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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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A TERRIBLE fire occurred in Pittsburgh last week, causing the death of more than twenty people. A large building, belonging to the Chautauqua Lake Ice Company, and used for offices, manufacturing and storage, took fire in some unknown way, and was completely destroyed. Among the articles stored in the warehouse portion of the building were two thousand barrels of whiskey, and the explosion of these, together with that of the tanks of ammonia used by the Ice Company, threw over the brick walls of the building, sending some portions to a distance of more than three hundred feet. These masses of masonry fell into the crowd of firemen and spectators, killing many persons, and, among them, the son of the president of the Ice Company, and injuring one of the city Building Inspectors, Mr. J. A. A. Brown. The region around the building is crowded with small wooden tenement-houses, inhabited by Poles and Italians, and many of these poor people are believed to have been killed. The warehouse, although popularly reported to be fireproof, was of ordinary construction, with wooden beams and floors, and, filled as it was with combustible goods, could hardly have been saved in any case; but it appears that it was provided with iron shutters, which the firemen were unable to open, and the flames burst through the roof, and a hundred feet into the air, before any water could be thrown upon them.

A COURAGEOUS reporter of the New York *Times* made an interesting study, a few nights ago, of the effect upon a high office-building of a fire outside it. On Nassau and Ann Streets is a structure known as Nassau Chambers, and about a hundred and fifty feet away stands the Vanderbilt Building, fifteen stories high, of the construction regarded ten years ago as fireproof. The Nassau Chambers building, which was an old affair, took fire, and was quickly burned out, and, naturally enough, the fire-engineers watched with some solicitude the effect of its destruction on its lofty neighbor. The window-frames and sashes of the Vanderbilt Building are of wood, and in about twenty minutes after the fire burst through the roof of the Nassau Chambers they began to smoke, and soon to burn. A few minutes later the glass gave way, and the flames burst into the offices in the ninth, tenth and eleventh stories of the Vanderbilt Building. Meanwhile, the firemen had been at work to protect the latter as well as they could. With some difficulty they obtained entrance, and asked for the elevators to carry hose to the upper stories; but the fires had been banked for the night, and, as it would be some time before steam could be got up, they walked up the staircase, carrying the hose with them. By the help of three reporters, they succeeded in getting up to the ninth story, where they found the offices nearest the Nassau Building filled with flames, and the furniture and woodwork burning. A few minutes afterwards the glass panels of the doors separating these offices from the hall gave way, and the fire burst through, filling the hall and stairway with suffocating smoke. Additional hose having been brought, water was thrown into the burning offices on the ninth and tenth stories, but the pressure was insufficient to reach the eleventh story until a message had been sent to the engineer for greater effort. After the water had become available, it was a comparatively easy matter to saturate the burning desks and papers in the offices, and in a few minutes the fire in the building was out. So far as the structure of the building was concerned, the reporter could not find that any injury was done. The walls did not crack or bulge, the floors remained tight, so tight, in fact, that the water thrown on them did not run through; and, except for the smoke, a tenant of one of the offices, if he could have made his escape into the hallway, would have been safe from harm. Of course, the test was not so severe as it would have been if the original fire had been nearer; and the office-buildings of the present day expose much less woodwork to outside fires than was the case here; but, on the whole, the result may be considered encouraging; and, with iron window-frames, and iron sashes, subdivided, as we think they will be in the fireproof buildings of the next decade, into very small lights, filled with thick glass, it is probable that the building and its contents would have escaped injury altogether.

THE hearing before the Pennsylvania court on the petition of the Attorney-General for an injunction to restrain the Capitol Commission from carrying-out the proposed scheme for building a structure with wooden stairs and wooden roof has brought out some singular evidence. One of the points urged by the Attorney-General was that after the formal bids had been received, and found to be far above the limit of cost fixed by law, some of the bidders were requested to propose modifications of the plans and specifications, which they did, accompanying them with new bids in conformity with them: this was excluded by the court, on the ground that it was not shown that the Commission intended to award the contract upon any of these modified bids. The testimony of various experts, including Professor Laird and Messrs. Boyden, Rankin, Boyd and Reeves, of Philadelphia, and Mr. Le Brun, of New York, to show that the building contemplated by the plans and specifications was very far from a fireproof structure, such as is called for by the statute under which the Commission acts, was, however, received. In rebuttal of this testimony, the architect to the Commission, Mr. Henry Ives Cobb, of Chicago, explained that much of the work was intentionally temporary, as it would have to be removed when the additional portions of the building, for the accommodation of the various departments, were added, and said that he intended to put fireproof paint on the woodwork; and Mr. Rorke, of Philadelphia, who is described as "a builder and politician," boldly averred that he "was a great believer in wood," that "oak posts were not so combustible as iron," and that the plans provided for a building "as nearly fireproof as possible."

A CORRESPONDENT of the Boston *Herald*, who appears to be either an architect or a builder, observes that the present building-laws in force in the city encourage alteration of existing buildings, rather than the erection of new ones, and he mentions some instances within his own experience, to show how defective many of the older buildings in the city are, and how much danger they present in case of alterations, or change in the circumstances surrounding them. In one case, where it was proposed to alter an old building, he found that one of its brick walls, nearly seventy feet high, was eight inches thick, and rested upon a foundation of dry rubble, which had evidently been built originally in a trench, but, by excavating on each side to deepen the cellar, had been exposed on both sides; so that hardly more than a touch would have been required to bring down the whole structure. In another case, an alteration involved the cutting away of a brick pier, which was to support a girder, leaving only a small portion of the brickwork. The girder was placed on this frail support, and made to carry a wall sixty feet high. Soon after the weight was brought upon the pier it split from top to bottom,

and bulged out in the middle about three-quarters of an inch; yet no change was made in the construction, and it still remains, awaiting, apparently, the slight concussion which will bring it to the ground. The worst instance, however, which he mentions is that of a building in constant public use, in which the main girders supporting the floor, instead of bearing upon the wall, do not even reach it, one of them, which has, apparently, shown signs of falling, being wedged up by a piece of brick forced in between it and the wall.

IN regard to the use of granite, also, the most perilous conditions exist, even in comparatively new buildings. Before the days of rolled-beams the Boston builders were accustomed to span the wide openings in the lower story of their mercantile buildings with granite lintels, often ten or twelve feet long. In buildings more than twenty feet wide, a longitudinal girder, supported by wooden or cast-iron posts, usually ran through each story. In the first story, this girder very commonly reached the front wall at a point over a window-opening; and, as stirrup irons were hardly known, and there was no easy way of cutting a mortise in the back of the granite lintel to receive the end of the girder, while to lower the lintel to allow the girder to run over it would cut off a good deal of light at the top of the room, it was very common to drill two holes in the back of the lintel, near the lower edge, and insert "dogs," in such a position that the end of the girder would bear upon them. Every architect could add to this list from his own note-book many other examples of the reckless construction of old buildings in Boston; and public opinion will, we hope, be brought to sanction a stricter interpretation, on the part of the Inspectors of Buildings, of the laws relating to alterations. In fact, we believe that a few more fires will teach the Bostonians the imperative necessity for extending the building laws to an enforced remodelling, within reasonable limits, of the scores of old structures which threaten the lives of their occupants, and it might not be amiss for those who are familiar with them, such as architects, inspectors and insurance officials, to join in a presentation of their condition, which would, we venture to say, produce a sensible effect upon the Legislature and the public.

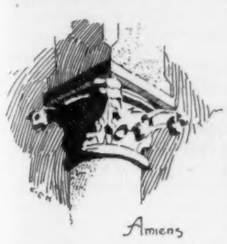
WE regret sincerely to learn of the death of Mr. James Fréret, of New Orleans, one of the most distinguished architects of the South. Mr. Fréret was born in that city in 1838, and educated at the Jesuit College, going thence to the School of Fine-Arts in Paris, where he was a fellow-student with the late H. H. Richardson, himself, as will be remembered, a native of Louisiana. At the outbreak of the Civil War Mr. Fréret returned to New Orleans, and joined the Confederate Army. He was severely wounded at the siege of Fort Hudson, and was taken prisoner, and, though afterwards exchanged, was permanently disabled. At the close of the war he entered upon the practice of his profession, and designed many of the most important buildings in New Orleans, including several churches. He was highly respected throughout his State, and was at one time a prominent candidate for the position of Supervising Architect of the United States Treasury Department. As our readers know, he occasionally contributed to these columns, and his observations were always interesting and valuable.

AN "accident" took place a few weeks ago in Canada, where the floor of the assembly-hall in the City-hall at London, Ontario, fell, when the room was crowded with people, and twenty-three persons were killed, and more than seventy others seriously injured. A coroner's jury investigated the affair, and ascertained that the catastrophe was "purely accidental," and that "more than ordinary care was used in the construction and selection of the beam"; this "beam" being a girder, on which rested the portion of the floor that fell. *Fire and Water* gives the dimensions of this beam, from which our readers can judge whether the accident was so miraculous and unaccountable as the jury thought it. The portion of the floor that broke down was twenty-two feet wide, and twenty-eight feet long, having thus an area of six hundred and sixteen square feet. This was supported by a girder composed of four three-by-twelve beams, nailed together with cut nails, and cased over with seven-eighths-inch sheathing. *Fire and Water* regards this as equivalent to a solid beam, twelve by fourteen inches in section; but the sheathing would, of course, add little or nothing to the strength, and the beam must be considered as practically a twelve-by-twelve-inch timber of rather inferior character. The clear span was a little over twenty-one feet. Presumably, the beam should be regarded as carrying the weight on half the supported area of floor, as a distributed load. Taking the usual maximum allowable fibre stress for white pine, which was the material of the girder, at seven hundred and fifty pounds, it is easy to calculate the safe load upon it, which would be about sixty-eight hundred pounds. It was found, however, that the beams constituting the girder were knotty, so as to reduce the strength of the combination, according to one witness, by one-third. Supposing this estimate to have been correct, the maximum uniformly distributed load that the girder could safely carry would be about forty-six hundred pounds. The girder itself, at twenty-eight pounds per cubic foot, would weigh more than six hundred pounds; the half-floor that it carried, including beams, flooring and plastering, would weigh about forty-nine hundred pounds more, leaving less than nothing as the maximum extraneous load that the girder could safely bear. Obviously, therefore, the girder was dangerously strained with its own weight, and that of the floor which it carried, with no extraneous load whatever; and, notwithstanding the "more than ordinary care" used in designing and constructing the floor, our readers will, we think, not regard the accident as entirely unaccountable.

