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The Second Feature of our <i>Topical Architecture</i> Scheme of Publication—the Library Feature.—The Volume on Italian Renaissance Doorways now ready.—The Steel Strike and the Possibility of Buying-off Labor-leaders.—Enterprise as understood by the Promoter of a Carnegie Library.—The Pollution of the Passaic River.—A German Competition for Store-front Designs.—Statistics concerning the Strikes of French Workmen.	49
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"**W**OE unto you when all men shall speak well of you," says the Gospel; but as this warning was addressed to mankind it can have little application to inanimate things, such as our monthly publication *Topical Architecture*, concerning which subscribers certainly express their approval without apparent reservation. Still, the support this undertaking already receives is far from being as liberal as it really deserves, and we once more bring the matter to the attention of our readers with the reminder that the publication deserves wider circulation and support, and that its subscription price is so small that it does not require a very great stretching of the instinct of generosity for an architect or draughtsman to take his part in coöperating in the maintenance and growth of the periodical.

WE speak of this matter now because this important undertaking consists in two distinct features, with one of which, the publication of *Topical Architecture* as a monthly periodical, our readers are already familiar. It is evident to even the least thoughtful that, as there are a variety of individual tastes to be considered, a periodical must furnish a reasonable amount of differing matter, so as to give some proof that the editor at least realizes this condition of things, and is making some effort to cope with it and offer a fair amount of provender to satisfy each craving appetite. It is equally evident that, conducted in this way, the accretion of a considerable number of examples illustrating a given Topic must be slow, and the publication of that particular series must extend over several years. Now, as the real value of any classification lies in the fact that it shall be fairly numerous, representative and complete, it is evident that it may be several, and in some cases many, years before any of the several Topics begun in the monthly periodical are brought to a term and be ready for binding. To meet this difficulty, our scheme of publication of *Topical Architecture* is unusual and ambitious, and, as we say, consists in two parts. The second part of the undertaking consists in issuing contemporaneously with the monthly complete volumes of architectural illustrations, prepared and classified after the manner typified in the monthly publication, but, at first, no part of which has been (or will be) published in the monthly periodical. The first of these independent volumes in the "*Topical Architecture Library*" is published to-day, and is the occasion of our making this explanation. The volume illustrates Italian Renaissance Doorways.

OUR scheme of publication is carefully prepared, is consistent in all its parts, and thoroughly practicable, if only it receives from the profession the generous support it deserves. On this head we have little fear, for it is a fact beyond

peradventure that any architect who at the end of, say, ten years shall find on his shelves forty or fifty volumes of the "*Topical Architecture Library*" will at that time admit that these volumes form the most useful and oftenest consulted portion of his working library, and that he has secured them at a very reasonable price. Should any purchaser have procured every volume published, he would doubtless find that for some of them he had little, perhaps no, use; but in all probability he could truthfully make a similar statement regarding other books in his collection. The scheme of publication is good and thorough, but it is a scheme whose perfect operation depends on the generous support the profession is willing to give it, particularly in its early years, while it is establishing its own reputation; and this generous support we ask—and we mean "generous" in the sense that it may be given by some in the spirit of contributing to the establishment of a deserving undertaking rather than in the spirit of exacting in each case a *quid pro quo*. For the preparation of these volumes we have the promise of the support of the architectural schools and of the custodians of architectural libraries. It only remains, then, for each individual architect to join in this coöperative undertaking by purchasing the volumes as they appear.

THE seemingly approaching collapse of the steel-workers' strike, through the refusal of the union men themselves to obey the orders of their elected officers, suggests some interesting reflections. One of the elements in the present situation, which is not commented upon in the newspapers, but which private observers have probably noted, is that, immediately after the interview of the labor-leaders with the financial head of the United States Steel Company, in New York, a quarrel broke out between the leaders, the result of which was that the vice-president of the union is said to have gone to the Illinois members, and to have encouraged them to resist the order to strike. It will be remembered that, according to the first accounts of the interview between the moneyed man of the steel trust and the president of the union, the sentiments of the latter, without any very apparent cause, seemed to change from a portentous gloom to a feeling of great cheerfulness in regard to the prospects of the "toilers"; and it was not until the discontent of the other union officials began to take practical form that clouds appeared on the bright horizon. Of course, we do not mean to suggest that anything but legitimate argument has entered into the present discussion; but the thought that a corporation which pays its president a salary of eight hundred thousand dollars a year can afford to purchase, with a bribe which would amount to a reasonable fortune, the favor or the treachery of an influential labor-leader, is sure to occur to the persons most interested, and, in future, is likely to interfere materially with the blind obedience which such leaders have hitherto been able, in general, to command. Meanwhile, the defeated and desperate tyrants of the unions seem to have made up their minds to draw attention away from their discomfiture by rioting, and it is probable that a few days or weeks of violence will close the scene.

NOW that the Steel Corporation seems likely not only to defeat the union-leaders, but practically to break up the union itself, the public will be anxious to see what use it will make of its victory. According to our friends the Socialist professors, it will at once proceed to grind down its workmen to the starvation point, oppressing and crushing them until another beneficent union arises to save them. In practice, however, we venture to believe that every good man now employed by the Corporation will continue to be employed, so long as business warrants, at wages as satisfactory as those which he now receives, while the best and most willing ones will be better paid than they have ever been, or than the union would ever permit them to be; while thousands of men, not connected with the strike, will rejoice at being relieved from the heavy tax, amounting, in the present case, to ten or fifteen per cent of their wages, which they have had to pay to support a strike begun and continued to advance the interest of a few selfish and ambitious leaders. It is well known that the example of the Carnegie works has had much influence in shaping the course which the managers of the Steel Corporation propose to follow; and if they should adopt, later, Mr. Carnegie's rule

of making every workman of conspicuous zeal and ability a stockholder in the Corporation, the effect might ultimately be to revolutionize industrial conditions in this country.

WE have received from a responsible correspondent a copy of the following letter, received by his firm in reply to an inquiry. As the letter is of interest to all architects, and, possibly, also to Mr. Carnegie and his advisers, we reproduce it without comment, and without charge for advertising the enterprising parties concerned.

PORTSMOUTH, O., August 10, 1901.

"Gentlemen,—Your letter to 'Secretary Library Trustees' has been handed to me, and replying wish to state that only recently have I secured a donation of \$50,000 from Mr. Carnegie for a Library (see enclosed *Blade*, of which paper I am an attaché). The offer has been accepted and Committee appointed to select site, etc. I am Chairman of Committee and in addition to my work on the *Daily Blade* conduct an information bureau. In order to become a patron of the Bureau and receive all information pertaining to the Library, as also the new High School and Court House it is proposed to build here, as also all other news-matter pertaining to projected public building, it will be necessary for you to remit me \$25. You will see that I have some good references, and refer also to Major Banks and daily papers. I deal in information such as you want now and will want later. Upon receipt of draft I will send you names of Committee, size of site when selected, date of opening of bids, etc., also members of School Board, County Commissioners and Council, and agree to keep you advised of all steps taken with reference to public and large private buildings for one year from date. Will cheerfully give you any information in my power, and advise you by mail or wire of action taken. Being on the Committee and being on the daily paper, I am in a position to supply you with such information as will be early and of value, and trust you will see the advantage of placing your name with me. Please let me have an early reply, and I will at once give you such information as I have, and will try and give you such as you may want, answering any question pertaining to the proposed buildings. This will be of considerable value to you and much cheaper than a visit. When it is necessary, should it be so, that you should come, I will wire you. Library has been accepted, but no site has been selected, plans drawn or any arrangement made for such. All that will be done within a few weeks.

(Signed) H. A. LOEBERG."

IT is a satisfaction to see that the people who live on the banks of the Passaic have so far waked up to its objectionable properties that a public meeting was held the other day in Newark, for the purpose of demanding an extra session of the Legislature to deal with the trouble. Why the Passaic should smell any worse now than it did during the regular session of the Legislature is not explained, and it is likely that the inhabitants of the inland towns will object to sharing the expense of an extra session, to gratify the sudden haste of the people of Passaic, Paterson and Newark, who have been contentedly sniffing the odors of the stream, and adding new foulness to it, for forty years; but, even if the matter is delayed until the next regular session, it will be an advantage to have had it discussed. Those who have compared the appearance of a stream like the Passaic when it enters a manufacturing town with that which it presents when it comes out will not be deeply grieved to learn that some of the manufacturers of Newark, who certainly did not establish themselves on the bank of the river for the purpose of purifying it, find that their enterprising brethren farther up the stream have succeeded in defiling it to such an extent that the water cannot be used even in the pumps and tanks of the factories below; and the Newark manufacturers are obliged to buy fresh water for their processes.

EVIDENTLY, the remedy for all this is to prohibit at once all pollution of the river, by the discharge into it of sewage, factory wastes, or anything else but filtered and purified water. That it is perfectly practicable to do this is shown by the experience of England within the past thirty years, and it is shown more clearly every day that such prohibition will, in the end, be profitable to the community, by enforcing the saving and utilization of valuable material. Whether city

sewage can be utilized with direct profit is a question to which engineers give varying answers. It is certain that the sewage of some cities is a source of income to them, while that of others is disposed of at a loss; but the methods of utilization are undergoing constant improvement, and the cities on the Passaic are favorably situated for applying them. As for the factories, which present the greatest difficulty in utilization-schemes, through the poisonous chemicals which they add to wastes which would otherwise be available for agriculture, there would be no real hardship in requiring the immediate suspension of the discharge of such chemical substances. The modern science of applied chemistry is quite adequate to the task of devising processes for saving, or reducing to inert compounds, any chemicals used in manufacturing, and it would probably be profitable in the end, even to the manufacturers themselves, to compel the application of such processes.

THE noted publishing-house of Seemann & Co., of Leipsic, recently invited competitive designs for "modern fronts," announcing that the prizes would be awarded by a jury consisting of Professors Haupt, of Hanover, and Licht, of Leipsic, and Herr March, of Charlottenburg. The competition was divided into three sections, one to be devoted to designs for a front ten metres wide, the second to one twelve metres wide, and the third to one sixteen metres wide. A first prize of two hundred dollars and a second prize of seventy-five dollars were offered in the first section, and a first prize of two hundred and fifty dollars in each of the others, with a second prize of one hundred dollars in the second section, and of one hundred and twenty-five dollars in the third. Five hundred and eighty designs were sent in response to the invitation, and the prizes were duly awarded, two additional designs in each section being recommended for purchase. The list of names of the winners does not contain any of great distinction, but Gerhard Welzel, of Munich, who took the first prize in the second section, and whose design in the third section was first recommended for purchase, seems to be on the road, at least, to professional honors.

SOME very interesting statistics of strikes in France during the year 1900 are contained in a report drawn up by M. Arthur Fontaine, Director of the Statistical Department of the Ministry of Commerce. It may be observed that M. Millerand, the Minister of Commerce, is known as a Socialist of the most enlightened type, so that an official report from his Ministry could not be accused of favoring the "bourgeois" side, even if there were any reason for questioning M. Fontaine's careful figures. According to these, there were, in 1900, nine hundred and two strikes, or nearly three times the average annual number. About one hundred and eighty thousand people struck for higher wages, and lost three and three-quarter million days' wages in consequence, while only thirty-eight thousand obtained the increased wages that they asked for. Ninety-two thousand more obtained a little increase, but less than they demanded, the question having been settled by compromise. There is an excellent law in France, providing for voluntary arbitration, and twenty-six per cent of the strikes were settled by such arbitration. As usual in strikes, a large number of persons willing and anxious to work were prevented from doing so by their fellow-workmen, and it is estimated that these people were thus deprived of more than one million days' wages, which they could have earned if they had been permitted to work. The general deductions drawn from the figures are that, in 1900, only twenty-three per cent of the strikes were successful, while more than thirty-seven per cent totally failed; and, in the others, a compromise was only reached after a long struggle, which left both parties much poorer than when they began it. It is singular that in France, which is fortunate in possessing a particularly sensible and conservative population, the fashion of strikes should have spread so rapidly, and the French themselves explain the phenomenon by attributing it to the new laws favoring the association of workmen for benevolent purposes, the adoption of which has immediately been followed by a great increase in labor troubles. To people more experienced in union ways this explanation will seem quite sufficient, as it has long been a common artifice in this country for the wily conspirators who make their living out of the unions to begin operations, in manufacturing communities where no unions exist, by sending an agent to propose the formation of societies for literary enjoyment, or mutual improvement, which are soon converted into full-fledged unions,

THE POLICLINICO UMBERTO I, ROME.



AMONG the many notable modern works that are now in process of erection in Italy, the "Policlinico," situated in a charming position in Rome, may be held to be one of the first in importance and usefulness. In this building is being realized the fervid hope of Guido Baccelli, a Roman physician and statesman of international fame. He has desired through the uniting in one large enclosure of the Roman hospitals, clinics and also lodgings for students, to leave to the Italian School of Medicine



a locality for the development of medical science that probably would not be surpassed in any other country.

