

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. LXVII.

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No. 1256.

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

JANUARY 20, 1900.



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HARVARD UNIVERSITY has established a four-year course in landscape-gardening, in connection with the Lawrence Scientific School, leading to the degree of S. B. The course will include the study of architecture, the artistic treatment of natural forms, and practical horticulture and arboriculture, for which the Bussey Institution and the Arnold Arboretum will afford admirable facilities. To the thoughtful man, the prospect that the other great universities will follow, as they usually do, the lead of Harvard, in adding to the course of study which they offer, suggests the possibility that the profession of landscape-gardening, which counts at present about as many practitioners as can find employment in this country, may become overcrowded, as that of architecture is in great danger of being, if it is not already so; but it is to be remembered that a man who has thoroughly studied architecture or landscape-gardening, even though he may be obliged to gain a living in some other career, can exert an important influence in favor of good art in the community in which he lives, and it is just this awakening of communities to the difference between good art and bad art, or no art at all, which is most needed now to develop that love of the beautiful for which America, more than any other country in the world, is now ready, and which is likely in the next generation to furnish employment and fame to all artists who may deserve them.

IT is interesting to learn that the Supervising Architect of the Treasury has been obliged to apply to Congress for an increase in the appropriations for the public buildings under his charge, on account of the rise in prices of materials, which he estimates at an average of thirty per cent. As the office estimates of cost for public buildings, on which the appropriations are based, are made with an exactness which would surprise people not familiar with Department routine, it is quite natural that the rise in prices, since the estimates were made, should find the appropriations insufficient; and Mr. Taylor's opinion, that the average cost of materials is thirty per cent greater now than it was a year or two ago, is entitled to notice as the most serious, and probably the most accurate, estimate that has yet been made. As the increase of appropriation asked for will affect about one hundred and thirty public buildings, which are to cost about twenty million dollars, the additions needed will form a matter of some importance; but the Congressional Committee seems to have concluded, very sensi-

bly, that they must be made. It is quite possible, however, that the appropriation, when it comes up for a vote, will form the text of an interesting debate; and an intelligent man, intent upon distinguishing himself as the enemy of trusts, might find the substance of an effective speech in the history of those which control the manufacture and sale of certain building materials.

Public Library.

THE science of engineering has suffered a great loss in the death, at the early age of fifty-four, of Alfred Brandt, the engineer and contractor for the Simplon Tunnel, and the inventor of most of the important improvements which have been made in processes and machinery for tunnelling within the past twenty years. Brandt was a native of Hamburg, although he was a pupil of the Polytechnic School at Zurich, and spent much of his life in Switzerland. After his graduation from the Polytechnic School he was employed on the Hungarian railways, but before long he was called back to Zurich, as mechanical engineer in the central office of the St. Gothard Railway. Here he displayed so much ingenuity and mechanical intuition in solving the smaller problems which came up in the office that he was sent to Airolo, to study the machinery in use there for excavating the great tunnel from the Italian side. As every one knows, the drilling machines employed at that time were operated by compressed air, power for compression being taken from waterfalls in the neighborhood. Brandt soon saw that in the heating of the air by compression, and the subsequent cooling, there must be a loss of energy, while the conversion of the power from mechanical force into the latent force of compressed-air, and its subsequent revival as mechanical action, involved, in practice, a further loss, and he set himself to devise means of using the hydraulic power directly in the drilling machines without the intervention of compressed air. He submitted his scheme to the chief engineer of the railway company, who authorized him to have a machine constructed from his designs. When completed, the new machine proved very efficient, and Brandt added to it a device for changing the operation of the drills, with little modification in the apparatus, so as to substitute rotary for direct-acting tools at pleasure. Just as this invention was complete, the St. Gothard Railway Company fell into financial difficulties, and the work on the tunnel was stopped. Brandt, thus left without employment, resolved to make a venture as a contractor, using his knowledge of tunnel engineering, with his new drilling machine, to earn him a living. He associated with himself his friend and college associate, Karl Brandau, of Cassel, and the firm of Brandt & Brandau was soon overwhelmed with business. In the Arlberg, in Thuringia, Istria, Italy and Spain, in the coal-mines of Westphalia, and in the Caucasus Mountains, the Brandt machines were set at work under the supervision of their inventor, whose energy and enthusiasm, as well as his success, soon made him famous. It is said of him that in a difficult piece of tunnelling, where the men worked night and day in three shifts, he always saw every gang at work. The project of the Simplon Tunnel, the greatest, and perhaps the last, of the Alpine tunnels, gave him the opportunity that he wished for. No other firm could probably have competed successfully with Brandt for the contract, even if the renown of his establishment had not pointed him out as the one to whom it should be entrusted; and, from the first, it was put into his hands. There were long and annoying delays before the work could actually be begun, but the contracts were at last signed, and excavation began with energy. Brandt hired the Stockalper Castle, at Brieg, well known to tourists, and brought his family there, to live close to his work until it should be completed, saying that he would rather die himself than have the tunnel delayed beyond the contract time. Here, however, his wife and daughter fell ill of typhoid fever, and anxiety about them, added to his business cares, told even upon his determined energy. Before they were entirely recovered he was attacked by apoplexy, and died a few days later.

MR. F. T. DOLLMAN, who died a few days ago in England at the age of eighty-seven, was perhaps the last of the great group of draughtsmen who did so much to revive the mediæval style in England and elsewhere. Mr. Dollman was a pupil of Pugin's, as enthusiastic a lover of English

Gothic as his master, and a much better draughtsman; and his books on "*Examples of Ancient Pulpits in England*" and "*Examples of Ancient Domestic Architecture*" were quite worthy to be found, as, indeed, they generally are, on the shelves of the libraries of elderly architects, side by side with those of Rickman, Pugin, Scott, Brandon, Prout and the others whose fame as artists will long be secure, whatever fashion may say to the style which they loved so well.

THE Annual Report of the Architect of the United States Capitol contains an interesting account of the explosion and fire which occurred in that building about a year ago, badly damaging the rooms under and near the Supreme Court-room, and destroying the decorations in the court-room itself. Soon after the fire, Mr. Glenn Brown was employed to investigate the structural damage, to test the cracked walls, and make such recommendations as he might deem necessary; while Professor Charles E. Munroe, an expert in explosives, was commissioned to study the causes of the disaster. It was ascertained, practically beyond question, that the explosion was due to the escape of gas in the basement, at a time when the pressure in the mains had been temporarily increased to more than double the normal amount. Some of the gas probably escaped through a governor, which had been left improperly adjusted, but Professor Munroe thinks that leaks in the pipes, some of which have been buried under the cellar floor for nearly forty years, and have been tapped for new branches in various places, may have added materially to the amount which collected in the cellar. When gas enough had accumulated to form an explosive mixture with the air, it was at once fired by one of the numerous lights burning near, and exploded with such force as to blow out the brick vaults of the floor overhead, and even to dislocate the stone jambs of a doorway at some distance. The cellar being encumbered with combustible rubbish, fire soon followed, and spread to the story above, burning out the room of the United States Marshal, and breaking the skylights of the Supreme Court-room, but, fortunately, not setting fire to the furniture there. The investigation, besides ascertaining the cause of the explosion, and the necessary steps to be taken to restore the building to its former condition, showed incidentally the existence of a large number of disused drains under the cellar floor, any of which, as Mr. Brown pointed out, might conduct gas from a broken main outside into the Capitol, and cause another explosion, worse than the first; while some of the drains would even admit the passage of men with evil intent. The two experts therefore united in advising that all "vagrant" pipes and drains should be immediately removed, and their place filled up; and that drain-pipes still required should be exposed to view in trenches, nothing being left buried under the floor.

THE Municipal Art Society of New York gives notice of a competition for a Refuge, or Transfer Station, to cost not more than five thousand dollars, and to be placed at the Central Park terminus of the Broadway line of the Metropolitan Traction Company, at the junction of Seventh Avenue and Fifty-ninth Street. The competition is to be carried on under the rules of the Society, and three prizes are offered, the first being three hundred dollars in money, the second two hundred, and the third one hundred. Whether any of the designs will be executed is doubtful, but the Society will "warmly recommend" the carrying-out of the design placed first. Further information may be obtained from Mr. E. Hamilton Bell, 424 Fifth Avenue, New York.

THE Twenty-second annual Exhibition of the Society of American Artists will open in New York on Saturday, March 24, and continue until Saturday, April 28. Original works in painting and sculpture, not before publicly exhibited in the City of New York, and approved by the jury of admission, will be received, and must be delivered without packing-cases, at the Fifty-eighth-Street entrance to the galleries of the Society before 5 p. m. of Friday, March 9. The Shaw Fund of fifteen hundred dollars will be devoted to the purchase of a figure composition painted in oil by an American artist, to be selected by the jury; and the annual Webb prize of three hundred dollars for the best landscape in the exhibition painted by an American artist under forty years of age will also be awarded by vote of the jury. Further information may be

had by addressing the Society of American Artists, 215 West Fifty-seventh Street, New York.

THE final juries for the selection of American works of painting and sculpture for the Paris Exposition have been appointed, that for painting being composed of Messrs. E. A. Abbey, J. W. Alexander, W. T. Dannat, Alexander Harrison, Gari Melchers, F. D. Millet, John S. Sargent and Jules Stewart; while that for sculpture consists of Messrs. Paul W. Bartlett, Frederick MacMonnies, A. P. Proctor and Augustus St. Gaudens. We need hardly speak of the distinction of these gentlemen, all of whom have won fame for American art, but it is a pleasure to call attention to the care with which Mr. Cauldwell has made his selection, so that his juries may represent, not only the highest attainment in art, but the different tendencies of American work. With Messrs. Abbey, Millet and Sargent, although all three are probably equally open to the appreciation of good art in any form, the competitors who have been brought up in the black-and-white, the pure Classic, and the impressionist faith will find their motives and their efforts perfectly understood; while the Parisian element will represent the middle ground in which American, as well as French art, moves most safely. Among the sculptors, it would have been hard to find four men who are known to the public as combining more knowledge with more conscientiousness than those appointed, and the only regret that Americans, among whom sculptors of the first class are not very numerous, will feel at the selection is likely to be that so many of their best men, as members of the jury, will, presumably, be debarred from the competition for the honors in which their fellow-countrymen would share.

WE are always rather reluctant to advise any one to read Mr. Ruskin's works, and still more to give any one a gratuitous advertisement; but, seeing that Wanamaker, in New York, sells some of Mr. Ruskin's books for eighteen cents a volume, we are disposed to point out to our younger readers that it would be worth their while to buy certain of them. Undoubtedly the most useful of all the Ruskin books is the "*Elements of Drawing*;" and it is not too much to say that every architectural draughtsman should own a copy of it and practice diligently the exercises which it describes. The late Charles B. Atwood, one of the most skilful and rapid draughtsmen that ever lived, who, it will be remembered, made his prize set competition drawings for the New York Municipal Building in less than a day, gained his unrivalled precision of eye and hand in great part through his practice of the exercises in the "*Elements of Drawing*," which, as he once told us, he considered the most valuable book that an architectural draughtsman could possess. Mr. Atwood was not a person of romantic or transcendental disposition, at least so far as his business was concerned; but, whatever he may have thought of Mr. Ruskin's views of political economy or of architectural lamps, he recognized in the "*Elements of Drawing*" the thoroughness and concentrated knowledge which make it the best treatise on the subject ever published. Next to the "*Elements of Drawing*," Ruskin's most useful book is the "*Aratra Pentelici*," a treatise on sculpture which is invaluable to the architect. This, unfortunately, does not appear in the cheap edition, but it is well worth whatever it costs. Apart from these very practical books, which every one can read with profit, and the children's books, such as the "*King of the Golden River*," "*Ethics of the Dust*," and "*Sesame and Lilies*," which every girl, at least, should be familiar with, there are some which, if read with discrimination, are full of inspiration and encouragement to the artist; but, if read without discrimination, favor the development of the most abominable conceit and incapacity for intelligent judgment that has ever afflicted the artistic world. Among these the best, and also the worst, is probably the "*Lectures on Architecture and Painting*," which figures in the Wanamaker editions at eighteen, and, also, in smaller form at fifteen, cents. He must be a thick-skinned artist who can read this book without being inspired with noble sympathies and resolves; yet no book ever written contains more rubbish, which even its author could not have believed, or teaches more recklessly the doctrine of contempt and hatred for one's professional brethren. The "*Seven Lamps*," which is incomprehensible to some students, but inspiring and valuable to others, does not appear in the Wanamaker list; and the "*Stones of Venice*," the best studied and most thoughtful of all Mr. Ruskin's architectural works, is represented only by a small volume of selections.

THE DEWEY ARCH.¹—II.

THE mere record itself is a formidable document, including the name of nearly every well-known sculptor living in New York, with a goodly representation of the younger men, whose work bids fair to increase in importance with each new effort. As an epitome of current American sculpture, the arch is without rival; as a free-will thank-offering and tribute to greatness, it has no peer in the history of the world. But the sculpture of the arch represents much more than the selection of a certain number of subjects and the designation of the artists to execute them. It is an epitome of American history, and a carefully-thought-out scheme, in which history and allegory, suggestion and representation, the nation and the city, are included in a thoroughly-welded entity. The arch being erected in honor of the foremost living American naval hero, it symbolized the power of the United States as a naval nation, Mr. Ward's great group of "Naval Victory" appropriately crowning the structure. Its central figure of "Victory" dominates the arch, as well as the entire decorative scheme. The figures of "Victory," by Mr. Adams, are placed against the columns of the colonnade, and farther up Fifth Avenue the National Society of Mural Painters exhibited inscriptions of the American vessels that won such splendid victories in the war, for whose successful end the arch was built.

