt edges of the books, which have attracted a great deal of attention. The stamped-leather bindings and general ornamentation of same in gilt and colors are very fine. Among the recent paintings acquired by the Museum may be mentioned "A Dash for Timber" by Frederick Remington, and "The Temptation of St. Anthony" by Teniers; also "Mending the Canoe" by Douglas Volk, "Another Marguerite" by Joaquin Sorolla, and a number of others which were on exhibition in the Art Gallery at the World's Fair. There are some famous pictures recently acquired for the loan collection, among them two Verestchagins and a Rembrandt. There is a plaster cast, by Jean Goujon, of Louis de Brézé in a recumbent position, being a copy of the monument in Rouen Cathedral executed during the latter half of the sixteenth century. Some valuable additions to the collection of porcelains in the Museum have recently been made by a number of its benefactors, there being some very fine examples of old Wedgwood and Royal Worcester. The loan collection of porcelains has recently received several valuable additions, among which special mention should be made of the Japanese, Chinese, and Corean porcelains and jades. The latter is a portion of a very fine collection owned by Mr. Chauvenet of St. Louis.

We spoke in a recent letter in regard to the threatened pollution of the St. Louis water-supply by the Chicago drainage-canal. Like many other short-comings of our present Mayor and Municipal Assembly, the wholesale water sampling recently carried on under the supervision of the City Chemist has come to an end through their means, and the matter has dropped entirely out of sight. Because of this there is nothing else for the people of St. Louis to do, but to sit by and drink dirty water, — all the result of the inefficiency and slumbering attitude of the city administration. If the water simply contained pure clay or earths, they could easily be disposed of in the settling-basins (then, besides, these are not considered unhealthy), but it has been shown to contain albuminoids, nitrites, and nitrates in great quantities which have no other source than Chicago pork-packing establishments and slaughter-houses. Matters have stood thus during the life of the Illinois and Michigan Canal, so how aggravated they will be when the Chicago Canal is completed may readily be appreciated. The new waterworks at the Chain of Rocks on the Mississippi River are the occasion for our remarks and all the fruitless investigations that have been made.

They represent an outlay of over $6,000,000 taken directly from the pockets of the citizens of St. Louis, no bonds having been floated for the purpose of building the plant.

The Chain of Rocks is located at the extreme northern limits of the city, only about four miles below the mouth of the Missouri River, which flows into the Mississippi at this point. The location is an admirable one, being a point projecting into a deep part of the river, thus insuring a supply at all times. Opposite the point in the middle of the river channel is the inlet tower, built of granite for the base above high-water mark and for the remainder of the distance, one story, of limestone. The roof is covered with red Italian tiles. The water is conducted from the tower under the bed of the river to the settling-basins by means of the pumps. The basins are six in number and each covers a little over six acres, or an aggregate area of about thirty-seven acres. The stonework on these is about as fine an example of the stonemason's art as can be seen. The walls are extraordinarily heavy, even for the purpose, and are built of huge freestone blocks put together with great neatness and finish. They are capped with smooth-finished limestone blocks. The bottoms are laid with granitoid divided into squares and the whole pitching towards the centre, so as to facilitate flushing the basins when such an operation is necessary. At the intersections of the basins are placed the gate-houses, which are substantial little buildings of red granite and St. Louis press-brick. The pumping-station, boiler-house, coal-houses, etc., are very neat buildings for the purpose, and the materials used in their construction are red granite and press-brick as in the gate-houses. The pumps are of the latest vertical type, and their size may be appreciated by the fact that they extend about 100 feet below ground. The full capacity of the plant is 160,000,000 gallons every twenty-four hours, but the pumps now being installed will give only 100,000,000 gallons. Two are of 30,000,000 gallons capacity and were built by the E. P. Allis Company of Milwaukee, Wis., while the remaining 40,000,000 are divided into two units of 20,000,000 gallons each, supplied by Henry Worthington of New York, N. Y. The contract for the water-tube boilers was awarded to the National Water-tube Boiler Company of New Brunswick, N. J., after much discussion, it being the desire of the Commission to give the contract to a local water-tube boiler company. A conduit twelve feet in diameter extends from the works to the distributing plant at Bissel's Point, six miles below, and much further in the city. After settling at Chain of Rocks, the water flows by gravitation to Bissel's Point, the conduit being at a slight incline. Here it is again settled in basins, then pumped to the two water-towers, which create the pressure, and distributed over the entire city. The distributing plant is no longer equal to the demands put upon it, on account of there being no more room in the adjacent streets for an increase of pipes necessary to give a satisfactory supply to the northwestern part of the city, which has grown so rapidly during the past few years. To remedy this defect, No. 3 plant will very shortly be erected at Baden, halfway between plants 1 and 2, with the necessary pumps, settling-basins, water-tower, etc. The estimated cost of No. 3 plant will be only in the neighborhood of $500,000.

SOCIETIES

THE ENGINEERS' CLUB OF PHILADELPHIA.

AT the regular meeting, held April 21, 1894, President John C. Trautwine, Jr., in the chair, seventy-eight members and visitors were present.

A paper on "The First United States Pneumatic Postal System" was presented by the author, Mr. A. Falkenau, who stated that the year of trial of the first pneumatic system for postal service in the United States had just been completed and the extension of the system for commercial, as well as postal, service was contemplated. Before describing the Philadelphia system a brief review was given of what had been done in Europe in the way of pneumatic transmission, and the London and Paris systems were more particularly described as follows: In London the tubes were 2¼ and 3 inches lead pipes laid in cast-iron pipes for protection. The carriers used in 2¼ tubes were but 1¼ inches diameter, the remaining space being taken up by packing. Carriers are despatched singly. First, vacuum alone was used; later, vacuum and compressed air. The tubes used in the continental cities in Europe were wrought-iron, the Paris tubes being 2½ inches diameter. There the carriers are despatched in trains of 6 to 10, propelled by a piston. The carriers and tubes were more fully described, also the method of locating obstructions in the tubes.

The two methods of laying pipes on the radial and polygonal systems were fully described. To give an idea of the extent to which this work is carried in Europe, it was stated that the London system has 42 stations with a total length of 34 miles of tubes. Six engines of an aggregate of 216 horse-power constitute the power plant. The Liverpool and Berlin systems were similarly described.

