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SOME of our readers have probably noticed the advertisement of the Common Council of the city of Buffalo, inviting competitive designs for a soldiers' and sailors' monument. This project has been before the architectural world in various forms for a long time. Some six or seven years ago a Ladies' Monument Committee obtained from Mr. H. H. Richardson a design for a sort of memorial arch, which was, we believe, actually adopted, but the execution postponed for lack of funds. Afterwards, in 1878, the city authorities took the matter up, and invited designs in competition for a monument to cost not over twenty thousand dollars. Thirty or forty plans were submitted, and that of Mr. George Keller of Hartford, whose eminence in this class of design is familiar to all our readers, was selected as the best. The committee, however, as they naïvely asserted, were "unanimously of opinion that the designs submitted by Buffalo talent were in no wise satisfactory, and that others more artistic could be prepared; that the work should not go out of the city if they could obtain designs here that would insure the erection of a monument which would not only be a fitting memorial to the soldiers and sailors who died in defence of the Union, but the pride of every citizen as being evidence of what can be provided here by home talent;" and they therefore kept Mr. Keller's drawings, and invited the resident architects to submit new designs "which," as they say, "should compare favorably with the designs prepared by the more experienced monument builders of the East." The Buffalo architects were apparently too honorable to take advantage of such a questionable invitation, for nothing was received in response to it except a drawing from a co-operative stone company, and after waiting for six months in vain, Mr. Keller's design was definitely adopted. Two years more passed away, and a new city government came into office, of which the most prominent member was one of the unsuccessful architects in the competition of 1878. Before this time about fifteen thousand dollars had been raised by the Ladies' Committee, and a further sum had been appropriated by the city, so that there was nothing in the way of carrying the selected design into execution, when for some unexplained reason the previous action of the City Council was rescinded, and it was voted to proceed at once to erect the monument, but without specifying the manner in which this was to be accomplished. The Ladies' Committee declining to place their funds at the discretion of the Council under these circumstances, the latter resolved to make up the requisite amount from the public treasury and to advertise for new designs on their own account; which has accordingly been done, in spite of Mr. Keller's very justifiable protest.

A NOVEL form of electric lamp for domestic purposes has been devised by Dr. Paget Higgs, an electrician of New York. The source of light, instead of an incandescent loop of platinum wire or carbonized fibre, is in this lamp a minute electric arc, the carbon points being very small, and separated by a distance hardly perceptible, but the tiny spark formed between them emits a light equal to that of forty candles. The most remarkable feature of the apparatus is, however, its adaptation to the use of stored electricity. Following the indications given by several recent investigators, the inventor has succeeded in forming "secondary batteries," filled with some substance which, by voltaic decomposition and subsequent chemical re-combination, affords a practicable means of receiving and retaining an electric charge to be drawn upon afterwards in such quantity and at such times as may be desired. This gives a peculiar advantage in lighting ships or railway trains, but even where a continuous current can be had from a dynamo-electric machine, Dr. Higgs finds it advisable to interpose the secondary batteries for the purpose of equalizing and steadying the light. The principal objection to the electric lamps now used is their variability, and the light even of the incandescent wires flickers quite perceptibly with every vibration of the fly-wheel, so it may well be believed that such a means of accumulating energy would be useful.

DR. HIGGS'S system has been so far perfected that a company is already formed, and terms are fixed for the introduction of the new light into private houses. The lamps as now arranged depend upon a weak voltaic battery for their supply of electricity. The current from this would be far too feeble to produce the voltaic arc, but the energy produced by its constant action is stored up in what is called the "secondary battery," and drawn thence as wanted; the total amount of energy produced by the small battery in twenty-four hours being quite sufficient, when drawn in a large stream from the secondary reservoir, to give a brilliant light for four or five hours. The carbons are treated chemically in some way, so that their consumption is slow, one pair lasting a week under ordinary use, and they can be replaced in a few seconds. Unlike all other forms of electric lamps hitherto employed which derive their energy from voltaic currents, the Higgs light is said to be very inexpensive, and the published offer of the company is to place the apparatus, with a number of lamps, in the house of any responsible person on a month's trial. At the end of the month, if the cost of chemicals for producing the light, added to the interest on the first cost of the apparatus, is more than would have been the expense of the same light from gas at the rate of seventy-five cents per thousand feet, the company will take back the whole without charge. The batteries are enclosed in a box which can be set on a shelf in any convenient place, and require no more attention than the house batteries now used for many purposes. An application of the same principle has been made for furnishing motive power; and it is said that a street-car motor is about to be put into use which can be charged at the stations with electricity sufficient for a three hours' trip.

THE Broadway underground railroad is hardly yet begun, but its prospect of success is so flattering that already a second line is projected, to pass through Elm Street and Fourth Avenue directly from City-Hall to the Grand Central Depot at Forty-second Street. This will be used exclusively for through traffic, and the trains will run regularly from the Post-Office to the Depot, a distance of more than three miles, in five minutes. Although the suburban business of the New York railroads is small in proportion to that of Boston, such a transfer line would have ample patronage, while the railroads themselves might well afford to contribute something toward its construction, for the profit it would bring them. When all the new roads are completed, and a passenger arriving from the north by the New Haven, Harlem and Hudson River lines, from the east by the Blackwell's Island bridge, or from the west and south by the Hudson River tunnel, is landed in five minutes at the Post-Office, whence he can again be transported, either above or below ground, at a rate varying from five to forty miles an hour, to almost any point in the city, New York will indeed be the most convenient place in the world to do business in. Already the comparatively inadequate facilities furnished by the elevated roads have done wonders for the growth of the city, and the extension and perfection of such facilities will do still more; developing particularly the beautiful suburbs toward the north and west, which we hope soon to see occupied by those clean and spacious streets, wholesome and well-drained houses, and sweet glimpses of blossoms and verdure, which New Yorkers dream of, but have almost given up the hope of possessing.

Chicago, from the Ultima Thule of the West, has become almost the centre of population on the continent, and the need of better facilities for transferring from one side of the city to the other the freight and passengers to whom it is but a way-station on their journey has become pressing, as every traveller knows. Two or three plans for "belt railroads," to encircle the city, intersecting all the other lines, have been under consideration, and one is likely to be carried out without delay, which will extend from the docks and rolling-mills at South Chicago to the tracks of the Chicago Southern road, now owned by the Grand Trunk Railway; and thence to the Burlington and Quincy and North-western systems. It is very possible that more direct communication may be obtained in the future, but for the present this new line will prove very serviceable. Nothing is more desirable, so far as the interests of the public are concerned, than that this gradual interweaving of the great trunk lines should proceed without interruption, as a means of breaking down the monopoly which is always exercised by a single road. In England, where the system of branch and junction roads is carried to such a pitch that it is possible to travel between almost any two points by a dozen different routes, railway rates are, if not low, at least nearly uniform, and the alternations of extortionately high rates with absurdly low ones, so common here, are unknown.

The switchmen on the Chicago, Milwaukee & St. Paul Railroad struck about three weeks ago for an advance in wages, accompanying their demonstration by some acts of violence. After waiting awhile without being able to obtain the desired advance, they proceeded to call attention to their wants in a still more emphatic manner. One of the foremen at the company's yard at Milwaukee, who had refused to listen to the overtures of the strikers, was riding late at night on a shifting-engine with the engineer and fireman, when a bomb was thrown at the engine, fortunately falling short and striking in a ditch at the side of the track, where it exploded with a detonation like the discharge of a cannon, tearing up the ground for yards around, and shattering the glass in the neighboring houses to a considerable distance. The engine was slightly injured, but no harm was done to the three men upon it. On examining the ground, another bomb was found which had fallen in the mud of the ditch, and had failed to explode. It was about six inches long, filled with nitro-glycerine, and wrapped with canvas. Search was made for the persons who threw the bombs, but without result. The introduction of these new arguments into the counsels of railway strikers opens a prospect not altogether agreeable. If switchmen see fit to attempt the indiscriminate assassination of three persons to gratify a private grudge against one of them, there is no reason why the principle should not receive still further application, and the blowing up of passenger trains become a recognized means for raising the standard of wages among railroad employees, or securing other objects which they might deem desirable. It is scarcely necessary to point out the certain ruin which two or three repetitions of such outrages as have occurred on the Milwaukee & St. Paul and the Grand Trunk lines would bring to the business of any railroad, and the interest of the former line, as well as public protection, demands that these would-be assassins should be speedily found and brought to justice.

Considerable interest is felt in England with regard to the election of a President for the Royal Institute of British Architects, to succeed Mr. Whichcord, the present incumbent. The By-laws provide that the Council shall nominate an official candidate, and, probably to prevent dissensions in the government of the Institute, another recent regulation requires that in case of a vacancy in the Presidency, the senior Vice-President shall be thus nominated. In the present case, the senior Vice-President is Mr. Horace Jones, for a long time architect to the city of London, and a man personally popular, but by no means distinguished in the profession. The presentation of his name by the Council was a great surprise to the public, and to those members of the Institute who were ignorant of the regulation which left the government no other choice, and a movement was immediately commenced for bringing forward as an independent candidate Mr. George Edmund Street, now the most prominent architect in Great Britain. It is unquestionably for the interest of the Institute that it should be presided over by its most distinguished members, and Mr. Street, if he is willing to be a candidate, as is understood to be the case, will receive a very large vote. There are, however, many members who feel it a duty to support the official nominee, either from a sentiment of loyalty to the Council, or through fear of disturbing the harmony of the Institute, and Mr. Jones, unless he should see fit to withdraw his name, which would perhaps be the most graceful way out of the difficulty, will probably have a strong support. The question is still further complicated by the fact that Mr. Street held for some time the position now occupied by Mr. Jones, but resigned it in consequence of the dislike which he felt for the principle of official succession, so that the canvass will be to some extent not only a contest between persons and reputations, but between two systems of government for the Institute.

The representation of the *Œdipus Tyrannus* of Sophocles in the original Greek, which has been looked forward to with much interest for a long time, took place in the Academic Theatre at Cambridge last week before a very large and appreciative audience. So great was the demand for tickets that no less than three repetitions of the play were necessary to satisfy it, and the success of the undertaking certainly justified the care and time which have been devoted to it. The preparation of the single scene was entrusted to Messrs. Ware & Van Brunt, the architects of the theatre, who in turn delegated it to Mr. Eugène Létang, Assistant Professor of Architecture at the Institute of Technology, who prepared the carefully colored drawings and full-size details from which the work was very successfully executed by Mr. Albert Haberstroh. The whole flat was about sixty feet long, and nearly thirty feet high, and was painted in imitation of the conventional architectural composition which in the Greek theatres stood for whatever building the play might require. In the present case it depicted, with all the fidelity that attentive study of the best authorities could give, a royal palace of the earliest historical period in Greece. The lower half was occupied by a plain wall of masonry, with a large door in the centre and smaller ones on either side, surmounted by a frieze about thirty inches high on which was painted the battle of Greeks and Amazons, copied from the frieze of the temple at Bassæ in Arcadia, now in the British Museum, or rather, to speak with greater accuracy, from its miniature reproduction and restoration belonging to the architectural collections of the Institute of Technology, which was photographed and the enlarged image thrown upon the strip of canvas which was to become the frieze, thus simplifying the artist's work. This basement supported an order of engaged columns carrying a cornice and two small pediments, one over each of the side doors. This order was taken from the small temple B at Selinus, called by M. Hittorff the Temple of Empedocles, one of the best known examples of the combination of a Doric entablature with Ionic columns. A purer Ionic style would have seemed bare without another frieze of figures, while a pure Doric order, unless drawn in perspective, would have looked like a series of pilasters. Besides, the refinement of the Doric style would have been impracticable with the means at command, and without them the order would have seemed bare and rude. The architects availed themselves of the opportunity to try an experiment in polychromy on a large scale, closely following M. Hittorff's monograph, with blue triglyphs, red metopes, etc., and the effect though sufficiently novel was unexpectedly rich and sober, materially contributing to the splendor of the occasion. Many of the decorative accessories to the stage were copied directly from examples remaining in the Theatre of Dionysos, at Athens, and the splendid costumes of the performers were designed by Mr. F. D. Millet with the same care that marked all the efforts for obtaining local color. The performance was in every way excellent. Even the strangeness of the language in which the tragedy was given interfered very little with the enjoyment of the spectators, and the earnestness of the actors prevented it from detracting in the least from the serious, almost solemn interest of the story. The details of the affair were carried out with an attention perhaps almost too minute. The programme necessarily contained directions to the audience upon topics not strictly classical, and it recalled a little the burlesque documents which amuse undergraduates to see the announcement at the foot that "hamacsai hipposiderodromikai" would be in waiting to convey passengers to the city. Œdipus himself would hardly have suspected that this expression stood for simple horse-cars.

ARCHITECTURE AT THE ROYAL ACADEMY.— I.

London, May 2, 1881.