MR. JAMES McNEILL WHISTLER, who understands as well as a popular actor the advantages of keeping himself before the public, has, of late, been engaged in a lawsuit in France. It seems that a personal friend of his, Sir William Eden, commissioned him to paint a portrait of his wife. It was agreed that the price of the work should be "one hundred or one hundred and fifty guineas." Just as the finishing touches were being put to the picture, Sir William was called away to India, and, on making a farewell call on Whistler, left with him an envelope, telling him that it was a valentine, and asking him not to open it until later. When he had gone, Whistler opened the letter, and found in it a check for one hundred guineas, the minimum price stipulated for the portrait. According to Whistler's counsel, the artist felt aggrieved that Eden should have "arrogated to himself the right" of deciding whether to pay a hundred or a hundred and fifty guineas, and feeling that he had "been tricked," decided to try a little trickery himself, by accepting the hundred guineas as a "valentine" simply, and claiming that the portrait was still unpaid for. The unprejudiced reader will, we think, concede that the artist showed a much higher capacity for "trickery" than his patron, and the latter evidently came to the same conclusion when delivery of the portrait was refused, and when, after the demand was repeated more urgently, Whistler painted out the face in the picture. The portrait was shown at the *Salon* of 1894, and Sir William claimed damages, in the sum of ten thousand francs, presumably for the scandal accompanying the matter, and claimed also that Whistler, as having broken the contract, should not only deliver the picture but return the hundred guineas. After more than two years of litigation, the French Court of Appeals has now given a decision of the kind characteristic of French tribunals, ordering Whistler to pay back Eden's hundred guineas, with a thousand francs as damages, and a thousand francs more as costs; but allowing him to keep the picture. It is fair to Whistler to say that when Sir William first demanded the picture, although he refused to give it up, he offered to pay back the hundred guineas, and the matter seems to have been mainly one of "trickery" and bad temper on both sides.

THE famous Heine fountain, which was rejected by the New York Park Commissioners a year or two ago, and has been homeless ever since, will perhaps find refuge in the new "Borough of Bronx," which includes the suburban part of West Chester County; and if the Art Commission will consent to its acceptance for that locality, a site will be found for it. Whether the Art Commission will prove more compliant than the old Park Board remains to be seen; but it may be suggested, in behalf of a slight relaxation of its accustomed strictness in this particular case, that the present aspect of the Borough of Bronx, as seen from the windows of railway-trains, is about as unattractive as could well be conceived; and that the lonely "Lorelei," even though her limbs may be disproportioned, and her attitude ungainly, would be fairer to look upon than the mass of wooden tenements and crazy beer-shops to which the territory now seems exclusively devoted.

FIRE-AND-WATER RESISTANCE.[1]



THE great Chicago and Boston fires gave a great impetus to fireproofing, and many patents were taken out and various concerns for manufacture started. Nearly every material that would not ignite with a match was labelled "fireproof" and pushed in the market with the usual "recommends," advocated as better than everything else — from wood dipped in some magic fluid up to fire-brick. In some cases one might as well have used mud and glue as some of the stuff furnished; in fact, whitewash or common brick would have been better for the purpose.

Some of the steps of real progress were the use of iron beams with brick, terra-cotta, or corrugated-iron and cement arches; but the protecting of the lower flange of the beams was generally neglected.

Another step was the restriction of the use of granite and the substituting of other stones, or brick. But the most substantial and all-around progress was made in the field of mill-construction, of which Mr. Edward Atkinson has been the most advanced and prominent exponent.

The use of unprotected iron columns and fronts reduced the amount of inflammable materials, but added little to the fire-resistance of buildings; in fact, large wooden columns are generally better. No attention was paid to the fact that iron, either cast or wrought, commences to yield rapidly after the temperature reaches 800 to 1,000 degrees, nor to the fact that iron is peculiarly susceptible to warping and twisting upon the application of heat, or of heat and water, and that, therefore, the unprotected lower flange of floor-beams is a source of danger.

In other words, we often see certain parts of a building very well treated, but others of equal importance entirely neglected or the severe conditions to which they will be exposed very inadequately provided for. It is this ragged or piecemeal treatment that is responsible for many of the accidents and total losses. And I wish to urge the importance of considering the external and internal hazards in combination with the plan and the financial and mechanical means available to resist them to the best advantage. That is to say, make your building consistently retardent; instead of fireproof in one place and so inflammable in another that even the fireproof part is tested beyond its capacity to resist.

This view of the subject admits of a practical science of fire-and-water resistance and a removing of the crude and misleading idea expressed by the words "absolutely fireproof." Nearly every known material can be disintegrated by heat; but certain of them, if well chosen and put in the proper shape, are so highly resistant that all ordinary fires can by their use be confined to the room in which they started and the subsequent repairs confined to replacing plastering, woodwork and painting.

This is possible in a vast number of cases, but there are certain fires in which the contents of and conditions in the building are such that it is beyond the nature of things to resist them. But even these can be more or less mitigated. There are many buildings in existence and being constructed which can but act as great heating or melting furnaces.

In a large office the furniture and tiers of wooden letter-files may ignite and the fire be drawn into the elevator and stair shafts, 200 or 300 feet high, acting like a great chimney or blow-pipe, and producing a heat so great and so sudden that the elevators and stairs would be rendered instantly useless and ultimately and hopelessly injured.

I cannot agree with Mr. Purdy that temperature is an unimportant element. A large fire is not necessarily a hot fire and may not reach the melting, or even the calcining, point of many materials. Certain contents in a building and conditions of draught may make even a moderate-sized fire very intense, sufficiently so to test severely the most highly resisting materials.

It can be proved that each and every material has its own point of disintegration, by the temperature of the fire, or by the impact of heat and of water; that they vary greatly in degree one from another, and in practice may vary greatly in themselves; also that to get the best combination of resisting qualities shape and size are very important factors.

A curious fact in the promoting and accepting of fireproofing work has been the frequent use of a weight or strength test as the sole basis of fireproofing, whereas the most uncertain factor is the degree of fire and water that any given material or construction will withstand. These two elements furnish about the most severe test any material can be put to. The legal floor-load for an office-building in New York is one hundred and fifty pounds per square foot, equal to about one pound per square inch, yet iron, brick, terra-cotta, concrete, cement and many compositions will withstand very many times this amount. Therefore there can be ample margins in matters of strength, while in fire-resisting qualities the margin can never be so great, nor the available materials so varied; and when we add the necessity of resisting the fire-stream there is a still further limitation.

One laughable feature in this testing of fireproofing by putting weight on the floors was the way in which it was sometimes done. Many were deceived or self-deceived. A pile of brick was laid up neatly and well bonded, so that as the floor deflected an arch formed in the pile of brick, thus reducing the weight on the centre of the floor and throwing it towards the sides or ends. Nevertheless, everbody seemed satisfied that it proved the floor had stood a uniform distributed load, magnificent in amount, and that the floor was eminently fireproof. Fire-test chambers consisted ordinarily of a chimney at one end and an opening at the other, which enabled a current of air to draw in between the fire and the ceiling, this air preventing the full impact of heat against the ceiling; and it also may have caused the highest temperature to develop only in the chimney.

Among the architects, builders, manufacturers and scientific colleges there has been but little or no thorough investigation.

Most of the records of tests are very incomplete, rarely comparative, and leave out entirely the application of the fire-stream. This latter is manifestly a condition that must attend fires, and is of the greatest importance to the owner and occupant, because its cooling action and impact is very violent, very destructive in cracking material and tearing it away and warping ironwork. . . .

The demand for information finally led me to establish a department to my business and a laboratory which has frequently been consulted and made use of by manufacturers, architects, owners, etc. Over two hundred laboratory tests have been made of the relative fire-and-water resistance of materials, showing that there were differences of over fifty per cent between various materials and wide differences in the quality of almost any individual material on the market. Tests were also made showing that the shape or form of construction made a very great difference in the behavior of a substance subjected to both fire and water. A room, or kiln, and system for testing full-size floors and partitions was designed and put into operation over two years ago, having in view the securing of a proper distribution of heat over the ceiling, the application of a real fire-stream, the loading for working and factor-of-safety loads, the controlling and measurement of the range of temperature, deflections, time-limit, etc. This system was adopted by the Building Department of New York, and other parties, and may be called the modern method for testing on a large scale. An apparatus was also designed for testing sections of floors and partitions, and so planned that it might be taken to buildings in case investigations were required. Finally a system of office and shop testing is being evolved which will enable architects and manufacturers to ascertain the quality of materials being furnished; thus affording them a degree of certainty in this direction more commensurable with that attainable in other branches of structural work. One manufacturer has just informed me that he has developed his factory upon the lines of some of my tests which showed him that his second-grade material had sufficient strength for the purposes for which it was to be used, and was superior in fire-and-water resistance to what he considered his best and most expensive product. . . .

It seems to me that the time has come for the architects to study much more carefully the views and opinions of such men as Mr. Atkinson and the chiefs of fire-departments and insurance companies, and to recognize that it is only by some method of careful testing and study that substantial results can be assured.

The laboratory and full-sized tests which I have had some part in inaugurating and developing find some analogy in the history of steel and its successful and economic application to bridges and buildings. The extensive series of tests advocated by the Superintendent of Buildings of New York, and conducted by Mr. Henning and afterwards by Mr. Ewing, are most instructive. The light thrown upon floor-beam protection alone is worth the cost — showing how faulty was the practice in vogue, yet how easy the cure.

They have brought about a renewed interest in the subject and have brought to the front those who have been studying fires, fire-prevention and fire-resistance in a systematic manner and are developing a more scientific and thorough method of investigation and improvement.

We must agree with Mr. Atkinson, that "fireproof" is a misnomer, that "fire-retarding" and "fire-retardents" are the proper forms of expression, and I think that "fire-prevention and fire-and-water resistance" is a comprehensive and accurate title for the entire subject.