In 1892 the Pneumatic Transit Company of New Jersey contracted to install the Philadelphia plant. As the size of tube adopted and laid was 6½ inches diameter, entirely new problems presented themselves. The velocities adopted in all systems is about the same, being 30 miles per hour. The stored energy of a London carrier while at full velocity is only nine foot-pounds, while that of the Philadelphia carriers has been as high as 1,380 foot-pounds. The problems of dealing with this energy were thoroughly solved by Mr. B. C. Batcheller, the engineer of the company. Air-cushions were introduced, the accumulated pressure in the cushion chamber being utilized at the same time to operate automatically the receiving apparatus. The distance from the main post-office to the sub-station of Chestnut Street is 2,928 feet. There being an outgoing and return tube, the total length is 5,856 feet. The apparatus at the two stations was described in detail. The pressure of air at the main post-office is seven pounds, while at the sub-station it is about four pounds, as the pressure does not fall at a uniform rate. The air passes through the entire system of tubes, returning to the post-office at atmospheric pressure, the end of the tube being practically open to the air. The two air-cylinders of the compressor located at the main post-office are 18-inch bore, while the steam-cylinders are 10-inch bore with a piston-stroke of 24 inches.

There has not been a single case of obstruction of the tubes since the plant was first put into operation.

The difficulties encountered in laying the pipes and boring the same were described. The use of air-blast in boring reduced the temperature near the cutters from 20° to 60° Fahrenheit.

Attention was called to the fact that, mechanically, pneumatic propulsion is not economical, about 90 per cent of the work being wasted. It was pointed out, however, that commercially the value of pneumatic transmission was amply proven and that the larger size of pipe adopted here would permit a more remunerative class of business to be done.

It is now proposed to extend the system to cover the greater part of the city, locating the central pumping-station about Twelfth and Market Streets, with other central stations at Columbia Avenue, South Street, etc., the connections being made on the radial system. Each central station will be the nucleus of a number of local polygonal circuits, covering territory within convenient limits. Views illustrating the Philadelphia and also the European plants were shown.

In closing, Mr. Falkenau stated that this first pneumatic postal tube in the United States was the largest of its kind in the world, and presented the Club with sections of the tube, thinking they might be of historical value.

DISCUSSION.

Mr. W. W. Carr, Postmaster of Philadelphia, stated that the tube had been placed in the hands of the Government before his appointment, and that much of the credit for its installation was due to the indefatigable energy and persistency of his predecessor, Mr. John Field.

The subject is one of great interest, not only to engineers, but also to the general public, on account of the direct return received through the increased efficiency of the mail service.

The tube has carried 30,000 letters per day, and has been working most satisfactorily and without a single stoppage. Great credit is due Philadelphia for introducing the first pneumatic system in the United States. Chicago and other cities are contemplating following our example.

Mr. John Field explained that he felt the need for improvement in the methods of handling the Philadelphia mails as soon as he entered upon his duties as postmaster. He visited European cities to learn the best methods in vogue, and decided to recommend the adoption of a system similar to that in use in Berlin. More or less meritorious designs were offered by different companies, but the greatest difficulty was to obtain the permission of the Government to make the trial. The system finally adopted has proved entirely successful and reflects great credit upon its constructors, as well as its designers.

Mr. B. C. Batcheller said that the most economical speed of carrier was about 30 miles per hour, and the actual time the mail was in the tube was but a very small part of the total time in handling. An increase in velocity would add to the wear and tear, with but little gain. This same speed is used in the Continental lines.

The diameter of the tube was determined only after mature deliberation. The original intention was to use 6-inch wrought-iron pipe; but finding the diameters varied too much, 6-inch cast-iron water-pipe was used, bored out to 6½ inches. This capacity has proved ample, and is by far the largest in the world. Each carrier holds about 200 letters, but 100 to 150 should be taken as the average, which, at the rate of 8 carriers per minute, gives a delivery of 48,000 letters per hour. The time required to make the distance between the two post-offices is about 57 seconds, and the carriers will run about 550 miles before the packing-rings placed on the outside to form air-tight joints will wear out. This packing was formerly made of felt, but it is now found that canvas answers the purpose very well.

The best form of carriers are those with open ends, as this gives a much stronger shape than those with the openings on the side, and there is much less danger of breakage. The largest size of pneumatic tube considered feasible was about 8 or 10 inches in diameter, as beyond this size the carriers increase so rapidly in weight that the packings, upon which the whole weight rests, would soon wear out. The length of such a line should not exceed 4 miles.

Mr. Batcheller closed with some interesting conclusions drawn

from his experience regarding the advantages and applicability of the polygonal system, giving special reference to the enlargement of the Philadelphia plant. STRICKLAND L. KNEASS,
Secretary, pro tem.

THE SKETCH-CLUB OF NEW YORK.

THE regular monthly meeting and dinner was held at the club-rooms Saturday evening, May 5, thirty-one members and four guests being present. President Edgar A. Josselyn occupied the chair. Mr. D. H. Haigh, the guest of the Club, gave a very interesting address on the chemical properties of plaster, the manufacture of lime and plaster-of-Paris. After this, ex-President Julius A. Harder read a paper on designing, giving some very practical views on this subject, which was highly appreciated by the members.

In response to a request from the American Institute of Architects for suggestions as to rules governing competitions, the following resolutions, referring to such points only as directly affect our (draughtsmens') interests, were adopted:

Whereas, Competitions being the principal medium through which the younger and unknown men may gain recognition, be it, therefore,

Resolved, 1st, That we believe that all competitions should be *open* except when paid competitors are selected by means of an open *preliminary* competition, similar to that of the Brooklyn Institute.

2d, That competitive drawings should be of the simplest character possible.

The meeting adjourned at 11.15.

H. C. PITTMAN, *Recording Secretary.*

ILLUSTRATIONS

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

HOUSE ON CAMP ST., NEW ORLEANS, LA. MR. JAMES FRERET, ARCHITECT, NEW ORLEANS, LA.

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

THIS house, No. 927 Camp St., New Orleans, was originally built in 1869 for the then Superintendent of the New Orleans Gas Light Co., and to meet his ideas of utilizing gas products, the roof was made of tar and gravel and the porch (gallery) columns of four-inch gas-pipes, which have since been changed to Doric. The house has now been remodelled, adding the octagons and conservatories and both exterior and interior changed from perfect plainness to its present appearance.