The display of architecture at the Royal Academy this year is specially noticeable for the absence of many well-known names, and particularly those of members of the Academy itself. Architecture has so few representatives among the Forty or the Associates that we can ill spare their designs from the small space devoted to it at Burlington House. Of the three architectural R. A.'s, only Mr. Street sends anything; of the Associates Mr. Waterhouse stands alone at the exhibition, as alas, he now does on the official roll. Nothing has been sent from the office of the late Mr. William Burges to remind us — if such were needed — of the gifted artist now no more, this very silence speaking all the more impressively of the great loss our profession has sustained in his untimely death. Through ill health we are deprived of Mr. Shaw's eagerly looked-for contributions: he has been abroad most of the winter trying what rest and a milder climate can do for a shattered constitution, and we fervently hope he will soon return well and strong once more, and with many years of good work before him yet. The loss of two such men as Mr. Burges and Mr. Shaw would make a terrible blank in the ranks of our artist architects. It is a relief to turn from regret to pleasure as we look at Mr. Street's works now in the gallery, so varied yet so masterly in design, and so admirably illustrated. His principal drawing (No. 1,109), View across the New Nave of Bristol Cathedral, again shows his wonderful draughtsmanship. All the peculiarities of the design are brought out in the most effective manner, without effort, and almost without a fault; the result looks like a bit of beautiful old English Gothic, fit to stand alongside anything of Mr. Street's favorite thirteenth-century period. So also is his Monument about to be erected in the South Transept of Yorkminster, to the late Dean, the Hon. and Very Rev. A. Duncombe (No. 1,093); it looks like an old tomb in an old cathedral, and in saying that we indicate the true character of the work, — an example of Early English of the very best type. The colored drawing of the Interior of the new Church at Kingston, Dorset (No. 1,101), is not quite so happy, inasmuch as it is apparently not from his own hand. The church has a richly moulded nave arcade supported on clustered columns, and a vaulted chancel reminding one very much of some of his former works. Mr. Street's other work is a View of English Church in the Via del Babuino, Rome (No. 1,057). We think this is hardly so successful as Mr. Street's Church of St. Paul in Rome; perhaps it suffers from the drawing not being from his own hand. Though the chancel apse is very good, and quite catches the feeling of the Italian brickwork, the gable of the transept seems out of keeping with the style, and the upper part of the octagonal tower is scarcely up to its author's usual power of design. The plan, however, is a careful study, and probably the whole design will look much better in execution than it does here on paper. Mr. Waterhouse sends three drawings. The principal one (No. 1,084), Central Institution for the Advancement of Technical Education, South Kensington, is chiefly remarkable for its decided leaning towards "Queen Anne," — an unlooked-for result from such a consistent Goth as Mr. Waterhouse. Has he also begun to bow the knee to Baal? Whether he has or not we have here a telling design much more artistic than some of his more recent works. It is a large building with a central gable and side wings. The gables of the latter are most picturesquely treated with shields and coats of arms, and form most prominent and striking features. The central gable, which is surmounted by a clock and belfry, is not quite so spirited, while the principal entrance is much more in his old manner; for the rest the building is in red brick, with its many windows divided into small squares with thick sash-bars,—an unmistakable mark of the beast set right on its forehead! but all remarkably well treated and shown in a most effective water-color drawing in its author's very best manner. The Library at Eaton Hall (No. 1,043), a large and important apartment, is not nearly so striking in effect; here we have his own peculiar phase of Gothic, with all the furniture and fittings just as we should expect to find them in a house by Mr. Waterhouse, but there the interest seems to end: it is very magnificent, very correct to the type in which it is designed, has evidently cost plenty of money, but somehow is very uninteresting all the same. He is much more to the point, however, in his third drawing (No. 1,010), The Clock Tower to be erected on the Pier Head at Liverpool to the Memory of the late Mr. Turner, M. P., — a shapely purpose-like tower, a capital landmark for the ships that come and go on the waters of the Mersey. The tower is in stone, with bands of reddish stone artistically introduced towards the top just under the dials, and is finished with a short octagonal spire. It will become one of the features of the great seaport with which many a passenger by the Atlantic liners will make his first acquaintance, and a very presentable feature too. It is shown here in a cleverly tinted drawing. Taking the numbers now in their turn as they come, the list is headed by 1,008, Temple Bar Memorial from the North-West, by Mr. Horace Jones, which is supplemented by 1,034, The same Memorial from the South-East, both water-color drawings of the now famous Memorial, the only difference of any importance being the backgrounds, which in the one case is Child's Bank, and in the other the new Law Courts. The Memorial itself looking very much the same in both, we are reminded of the Pecksniffian studies of another monument from the "N.-W." and "S.-E.," and other directions, with about as much purpose in the illustrations. The domestic work divides itself into the usual half-timbered and wholly brick versions of the present fashionable style. 1,013, Houses at Walmer, by Mr. Neale, and 1,011, Rowden Abbey, by John Douglas, are examples of the former, — Mr. Douglas's work being most picturesquely treated and very effective. In this category may also be placed some Houses at Leicester (No. 1,013), by Goddard & Paget. In Nos. 1,015 and 1,019 we have the interior and exterior of the Church of the Sacred Heart, Exeter, a very well-designed church. The interior shows a wide serviceable nave; there are narrow openings on each side of the chancel arch looking into the chancel aisles from the nave which helps to fill up the great width of its east end, and the exterior has a capital tower with somewhat later feeling in the upper stages thereof. No. 1,017 is a hard, stiff and almost forbidding Gothic Residence in the Isle of Wight, by Messrs. Goldie & Child. Of a very different type is No. 1,023, Reredos in St. Clement's, Bournemouth, by Mr. I. D. Sedding, an elaborate design in late Gothic. Panels and canopy work enclose an altar piece of the Adoration of the Magi, while on each side of the east window rich panelled compartments rise high above it, filled with figures and large statues; the latter seem out of scale with the other figures, but all will depend for their effect on their manner of execution. It should prove a very striking composition, and is very well detailed with a certain originality of treatment which is very welcome. Pontefract Town Hall (No. 1,024) is a very fair specimen of a Queen Anne design in stone, by Messrs. Perkins & Bulmer. The great oriel-window in the front gable, and the tower over the entrance, remind one very much of Mr. Collcutt's work at Wakefield, but they are very effective for all that. By the way, that is another architect who is conspicuous by his absence; there is nothing on the walls from Mr. Collcutt, how is that? After a few more houses of the ordinary type and in the prevailing mode we have a large elevation of the Post and Telegraph Office, Madras (No. 1,029), by Mr. R. F. Chisholm, a Madras architect. It is a curious mixture of Victorian Gothic with a sort of pseudo Indian feeling in several of the features and details, but the result is not much happier than several instances of the same thing that have been tried lately. Architecture in our great dependency has not attained to a very high order of merit as yet, we are a long way behind the wonderful old native artists of days gone by, and we are afraid this new Post-office won't help matters much from an art point of view. No. 1,033, Interior of the Church of St. Patrick, Wapping, by Mr. Tasker, is a very clever church of the basilica type. The nave and aisles are divided by Ionic columns of very poor design, and the nave is covered with a barrel-vaulted ceiling in timber, in fact, a free treatment of classic throughout; the detail is good and the drawing also. Nos. 1038 and 1044, The Exterior of and the Interior of the Staircase, in a house to be built at St. Cloud, Paris, by Mr. T. A. Howard, is a very poor specimen of domestic Gothic to send to France, where it won't do English art much credit. No. 1,039, The Lothians, a house and studio now being built for Mr. Pettie, R. A., by Messrs. Wallace & Flockhart is quite an artist's house, and shown in a very beautiful drawing. It is English domestic classic in style and very well carried out; the doorway is clever, but it leads into a rather commonplace entrance passage; indeed apart from the studio the plan seems to rather fritter away the space in a multitude of little rooms and places. The billiard-room looks much too small, and the pantry quite poky in size; notwithstanding these defects, however, there are pretty bits of details here and there throughout the design. We had almost passed a beautiful little drawing by Mr. Raffles Davison of a Terra-Cotta Warehouse (No. 1,035); it is adapted from an old design, and is a richly worked gable facing a canal or a river. No. 1041, Proposed Church and Convent at Dumfries, by Messrs. Pugin & Pugin, is a small design with a great name. In No. 1,042, Over Darwen Town Hall, by Mr. Charles Bell, we have Queen Anne again and in No. 1,047, Lewisham Mission Church, by Mr. James Brooks, Gothic of the severest type. The drawing shows the interior looking east, but the effect is anything but pleasing: it is bald, heavy and coarse to a fault. Massive circular stone columns, with nothing in the way of capitals but a square abacus with delicate little bits of carving under each projecting angle, support a great brick arcade, and nothing to relieve its square ingoings but a slight chamfer taken off the angles, with wide three-light windows having plain circles in their heads, are the principal features of note in the composition, and do not seem at all calculated to promote or encourage much elevation or refinement of feeling in the mission district of Algernon Road. No. 1,048, St. Peter's Hospital, Covent Garden, by Mr. J. M. Brydon, is a large brick building of Queen Anne character, and seems suitable for its purpose, the central gable with the entrance doorway, and the projecting oriel above, should be a striking feature in execution; the design is shown in a very good drawing. The central entrance of the Sheffield Corn Exchange, by Messrs. Hadfield & Son, shows a very good late Gothic doorway, extremely well detailed.

The Rouse Memorial Hospital and Almshouses at Newmarket (No. 1,052), by Mr. Frederick W. Roper, form a most picturesque group, built round three sides of a quadrangle; the drawing is hung too high to get a good look at it, but there are many charming features in the design which is Queen Anne in character, and very nicely carried out it is. 1,054, Catholic Church and Schools at Brumley, Kent, by Mr. E. I. Bell, a charming study of Early English work shown in a very good drawing: it is a small church, but it is admirably designed; the front gable and the gable of the belfry (the latter formed by a sort of quasi transept) group extremely well together, the windows and doorway are also very carefully detailed; altogether this is a very good piece of work; so also is No. 1,056, The Central Tower of Handsworth College, by Messrs. Ball

& Goddard: this is in late Gothic, and again very well drawn, the upper stage seems rather out of proportion with the underpart, but the entrance-doorway with the bay-window over it is very well designed indeed. No. 1059, Colored Decoration and Carved Woodwork, Mercer's Hall, by Messrs. Crace & Son, is a dreadful piece of work both in design and decoration. It seems to us that a decorator's work of a stamp like this and several other designs of stained-glass windows by several firms are rather out of place here, the space they occupy would have been more usefully filled with some architectural works which we hear have been excluded, and the gallery would have gained in artistic value by the exchange. No. 1,064, The Gates of Henry the Seventh's Chapel, Westminster, by Mr. H. W. Brewer, is a powerful drawing of a splendid piece of old work. No. 1,065, The Offices of the Life Association of Scotland now erecting in Pall Mall, by Mr. Alexander Peebles, will be a striking addition to the street architecture of the eastern part of Pall Mall. It is a boldly and freely treated classic front, with attached columns and pilasters of fairly good character; the lower portion with the shops is less satisfactory in treatment, and the porch looks rather stuck on, the bands on the columns of the latter would be also better away, but the whole design has a good deal of originality about it and is very effective. No. 1068, A Dining-Room, by Mr. Owen Davis, is another frightful thing and should certainly never have been here. It is a relief to turn from it to the magnificent Pulpit for St. Martin's Church, Brighton (No. 1,059), by Mr. Somers Clarke, Jr., which though perhaps a little overdone in the way of the canopy is still a very fine piece of design with a thorough wood-work feeling in its construction and detail. It is shown in an elevation and plans. No. 1,071, Haileybury, Bournemouth, a house by Mr. Champneys, is hung so high it is impossible to make out what it is, but 1,073, Barrow Court, Chester, by Mr. John Douglas, is a very fine English house, quite up to Mr. Douglas's usual careful work, even though it be a little unequal here and there in some of its features. The Master's Lodge, University College, Oxford, by Messrs. Bodley & Garner (No. 1,078), is worthy of its designers and of the college, quite in the spirit of the old work at Oxford, quiet and good, it must be in perfect harmony with its surroundings, which is much more than can be said for some of the recent work at the Oxford and Cambridge Colleges. The architects have got a little Elizabethan feeling in the central gable over the circular bay-window, which seems quite to link the old associations to the new lodge as if to keep its artistic traditions unbroken throughout. It is very pleasant to see such good work as this as also in a church by the same architects we shall have to notice in our next article.

ON THE VENTILATION OF HALLS OF AUDIENCE.[1]—II.

Returning from the long digression of comparison of American with foreign requirements, to the consideration of absolute requirements and practical demands: the following has been established by the previous argument, that for the support of life, each person must have one-third to one-half a cubic foot of fresh air each minute; that for the conservation of temperature at the point of comfort, each person supplied with air at 70 degrees in its usual condition of summer air in America must have four to four and a half cubic feet per minute; that to maintain the freshness of air in a continuously occupied room, so that it shall be pure to the sense of smell, — a condition which is found to correspond generally to the presence of 8 parts of carbonic acid to each 10,000 parts of air, — about thirty cubic feet of air per person per minute is requisite. It has been shown also how audience-halls without systematic ventilation, or at best supplied with very limited quantities of air, are, if of adequate cubic contents in comparison to the number of persons present, and if occupied only in short sessions, and if judiciously supplied with fresh air between the sessions, relatively healthy, comfortable and acceptable to the persons attending them. The point for enquiry which now follows is, What is the practical limit for quantity of air to be *systematically supplied?*

The proposition before established, that the cubic contents of the hall can be reckoned as part of the supply itself, by taking the number of minutes the hall is occupied by a certain number of persons, becomes now of importance in fixing the limit for momentary supply, when the average length of session can be assumed. But this is really of less importance than would appear from mere statement. On the whole, in audience-halls the cubic capacity per sitter will be found to be from 200 to 300 cubic feet, or only 6 to 10 minutes supply of air to each person, where the final relative purity is to correspond to a supposed regular supply of 30 cubic feet per minute. If this cubic capacity is to be taken in addition to any regular supply for a given length of time, then if 100 minutes (1 hour, 40 minutes) are taken as the length of the session, two to three cubic feet of air per minute become available as an addition to whatever is supplied.

The practical difficulties in ventilation of halls which affect the quantity of air to be supplied are those of introduction and of distribution. The difficulty of introduction is perhaps the most serious trouble. Dr. Reid's proposition for a perforated flooring would seem to present a satisfactory solution, and it is questionable if justice has been done the reputation of the scheme by the public; for the method continues in operation to this day, with twenty-four years' service at the Houses of Parliament, although embarrassed in its action by singularly unmechanical and inefficient apparatus for warming and supplying the air. It cannot be claimed, however, that the construction of a sub-hall for equalization of pressure will meet the approval of architects or builders in future, and Dr. Reid's effort will probably remain as an example rather than be accepted as a model. But Dr. Reid was for a whole lifetime of arduous labor an intelligent and careful observer of the requirements for the ventilation of audience-halls. As the result of his study he concluded, and he expressly states his conclusion as with diffidence, that ten cubic feet of air to each individual would suffice to properly ventilate a hall. His great effort was to arrange to supply this quantity in such way as should be at once effective and imperceptible to an audience. Much of his want of success lay in the imperfections of his mechanisms, in the coils or heating surfaces, and in the fans or means of impelling air; some of it lay in the effort to regulate the audience, as well as the ventilation. His life-long difficulty was found in the local currents engendered by his imperfect apparatus, and from the sensation of cold which such currents produce.

Systematic supply involves arrangements of ducts and passages by which the outer air, from some chosen point, shall be transported to certain desirable mouths of delivery or inlet registers. The dimensions to be given these ducts or passages are absolute and positive ones, when the quantity of air to be moved shall have been established by the number of persons and their supply, and when the velocity of movement of air is determined or accepted. The velocity of movement is limited on the one hand by the motive power applied to impel or effect it, that is, by the expenditure of force demanded; which means in the end, whether impulse by fans and engines, or a draught from a heated flue be used, expenditure of fuel; and on the other hand by practical dimensions accepted in construction of the ducts or passages.

In figures, ducts for forced ventilation must suppose currents of from 600 to 1,200 feet per minute, with some allowance of sectional area for branch ducts, which shall admit a less velocity of flow through them; while ducts for currents induced by exhaust shafts, or produced by the entry of heated air, at the usual temperature of steam-heated currents, will have a usual velocity of from 150 to 300 feet per minute: sometimes, under favorable conditions for making a draught, rising to 300 or even to 600 feet per minute.

Systematic supply involves also the heating of air to be supplied, in an extreme case, from 5 degrees to 10 degrees below zero up to perhaps 75 degrees, in such extreme case of cold weather. Ventilation is not attained except at cost for fuel, and a reasonable expenditure in this regard will meet approval when restricting the amount of ventilation to the necessities for health. The heat *will* in all cases be that of comfort or the *system* will be discarded.

Finally, the writer has sought with diligence and study to determine from irrefragable data the exact quantity of fresh air that should be supplied to each person of an audience per minute, and he now finds himself compelled to admit that no such data exists; that the quantity must be taken to have an arbitrary value founded on economic and structural, as well as upon medical and chemical considerations; that this value must have its authority from its general acceptation by the community or by its general acceptance by investigators, who will have considered the question from all points.

It would seem that for audience-halls occupied for sessions not exceeding two or three hours' duration, Dr. Reid's value of ten cubic feet of air per minute is all that should be arranged for when planning such halls, — all that can be judiciously urged in the accomplishment of ventilation in view of the cost in fuel and apparatus, quite sufficient to meet the physiological issue, and so large that it ought to be accepted from the medical point of view. This quantity might be referred to the maximum seating or holding capacity of the room to which it should be applied, when its partial occupancy would go towards increasing the general supply. And it should be referred to the coldest weather heating-power of the accompanying heating apparatus, so that in case of emergency of lengthened sessions in milder weather and in hot weather the quantity could be materially exceeded. When a forced ventilation by means of a fan is adopted, the flues and passages should refer to a winter ventilation at half speed of the summer one, and the quantity of summer ventilation would then become twenty cubic feet per person per minute; an amount of ventilation which, with open doors and windows, would, if the ventilating currents are suitably distributed amongst the audience, prove ample to give all the comfort possible to a crowd gathered in hot weather.

For audience-halls in legislative buildings, there is a propriety in adhering to the larger quantity of air, which has been mentioned as needful to preserve the sensation of pure air to the smell in continuously occupied rooms, to wit, thirty cubic feet of air per person per minute. As before, this quantity should be referred to the maximum attendance in any hall, and the capacity of the heating apparatus be referred to the coldest weather for such quantity, so that the forced ventilation should be able to give a double supply in midsummer.

