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WE hope we may be pardoned for recurring to the dispute now pending between the Mayor of New York and Mr. Henry J. Dudley, Superintendent of Buildings for that city. Of the character of the Superintendent, or of the justice of many of the accusations against him, we know nothing; we do, however, find in the printed list of charges some that appear to us unjust, and in the comments of the daily papers on the case much that is glaringly unfair. The very first item of Mayor Cooper's charge against Mr. Dudley accuses him of having appointed as Deputy Superintendent one Robert McGinnis, a man rejected as incompetent by the Examining Committee of the New York Chapter of the American Institute of Architects. Turning to the report of the New York Chapter in the Proceedings of the last Convention of the Institute, we find that having been requested by Mr. Dudley to nominate candidates for the office of Deputy Superintendent, according to law, their committee had *recommended Mr. Robert McGinnis for the office*. Either the Mayor or the Secretary of the Chapter would seem to have made a mistake here.

THE next specification charges that the Superintendent has authorized the erection and alteration of buildings in violation of the provisions of the Building Act, and gives a long list of items. It is true enough that the specific accusations show violations of the statute, but as all architects who have practised in New York know, the letter of the statute is necessarily violated in many cases, where old walls are built upon, alterations made, and the like, and for this very reason the law expressly directs that "the Department of Buildings shall have *discretionary power to modify or vary any of the several provisions of this act to meet the requirements of special cases;*" and in another place, where the penalties for violation of the statute are described, "the Superintendent of Buildings is hereby authorized in his discretion, good and sufficient cause being shown therefor, *to remit any fine or fines, penalty or penalties, which any person may incur under any of the provisions of this act.*" It would be difficult to confer in more explicit terms the power for the exercise of which Mr. Dudley is arraigned. Whether his discretion was wisely exercised, is another question; undoubtedly it was not in all cases, but it must be remembered that extraordinary wisdom cannot be demanded even of those vested with the most absolute powers. The other specifications relate to "arbitrary dismissals," "private malice," etc., and are comparatively trivial. The whole list of allegations appears to us such as would be likely to be drawn up against any official of extensive relations and unbounded authority. Some of our best architects regard building statutes as seriously detrimental to the public interests, by shifting the responsibility of those who design construction upon an official department, where it is lost amid the dust and noise of politics; and it seems as if these things proved the correctness of their view.

THE Archæological Institute of America has issued its first annual report, whose modest appearance hardly indicates the value of the work which it has, within so short a period, already accomplished, or the ambitious character of its plans for the future. With only about a hundred and twenty members, and limited in resources to the scanty income derived from their fees and contributions, the Institute has nevertheless been able to increase the sum of archæological knowledge by an interesting report concerning some examples of Grecian architecture hitherto little known, by Mr. J. T. Clarke, whose contributions to this journal on similar subjects will be remembered; and an account of investigations made in the interest of the Institute by Mr. W. J. Stillman among the pre-historic remains of Etruria, a field for exploration second in interest to none in either hemisphere. Besides these substantial results of the year's work, a well-considered scheme has been formed for future operations. As is natural, the importance of the study of American antiquity has engaged special attention, and steps have been taken for sending out a properly qualified agent not only to gather in New Mexico and Colorado such relics of the early civilization of our continent as may be obtained, but to investigate the habits and traditions of existing tribes, with a view to the light which may thus be thrown on the problems which American archæology still presents. Simultaneously with this inquiry, it is proposed to conduct an exploration at a site in Greece, which has been selected, but whose position is not yet revealed. The spot has been chosen with care, and, judging from the wonderful success of recent researches at Olympia, Mycenæ, Troy and Pergamon, it is reasonable to predict most interesting results. The Committee, feeling that the prospects of the Institute now give them ample justification for so doing, appeal for an increase of membership, and for contributions of funds to carry out their proposed work. The sum needed is small, and we hope for their speedy success.

THE San Francisco Board of Trade, whose opinion on the subject is entitled to great weight, has, in a special report on the inter-oceanic canal question, declared emphatically in favor of the Nicaragua route. The report urges that the impost of three dollars per ton for toll by the Panama line will practically prevent its use in commerce to a remunerative extent, and claims that the Nicaragua canal can be built for one-half the cost of the other, so that a rate of toll which would not be remunerative in one case would pay good interest in the other; arguing furthermore that the Nicaragua route will save eight hundred miles over that *via* Panama in the distance between our Atlantic ports and California, a difference which would in the long run weigh heavily in favor of the shorter line. Some of the members of the Board are very familiar with the Isthmus, and assert that Nicaragua can furnish ample supplies and materials for construction, which are wanting at Panama, while the natural products of the region will of themselves offer an inducement to commerce to turn in that direction. In regard to the practicability of the cutting, a member asserts of his own knowledge that one can at certain seasons sail in a steamer from the Atlantic to within twelve and a half miles of the other ocean, to a point from which he can see the setting sun dip into the waters of the Pacific. This being so, it seems as if a hundred million dollars were a liberal allowance for excavating the remainder of the way, and the San Francisco Board believes that this is far in excess of the sum which will actually be required. Considering that a single one of the new Broadway rapid transit companies expects to spend about fifty millions on its road and branches, the inter-oceanic canal begins to seem a less formidable undertaking than it did at first.

THE financial success of the New York elevated railroads seems to have stimulated afresh those capitalists who have long looked with desire upon the preëminent advantages which Broadway offers as a route for rapid transit to undertake some definite scheme, and the prospect of accomplishing the result they wish seems now particularly hopeful. It has often been reported that the property-owners on that thoroughfare, finding their rents depreciated by the transfer of business to the Sixth Avenue and the Bowery, through which the elevated roads run, were disposed to promote the construction of another elevated line through their own street; but from the comparative narrowness of Broadway, it is doubtful whether the obstruction by the track would not cause more injury to property than would be compensated by increased facility of access, and the subject seems to have been dropped. Lately, however, it has been revived in a modified form, two rival companies having applied for charters, one for an elevated road from the Harlem River hrough Madison Avenue to Ninety-ninth Street, thence under

ground through Broadway to the Battery; the other for a line wholly underground through Broadway and the Boulevard to King's-Bridge. The expense of the tunnel road is estimated at about two million dollars per mile, this enormous cost being due principally to the tough and hard character of the rock which underlies the city throughout almost its whole extent, and in which the greater part of the route would have to be cut. The experience of the elevated lines shows, however, that the road would pay interest on even this immense outlay.

A card has reached us signed by a well-known sculptor, Mr. T. H. Bartlett, announcing the formation of a school for instruction in sculpture and modelling at No. 394 Federal Street, Boston, where all who wish may study and practice the art. The rooms are open day and evening the year round, and instruction is free to those who are unable to pay for it. The modelling of terra-cotta and similar materials will receive special attention, and the course of study extends even to the glazing and burning of pottery. Mr. Bartlett's opinion is, that these materials are to occupy an important place in the arts of this country, and that there is already a widely-felt need of instruction in their use. Without quite agreeing with him in his anticipations as to the future extension of the use of terra-cotta, we nevertheless anticipate much good from Mr. Bartlett's school. The study of form is quite independent of material, and those who can model well in clay need little further instruction to make them good designers, and what is not less useful, good critics, of work in stone or metal. Indeed, we may expect great good to the art of architecture itself from any increased knowledge or perception of form; for a taste once cultivated to the appreciation of beautiful sculpture will be the first to be offended by the disproportioned clumsiness of bad architecture. Much is to be anticipated in the future from the remarkable interest in plastic art which has been developed among us within a few years by the efforts of a few individuals. The very children in the kindergartens are now very generally taught to model in plaster, and opportunities are provided for the ample development of faculties so early awakened. No doubt the results for which preparation is thus so effectively making will not be long in making their appearance.

Some time ago the Conservators of the River Thames, alarmed by the alleged silting up of the channel of the river, through, it was said, the deposition of sediment from the sewage poured into it below the city of London, and brought back by the tide, demanded from the Metropolitan Board of Works, in whose charge the sewers are placed, the removal of the deposit, if such existed. The matter was referred to two arbitrators, Captain Douglas Galton and Mr. F. J. Bramwell, with Sir Charles Hartley as umpire, and a unanimous opinion has just been presented by them, to the effect that the injurious deposits have not taken place to the extent supposed; that while certain banks have been formed, the main channel has been deepened, and that this effect is due to dredging operations, undertaken by the Thames Conservators themselves, near the outfall of the sewers, which have changed the character of the flow, increasing its velocity and scouring action in some places while it diminished it in others. Of the sediment which the water undoubtedly contains they report that a part consists of sand and mud scoured from the river-bed, and part from the drainage of other cities and towns: a small portion may be derived from the sewers of the Metropolitan Board, but the amount is so small in proportion to the whole, that these sewers cannot in any sense be said to have caused the deposit, and the Board of Works should not be called upon to remove, or pay any part of the expense of removing, the banks in question.

A question of considerable importance to builders has been decided in England lately. One Mr. Davies had contracted for alterations to his house in London, and while the works were in progress the builder took thirty loads of sand from the garden for making mortar, afterwards filling up the holes with rubbish. On discovering this, Mr. Davies sued the builder for ten pounds, the value of the sand, and thirty pounds more as damages for injuring the ground by the bad quality of the rubbish with which the holes were filled. The defendant claimed that he had a right to use the sand from the garden, and that the plaintiff not only consented to its removal, but paid him (under the contract) for digging it up and using it. The judge, however, refused to listen to the defence, and remarking that it was unreasonable to believe that the plaintiff consented and intended to pay for having his garden so damaged, gave judgment in his favor for the value of the sand. It is so common for builders to dig for sand to make mortar at the site of the works wherever practicable, that this decision should be remembered. The custom seems to be that where good sand can be obtained from the excavation for a building, the contractor may use so much of it as he needs for mortar, unless some other understanding can be proved; but in the absence of any agreement it cannot be expected that an owner should be forced to submit to having holes dug at random over his premises. As the difference in cost between digging sand from the site and buying it outside amounts in most cases to a considerable sum, it is very desirable for all parties to come to a mutual understanding beforehand.

M. Emile Trelat, who is well known as a writer on various points of what may be called practical architecture, makes, in a recent address, some suggestions in regard to the lighting and ventilation of school-rooms, which are interesting, and in some respects novel. He advocates strongly the lighting from one side only, which has already been recognized in Germany and England as the best arrangement for the eyes of the pupils, and proposes to gain the required amount of illumination by increasing the height of the class-rooms, and making the windows as lofty as possible. He considers that in order to gain steadiness of light, all the windows should face the north; thus there will be no need of shades or blinds. Nevertheless, he does not forget the necessity for sunshine and cross currents of air through rooms to be occupied by children; but believing that both of these are unpropitious to the school work, he would provide openings in the south wall, opposite the windows, closed by shutters, and at regular intervals in the school day he would have the pupils sent into the playground, and the shutters and windows thrown wide open, flooding the room with sunshine and fresh air, sweeping away the gathered effluvia which a gentler aëration might not be able to dislodge, and filling the room with a new and sweet atmosphere into which the children can return from their "bath of fresh air," as he terms it, without any sensation of closeness. These observations, proceeding from such a source, are worthy of careful attention.

A difficulty which probably many of our readers have encountered, often arises in computing the cost of a building, upon which the architect bases his charge, when a part of the materials are furnished by the owner. There is such a misapprehension of the nature of an architect's labors that many proprietors maintain, if they make their own contract for a furnace, for instance, instead of trusting their architect to make it for them, that the latter ought not to charge commission on the cost of it, whereas nine-tenths of the care and labor on his part, which the use of a furnace involves, consists in the planning and arranging for passage of hot-air pipes and location of registers; the actual receiving of estimates and signing of an agreement being a trifling matter in comparison; and so with many other details. In general, the architect must have in mind, and shape his plans, almost from the beginning, in accordance with all the minutiæ which he understands are to enter into the final result, often with an amount of care and thought quite disproportionate to the trifling addition which a percentage on their cost makes to his commission, and it is clearly unreasonable to claim that he is not entitled to payment for his trouble unless he happens to be charged with the actual purchase of the articles for whose reception he has been obliged to make all the preparations. To make the point clear, a thoughtless or unreasonable client may be asked whether he would claim that if he furnished all the materials the architect would not be entitled to any pay at all.

We have received the Report of the Boston Fire Commissioners for the year ending May 1st, 1880, containing much interesting matter. Every fire occurring in the city is described, and the cause, loss and insurance recorded, with other details. The total losses by fire for the year have been a little over a million and a quarter dollars. We are surprised to find how small a proportion of the losses are covered by insurance. It is true that most of the fires are trifling, and even a partial insurance on the building and its contents is sufficient to cover the damage they cause, but in the extensive conflagrations, causing total destruction of the building and contents, it appears that many of the parties interested had only one half, or less, of their risk covered.

THE VENTILATING FIRE-PLACE.[1] — III.

IN Fig. 181, the fire-place opening is shown closed with doors of soapstone decorated with incised carving. The writer has not, however, tried these doors on account of the difficulty of constructing them. They form no necessary part of the apparatus and are offered merely as suggestions. They are here divided into three panels; the lower two slide to the right and left in slots shown in Fig. 182. The upper panel rises like a window-sash, and when open takes the position shown in Fig. 189. It is hung by chains running over pulleys and balanced by weights, after the principle of the "Lhomond" blower shown in Figs. 60, 61, 62, 83, and others. The object of this arrangement of doors is twofold. It allows the fire either to be enclosed at night for safety by shutting all three doors, or it allows it to be increased in activity by opening the lower two doors and using the upper one after the manner of the "Lhomond" blower. These doors are designed to be made of soapstone in order to render them more air-tight than is possible with metal under great changes of temperature. The edges are tongued and grooved to fit nicely into each other when closed. Elastic strips of thin brass might fastened to the facings to increase the tightness by bearing against be the soapstone doors, but it is not probable that the advantage thereby gained would justify the extra outlay, inasmuch as even with them a sufficient degree of tightness could not probably be attained to arrest combustion and keep the cinders alive over night. Were this possible these dampers would be of the greatest value. As it is, their chief object is security against fire.

We can also have the same device in another form. The panels are in this case made of mica-slate set in a sculptured soapstone frame. The mica-slate becomes blackened by smoke in the course of time, but it may be readily cleaned or replaced by new. The effect of the fire behind them is very pleasing. The drawing is taken from the writer's dining-room except that the soapstone blowers have not been constructed. Inasmuch as the dining room fire-place is rarely used, the smoke-flue is left simple. The lower part is, however, made of terra-cotta drain-pipe which passes through the air-chamber in a straight line to the floor of the room above and then enters an ordinary brick flue. It thus forms a Galton flue. The free space in the chimney-breast by the side of this flue is occupied

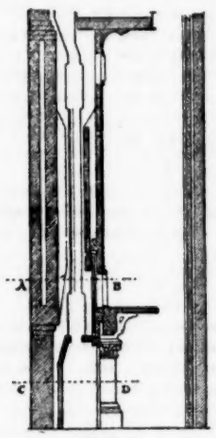


Fig. 190.