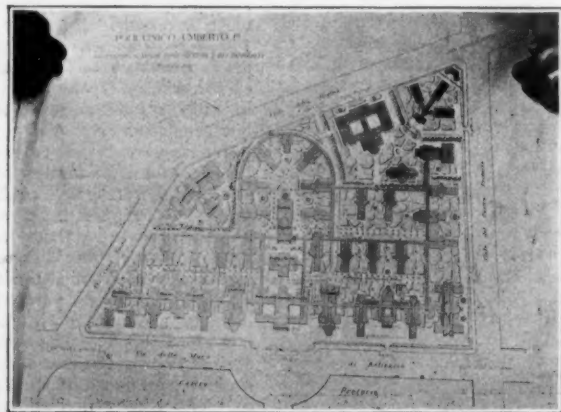
The design is by the architect Giulio Podesti, but the work is being carried on under the direction of a commission appointed by the Government, who relieved the city of the expenses of this work at an early stage. The ground, quadrilateral in form, covers an area of 50,000 square feet, of which 12,500 square feet are covered by buildings, and the site has been surrounded by a street 100 feet wide lined with trees.

The front, which is on a level and measures 1,840 feet, is enclosed by a wire railing mounted on a stone base; the other sides, owing to a difference of level with the street, by stone walls, which, in the vicinity of the buildings for infectious diseases rise to a height of 20 feet above the street-level. Along the front have been erected seven buildings connected by galleries. In the centre is the building for the administration, which has a frontage of 230 feet. This administration-building is connected with all the other buildings by covered galleries. The cases presented are received here, examined and allotted to the proper ward. The upper floor is occupied by sleeping and living rooms for the nurses.

In facing the ground, to the right are seen the three buildings for the medical clinics, and to the left those of the surgical clinics. Parallel with, and lying 65 feet behind the front row of buildings, is placed a row of isolated-ward buildings. This row is broken in the centre by a large open court whose level is dropped to that of the cellars. The kitchen and hydropathic establishment is built here; from this court an open road leads to the rear street and serves for the transportation of goods for consumption.

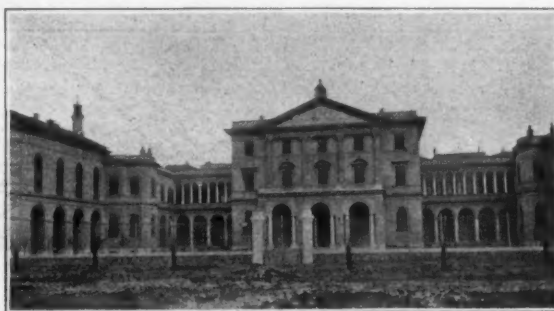
Other general isolated wards are placed behind this court in form of a semicircle.

Entirely detached from the main grounds, and where the north or south wind predominates, is the obstetrical clinic with its accompanying wards. In the most distant rear angle has been built the hospital for infectious diseases, consisting of a small office and three isolated wards. These wards consist of one-story brick buildings



erected on brick columns, 3 feet high, with a sufficient space between them to admit of a free circulation of air underneath. The plastering, of a special composition, is on iron lathing and is coated with an antiseptic varnish. The plastering can be removed and renewed after a disinfection of the iron lathing, which is permanent.

The general wards are built upon open galleries 25 feet high, and form a rear extension from their respective buildings; these are composed of two floors with cellars. The upper floor contains three rooms with a single bed in each and another room with three beds;



on the lower floor is placed a small kitchen, and the cellar is occupied by the steam-motor and ventilating-apparatus referred to later.

The general wards measure 27' x 65', and are 23 feet high; they hold 18 beds arranged in couples along the side walls, and between each couple of beds is placed a window opening to the floor. The spacious attic above is occupied by the tanks for hot and cold water, for baths, etc.

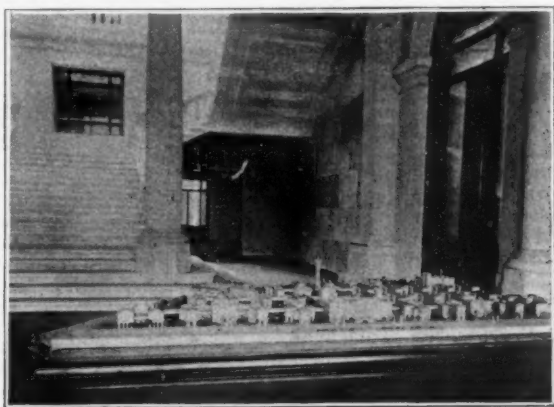
The communicating-galleries, which concentrate in the administration-building, consist of an underground passage which receives light and air from openings in the lateral walls, which project above the ground level, an open gallery for the ground floor, and a covered gallery for the upper floor, which is enclosed in glass, and is used for the transportation of patients to the different wards.

Passing over many interesting and novel sanitary arrangements special attention can be given to the steam-plant for heating



and ventilation. Great merit is due to the architect, Signor Podesti, for the precision with which it responds to the requirements of this large establishment. For economy and simplicity of service, a central plant of boilers and furnaces with a single chimney has been used. Through the chimney is carried off the sewer-gas collected from the sewer-pipes, which, in its passage through the smoke-stack, by an ingenious arrangement, is raised to a temperature sufficient to destroy all infectious germs. The Root system has been adopted for the boilers, and the steam-pipes conducting the steam to the different buildings are enclosed in the Leroy isolating covering.

The temperature in the wards is kept at 66°; in the baths, 72°;



kitchen, 60°; halls, 56°; offices, 64°; laboratories, 62°; libraries, 62°. Each building is supplied with a mechanical ventilator worked by a steam-motor receiving power from the central plant. The fresh air is received through small towers, 20 feet high, erected in the surrounding garden. The windows are protected

only by wire screening. Möller filters are placed at the base at the entrance of the subterranean pipes. The filtered air passes into a heating-chamber, where it is given the proper temperature as well as the needful humidity, and enters the rooms, such as the wards, on a centre line and at a height of 7 feet from the floor.



The vitiated air passes through openings in the side-walls placed alternately one near the floor and one near the ceiling, which conduct it through passages built in the walls, these being concentrated in a chimney supplied with a suction-valve.

For the wards has been calculated a renovation of 7,650 cubic feet of air per hour, corresponding to 425 cubic feet of air for each bed.

The lighting is done by electricity furnished by a city plant, with which the hospital is connected by means of underground wires.

Of the \$2,800,000 already expended, less than one-half was paid from the City Treasury, the Government assuming the balance of expenses, and with an additional sum of \$1,200,000 the Policlinico can be finished.

While the Government has made sacrifices in carrying to completion this work, which, if left in its initiative state of municipal enterprise, would have dragged through many years to an imperfect end, still it can be repeated that the inspirer and soul of the work has been Guido Baccelli, who with iron will and untiring energy has pushed the Policlinico to completion.

JAMES GILMORE.

VENTILATION BY ASPIRATION.¹—III.

THEORETICAL deductions in the books do not call for such a temperature difference even as 70 degrees and its corresponding pressure, but, for reasons appearing from the above discussion, it would seem a proper one, since in small work it assures sufficient power without an expense for fuel which may be relatively, but does not appear to be absolutely, great. Having assumed this temperature difference, and taking into account its effects in the light of the preceding considerations, it seemed to me there must be a law of heat-consumption in this process of ventilation showing especially its relation to the heating, notwithstanding the lack of precise formulas, and which could be recognized if an attempt was made to do it. After some study I have been able to discover and formulate this law, which is as follows:—

1. In a system of ventilation where the increase of temperature of the air required to effect the aspirating movement is not less than the maximum difference between the temperature of the outer air and that to be maintained within the building, the quantity of heat used is uniform in rate and independent of external fluctuations of temperature, and includes warming the air to a comfortable degree, in addition to promoting the ventilation.

2. In a system of ventilation by aspiration where the increase of temperature of the air required to effect the aspirating movement is not less than the maximum difference between the temperature of the outer air and that to be maintained within the building, the quantity of heat consumed in warming the fresh cold air to a temperature suitable for the occupation of the building and that required to be added in the shaft to complete the aspirating movement are proportional in rate respectively to the difference between the inside and outside temperatures and the difference between the inside temperature and that of the shaft, are inversely variable and are complements of each other, whose sum is constant for equal periods of time and independent of external fluctuations of temperature.

In other words, according to the first part of the law, the fuel-cost of ventilation for a summer day is the same as for the coldest day in winter when heating the air for comfort is superadded. So it would actually be in practice if our summer temperatures were not so high that all windows are kept open and artificial ventilation is thereby made unnecessary and superfluous. In climates where, in some buildings, even in summer the windows are kept closed, this law must hold good throughout the entire year. These facts explain how all Ameri-

can authorities have entirely overlooked this law, and why, on the other hand, European writers have almost detected it. Thus Box [edition of 1876, p. 272] states the cost of fuel "for ventilating in summer to be the same as for heating in winter . . . in both cases the whole of the heat of the fuel is eventually given to the air in the chimney, the difference being that in winter the heated-air is caused to pass through the building and in summer it is not."

It will be seen later on that the law holds good in this climate for all times when windows must be closed, and that, according to the second part of the law, as the proportion of fuel for heating diminishes that for ventilation increases, and *vice versa*. It must be borne in mind that the expression "heating" here refers to the air alone; it is limited to such partial heating of the air as will make it comfortable to the occupants of a building, say to 70 degrees, and to such additional heating at the base of the chimney as will cause sufficient draught. The loss of heat through walls and windows is another matter, and to the fact that this loss is usually made up by heating the air much higher than would be required were there no such loss and the confusion of ideas thereby involved is probably due the non-recognition of the law hitherto.

The practical application of this law demands a division of the air-heating apparatus, or, rather, its duplication. But further discussion of the question will be made clearer by diagrams. Referring to Figure 1, keeping in mind the principles of the heated shaft, and putting aside for the moment all questions of comfort so that the

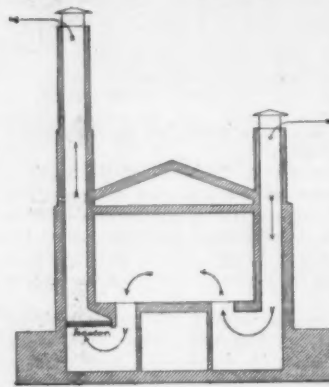


Fig. 1.

problem may be considered solely as one of ventilation, that is, the establishment and maintenance of a continuous regular movement of air in a definite course into and out of the building by the aid of heat applied at the base of an aspirating chimney, it is evident, according to the rules of physics, that this movement can only be secured by a certain difference between the outside temperature and that of the air in the shaft. If the air is everywhere zero, and 70 degrees elevation is required to move the air at the desired rate, then this difference must be added to the temperature of the room at zero and enters the shaft. So, too, if the air is everywhere at 70 degrees, the determined motion can only be secured by increasing its temperature by 70 degrees, so that the temperature in the shaft becomes 140 degrees. We will not take into account trifling variations of coefficients, because their effect is unimportant. Substantially, the quantities of heat required for equal times are themselves equal, no matter what the variations in the external temperature may be, a fact of the greatest importance, and always to be kept prominently in view.

The above is, of course, only an ideal case. Suppose, now, that the air, instead of traversing the building at zero, be warmed to a comfortable degree before entering the rooms. The resistances remain substantially as before, but the whole of the heat, that is, 70 degrees, is given to the air at an earlier point in its course, a mere incident, having no weight as regards the ventilation. Again, if the entering air be above zero, then less than 70 degrees will be imparted by the heater in the fresh-air flue; but since an elevation of 70 degrees is required to effect the aspiration, the remainder must be added at the base of the chimney, so that the temperature of the air in the latter will be 70 degrees higher than the outside air. If it is at 70 degrees outside, no heat is to be imparted to the entering air till it reaches the

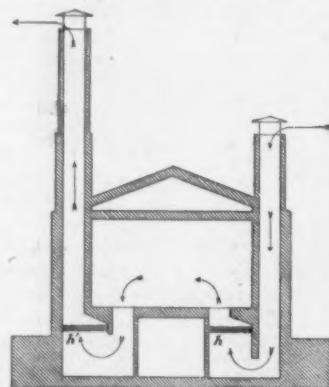


Fig. 2.

shaft, when its temperature must be raised 70 degrees or to 140 degrees as before. Intermediate temperatures demand corresponding quantities of heat; as less is required at the inlet, more is called for at the outlet, and the reverse, but the total is always the same for the same times. Referring to Figure 2, it will appear that sometimes the total heat must be imparted by a heater at h , sometimes at h' , but at most times partly by both, in accordance with the law above given. The effect desired is precisely that which could be produced if we had only one heater divided into portable sections, which we could transfer from one heating-chamber to the other as indicated by the conditions. Thus, all the sections would be at work at one time, the quantity of heat emitted would be constant, and the only variation would be in the points of emission. It is, of course, impracticable to move the heater-sections back and forth in this way, but it

¹ Continued from No. 1337, page 44.

will be seen later that it is quite practicable to cause an equivalent effect by making parts of two heaters reciprocally active and inactive in any desired proportion, and that it can be done by one operation in the simplest manner.