The crude art of fireproofing is to become the practical science of "relative fire-and-water resistance." Although the name of "fireproof" may cling to it, it will be recognized that the destructive effect of the fire-stream is nearly as important an element as the fire-resistance or the load-strength, and of great interest to the owner, occupant and insurance companies.

Investigation, analysis and testing has come to stay and win just as it has in other fields of practical science, to the discomfiture of those who deny the science of measurement and comparison and insist that only their "thirty years' experience is worth anything."

As regards insurance, it is, of course, the great means of distributing the loss of the individual. But insurance men are not necessarily interested in or bound to promote and compel the introduction of fireproofing, provided they can underwrite the risk satisfactorily to themselves and secure their rate and commissions. Were buildings and their contents absolutely fireproof, the subject of fire-insurance would have about as much interest as pig-iron under water, or

[1] Extracts from a paper read before the Boston Society of Architects Jan. 7, 1898, by Mr. Howard Constable, Architect and Civil Engineer.

were all fires total losses it would be difficult to make insurance companies profitable.

A well-known insurance man writes: "There are prominent men occupied in the conduct of fire-insurance companies who put every obstruction in the way of modifying rates, preferring to go on the old method of betting on the risks as they happen to be, taking high rates, heavy commissions and running for luck on conflagration."

Another writes that "he started as a civil engineer but has now been in insurance seventeen years and has often remarked that many companies did not recognize the great difference that must exist in various forms of construction and methods of fireproofing, but rated them all alike."

When it developes that a certain risk is too great, then a company runs up its rates or insists on improving the preventive or protective elements of the building. Many excellent improvements have been brought about and developed in this way. The underwriters' door and shutter are far better than many of those advocated by manufacturers. But it is not a general custom for insurance companies to show owners how to produce a building that scarcely needs any insurance. An exception, however, is the Manufacturers' Mutual of Boston, Mr. Atkinson, president. It has shown the manufacturers of New England the kind of building necessary in the economic problem of competing with the mills of England and elsewhere. The insurance interest is a great factor in the making and enforcing of laws and means of protection where they deem it necessary and its influence and experience should be appreciated and understood.

I believe many insurance companies do not investigate and compile their data on fires and fire-resisting construction as carefully as life-insurance companies compile their data, and that they would find advantage in more scientific methods. I think they will have to come to a more accurate comparison, grading and rating of the floor and other fire-resisting elements of buildings. However, we should not expect the highest and most complete result to come from the insurance companies. It must come from the owner, architect and engineer, who should bear in mind that fireproofing is not of the essence of insurance, also that insurance companies, in self-protection, must stand on technicalities in adjusting a loss. Therefore it is of great importance for the owner to know that his building is constructed strictly according to plans and specification and all legal requirments, and that the conditions for fire-and-water resistance should be laid down by an expert, if the architect is not already an adept.

In conclusion, as architects we must remember, that as we find owners ready to have the fireproofing of their buildings brought up to a par with what we are able to accomplish with certainty in foundation, ironwork, plumbing and the like, then we must study the subject in a more rational manner than heretofore and prescribe details and furnish specifications and supervision of a higher quality.

We must be familiar with the means of prevention,— automatic-sprinklers, smothering by steam, water-supply, water-curtains, fire-alarms, etc.; the isolation of extra-hazardous contents and processes, isolation of stairways, etc.; the closing and restricting of openings, automatically or otherwise; the difference between the sudden impact of heat and the gradual spread of fire; the behavior of various materials under these conditions and under the application of water; the violent action of the fire-stream, which is an unavoidable attendand on most fires; the menace of light-wells and shafts that may act as draught-producers; concealed air-spaces that may act as fire-distributors or heat-regenerators; the external and internal hazard of the building; the systems of construction best fitted to counteract them; the proper shape and size for the various details, so that the given material shall have a fair show to resist the violent expansion, contraction, abrasion and oxidation to which it may be subjected; the reducing and protecting outside openings as much as possible; the eliminating of dangerous lines of communication inside the building; the providing exits for smoke, so that the firemen shall have a chance; the providing more than one line of exit for occupants; the enforcing of a proper inspection of materials and workmanship based upon full-sized and laboratory tests and comparable with standards already established and proved.

This summary is not exhaustive, nor are all these considerations necessary or practicable for every building; and I hope shortly to complete a more detailed and technical treatment and sub-division of the subject. But I trust the main object of this paper has been accomplished in some degree and that some owners and architects will be led to appreciate the great importance and possibilities of the matter and develop improvements. A great disaster in some theatre, hotel or great office-building is all that is necessary to prove again what room there is for improvement, and compel the revision of the laws by acknowledged experts who are also thoroughly familiar with the science of building and the requirments of architecture.

We can accept it as pretty well established, that much of the practice of the past was pretty crude; that the protection of beams falls just short of what it should be; that the average fireproof floor and partition is most uncertain in its strength and in fire-and-water resisting qualities; also that no one material and system is the best possible for any and every purpose; that we have not yet seen the best that can be done with terra-cotta, concrete and new compositions; that testing and inspection is the guiding factor in successful progress and economy; that mineral and metallic products are steadily decreasing in price because of the introduction of new processes; that wood is increasing in price because of the exhaustion of our forests. Thus there is a wide field, and no excuse for not making most substantial progress in the resistance of fire and in the meeting of the demand for less dangerous city buildings and less inflammable country homes.

MEXICO TO-DAY.

I HAVE recently read the following rather divergent views on the archæology of Mexico: "The archæology of Mexico and Central America, exhibiting, as it does, little more than an active, and possibly, luxurious, barbarism, is very far from presenting the interest of the early history of the Aryan races."— *Anon.* "Zurita is indignant at the epithet of barbarians bestowed on the Aztecs; an 'epithet,' he says, 'which could come from no one who had personal knowledge of the capacity of the people, or their institutions, and which in some respects is quite as well merited by the European nations.' In respect to the nature of it (their civilization), they may be better compared with the Egyptian; and the examinations of their social relations and culture may suggest still stronger points of resemblance to that ancient people."— *Prescott.*

The first of the above quotations undoubtedly expresses the proper relation of the general archæological student towards Mexican antiquities, and the remainder that of the special students who are surcharged with the glamor and poetry of their subject. But whether the first or the second quotation be accepted as setting forth the proper standpoint from which to view archæological Mexico, certain it is that there is another class of people, now much in evidence in the United States and Mexico of to-day, whose business and family relations, and residence in the heart of the past Aztec civilization, not only surrounds them with the glamor and poetry of that remarkable people, but also leads their active minds to a most interested study of them and their customs, as leading to a better understanding of a living people, 52½ per cent of whose foreign commerce is with the United States, and who are merging so rapidly their language and customs with those of the composite race of the United States that Mr. Bryan — who is at least a keen observer, whatever vagaries he may have — is led to observe that at the end of twenty-five years the language of Mexico will be largely English.

To the architectural student this land should be extremely interesting; not only on account of its Toltec and Aztec remains, but also as affording abundant examples of Spanish architecture of the sixteenth century, together with the almost identical methods of building used at that time; and while many methods pursued here may seem clumsy, slow and inexact, there is much to be admired in their thoroughness. Ancient walls torn down to-day fall in great masses, cemented together with lime-mortar filling every crevice and joint. No walls in the United States will exhibit similar strength whatever their age. The "Gringo" architect or mechanic may smile at the "pensive peon" as he watches him placing little spawls here and there in his wall, carefully bedding in mortar and as carefully covering them with same; but these are the walls that have stood for more than three centuries on treacherous foundations and amidst the shocks of many earthquakes, and that now, when torn down or cut through, are like the solid rock. It is true that great age and a certain hydraulicity of the lime have much to do with this strength, still it must be admitted that, with even these advantages, an American mason, with his hurry and carelessness, would never achieve like results with the same materials.

Nowhere else on this continent can be seen, to such an extent, the partial blending of two alien races without the practical extinction of the weaker; and this blending bids fair to proceed at a more rapid rate, now that there is such an influx of other foreign elements. It is true that this blending is denied by some prominent Mexican writers; but even a superficial comparison of the physiognomies of the every-day Mexicans shows the strong admixture of Indian blood; and the scarcity of the Castillian type among native Mexicans is quite noteworthy. That this mixture of Indian blood, which flows in the veins of those who sometimes pretend the most to despise it, has not been an unmitigated curse may be shown, for example, in the persons of Mexico's two most celebrated patriots, viz., Juárez and Diaz; and many other similar forceful characters might be cited. It is true that the farm peon of to-day is but little above his fellow of the time of Cortés in intelligence and other capacities for a progressive and enjoyable life; but the influx of foreign ideas, the railways, the factories, and, above all, the schools, that are being so rapidly pushed forward by the progressive rulers of the Republic, bid fair to soon make even the "pensive peon" a surprise to himself. Primary, preparatory, normal, agricultural, art, musical, military and professional schools are being equipped with modern appliances and arranged with modern courses; and while, from the nature and origin of the people, everything is not done in as thorough a manner as among the most advanced nations, still it all tends to bring this people, but yesterday sleeping in mediævalism, into touch with the spirit of the age.

That until recently the Mexicans were still living in the manner of the "conquistadores" is shown by their language. Spanish, to the student of French, English and German, seems the most orderly and beautiful language that he has encountered; and so I believe it to be; but the Spanish of Mexico, while it has all the regularity of modern Castillian, uses approximately ten per cent of the words of the time of the Conquest, words marked "obsolete" in modern dictionaries, together with quite a mixture of Aztec and other Indian words not found in any Spanish-English dictionary.

The condition of Mexican architecture is analogous to that of the language, owing to the fact that the natives have had but limited intercourse with foreigners, except through the medium of books, and have had constantly before their eyes the work of the conquerors, and, being a very conservative people, modern ideas conveyed by books have made very slow progress. Their text-books are largely French, so that whatever there is new in their work has a strong French feeling.