The walls and ceilings of the hall, dining-room and library, above the solid walnut wainscoting, are veneered in oak and two kinds of walnut with the Chas. W. Spurr veneers.

TOWN-HALL, FAIRHAVEN, MASS. MR. CHARLES BRIGHAM, ARCHITECT, BOSTON, MASS.

THIS building was given to the town by Mrs. H. H. Rogers.

HOUSE AND STABLE FOR JOHN A. LYNCH, ESQ., CHICAGO, ILL. MESSRS. JENNEY & MUNDIE, ARCHITECTS, CHICAGO, ILL.

THE exterior is entirely of smooth dressed white granite from Maine quarries. The roof is of glazed Spanish tile. The interior is finished in polished woods, marble, mosaic and metal-work. The total cost will be nearly $100,000.00.

DINING-ROOM IN SAME.

HOUSE OF JOHN I. GLOVER, ARCHITECT, BALDWINS, L. I., N. Y.

INTERIOR VIEWS OF THE FOLLOWING CHURCHES, SHOWING THE ORGANS: EXETER CATHEDRAL, EXETER, ENG.; LINCOLN CATHEDRAL, LINCOLN, ENG.; RIPON MINSTER, RIPON, ENG.; ABBEY CHURCH OF ST. DENIS, ST. DENIS, FRANCE; NOTRE DAME DE BON SECOURS, ROUEN, FRANCE; AMIENS CATHEDRAL, AMIENS, FRANCE.

SEE article on "Church Organs" in this issue.

[Additional Illustrations in the International Edition.]

THE NORWEGIAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. W. HAUSTEEN, ARCHITECT.

[Gelatine Print.]

HALL IN HOUSE ON CAMP STREET, NEW ORLEANS, LA. MR. JAMES FRERET, ARCHITECT, NEW ORLEANS, LA.

[Gelatine Print.]

BRONZE DOORS, ADELPHI BANK, LIVERPOOL, ENG. MR. W. D. CARÖE, ARCHITECT.

BATHS AND LIBRARY, GREAT SMITH STREET, WESTMINSTER, LONDON, ENG. MR. F. J. SMITH, ARCHITECT.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

ARCHITECTURAL DESIGNS FOR THE MECHANICS ARTS HIGH SCHOOL.

BOSTON, MASS., April 27, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT. —

Dear Sirs, — The idea has come to me that it would be a fine scheme to hang the walls of the "Boston Mechanics Arts High School" with architectural designs and details; thus not only affording the scholars good examples of existing work, but also directing their taste in the right direction.

There are always on file in the architect's office many designs and details which have practically outlived their usefulness, but which would be valuable in a collection such as I desire to make and for the purpose intended, and I earnestly ask my brother architects to contribute to this object. It seems to me desirable, as far as possible, that the drawings so contributed represent a given building, by plans, elevations and details; so that the design and use of the details may be intelligently understood by the scholar. Contributions will be properly classified, and hung in groups, with the name of contributor attached. It is to be understood that contributions are to be held as *gifts* to the City of Boston, to be *placed* and to *remain* in the "Mechanics Arts High School."

The scheme has been submitted to the School Committee and meets with its hearty approval and coöperation.

It is desired that all contributions be delivered at my office, on or before Saturday, May 19.

Trusting that the scheme will enlist your generous support, I remain, Yours truly, JOHN LYMAN FAXON.

THERMOSTATS.

NEW YORK, N. Y., May 4, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can you inform me as to whether or not there is any form of thermostat now on the market which will operate the valve between the hot and cold air supply so as to mingle the two, to give the desired degree of temperature.

What I desire is one that will partially open the valve and not only operate the valve through two positions, one open and the other shut. Yours truly, GEO. HILL.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints:* at the Museum of Fine Arts.

Architectural Drawings by Albert Randolph Ross: at the St. Botolph Club, May 7 to May 19.

CHICAGO, ILL. — *Seventh Annual Exhibition of the Chicago Architectural Sketch Club:* at the Art Institute, opened May 10.

NEW YORK, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

ST. LOUIS, MO. — *Exhibition of Architectural Drawings by St. Louis Chapter, A. I. A.:* at the Museum of Fine Arts, April 27 to May 13.

NOTES AND CLIPPINGS

THE LARGEST BALLOON IN THE WORLD. — There has recently been built by Messrs. Charles Green Spencer & Sons, of Holloway, a balloon of larger capacity than any hitherto existing. Its capacity is over 100,000 cubic feet, and it will lift a ton, in addition to its own weight of 1 1-4 tons. It is a sphere with a diameter of 57.24 feet, and is inclosed by 120 gores of silk, each 18 inches wide, sewn together by four miles of stitching One object in building the balloon has been to enable continuous observations to be made over six days without descending, and to enable this to be done the bag is a double envelope of silk with a layer of varnish between, and uniting, the two skins. The cost of construction has been 2,500*l*. To enable the gas to be

quickly liberated after the balloon has been anchored by its grapnel there is a 4-foot valve at the top. This valve consists of two semi-circular flaps, each hinged along the straight side, and held up to the face by twelve helical steel springs, three-eighths inch in diameter and of 16 B. W. G. wire. The flaps are strengthened by light brass frames on their upper sides, and battens on their lower sides. The frame of the valve is a bent ring of ash, with two wood battens. It is placed in a hole prepared for it in the top of the balloon bag, and is held to the silk by an encircling metal band. The valve is opened by a line passing through the centre of the balloon into the car, and is closed by the springs. There is a drip cloth round the balloon about one-fourth the way up, to divert any rain that may be collected on the surface from falling on the passengers. A ladder affords communication from the car to the zenith of the sphere. The balloon made its maiden trip from the Crystal Palace grounds on Wednesday, February 21, and after remaining up for four and one-half hours in a comparative calm, descended at Horsham. It is proposed to undertake several scientific trips, after which it will be worked as a captive balloon at the grounds of Woodhouse Park, Uxbridge Road, during the summer season from May to October. — *Engineering.*