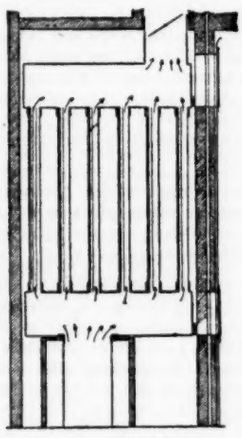
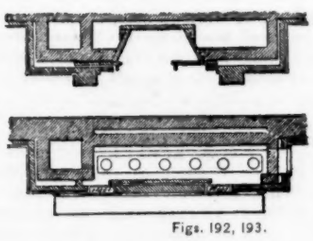


Fig. 191.

Fig. 201.



Figs. 192, 193.

by an iron distributor like that shown in Figs. 188 and 189, connected with the smoke-flue of the kitchen range below. In the chamber above, the same flue passes through another similar iron distributor, so that a large enough proportion of the range heat is saved to heat and ventilate both rooms without injury to the draught.

It may be sometimes convenient to draw the fresh air from the room itself instead of from the outside, when small fires are burned in the fire-place at irregular intervals and insufficient heat is generated in the distributor to raise the temperature of the outer air to the required degree. But this should only be done when the fire-place draught is supplied from the warm-air flues of a furnace. Where no furnace is in use in the house the air taken across the distributor should always be drawn from the outside. It will otherwise come into the house unwarmed through chance cracks, and the result will be that exactly that amount of heat which it could otherwise have abstracted from the distributor will be lost.

A hinged panel in the chimney-breast may be decorated with an oil painting and protected on the back by tinning. The entire wooden front of the chimney-breast in this case can be made to take down, by removing the four large screws or bolts at the right and left corners of the mantel-shelf and under the brass warm-air registers at the top. On the right and left are two sideboards, in connection with one of which, the lower square pipe of the distributor serves as a plate-warmer. Where two fire-places built over each other in the same stack are both likely to be used, but seldom at the same time, the same distributor may be connected with both of their smoke-flues in the manner shown in longitudinal section in Fig. 190. When one of the fires is in use it is only necessary to close the damper in the throat of the other. But both fire-places may be used at once because they have separate flues above the distributor. One of the flues may be the range-flue, and the Fig. 190 gives the distributor actually designed for the fire-place and range (though not so constructed). Fig. 191 gives the transverse section of the same fire-place and chimney-breast. The soapstone blower is shown in this section. Fig. 192 gives a horizontal section of the distributor and of the hinged and movable panels. The brick wall is vaulted behind the fresh-air space for the preservation of the radiated heat.

We see by the section (Fig. 189) that the back of the hinged panel is furred out in such a manner as to bring the tin-work close up to the perpendicular pipes of the distributor, just above the lower horizontal pipe. The object of this is to direct the rising current of fresh air against and between these upright pipes. Half of the success of the apparatus depends upon the care taken in setting, so that the fresh air shall be forced to strike every part of the heating-surface. To prevent loss of heat by the radiation of the pipes upon each other, thin strips of sheet-iron should be placed between them. This greatly increases the heating-surface.

By referring to the historical division of our subject, we shall see that the peculiarities and advantages of many of the ventilating fire-places and hot-air furnaces described have been brought together in a single apparatus.

The principle of the sloping jambs of Gauger and Rumford (Fig. 36) has been respected in the form of the fire-place itself. The fresh-air supply of Savot and Gauger at the back (Figs. 29, 30 and 34) is represented in the lower register behind the fire-place. The two-way valve (Fig. 38) may be used to regulate the admission of the fresh air from the outside, or from the room itself. The caliducts or meanders of Savot and Gauger (Fig. 37) are reproduced in a simpler

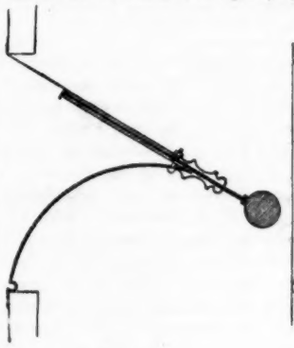


Fig. 194.

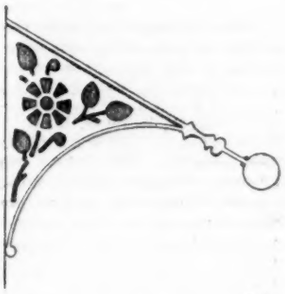
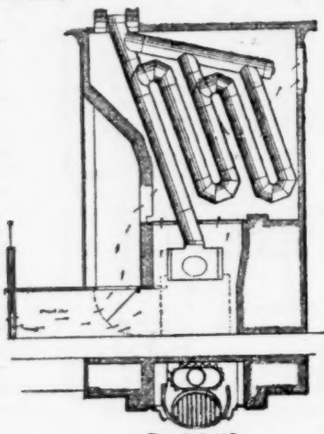


Fig. 195.

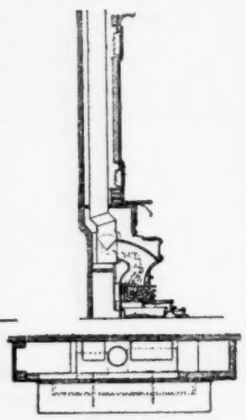
form in the "distributor" pipes. The contracted throat of the fire-place, the bevelled back and its rounded upper edge, and the non-conducting, heat-radiating linings of Rumford are found in the form and material (soapstone and tile) of our fire-place; the "soufflet" of Lhomond (Fig. 60) is given in the soapstone blower. The movable grate of Bronzac (Figs. 62 and 63) is or may be retained. For the inverted smoke-flue of Desarnod (Fig. 65) and Montalembert (Fig. 66), of Douglas Galton (Figs. 67 and 68), of Descroizilles (Fig. 69), of Peclet (Figs. 70, 71, and 72), we have substituted the simple conical damper in the upright flues, and obtained results equally good without danger of smoke or clogging. The advantages of the Taylor fire-place (Fig. 73) are retained in the use of terra-cotta, while its disadvantages are avoided by placing it where it can easily be reached for cleaning or repair. The further improvements of Leras (Fig. 75), Fondet (Figs. 84 and 85), Cordier (Figs. 86 and 87) and others, in the use of a direct smoke-flue with circulating fresh-air current, have been adopted in the upright pipes and meandering air-passage, and in the manner in which the fresh air is brought in contact with the distributor by the sides of the air-chamber and the tin linings. The principle shown in Figs. 80, 81, 82, and in the fire-places of Joly and Galton (Figs. 100, 101 and 103) of the increase of heating-surface by the use of iron plates intercepting or conducting radiant heat, has been followed in the use of the iron sheets placed between the upright radiating pipes. The principle of placing the heating-surface above the mantel, and of increasing it by extending the smoke-flue at this point (Fig. 125) is developed and carried to its utmost limits in the form and duplication of the dis-

[1] This paper, by the writer of the Open Fire-Place articles, will be incorporated with them in their separate form.

tributor. The principle explained in connection with Fig. 129, by which all the heat of the smoke may be obtained without destroying the draught, is employed to advantage. Finally, the extended heating-surface of a basement furnace is emulated. The simplicity of the MacGregor or Magee drum furnace (Fig. 132), the durability and tightness of the soapstone (Fig. 144) and terra-cotta furnaces (Fig. 143), the increased heating surface obtained by the use of separate pipes (Figs. 133, 134, 140, 141, and 142), are sought. The distribution of the smoke is accomplished with the minimum of friction and cost, and withal, the artistic treatment of the fire-place and mantel is unobstructed.



Figs. 196, 197.



Figs. 198, 199.

Any one of the ventilating fire-places described may be used in connection with it, and, by the combination, the maximum of effect may be reached in the minimum of space.

The heat of the fresh air rising from this combination with the Jackson fire-place, in the library of the house on Marlboro' Street, mentioned above, was so great as to affect the carving on the frieze of the black-walnut mantel. To provide against its destruction, the writer designed the cut brass hood shown in Figs. 194 and 195, to deflect the current of hot air from the woodwork.

The writer has also used the "Fire-place Heater" in connection with his distributor in the manner shown in Figs. 196–200. The form of distributor here used is objectionable on account of the reversed draught, but it is less expensive to make than any other form. The chimney in which it is used having a powerful draught, it never smoked. With an ordinary draught, however, it might be troublesome, and is not to be recommended. The lower two elbows are made to slip off for the purpose of cleaning out the pipes when necessary, but their removal will probably be attended with difficulty as soon as they become a little rusty. A damper is placed at the top of the first and third upright pipes where shown in the cuts, to direct the smoke through more or less of the pipe.

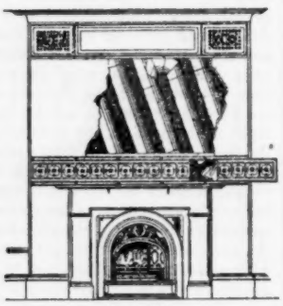


Fig. 200.

Fig. 201 gives this kind of distributor in a slightly more compact form, but open to the same, if not greater objections.

OLYMPIA.[1] — III.

The passage to the side aisles seems from a sinking in the stylobate of the interior columns to have been restricted to one intercolumniation, — that between the first and second shafts from the door, the space between the first and the wall being taken up by the wooden staircases which led to the galleries. The pteroma and part of the naos had a pebble cement floor; that of the side aisles consisted of several layers of stucco. The pronaos and epinaos had more costly pavements; that of the latter being of black marble slabs, that of the former the mosaic so well known from the Expédition de Morée and from Semper's Stil.[2] This has suffered so much since its first discovery, fifty years ago, that it was impossible to make a complete drawing of it. The material of which the temple was built is a limestone shell conglomerate. The little marble that is used — for the cyma with the lion masks and for the roof tiles — is from Paros. Where Pentelic marble appears it is generally attributable to an extensive restoration which affected the building at a late Roman date. The inexpensive and almost mean cement pavements, which must have taken the place of worn marble blocks, seem also due to alterations of that period. As in most Greek structures, the walls were commenced by a course of extra height, large stones placed on edge, upon which followed the narrower layers. The height of single drums of the pteroma columns varies greatly, an economy which may well be excused as the channeling, the fine priming of stucco and the *bapoe* rendered the joints and the differences in color of adjoining stones entirely invisible. There are few traces of the doorway arrangement; two pivot-holes and a bolt-slot in the threshold make it probable that the door opened outwards. The details of the elevation are not yet thoroughly published. The trigylph frieze over the ends of the cella is not continued around the sides, being terminated by a return. Traces of color are mentioned as distinguishable upon its entablature; the ornament of the cyma is particularly distinct. The staircases, the ceilings and roof-trusses were of wood; they have left heaps of ashes in different parts of the interior, as well as the beddings in blocks of the masonry which witness their existence. It is hardly necessary to add that no traces of a hypæthron have been found in any of the temples of Olympia. The execution of the stone-work is excellent, the connection of the separate blocks by iron dowels and clamps cast in lead is effected with great care. The excavations of the third year brought to light a well-preserved metope, with traces of stucco which distinctly show the former attachment of a shield; the diameter of this was 1.03 m. As the metope was the eighth from the east upon the south, it is concluded that eleven of the celebrated shields of Mummius were attached to the southern side, the remaining ten finding place in the metopes of the principal front. The exact dimensions of the plan, and to a great degree of the elevation, are now certain. The attempt of Herrn Dörpfeld to calculate the exact length of the Olympic foot and stadion from proportions and commensurable dimensions supposed to be recognized in the buildings of the Altis, seems to the writer, notwithstanding the great space which is officially devoted to it, to be only a new speculation upon a tempting but thoroughly fruitless field. The results which are obtained are in this case not even striking coincidences; they will not be accepted as proof by designing artists who are with right sceptical that arithmetical relations can possess a subtle influence upon the beauty of their work, and object to having this rendered so easy and schematic for them. Such systems of proportions and commensurable dimensions, interfering as they do with artistic composition, and rendering no advantages in return, should be looked for last in the rational architecture of the Greeks, calculated as it was, above all others, for the eye of the beholder. The Heraion was a peripteros of six by sixteen columns, with nothing abnormal in plan, it being upon the same scheme as that which appears in the temple of Zeus, near by, and in the temples of Ægina and Pæstum. The suggestion in the former notice, that the unusual number of the side columns, which does not elsewhere occur, stood in some symbolical relation with the sixteen maids of Hera, for whom the temple was built, who here held their festivals and represented the sixteen cities of Elis, at that time in existence, may perhaps gain weight, in as far as the futile question is worth arguing, by the discovery that the columns within the naos were also sixteen in number.

The stylobate consists of only two risers. This will go far to overthrow the supposition that the distinction between the temple of a divinity and a heroon was indicated by the number of steps. The ascent to the ptemora, which must have been crowded with statues and offerings, was not allowed at either of the fronts, but only through the corner intercolumniations of the southern side. The epinaos was provided with a *grille;* its two columns, one of which was said by Pausanias to be of wood,[1] have disappeared, their place having been taken by a rough mass of masonry, as the epinaos was at one period used for a wine-press. The elevation of the temple shows some very remarkable peculiarities. The building seems a curious patch-work of various ages, frequently restored after completion. The columns are of most different forms and dimensions; their diameter ranges between 1.00 and 1.29 m.; the distance between their centres is also varied; a greater irregularity can hardly be imagined. One of the shafts has sixteen channels, the rest twenty. The capitals, their abaci, rings and incisions are of the most dissimilar design. The drums vary in height from .50 to 2.40 m.; the sides of the abaci from 1.31 to 1.75 m., as each echinus has a different inclination. Of the forty columns of the pteroma, only eighteen have been discovered. There seems absolutely to be no two of these alike. The only two of which all the drums were found are published side by side, upon Plate 34, with eight other capitals; all are as different as possible. This peculiarity of the columns, which is not known to occur elsewhere, is puzzling. It is hardly probable that a gradual restoration of the building is answerable for all the varieties. The shafts appear not to have inclined inwards — even the customary contraction of the corner intercolumniations has not been cared for, and the metopes above them must consequently have been very much wider than the rest. Perhaps the adoption of the corner openings as a passage may have been to some degree accountable for this. Some slight pains have been taken, however, to hide the variation of their diameters. The exterior peripheries, not the centres of the shafts, are placed in line. Upon the northern side, which, standing next to the hill, was generally hidden from view, even this precaution was omitted, and the columns of the pteroma perform a most irregular dance. A still more remarkable peculiarity is that not the slightest fragment of the building's architrave (one

[1] Die Ausgrabungen zu Olympia. III. Uebersicht der Arbeiten und Funde vom Winter und Fruehjahr, 1877–1878. XXXVIII Tafeln, herausgegeben von E. Curtius, F. Adler und G. Treu. Berlin: Verlag von Ernst Wasmuth, 1879.