Mexico is, however, in many respects a cosmopolitan city, when one considers the variety of nationalities represented by its inhabitants; its pavements of many varieties, cobble-stones and vitrified bricks, block-stones, asphalt in sheets, and laid over stone pavements, etc.; its city and suburban car-lines extending in every direction; its electric-light plants, — the one now in use, which would be quite creditable to most cities in the States, is being replaced by one still better under a contract with the celebrated Siemens-Holske firm of Germany; its shops full of imported goods from all parts of Europe and the United States; its fine equipages, rivalling those of any city on this continent; its beautiful, though small, Alameda; its Plaza d'Armas with the picturesque cathedral; its streets thronged with well-dressed gentlemen and ladies, their clothing being such as one would expect to see in any European or American city; its beautiful "Paseo" or avenue leading from the statue of Charles IV to the castle of Chapultepec, a distance of two miles, and lined with fine trees and statues, — these and many similar attractions give the city quite a metropolitan air in its central portion.

A more intimate acquaintance with the town, however, reveals the fact that its 325,000 inhabitants may be divided into two classes, the first made up of about 50,000 of the rich and fairly well-to-do that go to make up the usual population of a modern city, and the second of 275,000 abjectly poor people, who can contribute in only a slight degree to the prosperity of the city as a whole. Therefore, in the extent of its improvements, public and private, going on at one time, it should be considered, when making comparisons, as a city of 75,000 to 100,000 people. This is especially the case, when we come to consider it architecturally in the past and present.

The architects, about twelve in number, plainly show, in their recent designs especially, their training from French sources; many of their designs with the French feeling grafted onto Mexican requirements and traditions of form are very pleasing.

The tendency to over-ornamentation seems to be the greatest fault; but much of this ornament is beautiful and delicate in design and quite artistically carved by native artists.

Some attempts have been made to build in the so-called "American style" — this, too, in the beautiful Paseo — and to say that these excrescences are a blot on the landscape of this fair valley would express it with extreme mildness. We all remember the "Yankee Rennaisance," carpenter-designed, mansard-roof abominations of thirty or forty years ago in the United States. These abominations are here repeated with added ugliness, and to the cultivated Mexican offer very little inducement to employ American talent. It does sometimes occur that a Mexican with more money than good taste asks his architect to design in the "American style"; and I half suspect that these malformations are the result of his architect's communings with some cheap "every-man-his-own-architect" journal of bygone days. With few exceptions, the architects have no business offices, but do their work at their residences. They are nearly all engineers and so call themselves.

One of our very popular American novelists has given a beautiful description of a gorgeous rock-cut apartment located under the bed of Lake Tezcoco, at the time of the last Montezuma, near the Plaza Mayor of this interesting city. The enclosed section of an artesian well put down but a few hundred feet from the temple of Quetzalcoatl, under which these apartments are located, shows no rock for a depth of 500 feet; and the formations shown by this section underlie the whole city, and, practically, the whole valley of Mexico. This not only shows to what length the poetic license of a novelist will lead him, but also brings us to the subject of foundations for buildings in this city — a subject which should be of considerable interest to foreign architects and especially to those who have entered the competition for the new Legislative Palace.

The greater part of the area now covered by the present City of Mexico, as is well known, was in former times covered by either lakes or marshes which have in great part either dried up or have been filled by the *débris* of centuries of occupation and destruction. The present water-line is now only two or three feet below the surface in most portions of the city, although when the new drainage and sewerage works are completed the bottom of sewers at the site of the proposed Legislative Palace will be about nine feet below the street grade. The surface soil of the valley to a depth varying from 0 to 15 feet is a clayey loam; below this loam in many places is found a layer of "tepetate." This tepetate is a soft stone-like substance, which seems to be formed of fragments of limestone or scoriæ cemented together with other limey matter, and when exposed to the air it becomes sufficiently hard to be used in the walls of even four-story buildings, the quoins and jambs of openings and frequent bond piers being built of brick. This layer of tepetate is often lacking, and below its level are a series of strata that are saturated with water to a depth of 100 feet or more, forming, indeed, a lake of mud. Piles in three lengths of 30 feet each — 90 feet in all — have been driven into this mud, the last blow of a 2,000-pound hammer driving the pile 6 or 8 inches, as it did at a depth of 30 feet. These piles were driven about 2,000 feet distant from the site of the Legislative Palace. Excavations made for some buildings at a distance of about 500 feet from proposed site show tepettae at a depth of 3 feet below surface. Engineers at the office of the Department of Public Works inform me that no borings or pits have been sunk on the site, and they express the opinion that the soil there is good for foundations compared with that in many localities in the city, and that it will safely bear a pressure of .75 kilogrammes per square centimetre, and that much of the soil elsewhere will bear only "1 pound per square centimetre." Seventy-five hundredths kilogrammes per square centimetre equals 1,450 pounds per square

Fountain on the Aqueduct from Chapultepec, Mexico.

foot, and 1 pound per square centimetre equals 910 pounds per square foot. These seem to be very moderate allowable pressures, and in a monumental building would seem to require an extended use of the steel-beam-concrete method of foundations. Some approximate estimates, made by the writer, of pressures on foundations near the proposed site show 1,500 pounds per square foot without undue settlement.

The architects from the time of Cortés until a very recent date seem to have paid little attention to the matter of a uniform pressure on their foundations, and it is therefore difficult to find among the many churches and towers any that are plumb. They seemed rather to rely on immensely broad foundations and thick walls, as is sometimes the case in more modern structures. The house in which this is written, being the old Franciscan monastery in which for a time lay the bones of Cortés, has at a height of 40 feet above ground walls 4 feet 6 inches thick, and these are light compared with walls in many churches. It will be interesting to note how competing architects comply with that part of the programme that calls for a plan of the foundat ons with the pressures distributed at all points, and I am promised the results, at least in the case of the premiated designs, — their authors being willing.

The sewers at the present time are merely leaching brick cesspools, with but slight, if any, fall, and when uncovered generally show standing water. The subsoil of the city is therefore one immense cesspool saturated with the filth of centuries, and this accounts partially for the fact that, during two months observed by the writer, the mortality was 45 and 48 per thousand per annum respectively, while during the same months in Chicago the rate was 12 and 11 per thousand. This city has in all probability as healthful a climate as any spot on the globe; conceding this, one may foresee what an immense saving of life and energy will be accomplished when the new drainage system has been in operation a sufficient length of time to dispose of the accumulated and accumulating filth. Of course, it will be many years before the effect is fully felt, and, perhaps, many more before the habits of personal cleanliness and sanitation will be the common practice of the lower classes, which is, of course, a very large factor in the mortality rate.

THE PROPER MANIPULATION OF TESTS OF CEMENT.

Boston, Mass., January 15, 1898.

THE Committee on the Proper Manipulation of Tests of Cement earnestly requests that you will give full and careful consideration to the following questions, and that you will, as soon as convenient, send to the Chairman complete and explicit replies, giving the result of your experience and the embodiment of your views. Any additional suggestions or information bearing upon the subject which you may desire to communicate will be thankfully received by the Committee.

This circular has been sent to every member of the American Society of Civil Engineers, and to many others, but in order that it may reach everybody whose opinion will be of value, you are requested to mention the names and addresses of any persons, not members of the Society, who, in your opinion, should receive it, and who will be likely to assist the Committee in its work.

You are also requested to send with your answer copies of any specifications for cement which you may have used, or any other information bearing upon the subject which you think would be of interest.

As the duties of the Committee will require considerable time and labor, you are earnestly requested to respond as promptly as is consistent with a careful consideration of the questions asked.

Yours very truly,

Committee: George F. Swain, *Chairman;* O. M. Carter, W. B. W. Howe, Alfred Noble, L. C. Sabin, Geo. S. Webster, Herbert W. York.

Address: Prof. Geo. F. Swain,
Mass. Institute of Technology,
Boston, Mass.

SAMPLING.

1. In the works which you have carried out, how much cement have you been willing to accept on the results obtained with a single sample?
If this depends upon the kind of work or reputation of cement, please indicate.
2. What method do you recommend for obtaining a sample from a package?
3. Do you mix cement taken from several packages to obtain a sample to use in testing, or are the samples from the several packages kept distinct?

CHEMICAL ANALYSIS.

4. When do you consider a chemical analysis essential or desirable?
5. What elements or compounds should be determined?
6. What do you consider the best methods of determining these compounds with sufficient accuracy?

MICROSCOPICAL TESTS.

7. Are microscopical tests of value, and, if so, when?
8. What power microscope is required, what observations should be made, and what are the indications?

FINENESS.

9. What sizes of mesh should be used in testing fineness of Portland cement? What for natural cement?
(If these questions are answered by stating the number of meshes per linear inch, please mention, also, the size of wire without reference to any wire gauge.)
10. What should be the diameters or sizes of the screens?
11. How large a sample should be tested?
12. Should any machine for shaking be used, and if so, what form, and what should be its manipulation?
13. How long should the shaking be continued?
14. Should there be any difference in manipulation for fine and coarse screens, or for different kinds of cement?

APPARENT DENSITY OR WEIGHT PER CUBIC FOOT.

15. What is your opinion of the value of this test?
16. What apparatus do you prefer, and how should it be used? (Please state any special precautions to be observed.)

TRUE DENSITY OR SPECIFIC GRAVITY.

17. What is your opinion of the value of this test?
18. What apparatus do you prefer, and what is the method of manipulation? (Please state any special precautions to be observed.)

STANDARD SAND.

19. What kind of sand should be used in tests of mortars? Would you recommend a natural sand or crushed quartz?
20. What fineness should be specified, and what degree of variation in size of grain should be allowed?

PREPARATION OF PASTES AND MORTARS FOR TESTS OF TIME OF SETTING, SOUNDNESS AND STRENGTH.

21. Should the same method of preparation be used for each test?
22. How should proportions be stated?
23. What should be the consistency of the pastes and mortars for the various tests, and how may this consistency be specified and determined in order that similar results may be obtained by all operators? (This question is intended to embrace not only the correspondent's views as to what consistency should be used, but also as to devices for determining when the proper consistency has been obtained. It is hoped that this question will receive full and careful consideration.)
24. What should be the temperature of the materials used in mixing?
25. What should be the temperature of the air at mixing?
26. How should the quantity of water used in mixing be defined?
27. What should be the method of mixing?
28. Do you prefer hand or machine mixing? If the former, please describe manipulation in detail.
29. If the latter, what machine do you prefer, or what form would you suggest for trial?
30. Do you know of any machine that has given good results? If so, what is the method of manipulation, and what are its advantages and defects?
31. How long should the mixing be continued? Should this be defined by stating the length of time, or by reference to the character of the resulting mortar?

