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CONTENTS.

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CONTENTS.

"WRITE to me plainly." It strikes us, Mr. John Brechting, 608 Pythian Temple, Grand Rapids, Mich., that that is a rather unwise request with which to adorn the back cover of the pretty little pamphlet, printed in red and black, that you are sending out to catch gudgeons. It will surprise us if you do not receive quite as much "plain writing" from the men you are injuring as your stomach can endure. It is evident, that in certain ethical and moral respects, your education has not been carried as far as most men's, who call themselves architects. But pass that. If moral questions do not concern your conscience, has the statute law, have the laws of the United States which govern the United States mail no terrors for you? Do you not know that Messrs. Lamb & Rich, of New York, Eckel & Mann, of St. Joseph, Mo., W. Ross Proctor, of Pittsburgh, Pa., Mason & Rice, of Detroit, Mich., A. W. Swasey, of St. Louis, Mo., Dehli & Chamberlin, of New York, and sundry others, whose rights you have invaded, can proceed against you under the copyright laws, one after another, each in a separate suit for civil damages? We hope that there are few men who would be willing, as you have been, to issue an advertising pamphlet adorned with illustrations of other men's work, declaring under each cut that it represented a structure "built from the plans" of the originator of the pamphlet, and we believe you will live to regret that you did not utilize your native shrewdness in a less stupid way.

IT is interesting to note that a new association has just been formed in Buffalo, under the name of the Engineering Society of Western New York, charter membership in which is confined to members of the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers and the American Institute of Architects. Several of the local engineering societies in this country, as well as the American Society of Civil Engineers, admit architects to membership; but it is, so far as we know, a new thing to recognize the American Institute of Architects, equally with the Society of Civil Engineers, as an acceptable source for recruiting the membership of a select engineering association, and we need not say that we regard it as an excellent thing for the members of both professions in and about Buffalo.

IN St. Louis, a very interesting movement has been carried out, which can, no doubt, be traced directly to the sensible and considerate attitude which has been, of late years, maintained toward building workmen by the National Master-Builders' Association and its affiliated bodies. A meeting was held there a few days ago of the Building Trades' Council, delegates being present from each of the thirty-two unions in St. Louis connected with the building-trades. At this meeting, a new constitution was adopted, by which the office of walking-delegate is abolished. The preamble of the new constitution expresses the belief that strikes are unnatural, and boycotts un-American, and that both should be discountenanced, and disputes between masters and men settled by arbitration. We shall hope to hear more of this movement, which, coming from a city which was, ten years ago, a hot-bed of anarchistic socialism, indicates something like a revolution in the minds of the working-men. It must be supposed that regularly-elected delegates from all the building-trades' unions represent the preponderance of opinion in the trades concerned; but that such an important part of the workingmen in St. Louis should have ceased to dream of the "universal strike," and should have taken to reflecting upon the un-American character of labor tyranny, indicates that a great change has taken place in their minds.

THE great cause of the organization of Labor has received one or two wounds last week. In Brooklyn, where the striking electric-car men had been rioting in brutality and mischief for several weeks, the magnates, finding that their paving-stones and clubs were met by bayonets and bullets, changed their tactics, and brought suit, or pretended to be intending to bring suit, against the car companies for various alleged infringements of the laws, or of their charters, and, among other things, asserted that they proposed to petition for a mandamus to compel the car-companies to run cars for the accommodation of the public. Before the petition was actually brought, it seems to have dawned upon the mind of some one that a petition to compel the companies to run cars, brought by the representatives of the motor-men who had deserted their posts, and were, at that very moment engaged in knocking off the cars the men who had taken their places, cutting the trolley-wires, and throwing bricks at the passengers, would have a rather grotesque air in court; and, according to the newspapers, the counsel for the motor-men advised that, unless such performances ceased, it would be useless to file petitions. Within a few hours, as the newspaper accounts show, the mischief and violence came to an end. None of the passengers or new motor-men were assaulted; and, for a day or two, only one trolley-wire was cut, and that was repaired in a few minutes.

ALL this spoke volumes for the wisdom of the strikers' counsel, and the influence of the leaders over the men; but decent people, remembering that labor leaders invariably disclaim all responsibility for disorders, saying either that they have no control over the men, or that the violence is committed by outsiders, began to reflect that an authority which showed itself so effectively when self-interest counselled the cessation of unlawful acts might just as well have been exercised three weeks before, when half a million men, women and children were suffering from terror and annoyance, when traffic was suspended, when the Mayor had appealed to all good citizens to help him in repressing violence, and when two thousand soldiers had been called in to see that unoffending citizens could walk or ride through the streets without being maltreated. The Brooklyn agitators themselves seem to have seen their mistake, and, a day or so later, the throwing of paving stones and cutting of trolley-wires re-commenced; but the public has learned that the "organizers," notwithstanding their habitual protestations, have shown that they can stop the violent acts of their constituents if they wish to, and, on the next occasion, are not unlikely to apply some suasion at the point where it is proved to be most effective.

A CURIOUS instance of the ill-considered use of words is to be found in the resolution passed at the last meeting of the Directors of the American Institute of Architects. This resolution declares that "The practice on the part of an architect of publishing, or allowing to be published, advertisements of builders and manufacturers of building-materials in connection with his designs is unprofessional." According to this statement, every architect who allows his designs to be laid before his professional brethren and the public in the pages of this and other professional publications is guilty of unprofessional conduct, for the "connection" between such illustrations and the advertisements of manufacturers is, we are glad to say, extremely close and intimate. We believe the

officials of the Institute will find it desirable to amend the language of their resolution and make more clear what reprehensible practices it is aimed at. We presume that they desire to put a stop to the practice, growing in some parts of the country, whereby an architect gets out a "trade catalogue" of his own performances and covers the cost of manufacture by inducing dealers in building-materials to pay for advertising space in it.

A GREATER considerateness for the meaning of words is shown in the code of ethics just adopted by the Boston Society of Architects, which may be found in another column. In the abstract, the Golden Rule contains everything in the way of ethical instruction that architects need observe. But in practice there is really need of a more formal and particularized statement of ethical considerations. Young men just beginning their careers, and older men under the pressure of supporting their families, are induced to do things sometimes which in later life they very much regret — things the impropriety of which they do not at all realize, or, if realized, which they trust will escape notice. The code now published will bar any one from setting up the plea of ignorance and it will also be of great value in strengthening those who are subjected to temptation. Perhaps its greatest usefulness will be found in its influence on the client, for just as there are few who will urge a man to break the statute law and suffer the penalties for its infraction, so, we earnestly believe, there will be found very few clients who will urge an architect to transgress the limits of proper professional procedure when the architect is able to lay before them a codification of its principles and assure them they can find no self-respecting architect who will be willing to follow the course which they urge. The recommendations of the Boston Society of Architects are somewhat crude, a little inconsecutive and incomplete, but they will doubtless be revised and amplified from time to time. They are recommendatory, not mandatory, they are not exactly Commandments nor yet are they Beatitudes, for they neither hint at punishment nor do they promise reward: they merely enunciate with clearness certain professional beliefs which are worthy of respect, and do honor to those who uphold them by regulating their actions in conformity with them.

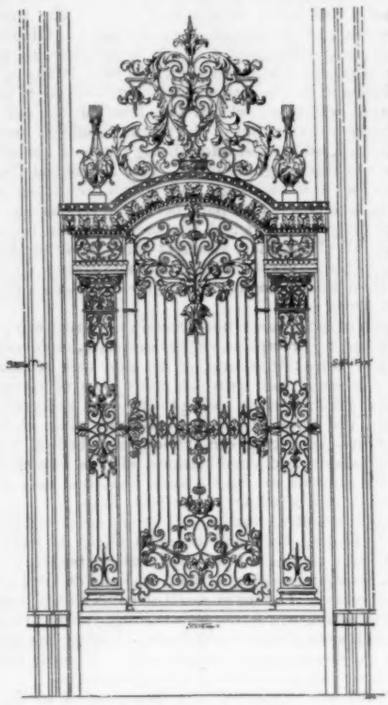
MR. PHILIPPE DOUVAL, Chief Engineer of the Quebec Fire Department, writes to *Fire and Water*, giving an account of two recent fires, one in the Quebec Post-office, and another in a private house, which were, in his judgment, caused by hot-water heating pipes, in contact with combustible matter; and he sends with his letter one from Mr. Baillarge, the City Engineer of Quebec, giving a similar instance, and calling attention to the fact that the pipes, in hot-water heating systems, where the expansion-tank is four stories or so above the boiler, may reach a temperature of nearly three hundred degrees; while a stoppage in the circulation may send them to a much higher temperature. Such temperatures, as he points out, will char the softer woods, and when the hot, charred wood is allowed to cool again, it may absorb oxygen so rapidly from the air as to enter into combustion. It is hardly necessary to say that these considerations have long been familiar to the mill mutual insurance companies, but there is an interesting question in the suggestion that hot-water pipes, which seem to have been the incendiary agents in all these cases, may, at the same temperature, be more likely to set fires than steam-pipes. This is quite contrary to the usual opinion, which regards the heat from hot water as "moist," while that from steam is considered "dry"; but, unless the hot-water pipes leak, they, of course, give no "moister" heat than steam, and it is not impossible that the continuity of the heat conveyed by hot water, in which there are no variations due to expansion or condensation, may help its chemical action. One of the most curious effects we have ever known from hot water was observed in the case of the wooden cover of a hot-water tank, such as were used twenty years ago, before copper boilers became universal. This tank was an open one, situated at the top of the house, and, therefore, under no hydrostatic pressure, but the wooden cover, which was used to keep the dust out of it, was found, after being some years in use, to be charred on the underside. Here, of course, heat and moisture acted together, but how much of the charring was due to the heat alone, and how much to the moisture, and whether the combination of the two is more hazardous than the heat alone, no one seems to know.

MR. HAROLD SWAINSON, the joint author, with Mr. Lethaby, of a recent book of great merit on Byzantine building, as illustrated in the church of St. Sophia, died a few weeks ago in Egypt, at the age of twenty-six. Mr. Swainson, young as he was, had gained a reputation which will unquestionably increase as his work becomes more widely known. He was a university man, a thorough scholar, and, at the same time well instructed in the art and science of architecture, for which he seems to have had an inborn inclination. Learned in the history of the art as he was, he took particular pleasure in observing, in the practice of the modern workmen of the East, the survival of traditions handed down in the craft from the remotest antiquity. His part of the book on St. Sophia gives many curious examples of this; and his letters, as the *Builder*, in a sympathetic note, informs us, show that in Egypt, where he was attacked by a sudden and fatal illness while engaged in archæological work, he had made some interesting observations of the same sort in regard to the modes of work of the Coptic and Arab mechanics. Such study as this, touching, as we may well say, the very soul of architecture, is of extreme value. Unfortunately, there are very few persons fitted by nature and education to undertake it, and the loss of one who had shown himself so admirably fitted for the task is a calamity to our art.

A PARAGRAPH is going the rounds of the newspapers, which presents as good an example as we have ever noticed of the way in which economic absurdities are propagated. A lecturer, not long ago, to show how machinery had cheapened production, startled his audience by announcing that if a carpenter dropped a nail, it was cheaper to let it lie where it fell than to have him pick it up. The *Iron Age* commented upon this statement, with additions; and the *Evening Post* devotes an editorial, more than a column long, to the subject, adorning it with references to "the Pharaohs," the Argentine Republic, the Trans-Siberian Railway, and so on.

TO a person who was faithfully instructed, in his youth, both in the multiplication-table and the fable of the horse-shoe nail, such a statement as that of the lecturer carries with it a presumption of fallacy. According to the figures given in the *Evening Post*, "Assuming that it takes a carpenter ten seconds to pick up a nail which he had dropped, and that his time is worth 30 cents per hour, the recovery of the dropped nail would cost 0.083 cent. There are 200 sixpenny nails in a pound, and they are worth on an average 1.55 cents per pound, making the value of one nail 0.0077 cent. In other words, it would not pay to pick up ten nails at the assumed loss of time and rate of pay of the carpenter." The *Evening Post* is intelligent enough to put the responsibility for the "assumed loss of time" on some one else; but every one who uses tools himself, or has to watch others using them, will observe that the whole substance of this sensational assertion lies in the ridiculous assumption that it would take a carpenter ten seconds, or something like that, to pick up a nail. When the "Friends of Labor" have had their way a little longer, it may be that ten seconds will be the regular union time for picking up a nail from the floor; but, at the present moment, that is at least twenty times as long a time as would be needed for the task by any carpenter who could earn thirty cents an hour for his work. Moreover, as, by letting the nails lie where they fall, the carpenter would soon be obliged to leave his work, go down to the tool-room, or perhaps to the hardware store in the village, and get some more, probably utilizing the opportunity for a little innocent diversion or refreshment on the way, it will be seen that the employer who consulted the political economists in regard to the course to be pursued with dropped nails would find some unexpected decimals entering into the other side of the account. Moreover, under the conditions affecting most carpenter's work, the employer has to hire some one to sweep up the nails and other rubbish that are dropped, and, as it takes quite as long to sweep up and carry away a nail as it would to pick it up at the time it was dropped, another large deduction is to be made from the profits to be derived from the politico-economical method of carrying on mechanics' work. It is perfectly true that nails are cheap, but nothing is so cheap that it is profitable to waste it, and it is a pity to encourage lazy and shiftless people by the grave dissemination of such a ridiculous piece of sensational economics.