[2] Der Stil in den technischen und tektonischen Künsten, von Gottfried Semper. München. Bruckmann: 1788. Band I. Die Textile Kunst. p. 57.

[1] Paus. V. 16. 1.

hundred and thirty-seven metres in length) has been found. It would be explained by the supposition that the entablature was of wood; but this seems very improbable and does not agree with the scamillus upon the summit of some of the abaci. The execution of the existing stone-work is good; the material is for the greatest part poros, primed with a fine white stucco like that of the great temple of Zeus. A peculiarity of the antæ of the pronaos and epinaos is that they were formed of some thin material, clamped to the cella wall, possibly of marble, or even of wood, coated with bronze; the roof-tiles are of terra-cotta. The pavement of the interior consists of rough limestone slabs, brought to a surface with cement. The columns within have left traces upon this, which measured .88 m. in diameter; this argues them to have been of the Ionic style. Fragments of Ionic capitals found in the naos, and the fact that the pedestals of statues stood in the usual situation of staircases, makes the adoption within of a dual system without galleries almost certain. As the details are of a very debased character, and as remains of Doric shafts and capitals have been found which fit, in general dimensions, to the interior of the temple, the theory of Adler, that a hyperoön of the Doric order was displaced during a restoration of the late Roman period by tall Ionic shafts, seems plausible. There is much in the character of the building which shows that the ruins known to us are not of great age. There is a certain formal regularity of plan, an inartistic dependency of the cella upon the peripteros, which never occurs in Hellenic structures. The naos is exactly in the middle of the plan; though the pteroma before the pronaos is somewhat broader than that at the rear, the difference is exactly equalized by the pronaos being curtailed in depth, with unhappy effect. It is plain that the correspondence of the lateral axis of the interior columns with that of each of the central eight of the side

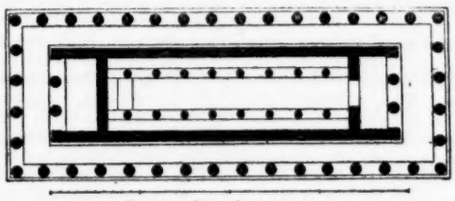


Fig. 2. Plan of the Heraion.

peripteros was the natural result of this central position of the cella, and had no further significance. All that speaks for the great age of the Heraion is its extreme elongation; this must have been retained through a number of rebuildings. It appears to have been intended that the upper steps of the temples of Zeus and Hera should be of the same height. The levels of the western fronts are exactly equal; the eastern fronts differ slightly from the normal horizontal plane, that of the Zeus temple being .05 m. below, that of the Heraion .17 m. above it.

A section through the foundation of the Metroön is given upon Plate 38, which shows little else than its breadth and position close to the terrace upon which stood the treasure-houses. Constructed of the same material as the other buildings, it was apparently erected at a late date, and disfigured by rough restorations. At the time of Pausanias it contained no statue of a divinity, but was filled with the portraits of Roman emperors.[1] The state of ruin in which it now remains is so complete that nothing can be surely recognized of its structure beyond the detail of the entablature upon Plate 38. Only one column remains upon the three steps of its stylobate. From the relative dimensions of these, it has been concluded that the scheme of the peripteros was six by eleven. This proportion is that advocated by Vitruvius,[2] and does not occur elsewhere in Greece or the Greek colonies; it does not bespeak great age. The Philippeion was the treasure-house which Philip II. erected, to protect the offerings dedicated by him. to Olympian Zeus, after the victory of Chæroneia, over the Thebans and Athenians, and the expedition into the Peloponnesus, against the Lacedæmonians, had rendered all Greece in effect a province of Macedonia. The date of the erection of the building is thus quite surely referred to 337 B. C., between the time of the battle and the diversion of Philip's attention by the projected attack upon Persia. The king doubtless took pleasure in reminding the Greeks who annually crowded to Olympia of his supremacy. The commemorative thesauros with the chryselephantine statues of Amyntas, Philip, and Alexander, was not placed upon the terrace with the others, but was erected in a novel form upon the most conspicuous spot that could be chosen, — near the southwest corner of the Heraion, where it bordered the open expanse of the great altar, the chief place of the Altis. It was close upon the passage between the Heraion and the Pelopion which led from the northwestern entrance-gate to the altar and agora. The remains of the Philippeion

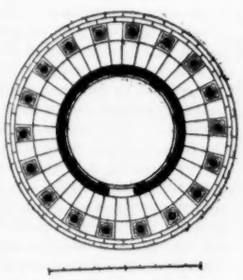


Fig. 3. Plan of the Philippeion.

[1] Paus. V. 20. 9.

[2] Vitruv. III. 3.

first discovered were only two concentric rings of foundation-masonry. Little by little the fragments belonging to it were collected, finally sufficient to justify the restoration of plan and details. The building was a circular peripteros upon three steps, the pteroma of eighteen Ionic columns, the interior with nine engaged Corinthian columns. It appears to have been the first Ionic structure of the Altis. No remains of the door architrave or jambs have been found, but its opening was probably upon the south of the cylindrical cella. The foundations were laid with especial care. The rings consist of thirty-six radial stones, in one course for the inner substructure which supported the wall, in three courses for that of the pteroma. The cella itself was, as Pausanias says,[3] of brick, but no remains of its material have been found. The stylobate was of Pentelic marble, ornamented upon the treads and risers by rough raised faces, and filleted upon the outer and inner angles. The columns and entablature, up to the cyma, are of poros with the usual priming. The profile of the bases is graceful; the shaft has twenty channels; the capitals are plain, without necking, astragal or sculptured echinus. They are

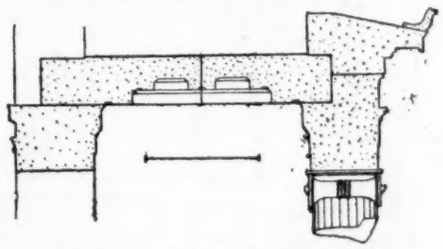


Fig. 4. Pteroma Ceiling of the Philippeion Section.

worked to a square plan, the parallel sides thus varying from the axis of the building, a want of care which is the more felt because of the shortness of the radius of the entablature curve. The Corinthian columns of the interior are not published in the third volume; their existence is known from a later report. They are said to be with four rows of leaves, the axis not marked by flower or palmetto, and to compare unfavorably with the contemporary Corinthian columns of the Monument of Lysicrates, — as might be expected from the comparison of any Olympian and Athenian works of architecture. The double-beamed architrave and the low frieze are of one stone, the bed for the stone ceiling of the pteroma being cut at the height of the frieze. The coffered blocks of the ceiling, though this does not have a greater clear span than 1.70 m., are strangely enough formed of two blocks which meet with a joint in the middle of the pteroma and depend for their support upon the bedding between architrave and cornice of the exterior entablature and upon their hold in the cella wall. The curve of the plan renders this a trifle more secure than it would be if the peripteros had been straight, but the stones must still have been in a great measure held in position by the principle of the arch. The side-thrust thus developed would react from the firm circular cella wall entirely upon the surrounding entablature, which was ill-fitted to bear it and the additional pressure of the roofing timbers and tiles in the same direction. The adoption of so faulty a construction is inexplicable. The ceiling beneath is ornamented by deeply-cut rhomboidal *lacunæ*. Prof. Adler suggests that the cella wall was continued up above the pteroma as a clerestory with windows for lighting the interior; but this seems improbable: a double roof was hardly necessary upon so small a building.

J. T. C.

[3] Paus. V. 20, 10.

ST. MARK'S: ITS CONSTRUCTION AND PRESENT CONDITION.

HOWEVER decided may be the opinion which any reader has formed, and even as he thinks finally formed, on the question of St. Mark's basilica, we beg to assure him that he will be repaid with interest for the time which he may devote to learning what M. Charles Yriarte has written, in the last number of the *Revue des Deux Mondes*, on a subject which has brought English architects and archæologists to the fore, among the lovers of art and of science in Italy and in France, in an unusual and unexpected manner.

Before entering into the comparison between the actual and the original state of such a monument as the Church of St. Mark, it is necessary to recall to mind the special circumstances under which it was founded. In Venice we behold a unique city. All the ordinary conditions under which the architect works are there changed. The soil is composed of eighty islets soldered together by the industry of the Venetians. The decoration is that of an immense theatre, of which the stage is left empty; and which we fear to see vanish from before our eyes, as if by the shifting of a theatrical scene. Below the visible stage is a series of mechanical contrivances. Few of the foreigners to whom Venice is best known have ever realized the remarkable spectacle of the subterranean passages which exist among the piles and the immense pontoons which actually support the Church of St. Mark and the Ducal Palace. Nor is this question one indifferent to the architect. For him, when he is called on to build, the nature of his foundation should be his first care. The

whole system of an edifice should be regulated by a just appreciation of the degree of resistance that is offered by the basis. It is the special condition of the foundation on which the architect has to rear his work at Venice that has given its special stamp to the architecture of that magic city.

The Church of St. Mark has no foundations, in the ordinary sense of the term. It is not that the soil is so mobile as to offer no appearance of solidity, but that there is a certain elasticity with which it is indispensable to reckon. The level of the lagoon is very nearly that of the soil of the great "Place." The tide has its daily rise and ebb, although they are small compared with those of the ocean. During winter, if strong winds coincide with spring tides, the Piazza San Marco is covered with a shallow and temporary lake, over which the gondolas can glide without danger. Thus the soil which for nearly 900 years has borne the weight of the Church of St. Mark is subject to unusual causes of disturbance. The result is one of the most curious monuments ever raised by human hands. The method of the foundation of the basilica is not the same as that of the Ducal Palace, which rears its façade close to the Bridge of Sighs. From the date of the first great buildings, by the Doges Participazio, Orseolo, and Domenico Contarini, down to the embellishments decreed by the Grand Council in 1422, that is to say, during five centuries, they have adopted at Venice a system of latticed platforms formed of enormous timbers. After 1422 the system was modified. First they drove piles, and then fixed sills and beams on the pile-heads, filling up the spaces between, where the water remained as if in so many vats. The produce of whole forests in Istria, Dalmatia, and Friali lies at this moment beneath the soil of Venice. The bare aspect of many of the Alpine mountains is due to the fact that they have been stripped, for a thousand years, in order to consolidate the soil of Venice. Time has done its work. Piles and sills cannot resist forever the action of tides and of stagnant water. Little by little the made ground has become permeable. Its level sinks, and as the settlement is not uniform, because some portions of the timber-work resist longer than others, the monuments of Venice are in visible danger.

So much for the soil. But another important condition is a disastrous result of this primitive peculiarity. That is, the system of construction of the mass of the edifice. If it is not exact to say that the monument is Byzantine, it is yet undeniable that the system of the Oriental builders has been followed by those of St. Mark. They have not, strictly speaking, made walls for their building, but simply partitions or closures, in order to avoid the settlement of large surfaces. Adopting for all the parts which enclose the area a system of arcades, of archivolts, of cupolas, of vaults, and of niches, they have accumulated all the weight of the superior construction, and all the thrusts of the arches, on massive pillars, deeply founded on piles. Once assured of enough resistance to support these pillars, they had no fear of settlements over the perimeter of the building. When it is added that marble has served for the springing courses of brick arches and archivolts; and that when, for the purpose of decoration, marbles of great value and high cost have been employed, they have been applied in thin laminæ, attached by cement to stone plaques, it is easy to see that any attempt at restoration must encounter almost insurmountable difficulties. The decoration of St. Mark is not an embroidery of the tissue, but a facing of the surface alone. What is technically termed, by the French architects, the "*Reprise en sous-œuvre*," an operation which is simple enough if the beauty of the monument is inherent in the mass (whether of stone or of marble), is no longer possible when there is nothing to repair and support but a mass of crumbling bricks, and a casing of thin plates of marble disconnected from their supports by the movement of the structure, and by settlements which have shelled them off from time to time. Here must be mentioned the difficulty which opposes the replacement of these plates of marble by similar materials. Even if the same quarries were worked, which is hardly to be expected, there would no longer be seen the rich *patina* which now covers the time-worn surfaces. Time has been the fellow-laborer of art in producing that perfect tone which is one of the chief glories of Venetian architecture, and it is altogether idle to look to science or to art to produce a like effect without the indispensable aid of time.

There could have been but one system adopted to prevent the irreparable damage which the studious observer of St. Mark's Church has now to lament; that is, the careful and uninterrupted maintenance of the building from the date of its foundation to the present time. It is hardly necessary to indicate the historic reasons which have led to a long neglect of the exterior of the basicila, and which explain the mode in which parts of the interior have been dealt with. The Procurators of St. Mark, once so jealous of their rights and their authority, found themselves, at the decline of the institution, without credit, without prestige, and without resources. How many causes of decay may be enumerated without including invasions and actual catastrophes? For how many years has the famous decree of 1500 been a dead letter? *Non si possi mai in alcun tempo far rompere opera alcuna in alcuna parte di essa chiesa senza la presenza del Procuratore del chiesa.* No work shall at any time be executed in any part of this church without the presence of the Procurator of the church. The framers of that excellent law seem to have had a prophetic fear of the work of the restorer, and a sense of the truth that it was only to the corporate tradition of living guardians that the safety of the edifice could be entrusted.

The especial mischief, in the case of any substantial repairs to a building of this nature, is the entire destruction of that general harmony of the monument which is the result of the action of time, of the effect of the atmosphere, of the hygrometric conditions of the locality, and of all those natural combinations of tint and tone which have produced themselves on the surface of the edifice, especially in a climate like that of Venice.

Suppose, now, — and it is the case in many parts of the basilica of St. Mark, — this covering to have scaled off; and after having been, for more than a century, held together by iron cramps let into the brickwork, to be losing its cohesion, — how is it to be replaced to-day? The *Marmorata* of the Tiber, no doubt, has been discovered. But this is not enough. Caneva, Sacile, Carrara, Verona, and the quarries in the neighborhood of Florence offer marbles of splendid names: the translucid white, the alabastrine white, the straw-colored veined with gold, the flower of Venus. But these cannot replace the *pavonazetti*, brilliantly spotted like the tail of a peacock, which the builders of Venice brought from the East. If the absolute necessity arises to replace a part of the *revêtement*, there is an end of the *patina*, and if it is not replaced, there is an end of the monument! There is thus often an absolute incompatibility between practical necessity and the preservation of architectural and artistic effect.