The building should be heated without regard to the ventilating-system and its specially assigned heaters. This might be overlooked, or deemed unnecessary, but it must be clearly understood that heating and ventilating are two distinct functions. The only reason for heating the building arises from its loss of heat through the cooling surfaces of windows and walls; a loss that is variable in the extreme, but one that has no relation to the ventilation. This process is designed, not at all for the purpose of warming, but simply to provide the occupants of an inclosure with pure fresh air to breathe. Now, air at zero is just as good, nay, it is better, to breathe than air heated by any artificial process whatsoever. But, since cold air cannot be introduced into a building in this climate without being tempered to a degree conforming to general ideas of comfort, and especially since heat is requisite in this system to generate and maintain a continuous movement of the air, we have to heat it somewhat. Moreover, there are usually long periods of time when buildings of this class are unoccupied, and the waste of a heating-system that is complexed and tangled up with the obscurities of ventilation as commonly applied is necessarily considerable at such times, because there is no need for expending fresh air, or rather the heat that it carries away, on the lifeless materials of which a building is composed. Therefore, let it be understood that although heat is consumed by the process of ventilating, it is strictly as an essential part of it, and not a part of the process of heating the building, and may be suspended altogether to save fuel when there are no occupants to be considered and provided for. As a concession to this principle, the building is to be warmed throughout by a system of direct radiation, locally distributed according to the exposure, and acting quite without regard to the ventilation, whether the latter is in operation or not, and neither system having power to affect or interfere with the other.

I am sure the unreflecting common opinion is that ventilation by aspiration costs more in cold than in mild weather, notwithstanding that the heat required in the shaft is known to be little or nothing in winter, more in so-called heavy weather in spring and fall, and in summer—well, in this climate, that is not thought of at all. Yet, as already explained, the fact is that the heat required to effect the aspiration is uniform in rate regardless of the external temperature and the season of the year, while heating the air for comfort, more or less, is only an incident of the process of ventilation and has no effect on the rate of fuel-consumption.

The application of this law shows that in every case where ventilation by aspiration is employed, the chimney, air-ways and coal-consumption should be first determined from the assumed data of number of occupants and unit volume of fresh air to be provided per person. No extra allowance of fuel need be made for warming the fresh air. The losses of heat through walls and windows and of warm air by leakage should then be taken up and the heating-surfaces and fuel-expenditure be calculated separately. The total boiler-power is thus arrived at, and it will be evidently the same whether the building be heated by direct or indirect radiators, provided that, if the ventilation be suspended in one case, it shall be in the other. For example, a school-house may be kept warm over night by a system of direct radiation, the heated shaft being shut off. Where the system is indirect, the air would be rotated while the shaft-valve was closed. The loss of heat and the equivalent fuel-consumption must evidently be the same in both cases.

I confess that the fact of the fuel-cost of air-heating being always less than the fuel-cost of efficient aspirating power in the case of a heated and ventilated building, impregnable as it is, seems at first rather startling. We have become so habituated to what may be called the spontaneous, or natural, ventilation of a warm building, that we have even imagined there is such a thing as natural ventilation, forgetting that all such ventilation is an effect of true aspiration, and that, so far as warming the air is concerned, the warming for comfort is but a part of the process of aspiration. It is a consequence of these facts that the design of a ventilating-system should be based upon them, but no such instructions will be found in any text-book. On the contrary, it is the universal practice to design the heating first and tack on the details of the aspiration afterwards, paying no further regard to the work contributed by the heating to the aspiration than to supplement it by an indefinite provision for heat in the shaft "to be used at such times as may be necessary."

It is most important for all persons who design work involving principles whose application in practice has not yet taken a definite form to have the clearest ideas concerning them. To confusion of ideas, and especially the custom of making the heating the chief part of a design and giving to the ventilation a subordinate place, must be attributed the present ignorance regarding the power, the limitations and the proper use of the heated shaft and the irregularity of the systems of which it is a moving-force. It has been largely employed in the State of Massachusetts, especially in public schools, where the inspectors never venture to make a test of the ventilation except on a cold winter day, at least not in any school-house for which the aspirating-system has been adopted in consequence of the official inspectors' advice. They know by experience that in moderate cold, when it would seem, if ever, according to the popular view, abundant ventilation could be afforded, the air-movement is sluggish and the ventilation insufficient and below the stand-

ard, while there are many days in spring and autumn when the ventilation is hardly apparent at all, or at least far below the standard fixed by the authorities. The reason for this is found in the small quantity of heat deemed sufficient to support the aspirating movement and in the shortness of the heated column, for most such examples are found to have the aspirating-coils at the level of the uppermost ceiling of the structure, and in some instances only a few feet below the outlet, while the power of the coils is ridiculously out of proportion to their duty. Such systems ought not to be called aspirating; they gave origin to the term, "natural ventilation," and they would best be classed under that head. All true aspirating systems should be limited to those where the heated column is measured by the extreme height of the chimney. The former only work well in cold weather when anything will work that has big enough flues, while the latter have an appropriate adjustment of means to ends, and hold their high rank through their systematic construction, designed to secure effective operation under any condition of weather.

FREDERICK TUDOR.

[To be continued.]

LABYRINTHS IN CRETE.¹

THESE are islands in the Mediterranean which may lay claim to greater natural beauties than Crete, but none ranks higher in myth, legend and romance. Poets, painters and historians have culled some of their finest themes among its fertile plains and noble mountains, and recent archaeological research points to it as the cradle of religion, law and art in ancient Greece. It behoves the amateur to walk warily amid the multitude of contentious theories which lie in kaleidoscopic variety across the path of even the most casual traveller. Famed in classic days for the labyrinth wherein dwelt the monster Minotaur, to whom the Athenians of old paid their annual tribute of living victims, the island is itself a labyrinth of puzzling paradoxes. The legendary birthplace of Zeus and the dwelling of Minos, that celebrated ruler who received his laws direct from his father, the king of all the gods, the tales of the Minotaur, Daedalus, Theseus and Ariadne proclaim its mystical past: its subsequent submission to Athens, followed by 500 years of Roman supremacy, an early conquest by the Saracens, the purchase of the island by the Venetians at the time of the fourth Crusade, its recapture by the Turks after a lengthened resistance, and the ensuing centuries of disorder and misgovernment afford material for a history of greater length than can be condensed into a review article. From these bygone annals, however, springs a present full of interest.

The town of Candia, towards the north-east, is perhaps the most important in the island. It can scarcely boast of a road into the interior, but it has direct communication with the Grecian mainland by sea, and a service of steamers to the other ports along the coast. The little harbor seems insignificant in comparison with the magnificence of the fortifications which the Venetians erected in the Middle Ages to protect the most valuable of their possessions against the ravages of the Turks. These massive ramparts recall the towns of the plains of Lombardy, and the lengthy tunnels which formed the only gateways are still in use, and testify to the solidity of their masonry. The Venetians were great builders in the days of their maritime supremacy, and the Lion of St. Mark has left many signs of his power throughout the island, as well as his image on the walls of the town of Candia. Round the harbor the ancient galley-houses, in which the fleet was docked, are utilized to this day as warehouses for grain and oil. For twenty-five years, from 1644 to 1669, the Venetians defended Candia by sea and land against the besieging forces of Turkey; and when they were at last forced to abandon the town they retired with all the honors of war. A piazza with a lovely fountain of carved stone and two or three fine brick public buildings are remnants of the departed glory of their dominion. The town throughout is a strange medley of East and West, the picturesque types and garments in the crowded central thoroughfares tending more to Eastern than Western customs. The principal streets are wide, with small open booths or shops on either side. The owners sit within on low stools in Oriental fashion, some in fez, some in turban, and some in imitation European costume. For the rest, long, narrow, winding alleys prevail, infamously paved, if paved at all, and running between high walls and almost windowless houses, save where, here and there, a latticed projection shows the residence of a Turkish family. . . .

At present the population is insufficient for the cultivation of the island, and all over the country there are remains of villages burnt and ruined during the troubles. The olives have been cut down, the fields left untilled, and the irrigation neglected. This year, owing to the long drought of the winter and early spring, many of the crops are destroyed and useless. While Western Europe was drowned in floods of rain, not a drop fell in Crete for several months, and some distress must therefore be expected before another year elapses. The records lately unearthed by the excavations of Mr. Evans and Mr. Hogarth prove the island to have been most wealthy and prosperous when Minos's famous palace of Cnossus, near Candia, was the capital of a great power which held sway throughout the Ægean Sea some 4,000 years ago, and traded with all the nations of the East long before the Phœnicians carried

¹ Extracts from a paper by Mary, Countess of Galloway in the *Nineteenth Century* for July.

purple dyes from Tyre. In the storerooms of King Minos stand rows of mighty jars—ancient receptacles for oil—and there are sunken chambers which would seem to have contained treasures of gold and precious metals. The ancient palace, or labyrinth, at Cnossus covers about 2 acres of ground, and was originally built of stone and wood, covered over with plaster. To the uninitiated it somewhat resembles a rabbit-warren, with its confused multitude of narrow blocked corridors and small, square chambers, which fully correspond to the accepted idea of a labyrinth. A great portion has yet to be dug out, and money is still required to complete the excavation. Much of what has been accomplished has been paid for by Mr. Arthur Evans himself, who has recently published an account of the work, and the reasons which gave him the hope of making historical discoveries of importance upon this site. The principal apartments in the palace were decorated with frescos, and these were still brilliant with color when first they came to light. They are now preserved under glass in a museum at Candia, but they are already fading, and do not all show the same artistic skill. Some of the most interesting and boldest for scenic effect decorated the gallery leading to the council-chamber, and here is the gypsum throne of Minos, with the seats of the councillors ranged along the walls.

It is from the varied life depicted in the frescos that some of the most interesting details of the civilization of that period may be gleaned. Opening direct out of the council-chamber are unmistakable little supper-chambers, where one imagines that Minos, in the intervals of deliberating on the mysteriously transmitted laws, retired to refresh himself from time to time with a chosen few. It is perhaps difficult to believe that the ladies of his court attended these supper-parties in the low-necked gowns of to-day, with frilled skirts, puffed sleeves, and their hair waved and dressed as if by the most modern of Parisian *coiffeurs*. Yet this is how they are here drawn and painted on the walls, and thus handed down to a remote posterity. There are other evidences of considerable artistic sense in this prehistoric period which equal, if they do not surpass, that of Mycenæ or Egypt, such as the modelling in low-relief of a life-sized bull in painted terra-cotta; a head of a lioness, beautifully sculptured in marble, and various little objects worked in gold and bronze. That the skill of the workman of the period was not confined to painting and modelling is evident from the interesting pottery and finely engraved seals, and it is mainly from these that scholars are able to fix the approximate date of this palatial building. Large paved courts spread out in front of the entrances, and the palace occupies the whole surface of a low round hill, the ground sloping downwards on one side to a stream at the base, and stretching away on the other to the distant spurs of Mount Ida, which was one of the traditional birthplaces of Zeus. The cave has, however, now been localized on the mountain of Dictæ, to the south-east of the island. Mr. Hogarth, who explored the cave some 60 feet into the side of the mountain, unearthed multitudes of native offerings in bronze at the shrine of the great god which he there found. These are also to be seen with the Cnossus treasures in the newly-arranged museum at Candia, as well as many examples of the Labrys, or double battle-axe, of Zeus, which gave its ancient name of Labyrinth to the palace of Minos and the home of the Minotaur. The Italian excavations under Mr. Halbherr at Phæstos, farther inland, have laid bare an even more extensive palace, which contained among other records an ancient code of laws inscribed on stone, and scarcely a week passes without some new and interesting object being brought to light in one or other of the sites which have lately been opened.

But for the genuine archæologist the most valuable and interesting of the discoveries are the numberless clay tablets found by Mr. Evans at Cnossus inscribed with a perfect linear type of prehistoric writing hitherto unknown. It is not Semitic, though it may be derived from Egypt, and it can be proved that the Cretans were possessed of a script anterior to, and of a character other than, that of the Phœnicians, who have until now had the credit of introducing the earliest writing into Europe. Here, then, in this small island, almost equidistant from Europe, Asia, and Africa, we find the three origins of all progress—religion, literature, and art—existing on a basis of their own and different from those of Assyria and Egypt. We have, moreover, a complete picture of the wealthy, orderly and prosperous community, using gold and bronze in an antiquity probably more remote from those Greeks for whom Homer sang than the histories of the Trojan War are remote from the legends of King Arthur.