HINTS TO ART STUDENTS ON TRAVELLING ABROAD. — I.



Grille at St. Ouen, Rouen, France.

THE object of this article is to give such data on methods and cost of travelling and living abroad as will enable the student to decide how much he can undertake.

It is not desirable for the student to go abroad to familiarize himself with certain buildings merely, in order to reproduce them on returning to America. On the contrary, his aim should be to gain by a study of the masterpieces of architecture a knowledge of the fundamental laws which underlie all design in all ages.

The benefits of study abroad are twofold. The student is brought in contact with masterpieces of art. His sense of beauty is enlarged and intensified, and he gains the power of original design through realizing the conditions under which certain buildings have been designed, and how those conditions have been satisfied. He will become not simply an archæologist, but may attain the power to create new and beautiful designs through the satisfaction of given requirements.

As a rule, students go abroad inadequately prepared. They are seldom acquainted with any language but their own. They do not know what they want to study, the point-of-view from which to study, or the methods by which to study.

Under such circumstances, the work of most students is aimless, desultory, and without much result. A little previous study would greatly enhance the value of their trip.

Let them first make a comprehensive study of the history of architecture, take up a course of reading on travel, art and general history, gain some knowledge of the French language, get some academic training in designing and planning, learn something of modelling, and measure up and draw out some building at home in order to familiarize themselves with such work.

In studying architectural history, do not make of it a mere dry *résumé* of buildings, dates and architects, but look underneath all for the vital points of architectural development, see why the Gothic grew into being, why the Renaissance came to life and what constitutes the essential elements of the different phases of architecture. You will thus gain a knowledge of the development of the principles of ornamentation and construction which underlie all styles in all ages. And you will not pass by buildings because they do not satisfy your individual ideas of beauty. On the contrary, they will become of great interest as illustrating successive steps in the development of styles.

As an aid to this sort of work, make a list of cities while reading architectural history, and note the buildings worthy of study, the especial point of interest and the architect, date, etc. You will thus avoid the mortifying realization later on, that you have passed through a city and failed to see something there of especial interest.

A trip abroad will gain immensely in richness and fulness of impression through reading books of travel, general history and historical novels. They will give you new eyes with which to see old places. Read books on art to gain a knowledge of the principles of art criticism. The list of such books is large. The following are good:

Fergusson, Lübke and Rosengarten, for an outline of Architectural History.

FOR ART PRINCIPLES.

Viollet-le-Duc's "*Entretiens sur l'Architecture.*"
Hammerton's "*Graphic Arts.*"
Ruskin's "*Principles of Drawing.*"

FOR TRAVEL.

Symmonds's "*Italian Sketches.*"
Howells's "*Venetian Life*" and "*Tuscan Cities.*"
Mrs. Oliphant's "*Royal Edinboro,*" "*Makers of Florence.*"
Vasari's "*Lives of the Painters.*"
Irving's "*The Conquest of Granada,*" "*Tales of the Alhambra.*"
Henry James's "*A Little Tour in France*"; and the list of historical novels is infinite.

It is a general fault of architectural students to be narrow. They neither know nor care for anything outside of architecture, and it is a great mistake, the mind becomes cramped and many fine influences are lost. Do not despise sight-seeing, and look with contempt on the tourist who makes no drawings. Do not neglect painting, sculpture, music, history, literature or anything else that is fine.

It was rather amusing lately to read in the newspapers an account of the impressions a trip abroad had made on one of America's leading pugilistic lights. His judgment of the comparative merits of cooking in the different countries was very sound; but in regard to architecture, sculpture, painting or places of historical interest, he had nothing to say, and contemptuously asserted that "this sight-seeing wasn't what it was cracked up to be."

Places are of much greater interest if one knows something of their history, and if one speaks the language of the country. A little knowledge of the French language will save considerable annoyance and some money on arriving in France. Not simply the ordinary smattering of French grammer, but a little practical speaking ability, such as may be gained in a short time by conversing with a French teacher, and it will be of great aid in picking up the other languages. There are language-primers printed in cheap pamphlet form which are handy to carry in the pocket; Franz Thims publishes such a set. By a little study of these, and talking with people in the trains, one soon acquires enough of a vocabulary to make his wants known. One can travel much cheaper when speaking a little of the language of the country.

If the student has not had some academic training before going abroad, it would be well to arrange his trip so that he may study in Paris before travelling, even if for a few months only. There is an atelier, in Paris, called the American, where problems are given at once without the preliminary "niggering" for other men.

The great question in students' minds usually is, "Shall I pass my time in Paris studying, or shall I travel?"

The study of existing work from the building itself is of the greatest importance. But it is best made after one has had some academic training. If one has already had the training before going abroad, Paris loses, in a great measure, its value. If one has not had academic training, it is well to arrange the route to pass the first part of the time in Paris. Paris is the centre of studentdom, of ideas, of inspiration for work.

Many students, who are well along in years, and have had considerable academic training, will find it to their advantage to study in the school at Athens, and in the new American school just established in Rome, rather than attempt the École in Paris, where it usually requires a year of preparatory study to enter, and then two years of application to mathematical studies and small problems, making three years of preparation before entering the First Class, where the real drill in design begins.

Arranging one's tour is another difficulty. The idea of passing the winter in the South and the summer in the North is pretty, but not eminently practicable. Some winters are so mild that one may work out of doors in Sicily and Greece, but, in general, the coldest months are best passed in studying in museums, working-up drawings, etc., in Athens, Rome, Paris or London. It is a very good idea, however, to begin work in the South and go north during the summer.

It is not pleasant travelling alone; there is a certain satisfaction in being free to go where and when one pleases, but it is more profitable to have some one with you. It is more economical, and a great advantage in case of accident. Two fellows can help one another immensely in working together, but "two is company, three is a crowd." Beware of parties where the continual wrangle is, "What shall we do next?"

A very good route for a two years' trip would be to sail in the late summer to Gibraltar, take a circular tour in Spain, and continue from Gibraltar to Sicily and Greece, thence to Italy, passing the coldest winter months in Athens and Rome; then start north in the spring, giving the summer to Italy, that land of architecture, with a short tour in Germany. The second winter could be passed in Paris, followed by a circular tour in France during the following summer, and home through England. This would concentrate the time in profitable places and avoid recrossing one's track. But the best would be seen first. There would not be much enthusiasm left for the Roman antiquities after coming from the remains in Greece, and the English cathedrals would seem ridiculous after seeing the French ones.

Students often make the mistake of travelling too much. It is not necessary, nor profitable, to visit every small town in France and Italy.

Concentrate your time in profitable places, such as Athens, Rome, Florence, Venice and Paris. Remember that the small towns are usually copies of the big ones; St. Mark's Square is repeated over and again in the Northern Italian cities, and Paris is the model for all France to-day.

Measuring-up work and drawing it out to scale is the "*pièce de résistance*" of one's work abroad, and it is well to do some of that sort of work before starting; a book by Mr. Phené Spiers, of London

on measuring has many good suggestions and is worthy of careful study.

Some students abroad, who are pressed for time, rush hastily about from city to city, make small notes in a pocket sketch-book and simply get impressions. If one has but a limited amount of time, this method is better than nothing, and there may be a certain advantage in a first preliminary trip as an aid to a second one of serious study. Even a hasty three months' trip will open one's eyes to new beauties and be rich with inspirations. J. W. Case.

(To be continued.)

THE PARKS AND PROPOSED PARKS OF WASHINGTON CITY.

ALTHOUGH Washington City has always been well provided with small parks and while the larger number of its streets are parked on both sides, it was not until the year 1893 that property was finally acquired for a park in proportion to the expected magnitude of the city. The Engineer Commissioner has mapped out quite an elaborate scheme for connecting the parks and proposed parks in the District of Columbia by broad avenues, and the map [See Illustrations] which accompanies this letter will show the general idea at a glance.

Beginning at the Capitol: The boulevard indicated on L'Enfant's map in 1792 is shown to the west. This was to have been 400 feet wide, with parks 600 feet wide on either side ending against a background of Government buildings. This boulevard would run through the mall to the Washington Monument, from which you would pass directly into the reclaimed flats of 740 acres area. A driveway encircling this tract of land would give an opportunity for an unexcelled river-view, with the low undulating hills of Maryland on one side and the Arsenal grounds on the other, in the foreground lying the low land of Anacostia [? Analostan] Island.

From the eastern point of the park one would have a direct view down the river for twelve miles. The river at this point is 1¾ miles wide, sufficient to give breadth and dignity to the water-view.

Passing around the western portion of these grounds you would enter the old Observatory site. From this location, on a line with New York Avenue, it is proposed to erect, as a memorial of prominent soldiers of the late war, a bridge leading into the Arlington estate, now owned by the Government, a large portion of which is already laid out as a park. Here one could drive or wander in the woods under the shade of oaks centuries old: in this section of country this would be a treat, as but few of the old forests have escaped the destroying hand of war.

From the hills of Arlington many a charming view may be obtained of the river, the city and the hills of Maryland.

The charm of the Monument and the Capitol in connection with each other and their surroundings, when seen from these hills, is impossible to describe.

A noted object of interest in the Arlington estate is the old residence of G. W. Parke Custis, afterwards the home of Robert E. Lee, which is in the small portion of the grounds used by the United States as a Soldiers' Cemetery, while on another part of this tract the Government has four cavalry companies with their barracks, officers' quarters, etc.

Starting again at the Observatory grounds, toward the west a broad parked avenue is to pass along the present line of Twenty-fifth Street, 160 feet wide, into Rock Creek valley at a point just west of Q Street. From this point, both sides of Rock Creek will be parked for the distance of about eight miles, following the winding course of the creek, and about five miles in a straight line. It will vary in width from a few hundred feet to six thousand. It would be difficult to find, except in a mountainous region, a stream with more wild and picturesque banks or a greater variety in the scenery of the country through which it passes. Starting at Q Street, you immediately enter a deep ravine, passing through steep wooded banks on the one side and bold gray cliffs on the other, occasionally opening on low rolling hills, until you reach the Zoölogical Park. This narrow strip of ground from Q Street to the Zoo has not been acquired by the Government.

The new Naval Observatory grounds is only a few hundred feet west of this proposed park. From the crown of the hill and the tops of the building a very pleasing view is obtained of the city and surrounding country.

Soon after entering the Zoo you pass the ruins of the old Adams mill, built early in the century. At this point the banks of the creek are rugged, bold and picturesque, with massive jutting cliffs, boulders and dense growth of trees; passing around a curve in the creek, you come upon a low, gently-sloping hill with its covering of green grass on the one side, and on the other a bold cliff approximating a hundred feet in height.

The Zoo is full of charming bits of scenery, with oak, beach, dog wood, maple and other trees natural to this section of the country. The banks of the creek and the cliffs are covered with mosses, ferns, Virginia creepers, laurel and other shrubs and vines. The roads and general landscape work of the Zoo has been in charge of Olmsted & Eliot, and although its development has only begun, enough has been done to indicate what the completed work will be. It has been one of my pleasant duties to design and execute artificial inlets and outlets to lakes, a rapid where we wished the level of the creek raised, and a bridge, over a ravine, out of the natural boulders found in the surrounding country, an earnest effort being made to conform with nature as it exists in this neighborhood. The Zoölogical Park has a limited number of new buildings and is fast acquiring an instructive collection of animals. This park being the largest one in the world devoted entirely to zoölogical purposes gives an opportunity to allow the animals more space, an effort being made to allow them conditions akin, as far as practicable, to the wild state.

You pass directly from the Zoölogical Park into the Rock Creek Park, a tract of 1,606 acres.

In this tract of land (in most cases not accessible by roadway) is every variety of landscape: Precipices, rugged and bare, or covered with clinging plants and vines; woodland, of old and new growth; foliage, which makes the scene rich with the many hues of nature, varying from the tender green of early spring to the dark evergreens of the pine and cedar, the white of the dogwood, the pink of the laurel; the varied autumn hues of green, yellow, red, brown, with their hundreds of variations and combinations, always changing, always beautiful. The grounds are so disposed that one may see these variations and splendors of nature to the best effect.

Rock Creek is always the central feature. Here we see it — a long quiet sheet of water reflecting the many beauties along its banks, now rippling over a decline of small stone, then rushing beside, over and between boulders, great and small, gray with the hand of Time and green from Nature's nursery. The many small streams which enter the park make a never-ending attraction — tumbling, rolling, rippling, as they do, over and among their rocky beds. Nature has here given us the basis for the finest park in this country. It needs little but opening, so the people can see its many natural beauties.

In the report for 1894 the Commissioners incorporated in their appropriation bill for the District an item for $5,000, with which to secure from some landscape architect a scheme for laying-out this park, but Congress has cut the item from the bill.