The Basilica of St. Mark has three façades, — that on the south, towards the Piazzetta; that on the north, towards San Basso; and that on the west, towards the Piazza San Marco. The repair of the northern façade was first taken in hand. Men of the rising generation have never seen the original façade. The works were commenced in 1842. To understand the changes effected it is necessary to refer to old drawings and descriptions. The chief beauty of this façade consisted in the precious bas-reliefs which were encrusted in the walls. They were composed of sculptures brought from Altino, Aquileia, Grado, Torcello, Byzantium, and even from Persia. The surface was coated with Oriental marble. In the progress of the works the bas-reliefs were preserved, but the entire *revêtement* was renewed. The façade has assumed a tone that is grey, hard, and dry, from which the sculptures and the capitals of the columns, blackened by time, stand harshly apart. It was thought proper, for the sake of uniformity, to reduce the ancient columns, brought from many a ruined temple, to the diameter of the capitals with which they had been surmounted. Thus the chisel and the rasp destroyed the graceful entasis of the columns, and the brilliancy of which their rich material is susceptible. The bases of the columns throughout have been solidly fixed on new foundations. The mouldings are fresh, sharp, and exact. Symmetry and rigorous uniformity have replaced a less rigid, and often irregular treatment. The ground of verde antique which relieves the Moorish arch of the thirteenth century, with its curious bas-relief of the Nativity, has been untouched. It preserves its antique *patina*, and the result of the contrast thus produced is a violent discordance of effect. Without entering into too minute detail, it may be pointed out that the special physiognomy of the old *revêtement* is destroyed. All the veining of the marbles in the ancient casing, — as, indeed, true taste, if not due consideration for the absolute durability of the material, would demand, — was horizontal. In the new work the veins are perpendicular. Thus the modern façade is really quite different from the ancient elevation; and even if the substitution of marble be admitted to be wise, the monument has lost much more than the halo of antiquity which harmonized its different parts.

It was the removal of the southern façade, that which looks upon the *Piazzetta*, which, led as our readers know, to the protest of Count Zorzi, and the subsequent action of artists and art-lovers in England. There is no doubt that this façade was in a state of menaced ruin. Not only were the walls cracked, and the *points d'appui* out of plumb, but the foundations themselves had become unable to resist the pressure to which they were exposed, and the Chapel Zeno, the baptistery, and the treasury were in danger. The works of restoration were commenced in 1865. The architects of the church were then controlled only by the fabric committee of the Duomo, which contained but one competent member, M. Saccardo, a civil engineer. The Austrian Government was then supreme at Venice; but the direction of the restorations was confided by them to the recommendation of the Academy of the Fine Arts. When it was proposed to substitute modern compositions, by an Austrian artist, for the twelfth-century mosaics, M. Saccardo energetically opposed the scheme, and had the happiness of doing so successfully.

The work thus effected cannot be called restoration. It was a total reconstruction of the façade, including foundations, walls, and vaulting. Rightly judging that the nature of the soil was the cause of decay, the architect began by driving more than 20,000 piles, on which he laid a bed of Trieste stone. On this he rebuilt the façade, and, such as the work is, it may now remain for ages. It cannot be denied that the building is no longer the same, however faithful was the attempt to reproduce the St. Mark of the Crusaders. Sad necessity has destroyed the beautiful façade, of which the splendid materials had been gilded by time, and richly colored by the effects of centuries of the Venetian climate. All that can be claimed for the work is that it is an attempt, naturally not perfectly successful, to reproduce the original architectural conception.

With regard to the principal façade, the immediate object of public solicitude, its situation is not yet entirely compromised, excepting at the return of the angle of the façade. Here the architect

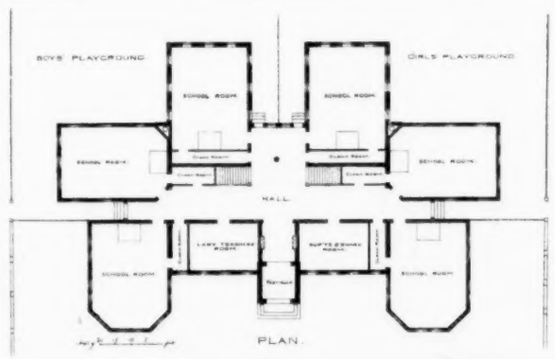
No. 233 American Architect and Building News, June 12, 1880.

Public School House,

Wellsville Ohio.

Wm. S. Fraser Architect.

Pittsburgh, Pa.



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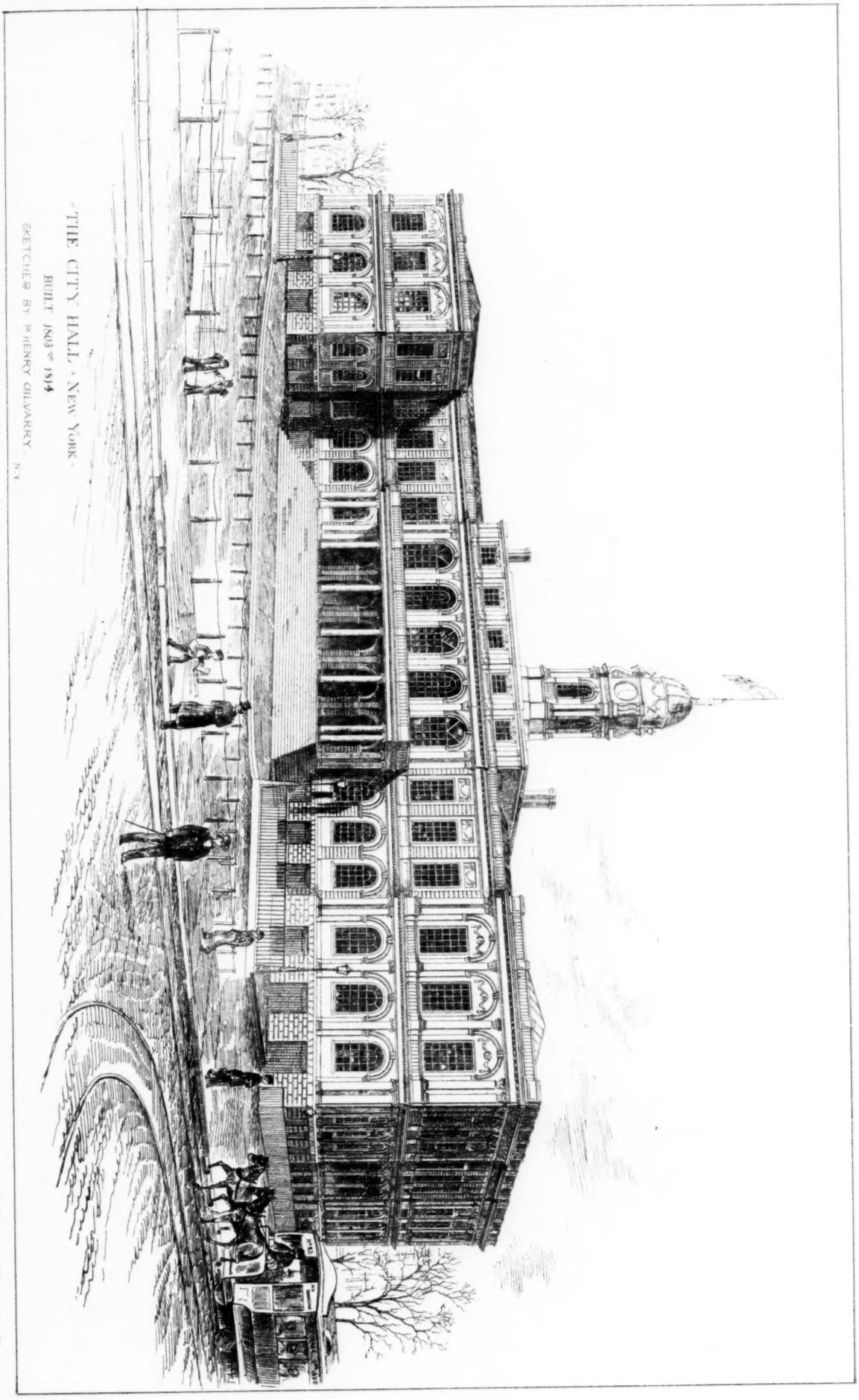
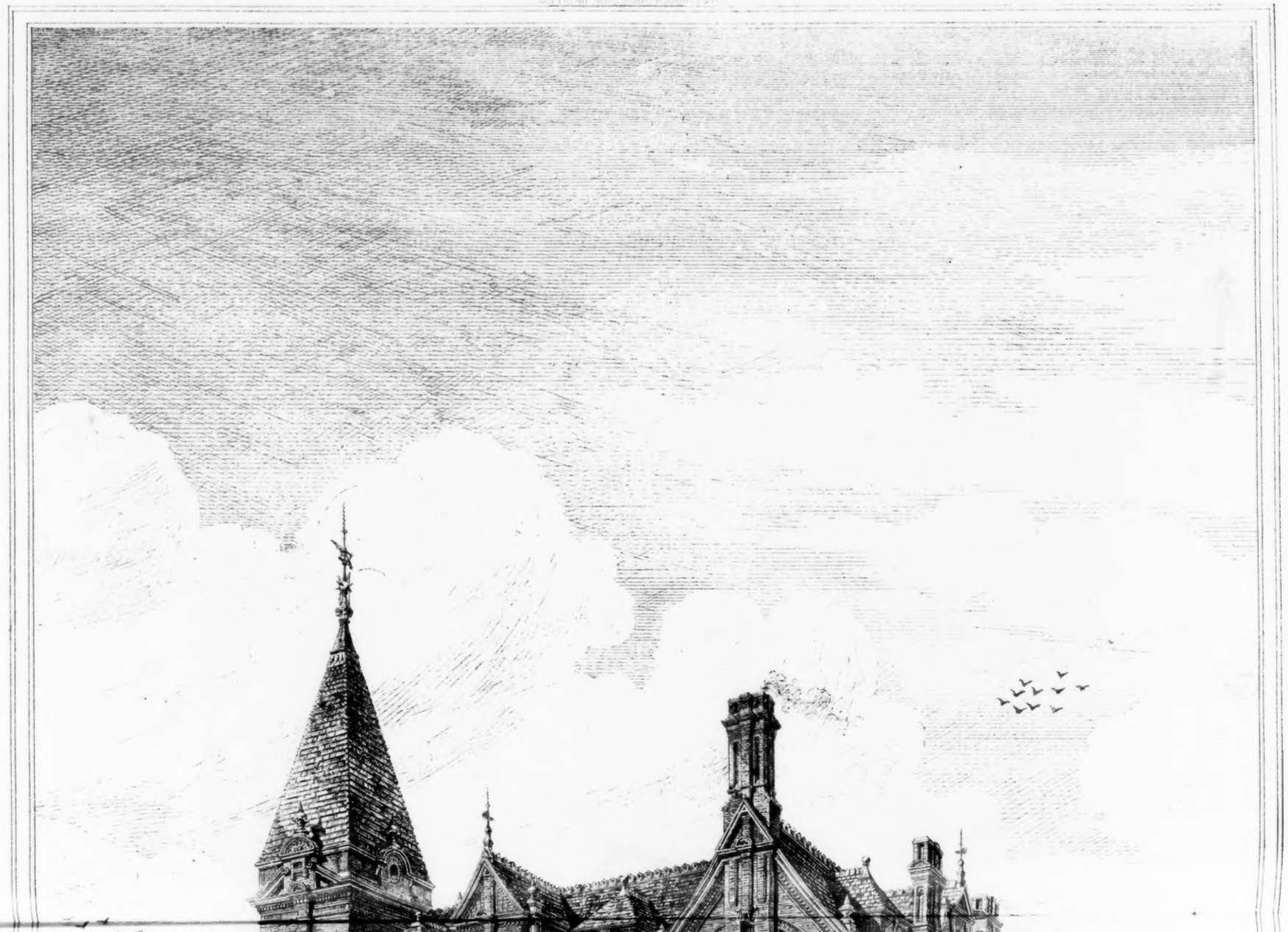


THE CITY HALL, NEW YORK.

BUILT 1803-12 1914

SKETCHED BY HENRY GILVARRY, N.Y.

THE HELIOTYPE PRINTING CO. BOSTON.



THE PHOENIX BUILDING · S.W. COR. OF RACE AND GEORGE STS · CINCINNATI. O.

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having raised all the plane of the base by, at least six inches, a rise which affects the whole gallery round the building, had prepared for the scaffolding for the future restoration of the whole principal façade. The Italian Government, however, has now declared that if, on a careful survey of this part of the monument, it appears not to be in actual danger, no further work shall now be carried out. Meantime, the operations are entirely suspended. — *The Builder.*

THE ILLUSTRATIONS.

OFFICE OF THE PHŒNIX INSURANCE COMPANY, CINCINNATI, O. MR. SAMUEL HANNAFORD, ARCHITECT, CINCINNATI, O.

THE CITY HALL, NEW YORK, N. Y. MR. JOHN McCOMB, JR., ARCHITECT.

THE corner-stone of the Hall of the City of New York was laid by order of the Common Council on the 26th of May, 1803, the twenty-seventh year of the Independence of the United States, by Edward Livingstone, mayor. The total cost of the building was $538,733.45. The building committee consisted of John Oathout, Wynant Van Zandt, Philip Brasher, Joshua Barker, Mangle Minthorn, Jacob Leroy, Robert Bogardus; John McComb, Jr., architect; Joseph Newton, carpenter; Anthony Steinback, Anthen Smith, masons; George Knox, Alexander Campbell, stonecutters. The eastern and southern fronts, seen on sketch, and also western, are of white marble. The north front is of brown-stone, it being considered extravagant at the time to use marble, as the city did not extend farther in that direction. The building was finished in 1814.

PUBLIC SCHOOL-HOUSE, WELLSVILLE, O. MR. W. S. FRASER, ARCHITECT, PITTSBURGH, PA.

The building is of brick, with local sandstone and white Milwaukee brick for the finish. The contract for the building, including steam-heating apparatus, but excluding the seating, was $26,000. The total cost including inside shutters, stained-glass in transoms, seating, and the necessary outlay outside the building, will be $32,000 or $33,000.

CORRESPONDENCE.

THE WATER-COLOR EXHIBITION.

PARIS.