All these revelations of past history indicate a close connection with the ancient races of the Greek mainland. After the prolonged siege of Candia, when Crete virtually became part of the Turkish Empire, the Venetians contrived for some time to maintain themselves at Suda Bay. The republic was apparently quite of the opinion proclaimed by Napoleon, that the possession of this splendid anchorage would mean paramount power in the Mediterranean. Suda Bay lies about three miles from Canea, the present seat of the Government of the High Commissioner of Crete, Prince George of Greece. It is a long, wide inlet from the sea, well sheltered and of great depth. When the Great Powers of Europe stepped in to keep the peace between the Mussulman Government and their Christian subjects, after the massacres and insurrection of three years ago, the British and allied fleets were stationed here for the purposes of the blockade. Since order has been proclaimed and maintained, the flags of the protecting Powers, as well as the standard of Turkey,

are hoisted at the entrance of the bay, and each nation has usually a man-of-war anchored inside, as well as a contingent of troops on the island; the English, as before mentioned, are quartered in Candia; the French, Russians and Italians in Canea. The Cretan *gendarmérie*, commanded by Italian officers, are a magnificent body of men, wearing a modified native uniform which does full justice to their fine physique and appearance, and the whole island is perfectly peaceable and safe for travellers, which can hardly be said of all parts of the Turkish Empire.

UNFINISHED MONUMENTS.



We live in a half-made world, says the *New York World*. So it ever has been since the Tower of Babel was left uncompleted, and so it will be, no doubt, to the end of time. In our hurry to begin things we forget to finish them, and all over the world to-day the Great Unfinished stares us in the face—some big thing waiting its completion.

There is the Washington Monument, that giant obelisk rising up from the low flats back of the White House. Every one is familiar with its present appearance, but few people remember how it was originally designed to look. This tribute of a grateful nation to the Father of his Country was begun in 1848, and has never been completed according to the original designs. Probably it never will be. It was hard work to get it as near completion as it is. When the monument was started all the rulers of the world sent blocks of marble to be placed in the interior of the ornate, columnated structure which was to surround the lower part of the great shaft. The work of building went on briskly at first, then languished, and finally stopped entirely. It was not until 1876 that work was resumed upon the monument, and not until 1884 that the shaft was finished. All intention of completing the monument according to the original design seems to have been abandoned, and there it stands, towering aloft 555 feet above the unfinished world.

The Grant Monument, as designed by Mr. Duncan, had imposing approaches, with great flights of stairs leading down to the river, and many other accessories of which it is now bare. As it is, the monument has an unfinished look, and a glance at the original design will show how far from completion this memorial to the great General is, and is probably destined to remain. Among older structures there is Trinity Church, certainly ancient enough and wealthy enough to be complete in every detail. Yet, in many details, it is incomplete. As you pass down Broadway, look up at the niches above the main door, niches designed for the statues of saints and martyrs, but empty since the hand of the stone-mason finished them.

Out in the bay, the Statue of Liberty stands, on a pedestal, it is true, but it is an unfinished one. Wooden stairs still lead up to the entrance to the interior, and the lower part of the pedestal is frankly, not to say obtrusively, incomplete. The pedestal as it was designed by Richard M. Hunt and the pedestal as it looks to-day are two different things. As the erection of the great statue upon its pedestal was accomplished in 1886, it looks as if Bartholdi's colossal creation had passed into the category of the Great Unfinished.

Mr. Hunt's plans call for converting the earthworks of old Fort Wood into terraces rising one above the other from the shore at high-water mark to the base of the pedestal. The island was to be surrounded by a stone bulkhead, from which piers should project for the boats which should take visitors to and from the island. From the landing-places flights of stone steps were to be constructed, leading by easy stages to the base of the monument. The moats and the interior of the earthwork were to be filled and the terraces to follow somewhat the line of the ramparts. But the wooden steps that were put up at the beginning still afflict the eye and torture the leg. When money enough had been subscribed for the pedestal, there was none left for laying out the grounds and approaches in a dignified manner.

Then there is the North River tunnel. That is one of the greatest tunnels ever begun, and when work was commenced on it there was no one who did not believe that, long before this, freight and passenger trains would be whisking between the Jersey shore and Manhattan under the river's bed. From both sides of the river the work was pushed out under the stream, and night and day men toiled in the compressed air as they dug their way toward each other from Hoboken and from New York. The papers in the late seventies and also in 1880 and 1881 were full of news of the progress of the tunnel. Then the chief promoter of the enterprise died, work on the tunnel was stopped, and for eighteen years now little or nothing has been done on the work. The shafts, which extend for considerable distances from either shore out under the river's bed, have long since been abandoned, the shore-works nearly all removed, and the enterprise, which seemed so sure of success, is scarcely remembered. And down under the mighty river the water has percolated through, filling the dark galleries of another item in the inventory of the world's unfinished things.

These are only a few of the great incompletable things—most of them right in our own city. Scattered over the country there are many more buildings, monuments and engineering works which never have been completed and never will be. Every one knows the story of the apparently endless task of finishing the Capitol at Albany, and the Capitol at Washington is said to be still incomplete in some of its interior decorations. And so, turn where we will, the world lies all unfinished.

Who will take up again the Channel tunnel at Dover, which was to connect England and France? Of these works the late Sir Edward Watkins said that they "were blessed by princes, peers and commoners" and were suddenly and peremptorily brought to an end by Joseph Chamberlain, of Birmingham.

A striking example of the unfinished is afforded by a row of columns which rear their heads on Carlton Hill, Edinburgh. They represent the beginning of a model of the Parthenon, and they are talking in Scotland now of a rumor that King Edward will urge the completion of the structure.

Some eighty years ago, while the memory of the Battle of Waterloo was fresh in men's minds and Britain's gratitude for her deliverance was still bubbling and seething, it was proposed by a committee of Scotchmen to erect on Carlton Hill, overlooking Edinburgh, a duplicate of the Parthenon in memory of the British soldiers who fell upon the field which closed the mighty epic of Napoleon. George IV visited the Scottish capital, and the first stone was laid with imposing ceremonies. Thirteen columns were set up at a cost of \$5,000 apiece, and then—the work stopped. It was never begun again. It would take \$200,000 more to complete the structure, and show the world that Scotland is still ready to pay for Waterloo. But that amount of money has never been forthcoming, and probably never will be, in spite of the rumor about the intentions of King Edward, in which the wish is probably father to the thought.

England was exceedingly grateful, too, over Waterloo, and when Wellington died decreed him a public funeral and laid him away in St. Paul's Cathedral to the "noise of the mourning of a mighty nation." But she never finished his tomb. The equestrian statue which was to have surmounted the tomb stands headless in the crypt of the Cathedral, propped up by some old lumber and tied about with ropes. Where the head is no one knows—if it was ever made—and the pedestal which was to support the statue was never completed. The House of Lords surprised itself into a discussion of the subject a year ago, and all that could be said officially was that the money appropriated for the tomb ran short and the work had been arrested "in its present stage of development." Yet \$100,000 was appropriated for this tomb fifty years ago. Nobody seems to care now whether it is ever completed or not. After the lapse of half a century, patriotism is not easily transmuted into money. The Iron Duke, however, no doubt, sleeps very soundly without his equestrian statue perched above him.

London is in a much more half-made state than New York anyway, and evidences of incompleteness meet one on every hand, although your true Briton is never tired of talking about British "thoroughness." An empty pedestal in Trafalgar Square stands proclaiming daily to a wondering world that England has now no hero to stand with Nelson, Gordon, Napier, Havelock and George IV! Save the mark! And will somebody put a clock in St. Paul's tower, which was evidently designed for one, and place the statues on the pedestals along Blackfriars Bridge, as was originally intended? Then there is Westminster Abbey, which was meant to have a spire, and the much-discussed Marble Arch, which was designed to have a statue on top of it.

The Abbey is perhaps the most widely known specimen of an uncompleted edifice in the world. Wherever the English tongue is spoken "the Abbey makes us we"; yet it never has been finished, and probably never will be. The disastrous attempt at completing it made by Sir Christopher Wren when he put up the two incongruous square towers on the west front is a well-known architectural crime, the results of which are enough to frighten off any other architect from trying his hand on the ancient edifice. The existing Abbey is, in a great degree, the building erected by Henry III after he had pulled down most of the Confessor's building. It was Henry who erected the Chapel of the Confessor, which forms the rounded end of the choir, or the apses of the building, the four chapels in the ambulatory that extends around the choir, a considerable portion of the choir itself, a small portion of the transepts, and probably the chapter-house. The nave thus begun was carried forward further in the reign of Edward I, and gradually finished with other portions of the edifice in the thirteenth and fourteenth centuries, and the grand close of the whole work took place in the reign of Henry VII by the erection of the chapel which bears that monarch's name. The great central tower and the western towers were, however, still unbuilt, although the work had been in progress for three centuries. Knight says: "The great central tower and the western towers were still unbuilt, and so to this time the former remains: the latter have been added to by the architect of St. Paul's in a style that makes us regret that he did not confine himself to St. Paul's and works of a kindred character; most assuredly he was profoundly ignorant of the character and merits of the productions to which he presumptuously applied the epithet of 'Gothic crinkle-crankle.'"

The first church was built on the site of the present abbey in 184 A. D., and so, with rebuilding, tearing down and adding to, the work of the making of Westminster Abbey has been going on for 1717 years, and the edifice is still incomplete. So it will, in all probability, always remain, chief among the world's Great Unfinished.

Within the enclosure of the Alhambra, at Granada, stands the unfinished palace of Charles I of Spain, a structure which the monarch fondly imagined would outvie the palace of the Moorish kings, to which it stands adjacent. Charles died before the building was completed, and there it stands to-day after the centuries have swept by, still incomplete.

Near London stands a modern example of unfinished things. It is the so-called Wembley Tower, which its projector designed to be 150 feet higher than the Eiffel Tower in Paris. It was to cost \$1,000,000. The lower platform is all that has ever been built of the structure. This lower platform occupies the same space as St. Paul's Cathedral. So the list might be stretched out. Nearly every one will remember something to add to it. But these few examples cited show what a half-made world this is, after all.

BOOKS AND PAPERS

WE are so fond, in these days, of admiring ourselves, our immense energy, and our rapid progress in the arts, that it is sometimes useful to compare the achievements of our own age with those of the period between the middle of the twelfth and the end of the thirteenth century, a period in which, as it pleases us to think, the world was slowly emerging from barbarism. That a large part of the world was then emerging from barbarism is true enough, but architectural evidence shows that the process was anything but a slow one. In the early part of the twelfth century, David, Prince of Cumbria, and afterwards King of Scotland, introduced Christianity into the Scotch Lowlands. A feeble attempt had been made by St. Mungo to Christianize the country five hundred years before, but after his death, his flock had relapsed into heathenism, and Achaius, appointed Bishop of Glasgow in 1115, preached the Gospel in the midst of pure paganism. In 1136, a small church was begun for the Christian community. Its erection proceeded slowly, and it was not consecrated until 1136. Forty years later it was destroyed by fire, and amid its ruins were immediately laid the foundations of one of the finest churches in Europe. It is true that, at this period, a fever of cathedral-building raged all over England and the Continent, and the canons of Glasgow undoubtedly caught the contagion; but it is none the less wonderful that the substructure of the present cathedral, substantially in the form in which it now exists, should have been commenced within sixty years from the first preaching of Christianity by Achaius, so that many hundreds of people, born in paganism, must have watched the laying of the first stones of the great cathedral in which their descendants worship to-day.

In Glasgow, as on the Continent, rather than in England, the building of the cathedral was, to a certain extent, a political event. We all know that, in France and Italy, the cathedrals, being under the charge of the secular clergy, or bishops, as distinguished from the conventual churches, the property of monks, often foreigners, and always subject to control from Rome, were the object of great popular affection; and that the bishops, in return for the contributions of the citizens, allowed the cathedrals to be used as market-places and places of public assemblage; and in Glasgow, the issue of a royal charter, conferring on the city municipal rights and the privilege of holding a weekly market, coincided in time with the founding of the present cathedral; while ten years later, the extension of municipal privileges coincided with important gifts to the cathedral foundation, as if the Bishop and canons had used their influence with the Royal Government in behalf of the citizens, and the latter had returned the favor. However that may be, means were found for prosecuting the work rapidly. The architects of Glasgow had the advantage of the example of cathedral-builders on the other side of the border, and we know that, whether through Free-masonry or otherwise, improvements in the new art of construction spread over Europe with astonishing rapidity; so that it is not surprising to find that, in Glasgow, as in nearly all other great cathedrals, changes were made in the design as the work went on, to adapt it to the improved methods which were continually being invented; and it is the history of the curious and interesting development of the vaulting of the choir which Mr. Watson makes the subject of his admirable monograph. It is hardly necessary to say that some of his views have failed to find favor with other architects and archaeologists, but he has at least presented them with a learning and intelligence which go far to carry conviction with them at the same time that he has been able to clothe his ideas in the purest and most charming English that we have found for many a day in a work on a technical subject. There is an old saying that an advocate who wishes to win his case must not only have the best argument, but must be able to present it attractively, and this part of his task, at least, Mr. Watson has well fulfilled.