Piney Branch runs into Rock Creek near the southern boundary of the park. This is one of the most picturesque tributaries — full of small water-falls, enormous boulders, quiet pools and rushing rapids. It is proposed, although the ground has not yet been acquired, to park both sides of Piney Branch, the whole being 250 feet wide, making a grand boulevard and bridle-path from the Rock Creek Park to the Soldiers' Home. The latter is a park of 475 acres belonging to the United States soldiers, but open to the public. The Soldiers' Home has been developed since early in the sixties, and is well known to the travelling public. The scenery in this park is quite different from that in the Rock Creek Valley. Here the rugged and picturesque are lost, but we have low undulating hills cultivated in grass and woodland, and good roads, as well as several charming views. The view from the base of Scott's Statue will always be remembered with pleasure by any one who sees it: over a broad foreground of green the City of Washington stretches out in the distance; the Capitol on the east, the Washington Monument on the west, both always beautiful, no matter what the condition of the sky or atmosphere may be. Between them the branching Potomac stretches directly in front until it disappears in the distance: the green hills of Virginia on one side, and the District of Columbia and Maryland on the other. A remarkably effective small view from the Home is the Capitol Vista — an opening through the dense foliage just large enough to form a frame around the dome of the Capitol. How pleasing the effect is can only be realized by actual experience. The white dome, the blue sky, the green foliage, nothing more. The principal buildings of the Home harmonize and form a fitting part of the landscape. I am sorry to say that the other buildings belonging to the Home mar the effect.

From the Home a parked avenue is to run 160 feet wide to a proposed park along the eastern branch of the Potomac. This park will be the least effective, naturally, of the whole group. Through this section the drive will continue to East Capitol Street, 160 feet wide, thence to the Capitol or point of beginning.

From the extreme northwest end of Rock Creek Park another parked avenue, 160 feet wide, is to run to the Eastern Branch Park along the grounds of the Reform School to East Capitol Street.

For nearly a hundred years the city has remained as laid out by Washington and L'Enfant. Towns and villages have sprung up in the District of Columbia adjoining the city without any supervision or direction from the authorities in charge of the District. The individuals or groups of individuals who have subdivided these tracts have paid no attention to the streets of the city, but have laid out their streets to run in any direction and of any size, always narrow, in no case conforming to or harmonizing with the plan of the city. [See solid lines on map.]

A few years ago the peculiarly evil effect of this method dawned upon the Commissioners and the property owners in Washington. The matter was brought to the attention of Congress and for several years no new subdivisions have been allowed without first being

authorized by the Commissioners. Since this time they have been studying the subject of street extensions. They have wisely determined to extend the streets wherever practicable on the lines of the present streets and avenues.

The map, accompanying this letter, shows the proposed extension of streets in dotted lines. Although the system has not been finally adopted there will probably be little deviation from the plan as shown.

The section west of Rock Creek Park is very rugged, with high hills and deep ravines. Through this section, and in some places adjoining the park, the streets will probably run so as to agree with the natural contours of the land, giving winding roads, terraces and picturesque villa sites.

Within the last few months Mr. Frederick Law Olmsted was, by Act of Congress, called into consultation in reference to the extension of the streets; but both the Commissioners and Mr. Olmsted are handicapped by the law under which the proposed extension of the streets are to be made.

The extension of the streets in the suburbs has been divided into sections. The first section is from North Capitol Street to Rock Creek Park. Mr. Olmsted has divided the first section up into five divisions, on four of which he has made a report. His advice as to running streets parallel to the railroad line, but one square distant, with only occasional crossing, was commended and adopted.

His last report includes suggestions as to the treatment of the proposed boulevard along Piney Branch, between the Park and Home, making suggestions as to the treatment of the creek, lake, hills and streets which run in and across the boulevard. Mr. Olmsted's studies are preliminary to a more detailed consideration of the question. It is most desirable that the park and systems of parks should be studied and mapped out by capable and experienced landscape architects. It is to be hoped that Congress will authorize a comprehensive plan to be made which can be developed in detail as the Commissioners obtain the money.

TABLE SHOWING AREA OF PUBLIC GROUNDS IN WASHINGTON CITY AND VICINITY.

PROPERTY IN OLD CITY-LIMITS.

Name.	Area in Acres.	Remarks.
Capitol Grounds	58	Improved.
Library "	8.91	Unimproved.
Botanical "	11.80	Improved.
President's "	82.22	"
Monument "	78.51	"
Agricultural "	35.70	"
Smithsonian "	58.02	"
Armory "	14.86	"
Seaton "	18.94	"
Garfield "	23.97	Partly improved.
Judiciary "	19.82	Improved.
Old Observat'y "	19.00	Partly improved.
294 Small Parks, Squares and Circles	108.70	
Fish Commission (about)	15	
Arsenal (about)	80	Improved.
Navy Yard	42	Partly improved.
Jail and Alms-house (about)	80	Unimproved.
Total in acres	755.49	

Public Grounds in the vicinity of the City.	Area in Acres.	Remarks.
Reclaimed Flats	739 42	Unimproved.
Arlington	1,090.9	Partly improved.
New Observatory	75	" "
Receiving Reservoir	166.25	Unimproved.
National Zoölogical Park	166.25	Partly improved.
Rock Creek Park	1,606	Unimproved.
Soldiers' Home	474	Improved.
Distributing Reservoir	65	Not public.
U. S. Reform School	266	Partly improved.
U. S. Industrial School (about)	14	" "
U. S. Insane Asylum	164.63	" "
New Reservoir (about)	67	Unimproved.
Total acres	4,894.74	

Proposed Parks.	Area in Acres.	Remarks.
Q Street to Zoo (about)	80	Unimproved.
Piney Branch (about)	38	"
Eastern Branch (about)	600	"
Total acres	718	

	Acres.
Total in old city limits	755.49
" " vicinity of city	4,894.74
" proposed parks	718.00
Total acreage	6,368.23

BOULEVARDS OR PARKED AVENUES, CONNECTING PARKS.

Piney Branch, connecting Rock Creek Park with Soldiers' Home	250	feet	wide,	1½	miles	long.
Parked Avenue, connecting Soldiers' Home with Eastern Branch Park	160	"	"	2½	"	"
Stotts Avenue, connecting Rock Creek Park with Eastern Branch Park	160	"	"	6¼	"	"
East Capitol Street, connecting Eastern Branch Park with Capitol Grounds	160	"	"	1¾	"	"
Twenty-fifth Street, connecting Reclaimed Flats with Proposed Park	160	"	"	1½	"	"

VENETIAN ART AT THE NEW GALLERY, LONDON. — I.

FOR some few winters past, the New Gallery was devoted to exhibitions of pictures, drawings, books, manuscripts and personal relics of the members of the reigning families of England from the time of the Tudors. Although, notwithstanding the abundance of material, the glorious epoch of the Commonwealth was judged unworthy of being represented on the walls — which, after all, is not to be wondered at from a committee, which, in its catalogue, without scruple, designated the Pretender "His Majesty James III."

The royal houses having been exhausted, the directors determined to have a succession of exhibitions representing the various art-centres of Europe, which promise to be of great interest.

That of last year, as your readers are aware, was very properly set apart to the Renaissance in Italy, and included, in addition to a great number of articles of *bijouterie* and *vertu*, works of the Tuscan, Umbrian, and Milanese Schools; from Cimabue and Giotto, — shaking off the influence of the Byzantine method, characterized by "streaming crucifixes, lean Madonnas and saints," and a superabundance of gold on robes and background, — until they reached the glorious days of the great Leonardo and Raphael; and affording an opportunity, seldom met with, of tracing the struggles of art to free itself from its chrysalid state in the Dark Ages, in which so many sources of intellectual and imaginative enjoyment had actually disappeared, till it arrived on ever-soaring wings at the perfection of the Master.

The Renaissance of Art in Italy is so fascinating a subject that one could easily devote pages to it; "it must not, however, be looked on as a local phenomenon, for, indeed, it was part and parcel of the mighty movement which, while it placed the fine arts, in a large sense, on their highest summit in Italy, produced Luther and the Reformation in Germany, Shakespeare in England, John Knox in Scotland, and throughout all Europe a change in political and religious conceptions, and a growth of culture and learning which continue still to quicken and expand." As the late J. Addington Symonds said, "the history of the Renaissance is not the history of arts, or of science, or of literature, or even of nations. It is the history of the attainment of self-conscious freedom to the human spirit; manifested in the European races." The growing delight in life, with the consequent love of health, beauty and joy were felt more powerfully in Venice, than anywhere else, which may be accounted for, partly, by the form of government giving little room for personal glory, so that while Florence, for example, was stirred to its depths by internecine feuds, Venice was the only state which at that period was enjoying internal peace.

The visitor to the New Gallery cannot fail to be charmed with the glowing colors that on all sides attract his attention, for it is an exhibition of *Venetian* art; and, although those who have visited "the all-glorious Mistress of the Sea" have, like Charles Dickens's "marchioness" "to make believe" "very much," the show is a goodly one notwithstanding, and our sincere thanks are due to the organizing committee, as also to those owners, who, like Her Majesty, have so ungrudgingly lent their treasures.

Unfortunately, the gems at Bridgewater House are again conspicuous by their absence, and some paintings of the period under review are at Burlington House. There are, however, about three hundred paintings by, or attributed to, the great men whose mastery over color is the first thing that attracts most people to the painters of Venice, who, from the first, were endowed with such exquisite tact in their use of color, that, as a late writer says, "It was never an afterthought, as in many Florentine painters, nor is it always suggesting *paint*."

The central, or entrance hall presents the aspect of a Venetian court-yard; the small fountain, surrounded with flowers, in the middle of the marble floor, is now covered by an old well-head, or *pozzo*, in carved red marble, having a copper bucket suspended above it; from the ceiling hang three of the carved and gilded lanterns with red glass sides, formerly belonging to the "Bucentaur," used at the annual ceremony of the marriage of the Adriatic; they are lent by the Duke of Norfolk; while M. Léon Somzée lends four torch standards — fixed to the walls — in wood, carved with angels bearing escutcheons inlaid with mother-of-pearl and gilt. From the railings of the balcony running round the hall, are hung rich tapestries and silken embroideries of every hue, the sides of the hall being occupied by cases containing copes and other articles in bright colors, which form a fine setting for the various cabinets and carvings in bone, wood, and ivory within, while the remaining space is occupied by suits of armor, busts and cases of domestic glass.

So fond were the Venetians of brilliant effects of color, that they often painted real marble. In the more magnificent buildings, the whole of the marble carvings were covered with costly ultramarine and gold; gorgeous as is the coloring of Venice now, it is very difficult to realize what its chromatic splendor must have been in the old days when gold and color in lavish profusion decorated the palaces; when costly hangings of damask and velvet were suspended from balconies and windows, and when over the central canopies of the many gondolas, which flitted along over the sparkling waters of the canals, were spread awnings of most sumptuous damasks woven in gold and silver thread, or else decorated with rich embroidery, the chief part of the design being the arms of the owner.

Remarks on the paintings and engravings contained in this interesting exhibition we shall postpone to another paper, and devote the

present notice to the numerous other illustrations of Venetian art scattered around.

Simply to observe the variety of materials in which the Venetians worked is, in itself, an education; everything which the artist of the Renaissance touched, whether stone, wood, ivory, bronze, steel or pottery, he adorned with that loveliness which increases, and which still, after a lapse of four or five centuries, exercises a supreme controlling influence on the art inspiration of the civilized world.

Though the paintings exhibited are more numerous this year than last, there is an entire absence of jewels for personal adornment — just two ecclesiastical silver-gilt finger-rings, which were found at Murano, to remind us of the magnificent display of last year; and a few pendants, by no means very fine specimens of their kind.

Of furniture, again, the quantity is sparse: four carved chairs and a *cassone* of walnut wood (date wanting), lent by A. Cassella, Esq. The *cassone*, or linen-chest, an essential in all households of any pretensions, was a sarcophagus-like box, made, sometimes, but very rarely, of plain wood, magnificently painted and gilded — but usually of walnut wood; the broad and massive surfaces of which afforded a fine field for bold and graceful carving; often, as in the present instance, consisting of the family arms in the centre; figures and foliage occupying the ends and lid. The early *cassone* or *bahut* was a leathern or wicker basket covered with cloth — of which the French "*corbeille*" is a survival — was used to contain and protect a large box in which other boxes were lodged; in course of time the name passed to the box itself. When the family was at home, the *cassone* served as a wardrobe, and was used as a seat or table. From the carvings on the panels of one *cassone* of incontestable Italian origin — elsewhere exhibited — there is evidence that its primary use was that of a marriage coffer, as the marriage ceremony is depicted on it; the whole concluding with the arrival of the bride and bridegroom at their home, sumpter mules bearing the baggage. On the brilliantly-painted *cassoni* of Florentine workmanship, exhibited last year, there were as many incidents represented, grave and gay, connected with the wedding-feast, its tournaments and receptions, as would fill a volume. In the carving, as in the painting of these chests, the most eminent sculptors and painters did not scorn to be engaged.

In those vast and lofty palaces, as in the churches, the first necessity was to cover and beautify the walls, and while this was effected in the latter by means of those frescos which are still the envy and admiration of surrounding nations, the walls of the family apartments were adorned with rich tapestries and hangings, which employed woman's deft fingers from the earliest ages, and especially in the Renaissance; as Ruskin says in one of his lectures, "There has been no nation of any art energy, but has strenuously occupied and interested itself in this household picturing, from the web of Penelope to the tapestry of Queen Matilda and the meshes of Arras and Gobelins." A French writer traces silk-embroidery to China as far back as 1200 B. C., but the Renaissance affected this art also, for in the fifteenth century all articles of costume were so decorated, that every householder of any standing felt bound to employ an embroiderer by the year; another reason for the need of hired aid may have been that the ladies of the house were giving a large portion of their time to the study of the new learning. The first engraved pattern-books were invented in the sixteenth century and a few are exhibited, though without name or date; but it may doubtless be interesting news to some of your readers, that to these pattern-books of embroidery and lace, we owe our botanical gardens. Jean Robin started a garden in Paris, soon purchased by Henri IV, now known as the Jardin des Plantes, to grow strange varieties of plants for designs; and shortly afterwards, Guy de la Brosse suggested the idea of medical students studying the plants for scientific purposes, an example soon followed by other nations.