In the mind of the writer there can be no question whatever as to the direction of ventilation in a hall. A man lives in an ascending current of air — he is enclosed in one. In a crowd, without ventilation, a circulation takes place; in some way the roll of air which rises above one's head is replaced by cooler air sucked in sidewise at the feet, or downwards, between the persons who form the crowd. If fresh air can be, and is introduced imperceptibly at the floor near the person who needs it, the rising current supplies, nearly unmixed

[1] A paper by Robert Briggs, M. A. S. C. E., read before the American Institute of Architects, and printed in the Proceedings of the American Society of Civil Engineers.

by diffusion, the air for respiration, while the vitiated air is swept upwards with the advantage of its levity as well as of the current of supply. A downward system of ventilation, on the other hand, where the air is supposed to be abstracted at the floor, near to the individual, supposes a thorough admixture, mechanically, of the respired and vitiated air with the descending sheet of fresh air. Within any hall where the air enters at the top, there could scarcely exist any fresh air whatever, while the degree of vitiation would increase downwards, until the occupants of the hall would breathe and live in the vilest air possible for any given supply of fresh air.

There is also another matter to be thought of in ventilation of halls, — the ventilation of the gas-lights, and besides this ventilation, the removal of the heat they generate. The ordinary gas-burner consumes four and one-half cubic feet of gas per hour. Each burner may be taken to demand 2,700 cubic feet of air per hour, or 45 cubic feet of air per minute, when the temperature of the gases of combustion, including the 45 cubic feet of air, becomes, for open burners, as high as 99 degrees, and for Argand burners possibly as high as 128 degrees. In an upward ventilation the gas-lights present little difficulty, as the air for ventilation of the persons composing an audience will commonly exceed in quantity the greatest requirements for gas-burning. The vitiations arising from gas-lights are very objectionable when the attempt to introduce air strictly at the ceiling is made. The figures given here as to the requirements of gas-lights will allow provision to be made for them in arranging the ventilation of halls. The radiation of heat from gas-lights of a brilliantly lighted room becomes not only an important addition to the heat of the air, but also to the heat of the occupants of the room, independent of its temperature in some degree. This effect of gas-light is sufficient to reduce the desirable average temperature of a gas-lighted room, some two degrees to five degrees, and the necessary temperature of admitted air should fall off in like degree. No amount of ventilation will make it comfortable to sit near the great chandelier.

It is a source of great gratification to know that the electric light has reached that point of development where it has become available for lighting audience-halls. The practicability of electric lighting at present is found in the production of large quantities of light. As the introduction of gas-light led to the use of much greater illuminating power than was obtainable by candle lighting, however numerous and sparkling the candle-lights may have been displayed from reflecting sconces or chandeliers hung with lustres in old times, so the electric light also overpowers the gas-light wherever substituted, to much the same extent. The electric light is the nearest possible to the natural one of the sun. Properly arranged, to avoid distinct shadows, the correspondence to a carefully shaded room with ample mid-day light can be secured. Lighted from above, a complete avoidance of objectionable glare can be effected. Colors will have natural tints and values, and the gratification of our most delicate sense is not the least of promise in the perfection of electric lighting.

The vitiation of air by the electric light, arising from the slow combustion of the carbon, is too insignificant to form any element in considering the ventilation. For an equal quantity of light, there is generated seven hundred times as much carbonic acid in coal-gas lighting as in electric lighting. There is a small amount of vitiation from the electric light in the form of nitric or nitrous vapors, which may or may not accompany coal-gas burning to equal extent where equality of light-giving effect is made the standard of comparison. But this quantity of vitiation is also utterly harmless, in the volume of air demanded for ventilation of the number of persons who are to derive their light from any given electric source. The heat effect of electric lighting is as favorable to the ventilation and comfort of audience-halls as any other advantage presented. Thus, the same light-producing capacity gives thirty-four times as much heat for gas lighting as for electric lighting with equivalent light values, as the most unfavorable showing of the electric system, supposing all the force expended in the electric arc is transformed into heat. Furthermore, the superior safety of the electric light as regards danger from fire is not the least of its recommendations when enumerating advantages. At the present time the cost of electric lighting, with liberal allowance for use and deterioration of apparatus, is about one-half that of gas lighting, when the same quantity of light is supplied; but in view of the superior lighting usually practised when the electric system is introduced, the two methods approximate to the same cost generally.

Resuming the discussion of ventilation again: it must not be accepted from the foregoing remarks on downward ventilation that the removal of air at the floor of a hall is wholly impracticable. In rooms of limited floor area, like school-rooms, an arrangement for supply and removal of air in conformity with the great natural circulation which occurs in all heated rooms is likely to prove successful in those conditions of the weather which demand warm rooms. And as has been shown in our climate there is but one month in any year in which closed windows are desirable, *without an attendant supply of heat to the room*, it follows that such school-rooms may be effectively ventilated during the eight months when our temperatures vary from zero to 40 degrees or 50 degrees, that is, for seven-eighths of the time when windows are closed. By judicious manipulation of windows and of eduction flues and their registers, the ventilation during the one month of closed windows without fire may be ameliorated, if not made altogether efficient.

Again, in churches and lecture-rooms, where the economy of apparatus and of operating is esteemed superior to ample but expensive ventilation, the systematic provision and removal of much smaller quantities of air than have here been shown needful for desirable purity may accomplish much improvement in the direction of relative purity. The habitual method of warming a church building in America is by means of several hot-air furnaces, placed in the cellars underneath, as sources of heat; these furnaces having usurped the functions of the close stoves, with long lines of smoke-pipes, which were formerly a peculiar feature of the "meeting-houses" of our fathers. The furnaces have just about the same heating capacity, and the distribution and circulation of the heating currents within the walls of the church is effected in much the same way. When actively employed in warming the church by means of furnaces, there is a supply of fresh heated air, considerable, perhaps, in itself, but inconsiderable, at its largest quantity, to the wants of ventilation of the numbers present. The control of temperature of the heating currents is very limited, the lowest temperature being commonly about 180 degrees, while the highest, often demanded in the coldest weather, rises to quite 300 degrees, and sometimes above this point; and the control of warmth in the church itself is obtained by closing or opening — registering off — the hot-air current. In ordinary cases, the registers are shut soon after the commencement of any session, and if the room be well filled, the heat of the persons present (especially at evening meetings where gas-lights increase this heat) causes it to become overheated long before the end of the hour, or hour and a half, of usual session.

The equilibrium of temperature in such a room is established solely by the cooling effects of the walls or windows, downwards along which there falls a sheet of cooled air (augmented in cold at the windows by leakages inwards at the bottom of the same), a sheet which flows inwards towards the register openings, and is directed upwards with the flow from them; or when the register is closed off, the sheet forms part of the current of personal origin rising in the middle of the room. This roll of circulation goes on continually, and at some degree of elevation of temperature at the top of the room, the lower strata, reaching to the height of above a gallery sometimes, will be found to have attained some uniformity of heat. In fact, when filled with heat, as the furnace constructors denominate it, there will, in a church building of 35 to 45 feet in height, be less than 10 degrees difference between the floor-level temperature of air and that taken 20 to 25 feet above such level. No large ventilating shaft can be taken from the upper part of such a room. Even the small opening to remove the gases of combustion of a chandelier disturbs the circulation of heat and intensifies the cold descending currents near the window, besides accelerating the leaks of cold air at the cracks; so that the ventilation of churches thus heated is practically limited to what leaks *out* of heated air, at or near the top of windows, and what leaks *in* of cold air, at or near the bottom of the same, — a systematic leakage, which on windy days is modified by all leaks *in* at the windward windows, and all leaks *out* at the leeward ones. Now a kind of semi-ventilation of a church thus warmed and arranged can be effected by removal of air, at or near the floor, by means of ducts connected to an exhaust shaft; all of which will become operative if the currents from the hot-air registers have been augmented to meet the requirement of air, by tempering the heated currents with direct currents of cold air, to desirable heat and quantity. Here it is seen that a downward ventilation, under conditions, may effect a good purpose to a certain extent.

It will not be attempted at this time to argue fully the advantages of the method of supplying air for ventilation by impulse through mechanical means, — the superiority of forced ventilation, as it is called. This mooted question will be found to have been discussed, argued and combated on all sides, in numerous publications, but the conclusion of all is, that if air is wanted in any particular place at any particular time, it must be put there, not allowed to go. Other methods will give results at certain times or seasons, or under certain conditions. One method will work perfectly, with certain differences of internal and external temperatures, while another method succeeds only when other differences exist. One method reaches to relative success whenever a wind can render a cowl efficient. Another method remains perfect as a system, if no malicious person opens a door or a window. No other method than that of impelling air by direct means, with a fan, is equally independent of accidental natural conditions, equally efficient for a desired result, or equally controllable to suit the demands of those who are ventilated; which last requirement, it will be shown further on, is more essential than to meet their necessities.

To many people it is a favorite belief that ventilation should be in some way effected by a natural process. Windows and doors and open fires are the limit of artifice to be endured, houses being *presumed* in lieu of caves. There may be a fireplace with its chimney in the category of *natural* apparatus, although this was as artificial and as abstrusely ingenious to our ancestors of five or six hundred years since, as the best steam or hot-water heating apparatus is to us to-day. Perhaps to quote from my former paper on moisture in air will be the best answer to such persons: "Clothing, houses and fires are the means by which mankind is enabled to inhabit the earth. It is an artificial existence for an animal whose natural life would otherwise be limited to a small belt of the torrid zone, where the temperature never falls below 80 degrees, nor rises above 100 degrees." Fresh air will not be supplied naturally to a person in an audience-

hall, as one obtains it on a mountain-top, at the sea-shore or upon the deck of a vessel. Neither the currents nor the temperatures of the healthful breezes are admissible in the processes of *ventilation*, so that the natural supplies cannot even be simulated artificially. To meet the demand for health and comfort in the natural gregation of men, which is one of the conditions of advancement in civilization, ventilation and warming must be effected with unnoticeable means and yet with positive results. Success in ventilation of halls can only follow the complete adaptation of mechanical appliances and apparatus, as well as of structural arrangements, to the ascertained wants and requirements of the individuals composing an audience. In all mechanical appliances that is simplest which most positively and directly effects the purpose in view; and in this matter of supplying air it may be claimed that the process of impelling it, when and where wanted, is at once the most certain and efficient, and that the fan (in its form of a rotating wheel with vanes for large uses) is the simplest and readiest machine for impelling air.

It will not be attempted at this time to discuss the theory of rotary fans. The fan itself will simply be accepted as one of the recognized appliances in the construction of ventilating apparatuses, available with other mechanisms in established forms and defined types for American practice.

The fans most generally in use for the ventilation of large buildings in this country have been derived, in all essential particulars of conformation, from those designed by the writer for the United States Capitol at Washington in 1855 and 1856. These particular fans were based upon a type given by M. Combes (in his "Aerage des Mines"), where the fan blades or vanes were placed upon the face of a disk; and the fan itself thus constructed was located in front of a circular opening in the wall of a building, the wall forming one side of the zone of blades, in opposition to the outer edge or face of the disk, which formed the other side. In this construction, no case whatever is demanded for the fan, which receives its air through the central circular opening in the wall, and delivers its air at all points of the periphery into a large but close room; from which room the ducts for conveying air branch in any desired direction.

The heating and ventilating at the United States Capitol was under the charge of Maj.-Gen. M. C. Meigs (then Lieut. U. S. Engineers), who selected this type of fan as presenting certain structural advantages for its employment. The study of the conditions of fan construction which was devolved upon the writer led to some modifications in the forms of blades, etc., as accepted by M. Combes, with which changes these fans were employed in the ventilation of the United States Capitol buildings. More recently the disk type has been departed from, but in other respects the proportions of the Capitol fans have been followed and have now become established in general practice. It was a recognized necessity that a fan should be reduced to its least practicable dimensions, and the most cursory observation showed that the passage of air through the fan itself was an accelerating flow, whose least velocity should be that at which the entering air approached the inner edges of the blades, and its greatest velocity should be that at which the escaping air left the tips of the blades; the action of the blades being to give an accelerating velocity, to be mainly derived from the increase of velocity of the blade surface as it became farther from the centre. It followed, as a resulting consequence, that the area of any cross section of the passage through the fan (any one of which will be formed between the disk and wall or case side, and between any two blades) should reduce in proportion as the air accelerates, and that the air should thus be kept in contact with and be acted upon by the blades as the source of impulse. These propositions gave, for instance, where the disk of the fan was taken to have a diameter equal to one, the diameter of the mouth or central opening becomes seventy-four hundredths; the width of the fan at the mouth becomes seventeen and a half hundredths; while the width at the periphery becomes one-tenth. The number of blades was found (by experiments as to most efficiency with several different numbers) to be about sixteen; a number giving the section of the several passages formed by blades, disk and wall, most nearly a square one, or most nearly that section of duct where the sides offer the least resistance to flow of a fluid.

The advantages in effectiveness or economy in power over other fans as before made, with small central opening and great width of vanes in direction of the axis, is not very considerable; 10 to 15 per cent of higher useful effect is all that can be claimed, when 55 to 60 per cent is usual; but the advantage of obtaining at least twice the capacity, simply by enlarging the mouth and by increasing the number of blades to suit their reduction in length, is of high importance when room to place a fan in a building is frequently one of the troublesome questions to be met. Since 1856 probably 150 of these fans have been put into use in various hospitals and public buildings. The principal modification adopted has been the frequent use of blades on both sides, with the same disk construction; sometimes (for fans of four to eight feet diameter) with iron in lieu of brickwork cases. This last arrangement presents some difficulties in the entering air passages, but it reduces the diameter of a fan to do any given work, to seven-tenths that of a single disk fan.[1]

In general these fans are driven by a directly connected engine of suitable size; sometimes a belt and pulley is used for transmission from an independent engine. This last condition, that of independence from other uses, is desirable for hall ventilation, so that an economy of working may be practised to meet the condition of occupied and unoccupied halls; but for hospital ventilation it is about as well to drive the fans from the general source of motive power, always indispensable in large hospital establishments.

Boilers and all their appliances, engines, etc., are not distinctive or peculiar to ventilating or heating apparatuses, and call for no mention in this paper as to methods of construction.

The steam-heating apparatus in all its details, as used in America, is peculiarly American, especially the apparatus of small wrought-iron tubes which had its origin at the hands of the late Joseph Nason, between 1840 and 1850, and has now become one of the established industries of the land, employing a whole class of workmen known as steam-fitters, and supporting large establishments, devoted entirely to the manufacture of and trade in tubes and fittings.

The little step in mechanism which is the foundation of this art is found in the use of the tapering thread on the end of the pipes, wherewith a perfectly stanch joint is cheaply provided and made. It is curious, that with over forty years practice in steam fitting, until no workman in iron regards this taper screw joint as other than the matter-of-course way of making a pipe joint, with this established habit of workmanship, no description or notice of the tapering screw is published in any text-book, nor have its peculiar advantages been considered by any general writer on constructive mechanism. The great importance of this improvement in making the joints of steam-pipes to this industry of steam heating, can scarcely be over-estimated; but it was not only in this particular but in many others of detail that Mr. Nason's ability as an inventor and adaptor was shown in the apparatus; while super-eminent above this he was at once the best informed of his day on the theory, and the most able in the practice, of steam heating. Under his tuition the whole trade originated, — ten or twelve years since it was possible to trace the descent or pedigree of any concern in the business to the original source; at this time, the growth of the business going to a third and fourth race of firms or of workmen, precludes the following out of the continuity, although it certainly exists. The business, however, has been and is dependent upon the development of mechanical ingenuity, mainly from Joseph Nason, who gave form to the globe valve, originated and derived or adapted from the practice of hot-water heating apparatus in England — either the Perkins's high-pressure or the green-house low-pressure system — all the essential details, which now form parts of usual every-day construction in the United States. Curiously, steam heating as practised here, is not yet fully known or used in England or France, and but little more known in Germany.