THE recently-awakened interest in water-colors has, during the past year in Paris, produced results which must be noted as of permanent importance to art. The English have for so long given such attention to this branch of painting, that it is not strange to find persons counting this movement as another of the fashions in which the French have of late been imitating their insular neighbors. But this is an error; for the new influence came from Italy, and it will be perhaps hereafter the chief glory of the Roman water-color school to have given a valuable hint to French artists, who had heretofore used water-colors as merely a means of hasty sketching. At a time when English water-colorists were laboriously muddying their naturally transparent medium, so as to produce a weak imitation of oil painting, the simplicity and brilliancy of the pure water-color studies by that cosmopolitan genius, Fortuny, came like a revelation to the French public. The Simonis and Simonettis who followed in his footsteps showed that the simplicity of the process brought it within reach of all, and aquarellists suddenly appeared in force. Amid the wilderness of great canvases in the annual *Salon*, the public have neither the spirit nor leisure to examine delicate water-colors, and so a small club was formed under the title of "La Société des Aquarellistes," for the purpose of exhibiting the members' works to the best advantage. As this little coterie of artists belongs to fashionable life their prettily-furnished rooms were at once crowded by people of distinction, and their first exhibition, last spring, obtained a social prestige which insured success. From this, and the fact that two of the members are ladies, their gallery, in contrast to the *Salon*, might be called the *Boudoir*. Last autumn they filled the gallery with oil pictures; but this was not so successful. They will do better to preserve their distinctive character, as is shown by the renewed success of their present water-color exhibition, which is even more interesting than the first one.

Through the older to the younger members, the club illustrates the entire history and practice of water-coloring in France, since its introduction from England by Delacroix down to the present day, and curiously enough, the two methods of transparent and body color may be traced back, side by side, through their various modifications. Thus Eugene Lami and Isabey both belong to the last generation, sketching as vigorously as ever the brilliant costumes and splendid pageants which they themselves saw in the beginning of the century. One looks with awe at these old men, dashing off instinctively, and with graphic touch, the costumes and ceremonies which their brother painters have now laboriously to reconstruct in libraries and museums. They both use body-color more freely than of old; for generally painters, as they advance in years, become impatient of washes and glazes with their delicate but slow results, and love to dash in at once their effects with opaque colors. They both have rather a theatrical style. Lami loves to illustrate, with delicate *finesse*, scenes from Molière. Isabey has a fantastic imagination, and throws a certain scenic effect over all he does; there is a tragic mystery in his hurrying processions and stormy coast scenes. However conventional his color is, there is always great life and movement in his wind-tossed draperies and dramatic figures, dashed off with tremendous *fougue*. In bright contrast with the preceding compositions are Baron's melodramatic pictures, like pretty drop-curtain scenes. Sumptuous banquets on palace terraces, Fountains of Youth in the loveliest retreats, etc., give never-failing opportunities to this modern Veronese — but what a diminutive one! — to display his exquisite color and graceful figures amid their Venetian luxury. This sentimentalist, in spite of his skill in all the resources of both body and transparent color, becomes monotonous from cloying prettiness. If these men seem out of date, Français reaches far back past them to the school of Claude, and offers the measure of realism of modern French landscape. He has the grand manner, the harmonious composition and subdued tone of the early masters. Conscientiously studying from Nature, he still only paints it as seen through an ideal atmosphere and I must own that his elegant chastened views do not appeal to me, for they never have those accidents and surprises by which Nature converts one's admiration into sympathy. There is nothing intimate in his expression of a scene. You see the beauty of his atmosphere, but you never feel in it the dampness of sunset nor the hot glare of mid-day. I spoke of Français as closely studying Nature, but it is as a draughtsman; for, the laborious drawing of his studies concluded, his conscience and interest are satisfied, and the local color is washed in chiefly as a base from which to compose a scheme of coloring for the picture; hence the conventional tone of his work. With these characteristics, it is not surprising to notice among his water-colors a preference for the classic gardens of Italy and the grand lines of her Campagna. He uses generally washes upon old-fashioned coarse gray paper, touched up with body-color. Rather old-fashioned, too, in their way, are Beaumont's pretty water-colors, which have a certain English sentiment.

The other members of the Society, though each with a distinct personality, have in common a marked modern character. Beginning with those who most use body-color, Heilbuth comes first, for his work is entirely opaque, treated in broad masses without stippling, just as he does oils. This process, to be sure, has over oils the advantage of saving the painter from the labor at night of washing out his brushes, but is inferior in every other respect; yet Heilbuth throws such graceful sentiment into his figures that they are charming, whatever *technique* he chooses to employ. Détaille, the military painter, also uses water-colors as he does oils, and with a certain success when on a small scale; but in the two large compositions we have before us, the technical result is a failure, and we can but wish they had been done in oils, to escape the dry look of distemper painting, for as studies they are of great interest — intelligent photographs, so to speak. Détaille went to England for a short time, to paint, by order, a scene in the Zulu war, and brought back with him, among other sketches, this Review in the Tower of London Court, and the Scotch Guard in Hyde Park, in both of which the expressions and attitudes are so perfectly characteristic that one can hardly believe they were not the result of long study and experience among the cockneys. Vibert, one of the most consummate masters in the manipulation of oils in Paris, is no less skilful, within the measure of possibility, in combining body and water color. His work is most carefully stippled, and he obtains, by laborious artifice, almost the *natural* effect of oils, as far as solidity goes, and, I must add again, in small single figures; for in his Interior of a [pseudo] Japanese Bath, a large picture, all his patient labor and skill have not saved him from a signal failure, owing partly to the disagreeable, labored color and partly to the difficult point of sight chosen. I regret to be forced now to class among the body-colorists an artist who, a few years ago, used pure water-color with such charm that he may be said to have been one of the chief influences which brought *aquarelles* into fashion. Louis Leloir's small figures are as exquisitely drawn and colored as formerly, and the body color is so cleverly applied that it can hardly be seen; yet it is felt in the absence of that clear sparkle and crisp brilliancy which has been sacrificed to obtain solidity by a fine stippling like miniature painting. His art, however, is exquisite, and his collection of works at the Universal Exhibition I believe to be (if I except the more free and sketchy works of Fortuny) the most successful result ever obtained in the application of water-color to finished studies of figures. This Leloir must not be confused with Maurice Leloir, whose careful work is much inferior in brilliancy and snap, although the latter has a sense of humor which gives interest to the episodes he represents. But more clever, and probably the wittiest painter in Paris, Worms, is painter *par excellence* of amusing episodes, which are so generally taken from Spanish life that he is often set down as a Spaniard. Worms uses transparent washes with skill and success in his sketches, and it is only in closely finished work that he uses opaque color, and then it is carefully and delicately introduced. Each of these last-named men introduce their body-color only in the high lights or to bring planes forward, and it is done very discreetly, almost apologetically, concealing it as much as possible by grading it into the washes. Stippling is very apt to lead to this retouching, though there are Italians, who, like G. Simoni, model most minutely the flesh by stippling, and yet hold in horror Chinese white and its compounds. To be sure, less skill is required and time is saved in dotting that speck of white upon the nose, instead of carefully working around it, but in the end the result is worth the pains, if not in an individual instance, at least in avoiding a habit which generally becomes fatal.

Before speaking of those few water-colorists who have the courage to keep to the most beautiful, though the harder process, I must men-

tion Lambert, the painter of cats, — of cats, and nothing but cats, and yet in his feline families he expresses a great variety of sentiments of an amusing and charming character. His baskets of kittens are inimitable, and he has immortalized the beautiful long-haired race of Angora cats. His most charming contribution is a fan with a circle of twelve heads of kittens, each with a different characteristic expression, rendered with a few strokes of the brush. Most of the members of the Society exhibit a design framed as a fan, but one wonders at such affectation, as fan-painting can only have interest from the composition being adapted to the form of a fan, and Lambert and Beaumont are the only ones who have attempted to do this. An architect might insist that the character of a fan should in some measure decide the subject to be placed upon it, but such ideas of decoration seem quite unintelligible to the average painter, who generally paints without hesitation his specialty. Thus, I have seen — not in this exhibition — on a fan a woman hoeing potatoes — very well painted, too; on another, by a well-known military painter, soldiers making soup: that half of them had their dirty feet and legs cut off by the circle of the fan, was a pardonable defect in the design.

I now come, and with undisguised pleasure, to the pure water-colorists, among whom I class Gustave Doré. Although he occasionally uses a little body-color on a figure, he shows an entire appreciation of transparent effects, and uses them with consummate skill. His best contributions here are some Swiss scenes, done with a few strong washes. Very refreshing are Jourdain's landscapes, rendered as much as possible with a single tint, by running colors in together when wet, which always gives a delicious freshness to them. Jacquet contributes some charming figure studies for his large oil picture, The Minuet. They are indicated with great *chic* by a single tint, cleverly varied. Madame Madelaine Lemaire was one of the first to practise in Paris the Roman water-color style, and has attained remarkable skill in the use of transparent color. An architect cannot fail to be delighted by the ease and simplicity with which she indicates the furniture, tapestries, and other accessories in her figure studies. She uses, like the Romans, a great deal of water, and, though not running colors together much, she manages to overlay her washes and keep all their delicate transparency. This year she contributes, beside several flower pieces, two exquisite female figures, the best she has ever done. Everything, except the stippling of the flesh, is in the freshest tints. Her flowers are too cold and hard, though done with the same brilliant execution. Jacquemart exhibited, last year, some views boldly washed in, appearing as if done by a clever painter not yet quite at ease with water-colors. If that was really the case, the painter now has gained not only a thorough mastery of his washes, but proves himself to have the most daring originality in attacking difficult effects and rendering them, in all their details, with an ease and simplicity which I have never before seen approached; be it the glare of a sunny road at Mentone, or a rainy day on the quays at Marseilles, each is simply and forcibly expressed with a few washes — rarely overlaid — and over this he boldly sweeps a dry brush, to give necessary indication of detail; he even passes the side of this dry brush over distant hills, and, wonderful to say, they still keep their place. Dry brush work in the foreground is invaluable, but I have never seen it thus successfully used in the distance, without washing or sponging over it. It is in vain to seek how Jacquemart succeeds in giving to each scene so much character with such simple means, for there is no concealment; a single wash, with colors run in so rapidly that the absorbing paper often leaves little specks of white, is made to express at once as much as possible and then, as I have said, a few touches of a dry brush complete an absolutely truthful sketch, of a deliciously fresh tonality. His process has a charm from the extreme freshness of the color, but his success lies in the unerring precision with which he lays his wash. His works have excited much enthusiasm, and will help to show the true process and aim of water-colors. If I have little to say of the Baroness C. de Rothschild's studies amid such excellent professional work, it is because her name and wealth having opened the doors of this select club to her, that honor is sufficient, and I may add, her sex is so evident in her handiwork that it would be ungallant to say more. Water-coloring now may be said to have taken a vigorous start in Paris, and, to judge by the large prices paid for works in these exhibitions, will tempt many clever artists in the same direction. I sincerely hope some of the best examples may find their way to America. R.

VENTILATION AND CLEANING OF SEWERS.[1] — II.

No city in the world has spent so much as London upon this subject. The reports of the Metropolitan Board of Works give a complete history of their experience, from which the following abstract is gathered. The original method of ventilating their sewers was by the "gully gratings" or inlets at the sides of the street. These were efficient so far as ventilation of any kind could help the wretched condition of these old, half-choked receptacles of filth. But, as may readily be imagined, they became sources of great annoyance to foot-passengers, as well as to the adjacent residents so that while the sewers themselves have recently been made "self-cleansing," these openings near the sidewalks have been trapped as fast as others were made in the centre of the street, by building shafts for that purpose, with perforated covers. During the period of transition, however, from the former filthy condition of their sewers to their present comparatively clean condition, through judicious reconstruction, various complaints arose from certain localities, on account of the bad odors arising from these new vent-holes. This subject has given rise to a prolonged investigation by experts, who experimented during a period of several years upon various devices for alleviating or entirely removing this source of complaint. But the system of frequent vents in the centre of the streets has never yet been abandoned, simply because no other device has yet been found adequate to take its place. We learn from the report of 1865 that the subject of the ventilation of the sewers was referred to a committee who were then experimenting upon the ventilation of the Southern Outfall Sewer by artificial draught, created by furnaces in Woolwich Dockyard. This committee employed Sir J. Bazalgette and other experts, and finally made a report in 1872, giving a review of all the various methods that had hitherto been adopted in the metropolis. They stated that the amount of success attending these various methods "was variable, depending on the local circumstances of each particular case." In short, no one method was found to be generally applicable, and most of the expedients tried were found to have an effect that was only palliative, even for the locality where it seemed best adapted to the circumstances there existing.

Among the experiments tried, a large class were with the view of deodorizing and disinfecting the gases which escaped from the street vents. The device which attained the largest measure of success in this direction was that of suspending charcoal, spread upon gratings, one above the other, in the vertical shafts above the sewer, through which the air must pass while moving upward on its way to the open air in the street. So long as this charcoal remained dry and loose, it worked well, and afforded considerable relief in certain localities. Its use was adopted by Liverpool and various other towns, in a similar manner and with similar results. Various patented devices were applied for holding and exposing this charcoal in a manner which should least obstruct the passage of the air, while keeping it free from dirt and water falling from the street, and giving the largest facility for renewal when it became clogged. Such renewals were frequently found necessary in most places, in order to keep the apparatus in an efficient condition. This involved considerable cost and trouble for attendance, besides the outlay for the apparatus itself. Moreover, the Board states, in summing up the whole subject, that although the results were sufficiently favorable to warrant the use of charcoal in some of the air-shafts which were sources of annoyance and complaint, it was found that their use was attended with no little inconvenience; for the charcoal obstructed the exit of air through the shafts, thereby causing such an accumulation of bad gases in the sewer as to endanger the safety of the men whom they sent to work in them. "It therefore became necessary that such vents should be cautiously and not generally applied."

Experiments were also made by disinfecting or deodorizing the air from the vents by use of acids and of chlorine gas generated in the shafts, by apparatus placed there for the purpose. Although a partial relief was had in some cases, the variable nature of the foul gases to be dealt with prevented this method from being adopted, except in certain limited cases where peculiar circumstances existed; so that such a method could be but very partial in its application, and could never become general.

The plan of ventilating the sewers by air-flues connected with the furnaces and shafts of factories and other buildings was tried in some localities south of the Thames, and the effect was considered beneficial by the residents of the immediate neighborhood. But the good effects were confined to a small district in each case, and it was doubted whether any large portion of the noxious gases evolved was actually consumed by this method, for this reason, viz.: The vacuum produced by the artificial draught was inevitably supplied by the air entering the sewer through an immense number of openings in the close vicinity of the locality where the exhaust draught was applied, so that the air drawn out from any part of a long sewer near which a furnace was applied was to a large extent replaced, not, as was desired, by the offensive gases from distant parts of the sewer, but by pure air rushing down through the numerous small openings near the furnace, leaving the more remote places uninfluenced. For this reason, also, the method used in mines, where there are only two openings to be dealt with, is inapplicable to sewers. Moreover, where the chimneys used were not public property, the owners of the factories or furnaces objected to such connections being made with their chimney shafts, while in many parts of the city no such factories existed. In order to provide chimneys and furnaces specially for such localities, and maintain them in blast, a very large cost would be incurred for a remedy that would at best be confined in its action to a very small district in each case, for reasons given above.