The great pier groups are not only emblematic of American character, but sum up and illustrate the whole history of war as interpreted by the American people. The series begins with the north-east group, Mr. Martiny's stirring "Call to Arms." Next, on the south-east pier, Mr. Bitter's intensely vigorous "Combat,"—a group not reeking of the battlefield, nor saddened with the dead and dying, but vigorous and alert,—the American in defence of his country; then the stately "Triumphal Return" by Mr. Niehaus, on the south-west corner, and, finally, the supreme theme of life itself, the "Peace" by Mr. French. A fine conception truly that thus brought the happy end, the joys of domestic life, in deliberate contrast with the beginning of the fight, and enshrined them both on the same great monument. For the great lesson of war is peace; and the admiral in whose honor the arch was built and his own home-coming gave visual evidence of its truth. And, so, in amplification of the same thought of peace and prosperity are the side panels,—the "Protection of Our Country," by Mr. Couper, and the "Progress of Civilization," by Mr. Gelert,—both eminently appropriate for an American naval memorial, both themes that would scarce have found place on a war monument of a more warlike nation.

The American nation has been peculiarly fortunate in the naval battles that have brought it renown in its wars. The three periods of 1776, 1812 and 1861 find fitting place on a monument erected to commemorate the latest American triumph in this branch of warfare. Commodore Paul Jones stands for the War of the American Revolution. Commodore Hull, Commodore Decatur, Commodore Perry and Commodore McDonough stand for the War of 1812. Admiral Farragut, Admiral Porter and Lieutenant Cushing represent the Civil War.

Here, again, was admirable appropriateness. Naval history is not achieved by allegory, but by personality; so the effigies of the nation's past heroes find fitting place on the monument to the great living hero of the service. The names of these naval heroes were suggested by Secretary Long of the Navy Department. The statues supply that personal element, that definite reference to history, without which a monument ceases to be intelligible; and their position on the attic, where they carry up the lines of the columns to the summit of the arch, is dignified and logical. The eight figures are sufficient in number to honor the greatest of American naval heroes; their position gives them place on the monument in an extremely happy manner. The personal side of the American Navy is further illustrated in the memorial medallions placed in the spandrels of the side transverse arches, where the portraits of some of the lesser men help to illuminate this splendid naval monument. Both symbolism and personality are, therefore, amply illustrated on the arch itself. Fortunately for art and for the sake of the sculptors, it is the former that predominates. But the allegory is at all times intelligible, penetrating and admirable, a circumstance so notable in works of this description as to be worthy special mention.

The arch typified and expressed a naval victory that vitally concerned the whole country,—a country whose shores were washed by the Atlantic and Pacific Oceans, and whose responsibilities, as resulting from the war, had extended to the East and West Indies. Symbolic figures of the two great seas, then, found place in the north spandrels of the arch, while the corresponding spaces on the south side were filled by figures of the "North" and "East Rivers," the two waterways that bound the shores of the metropolis which was welcoming the victorious admiral. On the north, at the entrance of the Court of Honor at which the admiral was received, were groups representing on the one side the "East Indies," and on the other the "West Indies," thus symbolizing the new dependencies of the nation, and appropriately placed at the threshold of the Court of Honor. On the farther side, at the south entrance of the colonnade, were groups representing the "Army" and "Navy," the two branches of the military service. And, finally, to emphasize the victorious purpose of the monument, there was not only the majestic group of "Naval Victory" on the summit of the arch, but figures of "Victory," by Mr. Herbert Adams, were placed against the coupled

columns of the colonnade facing the Courts of Honor. The whole plan was admirably conceived, the statues and reliefs were well chosen, and the themes of the sculpture of the arch and its approaches afforded fine opportunities for artistic interpretation.

In attempting to form an artistic estimate of the value of the arch its temporary character must be recognized at the outset. Strictly speaking, it is not a work of sculpture at all, but a full-sized sketch, developed with unusual care, executed with an unusual attention to detail and effect. The fact that it formed the chief decoration for a triumphal procession has nothing whatever to do with the artistic character of the sculpture. It is not permanent sculpture we are called upon to view, but temporary sculpture, sketched at the beginning in a necessarily hasty manner, developed in many instances without that constant supervision by the master which every sculptor gives to his work, and brought to completion in an unprecedentedly short space of time.

Is its value less because of these unusual circumstances? That is not the question. The real point at issue is not, Wherein does his art fail? In what is it wanting, or how conspicuous are its shortcomings? But, most decidedly, how excellent it all is, and how admirable! We do not, fortunately, need to force ourselves to admire it, for it appeals to every one by the beauty and dignity of the whole. It is not a perfectly digested work. It is not accurately balanced. It has errors that, were it to be done over again, would be instantly corrected. But when it is remembered that it is but a sketch in reality, that no opportunity was given to any of the sculptors to materially modify any part of his work, and that only a relatively slight supervision could in any case have been given it, the faultfinder—if there be such a person in this connection—cannot expect to win any considerable number of supporters. The pessimist has no place before the Dewey Arch.

The proper spirit in which to view this structure and its adornment is one of intense satisfaction that so fine a work was produced under such extremely difficult conditions. It is a most unfortunate fact that we do things in this country in too great a hurry, and the success of the Dewey Arch bids fair to demonstrate that even great things in art can be accomplished in a hurry. It would be unfortunate if such an impression should win general credence, for if there is any phase of human activity that requires extended and uninterrupted time it is the production of a work of art. Time, however, was the one element that could not enter into the designing of the arch. Its real success, in view of this fact, is nothing short of amazing.

It must not be inferred, however, that the arch was without its genuine successes in art, or that it is necessary to excuse shortcomings at every point, because of lack of time or its temporary character. Its sculpture is, absolutely as well as relatively, of a very high quality. It is quite beside the mark, that no doubt each sculptor, now his sketch is in place, would introduce changes that had not occurred to him at first. There would be an adjustment of scale; perhaps in one or two instances a more complete grouping of the figures forming the groups,—just the things, in fact, that any sculptor would do in his studio had he there brought his study to an equivalent state of advancement.

It was indeed a stirring sight, the last few days before the land parade, to see the great open-air studio in Fifth Avenue, with the busy sculptors and assistants eagerly engaged in their patriotic work. Never before, we may be assured, did Mr. French and Mr. Bitter, Mr. Ruckstuhl and Mr. Adams, Mr. Lopez and Mr. Konti and Mr. Martiny appear in the public highways clad in their studio costumes,—Mr. Bitter in a pick jacket, Mr. French and Mr. Adams in white, Mr. Martiny in his beloved blouse,—and give the finishing touches to their work under the eyes of an admiring throng that crowded the street and sidewalk within seeing distance,—a throng so great that even the hardy truckman and the impatient motorman, for once in their lives, yielded to the citizen on foot. Even the completed arch itself does not speak so eloquently of the patriotism of the sculptors as did the scaffolded structure a few days before the end. Verily those were great days for art in New York, and we may be sure both artists and sculptors enjoyed it hugely.

But what is the meaning of it all? Is it simply that a noble piece of public decoration was put together in an incredibly short space of time and set up in the most conspicuous situation in New York? Does it mean simply that a certain group of men were so enthused by the great wave of patriotism that swept over the land on the return of our victorious admiral as to put forth their efforts in the accomplishment of an unusual task? It was very much more than either of these. First and foremost is the great fact of coöperation among artists in the creation of a single work. It would hardly be possible to exaggerate the significance of this fact. It is a fact of supreme value both for the public and for the artists. It has shown that, great as is the power of individuality, the power of union and coöperation is far greater. Artists have found they could work together in a task of great magnitude and emerge from their labors with their individual reputations enhanced through the very coöperation that they feared would hurt them. They have found an added strength in unity, and they are not likely to forget the lesson. The completed arch is a much greater and much more interesting and a much more valuable work because of this coöperation than had any one artist carried it out individually.

This in itself is of more value than a hundred arches, and its influence on American art is destined to be very great. Artists have

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found it possible to do more important work together than they could ever have hoped to accomplish singly; and not only to do that, but to increase their individual reputations. It has been proved that the seclusion of the private studio is no longer necessary to the accomplishment of notable things in sculpture. We are likely, therefore, to have more and more examples of this delightful brotherly work, and the sequel cannot but be helpful in very many ways.

Another important fact is the value of a definite idea taught by the arch. It is true that the original offer of assistance made by the Society to the city officials did not suggest a definite scheme, did not do more than offer coöperation, wherever it might be needed. But we may be assured that the idea of an arch speedily suggested itself to the committee, and when the chairman of the land parade, General Daniel Butterfield, suggested an arch and its location, no time was lost in submitting a scheme which was not only an idea but a working plan, capable of being immediately carried out, and practically complete in itself. And the scheme, once undertaken, was pushed to completion without change or debate. No time was lost in argument, no time was wasted in studying suggestions for betterment. At the very beginning it was determined what was best to be done, and the work was carried out from that point-of-view. This adherence to a single idea was itself so valuable that we may entirely neglect the question, Was the scheme the best possible one to adopt? Once more the artists have demonstrated a new thing: not only have they taught the value of coöperation, but they have proved that they are capable of carrying out a great plan in a business-like manner, and without that strange, pottering by the wayside that is so popularly believed to be part of the artist's character.

Another notable fact was the coöperation of architect and sculptor in a joint work from the very outset. This lesson alone is worth all the cost. The ordinary method of employing sculpture with architecture is, as is very well known, to design the structure and provide a few places, more or less, for the display of sculpture. The National Sculpture Society has, time and again, insisted that this is not the way to secure the best results. Its costly and elaborate exhibitions, in which for the first time sculpture was properly displayed as an independent art, and exhibited for itself, were important object-lessons in this direction. The Dewey Arch is an even more complete demonstration of this cardinal principle. It is true that in certain quarters one is told that it is a sculptors' arch, and therefore by inference not so good as an architects' arch would have been. This question need not be discussed. The arch speaks for itself. The most important fact is that sculptors and architect were joined, from the very beginning, in the production of a single scheme. It was not a scheme for an architectural display, nor was it a scheme for a display of sculpture. It was a monumental construction designed for the display of sculpture, and it is not too much to say that the greatest element in its success was the coöperation of the architect and the sculptors at every stage of the work, from the beginning to the end. It is to be hoped that this important object-lesson will not be lost to view when other great enterprises are proposed necessitating the union of the arts.

For many years architects have been stoutly demanding compensation for every possible service. Their efforts to raise the incompetent to a higher standard than they deserve, and to lower the men of genius below their natural level, by insisting on a uniform rate of pay for all, are too well known to be referred to. No doubt, many men have been benefited by the five-per-cent rule; but it is a strange proceeding for men calling themselves artists to insist that art shall be charged by a uniform schedule, at which the products of the good and indifferent, the incompetent and the man of genius can be had at a uniform rate of pay. But now the sculptors have come forward and performed a prodigious amount of work without asking for compensation or receiving the slightest pecuniary remuneration. No doubt, now the lesson has been taught, the architects would do the same were they to see a possibility of disavowing themselves in a similar way. The sculptors never counted cost, never considered time, coöperation or possibility of failure. They saw an opportunity to ennoble their art by suppressing the question of compensation, and they did not hesitate to make sacrifices for Art's sake that they would not have done under other considerations. And the lesson is an easy one: it is sometimes better to work for Art than for five per cent.

BARR FERRELL.

CHEAP ELECTRIC-LIGHT FROM GAS.

 INCANDESCENT electric-light is generally considered more desirable than gas-light, but the latter is much used because of its lower cost. At the usual figures charged for gas and electric energy, from the public supply, the cost of electric-light is frequently from one and one-half to twice that of the same candle-power from gas. As a common example, take the cost of electric-energy at 15 cents per kilowatt-hour and that of gas at \$1 per 1,000 cubic feet. Allowing 5 cubic feet of gas for each 16 candle-power gas-burner per hour, which is a common consumption, the hourly cost per burner is $\frac{1}{2}$ cent. Sixteen-candle incandescent-lamps may be had that consume but 50 watts, though many in use on the public electric-supply use energy at the rate of 60 watts. On the 50-watt basis, the cost of energy for a 16 candle-lamp per hour is $(15 \div 1,000) \times 50 = .75$ cent, or one and one-half

times the cost of the same lighting-power from a gas-burner. While it is thus true that gas consumed at the burner gives cheaper light than is to be had from the public electric-supply, it is equally true that far less light is to be obtained from a given quantity of gas when used at burners than it is capable of giving under other circumstances. A very small per cent of the energy from gas-combustion is given off as light at the gas-flame, but a very much greater portion of this energy can be obtained as mechanical power in the gas-engine cylinder. It thus happens that a far larger amount of light is to be had from a given quantity of gas when used in a gas-engine to drive a dynamo than when the light results directly from the gas-combustion. A fair quality of coal-gas when burned in a gas-engine of moderate capacity develops one brake horse-power with about twenty cubic feet of gas per hour, and some large gas-engines will show a horse-power hour on as low as 15 cubic feet. Dynamos with a capacity of 30 or more horse-power should show an efficiency of not less than 90 per cent on from three-fourths to full load, and smaller dynamos, above ten horse-power, should not fall below 85 per cent efficiency under the same conditions. To allow for the lower efficiencies on small fractions of its full load, the dynamo may be assumed to deliver only 80 per cent of the mechanical work transmitted to it as electrical energy. Since the gas-engine delivers one mechanical horse-power to the dynamo-shaft for each 20 cubic feet of gas burned per hour at full load, the delivery of one electrical horse-power hour, or 746 watt-hours, at the dynamo-terminals under average conditions will require $20 \div .80 = 25$ cubic feet of gas to be consumed in the gas-engine cylinder. The electrical horse-power hour thus produced will operate very nearly fifteen (that is, $746 \div 50$) 16 candle-power, 50-watt incandescent-lamps during one hour. As 5 cubic feet of this gas must be consumed at each 16 candle-power gas-jet per hour, the number and amount of electric-lights produced through the medium of the gas-engine and dynamo, by a given volume of gas, is three times as great (or $15 \div 5$) as the gas-light this gas will furnish at burners. This great reduction in the amount of gas necessary to produce a given candle-power of light, by the use of the gas-engine and dynamo, obviously makes such an equipment very desirable in places where much gas is now used for illumination direct, unless the first cost and the subsequent care of a gas-engine and dynamo are such as to offset the higher efficiency of the gas with this machinery.