How a Priest saved a Gold Altar. — The gold on the Paliotto executed for that very interesting church in Milan, S'. Ambrogio, by the goldsmith, Wolvinus, was valued at 280,000 gold crowns: it is a most beautiful piece of goldsmiths' work, enriched with cameii and intaglii, precious stones and enamel. Quintilian justly observes, "*Ars summa materia optima melior*," and the value of the exquisite design and arrangement of this work is far above the value of the material employed, yet the value is, in this case, so far above price, that there is an additional reason for being glad it is still preserved to us. Count Balzani told me how nearly it was lost when Milan was entered by the famished soldiers of Napoleon, and how it was saved by the adroitness of a priest, who knew that a small portion had either been stolen or lost, and that the vacant space had been supplied with a good imitation in copper gilt. This little accident was only known to a few of the priests, the outer world knowing nothing of it. When the soldiers entered the church the priest advanced to them, asking what they wanted. He was rudely answered, "the gold altar case and the gems set in it." "Alas!" he said, "would that we had a gold altar, its value would supply the wants of many; it is this gilt Paliotto," he continued, "that you must mean. Look! I will show you the gold." And he coolly broke away the restored copper-gilt portion, saying, "Do you think, if the gems ever were real, those here now are better than the copper? No, poor fellows, it is not in this bare, half-empty, poor old church that you will find treasure; go, seek it elsewhere." And they went without touching the Paliotto. — *From a Lecture by Mrs. Newman before the Society of Arts.*

Chicago Building that stopped Clocks. — A local corporation, recently organized, established its headquarters on the top floor of one of the tallest buildings in town. The attorney had a room to himself; the secretary was given another palatial apartment; the superintendent reigned supreme in another place; the president was, of course, compelled to outdo all the others in leather-cushioned chairs, massive tables and expensive bronzes. The crowning glory of his private office was a big clock with an elaborately-carved case. It was the best clock in the entire stock of a local dealer, and it had a long, shiny pendulum, which was to swing slowly and with regularity, as became a clock owned by the president of such a solid and respectable corporation. On the first day the pendulum stopped. The clock was sent back to the dealer, whose experts took it apart, oiled it and set it to running again. Once more it was taken up to the president's office and once more it ceased running. For a second time the experts dissected it and found every part in working order. It kept time to the second for two days and was confidently returned to the buyer, who reported back again in two hours: "The clock has stopped." An architect who became acquainted with the facts in the case solved the mystery. He said the oscillation of the high building counteracted and stopped the swing of the pendulum. The pendulum couldn't work with any regularity, so long as the building was nodding around in the changing winds like a cat-tail before a summer zephyr. "So the tall buildings do swing back and forth?" he was asked. "Certainly, but don't be afraid: they'll not break."— *Chicago Record.*

An Artificial Pavement used in Munich. — Since the ideal pavement is not yet generally found in New York streets, it may be of interest to observe that they are getting on particularly well in Munich with one made of artificial stone. The basic material is serpentine, crushed or ground into meal. A fluid, the composition of which is a secret, is added, and the mixture is pressed into moulds with hydraulic power, forming bricks about the size and shape of the granite blocks used here. These bricks are dark brown, very hard, but curiously elastic. The blow of a hammer, if strong enough, will make an impression upon one, but, though close to the edge, will not split or splinter it. Attrition has no more effect upon this pavement than upon granite, and when worn smooth, it is never slippery, it is scarcely more noisy than asphalt, and yields no dust: indeed, according to the proud Munichers, it is just about perfect. Whether it would be so satisfactory here, where it would probably be carelessly laid, and certainly would be torn up for pipe-laying three or four times a year, is a problem. — *N. Y. Tribune.*

The Lion Bridge, near Sangang, China. — The longest bridge in the world is the Lion Bridge, near Sangang, in China. It extends five and one-fourth miles over an arm of the Yellow Sea, and is supported by 300 huge stone arches. The roadway is 70 feet above the water, and is inclosed in an iron network. A marble lion, 21 feet long, rests on the crown of every pillar. The bridge was built at the command of the Emperor Kieng Long, who abdicated in 1796, on account of old age. — *Philadelphia Record.*

The World's Tunnels. — The tunnels of the world are estimated to number about 1,142, with a total length of 514 miles. There are about 1,000 railroad tunnels, 12 subaqueous tunnels, 90 canal tunnels and 40 conduit tunnels, with aggregate lengths of about 350 miles, 9 miles, 70 miles and 85 miles, respectively. — *Invention.*

Long Clock Pendulums. — No clock in England has, it is stated, so long a pendulum as St. Chad's Church clock at Shrewsbury, which was made last century. The pendulum of this clock is 22 feet long, and the ball 4 feet 3 inches in circumference and 200 pounds in weight. "Big Ben" in the Westminster Hall Clock Tower has a pendulum 15 feet in length, the dial is 71 feet in circumference and the minute-hand, which is 11 feet 6 inches long, is hollow, made of copper, and weighs 1¾ cwt. The figures on the face of the clock are over 2 feet in length and the minute dots exactly 1 foot 1 inch apart from centre to centre. The clock reports its own time at Greenwich and is so accurate that it does not vary more than four seconds in the year. The longest pendulum ever made is said to be that used at the Eiffel Tower in Paris, the length of which is 377 feet. — *Invention.*

Doulton's Soil-pipe Joint. — The joint between the leaden soil-pipe and the stoneware of a closet has long been a *bête noire* to sanitary engineers. The usual practice is to use red lead to render the joint gas-tight, but such a joint can never be depended upon in the same way that a soldered joint can be. Messrs. Doulton & Co., of Lambeth, however, after a long course of experiments, have at length succeeded in soldering lead-piping to stoneware by what they call a "metallo-keramic joint." The stoneware, after baking, is metallized, by painting a belt on it with a composition containing platinum. It is then re-fired, and in this way the metallic band is incorporated with the body of the pottery, and forms a basis to which solder will firmly adhere. The joint in question has now been in use for eighteen months, during which it has been severely tested with perfectly satisfactory results. If a band of lead is soldered on to a piece of pottery in this way, and then stripped off by main force, the surface of the stoneware comes off with it. The staunchness of the joint has also been tested by soldering metal discs to the ends of a stoneware pipe. On applying hydraulic pressure, the pipe burst before the ends could be forced off. — *Engineering.*