The plan of ventilating sewers by pipes carried up the outsides of houses, which we have hitherto discussed and objected to, was also tried in London to some extent, but was condemned because of the reasonable objections of the owners of the buildings, and "in consequence of the liability of the gas to descend into the chimneys and windows of such houses." The Board tried an experiment at the east end of Southwark Street, by erecting an ornamental ventilating shaft in the centre of the thoroughfare with refuges and lamps, and the extension of this system to other localities was discussed. Its adoption was estimated to cost from £200 to £300 in each case, according to

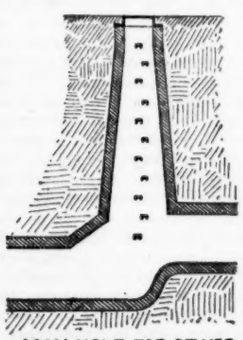
[1] A lecture by Mr. Edward S. Philbrick, C. E., delivered before the students of the Massachusetts Institute of Technology.

This lecture, although delivered in this course, was published essentially in its present form in the *Sanitary Engineer* some two years ago.

the position and depth of the sewer, exclusive of the cost of maintenance. If this system were to be largely extended, it was found that the details must be varied to suit the local peculiarities which must be considered and provided for in each case, which would involve a separate study for each locality, and prevent the possible diminution of cost by a repetition of the forms of the appliances to be used. In short, it was found that every new case must be tentative in its nature, and therefore not susceptible of having any accurate estimate made of its cost. The only principle settled upon as capable of a wide and successful application was that of flushing the sewers with such a copious supply of water, that the decomposing substances clinging to their sides or flowing through them should be largely diluted and carried away before sufficient time should be given for the generation of noxious gases in any considerable volume. To accomplish this result frequent flushing would be needed during periods of drought; but during periods of rainy weather the natural influx of water might sometimes take the place of flushing, especially in a climate like ours, where rain in the summer months frequently falls in large volume during a few hours. The Committee of the Metropolitan Board were requested to continue their investigations, treating each case as the local circumstances might indicate. Four years more were spent in experimenting, but with no result except that the various devices tried were found to give various degrees of success in various localities, as before. In 1876, the committee reported a sort of digest of their conclusions, giving them in a concise form.

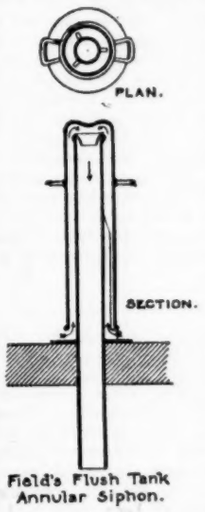
CLEANSING OF SEWERS.

The inclination of sewers is generally governed more or less by the topography of the surface; but in flat districts, where the fall is limited by Nature, a sewer must, in order to be self-cleansing, have an inclination that will secure a velocity of at least three feet per second in small pipes, and of two and one-half feet in larger sizes. Where this cannot be obtained without pumping, pumps are often applied, which by lifting the sewage to a sufficient height enable us to conduct it farther from the city, and to a point of discharge which is more eligible than could be found nearer. If the large sewers are not self-cleansing, arrangements must be made for ample flushing at frequent intervals, and perhaps also the removal of sand by hand, which must be taken out through the man-holes. The heaviar part of the road detritus is generally intercepted by pockets or catch-basins at the inlets under the curb-stones; but in heavy rains the water does not remain long enough in these pockets to deposit the finer silt which is therefore very likely to be deposited within the sewers themselves. The modern forms for sewers with small narrow invert are much less likely to collect deposits than the older forms or circular sewers; yet the latter are sometimes adopted, as in Chicago, for lack of height below the street level. This is admissible for such sewers as are generally half filled, or more, with their ordinary flow, and in that way more likely to be kept clean by scour. In order to favor the velocity of flow, and guard against checking it by all possible means, great care should be taken that all inlets and junctions should be at an oblique angle. Rectangular junctions are always found to produce eddies and favor deposit, whether the inlet is applied on the side or top of the sewer. The ordinary house inlets are provided for by Y branches in pipe sewers, and by special branch blocks in brick sewers. Where sewers join at street-corners, those on either side the main should be curved around to approach parallelism before joining, and come together in a bell-mouth. The invert should be prolonged in a tongue beyond the point where the sides join, so as to guide the current as far as possible to a parallel course. Inverts of stone-ware are now made, and are superior to brick for two reasons. They not only resist the abrasion of sand for a much longer time, but being made hollow, afford a channel for the ground-water, which is often a great convenience in favoring construction in wet ground. This means of draining the soil-water, if adopted for permanent use, does not keep it so well separated from the sewage as may be desirable, for the sewage would almost inevitably leak into such ducts. Junctions are often made at man-holes, and many reasons favor their being so made, for convenience of inspection and cleaning out. In order to avoid the checking of currents which are inevitable when such junctions occur at a considerable angle in man-holes, Latham and other writers advise stepping down some six inches or more at the man-holes to accelerate the flow. (See Fig. 3.) Wherever there is sufficient fall to allow this and at the same time retain slope enough to keep up the proper velocity in the sewer, there may be no objection to such a course; but where there is no fall to spare, as may often be the case in flat districts, the loss of head by the ordinary man-hole junction ought to be avoided. This loss of head is partly due to the sudden change of direction of the current by bringing in the branch sewers at right angles with the main, and this can be avoided by a previous curvature of these branches near the man-hole. But a good deal of the trouble arises from the contraction of the vein of the current in entering the sewer as the water passes out of the man-hole. This can be remedied in a large degree by rounding off the corners, like a small bell-mouth, to conform with the vein of contraction. The method of stepping is advocated as an assistance to ventilation, it being alleged that the air in passing into the man-hole is by this step, deflected upward, and finds a readier exit through the top of the man-hole into the street. But in practice I cannot attach much value to this consideration. This argument, whatever it may amount to, must depend on the supposed *momentum* of the air, which would tend to prevent it from rising and throw it across the man-hole if built without a step; but the velocity of the air, when at its greatest, can never be so great in a sewer provided with a proper number of man-holes, as to allow of any momentum being acquired by the air which would produce any practical result. Moreover, if the air is to be poured *out* at every man-hole, where is it supposed to come from? If from the lower end of the system, near the outfall, the quantity of air so entering any sewer could, if all diverted upward, readily find exit at the first ten man-holes that it encountered, leaving no current to go beyond. The fact is, I imagine, that air is drawn *in* at all the man-holes of a district whenever a heavy rainfall is running off, as the water subsides, and again every evening, as the amount of sewage flow due to the working hours subsides to the night flow; and flows *outward* at all of them when the fluid contents are increasing from similar causes. Whatever currents through the sewers are due to winds outside, are influenced by the air entering at any point on the windward side of the town where the wind-pressure accumulates by being confined between walls or otherwise, and goes out again on the leeward side of the town where it finds the least resistance.



MAN-HOLE FOR SEWER.
Fig. 3.

The flushing of sewers by intermittent flows or artificial methods is often found necessary to keep them clean in a district having a limited fall. Various methods are pursued for this purpose, suited to the local circumstances. Where streams of water are found at hand, they afford the best means of flushing, and provision can be made for using them by laying conduits and building tanks for that purpose. But where no such streams exist, the sewage itself is often dammed back by a gate till a considerable length of sewer is filled or nearly filled, when, the gate being suddenly opened, the restrained water rushes along, and scours the sewer for a considerable distance. These gates are sometimes made to be operated by hand, requiring the presence of an attendant, and sometimes made to work automatically, by the height of the water. In conducting all flushing operations, care must be taken to guard against the flooding of houses by impounding sewage to too great an extent, and at the same time to use a current of sufficient volume and force to wash all the inside of the sewer. There is in all sewers a film of organic matter in a slimy condition, clinging to their sides, consisting chiefly of putrid greasy refuse, emitting a very foul smell, and therefore not a desirable material to retain. Rain-water may assist in flushing sewers very materially; but as it is extremely intermittent in its action, some more reliable source is often needed, by which the process can be repeated at will and at certain intervals, found by experience to be required in any particular locality. It is usual to begin flushing at the lower end of a district and work back. Each successive discharge will generally be carried quite through the system in this case, unless large deposits have been allowed to accumulate through too long neglect, which may stop on the way and need following down the line by more water. Tanks are sometimes provided at the upper end of small pipe-sewers, to discharge automatically when filled. If these are made to hold the sewage, a sufficient height is rarely obtained in flat districts to enable the tank to be filled without setting back the sewage to an inconvenient extent into the house-drains. It is better to use rain-water, brook-water, or water from the mains that supply the town, in such cases. It not only washes the sewer better than sewage, but avoids all chance of setting back the sewage in house-drains, for the tanks can in that case be made entirely independent of the sewer except while they discharge, which is done through a pipe at the base of the tank or a siphon at a similar level. The automatic siphon of Rogers Field of London is often used in England for this purpose, especially for flushing house-drains. The best form of siphon for sewers is the annular one (see Fig. 4), composed of two concentric tubes, one inside the other: the inner tube forms the long or outlet end of the siphon, the outer tube being sealed at the top. The air is readily expelled from the siphon by a very small stream of water, if this can be made to fall *through the air* in the inner tube instead of trickling down its sides, for which purpose a funnel-shaped mouth is provided at its top. The inner tube must dip in water at its lower end, or outlet, before the air can be expelled; for which purpose a basin is constructed for it to slip in. If kept thus sealed all the



Field's Flush Tank
Annular Siphon.
Fig. 4.

time, however, the siphon would keep delivering the water as fast as it comes into the tank, which would defeat the object. It is important, therefore, to allow the air to enter the siphon after discharging the tank. This is accomplished by applying a small siphon to empty the little basin in which the lower end of the large siphon dips. This small siphon is readily charged by the rush of water while the large one is in action, and as soon as the tank is emptied the small siphon draws the water off from the discharging end of the large one, and both are empty. As soon as the tank fills up, the first quart of water that overflows through the large siphon seals its lower mouth, and as this overflow continues, it is made to drop clear of the sides of the tube by the funnel-shaped appendage at its top, which turns the the water into the centre of the tube. The small siphon is best when made of lead, which is a metal that suffers but very little change in such situations.

NOTE S AND CLIPPINGS.

A Loadstone Mountain. — There has just been discovered in the northern part of Sweden a mountain in which lies a vein of magnetic iron ore of unknown length, and more than a metre in depth.

Insanitary Condition of a London Club-House. — A startling discovery has been made at the Junior United Service Club, London, which will necessitate the closing of the club for some months. It has been discovered that the air pumped into the building came direct from the main drain, and the drainage from the kitchen is also in direct communication with the sewer. In fact, to use the words of the report of Mr. Field, C. E., the air of the sewer is, as it were, laid on to the house.

St. Gothard Tunnel. — The length of the tunnel is 14,920 metres (9.27 miles), the breadth 6.5 metres (7.11 yards). The perforation has required seven years and five months (4½ years less than Mont Cenis). The average progress per day has been 5·5 metres (5.541 yards). The blasting has used 490,000 kilogrammes (1,302,821 pounds) of dynamite. The total number of mining holes was about 320,000. There have been 1,650,000 drills, and 1,450,000 cart-loads of material have been taken from the interior of the mountain. — *Les Mondes.*

The Tuileries. — The commission which is charged with deciding what shall be done with the Tuileries has just decided unanimously, after listening to the opinions of M. Lefuel, the architect in charge of the Louvre, and M. Daniel Ramée, to restore the palace, this course being considered less expensive than a complete reconstruction. This step will be taken with the express understanding that the palace shall be used as a museum. M. Lefuel has been directed to prepare preliminary plans and estimates.

Pergamon. — In view of the curious interest generally felt as to the excavations at Pergamon, it has been decided to prepare immediately a concise official publication of their chief results. This will contain the better preserved blocks of the sculptured friezes, from drawings by Professor Knille, plans and elevations of the altar itself, and perhaps also of the Sebasteion and the Roman gymnasion. It may be hoped that the photographic views of the city walls of Pergamon, among the chief scientific results of the expedition, will be included in the volume.

Cologne Cathedral. — While one party of workmen is busily completing the summit of the south tower of Cologne Cathedral, another party is equally active in renewing the foundation of the same tower. This race between progress and decay is going on in other parts of the building, so that it sometimes looks as if the building, even if it does not fall into complete decay, would never be delivered from the sound of the mason's chisel and stone-plane. However, the stone roof of the north tower is now in place and rises above the surrounding scaffolding.

Effect of Use upon the Quality of Iron. — In the summer of 1878, Prof. Bauschinger superintended some repairs upon a chain bridge which had been built in 1829. He examined several of the links by various tests, and found that there was no evidence of any diminution in the strength of the iron, nor of any change in its structure or its elasticity during the use of nearly half a century to which it had been subjected. In 1852 Von Pauli tested several bars for another bridge, which was repaired in 1878, when Bauschinger subjected some of the same bars to new tests. He found that the mean strength was still the same, after twenty-five years' use, and that no change of structure appeared to have occurred since the time of Von Pauli's original tests. — *Dingler's Journal.*

An Ancient Jutland Tomb. — Our correspondent at Copenhagen writes: "An interesting and probably unique discovery has been made close to the town of Randers, in Jutland, of a grave, dating probably from the sixth or seventh century, containing the remains of a woman who had been buried in her richest attire, it being still possible to trace the dress, which had been interwoven with gold thread. Across the chest were laid two bands with a kind of gold lace, on the top of which again were laid some ornaments composed of colored glass beads, some having an outer shell of gold leaf, and several cut like diamonds, as well as a small perforated silver coin. To the left of the body was found a knife, a pair of scissors, a small whetstone, (for needles) and a small glass cup, which was broken in pieces. In the tomb was found also the remains of a wooden pail with iron bands, which had contained the food supposed necessary to support the deceased on her journey to Hades. The discovery affords another proof of the exceptionally high position occupied by the women in Scandinavia during heathen times, in comparison with nearly all other heathen countries. The body had evidently originally been inclosed in a coffin of rough oaken planks. Great interest is taken in the scientific examination of the silver coin, by which the actual period may be at least approximately ascertained."—*The Pall Mall Gazette.*

Japanese Estimate of Japanese Art. — When the feudal system in Japan collapsed, in 1868, thousands of families became suddenly impoverished. They were then obliged to dispose of their heirlooms and art treasures for bread, or, when not so hard pressed, being driven from their official residences, they could not carry back to their future homes, in the remote provinces, their bulky *impedimenta.* Immense quantities of lacquer, bronze, and ceramic wares were then thrown upon the market. So low did the value of such objects fall, that foreigners would not even pay the price for them that the gold with which they were decorated was worth. The native dealers were, consequently, driven to the last resource; the beautiful gold work was rubbed off with charcoal, and sold to the makers of the cheap meretricious ware of modern times to be used anew. The objects most prized in Old Japan were not the articles so commonly seen amongst us here, so profusely displayed in the windows of tea-dealers and mercers — not even the lacquer ware we so prize as old, and have to pay such high prices for. It was, first of all, old swords, sword mountings, tobacco-pipe and pouch mountings, pocket-book mountings, beads, the buttons called "Nedzakies" — those quaint and curious bits of carving, many of which are gems; fans, with autographs and seals, sketches by personages of note, ancient and modern, old scrolls, albums of beautiful sketches, Chinese or Japanese poetry, written in any one of the many curious styles, fantastical, large and small, from characters each several inches square, to entire poems within the area of a superficial inch. Such were some of the art objects that were the delight of the cultured people of feudal times in Old Japan.