As to the care of a gas-engine and dynamo-plant, it should be noted at the start that no licensed or highly skilled steam-engineer is necessary, as there is no boiler involved. A small plant of this kind may be entrusted to the care of one with very little mechanical skill; but when the capacity is several hundred lamps, or more, it will usually pay to employ a machinist with experience in quick-moving machinery. The gas-engine and dynamo equipment does not require continuous attention, as is the case with steam, but may be safely left in operation during moderate periods while the person in charge is about the building on other work. As nearly all buildings that require enough light to make a gas-engine and dynamo advisable usually employ a man on heating and general mechanical matters, the addition of an electric-plant of the kind named will often add no labor-expense. As the labor item must in any case be small, and depend much on particular circumstances, no figures are given for it here, but the proper allowance may be made to suit individual circumstances.

The remaining charges against the engine and dynamo-plant are those for interest, repairs and depreciation, which may be calculated as follows: The approximate cost of gas-engines with the necessary fittings ready for service may be taken at \$60 per horse-power capacity. Allowing but 80 per cent of the power delivered to the dynamo at full load to be supplied to the lamps, the cost of engine per electrical horse-power, or for each 746 watts delivered to the lamps, is found from $60 \div .80 = 75$, or \$75. A dynamo of moderate size, with suitable switch-board and fittings, in position to operate, may be had for \$25 per horse-power capacity of output. In case electric-wires are installed at the start, instead of gas-pipes, the additional outlay for this part of the equipment will be small beyond that required by gas. Assuming that the wires must be erected in addition to the gas-pipes, the complete cost of wires, fittings and incandescent-lamps may be fairly taken at \$50 per horse-power of electrical energy distributed. This figure for wires and fittings is large enough to cover the cost of first-class work in most buildings, and may often be reduced. The sum of all costs for gas-engine, dynamo, wires, fittings and lamps, as above found, is \$150 for each electrical horse-power distributed to the lamps. As one electrical horse-power, or 746 watts, supplies practically fifteen 50-watt incandescent-lamps, the total investment per lamp is \$10. Placing the interest at 6 per cent, and the combined depreciation and repair charge at 10 per cent, of the first cost, the total of these charges per year is \$1.60 per lamp.

The average number of hours that each lamp or gas-jet must burn per year is subject to much variation in different buildings, but may be fairly taken at four hours per day during 300 days in the year, or 1,200 hours. Incandescent-lamps may be operated as much as 400 hours without serious diminution of candle-power, and at this rate three lamps per year will be required in the place of each burner. The market-price for 16 candle-power incandescent-lamps is 20 cents each, so that the three lamps will cost 60 cents. The total charges per 16-candle-power incandescent-lamp for interest, depreciation, repairs and lamp-renewals is thus $160 \div 60 = 220$ cents for a year

of 1,200 hours' use, so that the cost of these items per lamp-hour is, $220 \div 1,200 = .183$ cent. It was shown above that 15 incandescent-lamps are supplied with electric energy by the dynamo, with a consumption of 25 cubic feet of gas per hour in the engine, so that the gas used per lamp-hour is $25 \div 15 = 1.66$ cubic feet. At \$1 per 1,000 feet, or one mill per cubic foot, the cost of gas consumed by the engine for each 16-candle-lamp maintained per hour is .166 cent. The total cost per hour of each incandescent-lamp for all charges, aside from the labor of supervision, is, therefore, $.183 + .166 = .35$ cent. The same quality of gas consumed directly at the burners on the basis of 5 cubic feet per hour for a 16-candle gas-flame gives a cost per light for gas alone of .5 cent.

Disregarding the item of labor, the gas-engine and dynamo equipment offers, therefore, a reduction of 30 per cent in the cost of lighting by gas and at the same time supplies a quality of light that is decidedly superior. While the labor-item in the care of the engine and dynamo is a variable quantity, it can hardly amount to more than a small part of the above saving in the ordinary case. It should be noted that the method of lighting by gas consumed at the burner was allowed several advantages in the above comparison in that no interest or depreciation was figured on the gas-pipes and by a liberal allowance for each item of the electrical equipment.

When a gas-engine and dynamo-plant is considered, the quality of the gas that is available should be learned, as its capacity to develop power in a gas-engine depends directly on the number of heat-units developed per cubic foot at combustion. The above figures are based on coal-gas, which has about 600 heat-units per cubic foot. Carburetted water-gas also has about 600 heat-units to the cubic foot, but water-gas from bituminous coal and from coke has but 300 to 400 heat-units per cubic foot, and what is known as producer-gas develops only about 150 heat-units per cubic foot when burned. The coal-gas and the carburetted water-gas are generally supplied for illuminating purposes. Natural gas has a heating value of 1,000 heat-units per cubic foot, or more than any of the manufactured gases.

ALTON D. ADAMS.

THE DANGERS OF ELECTRIC WIRING.



RECENT issue of the London *Times* contains the following interesting letters from two men well known for their knowledge of electrical matters:

"Sir: Mr. Crackanthorpe has drawn attention to the undoubted dangers of bad electric wiring in houses. And though he mentions one remedy—the use of a particular incombustible mineral material as an insulator for the conducting wires—I would point out that there are others quite as satisfactory. In the first place, I would advocate the total abolition everywhere, except in laboratories and factories, of the use of wood-casing for covering the wires. I know that in this view I am at variance with many of the authorities and with half the electric-lighting contractors. I would not allow a single inch of wood-casing in my own house. When I wired it about six years ago I decided, in the teeth of all existing fire-insurance rules, to exclude wood-casing, and to employ instead either wires drawn into incombustible pipes or wires the insulation of which was protected by an armoring of lead. Lead-armored twin-conductors, braided together externally with an outer braiding, tarred or painted, constitute the main part of the wiring of my house. Such protected conductors are air-tight, water-tight, electric-tight, gas-tight, and rat-tight. They can be either imbedded in the plaster of the walls, or secured against its surface, or run under the floors, with the utmost security.

"In cases where internal conduits are employed, these likewise may be imbedded in plaster, or run under the floors with safety. Another point of divergence from the fire-rules that were in favor six years ago is the absolute avoidance of fuses in ceiling-roses and other inaccessible places. On the other hand, I rigidly exclude from permissible things, though permitted by the Insurance Inspectors, the existence of any joint, soldered or otherwise, however well made, in an inaccessible place under the floor. All branch-wires must be continued back to some accessible place, where they can be brought to a joint-box or fuse-box. Far too great a reliance has been placed by insurance-officers upon the use of fuses, with the result that there are far too many of them, and they are put in all sorts of bad places; for example, in ceiling-roses, and at every place where flexibles are joined to the leads. Far too little stress has been placed on the necessity of not allowing any joint where it cannot be inspected. But the greatest defect of all is this foolish allowance of the use of wood-casing. Behind it bad workmanship and bad joining lie hidden. As wood-casing is difficult to carry between floors it is often omitted in such parts, and the wiring goes unprotected in these uninspected regions. Also when wood-casing passes along a damp wall it may, except in those cases where alternating currents are supplied, set up new troubles arising from electrolytic conduction.

"In my Presidential address to the Institution of Electrical Engineers, I have so recently touched on another aspect of the use of internal piping for protection of electric wiring—namely, the question of cost—that I forbear to enter on that point. The main endeavor should now be to get rid of wood-casing at all costs. Mr. Crackanthorpe's letter shows how, even when carried out expensively, it is unsafe. What greater evil it may entrain in cases where

the wiring is done by a jobbing-contractor at 8s. 6d. a point may be imagined. Prohibit wood-casing, and every wiring-contractor will be compelled to adopt methods which allow less scope for bad workmanship. With the total prohibition of wood-casing the chance of fire will assuredly diminish." I am, Sir, your obedient servant,

SILVANUS P. THOMPSON.

Technical College, Finsbury, E. C., December 19.

"Sir: I have read the letter of Prof. Silvanus Thompson which you printed yesterday with mingled feelings of satisfaction and regret—satisfaction that so high an authority concurs with me in distrusting the ordinary wood-casing as a protection to the insulating-envelope of electric-wires, regret that I had not had the advantage of his opinion before I used such casing in two residences—one in London, and the other in the north of England.

"My unpleasant experience of December 7 was not unique, for the next day I received from a distinguished artist a communication as follows:

"The very same accident occurred to me in a London hotel. I had gone to bed, being very tired, soon after nine, and between twelve and one awoke with the room full of grayish vapor, which was not smoke and, though disagreeable, not suffocative, nor do I remember that it had any particular smell. I jumped out of my bed, however, and in running toward the bell to get assistance, my foot went clear through the floor, and flames, with all the ordinary scents of burnt wood, burst out. While waiting for help also, I did exactly what you did—poured everything I could get hold of in the shape of water through the burning hole. I had never the slightest doubt of the nature of the accident, and knew well enough that it came from an incandescent-wire."

"In my previous letter I mentioned three precautions against insidious electric fires, viz: (1) Outside wiring; (2) abolition of wood-casing; (3) testing periodically for leakage, both by the earth test and by the pole-to-pole test. I propose now to enlarge a little on No. 2, since the proposal is of the highest importance and will be regarded as revolutionary by the trade. Prof. S. Thompson's words are 'the main endeavor should be to get rid of wood-casing at all costs,' and he suggests that we should employ instead 'either wires drawn into incombustible pipes, or wires the insulation of which is protected by an armoring of lead.' The latter, he tells us, is the way in which his own house was wired about six years ago, and he holds his apparatus to be 'air-tight, water-tight, electric-tight, gas-tight, and rat-tight.' I should be sorry to ruffle a feather of my friend the professor, for whose scientific attainments I have the most sincere admiration, but I confess that I am not entirely satisfied with his lead-armoring for general use. As was pointed out in a paper read last year by Mr. Frederick Bathurst before the Incorporated Association of Municipal and County Engineers, 'lead-coverings are liable to rapid deterioration when in contact with the strong chemical cements and plaster now commonly used in building-construction,' and just as rats and mice occasionally attack lead-covered gas and water pipes, so also will they attack lead-covered wires, regardless of the consequences to themselves that may ensue. The Conduit and Insulating Company, Limited, claims to have solved the insulation-protecting problem by running the wires through an iron tube, carrying on its inner surface an insulating lining so expanded by pneumatic pressure as closely to fit the tube. I pass no opinion on this contrivance, except to say that it seems to be both fire-proof and water-proof, also (so far as the lining goes) non-conducting. The material is, however, heavy, and, I should imagine, expensive.

"Another much cheaper method is to employ wood-casing, but not until it has been treated by a special process so as to be incapable of transmitting fire to other wood. In May, 1897, there was published in *The Times* a report of a testing of this process which took place on the site of old Millbank Prison, in the presence of the Prince of Wales, the United States Ambassador, and divers other personages. The result was entirely satisfactory, and wood so treated is now largely used in the ships of the United States Navy and also by our own Admiralty. The objection to it for electric conduits is that it carbonizes at the point of contact with flame, and therefore soon loses its protective quality when exposed to an arc-light caused by some rupture or defect in a wire.

"In my previous letter I also referred to asbestos, and there is no doubt that asbestos, such as that obtained from the neighborhood of Montreal, will, when mixed with good cementing materials, bear an enormous amount of heat without its durability being impaired. The Asbestos Company, Limited, claims to supply asbestos-fibre adapted for packing into electric wood-casing at a cost of not more than 3d. per foot, but the trouble is that asbestos is not moisture-proof, and that leaking of electricity through moisture is a dangerous source of fire.

"There is yet another method which I also referred to—viz., the use of uralite. On December 19 the manager of the British Uralite Company, Limited, wrote to you, Sir, to say that this material was about to be further tested and that he believed it would prove a success. I do not know how this may be, and shall await the result of the further testing with considerable interest.

"I have now, Sir, enumerated all the substitutes for ordinary wood-casing which have come to my knowledge. The question is, Who is to decide between them? In the United States the fire-insurance authorities have established an electrical-bureau, whose

business it is to examine and test electrical-apparatus, to record particulars of electric fires, and to discover their probable origin. Can such a bureau be established here? I suggest that it can, and that the nucleus of it already exists in the electrical-department of the London County Council. That body sends us its admirable fire-brigade, and, after the fire is well over, if it is reported to have occurred through electricity, it sends us a highly-trained official to endeavor to ascertain the specific cause. These causes are, I presume, duly tabulated and classified. Prevention is, however, better than cure, and there are many of us who would be glad to have had the benefit of this departmental experience before we wired our houses. It is, perhaps, too much to expect that the insurance companies will unite and revise their rules made some eighteen years ago, and, failing such revision, we must look elsewhere. The London County Council might, as it seems to me, take the matter in hand, might examine the competing substitutes for wood-casing with the aid of impartial experts, and might recommend to the ratepayers of the metropolis such methods of electric-lighting as can be adopted at the least cost compatible with perfect safety." Yours faithfully,

MONTAGUE CRACKANTHORPE.

December 23, 1899.

THE NERNST ELECTRIC-LIGHT.

ELECTRICAL illumination has come to play so large and important a part in the economy of daily life that any invention which may have the effect of cheapening the cost of electric lighting by increasing the efficiency of the lamp, or of improving the color or quality of the light itself, must command a certain degree of popular interest. These attributes would seem to belong to the recent invention of Prof. Walther Nernst, of the University of Göttingen, a young man who is known by his published works as a leading authority on applied chemistry, and an original thinker and worker in the field of physical science.

It is generally known that the efficiency of an incandescent body is measured by the temperature to which it can be safely raised. In the ordinary bulb-lamp, the incandescent body which emits the light is a long, slender filament of carbon attached at its two ends by platinum connections, and set in a hermetically-sealed glass bulb from which the atmosphere has been exhausted. As this filament is necessarily slender and delicate, the temperature which it will stand—and consequently its luminous efficiency—is definitely limited, and as this limit was practically reached a number of years ago, there has been comparatively little improvement in incandescent lamps during the past ten or fifteen years. While nearly every other feature of an electric-lighting plant, generators, rectifiers, conductors, volt and ampère meters, etc., have been constantly and steadily advanced towards perfection, the lamp has remained limited as regards efficiency, which varies from 3 to 5 watts per candle, as well as in respect to amount and variation of pressure, and is moreover not wholly satisfactory as to cost of maintenance.