ILLUSTRATIONS

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

COLONIAL COURT: APARTMENTS FOR HORACE B. HOWLETT, ESQ.,
LEE ST., CAMBRIDGE, MASS. MR. C. HERBERT MCCLARE,
ARCHITECT, CAMBRIDGE, MASS.

"The Double Choir of Glasgow Cathedral." A Study of Rib Vaulting. By Thomas Lennox Watson, Fellow of the Royal Institute of British Architects. Glasgow: James Hedderwick & Sons. 1901.

HOUSE AT CLEVELAND, O. MESSRS. WALES & HOLT, ARCHITECTS,
BOSTON, MASS.

DESIGN FOR A FRATERNITY HOUSE. MESSRS. VAN VLECK &
GOLDSMITH, ARCHITECTS, NEW YORK, N. Y.

UNITED STATES POST-OFFICE, JAMESTOWN, N. Y. MR. JAMES
KNOX TAYLOR, SUPERVISING ARCHITECT, WASHINGTON, D. C.

[The following named illustration may be found by refer-
ence to our advertising pages.]

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[Additional illustrations in the International Edition.]

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TECT, NEW YORK, N. Y.



STATUARY FOR CHICAGO POST-OFFICE. — The colossal statuary groups which are to adorn the four corners of the new Government building at Chicago are to be by R. H. Park. They will depict the four quarters of the globe. Each will be 18 feet high and will be of bronze. The whole cost will be about \$80,000. — *N. Y. Evening Post*.

NATIONALITY OF VISITORS TO MUSEUM AT OLYMPIA. — The *Ethniké Agoge* of Athens publishes the statistics of visitors at the museum in Olympia, from 1888 to 1900, as reported by the Ephor. In these thirteen years, 9,725 foreigners, more than one-half of whom were from England and America, were attracted thither. Germany stands third in the list with 1,524, and France fourth with 1,444, while the Russians, Austrians and Italians together made a contingent of only 1,000. There were 31,711 Greek visitors. There has been a steady increase in the annual attendance from 201 to about 1,200 in recent years, the greatest increase being shown in the American contingent from 28 in 1888 to 419 in 1900.

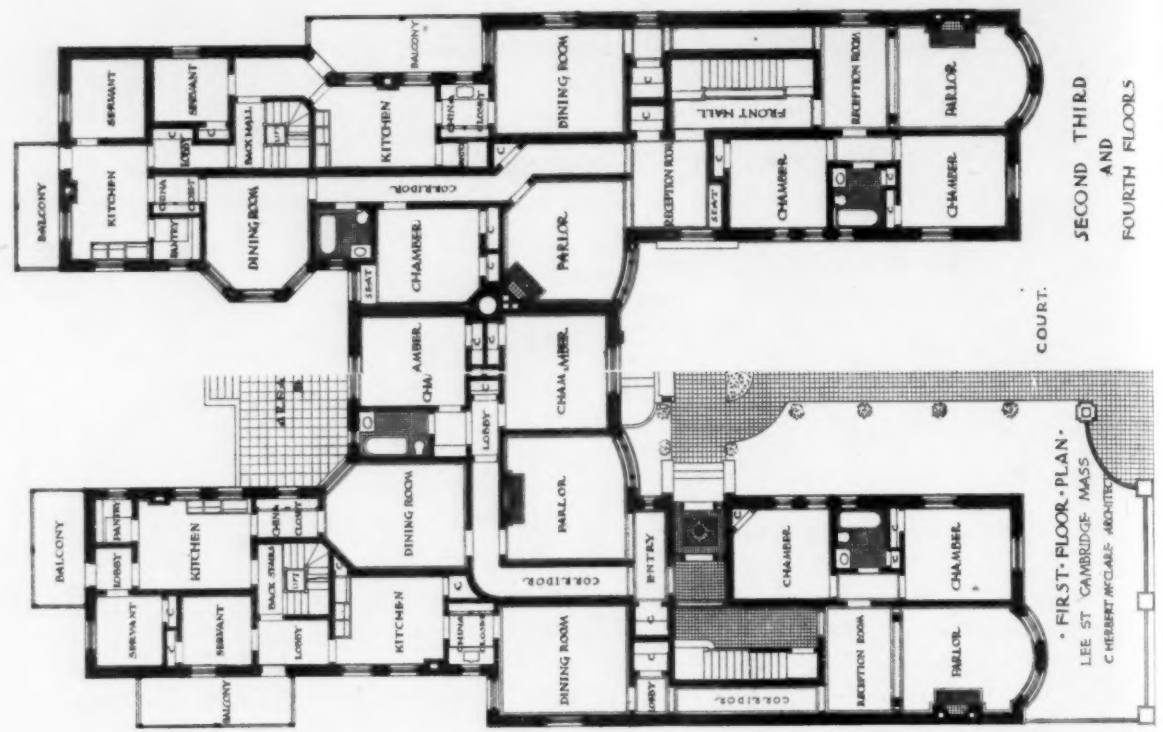
LOMBARDIC COLUMNS. — The capital was larger in proportion to the rest of the column, thereby affording a greater surface, or impost, for the arches to rest upon, and also combining the appearance of security at that point with general lightness of appearance. The shaft was mostly plain, yet frequently highly ornamental, striated or carved in different ways, and sometimes twisted, either singly or with two stems twining spirally around each other. Columns furnishing examples of all these different modes occur in the cloisters of San Paolo and San Giovanni Laterano at Rome, and the capitals present quite as much variety, it seeming to have been the aim on such occasions to introduce as much diversity as possible, instead of so arranging the columns as to have two of the same kind placed together, a practice probably originating in making use of columns and fragments taken from other buildings, and afterwards retained as conducing to variety and richness. Although the arches were, as frequently as not, quite plain, and without archivolt mouldings of any kind, the use of archivolts was by no means uncommon, sometimes consisting of merely a single moulding enclosing a plain border around the arch, at others divided into *facie*, and more or less enriched, as in the front of the cathedral of Pisa, in which building the arches describe more than a semicircle above the capitals of the columns, being prolonged downwards by a deep abacus, consisting in some places of two, in others of a single plain block resting immediately on the capital, a mode certainly preferable to that of placing a mere lump of entablature upon the column, and not ungraceful in itself, because it gives greater height and importance to the arches, which, being narrow, would else appear stumpy, depressed and overloaded by the ornament around them. Similar blocks, or abaci, occur in the remains of Frederick Barbarossa's palace at Gelnhausen, where small heads or masks are introduced immediately above such abaci, so as to fill up the space there between the arches, and continue in some degree the vertical lines produced by the columns. — *The Architect*.

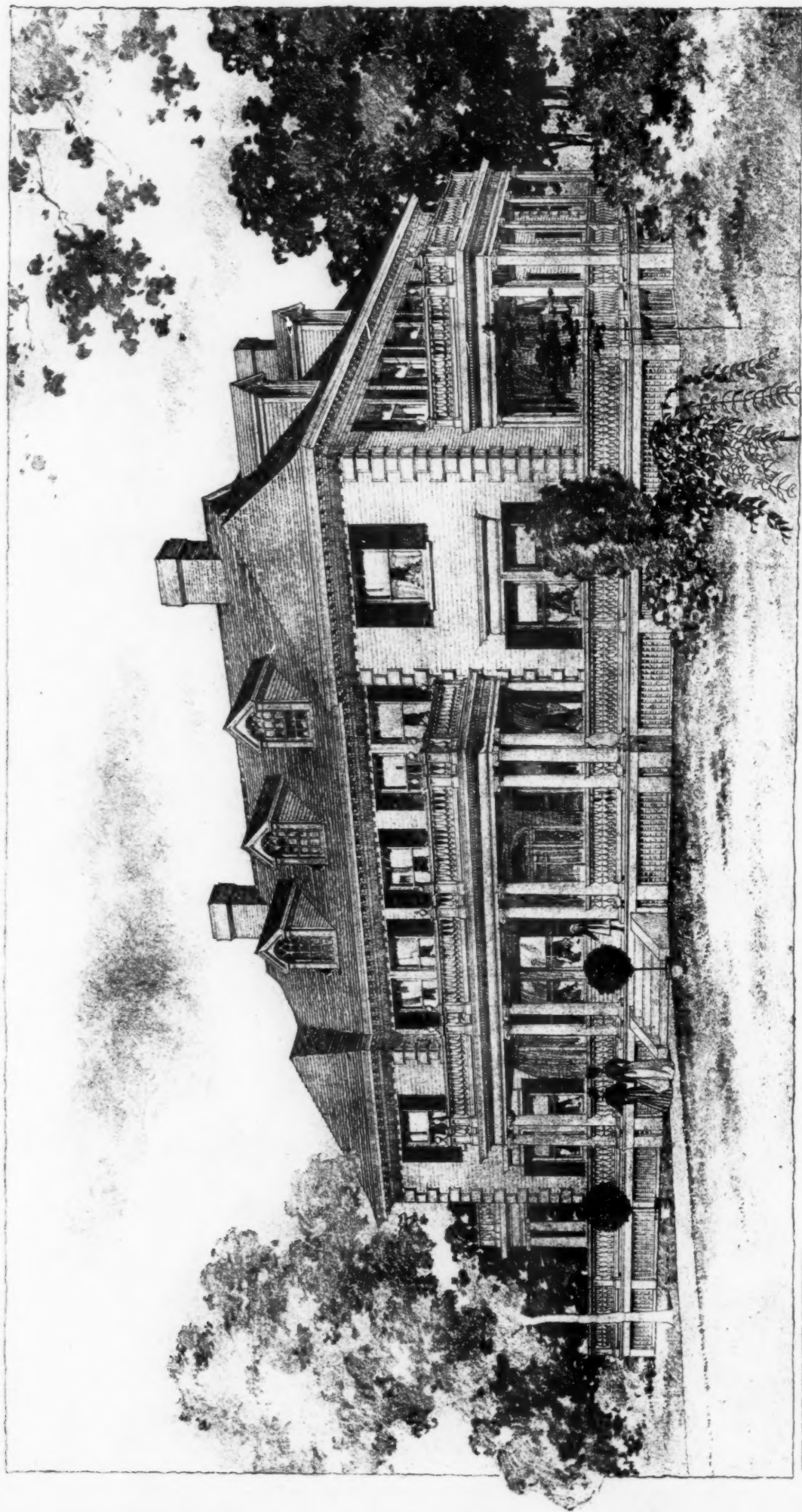
PROTECTION AGAINST THE FOREIGN STUDENT IN GERMANY. — There is an outcry in Germany concerning the number of foreign students in the universities, and the injuries which native students suffer in consequence. It appears that the names of more than 2,500 foreigners are on the books of the different institutions. Of these, 855 are at Berlin, 370 at Leipzig, 232 at Munich, 159 at Heidelberg, 141 at Halle, 140 at Freiburg, and 102 at Göttingen. The Russians are most strongly represented with 717 students, the result, of course, of the troubles in their own country. In addition to the Russians, there are 507 Austrians, 256 Swiss, 157 Englishmen, 323 Americans, 154 Asiatics (mostly from Japan), 68 Bulgarians, 50 Dutchmen, 47 Frenchmen, and 35 Turks. The complaint is made that it is unjust that so many strangers should reap the benefit of the sacrifices made by the German States for the higher education of their youth. Professors declare that the majority of the foreign students lack preliminary training, and thus retard the progress of the classes in which they take part. German students protest that a disproportionate share of the accommodation in the laboratories is occupied by foreigners, to the disadvantage of the native students, for whom it was primarily intended. The foreign students, moreover, being more or less ignorant of the German language, absorb a large part of the time and the attention of the professors and their assistants. The native students of the Technical High School of Munich have signed a petition requesting that the question of the admission of foreign students be reconsidered. — *N. Y. Evening Post*.

CURIOUS EFFECT OF LIGHTNING. — A letter by "L. H." in Wednesday's *Times* describes the somewhat disastrous effects produced by a lightning-discharge in earthenware sewer and drain pipes during a thunder-storm at Camberley on June 20. Some of the discharge got access to the sewer by an ordinary wrought-iron ventilating-column, surmounted on the top by the usual galvanized-wire balloon. The drain-pipes from a neighboring man-hole to the ventilating-shaft were blown to fragments, and several yards of the sewer and of two pipes draining into it were destroyed. The walls of the man-hole, which was 3 feet deep, were completely shattered, and it had to be rebuilt. "L. H." raises the question of whether ventilating-shafts are a source of danger. That they are a possible source of danger this accident proves, and it may be worth while taking precautions against lightning in special cases. The path of least resistance of the discharge to earth was down the iron ventilating-shaft into the sewer, and then along the water in all directions, apparently even branching off into drain-pipes. The discharge obviously decomposed some of the water, and the gas caused an explosion, either by its sudden generation or by its ignition, or probably by both. We have noticed in a thunder-storm at sea that where the lightning struck the sea a narrow column of water or steam several feet high seemed to rise, not unlike the splash made by a gannet when diving. As the discharge in this case could distribute itself throughout the immense volume of a good conducting liquid, and yet on impact caused some kind of explosion, it will be obvious that when confined in narrow drains it could easily do great damage. The accident at Camberley would probably not have happened if the thunder-storm had not been preceded by a long spell of dry weather, making the earth round the pipe a very poor conductor. If the ventilating-column had made good contact with earth, or if it had been connected by a wire rope to a water-main, this would not have occurred. It might even be advisable in very special cases to use an earth-plate like a lightning-conductor. If galvanized-iron were used the cost would be very small. — *The Builder*.