A New Horological Wonder. — A wonderful clock, said to be superior in mechanism and the variety of its performances to the famed Strasburg astronomical and apostolic clock, has been constructed at Detroit by Prof. Felix Meiers, a gentleman who has devoted his entire life to the study of astronomy and mechanics. It is called the American National Astronomical Clock, and it is among the most complex and ingenious horological works that the hand of man has ever produced. The clock is eighteen feet high, eight feet wide, and five feet deep, and weighs 4,000 pounds. It is wound once in twelve days, and is run by weights of 700 pounds. It shows the local time in hours, minutes, and seconds, and the time of thirteen other cities of the world, among which are Washington, San Francisco, Melbourne, Pekin, Cairo, Constantinople, St. Petersburg, London, Berlin, and Paris. It also denotes the movements of the planets, and measures their movements by seasons, years, and cycles for 200 years, including leap years. Concealed in its interior is a music-box, which plays when Death strikes each hour. At the same moment the figure of Washington seated in a chair beneath a canopy, rises to his feet, holding the Declaration of Independence in his right hand. A liveried servant sitting at the right hand also rises and opens a door, through which come all the Presidents of the United States, who march in review before the effigy of Washington, saluting him as they pass. The procession disappears through a door on the opposite side of the platform, which is opened and closed by a servant in gorgeous livery. The likenesses of these figures, including that of President Hayes, who is in the rear, are said to be excellent. As soon as the door is closed, the figure of Washington resumes its chair of state, and all is quiet until the hammer of Death again sounds the hour on the gong, when the extraordinary scene is repeated. The quarter-hours are struck by an infant, the half-hours by a youth, and the three-quarters by a man. It is reported that the Old South Society of Boston, has offererd $45,000 for the clock, the price of which is $50,000,

A Memorial of the "Princess Alice" Disaster. — The monument provided by a national sixpenny subscription, in memory of the victims of the wreck of the Princess Alice in September, 1878, has just been erected in Woolwich Cemetery, England, on the summit of the hillock where the bodies of the unclaimed dead were buried. The memorial consists of a cross of white marble, about sixteen feet high. On the pedestal is inscribed: "The saloon steamer Princess Alice, returning from a pleasure excursion, was wrecked off Tripcock Point by collision with the steam collier Bywell Castle, on the night of September 3, 1878. It was computed that seven hundred men, women and children were on board; of these about five hundred and fifty were drowned, and one hundred and twenty were buried near this place. To the memory of those who perished, this cross was erected by a national sixpenny subscription, to which more than 23,000 persons contributed. In the midst of life we are in death. Jesu, mercy." At all the graves have been placed small headstones, bearing the names of such of the dead as were identified, and the space which they and the monument occupy is carefully preserved and attended to.

Effects of Heat on Granites. — Mr. Hiram A. Cutting, State Geologist, of Vermont, has been testing the capacity of different sorts of granite to withstand heat. He tested twenty-two specimens of the best known quarries, and found that while all were unaffected by 500 degrees Fah., damage usually began at 600 degrees, was serious and frequent at 800 degrees, and at 1,000 degrees all the specimens were ruined, the stone from Mount Desert standing the test perhaps better than any other. He gives it as his opinion that the effect of water on heated granite is rather apparent than real. — *Scientific American.*

Fire and Water-proof Paper. — Mix one-third of ground asbestos fibre with two-thirds of paper paste in a solution of common salt and alum. Pass the mixture into a machine, plunge the paper thus made into a bath of dissolved gum lac and send it through the finishing rolls, when it may be cut into sheets. The salt and alum increase the strength of the paper and its resistance to the action of fire. The lac renders it impermeable to moisture, without interfering with its fitness for the reception of ink.—*Les Mondes.*

Viollet-le-Duc's Library. — The library of Viollet-le-Duc has been scattered by an auction sale which took place in Paris last month. The catalogue descriptive of the 2,242 lots formed an octavo volume of 290 pages.

BUILDING INTELLIGENCE.

[Reported for The American Architect and Building News].

[Although a large portion of the building intelligence is provided by their regular correspondents, 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.]

227,130. SEWER-TRAP. — William L. Randolph, Brooklyn, N. Y. This trap consists of three chambers, of which A is a prolongation of the inlet-pipe, and C is the beginning of the outlet-pipe. At the orifice of the pipe, C, is a valve-seat which receives the ball-valve, D. This valve-seat is placed at a higher level than the valve-seat formed at the top of the middle chamber, B, which is also closed by a ball-valve, E. The object of this difference of level is that as the water is forced by the momentum of its flow through the trap, the valve, E, which will be raised first from its seat, may in its rise lift up the valve, D, so as to uncover the orifice of the outlet-pipe, C, and allow the passage of the water. As soon as the flow ceases both valves drop back into their seats. This arrangement of valves also prevents the passage of sewer-gas from the drains into the house, for, supposing that the pressure of gas is strong enough to force the valve, D, from its seat, it can only affect E so as to press it more firmly onto its seat. The same arrangement prevents the siphoning of the trap by the entrance of water from other fixtures emptying into the same waste-pipe below the trap. F is a glass plate fixed in the side of the trap, so that the working of the valves can be seen. There is also a clear-out hole at the bottom of the trap.

Fig 1.

Fig 2.

228,166. STOVE. — Amos C. Barstow, Providence, R. I.

228,171. PROTECTOR FOR THREADED ENDS OF PIPES. — Henry E. Boyd, McKeesport, Pa.

228,188. HEATING AND VENTILATING APPARATUS. — James W. Geddes, Baltimore, Md.

228,189. WINDOW CORNICE. — Harvey F. Gray, Columbus, O.

228,194. COMPOUND PAPER FLOOR-COVERING. — Henry Hayward, New York, N. Y.

228,199. FASTENER FOR METING-RAILS. — Samuel P. Jackson, Manchester, N. H.

228,203. PUMP. — W. S. Laney, Lithopolis, O.

228,218. CIRCULAR SAWING MACHINE. — Paul Prybil, New York, N. Y.

228,219. FAUCET ATTACHMENT. — Charles A. Raggio, Chicago, Ill.

228,237. DRAG SAWING MACHINE. — Asa Wilkins, Cincinnati, O.

228,244. EXTENSION CHANDELIER. — George Bohner, Chicago, Ill.

228,245. VISE AND CLAMP. — James Brady, Brooklyn, N. Y.

228,249. CENTERING MACHINE. — John E. Dimsey, Vienna Station, Va.

228,264. FLUSHING CISTERN FOR WATER CLOSETS. — S. G. McFarland, Newton, Mass.

228,267. PNEUMATIC ANNUNCIATOR. — David and Theodore Morris, San Francisco, Cal.

228,274. METING-RAIL FASTENER. — Joshua Pusey, Philadelphia, Pa.

228,284. ELEVATOR GOVERNOR. — Isaac H. Small, San Francisco, Cal.

228,285. LIFTING JACK. — John State, Springfield, O.

228,288. SCREW BOLT. — Leopold Strauss, Middletown, Conn.

228,304. SPRING HINGE. — Lorenz Bommer, Brooklyn, N. Y.

228,323. LATCH. — George L. Crandal, Binghamton, N. Y.

228,331. BRICK AND POTTERY KILN. — Hermann Escherich, Schwandorf, Bavaria, Germany.

228,333. PIPE-TONGS. — Samuel Fawcett, Rochester, N. Y.

228,336. HOT-AIR FURNACE. — Benjamin W. Felton, Boston, Mass.

228,344. ROTARY PUMP. — John Hollner, Saunders, Neb.

228,349. SASH CORD FASTENER AND SASH-LOCK. — Edwin V. Heaford, Covington, Ky.

228,369. MANUFACTURE OF PLUMBER'S TRAPS. — John McCloskey, New York, N. Y.

228,379. LOCK. — Christian F. Otto, Zerbst, Germany.

228,384. WINDOW-SCREEN. — Rice Perrin, Springfield, Mo.

228,388. FIREPLACE WATER-HEATER. — Isaac B. Potts, Columbus, O.

228,421. WOOD-BIT. — Lycurgus Thuston, Findlay, Ohio.

228,429. SCREW-THREAD CUTTER. — James C. Williams, Cleveland, O.

9,221. MORTISING MACHINE. (*Reissue*). — Edward H. N. Clarkson, Baltimore, Md.

9,222. SASH-CORD GUIDE. (*Reissue*). — Edward H. N. Clarkson, Baltimore, Md.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — The following building permits have been issued since the last report:

Mr. Adler, three-st'y brick building, 308 Howard St.

Gable & Beacham, addition to warehouse on Canton Ave., cor. President St.

Mrs. C. L. McKinn, 15 three-st'y brick and stone dwells., Calvert St., between Eager and Chase Sts.

Herman Meyer, 2 three-st'y brick dwells., Baltimore St., between Exeter and Temple Sts., 20′ x 78′ each.

SUNDAY-SCHOOL. — The Friends' Gospel Mission is about to build a large Sunday-School on Light St., near Hamburg St., 42′ x 120′, to be of press brick, with Cheat River stone finish, one story high, for Sunday-School, and the front part to have two stories, the second story to be used as a library and reading-room; cost $10,000. Mr. Geo. Archer is the architect.

OFFICE-BUILDING. — The old and dilapidated building, northeast corner Charles and Saratoga Sts., owned by the Wilson Sanitarium estate is now being torn down, to be replaced by a modern structure. The first story will be used as a store, and the remainder of the building will be used as offices for the Wilson Sanitarium and Fuel Saving Socity. The plans have not as yet been decided upon.

Boston.

BUILDING PERMITS. — *Brick.* — Cor. *Gloucester and Newbury Sts.*, for Wm S. Rand, 4 dwells., 23′ x 45′, three stories; Frank Jones, builder.

Wood. — *Forest Hills St.*, for A. D. Weld, Jr., 1 dwell., 50′ x 60′; McNiel Bros., builders; Appleton & Stephenson, architects.

Cambridge St., Ward 25, for Wm. Roach, 1 blacksmith's shop, 22′ x 35′; C. Marshall, builder.

School St., Ward 23, two dwells., 21′ x 55′, three stories; J. W. Rollins, owner and builder.

East Sixth St., for J. H. Graham, 1 pavilion, 30′ x 45′; Raynor & Flint, builders.

Ruggles St., No. 122, for J. Nichols, 1 dwell., 18′ x 22′. J. Jackson, builder.

ALTERATIONS. — The Ballard estate on Washington St., is to be entirely rebuilt for stores and tenements, at a cost of $40,000. The building measures 48′ x 125′. Mr. Fred Pope, architect.

OFFICE-BUILDING. — The present estate, corner Devonshire St. and Spring Lane, is being altered for an office-building. The first floor is fitted for the Pacific National Bank. The materials will be brick and brown-stone, and the walls will be 80 feet high, and in Italian Renaissance. The entire height of the building will not be built at present. The estate measures 75 feet on Devonshire St. and 80 feet on Spring Lane. Mr. Wm. Minot, Jr., is the owner, and Mr. Fred Pope the architect. Cost, about $60,000.

Brooklyn.

ALTERATIONS. — *Fulton St.*, cor. Tillary St., raised one-st'y; cost, $4,000; owner, Samuel A. Willoughby; builders, C. Cameron and Wright & Brook.

South Third St., cor. First St., one-st'y brick extension on side, 24′ x 78′; cost, $10,000; owners, Havemeyer & Elder; architect, T. H. Havemeyer; builders, Thos. Winslow and J. James.

BUILDING PERMITS. — *Quay St., Nos.* 93 *and* 95, 1 four-st'y brick hay and cotton press factory, 50′ x 86′; owner, etc., N. L. Balston.

Monroe St., No. 134, 1 two-st'y brown stone dwell., 20′ x 42′; owner, Chas. Kimberly, 152 Monroe St.; architect, Geo. Chappell; builder, C. King.

Myrtle Ave., 4 three-st'y brown stone dwells., 20′ x 50′; cost, $4,500; owner, A. G. Van Wagner, 548 Lexington Ave.; carpenter, B. Morgan; mason, N. Wood.

Adams St., 1 four-st'y brick factory, 26′ x 50′; cost, $4,000; owner, James Howell, Adams St., near Willoughby; architect, W. A. Mundell; builders, G. Phillips and I. B. Jacobs.

Remsen St., No. 73, three-st'y brown stone dwell., 25′ x 58′; owner, Aaron Wright, Ohio; architect, M. J. Morrill; builder, E. H. Day.

Broadway, cor. Myrtle St., 2 three-st'y brick stores and dwells., 21′ and 24′ 6″ x 55′; owner, Frederick Herr; builders, Johnston & Bros.

Chicago.

BUILDING PERMITS. — Le Roy Payne, two-st'y brick livery stable, 94′ x 162′; No. 169 to 173 Michigan St.; cost, $8,000.

Wm. McCarthy, two-st'y brick dwell., 24′ x 48′, No. 407 Taylor St.; cost, $3,000.

N. Johnson, two-st'y brick dwell., 22′ 6″ x 45′, No. 222 Townsend St.; cost, $4,000.

Thomas O'Connell, three-st'y brick store and dwell., 42′ x 100′, Nos. 365 and 367 Blue Island Ave.; cost, $7,000.

J. Messerole, one-st'y brick dwell., 21′ x 42′, No. 33 Emma St.; cost, $1,200.

A. Koerner, two-st'y brick dwell., 20′ x 56′, No. 48 Bunker St.; cost, $3,000.

— Wherle, 5 three-st'y brick dwells., 19′ x 55′, Thirty-Seventh St. and Vincennes Ave.; cost, $25,000.