The problem undertaken by Professor Nernst was to find an incandescent filament or body which would stand a much higher temperature than carbon—one that would be less sensitive to variations of pressure, and, if possible, work without being sustained in a vacuum. For this purpose he chose the oxides of thorium, zirconium, cerium, and the other so-called rare earths which are used in making the mantles for incandescent gas-lights of the Auer von Welsbach type. Just what combination of these earths he has found most effective is not revealed, but his lamp consists of a rod of this material, 3 or 4 inches in length, held by metallic attachments at either end and inclosed for safety in an open glass globe.

This combination of oxides is in the highest degree refractory—that is, capable of withstanding very high temperature—but it is at the same time a non-conductor of electricity when cold, and only becomes an electrolyte when heated to a certain temperature. Its obvious advantage is, therefore, that it will bear pressures which would quickly destroy an ordinary carbon filament; and, as the luminosity of the lamp is measured by the temperature which it can withstand, it follows that the Nernst lamp should produce a given quantity of light cheaper than by the ordinary lamp with carbon filament. It is claimed for it that its consumption, including the resistance, is but 1.5 watts per candle for large lamps, and 1.6 watts for small lights or low pressures. Another—perhaps the chief—advantage of the new lamp is, that whereas the light of an ordinary carbon incandescent-lamp is too yellow, an arc-light too blue, and a Welsbach gas-light of a greenish hue, the Nernst lamp gives a light having almost precisely the same spectrum as sunlight, and it is asserted that this is the only artificial light by which delicate colors can be matched with practicable certainty.

On the other hand, Professor Nernst's invention would seem to be subject, at its present stage of development, to two grave defects, both of which may be more or less successfully overcome, but which now seriously restrict its commercial value. The first of these is the fact that it does not light instantaneously by simply turning on the current; the rod of refractory oxides must first be heated. For this purpose two devices are used—a small spirit-lamp which must be lighted with a match and turned out when the electrolyte has become hot and begun to glow, and, secondly, a heater, in the form of a coil surrounding, but not touching, the incandescent glower. This heater is supplied by the current from the moment when it is turned on, and is so arranged that when the rod has been heated

and has begun to glow, the heater is automatically cut out of the circuit and relapses into disuse until needed again to light the lamp. All this apparatus, although beautiful as a mechanical device, is so expensive as to seriously limit the value of the lamp for practical purposes. Thirdly, the life of the incandescent glower, if operated at so high a temperature as to reach the best efficiency—say, two-thirds of a candle per watt—does not exceed three hundred hours, while the carbon filament is good for from six hundred to one thousand hours.

Until the first two of these defects can be reasonably overcome by further improvements, the use of the Nernst lamp will probably be confined mainly to large, powerful lights in stores, restaurants, churches, railway-stations, and public buildings, where the few seconds of time which is required to artificially heat the oxide rod to conductivity and the initial cost of the lamp itself are of small importance compared with the saving of 2 watts per candle and the advantages of an electric-light as genial and normal as sunlight. For photography, it will probably supersede all other forms of artificial light and make the photographer practically independent of weather.

Any general adoption of the Nernst light would require that in the end systems of distribution, which are now made for the carbon-lamp, should be laid out to suit it, and this would lead to important economies in cables, which now form so large a part of the cost of distribution systems. The new lamp can not only compete with the carbon filament at all ordinary pressures to which the latter is adapted, but in the higher pressures it will have the field practically to itself. Though not at present a perfected invention, it is entitled to the interest which belongs to a discovery that involves a radical departure from existing methods and points out a new direction in which future progress is likely to be made.

FRANK H. MASON, U. S. Consul-General.

BERLIN, October 27, 1899.

BOOKS AND PAPERS

WHEN a great painter also happens to be a genial, kindly gentleman; when a large part of that painter's work takes the line of portraiture; and when the writer of the "*Life and Letters*"¹ happens to be his son, what can be expected as the result of these conditions but a most interesting and attractive volume. Sir John Millais met everybody worth meeting, from the professional beauties to the famous statesmen; and it is from a letter of Mr. Gladstone's to Mr. J. G. Millais that we gather some insight into the painter's manner of working, or rather of the "intensity with which he worked," to quote the great statesman's words. Mr. Gladstone had always been surprised that artists can paint and talk at the same time—many cannot; hence their inability to be successful portraitists, for, as Mr. Gladstone says, "this must cause a division of energy unfavorable to the work," for portraiture, he adds, "is very arduous work. . . . The result of your father's practice was that, of all the painters I have ever sat to, he took the fewest sittings. This, as well as his success, was due, I think, to the extraordinary concentration with which he labored." Five hours is Mr. Gladstone's estimate of the length of the sittings which Millais required for the magnificent portrait, now, through the generosity of Sir Charles Tennant, one of the gems of the National Gallery, London.

Some of the anecdotes have of course been told before; but the following is new: "The Carpenter's Shop" was the outcome of the combined brains of the Millais family. Every little portion of the whole canvas was discussed, considered, and settled upon by the father, mother and Johnnie before a touch was placed on the canvas. While he was at work, his father and mother sat beside him most of the time, the mother constantly reading to him on every imaginable subject that interested the boy, or stopping to discuss matters with him. The boy himself joined freely and cleverly in the conversation, and when asked how he could possibly paint and talk at the same time, and throw such energy into both, he said, tapping his forehead: "Oh, that's all right, I have painted every touch, as it were, in my head long ago, and have now only to transfer it to canvas!" . . . The father, when unable to help in any other way, would occupy himself in pointing out Johnnie's pencils, or playing whole operas on the flute. This is a domestic interior that would have made an excellent subject for Millais's own brush. The picture, too, of the little boy-student of the Royal Academy being placed upon a stool to receive "all the medals and prizes" from a Royal Duke would be another good subject. The Duke asked the child (a name attached to Millais all his life by his intimate friends) if he could do anything for him. "Well, sir," said the young art-student, knowing that his questioner was Ranger of the Royal Parks, "if there is one thing I should like to ask, it is that I may have permission to fish in the Serpentine." Here is a witness to the truth of the proverb that the child is father to the man; for the great painter is said to have been prouder of landing a big salmon than of any of his professional successes; and upon this subject the book contains a witty letter from Sir William Harcourt, purporting to prove that

¹ "*The Life and Letters of Sir J. Millais, President of the Royal Academy.*" By his Son. 319 illustrations, including 9 photogravures. Two volumes. London: Methuen & Co. 32s.

the artist was under a "delusion" that he had killed a stag, which was but a wooden dummy set up to humor him after his "many failures," which were telling on his health and intellect.

The story of Carlyle asking Millais if "paint did all this," when he was leaving the palatial abode, is corrected by the biographer. It was Carlyle's niece who asked the question; and the answer, although characteristic of the sage, is thought to be apocryphal. "Ah, well, it shows what a number of fools there are in the world!"

In the early Pre-Raphaelite days, Millais suffered much pain from the short-sighted, narrow-minded, and, frequently, ignorant, critics, for any new departure in art invariably brings trouble upon the innovator; and, however confident an artist may feel of his own powers, he must, being of a sensitive temperament, feel hurt at adverse criticism when he knows it to be unjust and born of prejudiced camaraderie. Millais had a firm friend in Mr. Ruskin, to whom was mainly due the "discovery" of the two greatest British painters of the century, Turner and Millais. But even Mr. Ruskin poured forth his wrath over "Sir Isambard" and one or two other pictures of that period. But at the beginning of Millais's career, the ever short-sighted British public, led on by the critics, only coupled the writer with the painter, and dubbed them both a couple of fools, if not mad fools. Millais considered that there was a widespread conspiracy against him. "I cannot tell you of the incivility of certain of the members and their cantankerousness and jealous criticisms and ungenerosity. The *Times* is more wickedly against me than ever. It is well understood . . . that there is more than mere ignorance in the man [the critic]. I don't think there have ever been such endeavors to swamp a man as in my case." Doubtless Millais's honest and candid character added to his troubles in his young days; when he had made his name, outspokenness did not matter; but that a man should make such a remark, when discussing an Old Master, as this — "I can fancy that, some day, people will talk of that picture" (one of his own) "as we are now talking of Frank Hals," was to an ordinary man, if not an impertinence, at all events a piece of aggressive vanity and conceit. And yet, was he not right? Are not many of his portraits equal in power to those by Hals; and should we not couple the modern British painter with Rubens, Rembrandt and Velasquez? This is bold criticism, but most people, certainly all artists whose opinion is of any value, will endorse it; and, taking the work of those three great men, are we giving too much praise to our own painter if we say that his portraits of "Mr. Gladstone," "Cardinal Newman," and "The Yeoman of the Guard," are quite equal to, and may be compared favorably with, any of those by the above-named Old Masters.

It is impossible, in the space at our service in this journal, to give an ample review of this most interesting "Life"; it swarms with letters from, and to, the painter, besides appreciations, recollections, and anecdotes of the latter. The following is not a bad specimen: In the picture of "Nell Gwynne," now in the Tate Gallery, the horse alone was finished by Landseer at the time when he died, and the owner, one of the Rothschilds, asked Millais to complete it. Every one knows the peculiarity of the animal-painter's handling of the brush. One morning a celebrated art-critic called and was much impressed by the work. "Ah! to be sure," he said, going up close and examining a deerhound which almost breathed in the foreground, "how easily one can recognize Landseer's dogs! Wonderful, is n't it?" "Yes, it is wonderful," remarked Millais, lighting another pipe, "I finished painting that dog yesterday morning, and have done the whole of it myself." Many of Millais's models were friends. In the early pictures, Rosetti, Hunt, Stephens and Hughes figured; in one of the later, the "Northwest Passage," Trelawney, the friend of Byron and Shelley, sat for the old sea-captain.

The painter was an excellent correspondent — his letters are witty and entertaining; as a critic too, he was supreme. He not only saw the faults, but he put them straight with a few touches, though some sensitive students dreaded his "piece of chalk." On the testimony of Mr. Val Prinsep, R. A., he used the chalk most freely. "That's too small. Your ear is in the wrong place; it ought to be there (chalk). It's extraordinary how seldom fellows get the position of the ear correctly. Bring that out — so (chalk)" — and so on. On the other hand, he said it mattered little how you get the effect, "so long as you get it." Millais loved music; it cheered and inspired him, and of course he had the pick of the profession to entertain him, besides home music by members of his own family. As an art-critic he was most just to both young and old, as time will prove. "When I look round and see the work of some clever young men, I find no sense of beauty. Even their paint is not beautiful! Now, look here (pointing to Leighton), you may, or may not, agree with his method of painting, but it is *all beautiful*." Here again — of Whistler. "Clever a fellow as he is, I regard him as a great power for mischief amongst young men — a man who has never learnt the grammar of his art, whose drawing is as faulty as it can be. He thinks nothing of drawing a woman all out of proportion, with impossible legs and arms proceeding from no one knows where. Any affectation of superiority in style has its effect on certain minds and attracts a certain number of followers, but when a spectator has to ask himself 'Is this right?' he may be pretty sure it is wrong."

As to Millais's precocious talent, the reader should turn to some of the portraits done at the age of nine, and a wonderful sketch of Hatfield House, in order to realize what a pull a man with such correct observation must have over those who only arrive at the same amount of skilfulness after years of study. It is also interest-

ing to trace the different influences of Hogarth, Elty, Dürer, Michael Angelo and Retsch, before he developed his own Pre-Raphaelite manner in "Isabella," "Ferdinand lured by Ariel," "The Carpenter's Shop," "Grandfather and Child," and finally, the exquisite "Huguenot." Here we must pause, but not without strongly recommending the reader to turn to the work itself, if for no other purpose than to see the most astounding example in modern times of artistic development. Now and again, he goes backwards (what artist does not?); but the *faux pas* only gave impetus to a still more astonishing bound into the ranks of the great army of Immortals.



AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS.

THE annual dinner of the American Society of Landscape Architects was held recently at the Hotel Martin. Members of the Society were present from Boston, Chicago and other cities. Among the members attending were: John C. Olmsted and Frederick L. Olmsted, Jr., and Warren H. Manning, from Boston, and O. C. Simonds from Chicago. Among the members from this city were Miss Beatrix Jones, C. N. Lowrie, Downing Vaux, Samuel Parsons, Jr., D. W. Langton, George F. Pentecost and Miss Bulard.

The officers elected for the ensuing year were as follows: *President*, John C. Olmsted, Boston; *Vice-President*, Samuel Parsons, Jr., New York; *Secretary*, Downing Vaux, New York; *Treasurer*, C. N. Lowrie, New York. William H. Manning, of Boston, was elected a member-at-large, to constitute, with the four officers, the executive committee. There were no papers read or addresses delivered, as the dinner and annual business to be transacted consumed too much time.



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

THE SOUTHWEST PIER OF THE DEWEY ARCH, NEW YORK, N. Y.: "THE TRIUMPHAL RETURN." MR. C. H. NIEHAUS, SCULPTOR.

SEE article elsewhere in this issue.

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TOMB OF CARDINAL TIRASO, IN THE CLOISTER OF THE DOMINICAN CONVENT OF MINERVA, ROME, ITALY.

THIS plate is copied from Giacomo Fontana's "*Raccolta delle migliori Chiese di Roma e Suburbane*."

THE ZEN FAMILY TOMB, IN STA. MARIA GLORIOSA DEI FRARI, VENICE, ITALY.

THIS plate is copied from Cicognara's "*Le Fabbriche e i Monumenti conspici di Venezia*."

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

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[Additional Illustrations in the International Edition.]

THE NORTHWEST PIER OF THE DEWEY ARCH, NEW YORK, N. Y.: "PEACE." MR. DANIEL C. FRENCH, SCULPTOR.

[Gelatine Print.]

THE SOUTHEAST PIER OF THE DEWEY ARCH, NEW YORK, N. Y.: "THE COMBAT." MR. KARL BITTER, SCULPTOR.

[Gelatine Print.]