In some of the choice embroideries here exhibited, the work is of the most exquisite kind; notably, one piece of white satin on which are embroidered tulips — perfect, both in color and form. There are several vestments, stoles, copes and chalice veils, many richly embroidered with gold and silver threads and colored silks; some having jewels introduced, and one, corals; the chalice veils are, for the most part, composed of lace and the centre-piece embroidered with emblems of the Passion, or sacred symbols.

The specimens of lace are magnificent, and some of priceless value; they are of various kinds, known as rose, or Venetian Point; *punto in aere*, or point in air, lace without foundation, patterns for which are first met with in a book by Antonio Taglienti in 1528: drawn lace, cut lace, and Burano Point, covering a period extending, with one exception, from the end of the fifteenth century onwards to the eighteenth. Vinciolo, a Venetian, published a book on lace in 1592, with patterns exceedingly complex and beautiful; and Venice soon became famous for a peculiar variety of Point-lace, called Venetian Point, a kind of rose — or raised point — very much in demand for the large ruffs then in fashion. It lasted till Point d'Alencon at last surpassed and superseded it. Coverlets for beds were made of Venetian Point, and sometimes cost, with the trimmings of the sheets, 4,000 or 5,000 crowns. This was the kind Van Dyk loved to paint and Venetian beauties to wear. Much of the Venetian Point exhibited is in the form of flounces, 14 or 16 inches wide; the widest flounce, 27 inches, was given by Napoleon Bonaparte to his uncle, Cardinal Fesch, and is lent by Lady Harriet Harrison. Of a date anterior, however, to the above mentioned, are the few specimens of very old Greek Venetian lace, two of which deserve special mention; the first is made up of little figure-subjects conventionalized into the prettiest forms, with a broadness of design seldom met with in lace; the second is a curious old piece, illustrating the story of John the Baptist; it is about 2 yards long, and 7 inches wide, and, like the former, is in panel form, separated by close work; while the figures are of the same description as those in Honiton lace. The whole story is distinctly and realistically delineated, *e. g.*, in one panel is seen the headless body on the ground while in the next is the executioner holding the head aloft. Also of Greek Venetian lace, is the trimming of a pillowslip formerly belonging to Queen Henrietta Maria. In one of the cases with the lace, there is a very fine miniature of a man in profile, wearing a red coat — by Titian; and a pair of gold earrings of delicate goldsmith's work, of the seventeenth century.

[To be continued.]

THE PNEUMATIC TELEGRAPHS OF PARIS.

COMPRESSED air, which has never been utilized very extensively in the United States, finds large and steadily increasing application in Europe for various purposes. In Paris and many other Continental cities, compressed air, distributed from central stations, is supplied for motive power in factories, for the generation of electricity, for the ventilation of large buildings, for operating elevators and clocks in public and private buildings, factories, stores, etc., for pumping water and other liquids, for refrigeration and cleaning, and for various other purposes. Its use as a motive power for tramways in Paris, already considerable, is extending rapidly, and the same is true of other great European cities. It is not the purpose of this report, however, to consider the many and varied uses to which compressed air is put in Europe, but only to speak of one of its most important and successful applications in Paris, viz, in the intramural transmission of correspondence.

The pneumatic-tube system, which has had such an enormous development in Paris, and has long been regarded as an indispensable adjunct of the postal and telegraph system, was originally introduced in London in 1858. It has been in successful operation in Paris, and also in Berlin since 1866, and in Vienna since 1875. It is also in use, in a more restricted way, in the cities of Lyons and Marseilles.

In Paris, it affords a cheap, speedy and always reliable method of postal communication. It is employed not only for the communication of *cartes télégrammes* (card telegrams) originating in the city, but also for the distribution to sub-stations, in all parts of the capital, of telegrams from the provinces and from abroad, and for the collection of telegrams at such stations for transmission from the principal bureaus to their destinations, whether in France or other countries.

The system is constantly being extended and perfected. The postal officials state that the maximum interval between the posting of a *carte télégramme* in Paris and its arrival at its destination in Paris is an hour and a half; but in practice, the time required for the transmission of *cartes télégrammes* between opposite extremities of Paris very rarely exceeds an hour. The average time is somewhat less. This system is so successful and so well adapted to the needs of the people that the use of the electric telegraph for purposes of intramural communication is comparatively small.

The "pneumatic telegraph" system of Paris owes its adoption to the encumbrances of the electric wires, which, so long ago as 1860, had caused frequent delays in the transmission of messages and great inconvenience and losses to the public. For a time, in order to relieve the pressure upon the wires, especially between the central bureau of telegraphs and the Bourse, or stock exchange, where the congestions were the greatest and most numerous, it was found necessary to establish a regular system of couriers, who, in light vehicles, made trips between those two points every fifteen minutes during business hours. These couriers conveyed the latest quotations from the Bourse to the central station, whence they were disseminated far and wide by the electric wires.

Returning, the couriers carried to the Bourse messages sent to Paris by wire from the provinces and from abroad. This was but a temporary expedient, and was soon supplanted by a subterranean conduit from the Bourse to the Grand Hôtel, a distance of 700 metres (765.5 yards). This was the beginning of the pneumatic telegraphs of Paris, which now embrace a network of conduits under the city to every quarter of the great capital. The production of compressed air by the use of the municipal water-works having succeeded, the experimental line was extended from the Grand Hôtel to the central station (No. 103 rue de Grenelle St. Germain), thus affording direct pneumatic communication between the latter and the Bourse.

The necessities of the service, and the importance of guarding against any possibility of an interruption in the same, led to the construction of a second line (following a different route) between the central station and the Bourse, which was completed in 1867.

From that time to the present, there have been few years which have not witnessed extensions and improvements in the system.

The number of dispatches of all kinds carried during the year 1876 averaged about 250,000 monthly, or 8,300 daily, of which about 2,500 were sent from or received at the Bourse. Forty-five branch stations were then in operation, and the average length of time actually occupied in the transmission of dispatches (from the deposit of the same to their delivery at their destination) was officially

reported at from forty to forty-five minutes. The number of dispatches in course of transmission was the largest at the noon hour, during the session at the Bourse; in the early morning hours, the tide flowed to and from the great markets, and in the evening, between the leading boulevards and avenues and the fashionable residence quarters. The total cost of construction up to 1876 was, in round figures, 1,400,000 francs ($270,200).

To-day the aggregate length of the pneumatic telegraphs in Paris is 251,259.13 metres (156.12 miles), classified as follows:

	Miles.
Length of lines of 65 millimeters (2.58 inches) interior diameter.....	123.2
Length of lines of 80 millimeters (3.15 inches) interior diameter.....	17.84
Subterranean passages.....	15.08
Total.....	156.12

There are 105 postal bureaus or branch post-offices in Paris, all of which, with one exception, are equipped with the pneumatic tubes. The total cost of construction to date is, approximately, 8,000,000 francs ($1,544,000).

The number of persons employed in connection with the pneumatic service is 411.

The number of apparatuses in use is 365. The number of telegrams carried during 1893 was nearly four times the number carried in 1874, the exact figures for 1893 being:

Card telegrams (point to point in Paris): Total intramural.....	4,097,667
Telegrams: Total extramural..	9,668,784
Grand total.....	13,766,451

The gross revenue from transmission of telegrams from Paris was 1,576,225.10 francs ($304,211.44). Making no allowance for the earnings of the pneumatic system as an auxiliary to the general electric telegraph system of the country, there is a handsome surplus to the credit of the former. The total expenses of operation in 1893 were: Production of motive power, 300,000 francs ($57,900); repairing lines and apparatus, 75,000 francs ($14,475); personnel of operation, 590,000 francs ($113,870); total, 965,000 francs ($186,245). This shows a surplus of 611,225.10 francs ($117,966.44).

It remains to give a brief description of the system and the manner of its operation:

The general system is largely composed of a series of secondary systems of polygonal form, with several branch lines from points in these secondary systems to stations which could not conveniently be embraced therein.

Originally, the entire service was made over the polygonal systems, but some of the important stations are now connected by air lines of 80 millimetres (3.15 inches) in diameter, through which an "express service" is maintained. There are no intermediate stations on these lines, which serve only the terminal stations.

The lines are composed of soldered iron tubes. The sections are connected by joints and bolts. The interior diameter of the tubes is from 65 millimetres (2.56 inches) up to 80 millimetres (3.15 inches). The curved sections vary from 10 to 50 metres (32 feet 10 inches to 164 feet) in length. The proportion of curves to the straight portions is about 1 to 7. The tubes are sunk in the earth at an average depth of one metre (39.37 inches) with very slight inclines, save at the entrances to the stations, where special provision is made for the arrival and departure of the trains. Upon reaching the foundation of the stations, the line abruptly rises with a curve of 2 to 6 metres (6 feet 6 inches to 19 feet 10 inches) in length, and extends vertically to the receiving and dispatching apparatus.

Whenever possible, the sewer galleries are utilized. The tubes are supported along the walls by hooks suspended at intervals of from 2.5 metres to 3 metres (8 feet 2 inches to 9 feet 9 inches). Repairs are facilitated by this arrangement, by which means the lines are always of easy access. The sewers do not generally admit of curves sufficient for the passage of the cars. In these cases the tubes are carried out of the galleries at convenient points for short distances. The tubes generally follow the slope of the ground; when it is necessary to pass from the earthen trench to a sewer, the trench is gradually deepened to modify the slope as much as possible.

It frequently happens at the lowest points of the line that there occurs an accumulation of water which might impede the march of the cars, or at least soil their contents. This accumulation is caused by condensation of the vapor in the motive air as it emerges from the reservoirs. If the air-pipe is at a lower temperature than the dispatching office, moisture is formed therein which causes the interior surface to oxidize, and produces, with the rust, a yellowish substance which settles on the boxes. It is principally in winter, or when the air is very damp, that this occurs. Various remedies are employed to counteract this. The air which feeds the reservoirs is taken, when possible, from a cool and relatively dry place. Purifiers, such as are used in the canalization of gas, are also applied at the lowest parts of the lines.

VEHICLES.

The size and number of dispatches fix the dimensions of the line. Envelopes capable of inclosing (folded in four) the telegram form are used. The boxes in use are cylindrical in form, made of strong sheet-iron, with an exterior leathern covering. These boxes will contain from 30 to 35 messages each. A train is formed by placing several boxes, one after the other, inside the tube. A piston, composed of a hollow iron cone, bearing at its summit a leather shield, cut out into sectors, transmits to the boxes the pressure of the compressed air. The leather coverings are worn out, as a rule, and renewed after travelling 2,000 kilometres (1,243 miles). The sheet-iron boxes are scooped out, and are thick enough to be proof against the effects of all collisions. They last an indefinite period. The weight of the leather is 64 grammes (2.26 ounces), and that of the sheet-iron 182 grammes (5.85 ounces).

The pistons are also made of sheet-iron and are hollow. The interior of the cone is fitted with a wooden mandrel, having a long rod screwed on at its end. This screw holds the nut which fastens the plate, which, in turn, serves to hold the flange. This arrangement prevents the various pieces which compose the piston from separating while it is in motion. The weight of the piston is 556 grammes (18.164 ounces). A train composed of ten boxes and a piston has a maximum weight of 4 kilogrammes, 115 grammes (8.12 pounds).

Each box has a number, which is stamped both on the leather covering and on the sheet-iron which serves to fit them together.

One very important point is, that there should be sufficient adhesion to prevent the box from separating when in motion, and at the same time that the opening by hand remains tolerably easy. This detail has an enormous importance. The stoppages which occurred in the early workings of the system were always caused by want of adhesion of the coverings. It is customary also to change the boxes two or three times a day while on the circuit; this precaution reduces the wear and tear.

The name of each office or of each circuit is engraved on the base of the metallic coverings, and this enables the distributing clerks to sort rapidly.

Finally, at each station, there is a calibre for verifying the diameter of the boxes put in use. Stoppages may occur through letting a box go out which is a fraction too large.

To the invention by Hero, about one hundred and twenty years before the Christian era, of the fountain which bears his name, we owe the method of compression of the air which has given birth to pneumatic telegraphy. This fountain, which is to be found in all chemical laboratories, is too generally known to demand any description here. The principle is simply to force, by the introduction of water, the air in a receptacle to escape and join the air in another receptacle. Air added to air in a close vessel is compressed air, which acts in the manner of a spring.

For a number of years, the water-power provided by the immense reservoirs connected with the water-works of Paris, and situated on the high grounds about the city, was utilized for the production of compressed air. Gradually, however, the use of steam-power was substituted, and it is now used exclusively.