TIME OF SETTING.

32. What do you consider the best method of determining the time of setting? (Please describe apparatus and manipulation.)
33. How shall the beginning of the set be defined?
34. How shall the end of the set be defined?
35. Should this test be made on neat cement paste, or on mortar, and if the latter, what proportions of cement and sand should be used?
36. What should be the consistency of the mortar? (See 23.)
37. What should be the temperature of materials and of air, quantity of water, and method of mixing? (See 24, 25, 26, 27.)
38. What should be the method of making the pats, or of filling the moulds, if they are used?
39. How shall the pats or briquettes be treated during setting?
40. What should be the temperature of the water in which pats are placed?

SOUNDNESS.

41. What do you consider the best test for soundness in the case of Portland cement? What in the case of natural cement? (Please describe in detail the process recommended, and indicate any necessary precautions to be observed. If the process you prefer is too elaborate for any but a well-equipped laboratory, please indicate, if possible, any modifications for ordinary use, and give your opinion of the reliability of such simpler tests.)

TENSILE STRENGTH.

42. What proportions of cement and sand should be used in mortar for tests of tensile strength?
43. Do you advocate adhering to the Am. Soc. C. E. form of briquette in future requirements? If not, what form do you prefer?
44. Is your preference based on comparative experiments, or is it the result of satisfactory experience with one form?
45. Upon what sort of a surface should the briquette be made?
46. Should the briquette be finished with a trowel on both sides?
47. What should be the consistency of the mortar? (See 23.)
48. What method of filling the moulds do you advise? Do you recommend the use of a machine for moulding, and if so, what form would you suggest?
49. Have you used the machine you suggest, and have the results been satisfactory?
50. How should the briquettes be treated during the first twenty-four hours after moulding?
51. How should they be treated during the remaining time until tested?
52. If placed in water, how often should the water be renewed, and is it important that it should be maintained at a nearly constant temperature? What should that temperature be?
53. At what age should briquettes be broken for acceptance tests on ordinary work?
54. Under what conditions would you deem it essential to make longer time-tests?
55. Will weighing briquettes before testing give information of value, and, if so, what?
56. What form of clip do you prefer?

57. What should be the distance between opposite gripping points of the same clip?
58. What should be the rate of applying the stress?
59. What style of testing-machine do you prefer?
60. Can you suggest any desirable modifications to machines now in use?
61. What special precautions are necessary in breaking briquettes?

COMPRESSIVE STRENGTH.

62. Do you advise compressive tests, and, if so, why?
63. What form and dimensions of test-piece do you prefer?
64. Should the test-piece be treated differently as regards manipulation of mortar, mixing or setting, from tensile specimens? If so, please state in what particulars, and why.
65. How should the specimen be prepared for the testing-machine?
66. What form of testing-machine do you recommend?
67. What should be the rate of applying the stress?

TRANSVERSE STRENGTH.

68. Do you advise bending-tests? If so, under what conditions and why?
69. What form and dimensions of test-piece do you prefer? What span?
70. Should the test-piece be treated differently as regards manipulation of mortar, mixing and setting, from tensile specimens? If so, please state in what particulars, and why.
71. What form of testing-machine should be used?
72. What should be the rate of applying the load?

MISCELLANEOUS.

Under what conditions do you consider the tests indicated below necessary or desirable? What should be the manipulation for the test if used?

I. Adhesion.
II. Abrasion.
III. Resistance to freezing.
IV. Resistance to action of sea-water.

MADAME BUSQUE.

THE interesting story about "Whistler and Old Sandy" that we published a few weeks ago has caught the editorial eye in various quarters, so that it has been more than once republished. One of the consequences is to be found in the following complementary anecdote which was published later in the New York *Tribune*:—

TO THE EDITOR OF THE TRIBUNE: —

Sir, — The article by Major Jenney in last Sunday's Illustrated Supplement to the *Tribune* aroused old memories. I sent a copy of the paper to my friend, Col. Daniel S. Lamson, of Weston, Mass., telling him he was about the only one left whom it would interest. In reply he sends me a copy of a letter he published in the Boston *Gazette* in 1894, on the same subject, and he tells me I may send it to you for publication. Charles B. Fairbanks, of whom he speaks, was a dear old mutual friend, who died in Paris in 1859. He had been assistant librarian in the Boston Athenæum, and had written a series of letters from abroad to the Boston *Saturday Evening Gazette*, afterwards published under the title of "*Aguecheek*," more in the style of Washington Irving than anything else I know. I edited a posthumous volume of his "*Memorials of the Blessed*." His friends placed a cross at his grave in the Montmartre Cemetery, with an appropriate inscription. We had been together in the seminary both in Paris and in Rome. He had received minor orders, and was an acolyte of the Holy Roman Church. Ill health, however, obliged him to discontinue his studies. Later he was in Paris as a correspondent of the Boston *Traveller*, I think, and died there in 1859, at the early age of thirty-three. I have never been in Paris since without visiting his grave, caring for it, and saying a prayer for the repose of his soul. Dear old Mme. Busque, who died either during or after the Siege, lies not far away. G. H. DOANE.

NEWARK, January 11, 1898.

COLONEL LAMSON'S RECOLLECTIONS.

To those of us of an earlier generation, who are treading the downward path of life, there is no greater pleasure left than the retrospect of "Auld Lang Syne." The Bohemianism of half a century ago is, I imagine, a lost art to-day, and the more is it to be regretted. Then were a life and energy, a makeshift and camaraderie, tenfold more tenacious and helpful than exists to-day among college graduates. Du Maurier's charming story of "Trilby" and the Latin Quarter studios, together with Howells's relations of his introduction to James T. Field, Dr. Holmes and James Russell Lowell in the July *Harper*, recall to mind days that have passed, when Boston's postal communication with Paris was not unlike a journey around the world. Fifty years ago, small but pressingly needed drafts from home made any delay in their receipt a matter of most vital import, involving the loss of breakfast, dinner and lodgings — the latter, in some cases, required a return to the example set by St. Paul, whose escape in a basket from no less ruthless enemies than the modern landlord made the use of a rope a friendly means of escape from harassing rent-day.

It was upon a cold and dismal morning in the early winter, when two young American students walked down the Rue de la Michaudiere with rueful countenances. Their combined earthly wealth consisted of only forty cents; the long-overdue, though small, drafts from home of a few hundred francs had not come to hand, and the delay was of most serious import to them — without friends or friendly bankers, in a foreign city. Breakfast, on this winter morning, was not to be thought of; a dinner, later in the day, was equally impossible. The future to these young men was dismal beyond the weather; a long walk was before them, and there was no money to pay omnibus fares. The humor of the situation was not lost upon one of these unfortunates (Aguecheek), always ready to meet any emergency, and whose overflowing wit followed him through life to his grave.

Spying a shop in the Rue de la Michaudiere where milk was sold, he entered and asked for a cup of milk for himself and friend. The good woman, a mother in Israel, offered them a cup of coffee, probably realizing, with the true instinct of a Frenchwoman, the financial strait of her customers. How little do any of us realize the import of a good action! If a drink of water once earned for a woman the promise of eternal life, so did this woman reap a reward little realized then through the gift of a cup of coffee. From that eventful morning began the fortune of Mme. Busque. Encouraged by the kind and motherly treatment of the morning, our two friends (Huntington, for many years the Paris correspondent of the New York *Tribune*, was one of them) returned at night and asked if she would prepare them a simple dinner. She readily complied, and drawing from them their difficulties, refused all pay for the dinner, and, furthermore, offered to trust them for their meals until such a time as help should reach them from home. This little episode was the foundation of the Restaurant of the Pumpkin Pie, as famous and well known and appreciated later on by Americans in Paris as was the Trois Frères among Frenchmen. In a short time Mme. Busque accomplished the making of most of our New England dishes by the help and assistance of her male guests. It was some time before women became interested in the "Pumpkin Pie."

The writer in the *Tribune* is mistaken when he says the first pumpkin pie in Paris was made by an American woman. The writer takes to himself that honor, as, with an apron tied about his neck, a French-and-English dictionary by his side to discover the French names of needed spices, etc., the first wonderful production was made with no little success. This was followed by the production of buckwheat cakes, the material for which, together with the soapstone gridiron, the writer ordered from America. The original effort at the production of the early pumpkin pie would have furnished subjects for several painters. Not one artist alone could do justice to it. This restaurant soon became the rendezvous of all that was Bohemian in art, literature and science among the Americans in Paris, Boston being most largely represented. The little dining-room was hardly more than 8′ x 10′ in size, and on the wall hung the portrait of the Boston poet, James Ticknor Fields, one of the founders; the genial doctor and ex-Mayor, Samuel Green; Charles B. Fairbanks, the charming author under the *nom de plume* of "Aguecheek"; Huntington, of the *Tribune*; Chandler Berrian, son of the Rev. Dr. Berrian, of Trinity Church; George Perkins, and others too numerous to mention. Fairbanks was the particular favorite of Mme. Busque, and she nursed him as a mother during his last illness, and when dead buried him in the cemetery of Montmartre. Mme. Busque died soon after the Franco-German War, and her death was due to the privations consequent upon the Siege of Paris. We shall not see another Mme. Busque.

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 MAJESTIC," DETROIT, MICH. MESSRS. D. H. BURNHAM & CO., ARCHITECTS, CHICAGO, ILL.

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

THE *Examiner* BUILDING, SAN FRANCISCO, CAL. MR. A. C. SCHWEINFURTH, ARCHITECT, SAN FRANCISCO, CAL.

THIS building, for the *Examiner*, is of brick, plastered rather roughly and showing trowel-marks. The detail is of terra-cotta very crudely done. The plain surfaces are whitewashed a cream-color tone, and the walls of the loggias are lined with red Numidian marble. The two stories occupied by the loggias are for the editorial rooms, etc., and the pots of flowers with vines will form a screen for a pleasant place for the editors in hot weather. Tile-course first story, and the roof of large, heavy, red Spanish tiles.