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NOTES AND CLIPPINGS

ODD ARTESIAN-WELLS.—“A very unique system of artesian-wells is being put in by one of the breweries at St. Louis,” said H. E. Geith, of St. Louis. “The wells may not be exactly artesian-wells, but the water obtained from them is clear and sweet, and the average man knows no better. These wells, instead of being bored perpendicularly, are driven at an angle which varies from one of forty-five degrees to others more acute. This may sound to you like a fairy tale, but it's a fact, curious though it may be. Underlying the territory around St. Louis is a thick layer of hard limestone which has proved no end of trouble to well-borers. No good artesian-water is possible without passing through this bed of limestone, and to do this is an awful job and a costly one. In order to get around this obstacle an ingenious well-man up there has devised the filter-well, like the one I first spoke of—a well which to all intent and purpose is artesian, but really gets its water from the Mississippi River. At St. Louis the sand-beds in the bottom of the Mississippi are quite deep, and this natural feature has been utilized in a very unique manner. From a barge in the middle of the river, in a direct line from the point where the well is to be sunk, a civil-engineer takes soundings and determines accurately the depth of the sand-stratum beneath the river. He then measures the distance from the plant where the well is to be to the middle of the river. From his measurements he calculates the angle necessary to strike the sand-stratum at its lowest point, starting from the point where the well is desired, as well as the amount of tubing required for the well, and with these figures starts the well-digger on his curious task. A core-drill is started into the ground at the proper angle and forced forward by a battery of hydraulic-jacks. As the drill goes deeper and deeper the core is forced out, more tubing is coupled on and the increasing length of pipe is shoved out toward, and finally under, the river. When the sands are reached, the water which percolates under pressure through them is forced through the tubing, to which a brass-strainer is attached to keep out the grit and allow the free passage of the water. After the well is finished a suction-pump, or ‘air-lift,’ is installed, and as long as the strainer is kept in order fair water is obtained. In wells of this type the air-lift is most desirable. By this system the water is forced out of the well by means of a column of compressed-air which is driven to the bottom of the well. Sometimes the well-tubing becomes bent and diverges from a true angle. If the curve is very great the chances are the strainer will not rest in the sand at all and the water will not be pure. But as a general thing these ‘horizontal’ wells are a success.” — *Memphis Scimitar*.

OPHIR.—Dr. Carl Peters, who arrived in London the other day from Africa, has given some further details concerning his discovery of what he believes to be the ruins of the ancient Ophir. He said that he had been exploring the country between the Zambesi and the Pungwe in Portuguese East Africa and Eastern Mashonaland. Before he started from England he had information which led him to believe that Fura was near the eastern entrance of the Lupata Gorge. There he had found it. It was situated on the banks of the Muira River, about fifteen miles south of the Zambesi and half-way between Sena and Tete. At the time of his discovery he had with him Mr. Puzey and two mining-engineers—Mr. Gramann and Mr. Napolski. Fura was the native corruption of the word Afur, by which name the Arabs of the sixteenth century knew the district. Afur was the Sabean, or South Arabian, form of the Hebrew name Ophir. He had ample proof that the Fura which they discovered and explored last summer was the Ophir of the Old Testament. The natives called themselves Makalanga, which means People of the Sun. They were to this day sun and fire worshippers. They were quite unlike the ordinary African, and had a distinct Jewish type of face. On arriving in the district he soon found that the natives had some idea of the existence of the ancient Ophir. In fact, they washed gold themselves after the rainy season, and after storing it in quills did a fairly large trade in it with Beira and Tete. A chief gave him valuable information regarding the position of ancient workings, which he at once investigated. Going to the spot indicated, he found ruins of undoubtedly Semitic type. Fura itself he found to possess a formation of quartzitic slate and diorite between which gold reefs were running. The workings which he found were not only surface workings, but shafts and roads hewn into the rock. — *N. Y. Evening Post*.

AN EARLY SUSPENSION-BRIDGE.—The first bridge built across the Merrimac River, at Newburyport, Mass., was built by Timothy Palmer in 1792. The structure consisted of two bridges resting upon Deer Island. An arch of 160 feet span and 40 feet above high water connected the island with the mainland on one side, and several spans did a like service upon the other. In passing, it may be said that an old legend relates that the island derived its name from the fact that a deer jumped upon it from the mainland across the channel. Passengers upon the old steamer “Merrimac” can even now see a pair of antlers fastened to a tree-trunk standing upon the island a little above the bridge, said to be the antlers of the deer which made the remarkable leap. The present chain bridge replaced the 160-foot arch in 1810, and was built by John Templeman of the District of Columbia. According to the tablet upon one of the towers this was “the first chain suspension bridge built in New England.” The distance between the centres of the towers is about two hundred and forty-four feet, and the length of the roadway carried by the cables about two hundred and thirty feet. The towers above the roadway are built of heavy timbers protected with a shingled covering. The bridge consists of two independent roadways, side by side, each about twelve feet in the clear; each roadway is carried by two sets of cables, each set being composed of three chains made of links 24 inches long. The floor-system is of wood. The

anchorage is about one hundred feet from the towers and the cables run to the tops of the towers without any vertical load. The cables hang in vertical planes, and there is no lateral bracing of any kind other than the floor-planking. Electric-cars have crossed this bridge some eight years, a line of rails being laid in each roadway. To one who has not experienced seeing the rails rise up in front of the car as it moves forward and downward, the sensation is anything but pleasant at first. A light summer-car in the centre of the span causes a vertical deflection of at least two feet. A car crossing the bridge, as viewed from a boat upon the river a little above the structure, gives a beautiful illustration of wave-motion. In the modifications which are contemplated to prevent so much wave-motion in the floor, it is to be hoped the general appearance of the structure may be preserved. — *The Railroad Gazette*.

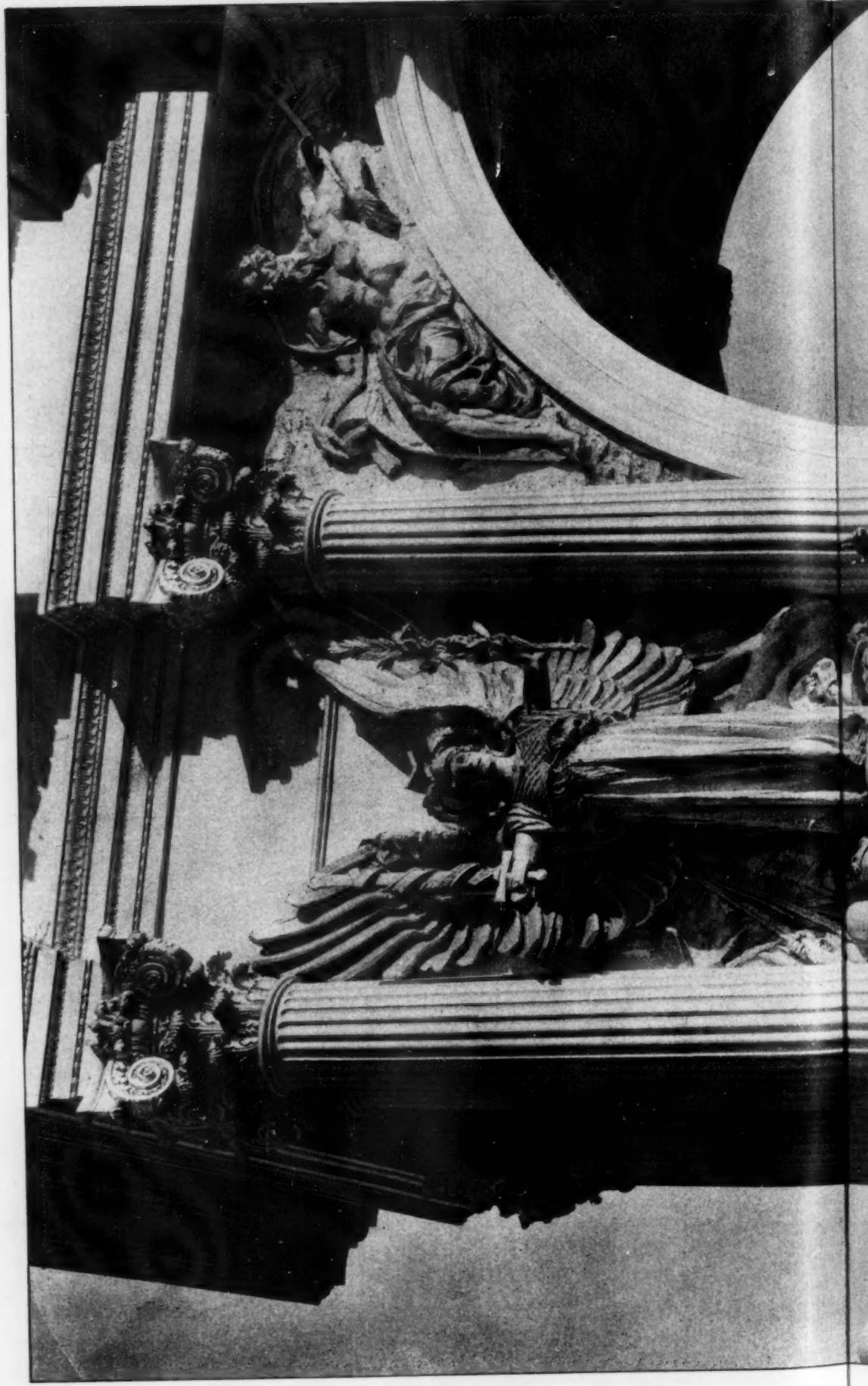
PROTEST AGAINST SEWAGE-FARMS IN THE SUBURBS OF PARIS.—I have already given your readers an account of the new sewage-farms situated to the northwest of Paris in the vicinity of Pierrelaye and Méry-sur-Oise intended to complete the amount of surface necessary for the complete earth-filtration of the sewage of the capital. So will be realized the dream of “everything to the sewer,” an idea formulated some fifteen years ago and already realized at Gennevilliers and Achères. The sewage-farms at Pierrelaye and Méry-sur-Oise, however, do not appear to give unmixed satisfaction. All the local wells are infected, and it is evident from the occurrence of an epidemic of intestinal troubles that the earth-surface is not enough to secure thorough filtration. The sewage seems to escape through fissures in the soil into the subterranean sources of supply to the wells. The authorities of the neighboring parishes were obliged during the hot weather to draw water from the Oise and carry it round in tanks for gratuitous distribution among the population. On learning that the City of Paris intended still further to increase the quantity of sewage distributed on the land, the inhabitants got up a protest, and already 5,000 names have been attached to it. The City of Paris, unable to deny the damage of which it is the author, and recognizing the necessity for doing something without delay, has placed Pasteur-filters in all the schools and public establishments. This, however, is only a provisional remedy, and the inhabitants maintain that Paris, which has contaminated their wells, should supply them with pure drinking-water at its own cost. — *The Lancet*.

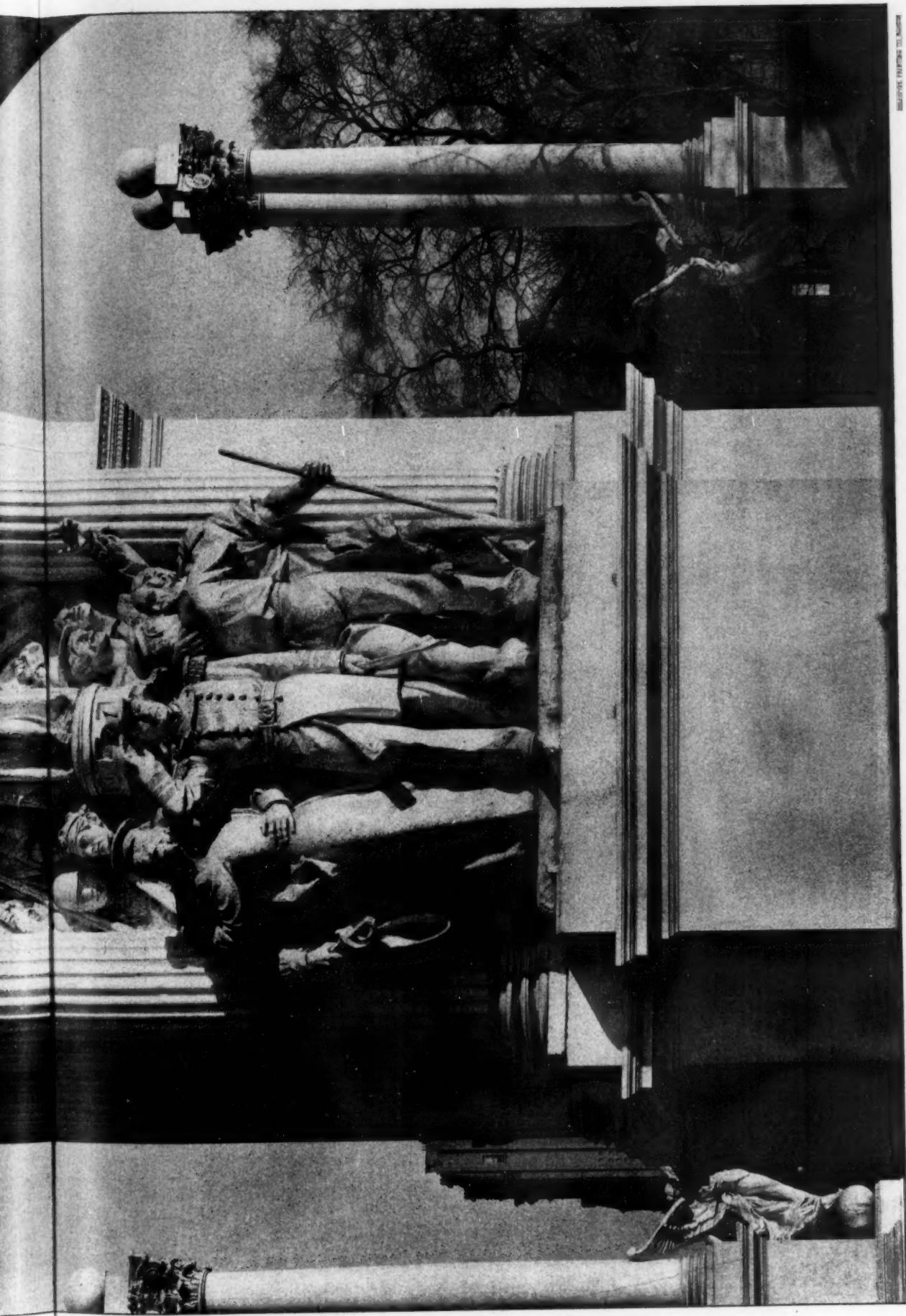
HOW TO VIOLATE AN INSURANCE-POLICY.—Property-owners often violate the terms of a fire-insurance policy, says the *New York Evening Post*, without knowing it. Hundred of dollars are thus paid out yearly for policies that would be worthless if a claim should be contested. An authority calls attention to the following ways in which a policy of fire-insurance can be violated:—

- (1.) Failure to pay premium at the proper time.
- (2.) Change of title or ownership by sale, gift, marriage settlement, devise—any way but by descent—without the consent of the company.
- (3.) Mortgaging the property insured, real or personal, when prohibited by the conditions of the policy, without the consent of the company.
- (4.) Foreclosure proceedings without the consent of the company.
- (5.) False statements in applications (when applications are taken) relating to title, encumbrance, and other facts material to the risk.
- (6.) Other insurance without the consent of the company.
- (7.) Permitting buildings insured to become vacant or unoccupied for more than ten days without the consent of the company.
- (8.) By taking in a new partner without the consent of the company.
- (9.) Increase of risk by keeping prohibited articles on the premises or by change of occupancy of the premises insured.
- (10.) By the removal of personal property to a new location without the consent of the company.
- (11.) The erection of an exposure to the property insured without the consent of the company.