The dispatching and receiving apparatus is, in fact, the "station" or office of the line. It is simply a continuation of the tube, with a receptacle at a short distance from the terminus. Above this receptacle are two distinct tubes, one extending to the compressed-air reservoir, the other for the purpose of letting off the air. These are controlled by a lever, which acts on two taps, so disposed that the same movement of the lever shuts one and opens the other, and *vice versa*. They establish communication between the line and the air, either for the reception or dispatch of the train.

To receive the train, the tap is opened so as to let off the air forced forward during its movement. The train strikes against the end of the tube and re-descends. Meanwhile, a fork is placed by one of the officials so that the train is stopped at the receptacle now open. The piston is first withdrawn and then the different boxes.

In dispatching the trains, the boxes are successively placed in the receptacle. Their weight sends them down, and the train is completed by the addition of the piston. The compressed-air tap is opened, and the air acting on the piston, drives the train on to its destination.

This description of a vertically-equipped station will serve equally for one in which there is space for the train to arrive horizontally, the only difference being a spring buffer at the terminal point.

At the central station, the electrical apparatus unceasingly bring in telegrams from all parts of the world. A clerk folds the paper and places it in an envelope which faithfully repeats the name of the addressee.

At 8 in the morning, work begins. The boxes are ready, a list accompanies the packet for each station, the tube is there, a puff of air and the first train is off; the circuits begin on the closed polygones; the trains run in each direction, alternating every three months. This avoids the obstruction of the tube by preventing the deposits of leather dust or of rust. In winter the boxes always arrive wetter than in summer. The air supplied to the tubes and proceeding from the stations, becoming heated, deposits the water with which it is saturated when it passes into the underground passages, which are at a lower temperature. This is obviated as much as possible by fixing the reservoirs and the air-feeders in the cellars.

When a train, for any cause, is stopped in the tube, the accident proceeds either from a disturbance in the line, in the train, or boxes, or in the station apparatus. Those occurring in the machines or apparatus are promptly repaired by the engineers, and the train is never long in distress. If the repairs cannot be immediately made, the corresponding station can, by blowing into the tube, send back the boxes to the starting-station. The shield attached to the piston turns back when the direction of the pressure changes and a new

piston is inserted by the station which "backs," goes on, joins the train and carries it back to its starting-point. In the case of damage to the wagons or to the line, the difficulties are of another kind. The first attempt is to increase as much as possible the pressure acting on the train. This often releases it; this failing, nothing remains but to make a search for the obstruction. Experiments made at the starting-station indicate approximately the location of the accident; the variations in the pressure of the air in the station reservoirs when in communication with a line of known length, and successively with the portion of the obstructed line are observed. In accordance with the Mariotte law, the spot to be reached can be indicated within 30 metres (32.88 yards). A pointed rod may also be used to a pretty good length (55 to 66 yards) on either side of the opening made by taking up one of the tubes. When the tubes are fixed in the sewer galleries the question becomes quite simple, as the line is then of easy access.

A few other causes of interruption may be mentioned:

(1) Omission to adjust the piston. The air, acting directly on the boxes, penetrates between the coverings, and the boxes are no longer set together; they arrive separately, one after the other, most of them open, and the telegrams all in disorder.

(2) Forgetting a train. This seems almost impossible, but this has happened. By an oversight, the official had signalled the reception before the arrival of the train. When the following train arrived, it pushed the first on and took its place. At the next station the second was mistaken for the first, so that for a good part of the day other trains came instead of the ones expected, till the verification of the way-bills revealed this singular error.

Other accidents have occurred through the mains becoming frozen. The remedy was simple. Several pistons were filled with hot water and started after the first. They established a thaw and pushed the train on to the next station, icicles and all. Now and then a blow from a pick during the laying down of gas and water mains, etc., may flatten or pierce the tube. Escapes of air, which might be thought to be of frequent occurrence, have, on the contrary, never happened.

While using every effort to recover the telegrams delayed by the accident, it is important not to delay the subsequent trains. The following arrangements are made: A van service is at once established, starting every fifteen minutes, and carrying the train from one station to the next station over the obstruction. This is the best solution when the delay lasts less than four hours. Should the delay continue, the polygonal circuit enables a change to be made from a circular route to an alternate return journey. Of course, the use of telegraphic signalling becomes necessary for the conduct of a double-journey service on one line, so as to prevent collisions and insure regularity.

Extensive improvements and enlargement of the system, the construction of which will extend over several years, are now under consideration, and will, no doubt, be carried out. These include among other things:

(1) The development of the system of direct lines of large diameter, by which all the most important telegraphic bureaus will be brought into immediate connection with the central station and the Bourse.

(2) The amplification of the secondary polygonal systems by reducing the number of stations on each of them and the creation of new systems.

(3) The transformation of a number of power-houses in order to increase the supply of motive power to meet the always growing necessities of the service. These power-houses were formerly in the hands of contractors; they are now carried on by the Department of Posts and Telegraphs, and the results are more satisfactory than under the old arrangement.

A project has been formulated, and is now under study by the French Government, for the substitution of electricity for compressed air as a motive power. This project, which would involve an enormous outlay, contemplates the construction of a system of very small gauge railways, laid underground in tubes, to be operated by electricity. It is improbable that this project will be adopted in the near future, if at all. The present system is operated very successfully, and with great economy. There is much difference of opinion among engineers as to whether better results would be obtained from tubular electric-railways, while there is a strong and growing opposition to the indefinite multiplication of underground electric-currents. When the improvements about to be undertaken are completed, and the facilities for the production of compressed air are made adequate to the wants of the service, the pneumatic telegraphs will hardly be abandoned for any other system by this generation, or even by the next.

The expense of pneumatic telegrams is very much less than that of electric telegrams in the United States.

The length of a message is only limited by the amount of space allowed on the *cartes télégrammes*. The sealed telegrams, which cost 50 centimes (9.65 cents), will contain quite a long message, which is not exposed to the danger of mistake in transmission or to public scrutiny, and, as a general rule, reaches its destination almost as quickly as an electrical telegram.

Of the advantages which this system presents for large cities, such as New York, Chicago, Philadelphia, St. Louis, etc., there can, I think, be no question.

In the cities of Lyons and Marseilles, which correspond in size pretty closely to Cincinnati and Pittsburgh, the pneumatic telegraphs, which now connect only the central station and the most important telegraphic bureaus, are to be extended to cover the entire cities, a fact which is of no little significance.

ACKNOWLEDGMENTS.

For valuable information contained in this report, and for courtesies extended me in the course of its preparation, I desire to express my acknowledgments to M. Lourties, Minister of Commerce and of Posts and Telegraphs; M. de Selves, commander of the Legion of Honor, director-general of the posts and telegraphs; M. Raymond, officer of the Legion of Honor, administrator at the Ministry of Posts and Telegraphs; M. O. Amiot, director and engineer at the telegraphic division at the Ministry of Posts and Telegraphs; and to Messrs. Vasbender, Shelignean, Vasseur, Escoffen and Victor Belugon, engineers at the Ministry of Posts and Telegraphs.

SAMUEL E. MORSS,
U. S. Consul-General.

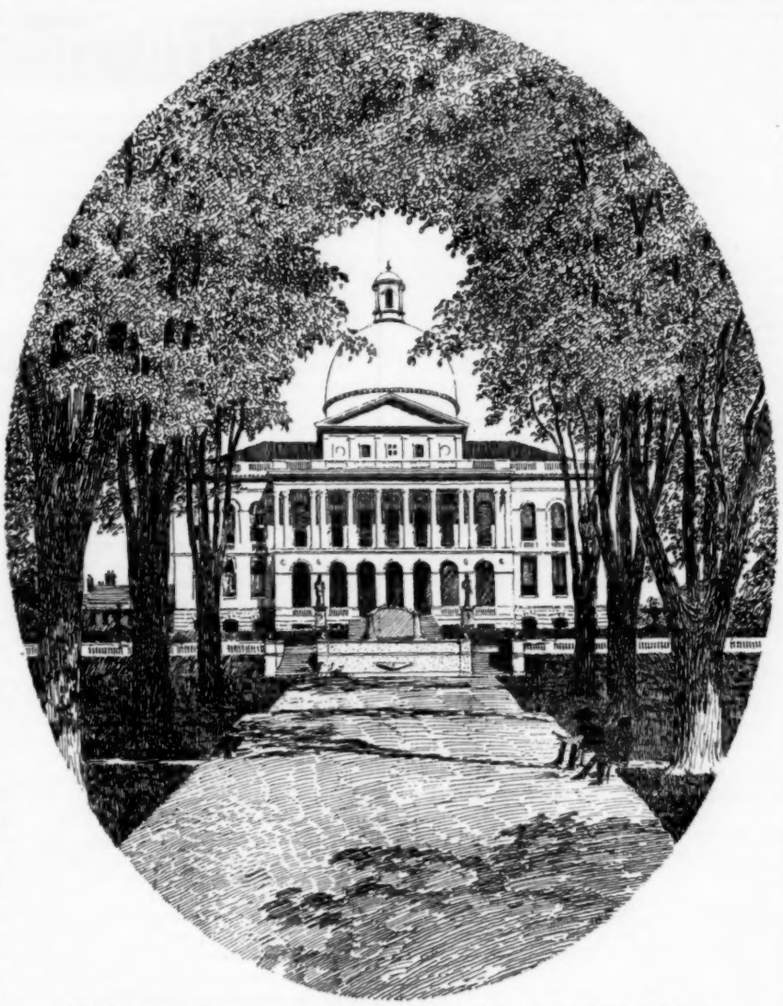
PARIS, November 20, 1894.

LONDON BRIDGE.

UNTIL the close of the tenth century, the principal line of communication between the north and south banks of the Thames, within the city-limits, was maintained by a ferry that, in early times at least, had proved a rich source of revenue to the owner, John Audrey, or Over; so much so, indeed, that his daughter had been enabled to found the Church of St. Mary Overies, to which a monastery was attached. In 993 the monks of this order built a wooden bridge near the site of the present London Bridge, which lasted for a century, and was swept away in 1093. It was replaced by a second timber structure, consumed by fire not long after. Then came the engineer, Peter of Colechurch, who devoted thirty-three years to the erection of the first stone bridge over the Thames. It was a famous, though not a very durable structure; the foundations were of elm piles driven to support the piers of twenty pointed arches, narrow, irregular and heavy, and varying in span from 15 feet to 35 feet. The piers reduced the water-way by more than half, and converted the river at this place into a mill-race. Some of the piers were over 30 feet in thickness, and their lengths varied from 26 feet to 115 feet. The width of the roadway was but 15 feet; the height of this narrow platform from the river, 60 feet. Military exigencies were satisfied by the erection of a drawbridge between two of the piers; ecclesiastical requirements were fulfilled by the construction of a chapel on the largest and central pier. Dedicated to St. Thomas a Becket, then of recent memory, money and art were lavished on this chapel, which, from a utilitarian point-of-view, might have been better expended on the bridge, which fell rapidly into decay, and, in the first years of the fourteenth century, appears to have been almost impassable. Storms and floods had destroyed some of the arches, and fire had consumed the towers which had been erected to flank the approaches. The chapel, however, must have remained long after the superstructure had been renewed, for remnants of the crypt were discovered during the work of final demolition in 1832. The original foundation built by Peter of Colechurch remained through many centuries; but, apart from this, constant renewals and alterations were necessary to maintain the line of roadway. The drawbridge, originally intended for protection, was found useful in the fifteenth century, to enable the increased shipping on the Thames to pass upwards to Queenhithe, then the centre of the city. Houses had been built along the bridge, which had to be widened for that purpose, and the approaches were protected by gates. In 1504, fire again was busy, destroying several houses and greatly damaging the bridge; a similar cause inflicted further injury about a century later. It was in 1582 that the Dutch engineers obtained permission to utilize the water rushing through the narrow piers. Water-wheels were erected, and the first water-supply of London was commenced. The Great Fire of 1666 did not spare London Bridge; all the houses were again swept away, and much destruction to the stonework was done; five years later this damage was repaired and two new rows of houses were built, leaving a roadway between them 20 feet in width. In 1725 the Southwark end of the bridge was again much injured by fire, the old Bridge Gate being practically destroyed; with the disappearance of this historic monument [a new gate was rebuilt in its place] the custom of exposing the heads of traitors over the bridge was abandoned. Between 1754 and 1759 large sums were spent in repairs and alterations, the work being entrusted to Mr. Labelye, the engineer of Westminster Bridge, and to Mr. Dance, the city surveyor. The alterations included the removal of the houses, the widening of the bridge, and the substitution of a larger central arch in place of the two narrow ones. This latter change, of course, involved the removal of the middle pier of the bridge. The disturbance of the foundations arising from this latter improvement imperilled the safety of the whole structure, and by the advice of Mr. Smeaton, who was called in to give an opinion, large quantities of stone were deposited in the bed of the river along the line of the bridge, to fill up the cavities that had been made by the removal of the pier, and more especially by the scour of the river. This precaution insured the safety of the bridge, but the scouring action continued with so much violence that large quantities of stone had to be deposited continually, and this being almost as continually swept away, there was gradually formed a sort of causeway a short distance below the

bridge, that stretched from shore to shore, and was nearly uncovered at low tide, while the depth of water at the bridge itself was nearly 30 feet. This was not astonishing, since the fall of water on opposite sides of the piers was sometimes almost 5 feet, and under the best conditions the navigation was difficult and dangerous. This torrent served one good purpose, indeed — that of supplying power to the water-works; but the presence of these wheels still further contracted the narrow water-way, and to improve this condition, the installation was finally removed in 1822.