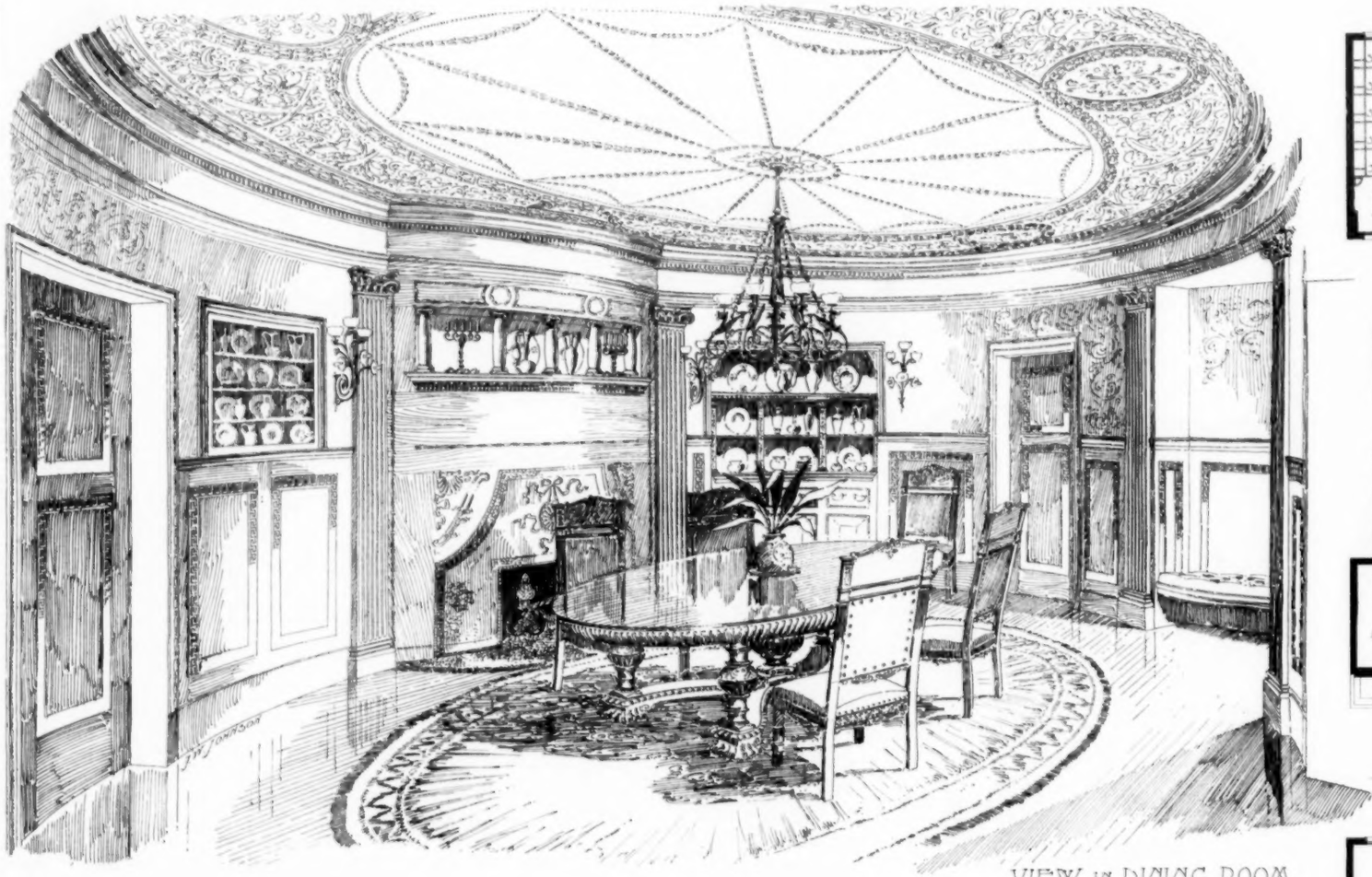
Turning Granite Columns. — Granite for columns, balusters, round posts and urns is now worked chiefly in lathes, which for the heaviest work are made long enough to handle blocks 25 feet long and 5 feet in diameter. Instead of being turned to the desired size by sharp cutting instruments, as in ordinary machines for turning wood and metal, granite is turned or ground away by the wedge-like action of rather thick steel discs, rotated by the pressure of the stone as it slowly turns in the lathe. The discs, which are 6 feet or 8 feet in diameter, are set at quite an angle to the stone, and move with automatic carriage along the lathe bed. Large lathes have four discs, two on each side, and a column may be reduced some 2 inches in diameter the whole length of the stone by one lateral movement of the carriage along the bed. The first lathe for turning granite cut only cylindrical or conical columns, but an improved form is so made that templets or patterns may be inserted to guide the carriages, and columns having any desired swell may be as readily turned. For fine grinding and polishing, the granite is transferred to another lathe, where the only machinery used is to produce a simple turning or revolution of the stone against iron blocks carrying the necessary grinding or polishing materials. Blocks are prepared for lathe work by being roughened out with a point, and by having holes chiselled in their square ends for the reception of the lathe dog and centres. This principle of cutting granite by means of discs revolved by contact with the stone has been applied to the dressing of plane surfaces, the stone worked upon being mounted upon a travelling carriage, and made to pass under a series of discs mounted on a stationary upright frame. — *Mechanical News.*

Lead Fountains. — None of the old English gardens were complete without a fountain, and no fountain was complete without a figure. Bacon says: "For fountains, . . . the ornaments of images, gilt or of marble, which are in use, do well."