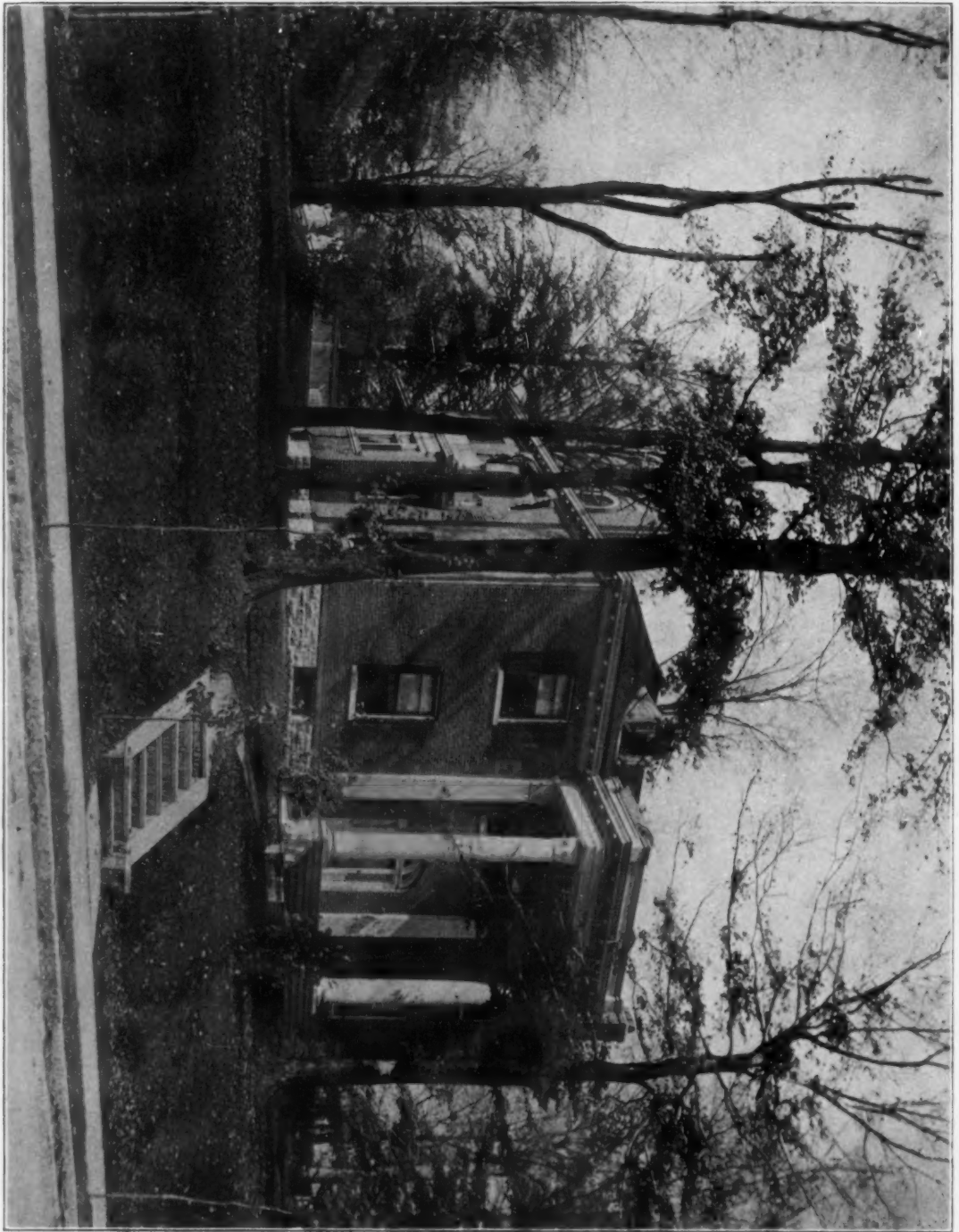
ÆSTHETIC EASEMENTS.—The law of “aesthetic easements” has been worked out recently by the Massachusetts Supreme Court. The Legislature in 1898 passed a law prohibiting the erection of buildings more than ninety feet high on streets adjoining Copley Square, and providing compensation for such property-owners as should be damaged by the limitation. The constitutionality and effectiveness of the statute were questioned by property-owners. The Court held that the statute, like the right of eminent domain, effected a taking of rights in property for the benefit of the public who use Copley Square. It added to the park “rights in light and air, and in view over adjacent land above the line to which buildings may be erected.” These rights were declared by the Court to be in the nature of easements over the lands adjoining the park, and similar to rights in highways, ponds, and navigable waters of the Commonwealth. The Court based its decision in part on the argument that the same reasons which justify the taking of land for a park justify the expenditure of money to make the park “attractive and educational to those whose tastes are being formed and whose love of beauty is being cultivated.” This case (*Attorney-General vs. Williams*, 55 *Northeastern Reporter*, 77) may be a precedent for similar efforts elsewhere, as, for instance, in the matter of preserving the Palisades. — *N. Y. Evening Post*.

AN ARCHEOLOGICAL SURVEY OF THE SOUDAN.—An interesting outcome of the opening of the Soudan by General Kitchener will be an archeological survey of the region. The Egyptian Government has already appointed as Inspector of Antiquities Howard Carter, who for many years has been identified with the Egyptian Exploration Fund. The appointment of an Englishman will be specially welcomed by Egyptologists and all who may be interested in the antiquities of the land of the Pharaohs, as hitherto posts of this character have invariably been given to Frenchmen. Mr. Carter is at present engaged at Thebes in completing his work at the temple for the Egypt Exploration Fund; but it is understood that this will be his last season there, and early in the new year he will enter upon his new duties. — *N. Y. Tribune*.





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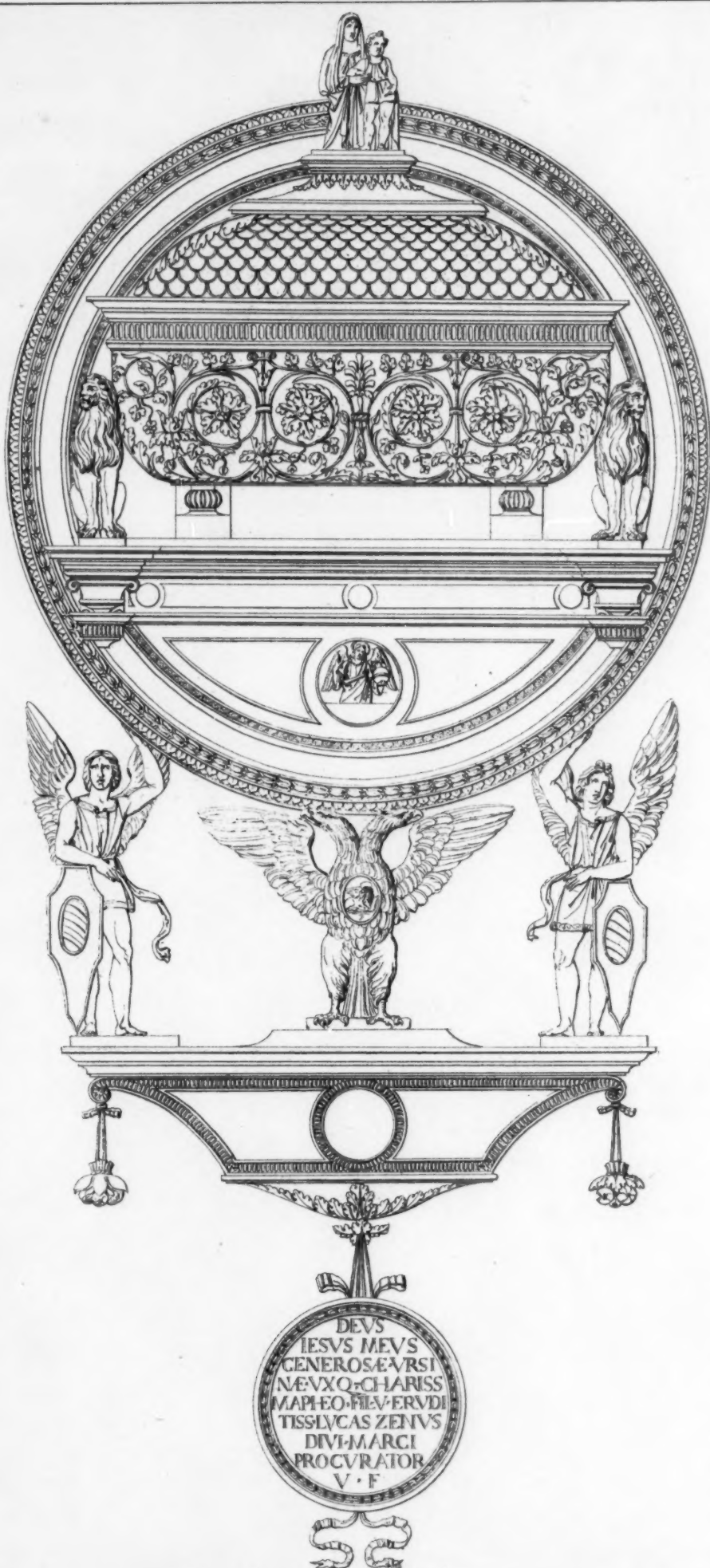
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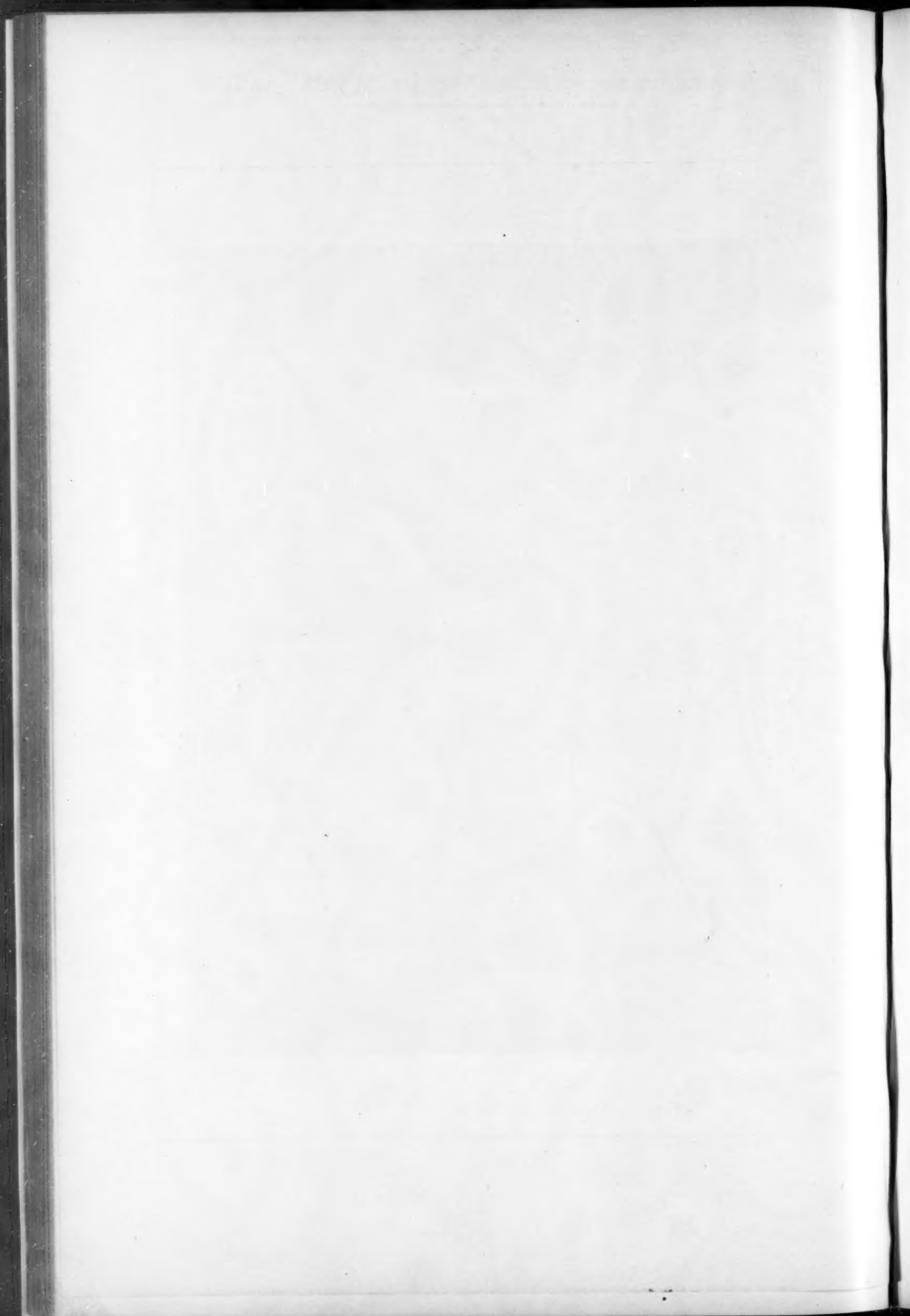
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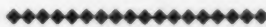
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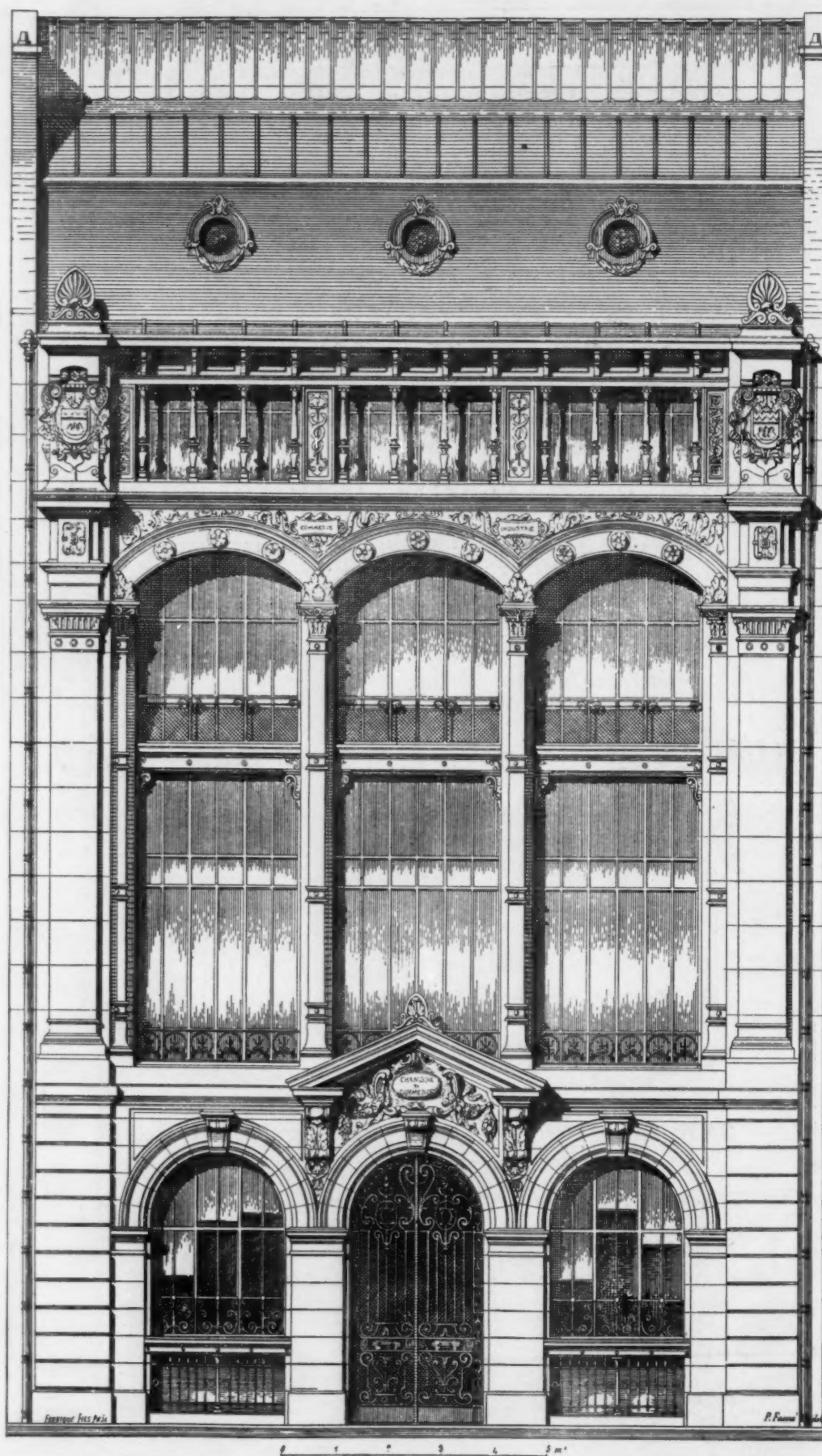
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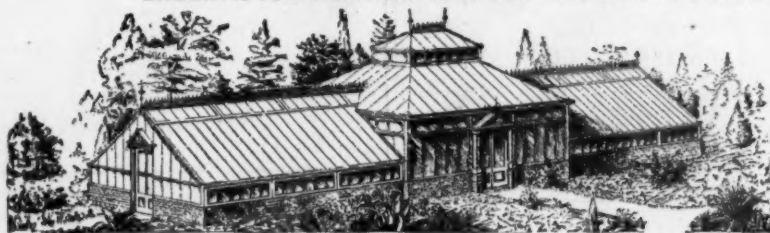
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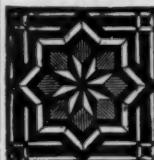
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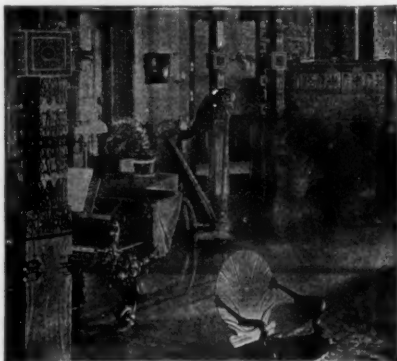
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ANNOUNCEMENT.