UPPER STORIES OF THE *Examiner* BUILDING, SAN FRANCISCO, CAL.

COMPETITIVE DESIGN FOR THE *Star* BUILDING, WASHINGTON, D. C. MR. GLENN BROWN, ARCHITECT, WASHINGTON, D. C.

DOUBLE HOUSE FOR PROF. COURTNEY LANGDON, PROVIDENCE, R. I. MESSRS. CLARKE & SPAULDING, ARCHITECTS, PROVIDENCE, R. I.

XVII–CENTURY FOUNTAIN IN THE PIAZZA EMANUELE VITTORIO, FAENZA, ITALY.

[The following named illustrations may be found by reference to our advertising pages.]

FOUNTAIN UNDER THE TERRACE, PALAZZO PITTI, FLORENCE, ITALY.

BORDER DESIGNED FOR BARON TAYLOR'S "*Voyages pittoresques*," BY VIOLLET-LE-DUC.

A GROUP OF EQUESTRIAN STATUES: THE GEORGES.

[Additional Illustrations in the International Edition.]

DETAIL OF MANTELPIECE IN THE HOUSE READING-ROOM: LIBRARY OF CONGRESS, WASHINGTON, D. C. ARCHITECTS, MESSRS. SMITHMEYER & PELZ; P. J. PELZ; E. P. CASEY.

[Gelatine Print.]

This mantelpiece in its entirety was published in our issue for August 28, 1897.

THE NEW CATHEDRAL, BERLIN, PRUSSIA. MESSRS. J. C. & O. RASCHDORFF, ARCHITECTS.

This plate is copied from *Architektonische Rundschau*.

ST. GEORGE'S CHAPEL, WINDSOR, ENG.

This plate is copied from the *Building News*.

BUCKINGHAM GATE, DACRE COURT, WESTMINSTER, ENG. MR. C. J. C. PAWLEY, ARCHITECT.

This plate is copied from the *Builder*.

MAIN ENTRANCE: NORTHAMPTON INSTITUTE, CLERKENWELL, ENG. MR. E. W. MOUNTFORD, ARCHITECT.

NEW ADMIRALTY BUILDING, ST. JAMES'S PARK, LONDON, ENG' MESSRS. LEEMING & LEEMING, ARCHITECTS.

SOCIETIES

WASHINGTON CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS.

THE annual election of officers of the Washington Chapter, A. I. A., took place at the regular January meeting, and resulted in the reelection of those who held office during 1897. *President*, J. C. Hornblower; *Vice-President*, J. G. Hill; *Secretary*, E. W. Donn, Jr.; *Treasurer*, W. J. Marsh; *Committee on admissions*, J. R. Marshall, W. M. Poindexter, Glenn Brown.

The Secretary's and Treasurer's reports showed a thoroughly healthy condition of affairs, every member being actively interested in promoting the welfare of the Chapter.

At the February meeting it was decided to make an effort to secure the next annual convention of the A. I. A. for Washington. It is hoped that the proposed establishment of Central Headquarters of the A. I. A. here in Washington will soon take place.

EDWARD W. DONN, JR., *Secretary*.

NOTES AND CLIPPINGS

REFUSE DESTRUCTION. — There is now a pretty general concensus of opinion that the most sanitary way of destroying organic matter is to consume it, and the municipal engineer has now a choice of three or four different and, on the whole, efficient forms of refuse-destructors. The uninitiated, it is true, often make the complaint that this involves the loss of matter which should be of great value for agricultural purposes; but experience has shown that there is no demand of any importance for the material in question, or even for the still more suitable pressed sludge-cake which forms the solid residuum left at sewage-precipitation works. Practically everywhere these wastes cannot be sold in any considerable quantity, and hence most municipalities have been forced to abandon the attempt and treat such residues of our civilized life as mere noxious matter to be got rid of as cheaply and safely as possible. It must be admitted that as concerns what is generally known as dust, many commercially valuable commodities may be rescued by a process of hand-picking; but how far this course is justifiable from a hygienic point-of-view is, in most cases, very debatable. However that may be, there must always remain a very large proportion of utterly valueless and noxious material, with reference to which the best that can be said is that it has a certain fuel value. Regarded commercially, however, there has in recent years been a decided tendency to overrate this, since the first essential of a destructor is that it must destroy completely, allowing no fumes to pass into the outer air and thus create a more or less serious nuisance. To secure this end, destructors, it is found, must be worked with great regularity, while, in general, demands for steam raised by the heat resulting from this destruction are variable. In practice the latter must, accordingly, be subordinated to the main business of destruction, and the amount of power commercially available is correspondingly diminished. Nevertheless, a very fair amount of steam may be raised without compromising the proper working of the refuse plant, as is shown very clearly by the tests carried out by Sir Douglas Fox with the Beaman and Deas destructor, which was erected at Leyton some little time back. We have already described this plant in detail (see *Engineering*, vol. lxii., page 671), and a peculiar interest attaches to it in that it was the first at which the burning of sewage-sludge was undertaken. The waste heat is used to raise steam in two 96-horse-power Babcock and Wilcox boilers, and the tests referred to were made to determine the available heating power of the refuse used. The latter consisted of ordinary house-refuse and cakes of sewage-sludge from the filter presses of the Leyton precipitation-works. This sludge contained from 61 to 68 1-2 per cent of moisture, and but 6 1-2 per cent of combustible carbon. The house-refuse was of low fuel value, the quantity of cinders being small; and during the trial, which lasted twelve hours, the cells were fed with a mixture of one part of the sludge to two parts of the house-refuse. In the time named 22 tons 2 cwt. of the latter and 11 tons 9 cwt. 1 qr. of the former were consumed, with the production of 9 tons 16 cwt. 2 qr. of clinker, and an equivalent evaporation of 0 507 pound of water per pound of the mixture supplied. An analysis of the furnace gases showed that the combustion was extremely complete, the presence of CO being only noted once, and then in the insignificant quantity of one-fifth of 1 per cent. The temperature reached in the combustion-chamber was 1562 degrees Fahr. — *Engineering*.

A SPECTACLE OF DA VINCI'S. — An incident occurred in 1489 which evinced the poetical imagination and the mechanical science of Leonardo da Vinci in a striking manner. It was upon the marriage of the young Duke Giovanni Galeazzo to Donna Isabella of Aragon. Among the various pageantries with which that ceremony was enlivened, one outshone all the rest in magnificence and singularity, and it was conceived by the fertile fancy of the renowned Florentine painter. Happily, the details of this inimitably graceful fête have been recorded by the contemporary pen of Monsignore Sabba da Castiglione: Late on the evening of the day upon which the august nuptials had been celebrated the nobles and dames are summoned by the sound of bugles to an open theatre, constructed after the fashion of the ancient amphitheatres attached to the Ducal Palace of Milan. Silver tripods, bearing vessels of porphyry, are disposed at intervals between the benches; under the tripods are torches of cedar-wood; in the vessels of porphyry are burning aromatic gums and incense. By this arrangement of the decorations, as well as by the gradual closing-in of twilight, a subdued and fluctuating light is produced which not only renders the jewelry and costume of the spectators unusually picturesque, but materially assists the illusion. A buzz from the assemblage — a pattering of rose-blossoms upon the arras carpeting — it is the bridegroom leading the bride to the seat of dignity, both of them robed in white velvet, slashed with violet silk and cinctured with cloth of gold, both crowned with flowers. Another murmur rises from the assembly: it is Leonardo seated under one of the tripods, holding in his hand a golden lyre of his own construction shaped like a horse's skull, upon which, say the Italian chroniclers, he played with such ravishing melody as to be accounted the finest extemporaneous performer of his age. His fingers are upon the strings — there is a death-like silence; his hand strays over the instrument deftly, playfully, winningly, as though he would decoy the wandering spirits of the air; there is a modulation in the melody: it is sorrowful, it is weeping, and now it rolls upwards — higher — it gains enthusiasm — it soars. Brightly twinkle the stars overhead. A cry of wonder bursts from the assembly: one of those stars seems to forsake its place in the heavens — it rushes downwards — it approaches them — it is a moon. The orb floats over the theatre to the rippling of the strings upon the golden skull. The globe opens and the god Mercury is revealed in its centre, his feet winged, his caduceus in his hand; he chants a bridal song — the epithalamium of Giovanni Galeazzo. The planet closes and is replaced by another; from it emerges Venus girdled with the zone of love — her tones are more impassioned and sapphic After Venus, Mars, with the god in his battle harness — his bridal verse is chivalrous and lusty. Then the Father of Olympus, grasping his baleful thunderbolt, his voice being solemn and majestic. And lastly, after Jupiter, Saturn, the sad and venerable. Then, while the planets are revolving in concentric circles above the theatre like five gigantic moons, while the golden lyre is breathing like an anthem under the fingers of its master, a bright light illumines the whole city, a thousand bonfires are ignited, the bells in the turrets are ringing, their clamor is drowned in the acclamations of the multitude, and the optical delusion of Leonardo's is completed. — *The Architect*.

THE DROUGHT AND NEGRO MORTALITY. — There is a coincidence in a prolonged drought and in an increased mortality among the negroes in Charleston, S. C., as also a connection between the two, the *News and Courier* of that city says. There has been little rain in that section for forty days or more, with the result that many of the water-cisterns are empty. The colored people in the city depend largely for their water-supply on water caught in barrels from the roofs of their houses. This is vile water under the best conditions, daily becoming worse when the supply is not renewed. With the failure of this the negroes, having no knowledge of hygiene, resort to the surface wells, which, if not worse, are as bad as the depleted cisterns. As a result, the health officer's report of the number of deaths among the negroes for the week ended on Saturday last was twenty-five, the deaths among the better-situated whites for the same period being only two. An effort to remedy the conditions is being made in the establishment of artesian drinking-fountains. Where these have been placed the sickness and death-rate have been greatly reduced, and the *News and Courier* calls for their general introduction in the negro quarter. — *N. Y. Evening Post*.