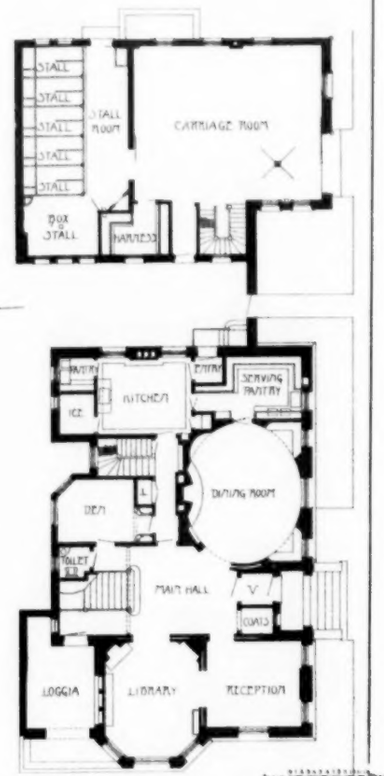
Paul Hentzner writes of the sixteenth century garden of Theobalds, the seat of Lord Treasurer Burleigh: "There was a summer-house, in the lower part of which, built semi-circularly, are the twelve Roman emperors in white marble, and a table of touchstone (alabaster); the upper part is set around with cisterns of lead, into which the water is conveyed by pipes so that fish may be kept in them, and in summer-time they are very convenient for bathing." At St. Fagan's, near Cardiff, in front of the house, is a remarkable lead tank;[1] it is octagonal, ten feet across and nearly four feet high; it is ornamented around the sides with flowers and shields in panels, and is dated 1620. At Lyon House there is a fountain in which a lead figure forms the jet d'eau. At Wooton, in Staffordshire, there is a fountain-basin with a lead duck so suspended as to float on the water spouting water from its bill. The swan which seemed to float on the water, described by Borrow, in "*Lavengro*," must have been of lead. At Sprotborough, in Yorkshire, are some lead toads, about nine inches long, which also seem to have belonged to a fountain. Some of the figures mentioned before stand in the centre of basins, and occasionally simple groups, as of Neptune in a two-horsed chariot, may be found, but we have nothing in England to compare to the great fountain compositions of the Versailles gardens or to the fountain called *Le Buffet*,[2] in the Trianon Park, designed by Mansard, and profusely decorated by the gilt lead-sculptures of Van Cleve and other artists. In Germany some of the earlier town-fountains are of lead. — *From Leadwork, by W. R. Lethaby.*

[1] See *American Architect*, January 27, 1894.
[2] See *American Architect*, April 5, 1890.

S. J. Parkhill & Co., Printers, Boston, U. S. A.



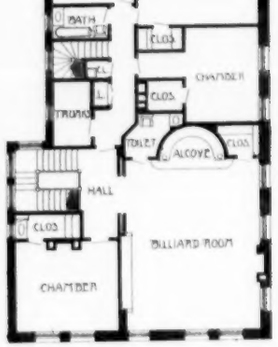
VIEW IN DINING ROOM



FIRST FLOOR PLANS

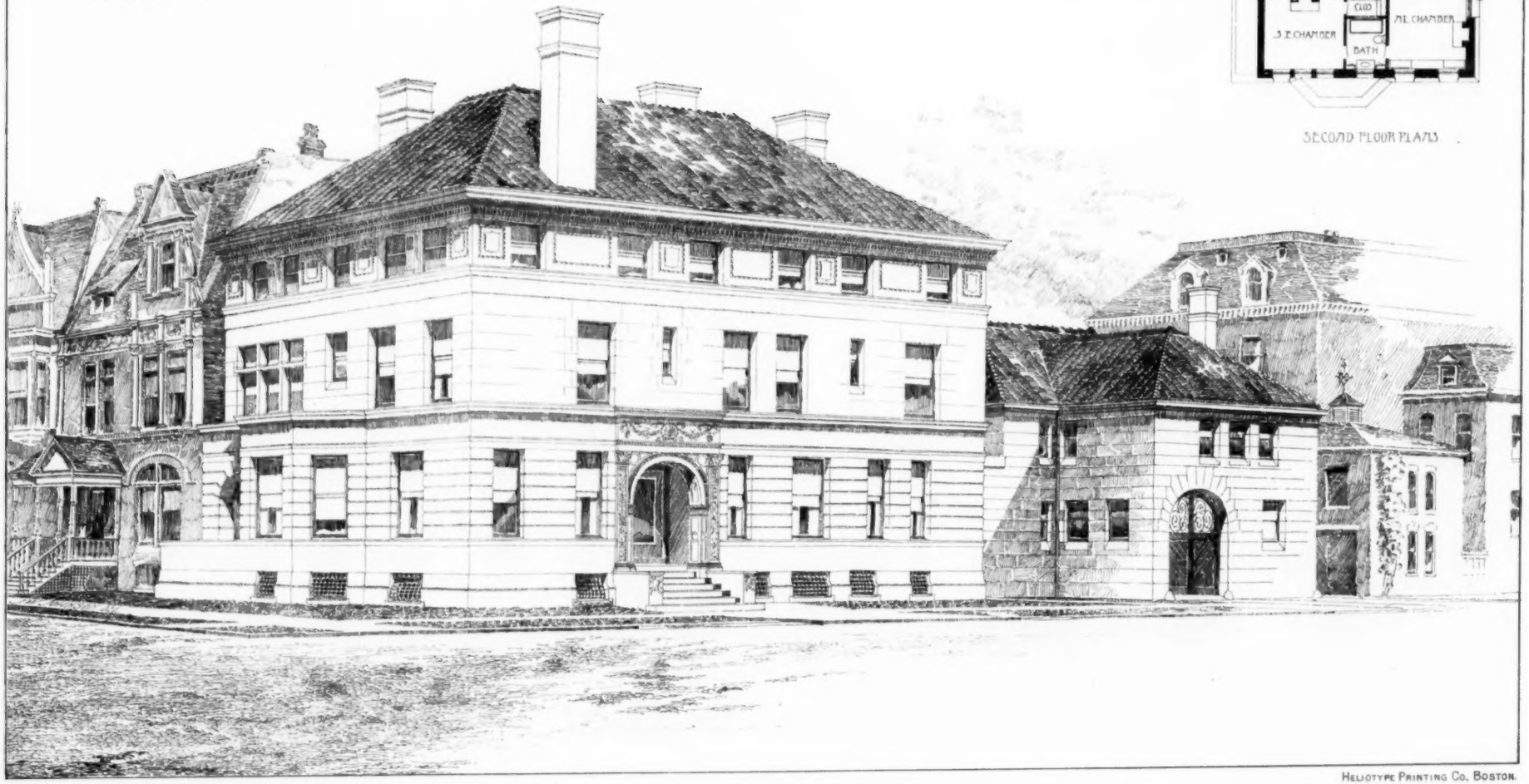
RESIDENCE AND STABLE FOR
MR J.A. LYNCH · CHICAGO · ILL.