From the commencement of the century, agitation was persistent for the removal of the structure, which had existed for 650 years, and which had become not only inadequate for the traffic, but a disgrace to the metropolis, the more striking since the completion of Blackfriars and Westminster Bridges. The city authorities and the controllers of the Port of London, stimulated by the remonstrances of the riverside property-owners. and others, appointed successive committees, which issued a series of reports, and received many designs for a new bridge. The most notable of these was prepared by Telford, and was a single arch of cast-iron, 600 feet in span. Cast-iron for structural work was greatly in favor at that time, and many important bridges had been successfully built of it. This fact, coupled with the high reputation of Telford, and the monumental character of the design he recommended, led to his proposal being favorably considered, although it was ultimately rejected. A bridge, 600 feet span, 65 feet above high-water, with a roadway 45 feet wide in the centre and 60 feet at the abutments, was a magnificent, but too bold an undertaking, and the City authorities did not feel justified in accepting the responsibilities inseparable from so great a work. Several more years passed without any action being taken, and it was not till 1823 that the necessary Acts of Parliament were obtained, and the design prepared by Sir John Rennie was accepted. That famous engineer had died the year before, but the work of constructing the new bridge was entrusted to his two sons, George and John Rennie. On March 4, 1824, the contract was let to Messrs. Jolliffe and Banks.



A Suggestion, by Mr. Wm. Atkinson, Architect, for creating a Vista for the Massachusetts State-House.

The first pile was driven on March 15, 1824; considerable preliminary work had to be executed in clearing the bed of the river before the foundations could be commenced. This was done by means of dredgers and diving-bells. The piers were all built within coffer-dams carried down to a depth of 29 feet below low-water. The foundation-stone was laid with great ceremony on June 15, 1825. From this time till 1831 the work was carried on continuously and successfully, and on August 1st in that year, the bridge was opened with much pomp.

Sir John Rennie, in his autobiography, gives many interesting particulars, not only concerning the construction of London Bridge, but also about the struggles connected with it, inside and outside Parliament; for these details we must refer the reader to the pages of that very interesting book, contenting ourselves here with a brief summary of the most salient facts. Had he lived, the building of the bridge would have been entrusted to the elder Rennie; he enjoyed the confidence of the city and of the Committee of the House of Commons engaged on the scheme, and his successful works of a similar character at Southwark and Waterloo, naturally led to his being chosen for this more important task. He had demonstrated the impossibility of maintaining the old bridge in a state of passable repair, and his plans for the new work were prepared and approved; that is to say, the general plans, for his death interrupted his detailed work. His son, speaking of this, says, "The design, as I have already observed, was made by my father, but no detailed working-drawings, specification, or estimate had been prepared by him; it fell to my lot, therefore, to do this." It was the original intention that the new bridge should be built on the site of the old one, the latter being first destroyed and a timber viaduct erected to accommodate the traffic. This very reasonable proposal, however, was not acted on, and the new site was fixed immediately above the existing bridge. Great difficulties in constructing the foundations were incurred from this cause. Sir John Rennie thus described the situation: "It should be observed the old bridge stood, as it were, upon a hill, the foundations of the piers being from 28 feet to 30 feet above the bottom of the river immediately above and below it, occasioned by the great fall and scour produced by the contracted water-way; thus it was necessary to secure the piers by large projecting starlings, and to throw considerable quantities of stone around them, in order to prevent the old bridge from being carried away." Apart from the difficulties due to the current, the scoured-out bed of the river, and the masses of stone that had been deposited for purposes of protection, the work of constructing the coffer-dams for the new piers was a formidable one. They were built of three rows of heavy piles driven 25 feet into the river-bed, the joints being carefully caulked, and each row braced to the adjoining one. The intermediate spaces were filled with puddled clay, and the structure inclosed a fourth row of piles driven into the outline of the actual foundation. So thoroughly was the work done that no trouble from water was experienced after they were pumped dry. The ground was excavated within them to a depth of 30 feet below low-water, well down into the London clay. Into the area thus cleared, series of piles were driven to a depth of 20 feet, or until they would not move under a weight of 12 cwt. falling through 18 feet; these piles were driven at intervals of 42 inches apart in each direction. When driven, the earth between the heads of the piles was excavated for about 1 foot and filled-in with stone bedded in cement. Tiers of beams 14 inches square were then laid across each other, and the spaces between filled with masonry in cement. On this was placed a platform of elm 6 inches thick, as a base for the masonry of the pier. A similar method was followed with all the piers and the abutments. The stone used was gray granite for the exterior, and Yorkshire grit-stone. The bridge is composed of five elliptical arches; the central span is 150 feet, the adjacent ones being 140 feet, and the two side spans, 130 feet; the two central piers are 24 feet thick, and the side piers 22 feet. A system of centering similar to that employed at Waterloo and Southwark Bridges was adopted. It consisted of eight independent braced ribs for each arch; these ribs were built at Millwall and brought up the river; on arriving at the site of the bridge they were transferred to a lighter in an erect position, and hoisted into place upon piles, a system of wedges being introduced beneath by which the exact levels were obtained.

London Bridge was advancing towards completion before a satisfactory solution of the problem of the approaches was arrived at. It was originally intended to use the existing Fish Street Hill, the

gradients being so modified as to present nothing steeper than 1 in 30. It was obvious that the arrangement was wholly unsatisfactory, because, apart from the gradient being too severe for a heavy traffic, the crowds of vehicles crossing the bridge from north to south would be in constant collision with those of Thames Street. The objections to this plan at last became obvious to the city authorities and to the Parliamentary Committee, and steps were taken to obtain powers for throwing an arch over Thames Street, so as to entirely separate the traffic and secure proper gradients. The change was very strongly opposed, and it was only after a severe struggle that the necessary powers were obtained in 1829.

It was not until the new bridge had been opened that the removal of the old one was commenced. The work was intrusted to the same contractors, Messrs. Joliffe and Banks, who received the sum of 10,000*l.* and the old material; the contract included the filling-up of the holes in the river below both bridges to a depth of 14 feet below low-water of spring-tides; moreover, all the old foundations, piles, etc., to the same depth had to be taken away. This work continued till 1834, when all traces of Old London Bridge had disappeared.

The cost of London Bridge was 1,426,645*l.*, or about 40,000*l.* in excess of Sir John Rennie's estimate. Of this amount, there was an allowance to the contractors of 46,000*l.* for extra work; the purchase of land figured for 692,000*l.*, and the approaches cost 57,000*l.* The Parliamentary expenses were 13,000*l.*, and salaries and allowances to the engineers came to 22,192*l.* The funds were largely raised from the Bridge House Estates, about 700,000*l.* coming from this source. The Bank of England advanced 450,000*l.*, and the Treasury, 150,000*l.* The sale of old material realized about 22,000*l.* Annexed are some particulars of the dimensions, and the materials used in the erection, of London Bridge:

	Ft.	In.
Span of centre arch	150	0
Span of side arches	140	0
Span of abutment arches	130	0
Height of centre arch above Trinity high-water	29	6
Height of side arches above Trinity high-water	27	6
Height of abutment arches above Trinity high-water	24	6
Thickness of two central piers	24	0
Thickness of two side piers	22	0
Total length of water-way	690	0
Total length of bridge	1,005	0
Extreme width of bridge	56	0
Width of each footpath	9	0
Width of carriageway	35	0
Height of parapets	4	6
Width of arch over Thames Street	35	0
Height of bridge above low-water	69	0

MATERIAL USED IN THE BRIDGE.

Number of piles under piers and foundations	2,092
Length of piles under piers and foundations (about.)	20 feet.
Stone used in bridge and abutments	120,000 tons.
Total number of piles in coffer-dam	7,708
Number of houses removed at each end of bridge	318
Time occupied in the erection of the bridge	7 years and 3 months.
Average number of men employed daily	800
Maximum depth of foundations below water	29 ft. 6 in.

PROFESSIONAL ETHICS.

THE following Code of Ethics prepared in conformity with the best standards of practice, and recommended to its members by the Boston Society of Architects, was adopted by the Society, February 1, 1895: —

Section 1. No member should enter into partnership, in any form or degree, with any builder, contractor or manufacturer.

Sec. 2. A member having any ownership in any building-material, device or invention, proposed to be used on work for which he is architect, should inform his employer of the fact of such ownership.

Sec. 3. No member should be a party to a building contract except as "owner."

Sec. 4. No member should guarantee an estimate or contract by personal bond.

Sec. 5. It is unprofessional to offer drawings or other services on approval and without adequate pecuniary compensation.

Sec. 6. It is unprofessional to advertise in any other way than by a notice giving name, address, profession and office hours, and special branch (if such) of practice.

Sec. 7. It is unprofessional to make alterations of a building designed by another architect, within ten years of its completion, without ascertaining that the owner refuses to employ the original designer, or, in event of the property having changed hands, without due notice to the said designer.

Sec. 8. It is unprofessional to attempt to supplant an architect after definite steps have been taken toward his employment.

Sec. 9. It is unprofessional for a member to criticise in the public prints the professional conduct or work of another architect except over his own name or under the authority of a professional journal.

Sec. 10. It is unprofessional to furnish designs in competition for private work or for public work, unless for proper compensation, and unless a competent professional adviser is employed to draw up the "conditions" and assist in the award.

Sec. 11. No member should submit drawings except as an original contributor in any duly instituted competition, or attempt to secure any work for which such a competition remains undecided.

Sec. 12. The A. I. A. "schedule of charges" represents minimum rates for full, faithful and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase, rather than to accept work to which he cannot give proper personal attention.

Sec. 13. No member shall compete in amount of commission or offer to work for less than another, in order to secure the work.

Sec. 14. It is unprofessional to enter into competition with or to consult with an architect who has been dishonorably expelled from the "Institute" or "Society."

Sec. 15. The assumption of the title of "Architect" should be held to mean that the bearer has the professional knowledge and natural ability needed for the proper invention, illustration and supervision of all building operations which he may undertake.

Sec. 16. A member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen and students.

THE ILLUSTRATIONS

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

THE GOVERNOR LANGDON HOUSE, PORTSMOUTH, N. H.

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

DETAILS OF THE HARRISON OFFICE-BUILDING, PHILADELPHIA, PA: THREE SHEETS. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

[Issued with the International and Imperial Editions only.]

A general view of this building was published in the *American Architect* for September 1, 1894.

SUBURBAN AND COUNTRY HOUSES. MESSRS. LONGFELLOW, ALDEN & HARLOW, ARCHITECTS, BOSTON, MASS.

THE PARKS BLOCK, WESTFIELD, MASS. MESSRS. GARDNER, PYNE & GARDNER, ARCHITECTS, SPRINGFIELD, MASS.

The block will have a frontage on Elm Street of 110 feet and will be 110 feet deep. The total cost will be over $60,000 and the structure will probably be completed and ready for occupancy by next spring. The first story is given up to two large stores running the full depth of the block, each store being 45 feet wide. The whole of the first floor will be of slow-burning construction, steel beams, girders and columns with heavy plank flooring being used. The three floors above the first will be given up to offices and in the fourth, besides the offices, will be a hall with a seating capacity of about 600 people. The grand staircase running directly to the top of the building will be of iron, and the elevator, which is adjacent to it, will be inclosed in a brick wall.

There will be over 80 offices in the building, averaging 14 by 20 feet each, all thoroughly equipped. The main piers of the first story are of carved Milford granite, with polished pink Georgia marble bond-stones crowned with carved capitals of Georgia marble. Above this to the window-sills of the third story the block will be of buff Amherst stone dressed, the third and fourth stories will be of buff Blandford brick with trimmings of terra-cotta, buff stone and marble. The carved stone corbels on the second story, which carry the pilasters above, are of buff Ohio stone, the two central ones weighing six tons apiece. The central portion of the front will be wholly of stone to the top of the fourth story and the pilasters which carry the balcony in the fourth story will be of Champlain polished marble with bases and caps of white statuary marble. The general style of the building is that of the later Italian Renaissance. Marble wainscoting will be used in the main hall and staircase and the entire finish of the building will be of the highest order.

MAP OF THE PROPOSED PARK SYSTEM FOR WASHINGTON, D. C.

See letter elsewhere in this issue.

HAYWOOD BUILDING, MINNEAPOLIS, MINN. MR. H. W. JONES, ARCHITECT, MINNEAPOLIS, MINN.

[Additional Illustrations in the International Edition.]

FOUNTAIN AT JUVISY-SUR-ORGES, FRANCE.

[Copper-plate Photogravure.]

THE DYING LION. MR. PAUL WAYLAND BARTLETT, SCULPTOR.

[Gelatine Print.]

THE idea of this work (exhibited at the new *Salon* in 1894) was suggested to the artist some years ago upon witnessing the death of an old lion in a menagerie. Impressed by the sight, he at once began a sketch which has since developed into this, which is twelve feet long. Composing his work little by little and executing it both from memory and from studies made at the Jardin des Plantes and elsewhere, he often waited hours and even days before he could get a sight of the animals in some movement that would aid him in rightly accenting the anatomy of the beast and giving expression to his work. In its execution the sculptor has tried to avoid the merely picturesque and all that could be called a strict imitation, and endeavored to produce a sculpturesque interpretation of nature. He has invented nothing, but taken his inspiration from the traditions of ancient art. The prevailing expression of the head and mouth especially has affinity with some of the Assyrian reliefs — it is essentially complaining in its nature and not ferocious, as in Barye's lions. It is the hope of the sculptor, which we share, that this work may be executed even larger in size and in bronze, and placed in some public ground amid surroundings suitable to its dramatic character.