THE DANGER OF VENICE. — A very alarming piece of news reached us from Venice, where a meeting has been held whose principal object was to determine what measures could be taken to prevent the encroachment of the Adriatic on certain parts of the city. Already the crypts of several churches are under water, and the great staircase which formerly led to the Grand Canal from the Ducal Palace has long been covered by the waves, which now threaten several outlying islands. It is well known that even as late as the tenth century four small islands were inhabited which are now submerged, and it seems that at no very remote period the whole fairy city may be engulfed by the Adriatic. Precautions are to be taken at once to prevent the Church and Palace of St. Mark from eventual danger. — *London Chronicle*.

EMPLOYERS' BLACK-LISTS. — The right of several employers to agree not to employ workmen who have gone out on strike, thus forming an employers' black-list, is upheld in a recent decision by the Circuit Court of Cook County in the case of Condon vs. Libby, McNeill & Libby, and other firms engaged in the canning business at the stock-yards in Chicago. The plaintiff, a girl, alleged that she was an expert canlabeller, and could earn \$15 a week. For two years prior to February 5, 1900, she had been working for the defendant. She quit work because of disagreement over wages. She claimed that prior to the day when she quit, the various canning firms maliciously agreed not to employ any of their workmen who should strike or quit work on account of a disagreement over wages, except with the consent of the former employer. She said that in consequence of this agreement one of the canning firms had refused to employ her after the strike. The Court, in deciding that the acts and agreements of the defendant canning firms were not wrongful, said: "An act is wrongful in law if it infringes upon the right of another, and not otherwise. An act which does not infringe upon any right is not as to such person wrongful. One has a right to decline to enter the service of another, and several persons acting jointly in pursuance of an agreement to that effect have a right to so decline. So one has the right to decline to employ another, and several persons acting jointly in pursuance of an agreement to that effect have the right to so decline. The existence of malice, of a malicious intent to injure a person, will not convert an act which does not infringe any right of such person into a wrongful act or a civil wrong." — *N. Y. Evening Post*.