[1] The only full published account of this fan is to be found in the Proceedings of the Institute of Civil Engineers, 1869-70, but the publication in the catalogue of apparatus of the Pascal Iron Works, Class IV, 1863, and subsequently, gives essential particulars, and has perhaps much aided in the introduction of the fan. The catalogue was compiled by the writer of this paper.

OBELISKS.[2]

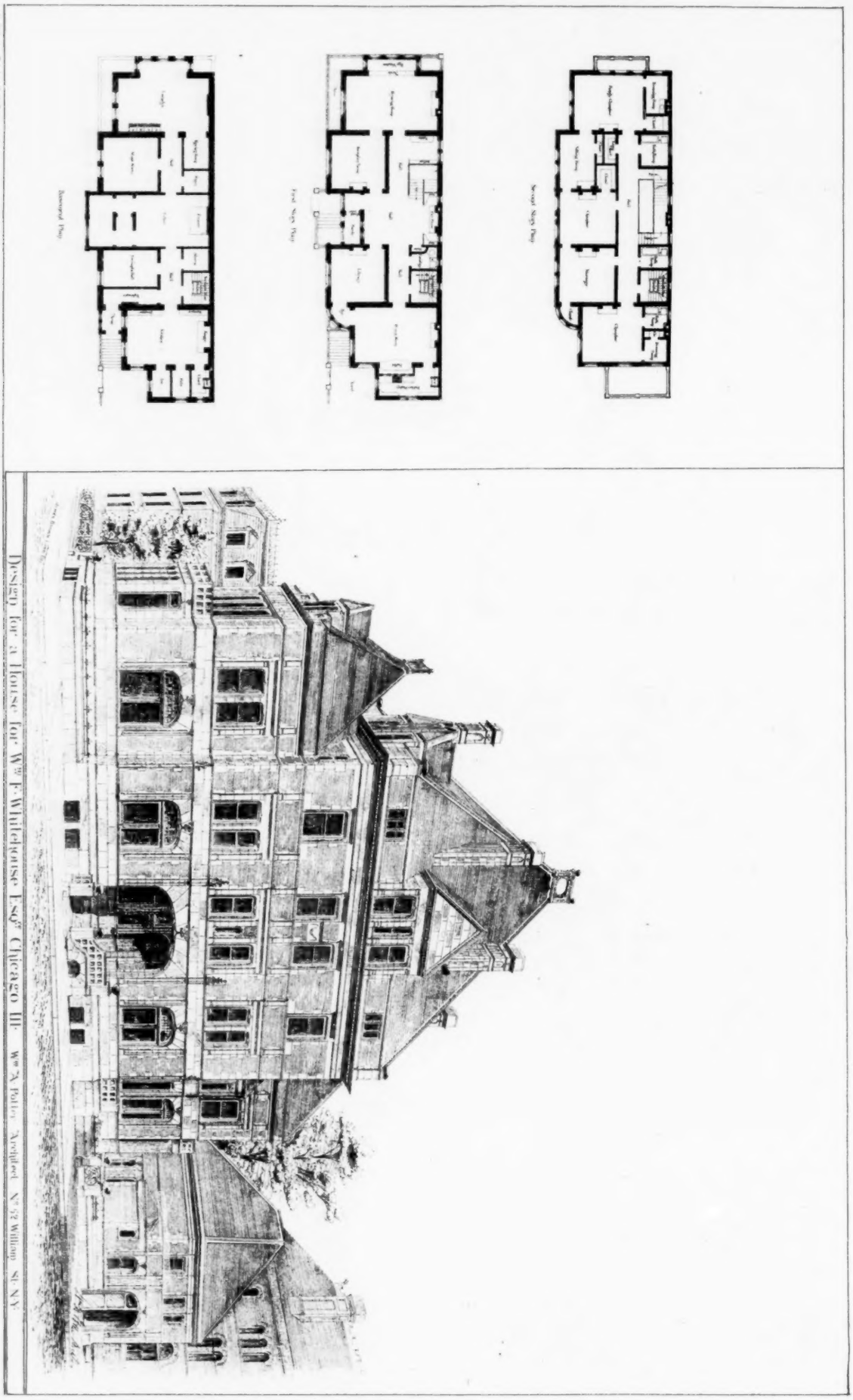
Only one large obelisk [3] is known earlier than the New Empire,[4] that at Heliopolis, erected by King Useftesen I, of the twelfth dynasty. In the New Empire the pride of victory and strength gained in the successful struggle with the Asiatic invaders called Hyksos, or shepherds, made the kings soldiers and conquerors; and as splendid monuments spring up in a military nation at the return of victorious kings, so in the eighteenth, nineteenth, and twentieth dynasties Thebes and other parts of Egypt were made stately with great palaces and temples, while obelisks of the warm-colored granite of Syene, with polished sides covered with inscriptions, became the indispensable pair of heralds at the pylons of new palace-temples, proclaiming the glorious names of the child of the sun. When Egypt began to decline from her position as the great power in the East, the obelisks also declined in height, but continued as monuments for bearing the royal names almost to the latest days of national life. The youngest obelisk known is the Barberini, on Monte Pincio at Rome, set up by Hadrian (first half of second century A.D.), and bearing his name and the names of his empress, Sabina, and his beloved Antinous. . . .

There are now five large obelisks standing in Egypt. Beginning with Thebes, at Upper Egypt, there are three, one left from each of three pairs. At the village of Luxor are the ruins of a vast temple-palace, at the entrance of which stood a pair of obelisks reared by the great Rameses II, of the nineteenth dynasty (about 1350 B.C.). One was taken to Paris in 1833 by the engineer Le Bas, having been presented to the French Government in 1831 by Mehemet Ali. The remaining one is eighty-two feet high. About a mile to the north of this temple-palace was a still vaster collection of buildings, joined with the other by a long avenue of sphinxes. Two pylons of the many quadrangles are still decorated by a pair of obelisks. In each pair one remains; the other lies fallen and broken on the ground, and the peasants have turned to account these broken bones of the giant herald by manufacturing millstones out of them. The pair before the outer pylon is the smaller, and was erected by Thothmes I, of the eighteenth dynasty. The standing obelisk is

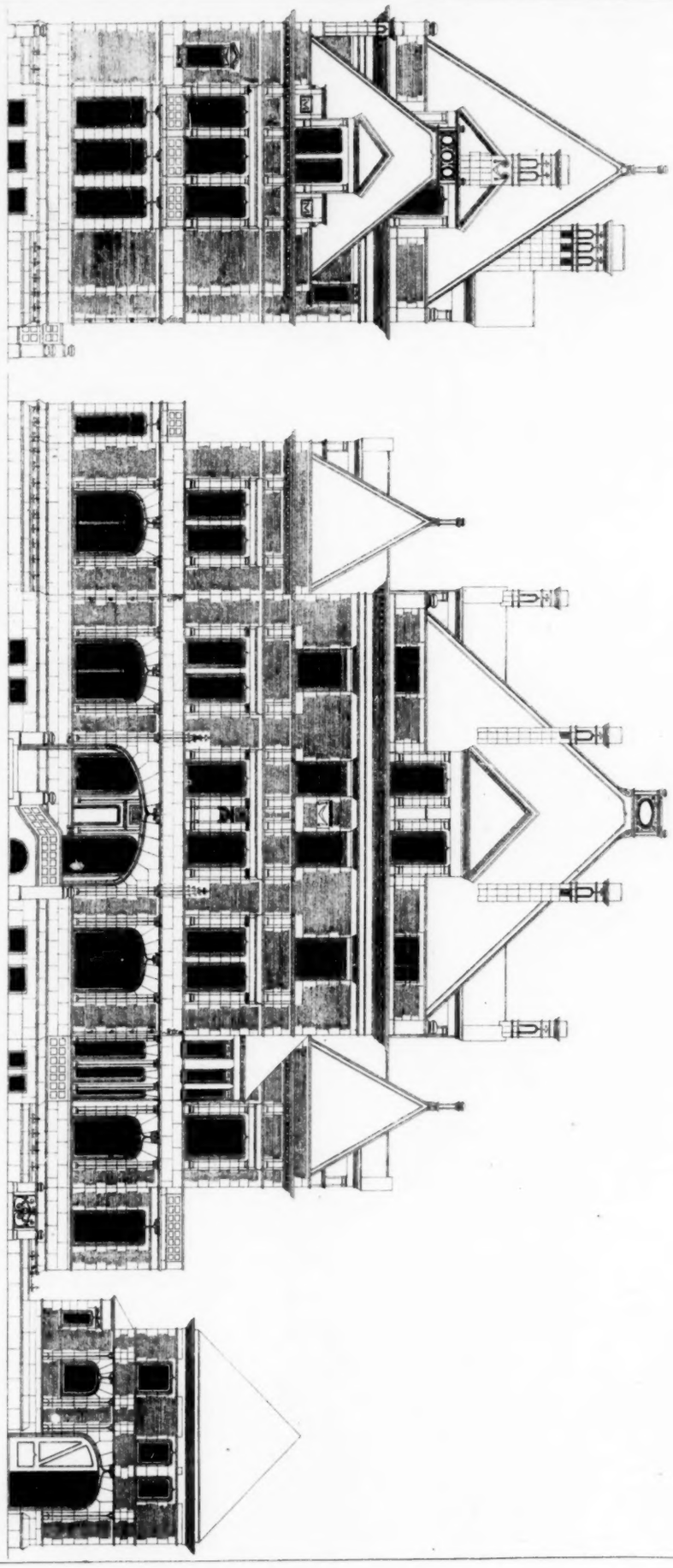
[2] Portions of a paper by General di Cesnola in the *Catholic World*.

[3] The obelisk of the most extraordinary proportions of which ancient writings give us any record, was that of Queen Semiramis, which is thus described by Diodorus Siculus: "Semiramis likewise caused a great stone to be cut out of the mountains of Armenia, 125 feet in length, and five feet in breadth and thickness" (so that it was twenty-five times as long as it was broad and thick). "This," Diodorus continues, "she had conveyed to the river by the help of many yokes of oxen and asses, and there put it on board ship and brought it safe by water to Babylon, and set it up in the most remarkable highway of that city, as a wonderful spectacle to all beholders. From its shape it is called an obelisk (*obelos* in Greek, signifying a spit), and it is accounted one of the seven wonders of the world."— *From a Paper by John Bell.*

[4] The New Empire began with the eighteenth dynasty, somewhere about 1600 B.C.



Design for a House for Wm F. Whitehouse, Esq., Chicago, Ill. Wm A. Potter, Architect, No. 57 William St. N.Y.

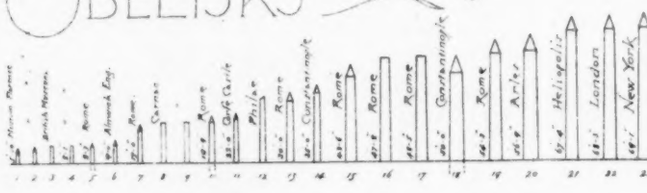


Side Elevation.

Front Elevation.

Wm A. Potter Archt.
72 Wall St. N.Y.

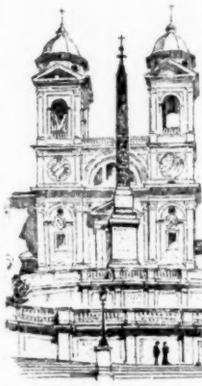
Skeiches of Some existing OBELISKS



Obelisk and General view
LUXOR.

The Lateran Obelisk
ROME.

Erected 1588
No 3.

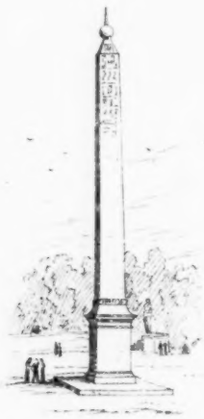


Obelisk of the Trinita dei
Erected 1789

Obelisk of the Monte Cavallo
ROME

Erected 1786

No 16



Obelisk at the Villa Mattei
Near ROME

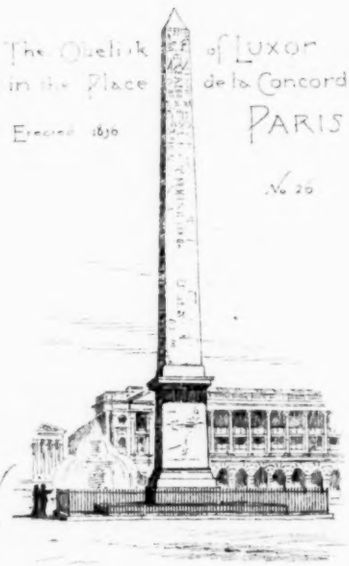
No 23

The NEW YORK Obelisk

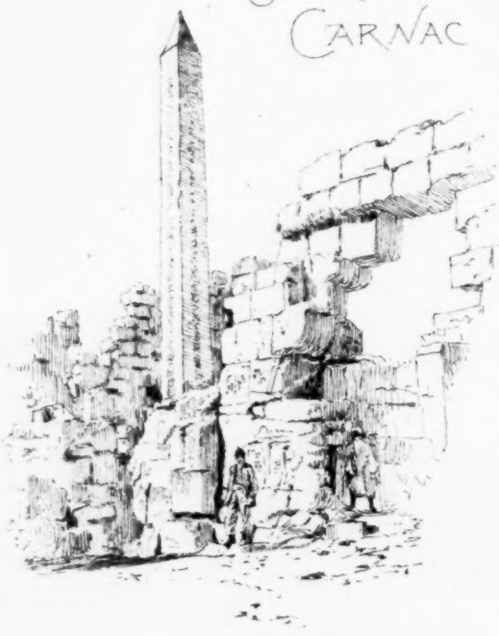
The Obelisk in the Place of Luxor de la Concorde
PARIS.

Erected 1836

No 20

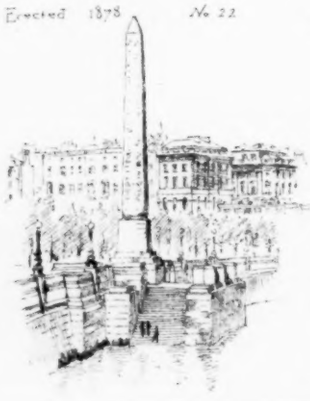


Obelisk at CARNAC



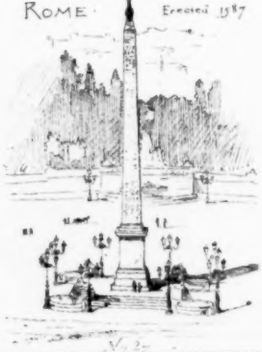
Obelisk at LONDON
On the Thames Embankment

Erected 1878 No 22



Obelisk in the Piazza del popolo
ROME.

Erected 1587



Obelisk of CONSTANTINOPLE.

No 18

xisting

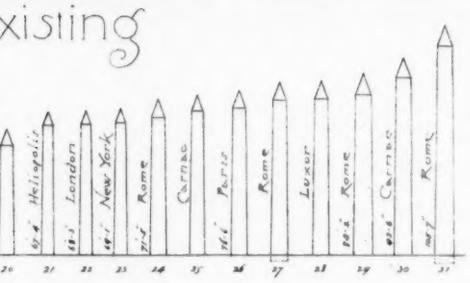


DIAGRAM
Showing
Relative heights
of OBELISKS
now erect.

Compiled chiefly from a paper by J. Bonomi on "Notes on Obelisks" (Report of the Royal Society of Literature of the United Kingdom.)