RESIDENCE AND STABLE FOR
Mr J.A. LYNCH · CHICAGO · ILL.
JENNEY AND MUNDIE ARCHTS



THIRD FLOOR PLAN

SECOND FLOOR PLANS



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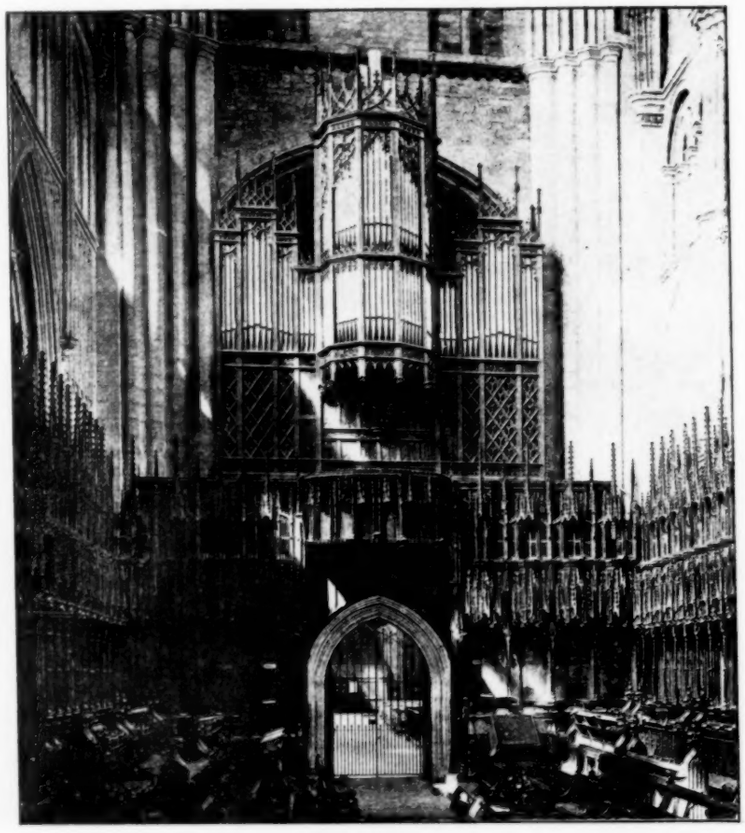

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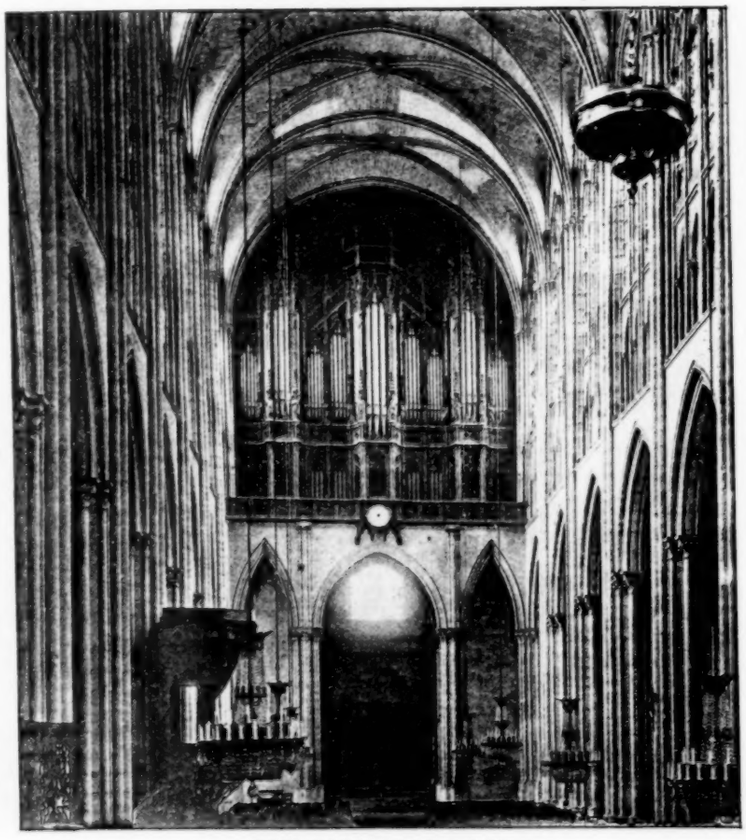
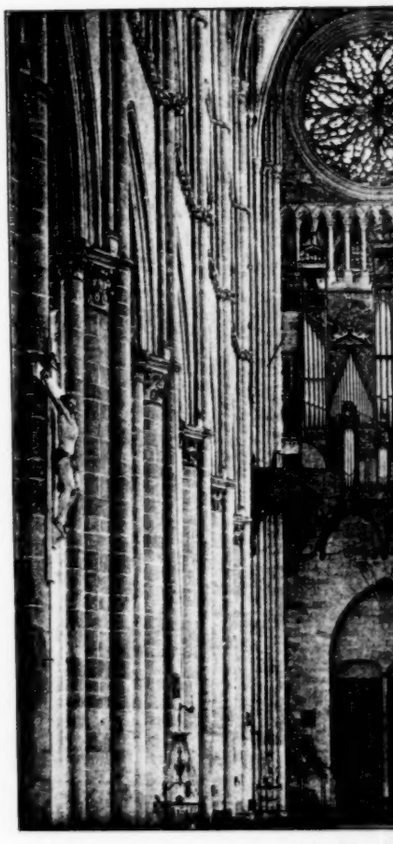
EXETER CATH



ABBEY CHURCH OF ST. DENIS.