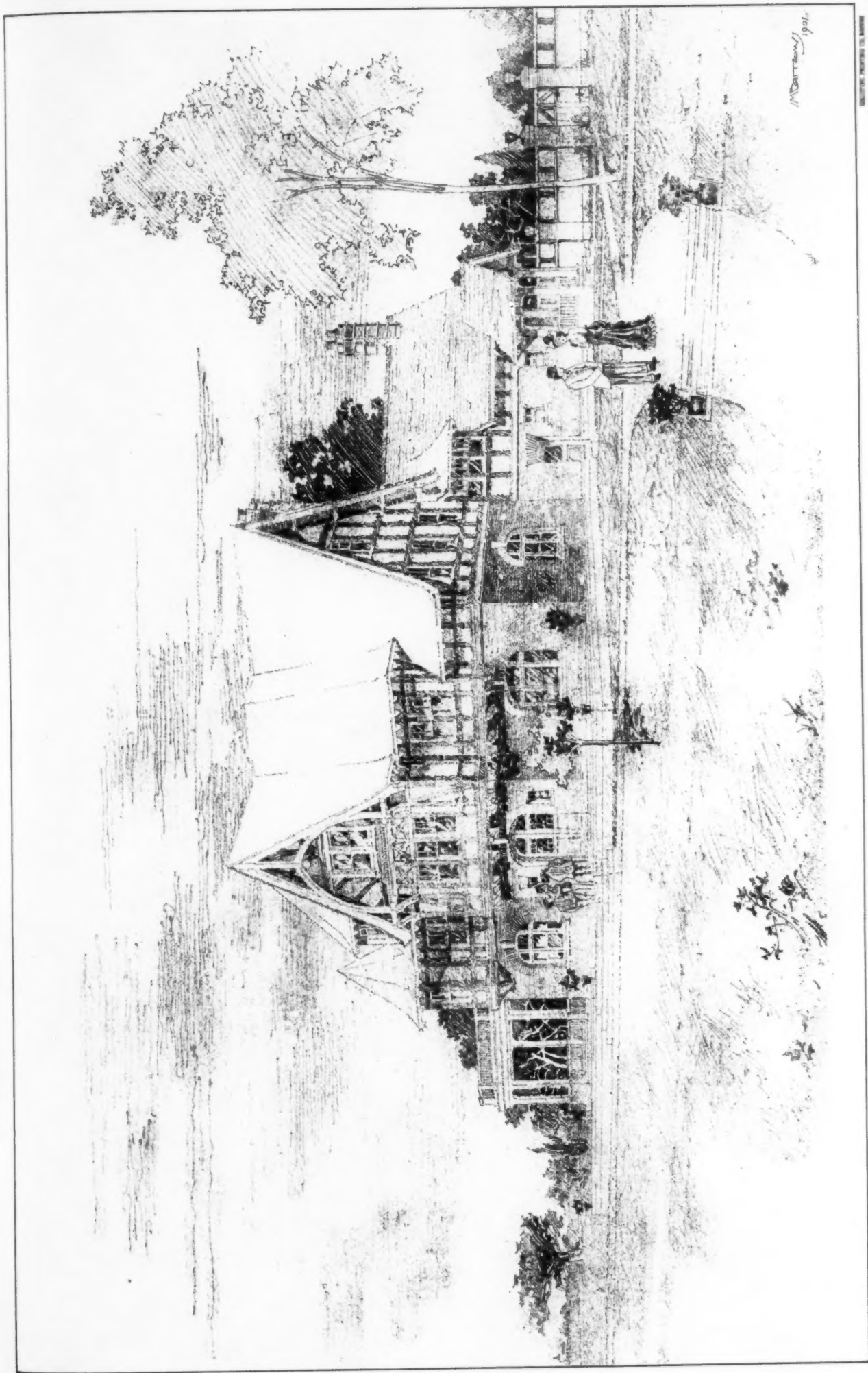




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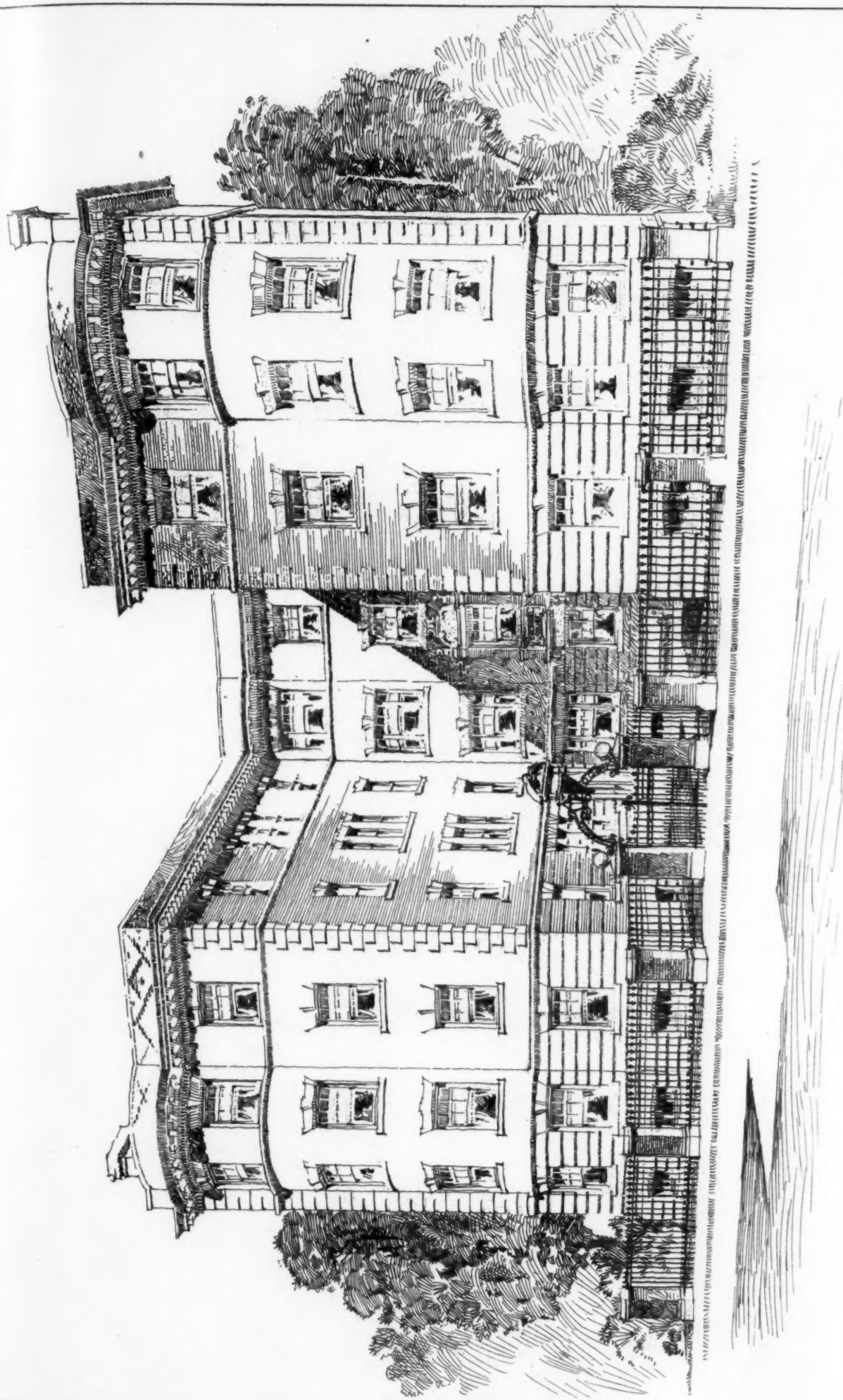
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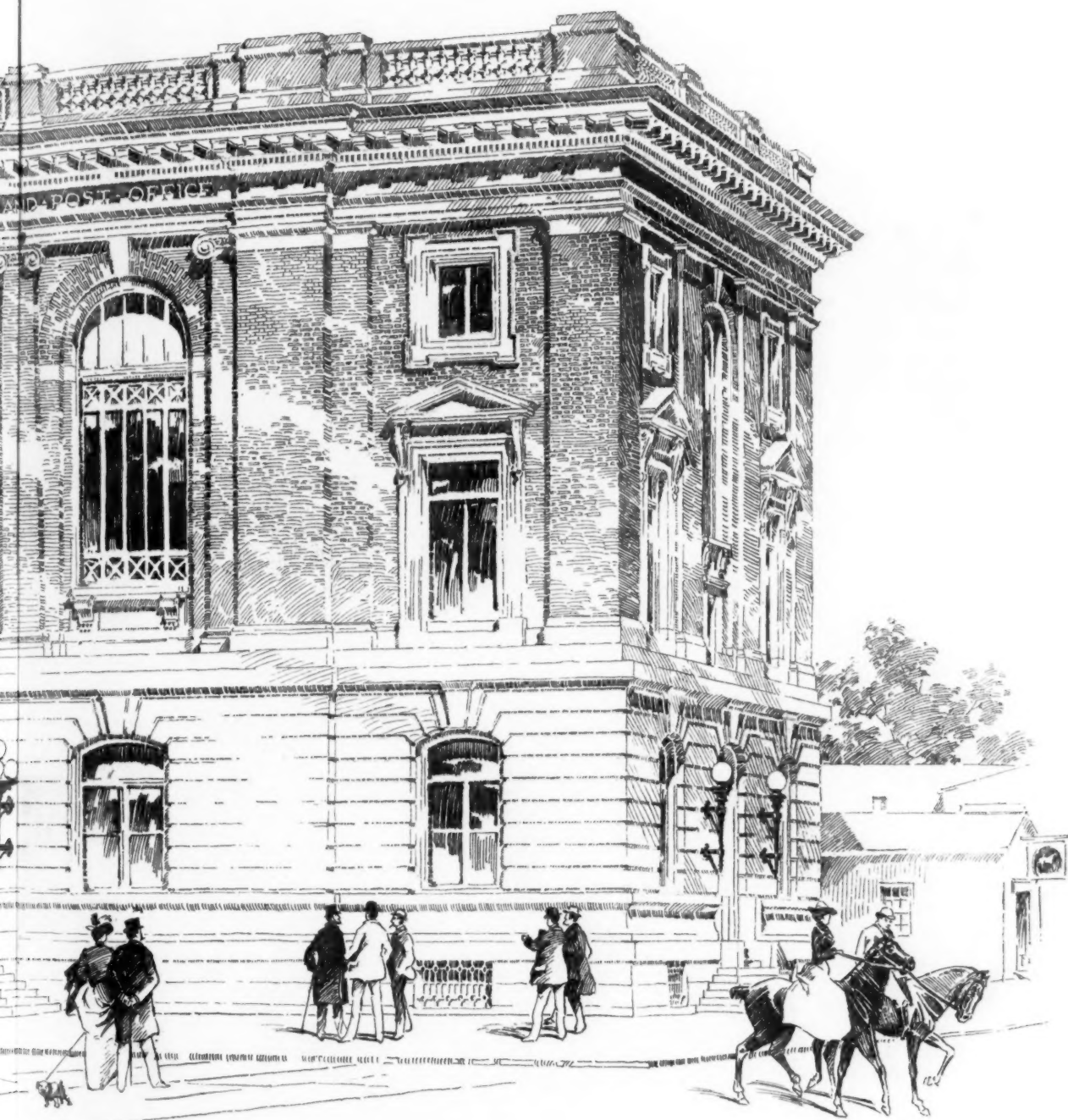
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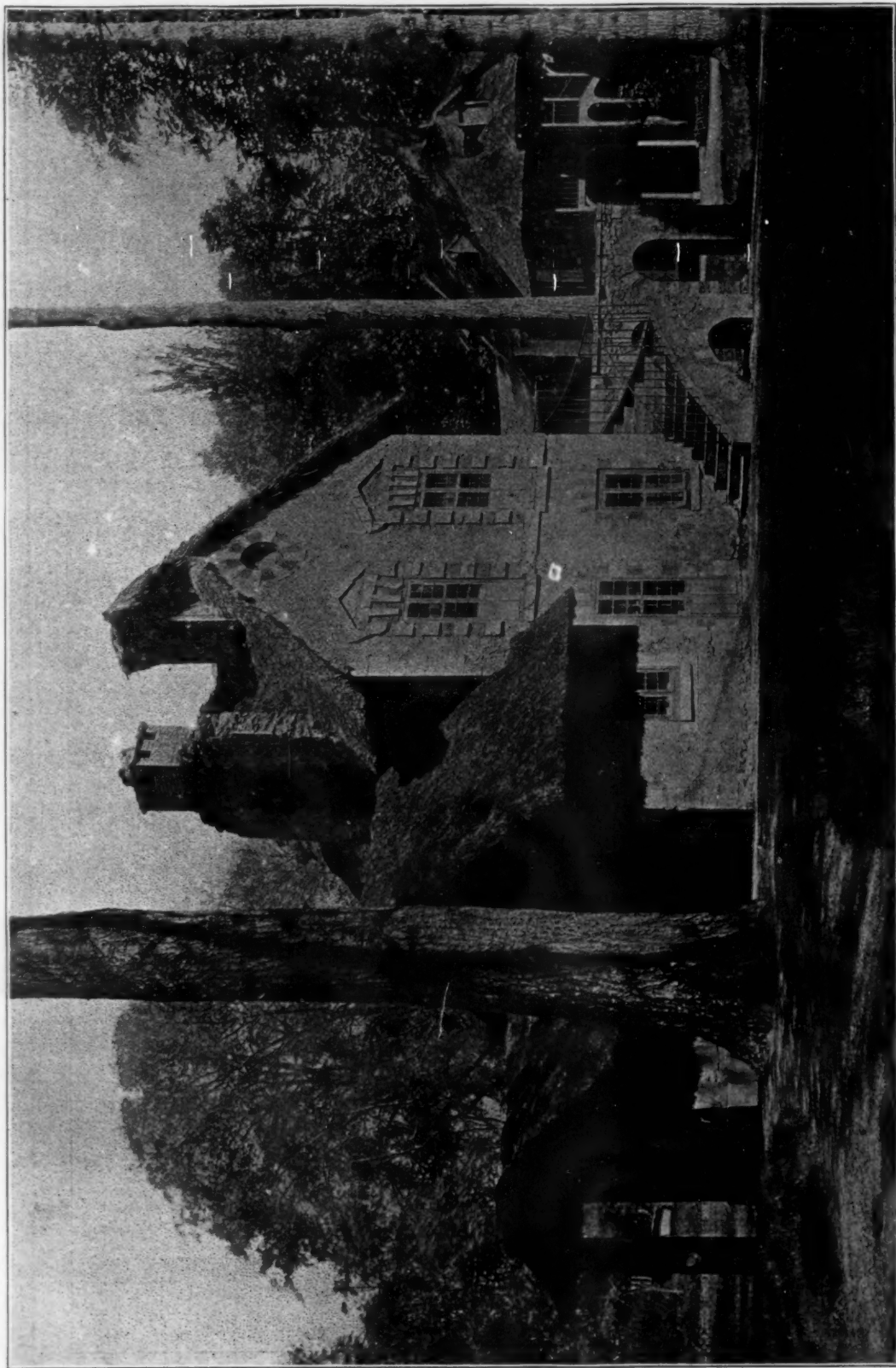
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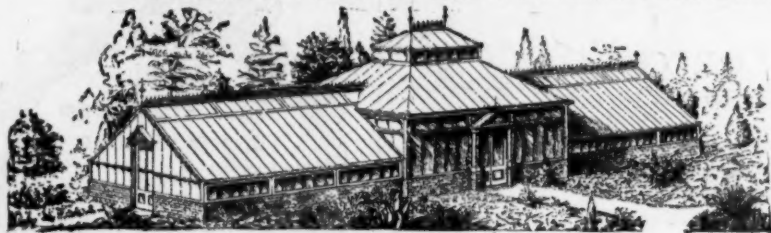
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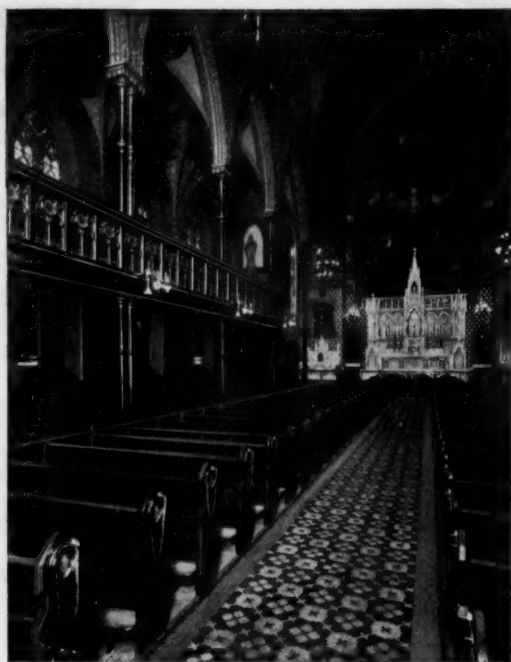
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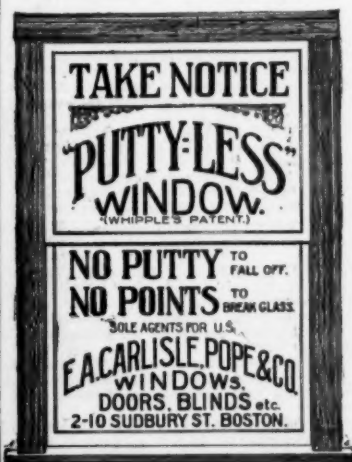
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Goshen, Ind.—Patton, Fisher & Miller, 115 Monroe St., Chicago, Ill., are preparing plans for the Carnegie Library, to cost \$25,000. It is to be built of Bedford stone, one-story and basement, 46' x 73', with red tile roof.

Greenfield, Mass.—A fine modern residence, to cost \$15,000, will soon be erected for Geo. E. Rogers, Esq., from plans in preparation by E. C. & G. C. Gardner, architects, Springfield.

Jacksonville, Fla.—The Dyal-Upchurch Investment Co. is about to build a five-story brick and stone office-building, 70' x 105', at Bay and Main Sts. Architects, Goltsche & Klutho. Cost, \$75,000. A vote has been taken in favor of issuing \$100,000 bonds for the erection of a court-house, jail, clerk's office, etc.

Jeffersonville, Ga.—The Manley Mfg. Co., of Atlanta, has received the contract for erecting a court-house and jail for \$25,000.

Joplin, Mo.—Andrew Carnegie has offered this city \$40,000 for a public library.

Leighton, Pa.—The Zion Reformed Church will erect a \$20,000 edifice.

Lincoln, Neb.—St. Paul's M. E. Society will erect a \$48,000 church. J. E. Miller, J. A. Adams, H. K. Burket, committee.

Marquette, Mich.—The contract for the erection of the Normal School-building from plans by Charlton, Gilbert & Demar has been awarded to Lipsitt & Sinclair, of Sault Ste. Marie, at \$28,215.

Miles City, Mont.—Andrew Carnegie will donate \$10,000 for a library building.

Minneapolis, Minn.—The Reformed Hebrew congregation contemplate erecting a large brick and stone church to replace the present building on 5th Ave. S. and 10th St.; estimated cost, \$30,000.

Montreal, Que.—Andrew Carnegie has offered this city \$150,000 for a public library.

New York, N. Y.—The Battick Publishing Co. will erect a ten-story fireproof building on Spring St., northwest corner of Macdougall St. and extending to Vandam St., from plans by Morgan & Slatery, 1 Madison Ave. The property fronts 118' 6" on Macdougall St., 79' 8" on Spring St., and extends 214' to Vandam St., where it has a frontage of 68' 10".

The contract for the erection of the twelve-story hotel for the Woman's Hotel Co. has been awarded to the Louis Weber Building Co. The new building will be located at 29 E. 29th St., the plot being 75' x 197' 6". Robert W. Gibson, 76 William St., architect. Estimated cost, \$350,000.

James Brown Lord, 160 Fifth Ave., will prepare plans for a three-story brick and stone building for the New York Public Library Association, 40 Lafayette Pl.

Philadelphia, Pa.—John T. Windrim, 1107 Walnut St., is at work on plans for a fifteen-story office-building, 50' x 145', to be erected by the Commonwealth Title Insurance & Trust Co., at 12th and Chestnut Sts., at a cost of \$450,000. Henry M. Dechert is president of the company.

Plans for the new University of Pennsylvania gymnasium, to be located at 33d and Locust Sts., have been completed by Architects Frank Miles Day & Brother. They show a building, 100' x 250', whose estimated cost is about \$350,000. A large amount of money has already been subscribed for the erection of the gymnasium.

Wilson Bros. & Co. are designing a large apartment-house to be built in West Philadelphia. Estimated cost is \$500,000.

Pittsburgh, Pa.—William Witherow, proprietor of the Hotel Duquesne, will erect an eight-story fireproof apartment-house, on plot 100' x 180', on Forbes St., near Moorwood Ave., East End, at a cost of \$300,000. George Orth & Bros. are the architects.

The contract for the new court exchange building of the Central District Printing & Telegraph Co. has been awarded to Henry Shenk, 300 Lewis Block, at about \$75,000.

William A. Berger will erect a four-story brick business block, at a cost of \$60,000.

The contract for erecting the new Second United Presbyterian Church was awarded to Hays, Sefton & Co., Allegheny. J. L. Beatty, 146 Sixth St., architect. Rev. D. S. Littell, pastor of the church. It will cost \$100,000.

Plans are being made by U. J. L. Peoples, Times Building, for a hotel to be built on S. Negley Ave., Shadyside. The building will be ten stories high, and cost \$600,000.

T. D. Evans has completed plans for a \$25,000 brick and stone residence, 43' x 71', on Negley Ave., for Richard R. Bennett, 103 Smithfield St.

F. J. Osterling, Times Building, has completed

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

plans for the building for the Colonial Trust Co., to cost \$100,000. Booth & Finn will have charge of the construction.

Pittston, Pa.—A \$40,000 fireproof Y. M. C. A. Building will be built in this city from plans by B. A. Crowther.

Racine, Wis.—Andrew Carnegie offers \$50,000 for the erect on of a library building.

Reading, Pa.—Plans and specifications have been completed in the office of Paul A. and Seymour Davis, architects, 907 Walnut St., Philadelphia, for the Colonial Trust Company's building. The new structure will be nine stories high, 60' x 72', and cost in the neighborhood of \$150,000.

Rochester, N. Y.—Thomas W. Finucane, 3 Elton Pl., was awarded the contract, at \$175,000, for erecting the new high school.

Corpus Church congregation will erect a \$60,000 building. Rev. D. J. Curran, rector.

Rockland, Me.—The Bay Point Hotel has been purchased by the Ricker Bros., of Poland Springs, who will in the immediate future make extensive improvements and alterations, to cost about \$40,000.

Rutland, Vt.—John F. Germain, 13 Liberty Ave., has received the contract for repairing the city-hall for \$24,765.