No 15

Trinita dei Monti
ROME

Obelisk in the Piazza S. Pietro
ROME

Erected 1586

No 29

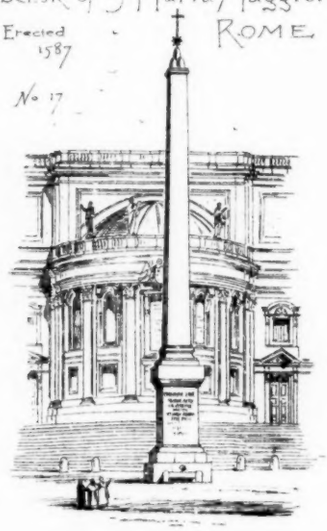
Obelisks at the Grand Temple
CARNAC *

in its former
position at
Alexandria

Obelisk of S. Maria Maggiore
ROME

Erected
1587

No 17



Erected 1711

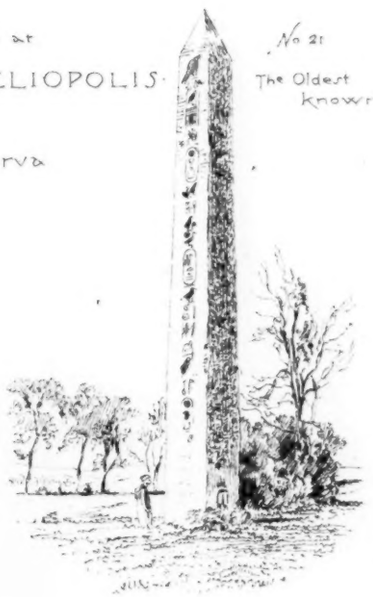
No 19

Obelisk of the Pantheon ROME

Obelisk at
HELIOPOLIS

No 21

The Oldest
known.



Theodosius.

Pamphilian Obelisk
in the Piazza
Navona
ROME

No 19

Erected 1651

Obelisk in the
Piazza della Minerva
ROME

No 7

Erected 1667

about ninety-two feet high. The pair that did duty before the inner pylon was erected by Hatasu, the daughter of Thothmes I. The shaft that remains standing disputes with the obelisk of St. John Lateran in Rome the honor of being the highest in the world. According to Mariette, its height is one hundred and eight feet ten inches. These are the great obelisks of Upper Egypt. Sailing down the Nile, we find one at Crocodilopolis, in Lower Egypt, forty-three feet high, of uncertain date. We then come to Heliopolis, with its famous obelisk standing alone and bereft of its fellow. It is about sixty-seven feet in height and was erected by Usertesen I, of the twelfth dynasty (about 2500 B.C.). . . . As that of Hatasu at Thebes is the highest, so that of Usertesen I at Heliopolis is the oldest, obelisk we know of. About a thousand years later a pair of obelisks was reared by Thothmes III, at Heliopolis, in the sixteenth century B.C. A millennium and a half later, about the time of Christ, they were removed to Alexandria on the sea-shore; and about nineteen centuries after that the pair was parted, one to London, the other to New York, the two capitals of the English-speaking world.

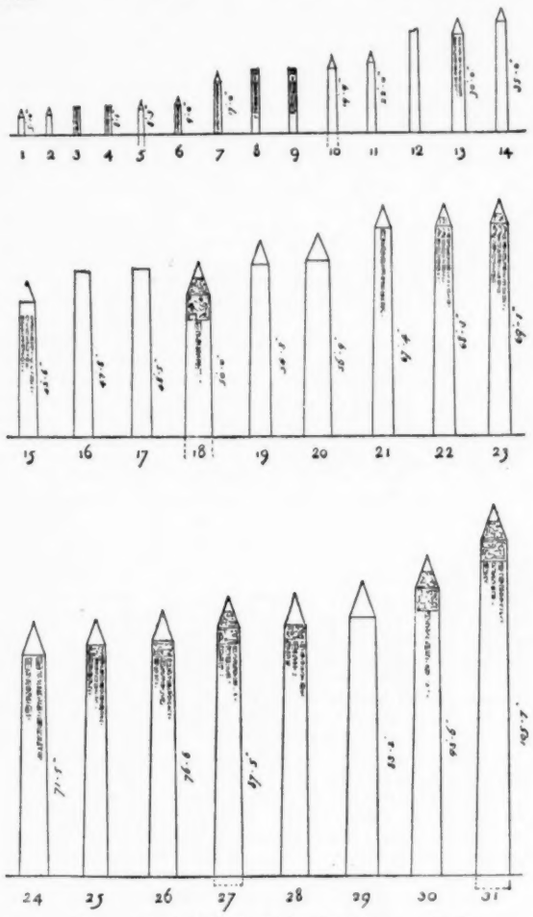


Diagram showing Relative Height of Obelisks now Erect.

Compiled chiefly from Notes on Obelisks, by J. Bonomi, read before the Royal Society of Literature of the United Kingdom.

1. Museum, Florence.	12. Philae.	22. London.
2. Museum, Florence.	13. Rome.	23. New York.
3. British Museum.	14. Constantinople.	24. Rome.
4. British Museum.	15. Rome.	25. Carnac.
5. Rome.	16. Rome.	26. Paris.
6. Alnwick, Eng.	17. Rome.	27. Rome.
7. Rome.	18. Constantinople.	28. Luxor.
8. Carnac.	19. Rome.	29. Rome.
9. Carnac.	20. Arles.	30. Carnac.
10. Rome.	21. Heliopolis.	31. Rome.
11. Corfe Castle.		

An unknown quantity is wanting at bases of Nos. 5, 10, and 18. A known quantity (as indicated) is wanted at bases of Nos. 27 and 31.

These all are of red granite, except Nos. 3 and 4, which are of basalt, and No. 12, which is of sandstone.

Besides the obelisks here shown there are prostrate nine at Sān and two at Carnac.

In modern times the three great obelisks taken to Paris, London, and New York in this century have made their journeys from Egypt such costly undertakings that we can appreciate the power, if not enterprise, of Roman emperors in bringing to Rome and other parts of Italy about fifty, many of them of great size. There are now sixteen in Italy, all transported from Egypt in the days of the ancient Roman Empire, twelve of which are in Rome. The four outside of Rome are very small.

The twelve obelisks now in Rome were erected between Augustus and Constantine. The cutting, and transportation, and erection of such huge monoliths had always been regarded by Egyptians and foreigners as triumphs of engineering science, so that the Roman emperors were glad to show that they were masters of the world by forcing from Egypt these cherished monuments of former greatness. It was a fine notion of the Roman emperors to place them on lofty foundations and make them serve as the turning-posts in the Circus Maximus and other racing-grounds of Rome. If they were to be taken out of their own country it was no unworthy site for them to tower above, nor scene to overshadow, the rush of the chariots and the passionate host that filled the benches. Of the twelve obelisks now to be seen in Rome, eight are of the eighteenth, nineteenth, and twentieth dynasties (before and after 1500 B.C.), two of the twenty-sixth dynasty (about 600 B.C.), and two were cut in Egypt and inscribed with Egyptian characters at the command of the Roman Emperors Domitian and Hadrian. Both, especially Hadrian, were greatly interested by the religion of Egypt. In the decline of civilization that entered with the advent of northern barbarians the obelisks of Rome were thrown down. Some were broken, others are probably still buried, and only one remained standing from antiquity into modern times, — the obelisk now in front of St. Peter's. The Egyptian obelisks at Rome shared in the regeneration of art that began four hundred years ago in Italy; the popes unearthed them, mended their broken shafts, reared them anew, and moved them to the squares of the new Rome. Prominent in this work were Sixtus V, Innocent X, Alexander VII, Clement XI, and Pius VI, especially Pope Sixtus V, by whom four, among them the two highest in Rome, were set up in their present position. Of the twelve Roman obelisks four are higher than sixty feet, four are between forty and fifty feet, two are between twenty and thirty feet in height. The highest is that in front of the Church of St. John Lateran,[1] and is the second highest known, surpassed only by that of Queen Hatasu at Carnac (Thebes). Measurements, however, differ, and the Roman monolith is often called the highest. It was erected in Thebes by Thothmes III, of the eighteenth dynasty (about 1600 B.C.). Constantine, in removing it to Constantinople, left it at Alexandria, whence his son Constantius took it to Rome, and set it up in the Circus Maximus. Here it was, after many centuries, found by Pope Sixtus V, prostrate, buried fifteen feet underground, and broken in three pieces. He caused the architect Fontana, in 1588, to rear it on its present site. It is about one hundred and six feet high. The same architect erected for the same pope the next highest obelisk in Rome, that in front of St. Peter's. This was taken by Caligula from Heliopolis, but, as it bears no inscription, its age is unknown. It was originally set up in the Vatican Circus, and, as already said, it still stood upright when Sixtus V had it moved. . . .

Constantinople possesses two large obelisks, one over fifty, the other more than seventy feet high, both brought there in antiquity. In France there is one, that in Paris on the Place de la Concorde, about seventy-six feet high. It was given to the French king in 1831 by Mehemet Ali. He had offered the pair at Alexandria, in 1821, to England and France. An officer sent out by the English Government had reported that the expense would be too great, owing to the shallowness of the harbor. The younger Champollion, when travelling in Egypt, made up his mind that the pair at Luxor (Thebes) were the best for France to have, and it was owing to him that the French Government asked Mehemet Ali for them. They were given, but only one was taken, and the smaller of the two. The engineer was Le Bas. The obelisk at Arles, though dating from antiquity, is not Egyptian.

In England, besides four small obelisks, there is the large one on the Thames Embankment in London, presented by the ex-Khedive Ismail Pasha in 1877. The gift was an old one, for, as already said, it had been made in 1821. At intervals three unsuccessful attempts were made to raise the money in England to defray the expense of its costly passage. Finally, in 1876, Sir J. E. Alexander made an appeal. It was answered, not by Parliament, nor by peer, nor by capitalist, but by a surgeon, Professor Erasmus Wilson, with £10,000, for which sum the transportation was undertaken by Mr. John Dixon, a civil engineer. The obelisk, the fellow of our New York monolith, had long lain prostrate on the shore across a small ravine, where it was used as a bridge by man and beast. Mr. Dixon encased it, as it lay on the sand, in the vessel in which it was to sail by surrounding it with iron plates. The cylinder thus formed was by various addi-

[1] Pliny, who tells the tale of its being first set up in Thebes by the King of Egypt, thus narrates: "When it was on the point of being elevated, the king, being apprehensive that the machinery employed might not prove strong enough for the weight, with the view of increasing the peril that might be entailed by due want of precaution on the part of the workmen, had his own son fastened to the summit, in order that the safety of the prince might, at the same time, ensure that of the mass of stone." This, probably, is but an old tale, yet it points to the value and importance which was attached to these monolithic monuments in old times, and the degree to which they were cherished. The same author further narrates that "it was in admiration of this work that, when King Cambyses took the city by storm, and the conflagration had already reached the very foot of the obelisk, that he ordered the fire to be extinguished; he entertaining a respect for this stupendous work which he had not entertained for the city itself. After remaining for more than 2,000 years on its original site it was floated down the Nile by Constantine to Alexandria, that emperor intending it to embellish his new city on the Bosphorus. His death, however, occurring before this was accomplished, his son, Constantius, preferred to have it conveyed to Rome. In a vessel provided with 300 oars he caused it to be brought to Ostia, and thence up the Tiber to the Vicus Alexandri, a small landing-place about three miles below Rome. From this place it was dragged slowly, on low-wheeled wagons, to the Circus Maximus, on the spina of which it was set up A. D. 357. Of the time when it fell from its base we have no record. In 1588 it was discovered lying interred to a depth of nearly 20 feet, and broken into three pieces. It was re-erected in its present site, near the Lateran Basilica, by the celebrated architect, Fontana, at the orders of the energetic Pope Sixtus V." — *From a Paper by John Bell.*

tions turned into a ship and taken in tow in the latter part of 1877 by a steamer. In the Bay of Biscay the two parted company in a storm, and this delay and a lawsuit for salvage cost Mr. Dixon £5,000 more than the £10,000 for which he had bargained. It arrived in London, 1878, January 21, and was set up on the Thames Embankment[1] September 13, 1878. Its height is about sixty-eight feet. The cross-section is not quite square nor the tapering uniform. Like its fellow in New York, the sea-air of Alexandria had injured some of its sides and inscriptions. The weight is nearly two hundred tons. . . .

Our New York obelisk,[2] as already stated, was one of a pair with the London obelisk, and was erected at Heliopolis (which is not far below the apex of the Delta), before the Temple of Tum, the Sun, by Thothmes III (eighteenth dynasty, about 1600 or 1500 B.C.). The pair was removed to Alexandria in the reign of Augustus, 22 B.C. From the time they became known to European travellers of modern times one had remained standing on the beach of Alexandria, the other was fallen, and they were known by the traditional name of "Cleopatra's Needles." An inscription, however, discovered in 1877, shows that they were erected in Alexandria eight years after the death of that Egyptian siren. Their Alexandrian engineer had supported the rounded corners of our obelisk on metal rods, which for ornament's sake were made to pass through the bodies of bronze crabs sixteen inches long, twelve wide, eight thick. The two remaining crabs were discovered, on excavating the base of the obelisk, by Mr. Dixon, the engineer of the London obelisk, in 1877. The two crabs had one claw left between them, and on the inner and outer sides of this claw were Latin and Greek inscriptions, which fixed the date of their erection at Alexandria and the name of the engineer. . . .

When Lieutenant-Commander Gorringe laid bare the foundation of the obelisk he found that the pedestal stood on a substructure of three low, square stages making three steps. These steps rose from a tesselated marble pavement of white and blue tiles. Underneath the steps was an underground foundation of rough, irregular stones not laid in mortar, in shape a cubical block with a side of about sixteen feet. The structure above ground was about eighty feet high. The heights of its members, roughly given, are: obelisk sixty-nine feet, pedestal seven feet, each of the steps one and one-half feet. The pedestal projected beyond the base of the obelisk about half a foot, and each step was about one and one-half feet wide. The lower step was about eighteen feet square. The exact dimensions of the shaft, converted into feet by Dr. Weisse from the metres of Zola,[3] are: height, sixty-eight feet eleven inches. One pair of opposite faces is eight feet three inches at bottom, five feet three inches and five feet four inches at top; the other pair is seven feet eight inches at bottom, five feet, and four feet ten inches at top. The pedestal was strangely irregular; only one face was rectangular, and no two faces were equal; it was six feet ten inches high, and the horizontal edges varied from eight feet seven inches to nine feet two inches. While the shaft and pedestal were of Syene granite, the three steps were a limestone, hard and whitish-yellow. The lower step was a square layer of eighteen stones. The upper two steps were not two separate layers like the lower, but formed a single two-stepped layer composed of six blocks surrounding a square space in the middle, which space, extending through the two upper steps, was plugged by three stones. Thus the two steps were a single layer of nine stones. One of the three blocks in the middle square compartment was not limestone but Syene granite, and it filled the east angle of the compartment (the angles of the obelisk and its foundations faced the four winds). In the lower step two of the eighteen stones were Syene granite and a third was an unusually white limestone. One granite block had hewn out on its upper face a mason's (or carpenter's) square. The granite block in the compartment of the two upper steps, and the two in the lower step, with the white stone, are considered by Lieutenant-Commander Gorringe to be Masonic emblems, as also certain stones with curious markings in the underground foundation. On a stone near the mason's square in the lower step was an iron trowel imbedded in cement. The trowel, the square, and certain mathematical figures on stones in the underground foundation were evidently deposited as the marks of the builder's calling. Whether Freemasonry of the present day descends in a direct line from antiquity, and whether the builders of the obelisk's foundation were members of the supposed brotherhood, is another question.