There are both battle-fields and burial-grounds in our country that, still without worthy monuments to the brave whose memory hallow their soil, would be fitly marked by such a work as this.

Born at New Haven, Connecticut, in 1865, but having spent most of his life in France, Paul Bartlett, who is the son of the well-known sculptor, T. H. Bartlett, studied under Frémiet and Cavelier. He sent his first contribution — a bust of his grandmother — to the *Salon* when but fifteen years old and it was accepted and highly praised. Since then he has modelled numerous small bronzes of animals, and various portraits, both in the round and in relief, but the work by which he is best known to his countrymen is the "Bear Tamer," now the property of the Metropolitan Museum of Art in New York. His other sculptures comprise an "Indian Dancing" and statuettes of John Brown and Washington, the latter an equestrian figure.

HALLYBURTON HOUSE, PERTH, SCOTLAND. MR. ANDREW HEITON, ARCHITECT, PERTH, SCOTLAND.

THIS building was designed for Mr. Robert Stewart Menzies. It was completed at a cost of 13,000*l.*

COUNCIL CHAMBER, PERTH, SCOTLAND.

THE Perth Municipal Building was another of Mr. Heiton's works. Although it has the effect which is needed in a town having so much historic interest, the outlay was moderate, being only 13,000*l.*

EXHIBITIONS

BALTIMORE, MD. — The Walters Art Gallery will be open to the public on Wednesdays, beginning February 6 and on February 22.

BOSTON, MASS. — *Winter Exhibition, including Pictures loaned by Quincy A. Shaw; Paintings by Puvis de Chavannes; Ancient Chinese Buddhist Paintings; Line Engravings, Mezzotints, and Etchings by Rembrandt:* at the Museum of Fine Arts.

Fifty-first Exhibition, Oil-paintings and Sculpture: at the Boston Art Club, January 18 to February 16.

Photographs of the Park System of Boston, by George B. King: at the Boston Camera Club, 50 Bromfield St., February 6 to 16.

Paintings by Claude Monet: at the St. Botolph Club, February 4 to 16.

Paintings and Water-colors of Holland by Mr. and Mrs. Charles Herbert Woodbury: February 12 to 23.

Water-colors by H. Peabody Flagg: at Wm. Hatch & Co.'s Gallery, 209 Tremont St., until February 16.

BROOKLINE, MASS. — *Exhibition of Pictorial Posters:* at the Public Library, opened February 11.

CHICAGO, ILL. — *Exhibition of the Chicago Palette Club and the Cosmopolitan Art Club:* at the Art Institute, January 25 to February 17.

CLEVELAND, O. — *First Annual Exhibition of the Cleveland Art Association:* January 21 to February 22.

NEW YORK, N. Y. — *Loan Exhibition:* at the Metropolitan Museum of Art, New North Wing, opened November 5.

Twenty-eighth Annual Exhibition of the American Water-color Society, also, New York Etching Club Exhibition: at the Academy of Design, February 4 to March 2.

Tenth Annual Exhibition of the Architectural League: at the Galleries of the American Fine Arts Society, 215 West 57th St., February 15 to March 9.

Paintings of the English and French Schools: at the Durand-Ruel Galleries, 389 Fifth Ave.

Water-colors illustrating Irving's "Rip Van Winkle" and "Sleepy Hollow" by G. H. Boughton, and Oil-paintings by W. L. Picknell: at the Avery Galleries, 368 Fifth Ave., February 4 to 16.

Pictures and Sketches by Theodore Robinson: at the Macbeth Gallery, until February 16.

Exhibition of the Dutch Water-color Society: at Boussod, Valadon & Co.'s Galleries, Fifth Avenue, opened February 15.

PHILADELPHIA, PA. — *Sixty-fourth Annual Exhibition of the Pennsylvania Academy of Fine Arts:* opened December 17, closes February 23.

Works by James B. Sword and F. De B. Richards: at the Art Club, February 11 to 25.

PROVIDENCE, R. I. — *Paintings in Oil and Water-color, and Sculpture:* at the Art Club.

SPRINGFIELD, MASS. — *Eighteenth Annual Exhibition of Paintings:* at James D. Gill's Gallery, February 1 to March 2.

NOTES AND CLIPPINGS

A RUSSIAN FUNCTIONARY'S AMERICAN APPRENTICESHIP. — Prince Hilkow, who has just been appointed by the new Czar to the post of Minister of Roads and Communications, rendered vacant by the disgrace of the dishonest and incompetent Krivoschine, is well-known in the United States, where he served for a number of years as fireman and engineer on the Pennsylvania and New York Central Railroads. After having sown an extensive crop of wild oats at St. Petersburg and squandered an enormous fortune, he forsook his companions of the *jeunesse dorée* and started to seek a livelihood in the United States. When he landed here the Prince had no idea of what profession he should adopt, but finally found employment as fireman on a freight engine. He gradually worked his way up until he became an engineer, and after several years spent in this country returned to Russia, where he experienced no difficulty in securing a similar position on the Government railroads. During the war with Turkey he greatly distinguished himself in connection with the railroading features of the campaign, and attracted both the admiration and commendation of the late Czar's father, the then Emperor. On the constitution of Bulgaria as an independent sovereignty he was tendered the post of Director of the Department of Roads and Communications of that principality, which he accepted. On the withdrawal of the Russian functionaries he returned to St. Petersburg and took a prominent part in the construction of the Trans-Caspian Railroad. — *Marquise de Fontenoy in the Philadelphia Press.*

DIEGO CANO'S AFRICAN PILLAR REMOVED TO GERMANY. — Diego Cano's pillar, marking the farthest south of the Portuguese discoveries in 1485, has been removed by the Germans from Cape Cross, in Damaraland, South Africa, and placed in the collection of the Marine Akademie at Kiel. The pillar consists of a shaft six feet six inches high and a foot in diameter, with a capital seventeen inches deep, hewn out of a single piece of marble. On the upper surface is the mark of the place to which the cross, also brought to Kiel, was fastened with lead. On one face of the capital are the arms of Portugal, in the form they first took in the reign of John II; the other faces are covered by a Latin inscription in Gothic characters, the substance of which is repeated in Portuguese in the same characters, on the shaft of the column. It reads: "From the beginning of the world there had elapsed 6,684 years, and from the birth of Christ, 1,485, when the most exalted and most serene King, Don John the Second, of Portugal, ordered a column to be erected here by his knight, Diego Cano." Two similar columns from Punta Santa Maria, formerly Cape Santo Agostinho, dated 1482, and from Cape Negro, were removed in 1891 to the Lisbon Museum. Emperor William has sent out to Cape Cross, to be erected on the spot from which the pillar was taken, an exact fac-simile of the monument, in polished dark gray granite, with, in addition, the arms of Germany and this inscription in German: "By order of His Majesty, the German Emperor and King of Prussia, William II, this was erected in 1894 in place of the original pillar, which had become weather-worn in the course of years." — *Cincinnati Commercial-Gazette.*

MEXICAN ONYX. — Some officers of the United States army in the war with Mexico noticed in a chapel of that country a rarely beautiful window made of thin translucent pieces of richly-colored stone. One of the officers brought home some pieces of the stone and left it with a jeweller of this city to be dressed and shaped, but being ordered to the frontier he went away without receiving the finished material back from the jeweller. This was the first of the stone seen in this country, and it attracted no great attention. About thirty years later considerable quantities of the material were exhibited as Mexican onyx at the Centennial exposition at Philadelphia. — *Chicago Times.*

THE NEW IMPERIAL PALACE, BERLIN. — Emperor William has been obliged to suspend all the extensive building operations which he had undertaken in connection with the new palace at Berlin. The estimates of Court Architect Ihne are now shown to have been exceeded by several millions of marks. This state of affairs is not so much due to the incompetence of that functionary as to the emperor's mania for decreeing costly alterations all the time, his purse being by no means commensurate with his extravagant notions of splendor and magnificence, and the consequence is that his personal finances are in a much more critical condition than at any time since he ascended the throne. — *Chicago Record.*

TRADE SYMBOLS ON TOMBSTONES. — It was for a long time usual in Scotland to place on a man's tombstone the symbols of his trade. Especially was this the case at Dunblane, where, in the burial-ground of the abbey, it has been found that, of those tombstones which are from 100 to 200 years old, about one-fourth are thus marked, the symbols being in low relief. A sugar-cane may be seen as showing the grave of a grocer; an axe and saw, with hammer and nails, occur on the grave of a carpenter; an awl and a hammer on that of a shoemaker. — *Scottish Nights.*

A Tubular Frame House and its Advantages. — M. Caron, of Chamounix, has just built a most peculiar house, for which he claims, first, a constant temperature and incidentally strength, durability, comfort and beauty. The change of temperature in the valleys of this mountainous region is frequent and severe, and the building of such a house was prompted by the severity and instability of the climate. Mr. Caron first put up a frame of steel water-tubing, allowing continuous circulation to a stream of water. Around this frame, he put up his house in the ordinary way, the entire structure being a very pretty specimen of the early Italian Renaissance. The peculiarity is that all floors and ceilings are likewise crossed and recrossed by the water-pipes. The water, after passing through the horizontal tubes first, that is, under the floors and ceilings, passes through the vertical tubes until all have been gone through. In summer, spring water, fresh as is only the water of the snow-capped Alps, circulates under pressure through the network of tubes, cools off the walls, and, after having run its course, flows off considerably warmer than when it entered. But in its course, it has absorbed much heat, which it carries away. During the long and severe winter, the water, entering through the basement, is first heated to nearly 100 degrees, and then forced through the tubing. Of course, much of the heat is left all over the house, and at the outlet, the temperature of the water is about 40 degrees. The speed of the circulation of water can be regulated so as to allow the fixing of a certain temperature for the house, which is equal throughout. The house has been put to a practical test through the last eight months, and has stood the trial well. The builder claims for it cheapness, solidity and elasticity, giving it immunity against earthquakes. The house measures about 6,000 cubic yards and weighs 120 tons, or 36 pounds per cubic yard inclosed. It is fireproof, having running water in every room, and fire can be drowned out in a remarkably short time. — *La Nature.*

The Destruction of the Colosseum. — Four hundred years after the time of Bede, the Colosseum was a fortress in the hands of one of the noble families who fought for the domination of Rome. In this, it shared the fate of all the larger buildings yet remaining from the antique time. Barons, with names like Frangipani, Orsini, Colonna, and so forth, strove for dismantled Rome like vultures for a corpse. In the Colosseum, the Frangipanian birds of prey had their lurking-place. All around them was a desert. Robert Guiscard's Saracens had, at the appeal of Pope Gregory VII, stormed Rome and ravaged it with lance, the edge of the sword and fire. Then were the Aventine and the quarters between the Lateran and Esquiline seen to form one immense pyre. The walls of the Colosseum had withstood even the flames. But there came a power that they were powerless to defy — the power that had given them existence — the hand of man. Three hundred years again, and the Colosseum had become a stone-quarry. Now Rome again began to be adorned with splendid palaces, for which the old amphitheatre must give a great part of the building material. The fortress-like Palazzo di Venezia that lies at the opening of the Corso, the mighty Cancelleria, Bramante's stately work, and the noble Palazzo Farnese, adorned with Michael Angelo's renowned frieze, descend both in the body and the spirit from the Colosseum, for not only the latter's blocks of travertine, but even something of its Roman style did they appropriate to themselves. — *The Architect.*

How London County Council succeeds as a Contractor. — The painting of the Hammersmith Bridge was a source of amusement to all who passed while the operation lasted. It was a fascinating spectacle for the building workman. It might have been an object-lesson devised with the intention of convincing him that when the contractor was abolished and all works were controlled by a County Council, then labor would become a pastime. The people of Hammersmith became anxious about their share in the experiment, but they were persuaded that the playing with colors would not be more costly to them than to remote parts of the metropolis. The estimated cost of the work was 1,000*l.*, which was a very large sum for one bridge. Then by manœuvring, 595*l.* was voted for extra work. It was revealed on Tuesday that the expenditure was 2,186*l.* In 1888, the cost of the painting was 855*l.* It is needless to say the bridges committee declared that no fault was attributable to anybody. But a great many experts could be produced who would maintain the contrary. Whether the men were to blame for enjoying themselves when an opportunity was given them to have a prospect of Thames scenery is an ethical question over which modern moralists will differ. It is evident, however, there must be no attempt at criticism of any extravagance over what is termed labor, for Mr. John Burns threatened to "whip the Moderate Party hand and feet if they dared to go against labor and in favor of the contractor." — *The Architect.*