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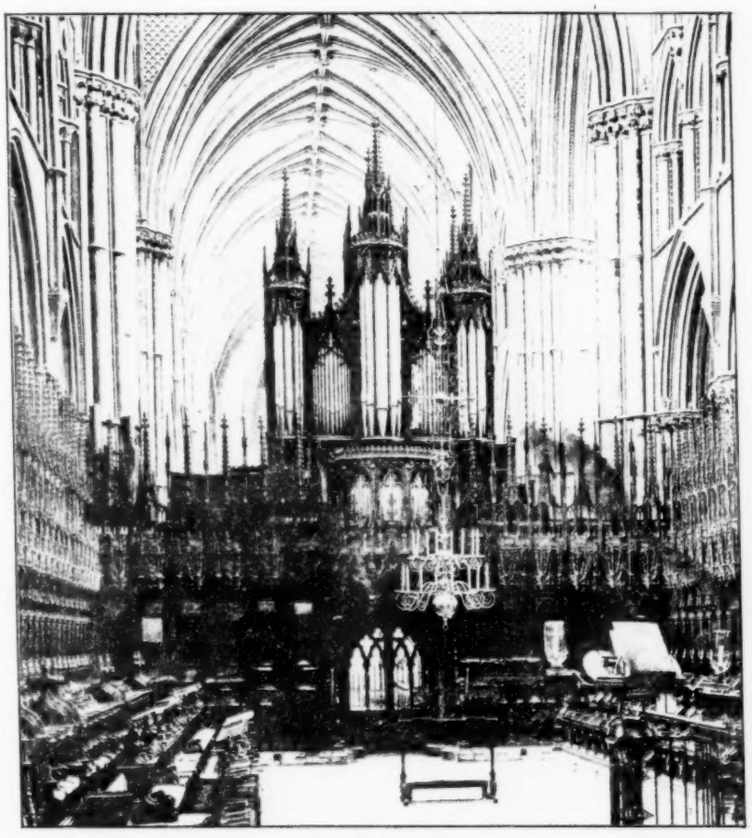
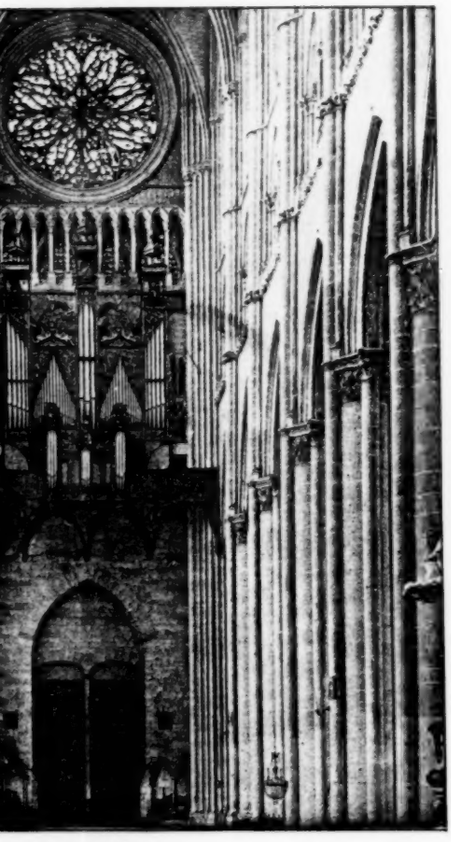
ETER CATHEDRAL.



LINCOLN CATHEDRAL.



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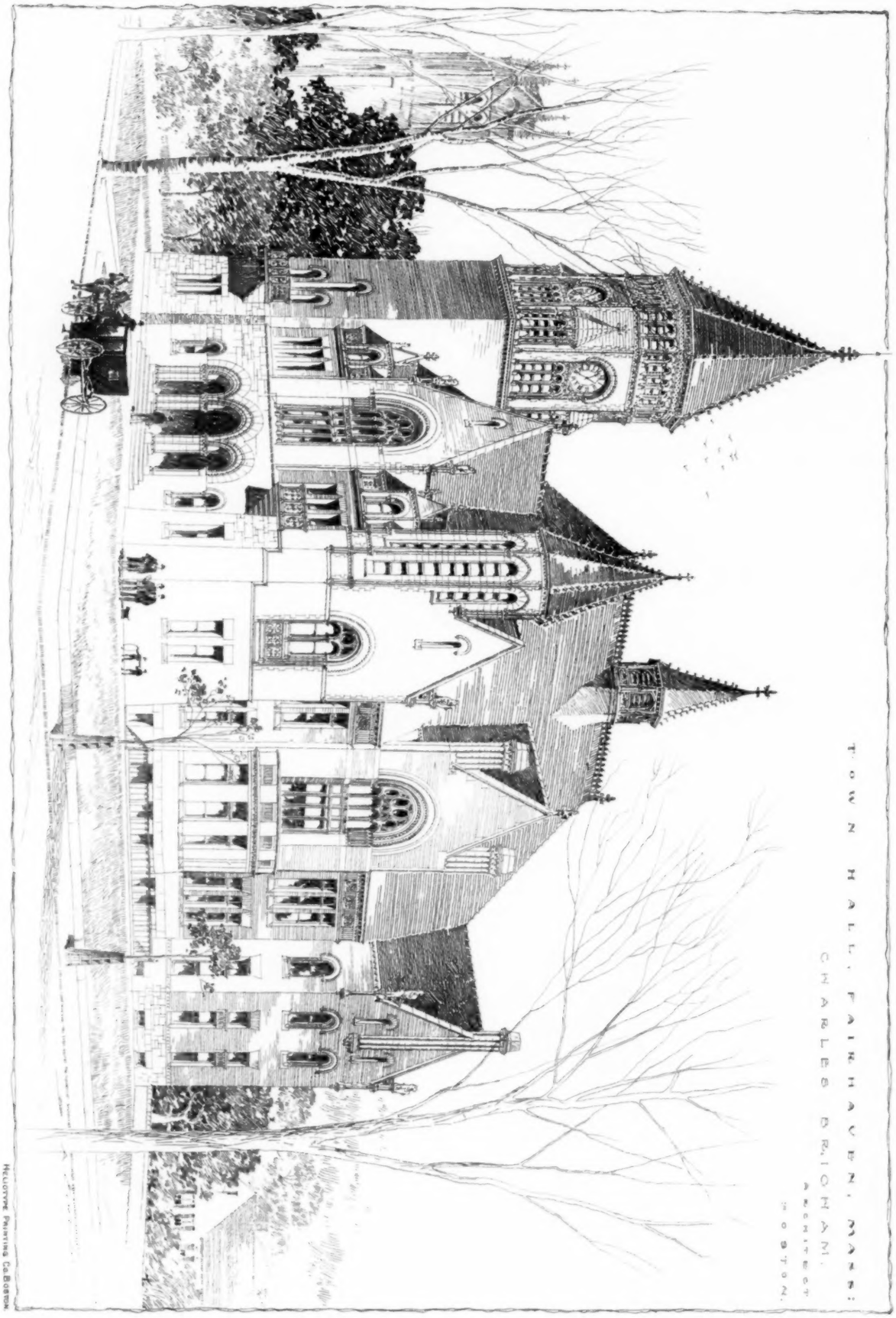

TOWN HALL, FAIRHAVEN, MASS.

CHARLES BRIGHAM, ARCHITECT, BOSTON.

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