In 1877 Mr. W. H. Hurlbert, the editor of the New York *World*, who had made the acquaintance of the Khedive of Egypt, was informed that Ismail Pasha would be glad to give to the city of New York the fellow of the London obelisk. It was through the eloquence of Mr. Hurlbert that a New Yorker gave £15,000, the sum named as adequate by Mr. Dixon, who was then engaged as the contracting engineer. Meanwhile the Secretary of State, Mr. Evarts, had been petitioned to convey to the Khedive a request for the gift of Cleopatra's Needle. The request was negotiated by the American consul-general, Mr. Farman. Political troubles in Egypt and other causes delayed the ratification, but finally, in May, 1879, the original offer was converted into a gift by the new Khedive, Mohammed Tewfik. Mr. Dixon now declined to take the risk for £15,000, for the accident in the Bay of Biscay had cost him dear. Here the man of the occasion presented himself. Mr. H. H. Gorringe, an American citizen and naval officer of West Indian birth, returned from a cruise in the Mediterranean, where he had studied the question and made up his mind as to the methods of removal. The result was that Mr. Evarts informed Mr. Hurlbert that Lieutenant-Commander Gorringe was the man for the work.

The obelisk was first encased in oak planking to protect the surface. The process of laying it on the ground consisted of two parts, — first to revolve it vertically on its centre of gravity into a horizontal position, then to lower it, always maintaining the horizontal position. To revolve the mighty shaft two huge trunnions were clamped on two sides at the centre of gravity, and the trunnions supported on two great iron scaffolds. Finally the shaft was guyed at top from four points to keep it steady throughout the operation. Before beginning the revolution the obelisk was slightly raised vertically to enable its base to clear the pedestal, and this was done by "right and left thread turn-buckles" connected with rods inserted into the bottom of the trunnions. This machinery was made in New Jersey after Lieutenant-Commander Gorringe's own designs, and was landed at Alexandria about November 1, 1879. On December 6 the obelisk was raised so as to clear the pedestal; then, pedestal and steps removed, it was revolved on its trunnions till it hung horizontally, high in air. In order to lower it to the ground a pile of beams laid crosswise was built up under each end as the new machinery to take the place of that which had done the revolving. The obelisk was slowly lowered by taking from the top of each pile in turn. The next step was to roll it on to the pontoon which was to take it to the steamer, and then into the steamer's hold. Resting in a cradle, it was rolled over cannon-balls in the grooves of a track. The track was laid down for sixty feet in front of the obelisk. The motion was effected by an engine winding a rope round a drum, the engine attached to the front of the cradle, and thus pulling itself and its burden up to a point at which the other end of the rope was fastened. The obelisk was rolled from the pontoon through a hole in the side of the steamer, made by detaching some of its iron plates. This steamer, the *Dessoug*, was bought expressly to take the obelisk across the Atlantic. The obelisk set out from its native shores on June 12, 1880, and arrived in New York on July 20. The *Dessoug* was put into dry-dock on Staten Island, at Clifton, and on September 6 the obelisk was rolled out exactly as it had been rolled in. After much waiting for good tides the pontoon, on September 16, was towed to Ninety-sixth Street and North River, New York. Its route to its resting-place in Central Park was through Ninety-sixth Street, down the Boulevard, through Eighty-sixth Street and its transverse road across the Park, down Fifth Avenue, then, turning west at Eighty-second Street, to the site on a knoll near the south-east corner of the lower reservoir, near the Metropolitan Museum of Art. After leaving the shore at Ninety-sixth Street the cannon-balls were replaced by frames containing rollers. From the gate at Eighty-second Street and Fifth Avenue a huge bridge of trestlework was built across the hillocks and hollows of the Park to bring the obelisk by a uniform grade to the level its centre of gravity was to occupy in revolving back upon its pedestal. For this the same machinery used in Alexandria to revolve it off of its pedestal had been shipped back to New York. . . . On January 22, 1881, "Cleopatra's Needle" was replaced on its ancient pedestal on the Greywacke knoll in the Central Park of New York.

[1] A discussion which is at present being carried on in the New York daily papers tends to throw doubt on the translation of the hieroglyphic inscription on this obelisk, and indeed tends to raise the question whether Egyptologists have yet discovered the real key to the hieroglyphic records of the ancient Egyptians.

[2] Weisse, The Obelisk and Freemasonry.

[3] The two colossal bronze sphinxes which are to be placed at the foot of the obelisk on the Thames Embankment will be finished by August next. One of them is nearly completed already, and is, perhaps, the largest bronze casting in one piece ever made, weighing as it does about seven tons, and standing nine feet height. The lions at the base of the Nelson column in Trafalgar Square were cast in twenty-seven parts and riveted together, and are smaller than these sphinxes.

THE ILLUSTRATIONS.

HOUSE FOR W. F. WHITEHOUSE, ESQ., CHICAGO, ILL. MR. W. A. POTTER, ARCHITECT, NEW YORK, N. Y.

"CLEOPATRA'S NEEDLE" IN CENTRAL PARK, NEW YORK, N. Y.

(Gelatine Print.)

For description see preceding article.

SKETCHES OF SOME EXISTING OBELISKS, MADE BY MESSRS. D. A. GREGG AND G. R. TOLMAN.

The date of erection attached to these sketches refers to the re-erection of the obelisks by the popes.

LEGAL NOTES AND CASES.

Mechanics' Lien. — Insurance from Loss by Fire. — Property mortgaged beyond the Value of Buildings and Land. — Failure to proceed upon Lien.

The Supreme Court of the United States, in April, in the case of *The Royal Insurance Company, of Liverpool, vs. Stinson*, considered the question whether or not a builder had an insurable interest to the extent of his mechanics' lien on the house he was constructing, when the mortgage upon the land was so large that it covered the value of the building and the land. There was in the case, also, the question: Should a builder who has insured the amount of his mechanics' lien be compelled to continue the proceedings taken by him to enforce his lien, after the building has been destroyed by fire, to entitle him to recover the insurance?

Stinson had a contract to build a hotel, to be called the Webster House, at Marshfield, Massachusetts, for $25,000; the work was nearly done, but the owner failed to make the payments, and Stinson stopped work and proceeded to enforce a mechanics' lien to recover the amount due him. Pending the action he insured his interest as contractor and builder for $5,000. The building was destroyed, and Stinson did not continue his action upon the lien, but brought suit upon the policy of insurance, the company having refused to pay him on two grounds: first, that he had failed to prosecute the suit for enforcing his lien; second, that he had no insurable interest from the fact that the amount of the mortgage, which was prior to his lien, was greater than the value of the land and the house. The court below instructed the jury in favor of Stinson upon both points, and the jury gave him a verdict for his claim. The insurance company carried the case up, and the judgment was affirmed.

Judge Bradley, in the opinion, said: "As to the abandonment by the plaintiff, after the destruction of the building, of the proceedings to enforce his lien, it is apparent from the evidence adduced by the defendants themselves that it could not have injured them. But aside from this consideration, if the plaintiff had an insurable interest at the time of issuing the policy and at the time of the loss, equal to the amount insured, he had a complete and absolute cause of action against the defendants, and it did not concern them whether he farther prosecuted his lien or not, unless they desired to be subrogated to his rights and gave him notice to that effect. Whether, if they had done this and had offered to indemnify him against all costs and expenses, a refusal on his part to continue the proceedings would have been a defence to this action, it is unnecessary to inquire. No such course was taken by the defendants.

"As to the other question, relating to the insurable interest of the plaintiff, there is no doubt that the owner of the property had an insurable interest to the extent of the value of the building, notwithstanding the existence of a mortgage on the property of a sufficient amount to absorb it. Leading authorities on the point may be found cited in May on Insurance, §§ 81, 82. The remarks of Chief Justice Marshall in delivering the opinion of the court in *Columbian Insurance Co. vs. Lawrence*, 2 Peters, 46, are apposite and illustrative. The insured in that case, though in possession, had only a contract for a purchase of the property subject to a condition which had not been complied with, but of which the vendor had taken no advantage at the time of effecting the insurance, or at the time of the loss. The Chief Justice says: 'That an equitable interest may be insured is admitted. We can perceive no reason which excludes an interest held under an executory contract. While the contract subsists, the person claiming under it has undoubtedly a substantial interest in the property. If it be destroyed, the loss in contemplation of law is his. If the purchase-money be paid, it is his in fact. If he owes the purchase-money, the property is its equivalent, and is still valuable to him. The embarrassment of his affairs may be such that his debts may absorb all his property; but this circumstance has never been considered as proving a want of interest in it. The destruction of the property is a real loss to the person in possession, who claims title under an executory contract, and the contingency that his title may be defeated by subsequent events does not prevent this loss.' The principle asserted in these remarks, as well as the reason of the thing, leads to the conclusion that the owner of an equity of redemption has an insurable interest equal to the value of the insurable property embraced therein, whether he is personally liable for the mortgage debt or not. His interest arises from his ownership, carrying with it the incidental right of redeeming the property from the incumbrances on it. If he is also personally liable for such incumbrances, it only makes his interest more direct and exacting.

"Such being the insurable interest of the owner of the equity of redemption, it follows that one who has a mechanics' lien on the property by virtue of a contract with such owner has an equal insurable interest, limited only by the value of the property and the amount of his claim. In the present case it is admitted that the value of the building insured exceeded the amount of the plaintiff's claim; and that the latter was equal to the amount insured. The insurable interest of the lien-holder arises from the nature of the lien, which is a *jus ad rem*. All the owner's rights in the property are potentially his. They are under hypothecation to him for his security, and he can reduce them to possession if the debt be not paid. He is, therefore, directly interested in the property to the extent of his demand, whatever other security he may hold, and is entitled to insure to that extent, and, if a loss occurs, to recover the full amount of his insurance, or so much thereof as may be necessary to satisfy his debt." H. E.

Nuisance. — Area, or Opening in Sidewalk. — Railing. — Fence. — Doors.

An owner of premises abutting on the sidewalk "has the undoubted right, in the absence of any law or ordinance to the contrary, to make and maintain an area or opening in front of the building; but he is liable to all persons lawfully using the sidewalk, who, while exercising ordinary caution, are injured thereby." In Cooley on Torts, 660, it is said: "If one make an excavation so near the line of the highway that one lawfully making use of the highway might accidentally fall into it, his duty to erect guards as a protection against such accidents is manifest, and he will be responsible for injuries occasioned by his neglect to do so." In Shearman & Redfield on Negligence, § 360, it is said: "Where an area is excavated by the side of the street, it must be surrounded by a secure fence; and where an opening is made into a cellar, it must be covered with a lid or flap of ordinary and sufficient strength. The want of such guards creates a public nuisance, for which the tenant is liable to any person injured thereby, even though the premises were leased in that condition." *Ruesching vs. St. Louis Gas Light Company*, Supreme Court of Missouri, March, 1881. H. E.

THE OPERA-HOUSE AT NICE.

THE following account of the burning of the Opera-House at Nice has been received from Mr. Harris, the British Vice-Consul at that place: —

The subsequent notes are the result of a careful examination of the remains of the Opera-House at Nice, as also of information collected by myself from reliable sources. The building was erected in 1828, and was not, as is generally supposed, ill-constructed as regards means of exit, situation or plan. Entirely isolated on three sides, north, west and south, it was only partially joined on the east side to a house containing actors' dressing-rooms, the theatrical library, etc. An exit was provided both east and west for the actors from each side of the stage, leading directly into the street at either side, and most of them thus escaped on the night of the fire, only a few in their fright jumping into the pit from the stage, and a single one, Cattani, the basso, being stifled. The entire house was divided into three portions: — 1. The grand entrance and vestibule, with the main staircase. 2. The auditorium. 3. The stage. Above the vestibule, and on a level with the floor of the pit and stalls, was the refreshment-room; above this again the *foyer* or promenade-room; and, finally, above this and the stairs a broad asphalted terrace on a level with the floor of the upper gallery, and communicating with it by a large doorway. The whole of this, forming the northern portion of the building, was divided from the auditorium by a solid stone wall from the foundation to the roof. Everything on the northern side of this wall is quite intact, even to a notice prohibiting smoking posted close to the main entrance to the pit, while the latter is merely a mass of blackened ruins, open to the sky. The glass door at the top of the landing is there without a broken pane; and as soon as the occupants of the pit, stalls and first tier of boxes were through this, they were safe. With regard to the occupants of the upper tiers, they were also quite safe as soon as they got into the promenade-hall on the second floor, for thence a separate broad staircase, placed in the north-eastern angle of the building, leads down into the vestibule below, whence the exit is sufficiently wide, although the drum inside this main entrance might easily be improved, and its doors should open outwards, not inwards. With regard to the upper gallery, where almost all the victims of this fearful calamity were collected, a separate and sufficiently wide staircase leads up to it from the side street to the west; the last flight, however, composed of twenty steps, not fifteen, as most of the accounts stated, is tortuous and steep. It was here that the wretched victims fell in the sudden panic and darkness, and were piled up and stifled in the thick smoke before, happily, the flames got at them. Yet, in spite of the defective nature of this flight of stairs, all would most probably have been saved had the door above mentioned leading from the gallery on to the asphalted terrace been opened in time. This might the more easily have been done, as full five minutes before the alarm of fire was given the fire had commenced behind the curtain. Had those precious five minutes been utilized, not a soul need have been lost. A controversy is going on as to whether there was or was not an explosion of gas. That the pipes were leaky, and the strong smell of gas had been often complained of, there is no doubt. Those, however, who will not admit the explosion must then account for the sudden turning off of the gas, leaving the whole building in complete darkness, until after some minutes the fire itself burst forth and lighted up the awful scene. — *The Architect.*

TWO DRAWINGS PARTS OF THE SAME CONTRACT, AND DIFFERING, WHICH GOVERNS.

ALBANY, May 18, 1881.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — Will you please answer the following through your valuable paper?

An architect prepared the plans, specifications, details, etc., for a church. The work was contracted and progressed to a height of ten feet or more above the ground, when the architect died. His successor furnished a detail of the framing of the turret roof or spire, procuring his dimensions for the same from a detail sheet showing the elevation of spire. All the details upon this sheet were larger than the regular set of plans, and in a number of particulars *differed* from the regular set, amongst others being the spire, which was contracted several feet. In all respects the work was constructed as shown on the detail sheet. The church committee desiring to have the roof of the turret carried higher, and like the same indicated on the small drawings, claim that the same should be done at the expense of the widow of the original architect. Asserting, as a cause for claim, that the *detail sheet was made wrong in that particular*, although both were made and given to the contractors at the same time.

From which drawing should the framing of turret-roof have been made?

2. — Would it be consistent and tenable to consider the detail sheet wrong in regard to the turret-roof, when the other differences were accepted as proper?

3. — The detail sheet having been accepted as *part of* the set of drawings, who would be the proper party to decide upon differences arising as caused by the drawings, the succeeding architect or the church committee?

Pardon the length of this, please. Yours very truly, J.

[J. does not state his case very distinctly. Was the detail sheet accepted as a part of the original contract with the builder? If so, unquestionably it should take precedence of the small-scale drawings in regard to everything definitely shown upon it. As to any differences of opinion between the committee and the contractor in regard to the drawings or other matters relating to the contract, there is probably some stipulation made in the contract itself. In default of this, the architect employed by the committee is generally assumed to be the proper person to decide such questions. — Eds. American Architect.]

A QUESTION OF STEAM-HEATING.

Lynchburg, May 2, 1881.

To the Editors of the American Architect: —

Sirs, — A building 46 feet × 130 feet, four stories high (exclusive of lower basement), 12 feet, 19 feet, 17 feet, 15 feet, all in the clear, has just been finished in this city under my superintendence. I decline to pass the heating, on the ground that there is not enough heating surface in the coils and radiators to meet the requirements of the specifications, which are as follows, to wit: —

Put in the lower basement a steam-boiler and a steam-engine of ample capacity and of suitable construction to drive the elevator and to warm the house thoroughly. Radiators of requisite heating capacity to be put in the second basement and in the three upper stories, with their connections made and appliances attached for regulating the heat; in short, the whole to be complete in all its parts and warranted to serve its purposes well. The work was to have been finished on or before the first of January last, when a test could have been made.