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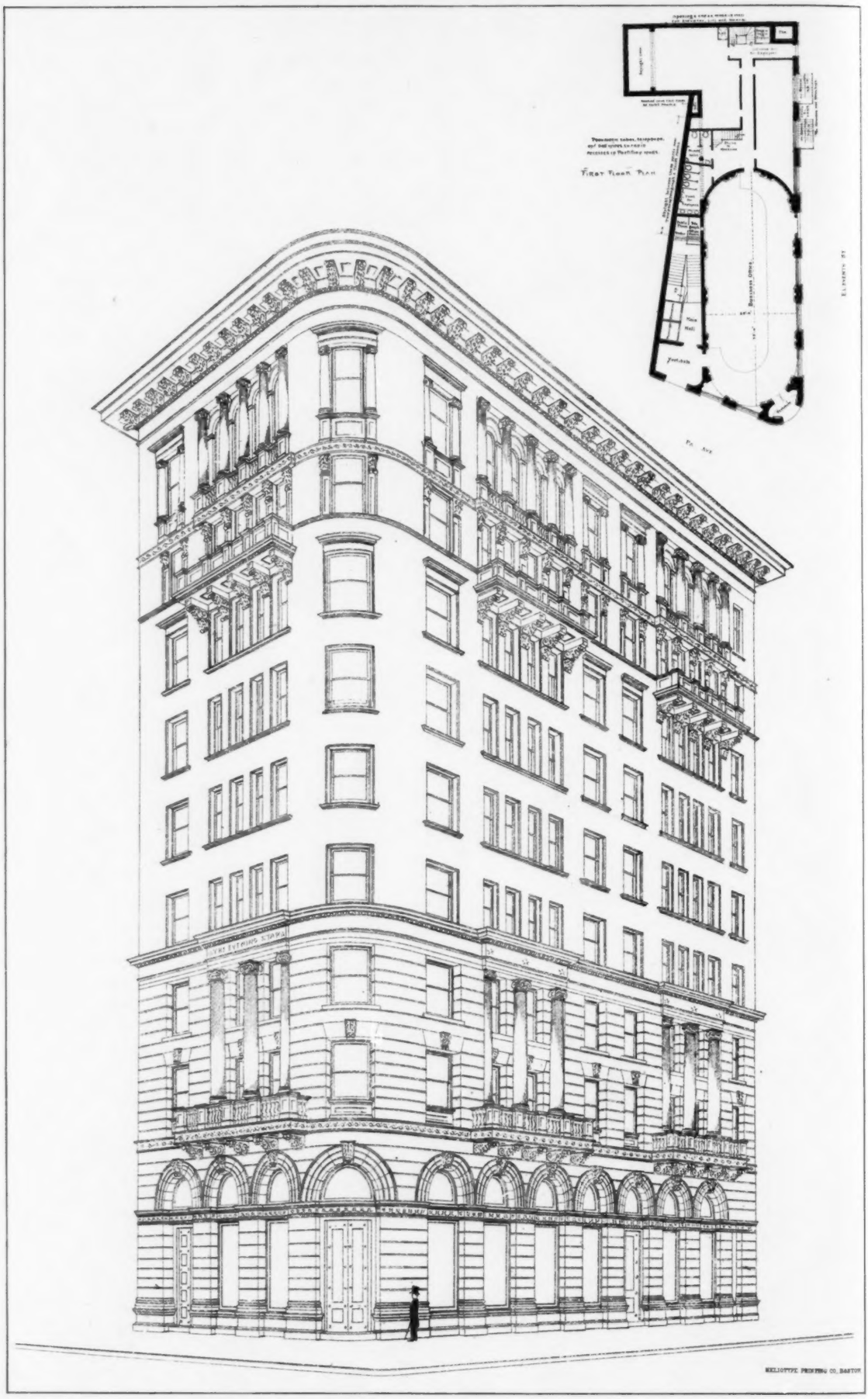

COMPETITIVE DESIGN FOR BUILDING FOR THE EVENING STAR COMPANY, WASHINGTON, D. C.

GLENN BROWN, ARCHITECT.

American Architect and Building News, Feb. 19, 1895. No. 1156

Double · Residence
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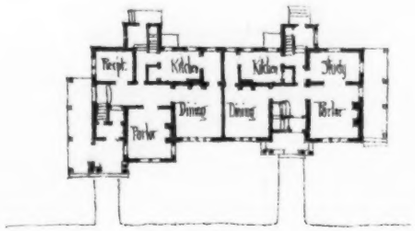
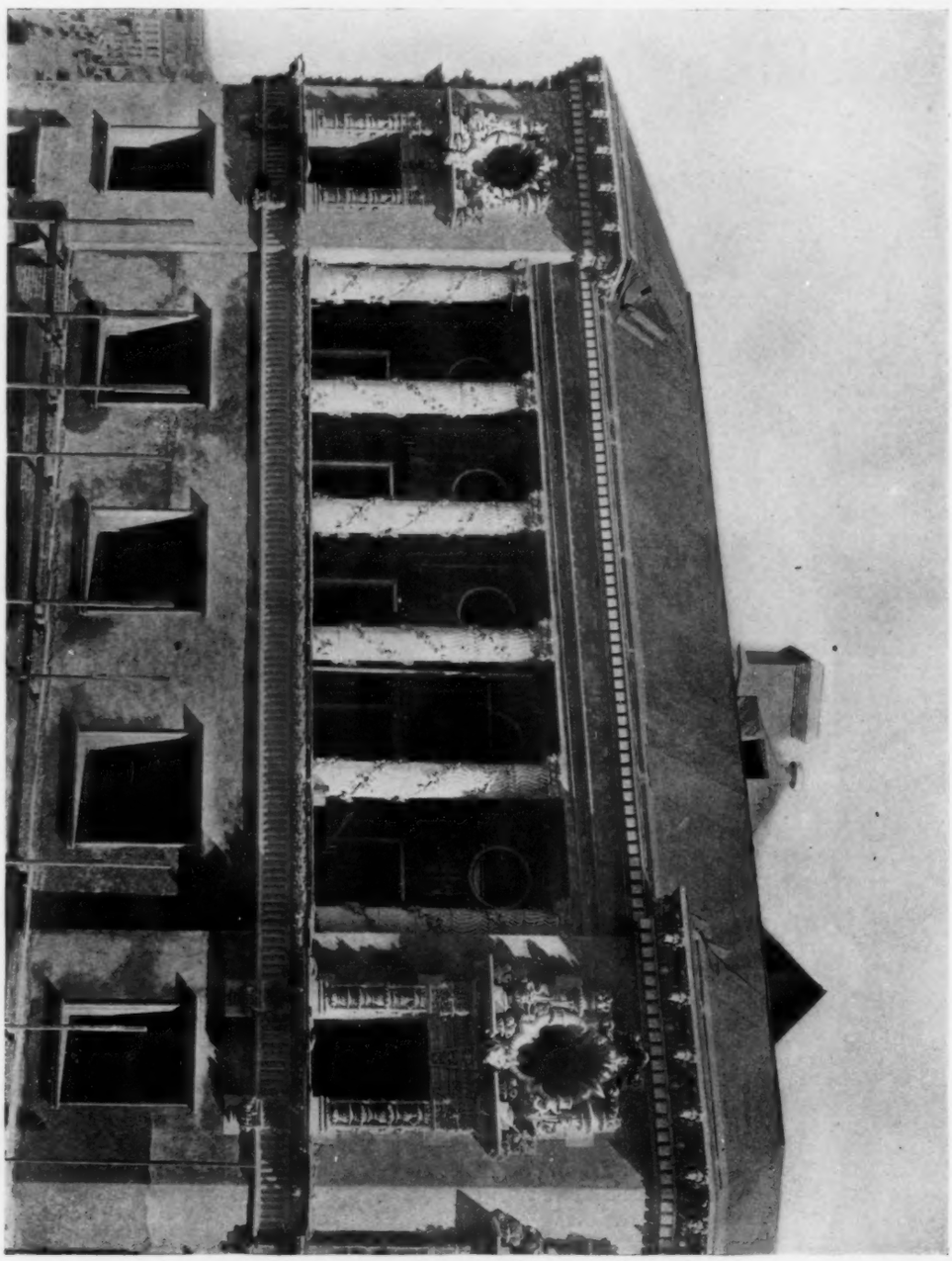
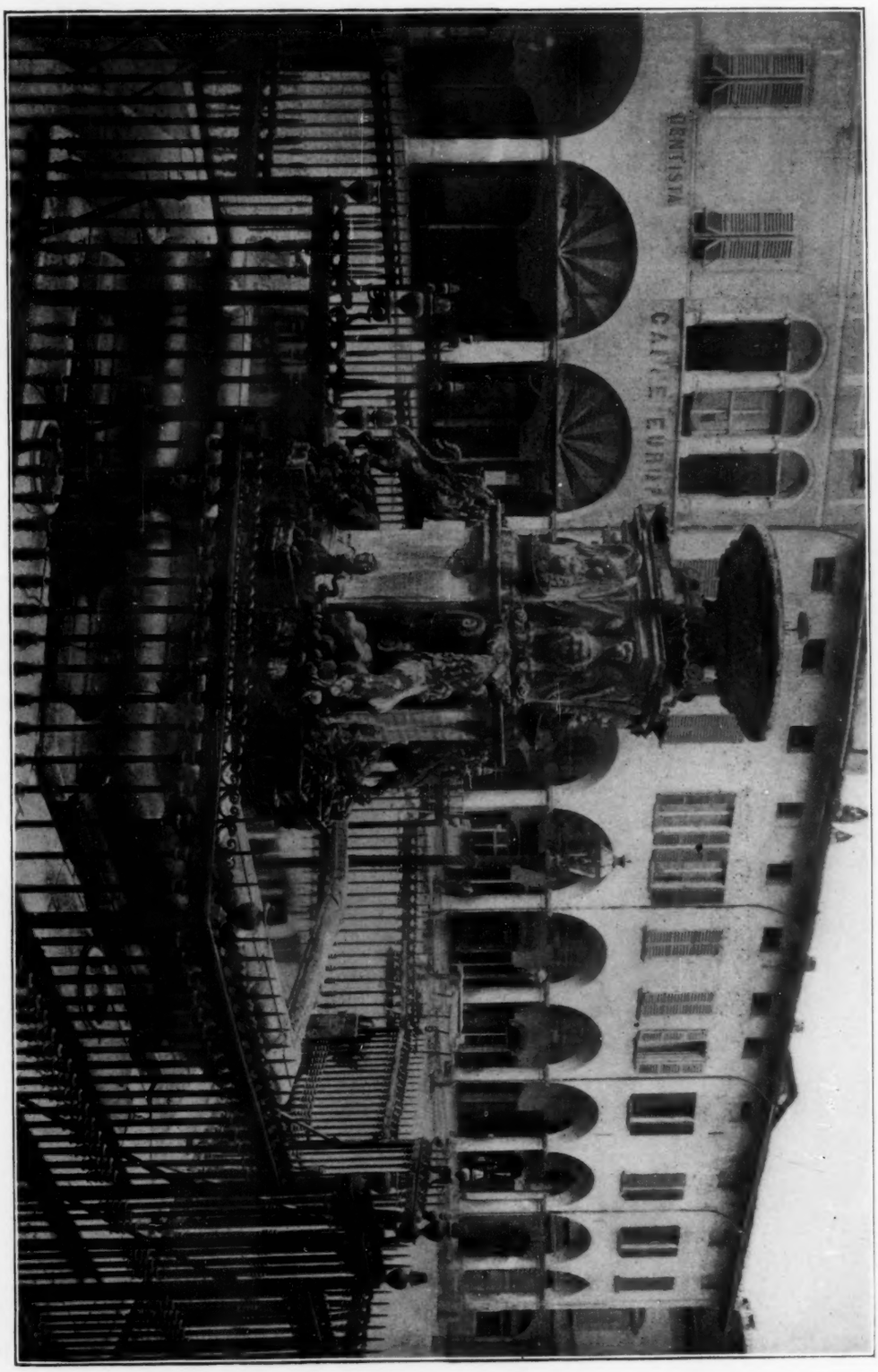