The Truth about the "Scab." — I have felt, as a friend once said, that if I were to lead any crusade to-day, I should want to be the champion of *unorganized* labor. I have no quarrel with organized labor, but I cannot forget that, while a certain band of laborers is receiving all the sympathy of the public and all the countenance of courts and legislators, there is a great body of workingmen, more needy and far more friendless, whom these privileged "knights of labor" treat only with abuse, and toward whose welfare the community at large seems absolutely indifferent. I cannot forget that there are hundreds of destitute workingmen in our city who are hooted and stoned for the crime of being willing to work. The epithet "scab" has become, in my ears, a title of honor, synonymous with pluck and patience. What American heart, unless dulled by long submission to such outrages, can help throbbing with indignation that hundreds of industrious workmen are subjected to violence and peril of their lives, simply because a privileged class of laborers do not choose to have any competitors? For the good name of Brooklyn, let one protest be heard, for this ignoble tyranny cannot but work degradation to the community which submits to it. — *From a Sermon by Rev. Samuel A. Eliot, of Brooklyn.*

The Staircase at Arundel Castle. — The Duke of Norfolk is so rich that he actually does not know what to do with his money, and it is supposed that to this must be attributed his extravagance in connection with the great staircase which he has just built at Arundel Castle. It has been in course of erection for over two years, and is estimated to have cost him $325,000. Arundel is a superb old place of much historical interest, but it possesses many sad associations even of modern times. — *Marquise de Fontenoy in the Philadelphia Press.*

An Early Wire Bridge. — One of the most unique bridges on record was a temporary affair made of wire, which spanned the river at Falls of Schuylkill, and was put up by Josiah White for the benefit of his employés. The permanent structure having been destroyed by the freshets of 1822, Mr. White, whose rolling-mills were on the western bank of the river, suspended wires from the upper windows of his mill to large trees on the opposite side. The wires hung in curves which supported other wires, which in turn supported a floor of boards 18 inches wide. The floor was, at least, 400 feet long, and had no intermediate support. No accidents resulted from its use, and many people came to the Falls to view it. — *Philadelphia Record.*

The Income made by Puvis de Chavannes. — Amid the turmoil and excitement of the resigning in Paris this week, one calm corner was found in which to give a banquet of honor to Puvis de Chavannes. His remarks upon his own art, and the aims and ideals which he has pursued from the outset are valuable and will be preserved as a part of the literature of the art of our times. But more general interest will be attracted by the statement that in thirty-six years of earnest and incessant labor his gross earnings amounted to $78,000, and when the cost of his studio, frames, materials, models and so on, is deducted from this, it leaves rather less than $1,000 a year, for, perhaps, the greatest of French artists. As some of his friends said, from the world's point-of-view, he would have done better as a retail grocer. — *N. Y. Times.*

Baltimore and Ohio's New Tunnel Opened. — The first regular train to make a trip through the new Belt Line tunnel, which is six miles long and cost the Baltimore & Ohio Railroad Company $7,000,000, left Camden station shortly before noon February 1. It was the Philadelphia and New York fast freight train, to which a passenger-car was attached for the accommodation of a party of railroad and electrical experts. Work has been in progress upon it for more than four years, and its completion has been expected for a long time. It is expected to have the electric apparatus in position by April 1, and the motors at work pulling trains through. After that time, no steam engines will be allowed to enter the underground passageway, which will be kept brilliantly lighted and clear from smoke. The tunnel will be of great value to the Baltimore & Ohio Company and to the travelling public, as the ferrying of trains across the bay at Canton will be done away with, and passenger trains between Washington and New York will save from twenty to thirty minutes on their present schedule. — *N. Y. Times.*

Frosted Glass. — A new sort of ornamental glass is now made in Paris by M. Bay, which he calls by the name of hoar-frost glass, "*verre givre*," from the pattern upon it, which resembles the feathery forms traced by frost on the inside of windows in cold weather. The process of making the glass is simple. The surface is first ground, either by the sand blast or by the ordinary method, and is then covered by a sort of varnish. On being dried, either in the sun or by artificial heat, the varnish contracts strongly, taking with it particles of glass to which it adheres; and as the contraction takes place along different lines, the pattern resembles very closely the branching crystals of frost-work. The pattern may be varied in character by changing the thickness of the film of varnish. A single coat gives a small delicate effect, while a thick film, formed by putting on two, three or more coats, contrasts so strongly as to produce a large and bold design. By using colored glass, a pattern in half tint may be made on the colored ground, and after decorating white glass, the back may be silvered or gilded. — *English Mechanics.*

Big Gas-engines — It is not long ago that a 50 or a 75 horse-power gas-engine was one of the big things in engineering, and was looked upon as a noteworthy achievement. How completely this state of affairs has been changed is perhaps best shown by the several recently published accounts of the power-plant of the Pantin Flour-mill, in France, which comprises a single-cylinder Simplex gas-engine, rated at nothing less than 320 indicated horse-power. The brake horse-power is 260. The engine is worked by producer gas, and has been pointed to as an admirable illustration of the certainty with which the steam-engine is being displaced for various kinds of work, though slowly, perhaps, by other forms of motors. Now that this jump to a 320 horse-power gas-engine has been made, and, apparently, with results of a most encouraging nature, an early step to still larger sizes seems more than probable, and it may not be long before we shall hear of the building of the 500 horse-power engine which Messrs. Matter & Co., of Rouen, the builders of the present Simplex engine, are holding in view. Messrs. Thwaite and Swineburne, in England, too, in agitating the subject of distributing electricity from the Midland coal districts direct to London, have contemplated the use of gas-engine units of 300 horse-power for a 10,000 horse-power station, so that the era of gas-engines of several hundred horse-power each would seem to be fairly ushered in. The Pantin Mills' engine, as a result of a 194-hour test, showed a consumption of 1,043 pounds of coal per brake horse-power per hour. The consumption of jacket cooling water and water for the gas-producers and washer for the same test was found to be 58·3 pounds per horse-power per hour, or very much less than the best condensing steam-engines would use, though about double the quantity that would be required for the best non-condensing engines. — *Cassier's Magazine.*

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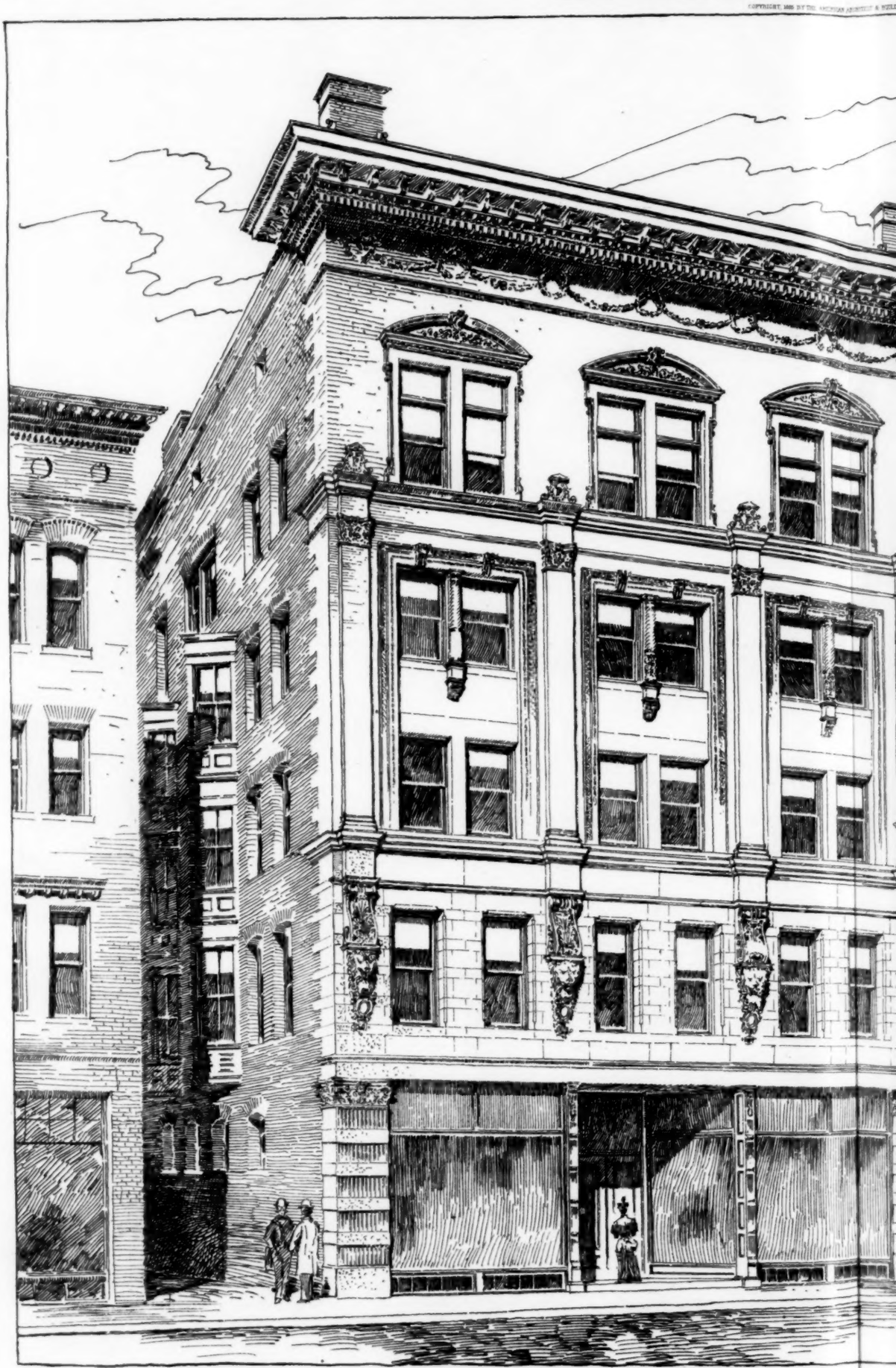

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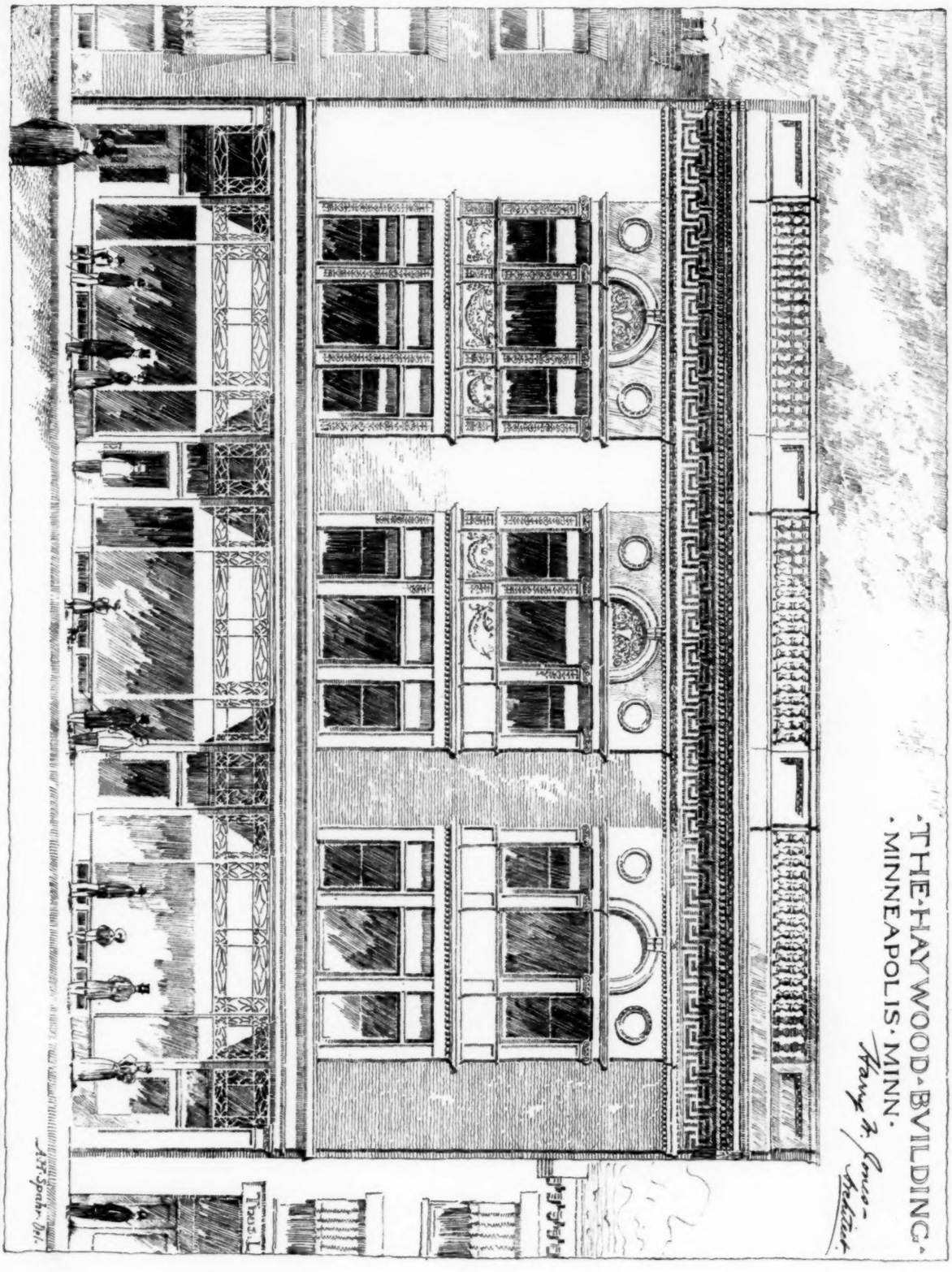

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