What would be a safe calculation of the heating surface required in this climate, and what is proper to require of the contractor under the above specifications? By answering, you will greatly oblige a subscriber. R. C. B.

[The ordinary rules for steam-heating by direct radiation would provide, for office-buildings or dwelling-houses in New York or Boston, one square foot of radiating surface to about seventy-five cubic feet of space to be heated. For stores, one foot of pipe surface to one hundred and fifty feet of space would be an average proportion. Most of the pipe radiators give one square foot of surface for each vertical pipe, so that their heating capacity is easily measured. As R. C. B.'s building contains an elevator, the steam furnished for heating may possibly, if taken direct from the same boiler, be under an unusually high pressure, and therefore more effective in heating, so that this point should be considered. — Eds. American Architect.]

NOTES AND CLIPPINGS.

St. John's, Chester. — It is said that money has already been raised for rebuilding the tower of St. John's Church, Chester, which fell a few weeks ago.

To Napoleon III. — The city of Milan is about to erect an equestrian statue of Napoleon III by Barzaghi in recognition of the service rendered to Italy by the French emperor.

The Pantheon. — Signor Bacelli, Minister of Public Instruction, has at length issued an order that the modern buildings which have been built around and against the Pantheon shall be removed. It is to be hoped that the disastrous results which attended a similar removal of squalid buildings about the Baptistery at Ravenna may not declare themselves in this case.

A Protean Well. — An artesian well at Atchison, Kansas, furnishes both fresh and salt water. A long tube, which reaches to the bottom of the well, penetrates a salt vein, while a shorter one only extends to a stream of fresh water. — *Fortsch. der Zeit.*

Pacific Coast Association of Architects. — At a meeting of the Pacific Coast Association of Architects, the following officers were elected: President, Augustus Laver; Vice-President, John Wright; Secretary, George H. Wolfe; Treasurer, H. C. Macey; Admission Committee, C. J. O'Connor, W. Mooser, G. W. Percy. Twenty-five members signed the roll. The constitution and by-laws of the association were signed by twenty of the architects present.

The Lincoln Monument. — Mr. Larkin G. Meade, the sculptor, now at Florence, Italy, writes as follows to Mr. O. M. Hatch: "I am now engaged in modelling studies for three additional figures of colossal proportions for the Lincoln monument, in accordance with my original conception of what the monument should be when completed. These figures represent Freedom, Justice, and Peace, to be placed on the same elevation with the statue of Lincoln on the remaining sides of the shaft. I am induced to do this by the advice of discriminating friends, and by representation and encouragement that the funds for the payment of this additional work may be provided for by the munificence of one or more generous citizens of Illinois." For the purpose of considering this matter a meeting of the association has been called at Springfield, Ill. It is thought that the association will approve and accept the designs of Mr. Meade as he suggests, provided the liberal-minded citizens of Illinois can be found. The association has on hand sufficient money to pay for the two groups now being cast.

A New Theory of the Pyramids. — Mr. Frederick C. Whitehouse of this city has communicated to several scholars and learned societies the results of certain observations made by him in a recent journey through Egypt and Syria. He offers an explanation of those stupendous masses, the pyramids of Gizeh, which removes them from the region of the unknown and the marvellous to class them with other triumphs of engineering skill, wisely directed to increase the wealth, knowledge and prosperity of an intelligent and well-governed people. He argues that although the pyramid was a common shape for the mound above a tomb, yet whenever these masses rise to a great height their cause is not to be assigned to the tomb-chamber hewn in the rocky plateau on which they stand, or the room constructed in the stone fabric above. He refers the fifteen which may be called pyramids of the first class to the great reservoir of water constructed in the Fayoum, and makes them part of the judicious system of irrigation, nobly conceived and splendidly executed, which, if repaired, would enormously increase the population of Egypt and redeem a vast extent of so-called desert. He distributes these pyramids into three classes, namely: Sand-hills inclosed by retaining walls; masses of clayey limestone terraced and adorned by trees and foliage, protecting and beautifying the cities which lay below; and the remains of hills, which, honeycombed by the tunnels and shafts of the quarrymen in pursuit of good materials for dykes and aqueducts, were afterward shaped into the well-known pyramids of Gizeh. According to this view the pyramid of the Cheops was not built in the ordinary sense of the term. The upper strata were lowered, block by block, upon the bed-rock, there piled in the most convenient and stable form, and afterward coated and decorated with hieroglyphs. This theory that these structures are due to practical and not sentimental reasons is supported by a great variety of arguments, chiefly extremely technical and appealing only to those who have made Egyptology a special study. The result, however, if accepted, will relieve the mind of an incubus, and humanity of the stigma that rulers were found to order, and a nation to execute, hideous and useless monuments of barbarous vanity. — *New York Evening Post.*

Marseilles and the Statue of Thiers. — A curious contest has arisen between the Municipal Council of Marseilles and the French Government over M. Thiers's statue. Last year the Municipal Council, with commendable anxiety to do honor to the famous son of a Marseilles locksmith, voted £800 for a Thiers monument, to be erected in the heart of the city. A decree was issued to that effect, the statue was finished, and it now awaits erection on the chosen site. But in the meantime a new municipal council had been elected that detested the memory of M. Thiers. The municipal elections turned upon the question of the statue, and the fierce democracy of the southern capital of France voted by a large majority against the erection of the monument. As soon as the new council met it passed a resolution annulling the grant of a site made by its predecessors. The prefect of the Bouches-du-Rhône annulled the resolution, and a ministerial decree has been issued commanding the reluctant council to give effect to the decision of its predecessor. The Irreconcilables are raging against the decree which forces a statue of the "Massacrer of Paris and the Bombarder of Marseilles" upon a reluctant city; and *L'Intransigeant* concludes a fierce invective against the memory of M. Thiers by calling upon the Marseilles Council "to rear monument against monument, statue against statue, and by the cruelest of antitheses to oppose in the same place honor to infamy, patriotism to treason, the republican to the monarchist, the assassinated to the assassin, Gaston Crémieux to Adolphe Thiers!" — *Pall Mall Gazette.*

A Filler for Porous Hard Woods. — Use boiled oil and corn starch stirred into a very thick paste. Add a little japan and reduce with turpentine. Add no color for light ash. For dark ash and chestnut, use a little raw sienna; for walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more color than is required to overcome the white appearance of the starch unless you wish to stain the wood. This filler is worked with brush and rags in the usual manner. Let it dry forty-eight hours, or until it is in condition to rub down with No. 0 sandpaper, without much gumming up, and if an extra fine finish is desired, fill again with the same materials, using less oil, but more of japan and turpentine. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety by following up the usual methods. — *T. F. Page in the Coach Painter.*

Rapid Bridge Building. — A rapid piece of work was done lately at Bucyrus, O., by the Pittsburgh, Fort Wayne and Chicago Company in replacing with an iron bridge an old wooden one. A scaffolding was first erected next the old bridge, and the new structure put together on it. Then all being in readiness and every part in place, the old bridge was removed and the new placed in position. This was accomplished in two hours and fifteen minutes. At 12.30 the last train crossed the old bridge, which the workmen immediately commenced to remove. Then the new structure was gradually drawn into permanent position by means of two large windlasses, one placed at each end of the bridge, and each worked by four men. This operation occupied eighteen minutes. Then the connecting rails were laid, the roadway filled in firm, and at 2.45 the first train passed over the new bridge.

Making Brickwork Impervious. — According to the *Industrial World*, to make brick masonry impervious to water, there may be employed two washes or solutions for covering the surface, the one castile soap and water, the other alum and water, the proportions being three-fourths of a pound of soap to a gallon of water and a pound of alum to four gallons of water, both being well dissolved. The wall must be perfectly clean and dry, and the air at least fifty degrees Fah. The soap wash should be laid on boiling, with a flat brush, and so as to form no froth. After remaining twenty-four hours to become hard, the alum wash is applied in the same manner, but at the temperature of sixty to seventy degrees. After another twenty-four hours a second soap wash is put on, this being repeated until the walls are impervious.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondence, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

241,485. DOOR-WICKET. — Leopold P. Garcin and A. W. Baldwin, San Francisco, Cal.

241,493. APARTMENT-HOUSE. — Philip G. Hubert, New York, N. Y.

241,496. OPEN FIREPLACE. — John Kellhofer and J. J. Eberle, Chillicothe, O.

241,507. STEAM-HEATING APPARATUS. — Eugene F. Osborne, St. Paul, Minn.

241,509. FIRE-ESCAPE. — Joseph Payne, Dwight, Ill.

241,534. PORTABLE PIPE VISE AND CUTTER. — George W. Glazier, Salem, Mass.

241,552. WRENCH. — John Lee, Mansfield, O.

241,568. SEAL-TRAP FOR WATER-CLOSETS, SEWERS, ETC. — Orlando W. Spratt, Philadelphia, Pa.

241,603. BUFFER FOR DOORS. — Ira Buckman, Brooklyn, Mass.

241,616. SASH-FASTENER. — Walter P. Chamberlin, Hartford, Conn.

241,619. APPARATUS FOR DETECTING LEAKAGE OR WASTE IN WATER-PIPES. — Benjamin S. Church, Scarborough, N. Y.

241,640. PAINT COMPOUND. — Augustus M. Fenner, Linesville, Pa.

241,648. FASTENER FOR MEETING-RAILS OF SASHES. — F. J. Grodavent, Syracuse, N. Y.

241,664. DOOR-KNOB. — William D. Hughes, Washington, D. C.

241,668. ICE-HOUSE DOOR-FASTENER. — Francis Keil, New York, N. Y.

241,674. PIPE-WRENCH. — Wladyslaw F. Kosinski, Brooklyn, N. Y.

241,686. COMPOSITION FOR FILLING THE PORES OF WOOD. — H. W. Mattick, Lawrenceburg, Ind.

241,688. WINDOW AND DOOR SCREEN. — David H. Metcalf, Battle Creek, Mich.

241,713. METHOD OF PREPARING PAPER FOR REPRODUCING DRAWINGS. — Henri Pellet, Paris, France.

241,720. FIREPLACE. — Gerard R. Ricketts, Quaker Bottom, O.

241,736. HINGE. — Charles D. Sigsbee, Washington, D. C.

241,743. CURTAIN-FIXTURE. — Presley B. Smith, Keyser, W. Va.

241,751. APPARATUS FOR CLEANING CESSPOOLS. — Nicolas Talard, Paris, France.

241,753. FASTENER FOR MEETING-RAILS OF SASHES. — J. Rufus Terry.

241,764. ELEVATOR SAFETY GRAPPLING DEVICE. — Thomas A. Weston, Stamford, Conn.

241,771. MOSAIC WORK FOR PAVEMENT, ETC. — Paul Würtz, New York, N. Y.

9,705. (*Reissue.*) ARTIFICIAL MARBLE. — William Burnett, New York, N. Y.

9,710. (*Reissue.*) METALLIC FASTENING FOR ROOFING-SLATES. — Samuel Farquhar, Boston, Mass.

9,713. (*Reissue.*) MANUFACTURE OF HINGE-HOOKS. — Wm. J. Lewis, Pittsburgh, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Thirty-six building permits have been issued since the last report, the following only being of sufficient importance to be mentioned:—

Michael Carling, 3 three-st'y brick buildings, Dolphin St., near Argyle Ave.

Thos. S. Hughes, three-st'y brick stable, rear of High St., between Low and Gay Sts.

Edward Filber, three-st'y brick building, Broadway, between Canton Ave. and Alice-Ann St.

B. & O. R. R., one-st'y brick building, Fort Ave., adjoining Dry Dock.

John Henry Keene, three-st'y brick building, n e cor. John and St. Paul Sts.

Messrs. Gail & Ax, one-st'y brick factory, Charles St., between Lee and Barre Sts.

Associated Reformed Church, one-st'y brick building, Fayette St., between Charles and Liberty Sts.

Margaret Lyband, two-st'y brick building, Hollins St., between Poppleton and Parkins Sts.

G. Rhinehardt and D. Sullivan, two-st'y brick building, Forrest St., near Madison St.

David Perine, two-st'y brick building, 53 Liberty St., near Lexington St.

Charles Heineman, two-st'y brick building, Canton Ave, between Broadway and Ann St.

John E. Bennett, three-st'y brick building, Baltimore St., near Gilmore St.

Jacob Saum, 16 three-st'y brick buildings, Druid Hill Ave., between Gold St. and North Ave.

Henry Westphal, 8 two-st'y brick buildings, commencing n e cor. Clarkson and Heath Sts.

STORE. — Mr. Chas. L. Carson is preparing drawings for a store, for Mr. Geo. R. Goldsborough, to be built on the s w cor. Baltimore and Light Sts., to be 58′ x 63′, four stories high, of brick with stone and terra-cotta finish; cost, about $50,000.

ALTERATIONS. — Mr. Frank E. Davis is preparing drawings for extensive additions and alterations to the residences of Dr. Smith and Mrs. Dr. George Johnston, at Frederick, Md.; also for a country-residence for Hon. Andrew Banks to be built at Reisterstown, Baltimore County, Md., to cost about $20,000.

BUILDING INTELLIGENCE.

Boston.

BUILDING PERMITS.—*Wood.*—*Water St.*, on Damon's, Tudor's, and Hittenger's Wharves, for Hoosac Tunnel Dock and Elevator Co., 3 store-houses, 100′ x 400′; Chas. R. McLean, builder.

Mill St., near Webster St., for National Dock and Warehouse Co., store-house, 80′ x 225′; Robert Maxon, builder.

East Fourth St., near I St., for Jas. E. Bowe, dwell., 21′ x 38′, two stories; J. H. Wigglesworth, builder.

Melville Ave., near Washington St., for Edward T. Merrihew, dwell., 28′ x 45′, two stories; Wm. Barton, builder.

Withington and Torrey Sts., for Wm. Love, greenhouse, 19′ x 95′; Wm. Love, builder.

Concord St., near Bartlett St., for Daniel Barrett, dwell., 22′ x 35′, three stories; Geo. M. Stairbird, builder.

Sarin St., near Tupelo St., for S. A. Denio, dwell., two stories; M. Goodwin, Jr., builder.

Crawford St., for Samuel Hall, dwell., 31′ x 34′6″, two stories; John F. Haines, builder.

No. 93 Princeton St., for Mary G. Cassidy, dwell., 21′ x 30′, three stories; David F. Lord, builder.

East Second St., near K St., for Patrick Murray, stable, 25 x 40′, two stories.

East Seventh St., near M St., for Sarah G. Henry, dwell., 22′ x 32′, three stories, and stable, 33′ x 33′, two stories.

Vernon St., near Cabot St., for Valentine Bock, dwell. and store, 30′ x 38′, three stories; Valentine Bock, builder.

East Seventh St., near M St., for Jennie L. Johnson, dwell., 22′ x 32′, three stories, stable 33′ x 33′, two stories; Clark & Lee, builders.

Summer Place, off Cabot St., for Thomas Jackson, 2 dwells., 20′ x 30′, three stories; Jas. Jackson, builder.

East Seventh St., near M St., for Jennie L. Johnson, dwell., 22′ x 32′, three stories, stable 33′ x 33′, two stories; Clark & Lee, builders.

Summer Place, off Cabot St., for Thomas Jackson, 2 dwells., 20′ x 30′, three stories; Jas. Jackson, builder.

Ware St., near Rill St., for Samuel B. Pierce, dwell., 29′ x 38′, two stories; Wm. J. Jobbing, builder.

Baker Place, near Willow Court, for Michael Foilett, dwell., 16′ x 27′; Wm. Manus McLaughlin, builder.