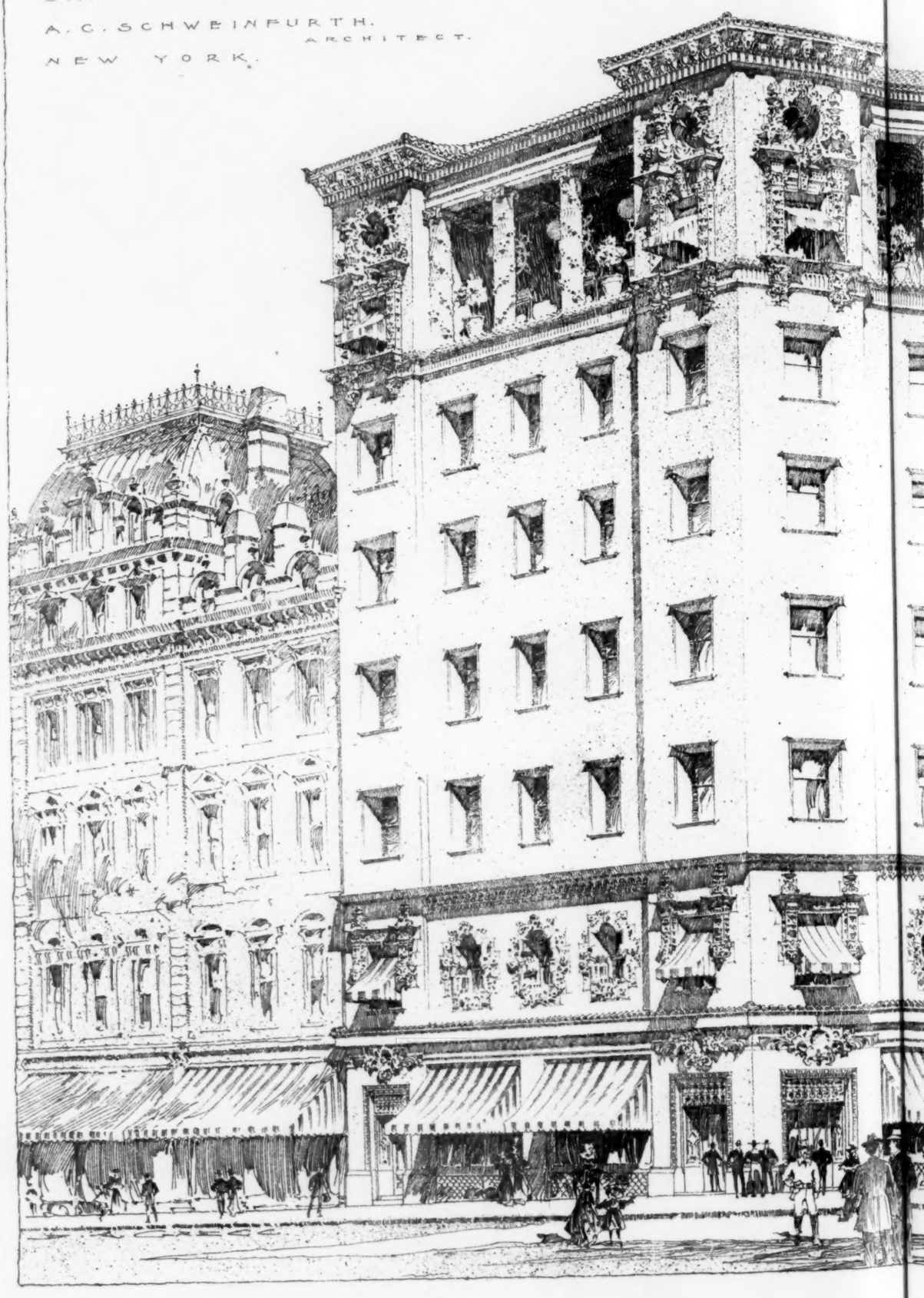
UPPER STORIES OF THE "EXAMINER" BUILDING, SAN FRANCISCO, CAL.

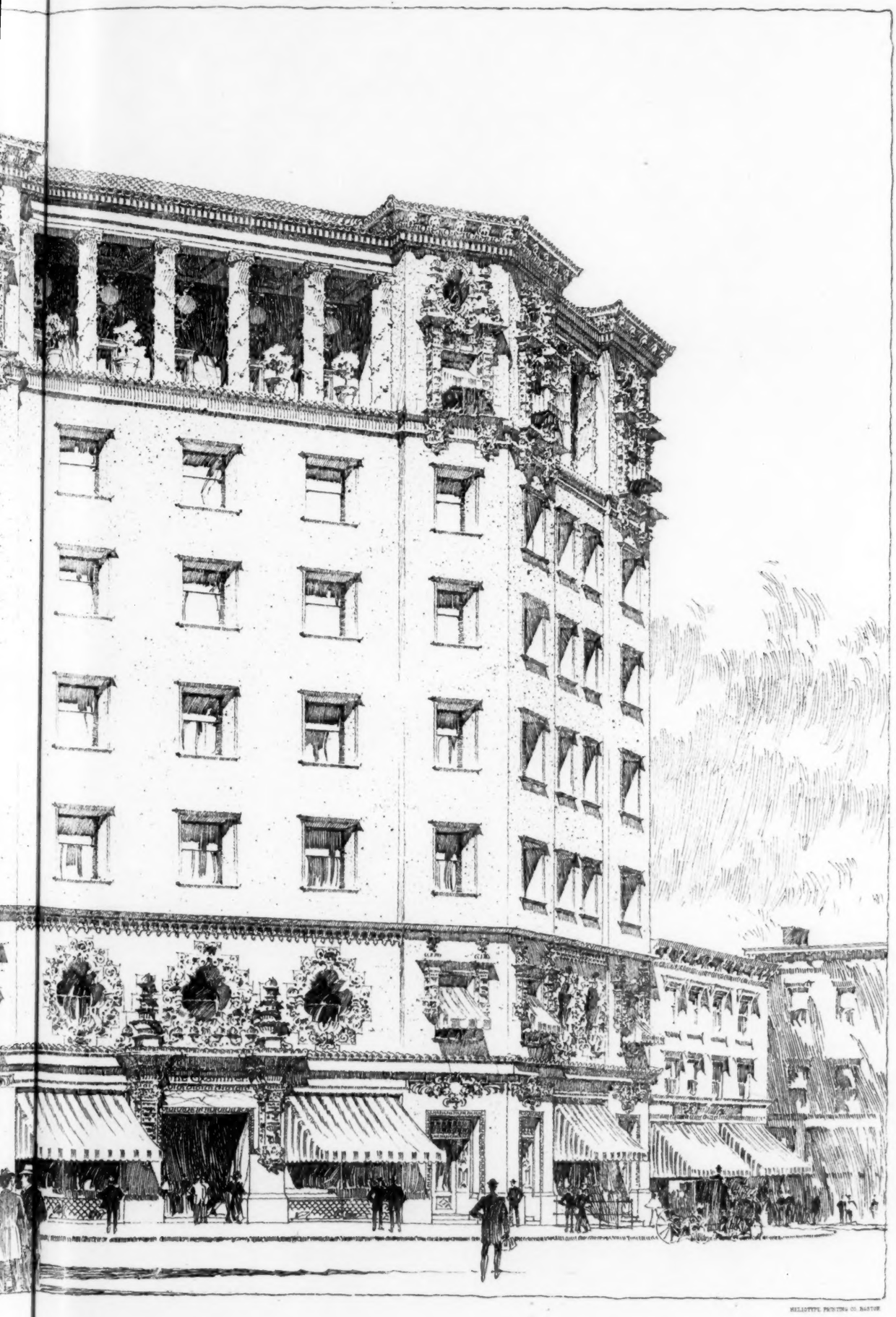
A. C. SCHWEINFURTH, ARCHITECT.



XVII Century Fountain in the Piazza Vittorio Emanuele, Faenza, Italy.

THE "EXAMINER" BUILDING.
SAN FRANCISCO. CAL.
A. C. SCHWEINFURTH.
ARCHITECT.
NEW YORK.





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