COLUMBUS, O., January 1, 1900.

WE beg to announce that The Kinnear & Gager Co. has sold to The Kinnear Manufacturing Co. the Steel Rolling Shutter Department, including patents, patterns, plans, machinery and material pertaining to the Steel Rolling Shutter, Door and Partition Department, also good-will of the business.

All unfilled orders and contracts for rolling shutters, steel curtains and partitions, have been transferred to The Kinnear Manufacturing Co., who will execute same in accordance with conditions named in each of our various contracts, and orders yet unfilled.

All payments, in accordance with condi-

tions stipulated in each order or contract, will be made to The Kinnear Manufacturing Co., on all shipments made on and after January 1, 1900.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

proceed at once with the erection of the Medberry Dormitory. The structure will be 30' x 165', and will be built of brick and sandstone in the Jacobean style. Clinton & Russell, of New York, are the architects.

Hattiesburg, Miss.—A company has been formed with a capital of \$500,000, and will erect a cotton factory here.

Hoboken, N. J.—The Stevens Institute of Technology has had plans drawn for a new engineering laboratory, toward the construction of which Andrew Carnegie donated \$50,000. Dr. Henry Morton, president.

Jackson, Ga.—The Pepperton Cotton Mills will expend about \$75,000 in enlarging their factory.

Jackson, Tenn.—Reports state that the Bemis Bros. Bag Co., of Boston, Mass., have completed arrangements for a \$400,000 cotton-mill.

Jersey City, N. J.—Max Beyer, of Hoboken, has prepared plans for an \$18,000 apartment-house to be built by Joseph Reed on 9th St.

Kansas City, Mo.—Architect Van Brant & Howe, 32 Bayard Building, are preparing plans for the new Humboldt Building, to be erected at 6th and Main Sts.; cost, \$15,000.

The Cable City Land Co. contemplate building a large office-building on a site at the corner of 11th St. and Baltimore Ave. The proposed structure will be of brick and stone, five stories high, and cost about \$100,000.

Kaukauna, Wis.—John Stevens has had plans prepared by Herman Wildhagen, architect, of Appleton, for a bank and office building; cost, \$20,000.

Kings Mountain, N. C.—A number of capitalists have organized under the name of the Cora Cotton Mills, capital \$100,000, with F. Dilling as president, to build a factory here.

Laramie, Wyo.—President Bart of the Union Pacific has presented to the University of Wyoming, six blocks of valuable land, lying just north of the university. The land will be used for building purposes.

Lodi, O.—Warren W. Sabin, England Building, Cleveland, is stated to have prepared plans for a \$60,000 hotel to be erected here for A. B. Taylor.

Louisville, Ky.—Architect J. J. Gaffney, 5th and Jefferson Sts., has prepared plans for a four-story brick vinegar factory, for Jones Bros. & Co.; cost, \$40,000.

Lyons, Mass.—A. W. Hurd will erect a two-and-one-half story residence on Ocean St.; cost, \$6,000.

McKees Rocks, Pa.—Reports state that the St. Mary's Catholic congregation will erect a \$50,000 Gothic church. Rev. A. F. Tonner, Pastor.

Milwaukee, Wis.—Plans are being prepared for a club-house to cost \$15,000, to be built for A. D. Meiselbach in North Milwaukee.

A. D. Meiselbach has had plans drawn by H. Messmer & Son for a one-story frame store-building, to cost \$7,000.

Minneapolis, Minn.—Carl F. Struck, architect, has plans for a residence to be erected on 6th and Harvard Sts., for C. Birkhofer; cost, about \$12,000.

Fred Kees, architect, has plans for improvements to be made in the 6th St. corner of the Syndicate Block. The entire front and side in the basement and first floor will be taken out and iron and plate glass put in place; cost, \$18,000.

Mobile, Ala.—It is stated that the Battle House hotel is to be remodelled at a cost of \$300,000.

Montgomery, Ala.—A \$300,000 hotel is to be erected here. F. M. Billings is said to be interested.

Muskegon, I. T.—E. E. McKibban has prepared plans for a dormitory and school-building, to be erected by the trustees of Spaulding Institute. The building will be three stories high, constructed of brick, and will cost about \$25,000.

Nashville, Tenn.—Thompson, Gibel & Asmus, 72 Cole Building, have completed plans for the clubhouse to be built by the University Club; cost, about \$25,000.

New Brunswick, N. J.—The Masonic Hall property at the corner of George and Albany Sts. has been decided upon as the site for the new Post-office building by the authorities in Washington.

New York, N. Y.—An association of well-known Hebrews in the 16th Ward called the Free School of Biblical Instruction will erect in Boerum St. a synagogue and free school for poor children; cost, about \$30,000. S. Epstein, pres.

Press reports state that Alfred E. Aarons, formerly manager of Koster & Bial's Music-hall has plans ready for a new music-hall building here. The section of the city is not mentioned, but it will have a Broadway frontage and will follow closely the same plans as Hammerstein's Victoria.

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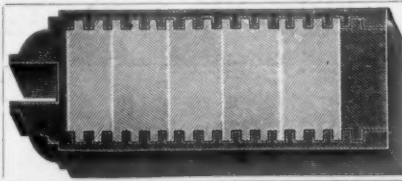
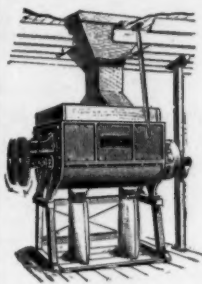
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

It is announced that the Progress Club will build a new club-house to cost \$2,000,000.

It is reported that the Erie Railroad has bought the block bounded by Washington, Reade, West and Duane Sts., and will erect upon it a large office-building, to cost \$1,500,000.

The Edison Electric Illuminating Co. has had plans drawn for a new power-house, to cost about \$800,000. The structure will occupy the block from 1st Ave. to the East River, and from 38th St. to 39th St. It will be three stories in height, of brick and stone, and when completed the plant will be one of the finest of its class in the country.

Norfolk, Va.—The Building Committee of the Central Church are said to be considering plans for a new edifice to be erected on Washington and South Sts., to cost about \$30,000.

North Attleboro, Mass.—Woodbury Melcher is to erect a \$6,000 dwelling after plans by Architect E. J. Lewis, Jr., Boston.

Oakland, Cal.—The congregation of the First Church of Christ has designs furnished by Architect Henry A. Sultze for a stone church, to cost \$40,000.

Oberlin, O.—Lewis H. Severance, of New York, has given \$60,000 to Oberlin College for a new chemical laboratory. Howard Shaw, of Chicago, Ill., is architect for the proposed building, which will be erected early in the spring.

Omaha, Neb.—A two-story frame residence will be built at 10th and Bancroft Sts., for Dr. Eskildson. It will be modern throughout, and will be 28' x 43'; cost, \$32,000. F. A. Henniger, architect.

A stone residence is to be erected for Geo. A. Joslyn, to cost \$75,000. There will be a stable for same, to cost \$25,000.

The Joseph Schlitz Brewing Co. will build a brick store and lodge room on S. 16th St., from plans by Kirchhoff & Rose, architects, of Milwaukee, Wis. The building will cost \$10,000.

Oswego Falls, N. Y.—T. J. Gillette, of Syracuse, has prepared plans for a 16-room school-building, to cost about \$35,000. A. C. Davis, Clerk Board of Education.

Oxnard, Cal.—An eight-room public school-building is to be erected here, for which plans and specifications are now being prepared; cost, about \$17,000.

Pavoli, Wis.—H. Messmer & Son, of Milwaukee architects, have plans for a brick church for St. William's congregation. It will be 38' x 88'; cost, \$7,000.

Peabody, Mass.—A summer residence, to cost \$10,000, is to be erected at Proctor's Crossing for Nelson P. York.

Philadelphia, Pa.—Francis A. Gugert has drawn plans for a \$15,000 stone house to be built on Elkins Ave., Ogants Park, for E. D. Douglass.

A New York architect is said to be preparing new plans for the alteration of the Wm. L. Kikins residence at Broad and Stiles Sts. into a modern apartment-house. A ten-story addition to be built

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

of brownstone, brick and terra-cotta is among the improvements, the whole to cost about \$500,000. Work will begin in the spring.

Rankin & Kellogg, 1624 Walnut St., are stated to have completed plans for a church to be erected at Broad St., above Pine, for the Chambers-Wylie Memorial congregation; cost, \$150,000.

Henry Hirsh, at 1719 Chestnut St., will build a four-story brick and stone front modern residence, to cost about \$12,000.

B. F. Teller & Bro. will let contracts for alterations and additions to their property at 1421 Filbert St. The work includes the alteration of a private house into a store and office-building, and additions to cover the whole site; cost, about \$15,000.