Brick.—*Nos. 42-52 South St.*, on estate of Ebenezer Francis, 3 buildings, 27′ x 107′, five stories; Thos. J. Whidden, builder.

Huntington Ave., cor. Camden St., hospital, 44′ x 50′, three stories; J. W. Coburn & Co., builders.

Harvieh St., near Dartmouth St., for John F. Meade, tenement-house, 36′ x 46′, four stories; Thos. R. White, builder.

BUILDING INTELLIGENCE.

Battery St., near Salutation St., for E. J. Hahn, dwell., 25′ x 100′; Dennis Sullivan & Son, builders.

APARTMENT-HOUSES. — Mr. J. P. Putnam, architect, is making plans of an apartment-house, to be built at the cor. of Columbus Ave. and Wellington St. It will measure 23′ x 85′, and will be six stories high.

Plans are being drawn for a building to be built on Commonwealth Ave., for Geo. B. Clapp; J. P. Putnam, architect.

HOUSES. — Mr. O. H. Flanders "broke ground" this week for five three-st'y brick and stone houses on Dale St., cor. Ninth St.: cost, $30,000. Mr. Geo. M. Harding is the architect.

T. F. Furber, Esq., has just commenced to build a first-class house at the cor. Warren and Gaston Sts.; Mr. Geo. M. Harding, architect.

Samuel Weld, Esq., is having built on Sunderland St. a house for Mr. S. M. Apollonio; Geo. M. Harding, architect; T. G. Brown, carpenter.

WAREHOUSE. — The property at the cor. of Chauncy St. and Rowe Place, covering 4601 square feet, recently purchased by Nevins & Co., will be immediately improved by the erection of a first-class dry-goods warehouse for their occupation and partly for rent: cost, about $70,000; Mr. S. J. F. Thayer, Boston, architect.

COTTAGES. — Messrs. Bean & Abbott are putting up on Mills St. 6 model cottage-houses, and a block of 2 attached or apartment dwells., from plans by Mr. G. M. Harding.

Brooklyn.

BUILDING PERMITS. — *Lorimer St.*, w s, 100′ s Noble St., three-st'y tenement; cost, $5,000; owner, W. H. Simonson, 84 Norman Ave.; architect, F. LeR. Sweet; builder, E. O. Simonson.

South Elliott Place, e s, 262′ 10″ s De Kalb Ave., 2 three-st'y brownstone dwells.; cost, each $9,000; owners and builders, Litchfield & Dickinson, 79 Schermerhorn St.; architect, C. Werner.

Grand Ave., w s, 200′ n Putnam Ave., 2 four-st'y brownstone dwells.; cost, total $19,450; owner, Margaret Findlay; architect, M. Thomas; builders, C. Cameron and Morris & Selover.

Grand St., n w cor. Olive St., four-st'y frame tenement; cost, $6,000; owner, Jno. B. Hauf, 217 McKibben St.; architect, G. Hillenbrand; builders, F. Brendel and J. Rueger.

Lafayette Ave., n s, 100′ w Tompkins Ave., 3 three-st'y brick and brownstone dwells.; owner, S. C. Phillips, 623 Willoughby Ave.

(*Continued on next page.*)

Publishers' Department.

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Architects, Builders, and others will confer a favor on the Publishers by mentioning "The American Architect and Building News" when sending for circulars or corresponding with parties advertising in these columns.

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DISSOLUTION OF PARTNERSHIP.

New York, May 17, 1881.

We have to announce to our readers that the firm of Bicknell & Comstock is dissolved by mutual consent.

The business, however, will be carried on the same as heretofore, by Mr. William T. Comstock, who has been known as a member of the firm for the past four years, and who is thoroughly conversant with the business.

We understand that Mr. Bicknell will for a time retire from active business, as the close confinement to it for the past sixteen years makes it seem judicious for him to take a season of rest.

For the present his office address will be the same as heretofore.

ASPHALTE.

The Neuchatel Asphalte Company, office 54 Astor House, has lately laid a large area of floors with its Asphalte in the Sugar Refinery of Messrs. Havemeyer & Elders, Williamsburgh; floors in the Harmony Mills, Cohoes; in the mills of the Merrimack Manufacturing Corporation, Lowell, Mass.; Messrs. Bolton's Brewery, Lansingburgh, N. Y.; the stables and floors of the Albany Brewing Company, Albany; stables for Mr. Lindsley, architect, Newark, N. J.; for the American Horse Exchange, Broadway and Fiftieth Street; for Mr. Adrian Iselin, New Rochelle, and is now laying walks in St. Paul's Churchyard and at St. Augustine's, Houston Street, for Trinity Church Corporation. The company has appointed the American Asphalt Pavement Company of New England, 31 Milk Street, Boston, its agents for Massachusetts, and has contracts in Boston to lay floors in the Standard Sugar Refinery, for Messrs. Snell & Gregerson, architects, and other parties.

BUILDING INTELLIGENCE.

Fortieth and Forty-first Sts., on wharf, 2 two-st'y brick oil factories; cost, $16,000; owners and masons, Bush & Denslow, foot Twenty-fifth St., on dock; architect, G. Damen; carpenter, Otto Christiansen.

McDonough St., n s, 250′ w Tompkins Ave., two and one-half st'y brick dwell.; cost, $10,000; owners, McKim, Mead & White.

Smith St., e s, 75′ s Butler St., four-st'y brick store and dwell.; cost, $10,000; owner, J. F. Peppard, 126 Hoyt St.; architects, J. Freeman and Hudson & Dolz.

Graham Ave., s e cor. Broome St., 4 two-st'y frame dwells.; cost, total $8,000; owner, R. Kohlman, 38 Van Cott Ave.; architect, F. Weber; builder, J. Schoch.

Norman Ave., n s, 100′ e Manhattan Ave., three-st'y brick tenement; cost, $5,100; owners, E. Naehr and B. Zurn; architect, F. Weber; builder, G. J. Roberts.

Hooper St., Nos. 195, 197, 199, *and* 201, 4 three-st'y brownstone dwells.; cost, $7,800; owner, Mary J. Ferguson, 350 South Fifth St.; builder, R. Ferguson.

Alterations. — *De Kalb Ave.*, n e cor. Adelphi St., four-st'y brick extension; cost, $5,000; owner, C. W. Von Glahn, 263 Adelphi St.; architect, C. F. Eisenach; builders, J. Renys and L. W. Seaman, Jr.

Floyd St., n s, 341′ w Lewis Ave., 2 two-st'y frame dwells.; cost, $3,500; owner, Anthony Straub, Floyd St., near Yates Ave.; mason, Mr. Kuhn; carpenter, John Rueger.

Chicago.

Building Permits. — Church of Ascension, one-st'y brick school-house, 17′ x 99′, La Salle and Elm Sts.

H. McGuire, two-st'y brick dwell., 39′ x 56′, Ashland Ave., near Nineteenth St.; cost, $7,500.

S. J. Cohen, same, 25′ x 62′, 48 Lincoln St.; cost, $7,500.

A. S. Maltman, 6 two-st'y brick dwells., 21′ x 44′, 152–72 Jay St.; cost, $10,000.

J. S. Maltman, two-st'y brick dwell., 21′ x 44′, 177–99 Seminary Ave.; cost, $3,500.

J. M. Dawling, two-st'y brick store and dwell., 20′ x 74′, 137 Canal St.; cost, $6,000.

C. O. Gleason, 4 two-st'y brick dwells., 50′ x 64′, 2310–14 Rhoades Ave.; cost, $6,400.

H. H. Gage, same, Tremont and Sophia Sts.; cost, $12,000.

G. L. Dunlap, elevator, 103′ x 380′, Thirty-third St. and river; cost, $400,000.

P. Canlin, three-st'y brick dwell., 21′ x 60′, Western Ave.; cost, $4,000.

E. R. Lott, three-st'y brick stores and dwells., 50′ x 64′, 783–5 Halsted St.; cost, $16,000.

S. E. Egan, two-st'y brick dwell., 30′ x 65′, Dearborn and North Aves.; cost, $17,000.

Mrs. E. G. Klaner, 2 three-st'y brick dwells., 40′ x 40′, Hubbard and Halsted Sts.; cost, $6,000.

R. H. Beratzkey, 3 three-st'y brick stores and dwells., 99′ x 111′, Blue Island and Centre Aves.; cost, $12,000.

O. R. Keith, two-st'y brick dwell., 52′ x 82′, Prairie Ave.; cost, $60,000.

D. Pyott, 2 three-st'y brick dwells., 38′ x 40′, 626–28 West Jackson St.; cost, 12,000.

R. D. Sheppard, five-st'y brick stores, 40′ x 175′, 77–79 Monroe St.; cost, $40,000.

BUILDING INTELLIGENCE.

Mortimer & Tapper, 3 two-st'y brick dwells., 42′ x 50′, Jackson St., near Ashland Ave.; cost, $10,000.

Mrs. Quinlin, two-st'y brick dwell., 21′ x 30′, Haynes Court and Lyman St.; cost, $3,500.

A. Schuerli, two-st'y brick dwell., 22′ x 56′, 2812 South Park Ave.; cost $5,000.

J. L. Waller, 2 two-st'y brick dwells., 40′ x 55′, West Indiana St.; cost, $11,000.

H. Klare, three-st'y brick dwell., 26′ x 55′, 229 Ontario St.; cost, $7,000.

C. J. Hull, 7 two-st'y brick dwells., 17′ x 40′, 29–35 Artesian Ave.

School-House. — A school-house, to cost $40,000, is about to be built at Nos. 145 and 163 Evergreen St.

Elevator. — Mr. George L. Dunlap is to build a grain-elevator, 103′ x 308′, on Thirty-third St.; cost, $400,000.

Houses. — Messrs. Burnham & Root, architects, have completed the plans for a house for Mr. A. Byron, to be built on Michigan Ave., near Twenty-ninth St.

J. W. Ackermann, architect, is now putting up on Archer Ave., cor. Main St., a two-st'y brick building 24′ x 65′ with stone trimmings, for Thomas Power, cost $4,600; for J. F. & M. Mewet, 37 Granger St., two-st'y brick house, cost $3,600; at No. 47 Granger St., a house for C. Helm, cost $4,800.

Armory. — Mr. George Edbrooke, architect, is finishing designs for Battery D's new armory.

Cincinnati.

Building Permits. — J. H. Epson, 4 three-st'y brick dwells., Seventh St., near Freeman St.; cost, $8,000.

John Seymour, 2 three-st'y brick, Third St., between Broadway and Ludlow St.; cost, $5,000.

B. Kohmau, three-st'y brick, s e cor. Sixth and Pearson Sts.; cost, $6,000.

Mrs. Oliver, three-st'y brick, Central Ave., near Liberty St.; cost, $6,000.

B. F. Fossett, two-st'y brick, 15 Stone St.; cost, $3,500.

Evans Estate, 5 double brick dwells., Bellevue Ave., Mt. Auburn; cost, $30,000.

John Ryan, two-st'y brick, No. 2 Charles St.; cost, $6,000.

Fifteen permits for repairs; total cost, $12,600.

New York.

Building Permits. — *One Hundred and Thirtieth St.*, s s, 175′ e Seventh Ave., 4 three-st'y brownstone dwells.; cost, each $8,500; owner, Wm. McReynolds, Westfield, N. J.; architect, T. S. Godwin; builders, Tyson & Van Dolsen and J. B. Smith.

Fourth St., No. 230 w, cor. West Tenth St., five-st'y brick store and tenement; cost, $19,500; owner, Herman Ragener, 101 Seventh St.; architect, F. W. Klempt; builders, Murphy & McGinty and Grissler & Fausel.

One Hundred and Seventeenth St., n s, 100′ w First Ave., 4 four-st'y brownstone tenements; cost, each $8,000; owner, L. Suydam, 163 Broadway; architect, G. J. Carey.

One Hundred and Twenty-eighth St., n s, 150′ w Seventh Ave., 3 three-st'y brownstone dwells.; cost, each $9,000; owner, R. M. Strebeigh, 7 East Forty-eighth St.; builder, Samuel Lynch.

One Hundred and Thirtieth St., n s, 350′ e Seventh Ave., 3 three-st'y brownstone dwells.; cost, each $9,000; owner, R. M. Strebeigh, 7 East Forty-eighth St.; builder, Samuel Lynch.

Tenth Ave., n w cor. One Hundred and Seventh St., four-st'y brick store and tenement; cost, $13,000; owner, James Hamel, 34 West Fifty-fifth St.; architect, R. S. Townsend; builders, Jasmes Hamel & Son.

One Hundred and Twenty-sixth St., n s, 125′ w Seventh Ave., 3 three-st'y sandstone dwells.; cost, each $6,000; owner, Adelaide Wilson, 74 East One Hundred and Twenty-eighth St.; architect, J. F. Miller; builder, Thos. Wilson.

Park St., Nos. 57, 59 *and* 61, six-st'y iron printing-office; cost, $40,000; owner, W. B. Smith, 314 Broadway; architect, E. L. Woodruff; builder, G. W. Moore.

Second Ave., w s, 70′ n One Hundred and Twenty-second St., four-st'y brick flat; cost, $13,000; owner and builder, E. L. Pierson, 57 Third Place, Brooklyn; architect, F. C. Merry.

Twenty-eighth St., Nos. 417, 419, *and* 421 w, eight-st'y brick factory; cost, $40,000; owner, Charles S. Fischer, on premises; architect, Geo. B. Pelham; builder, J. C. Wessells.

One Hundred and Twenty-fifth St., Nos. 62 *and* 64, four-st'y brick tenement; cost, $30,000; owner, Chas. Wilde, Nos. 413 and 415 East One Hundred and Twenty-fourth St.; architects, Babcock & McAvoy.

Fifteenth St., Nos. 247 *and* 249, 2 five-st'y brownstone apartment-houses; cost, each $35,000; owner and builder, F. A. Seitz; architect, J. M. Dunn.

Forty-ninth St., No. 140 w, five-st'y brownstone apartment-house; cost, $18,000; owner and builder, Frank A. Seitz, 332 East Forty-second St.; architect, J. M. Dunn.

One Hundred and Twenty-seventh St., n s, 250′ e Eighth Ave., 6 three-st'y brownstone dwells.; cost, each $10,000; owner and builder, S. O. Wright, 155 East One Hundred and Thirteenth St.; architect, J. H. Valentine.

Madison Ave., s w cor. Sixty-ninth St., 6 four-st'y Nova Scotia brownstone dwells.; cost, from $22,000 to $35,000 each; owners and builders, Chas. Buek & Co., 63 East Forty-first St.

North Moore St., Nos. 34 *and* 36, seven-st'y brick storage; cost, $50,000; owners, Jas. M. Dunbar and F. W. Haymes, 59 Leonard St.; architect, J. M. Slade; builders, J. H. Masterton and John Smith.

Fifty-fifth St., n s, 450′ w Sixth Ave., 3 two-st'y brick stables and dwells.; cost, each $6,000; owner, E. J. Donnell, 44 West Fifty-eighth St.; builders, L. N. Crow and McGuire & Sloane.

Fifty-fifth St., n s, 450′ w Sixth Ave., 3 two-st'y brick stables and dwells.; cost, $6,000; owner, E. J. Donnell, 44 West Fifty-eighth St.; builders, L. N. Crow and McGuire & Sloane.

Eighty-ninth St., s s, 135′ e Fourth Ave., 2 four-st'y brownstone tenements; cost, $12,000; owner, architect and builder, J. B. Squier, 21 East Seventy-ninth St.

One Hundred and Seventeenth St., n s, 200′ w Second Ave., 4 four-st'y brick tenements; cost, each $5,000; owner and builder, J. W. Warner, One Hun-

(*Continued on next page.*)

"CLEOPATRA'S NEEDLE," CENTRAL PARK, NEW YORK.