Salt Lake City, Utah.—The contract for erecting the main building of the State Agricultural College has been awarded to Bowman, Hodder & Co., at \$44,847.

Sault Ste. Marie, Mich.—J. C. Teague, architect, has prepared plans for the proposed St. James Episcopal Church. It will be of stone and will cost about \$20,000.

Shamokin, Pa.—T. P. Reitmayer, of Williamsport, is preparing plans for a three-story hall to be built on Independence St. for the Knights of Columbus.

Sheridan, Pa.—A \$15,000 M. E. Church is to be built. Rev. W. D. Sloane.

Superior, Wis.—Carl Worth, architect, has been awarded the commission in the competition for plans for the Carnegie library building; cost, \$50,000.

Taunton, Mass.—Plans are in preparation for the proposed new Y. M. C. A. Building to cost about \$15,000, and the site of the old Winslow church has been selected for the location.

Tuscola, Ill.—J. M. Deal, Lincoln, is preparing plans for a \$15,000 stone church for the Presbyterian congregation.

Walpole, Mass.—Andrew Carnegie has offered \$15,000 to the town for a public library building if the town will subscribe \$5,000 for that purpose, together with a site and \$1,500 annually for maintaining the same.

Wardenclyffe, L. I., N. Y.—Nikola Tesla, the electrician, will establish a plant here which will be the principal station of his system of wireless telegraphy. The plant, when completed, will cost about \$150,000. The land comprises 200 acres, and a number of buildings will be erected, the largest of which will be 100 feet square. Mr. Tesla has closed the contract for the erection of the buildings and plant.

Weyauwega, Wis.—Architects Van Ryn & De Gelleke, Merrill Building, Milwaukee, are preparing plans for a school, to be erected here. It will be brick, two stories high, furnace heat, stone foundation, and cost \$20,000.

White Haven, Conn.—Architect Addison Hutton, of Philadelphia, has been selected to prepare the plans and specifications for the Free Hospital for Poor Consumptives, to be built at this place. The structure when completed will cost about \$50,000.

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Kansas City, Mo.—Broadway, Nos. 1012-16, seven-sty' st., bk. & terra-cotta apartment-hotel, 67' x 107', arranged for 42 suites; \$95,000; o. Elmer and Chas. Williams; a. John W. McKecknie, N. Y. Life Building.

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Weid Hill St., No. 39, Ward 23, 2 1/2-sty' fr. dwell., 27' x 45', pitch roof, hot water; \$4,500; o. Catharine McDonald, 37 Weid St.; a. Mollard & Booth, 108 Dudley St., Roxbury.

Fisher Ave., nr. Estey St., Ward 19, three-sty' fr. dwell., 24' x 43', flat roof, stoves; \$5,000; o. J. Seannell; b. P. M. Moore, 37 Ellingwood St., Roxbury.

Hampstead Road, nr. South St., Ward 23, two 2 1/2-sty' fr. dwells., 26' x 50', pitch roofs, furnaces; \$11,000; o. b. Geo. Bulley, 72 Clarkson St.

Lawn St., nr. Hayden St., Ward 19, three-sty' fr. dwell., 27' x 52', flat roof, stoves; \$4,500; o. Mrs. D. J. Burker; b. Alex Fraser, 26 Wenham St., Jamaica Plain; a. Rob't A. Watson.

Chester St., Ward 25, two-sty' fr. dwell., 20' x 38', pitch roof, hot water; \$5,000; o. Nellie G. Brennan; b. C. S. Allen.

Conant St., Nos. 4-8, Ward 19, 3 three-sty' fr. dwells., 29' x 43', flat roofs, stoves; \$12,000; o. Mary A. Norton; b. Wm. Tobin, 32 Perkins St.; a. Rob't A. Watson.

Brooklyn, N. Y.—E. Twelfth St., nr. Beverly Road, 2 1/2-sty' fr. dwell., 26' 6" x 42', shingle roof, steam heat; \$7,000; o. F. E. Moore, 168 Seventh Ave.; a. J. C. Walsh, 127 Liberty Ave.

Washington Ave., nr. De Kalb Ave., three-sty' bk. dwell., 17' 6" x 60'; \$12,000; o. H. C. Helmsen-büttel, 232 Lafayette Ave.; a. T. Bennett, 188 Fifty-third St.

Acop St., nr. S. 2d St., three-sty' bk. store & dwell., 22' x 54' 6", gravel roof; \$6,200; o. H. Strangmeyer, on premises; a. A. Wislert, 179 Boerum St.

E. Twelfth St., cor. Slocom Pl., 2 1/2-sty' fr. dwell., 26' x 44' 6", shingle roof; \$6,300; o. Amy E. Grat-tan, 494 Thirteenth St.; a. H. Grat-tan.

Clark Pl., nr. Brooklyn Ave., 7 three-sty' & base, bk. dwells., 18' 9" x 48', gravel roof, steam heat;

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Flatbush Ave., nr. Regent Pl., three-st'y bk. store & dwell., 28' 6" x 51'; \$5,000; o., C. P. Skelton, 296 Sixth Ave.; a., H. L. Spicer, 326 Fifty-sixth St.
Park Pl., nr. Washington Ave., three-st'y bk. dwell., 19' x 58'; \$5,500; o., W. H. Nofur, 750 Washington Ave.; a., B. Driesler, 1432 Flatbush Ave.

PROPOSALS.

BUILDINGS.

[At Rochester, N. Y.]

Sealed bids are wanted until August 21, for constructing reception, infirmary, kitchen and connecting corridor and chronic disturbed and employees buildings at the Rochester State Hospital. FREDERICK COOK, president board of managers. 1338

PUBLIC HALL.

[At Bellevue, O.]

Bids are wanted August 31 for the construction of a public hall. M. J. CALLAHAN, village clk. 1338

PROPOSALS.

HOSPITAL.

[At Patton, Cal.]

Bids are wanted August 26 for the erection of a ward building for the Southern California State Hospital. John Morton, sec'y. THOS. A. LEWIS, pres. 1338

HOSPITAL.

[At St. Joseph, Mo.]

The Board of Managers of the State Hospital for Insane No. 2 has rejected all bids August 2 for the new buildings to be erected at that institution. New bids will be received. 1338

CONSTRUCTION, ETC.

[At Fort Williams, Me.]

Sealed proposals, in triplicate, for constructing one barrack, also heating, plumbing and electric wiring same, will be received here until 12 M., eastern time, August 27, 1901. Information furnished on application. LEROY T. HILLMAN, Q. M. 1338

SEWERS.

[At Washington, D. C.]

Office of the Commissioners, D. C., Washington, D. C. Sealed proposals will be received at this office until 12 o'clock M., August 31, 1901, for constructing sewers in the District of Columbia. Specifications and blank forms of proposals may be obtained at this office. HENRY B. F. MACFARLAND, JOHN W. ROSS, LANSING H. BEACH, commissioners, D. C. 1338

PROPOSALS.

POWER-HOUSE AND EQUIPMENT.

[At new Capitol for the State of Minnesota.]

ST. PAUL, MINN., August 6, 1901.

Sealed proposals in duplicate will be received at the office of the Board of State Capitol Commissioners, No. 512 Endicott Building, St. Paul, Minn., until 12 o'clock noon on the 24th day of September, 1901, for all labor and material required for the mechanical equipment and power-house for the new State capitol building at St. Paul, Minn., including power house and tunnel, boilers and mechanical appliances, electric-generator plant, electric wiring, plumbing, heating and ventilating, and elevators in accordance with the drawings and specifications, which may be seen at the office of the Board and at the architect's offices on and after August 6, 1901. Copies of said drawings and specifications may be obtained from Cass Gilbert, architect, No. 824 Endicott Building, St. Paul, Minn., or Room 704 Constable Building, 111 Fifth Ave., New York City, upon payment of the cost of such reproductions, and a deposit of \$100, such deposit to be returned to the bidder upon return of the drawings and specifications. Each bid must be accompanied by a certified check for a sum not less than \$5,000, payable to the order of said Board, as a guarantee of good faith. The right is reserved to reject any and all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the State to do so. Proposals received after the time stated will be returned to the bidders. Proposals must be made on

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1338

CONSTRUCTION.

[At Philadelphia, Pa.] Philadelphia Depot, Q. M. Department, 1428 Arch St., Philadelphia, Pa. Sealed proposals, in triplicate, will be received here until 11 o'clock A. M., Friday, August 30th, 1901, for the construction of a four-story fireproof storehouse (brick), at Schuylkill Arsenal, Philadelphia, Pa. Bids for proposals, with circular to bidders, will be furnished upon application. Envelopes containing proposals to be endorsed "Proposals for Construction," and addressed to COL. JOHN V. FUREY, Asst. Qr. Mr. General, U. S. Army.

1338

Treasury Department, Office Supervising Architect, Washington, D. C., August 9, 1901. Sealed proposals

PROPOSALS.

will be received at this office until 2 o'clock P. M. on the 16th day of September, 1901, and then opened, for the construction (except heating apparatus, electric wiring and conduits) of the U. S. Post-office at Butte, Montana, in accordance with drawings and specification, copies of which may be had at this office, or at the office of the Postmaster at Butte, Montana, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect.

1339

POWER-HOUSE.

[At Pittsburgh, Pa.] Bids for the power-house and sub-station equipments, amounting to about 3,000 K. W. capacity, consisting of engines, generators, boilers, piping, transformers, rotaries, switchboards, etc., for the Pittsburgh, McKeesport & Connellsville Railway Co., are requested. Plans and specifications may be obtained by request at the office of Westinghouse, Church, Kerr & Co., Engineers, No. 26 Cortlandt St., New York, on and after August 15th, 1901. Bids must be addressed to M. R. MCADOO, General Manager, and must be submitted before noon on Wednesday, September 4th, 1901, at the office of the

PROPOSALS.

Railway Co., Room No. 1001, Bank for Savings Building, Pittsburgh, Pa.

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PUMPING-STATION.

[At Washington, D. C.] Sealed proposals will be received at the office of the commissioners of the District of Columbia until 12 o'clock noon on September 21, 1901, for constructing a pumping-station building on Trumbull St., northwest, between 1st and 4th Sts., Washington, D. C., for the water department of the District of Columbia. A deposit of \$10,000 will be required with each bid as a guarantee that contract will be entered into if awarded. HENRY B. F. MACFARLAND et al., commissioners, D. C.

1339

STEAM PLANT, ETC.

[At Washington, D. C.] Sealed proposals will be received at the office of the commissioners until 12 M. Saturday, September 21, 1901, for furnishing and erecting a steam-generating equipment, steam-piping, etc., at the Trumbull Street pumping-station, Washington, D. C. HENRY B. F. MACFARLAND et al., commissioners, D. C.

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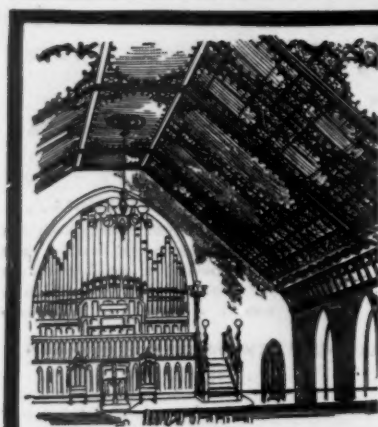
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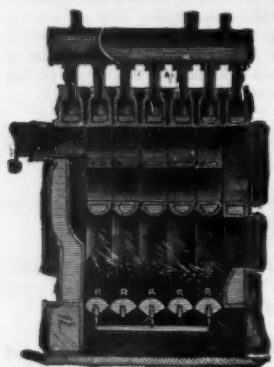
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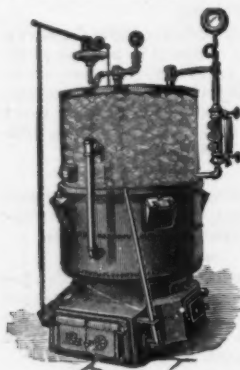
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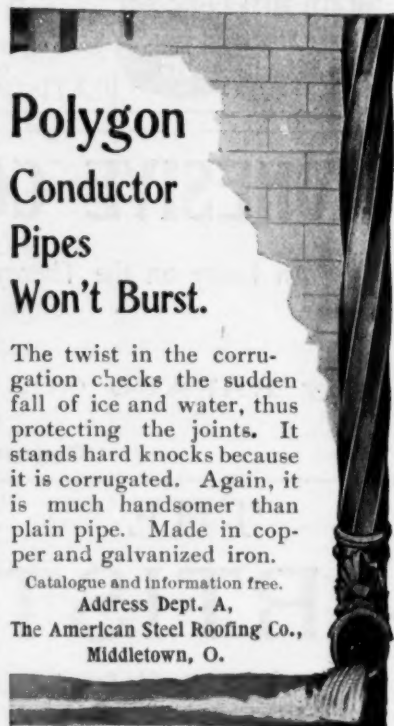
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