Plainfield, N. J.—Mayor Rockfellow in his message urgently recommends that a special committee be appointed by the Council, with power to procure and submit plans and specifications and do such other work as may be necessary to the preliminary steps toward the securing of a City-hall. The Councilmen are favorable to the project.

Portland, Ore.—It is announced that the Doernbecker Manufacturing Co. will shortly begin the construction of a large manufacturing plant between E. 20th St. and Hoyt Ave.

Providence, R. I.—Plans have been prepared for a \$60,000 edifice to be erected by the Church of Our Lady of Consolation. Rev. J. C. Bessette, pastor.

Reading, Pa.—Reading's Maennerchor, it is announced, will erect a society hall, to cost \$20,000.

Richmond, Va.—It is reported that Architect Charles H. Read, Jr., is preparing plans for a six-story brick and stone apartment-house, to cost about \$50,000.

Rockford, Col.—It is said that the American Beet Sugar Co. are arranging for the establishment here of a large beet-sugar plant, to cost \$500,000.

Rockingham, N. C.—The stockholders of the Steele Cotton Mills have decided to double the capacity of their mills at once, at a cost of about \$100,000. Robert L. Steele, president.

Schenectady, N. Y.—The General Electric Co. will build what it is said will be the largest office-building for manufacturing in the world. It will be 150' x 250', and five stories high. It will be used solely for the general offices of the company.

Seattle, Wash.—Wilbert L. Smith, of Syracuse, N. Y., will erect a five-story brick and stone business block, 110' x 120', at Occidental Ave. and Jackson St., to cost \$65,000.

Shelbyville, Ind.—The Knights of Pythias will build a castle hall and opera-house, to cost about \$40,000.

St. Louis, Mo.—Eames & Young have drawn plans for a new plant and warehouse to be erected on Newstead Ave., at a cost of \$75,000.

Stonington, Conn.—The Stonington Building Co. will increase its capital stock from \$36,000 to \$60,000 for the purpose of doubling the brick building, which it leases to the Velvet Co.

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250 "	6 "	8 "	155 "	6 "	12½ "
330 "	7 "	9½ "	200 "	7 "	15 "
430 "	8 "	11½ "	50 "	7 "	12½ "
80 "	9 "	13 "	250 "	8 "	17½ "
100 "	10 "	15 "	95 "	9 "	21 "
50 "	10 "	16 "	155 "	10 "	25 "
225 "	12 "	20½ "	200 "	12 "	31½ "
			200 "	12 "	40 "
			265 "	15 "	42 "
			150 "	15 "	50 "
			180 "	15 "	60 "
			25 "	20 "	65 "

In addition we also have all sizes on Angles both with even and uneven legs, from 1 x 1 x ½ in. to 6 x 6 x ¾ in., and Plates from 6 in to 60 in in width. We also have a fair stock of Zee Bars, Tee Iron and special shapes.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

St. Paul, Minn. — Reports state that Swift & Co. will expend about \$200,000 in making alterations to their plant in this city.

Wichita, Kan. — Architect Elbert Dumont, 117 N. Main St., has prepared plans for a brick and stone wholesale grocery building for the Lehman-Higginson Grocery Co.; cost, \$20,000.

APARTMENT-HOUSES.

Brooklyn, N. Y. — St. Nicholas Ave., s w cor. Harman St., 4 three-st'y bk. flats, 25' x 65'; \$21,000; o. Jacob Blank, 638 Willoughby Ave.; a. W. B. Wills, 17 Troutman St.

Pacific St., s w cor. Nostrand Ave., five-st'y bk. apart., 31' 6" x 109' 5", gravel roof, steam; \$25,000; o. E. J. Maguire, 62 Herkimer St.; a. A. S. Hedman, Arbuckle Building.

Pearl St., e s, 100' x Sands St., five-st'y bk. apart., 28' x 85' 8", gravel roof, steam; \$20,000; o. Thomas Corrigan, 1096 Prospect Pl.; a. H. E. White, 136 Seventh Ave.

Brushton, Pa. — Three-st'y bk. & fr. apart., 21' x 58', gravel roof, gas; \$5,000; a. A. Dudgeon, Wilkesburg, Pa.

Chicago, Ill. — Larrabee St., three-st'y bk. apart., 50' x 105'; \$20,000; o. John S. Ketcham; a. George L. Harvey; b. Leafgreen Bros., Chamber of Commerce Building.

W. Twenty-second St., No. 1509, four-st'y bk. store & flats, 24' x 70'; \$6,000; o. Albert Wachowski; a. L. Novy; b. Frank Leszczyk, 132 W. 23d St.

New York, N. Y. — Second Ave., s w cor. 63d St., 7 five-st'y bk. flats & store, 25' 1" x 80'; \$161,000; o. J. J. Houlihan, 99 Nassau St.; a. Schneider & Hester, 46 Bible House.

E. Fifteenth St., Nos. 338-340, seven-st'y bk. & st. flat, 42' x 93' 3"; \$30,000; o. Tchaff & Silberman, 83 Canal St.

Hamilton Pl., s w cor. 143d St., seven-st'y bk. flat & store, 88' 9" x 94' 11"; \$180,000; o. C. F. Rogers, 1663 Amsterdam Ave.; a. Hy. Andersen, 1180 Broadway.

Broadway, n w cor. 75th St., eight-st'y bk. flats & stores, 133' 6" x 159' 9"; \$400,000; o. William Waldorf Astor, England.

Ninety-ninth St., nr. 3d Ave., six-st'y bk. flat & store, 25' x 89' 7"; \$35,000; o. Dora Schreer, 307 W. 111th St.; a. Moore & Landsiedel, 148th St. & 3d Ave.

Pittsburgh, Pa. — Liberty and Millvale Ave., three-st'y bk. & st. apart., 120' x 137', gravel roof, steam, \$50,000; o. A. J. Carr; a. W. Arthur Thomas.

Yonkers, N. Y. — Riverview Pl., No. 24, three-st'y fr. flat, 35' x 57'; \$6,000; o. Gustave Kleins.

BUILDING INTELLIGENCE.

CHURCHES.

Boston, Mass. — Blue Hill Ave., cor. Wayne St., bk. church, 75' x 90' x 121', pitch roof, steam; \$75,000; b. P. Leach; a. Frank Keeley.

Evansville, Ind. — Bk. & st. church, 150' x 200', slate roof, steam; \$15,000; o. First Christian Congregation; a. Harris & Shopbell.

Milwaukee, Wis. — Southside, two-st'y bk. church, 34' x 60', pitch roof, furnace; \$12,000; o. St. Vincent Congregation; a. N. Dornbach.

Worcester, Mass. — Lincoln St., fr. church building, 64' x 69'; \$12,000; o. Adams Square Baptist Church; b. Rankin & Woodside; a. Earle & Fisher.

EDUCATIONAL.

New York, N. Y. — Randall's Island, three-st'y bk. & st. dormitory, 61' x 100'; \$40,000; o. City of New York; a. Horgan & Slattery, 1 Madison Ave.

FABRICATORIES.

Boston, Mass. — Humphreys St., nr. Cottage St., fr. dye-house, 38' x 76' x 121', flat roof, steam; \$10,000; o. & b. S. H. Deloz; a. E. P. Morse.

Brooklyn, N. Y. — Christopher Ave., nr. Glenmore Ave., six-st'y bk. store & factory, 27' x 95'; \$16,000; o. M. Levy, 47 E. Broadway, New York; a. Horenburger & Straub, 122 Bowery, Manhattan.

HOUSES.

Boston, Mass. — Batchelder St., Nos. 65-71, 4 bk. dwells., 21' x 22' x 54', flat roofs, stoves; \$30,000; o. & b. Max Hurvitz; a. C. A. Halstrom.

Brookline, Mass. — Clark Road, No. 11, 2½-st'y fr. dwell., 30' x 40'; \$7,000; o. Michael McGovern; b. A. G. Brewer & Co.
Clark Road, No. 14, 2½-st'y fr. dwell., 28' x 40'; \$17,000; o. George A. Brown; b. A. G. Brewer & Co.

Grosse Point, Mich. — Two-st'y bk. & fr. dwell., 40' x 64', pitch roof, furnace; \$6,000; o. Alfred K. Kiefer, Detroit; a. Louis Kamper.

Indianapolis, Ind. — Meridian and McLain Pl., two-st'y bk. & st. dwell., 37' x 63', hot air; \$5,200; o. T. W. De Haas; a. S. A. Hastings.

WAREHOUSES.

Council Bluffs, Ia. — Five-st'y bk. & sandst. warehouse, 10' x 110', gravel roof, steam; \$30,000; o. Wickham Bros.; a. J. C. & W. Woodward.

Detroit, Mich. — Jefferson Ave., Nos. 1326-44, fr. storehouse & foundry; \$10,000; a. Louis Kemper.

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LIBRARY.

[At Duluth, Minn.]
Plans will be received by the Building and Grounds Committee of Duluth Public Library until February 5th, for a library building, to cost \$50,000. W. M. HUBBARD, Chmn. 1258

SCHOOL.

[At Rutherford, N. J.]
Plans are invited until February 16th, for a new school-building, to cost \$42,750. BOARD OF EDUCATION. 1258

PROPOSALS.

OFFICERS' QUARTERS.

[At West Point, N. Y.]
West Point, N. Y., January 13, 1900. Sealed proposals, in triplicate, will be received here until February 13, 1900, for construction of officers' quarters, as per plans. Address Q. M., U. S. M. A. 1258

SCHOOL.

[At Brooklyn, N. Y.]
Sealed proposals will be received by the Committee on Buildings of the Board of Education at the hall of the Board, No. 146 Grand St., Borough of Manhattan, until January 23, for erecting new public school 125, Borough of Brooklyn. RICHARD H. ADAMS et al., Committee on Buildings. 1256

DESKS, ETC.

[At Havana, Cuba.]
The Military Governor of Cuba invites bids until February 15th, for supplying one or more lots of school-desks, book-cases or closets, chairs, teachers' desks, clocks, etc., for the public schools of the island. ADNA K. CHAFFEE, Chief of Staff. 1258

HIGH SCHOOL.

[At Fremont, Neb.]
Sealed bids will be received by the Board of Education of the Independent School District of Fremont, Nebraska, until February 6, 1900, for the erection of a high school building. M. E. REYNOLDS, Sec. of Board. 1258

CHURCH.

[At Spring Green, Wis.]
Bids will be received until February 1, for the erection and construction of a church for St. Mary's parish. REV. J. LAW, pastor. 1256

RESIDENCE.

[At Sacramento, Cal.]
The State Capitol Commission invites sealed bids until January 5th, for the erection and construction

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No. 585,275, May 25, 1897
No. 585,276, May 25, 1897
No. 591,588, Oct. 12, 1897

No. 620,888, Mar. 14, 1899
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No. 608,540, Aug. 2, 1898
No. 608,972, Aug. 9, 1898

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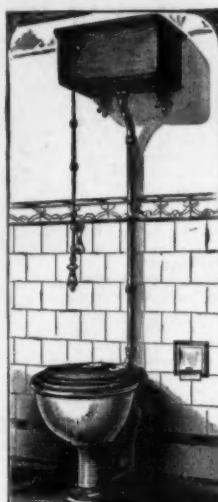
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PROPOSALS.

tion of a residence for the governor of the State of California. HENRY T. GAGE, pres., W. H. DAVIS, sec. 1256

COURT-HOUSE.

[At Dixon, Ill.] Sealed bids will be received until January 20, 1900, for the erection of a court-house for Lee County. E. W. SMITH, Chairman Building Committee. 1256

PROPOSALS.

ASYLUM.

[At Pueblo, Col.] Sealed bids will be received until February 1st, for the erection of a home for feeble minded. DR. H. WORK. 1257

Treasury Department, Office Supervising Architect, Washington, D. C., January 8, 1900. Sealed proposals will be received at this office until 2 o'clock P. M. on the 26th day of February, 1900, and then

PROPOSALS.

opened, for the construction (except heating apparatus, electric wiring and conduits) of the addition to the U. S. Court-house and Post-office Building at Topeka, Kansas, in accordance with the drawings and specification, which will be furnished at the discretion of the Supervising Architect on application at this office or at the office of the Custodian, U. S. Court-house and Post-office, Topeka, Kansas. JAMES KNOX TAYLOR, Supervising Architect 1256

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

SECTION 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.

SECTION 3. No Member should be a party to a building contract except as "owner."

SECTION 4. No Member should guarantee an estimate or contract by personal bond.

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

SECTION 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.

SECTION 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.

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

SECTION 9. It is unprofessional for a Member to criticize 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.

SECTION 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.

SECTION 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.

SECTION 12. The American Institute of Architects' "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.

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

SECTION 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."

SECTION 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.

SECTION 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.

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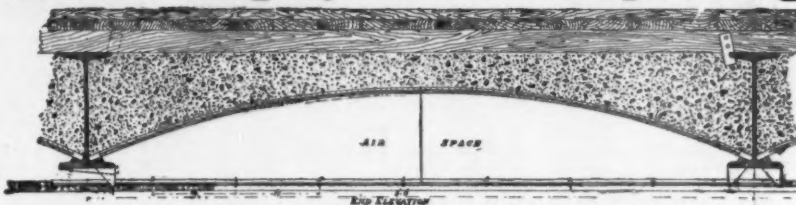
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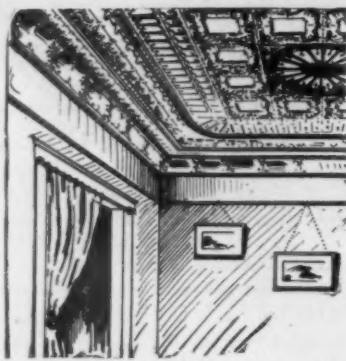
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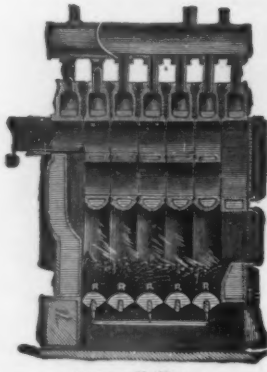
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