E. K. Hubbard, two-st'y brick office, 24′ x 40′, Robey near Blue Island Ave.; cost, $2,800.

A. Kuchenbeiser, two-st'y brick dwell., 22′ x 50′, No. 649 Franklin St.; cost, $2,600.

E. K. Rogers, two-st'y brick dwell., 20′ x 50′, Ontario and St. Clair Sts.; cost, $6,000.

W. T. Baker, three-st'y stone dwell., 50′ x 90′, Michigan Ave. and Twenty-Third St.; cost, $50,000.

A. E. Walker, three-st'y brick dwell., 24′ x 60′, Indiana Ave. and Twenty-Ninth St.; cost, $12,000.

J. Steiner, two-st'y brick store and dwell., 30′ x 82′, Clayton and Morgan Sts.; cost, $5,000.

C. Laux, two-st'y brick dwell., 24′ x 42′, — Centre St.; cost, $6,000.

C. J. Hull, two-st'y brick dwell., 24′ x 53′, No. 267 Forquer St.; cost, $3,500.

Conrad Seipp, three-st'y brick dwell., 60′ x 41′, State and Goethe Sts.; cost, $20,000.

J. Medill, two-st'y brick dwell., 58′ x 64′, Cass and Ontario Sts.; cost, $20,000.

DEPOT. — The Wabash Railroad officials have closed a contract for building a freight transfer depot on the company's grounds at Forty-First St.

Cincinnati.

BUILDING PERMITS. — W. Stichtenoth, to repair a four-st'y brick malt house, cor. of Twelfth and Clay Sts.; cost, $5,000.

Fred. Otte, three-st'y brick, Hopkins St., between Linn and Baymiller Sts.; cost, $3,000.

John P. Scharr, two-st'y brick, No. 596 West Eighth St.; cost, $4,500.

John Cochnower, two-st'y brick, Grandview Ave., south of McMillan St., Walnut Hills; cost, $6,000.

Kuhlman & Buenning, two-and-a-half-st'y brick, Browne St., between Baymiller and Freeman Sts.; cost, $2,500.

J. H. Walters, two-and-a-half-st'y frame, cor. of Gilbert and Church Aves.; cost, $3,500.

John Winterburn, to repair 2 four-st'y bricks, Nos. 222 and 224 West Pearl Sts.; cost, $2,100.

Cleveland.

FACTORY. — The White Sewing-Machine Co. is building a $3,000 addition to their extensive works on Canal St.

CHURCH. — A Congregational church is to be built on Prospect St., cor. of Perry, this summer; cost, $30,000; Mr. Joseph Ireland, architect.

STORES. — The "Worthington Block," which was destroyed by fire a short time ago, is to be rebuilt.

Indianapolis.

SCHOOL-HOUSES. — B. V. Enos & Son are the architects of the two new school-houses, which are to cost $4,000 and $5,000 respectively.

THEATRE. — Work on the English Opera House has begun, under the charge of Mr. J. B. McFaterick, architect.

DEPOT. — Mr. W. H. Brown, architect, is to build the new freight-house for the I. D. & S. R. R.; cost, $18,000.

RAILROAD OFFICES. — The building of the general offices of the C. I. St. L. & C. R. R. is under the charge of Mr. J. H. Stem, architect.

New York.

ALTERATIONS. — *Lafayette Pl., No.* 16, one-st'y brick extension, 28′ x 56′, for Russian baths; cost, $15,000; owners, Capes & Ryan; architect, Paul F. Schoen.

West Twenty-Third St., No. 448, three-st'y brick extension, 19′ 2″ x 37′ 6″; cost, $6,500; owner, Z. H. Kitchen; architect; Emile Gruwé.

East Fifty-Fifth St., No. 51, four-st'y brick extension, 15′ 4″ x 26′; cost, $4,000; owner, Horace White; architects, McKim, Mead & White; masons, J. & W. C. Spears; carpenter, Henry Christie.

West Seventeenth St., No. 22, to be raised to four stories, also two-st'y brick extension on rear, 22′ 9″ x 5′, and interior alterations; cost, $5,000; owner, Henry De Cappet; architects, Gambrill & Ficken.

BUILDING PERMITS. — *Sixty-Ninth St.*, 1 three-st'y brick stable, 25′ x 85′; cost, $18,000; owner, H. R. Bishop, 18 Wall St.; architect, John Correja; mason, R. L. Darragh; carpenters, McGuire & Sloane.

West Forty-Fifth St., No. 408, 1 two-st'y brick stable, 25′ x 100′; cost, $3,000; owner, John J. Lydecker, 412 West Forty-Fifth St.; architect, Geo. Holzeet.

Third Ave., 1 four-st'y brick store and tenement, 23′ x 50′ 6″; cost, $7,000; owner, Mrs. Sarah A. Martin, on the premises; architect, Thomas H. McAvoy; masons, J. & W. C. Spears; carpenter, John Knox.

One Hundred and Fifty-Sixth St., 1 two-st'y frame dwell., 16′ x 20′; cost, $2,000; owner, Gottlieb Wirth Melrose; builder, John Friese.

Forty-Sixth St., 5 five-st'y brick (brown stone front) apartment houses, each 25′ x 58′; cost, each, $15,000; owner, Charles Reilly, 168 East Eighty-Eighth St.; architect, John C. Burne.

One Hundred and Fifty-Eighth St., 1 two-st'y frame dwell., 22′ x 30′; cost, $2,200; owner, James F. Thomas, One Hundred and Fifty-Fifth St., near Elton Ave.; architect and builder, J. C. Stichler.

Ninety-Eighth St., one-st'y brick and iron building for gas works, 66′ x 70′ 5″; cost, $22,000; owners, Knickerbocker Gas Light Co., Second Ave. and Ninety-Ninth St.; architect, Thomas J. Rowland; mason, Wm. C. Whyte; carpenter, S. F. Bartlett.

Broadway, cor. Wall St., 1 nine-st y brick bank building, 72′ 5″ x 92′ 2″; cost, $450,000; owners, First National Bank and Bank of the Republic; architects, Peabody & Stearns; mason, Robert L. Darragh; carpenters, Morton & Chesley.

One Hundred and Twentieth St., 4 two-st'y and basement brick (brown stone front) dwells., 18′ 9″ x 45′; cost, each, $6,000; owner and builder, Isaac E. Wright, 153 East One Hundred and Twenty-Eighth St.; architect, J. H. Valentine.

One Hundred and Tenth St., 3 three-st'y and basement brick (brown stone front) dwells., 16′ 8″ x 50′; cost, each, $10,000; owner, M. J. Moore, 311 East One Hundred and Thirteenth St.; architect, J. H. Valentine; builder, H. Moore.

One Hundred and Fourth St., 3 three-st'y brick apartment houses, 16′ 8″ x 50′; cost, $7,000 each; owner, A. M. Jenny, 241 East One Hundred and Fourth St.; architect, J. H. Valentine; builder, J. Jenney.

Sixty-Fifth St., 5 three-st'y brick (brown stone front) dwells., 16′ x 52′; cost, $7,000 each; owner, Mary Murphy, 100 East Sixty-Fourth St.; architect, S. Murphy.

West Thirty-Sixth St., No. 449, 1 five-st'y brick (brown stone front) tenement, 25′ x 65′; cost, $12,000; owner and builder, Andrew Ewald, 422 West Fifty-First St.

Broadway, No. 55, 1 five-st'y brick office building,

26′ 4″ x 199′ 6″ and 201′ 6″; cost, $105,000; owner, Henry H. Houston, Philadelphia, Pa.; architects, Geo. Fletcher Babb and Walter Cook; mason, John J. Tucker; builders, Morton & Chesley.

Fourth Ave., cor. Eighteenth St., 1 six-st'y brick hotel, 53′ x 136′; cost, $225,000; owner, Joseph Wehrle, Belvedere Hotel; architect, Emil Gruwé.

Monroe St., Nos. 126, 128, 132 *and* 134, 6 five-st'y brick tenements, each 15′ x 75′; cost, each, $7,000; owner, Joseph G. Harrison, 329 West Thirty-Fourth St.

Vandewater St., No. 9, 1 two-st'y brick store, 25 ft. front, 11 ft. rear, 100 ft. deep; cost, $6,000; owner, J. H. Haulenbeck; architect, E. Sniffen.

Norfolk St., Nos. 102, 104, *and* 106, one four-st'y and attic public school-house, 65′ x 90′; cost, $60,000; owner, Corporation of the City of New York; architect, D. I. Stagg.

Apartment-House. — On Fifty-fifth St., corner Seventh Ave., a five-story apartment-house, in the Elizabethan style, to be of brick with stone finish, is to be built for Mr Ed. Clark, President of the Singer Sewing Machine Company, at a cost of about $100,000. Mr. H. J. Hardenbergh is the architect.

City Work. — For the city of New York the following work is under progress, or about to be started: On Ward's Island, a west wing to Insane Asylum, of brick, with Ohio-stone finish, 80′ x 200′, to cost about $150,000.

On Blackwell's Island, an addition to the Retreat Building, of brick and stone, to cost $30,000; a brick laundry building for Charity Hospital, to cost $15,000; two pavilions for the Almshouse, to cost $24,000; two pavilions for the Maternity Hospital, to cost $15,000; a fire-engine house, to cost $15,000; bath house, etc., for Men's Almshouse, to cost $3,000; addition to Lunatic Asylum, of laundry, kitchen, and engine house, to cost $12,000.

On Randall's Island, a brick quarantine building, to cost $10,000.

On Hart's Island, a pavilion for Insane Asylum, to cost $13,000; for Bellevue Hospital a new pavilion, to cost $25,000; also an office waiting-room and Coroner's Jury room with subterranean morgue on a new plan, to cost $15,000. Mr. Joseph M. Dunn is architect for all the buildings.

Market. — New buildings are being put up at Burling Slip, to accommodate the occupants of Fulton Market, while that structure is being rebuilt.

Philadelphia.

Building Permits. — *Latona St.*, between Thirtieth and Thirty-First Sts., 7 two-st'y dwells., 14′ x 28′; Alex. Wilson, owner.

Sixteenth St., north of Columbia Ave., 5 three-st'y dwells., 17′ x 60′; Jos. S. Albright, owner.

Adams St., cor. Taylor St., two-st'y dye-house and addition; Firth Bros. & Co.

Sixth St., north of Dauphin St., three-st'y dwell., 16′ x 56′; S. R. Stewart, contractor.

Marshall St., south of York St.; 2 two-st'y dwells., 16′ x 30′; S. R. Stewart, contractor.

Adams St., southwest of Church St., three-st'y factory, 54′ x 144′; C. S. & J. P. Jones, owners.

Twenty-Seventh St., south of Poplar, ice house, 38′ x 65′; J. B. Doyle, contractor.

Chestnut St., No. 923, four-st'y back building, 16′ x 100′; J. B. Doyle, contractor.

Knorr St., north of Filmore, three-st'y dwell., 20′ x 36′; J. K. Knorr, owner.

Clearfield St., cor. Mercer St., 5 two-st'y dwells., 13′ x 40′; J. K. Knorr, owner.

Thompson St., north of Clearfield St., 4 two-st'y dwells., 13′ x 40′; J. K. Knorr, owner.

Dock St., No. 104, new front; A. Casely, contractor.

Fortieth St., cor. Locust St., two-st'y building, 11′ x 35′; Jacob Myers, contractor.

Fairmount Ave., between Twenty-First and Twenty-Second Sts., two-st'y stable, 32′ x 46′; A. A. Campbell, contractor.

North Twenty-Third St., Nos. 214 *and* 216, three-st'y store-house, 30′ x 132′.

Linn St., between Twenty-Second and Twenty-Third Sts., three-st'y factory, 49′ x 140.

Baltimore Ave., Angora, three-st'y factory, 75′ x 140′.

Montgomery Ave., cor. Cadwalader St., five-st'y factory, 52′ x 90′.

Division St., cor. Thompson St., two-st'y factory, 60′ x 140′.

Franklin St., north of Columbia Ave., one-st'y factory, 40′ x 240′.

Factory Buildings. — Seven buildings are being erected by Horner Bros., for the manufacture of carpets, at the northwest corner of Fourth St. and Lehigh Ave. as follows: two-st'y office, 91′ x 22′. Six-st'y warehouse, 55′ x 153′; contains elevator, and tank capable of holding 12,000 gallons of water, in case of fire; stairs fire-proof; buildings are of pressed brick, with granite finish. Dry house, 43′ x 40′. One-st'y dye-house, 103′ x 47′; stack 125 ft. high. One-st'y filling and sizing house, 80′ x 42′. Two-st'y engine-house, 35′ x 33′; beams and columns of wrought iron. One-st'y weaving-room, 278′ x 85′; cement floor. Entire cost about $100,000; Walter H. Geissinger, architect and superintendent.

St. Louis.

Building Permits. — Thirty-five permits have been issued since our last report, three of which are for frame structures of slight importance. Of the rest, those worth $2,500 and over are as follows: —

Owners Name.	Use.	Stories.	Rooms.	Cost.
E. F. Gleason,	Dwell.	2	6	$3,700
J. T. Drummond,	Fact'y	6	6	8,000
Mary Stuede,	Dwell.	2	8	3,000
J. Frein,	Ice House	1	1	6,000
Mrs. A. Cherot,	Dwell.	3	8	3,000
Jno. Schop,	Stores	3	3	7,500
W. H. Chappell,	Chem. Wk's	1	1	4,000
H. Lyons,	Dwell.	2	9	4,000
Franz Krein,	Ware H'se	2	4	7,000
Lindell Railway Co.,	Stable	2	4	12,000

General Notes.

Adams, Mass. — H. T. Crandall is to build a six-tenement brick block on Centre St., corner of Crandall St.

Adrian, Mich. — Mr. M. L. Smith, architect, of Detroit, is preparing drawings for the Reform School for Girls, which will cost $30,000.

Albany, N. Y. — The sum of $100,000 has been appropriated to complete the Senate Chamber of the new Capitol. The bill further provides that the Senate Chamber and Governor's room shall be ready for occupation by the first of next January. The sum of $1,500,000 is appropriated, in another bill, to continue work upon the building generally.

Altoona, Pa. — Mr. F. C. Withers, of New York, has drawn plans for St. Luke's Church. It is to be of stone, and will have seating accommodations for 500 persons.

Anderson, Ind. — B. V. Enos & Son, architects, of Indianapolis, are to build a block of stores, which will cost $5,000.

Appleton, Minn. — A Catholic church is to be built here.

Blackstone, Mass. — Blackstone has voted to build a new town poor-house; cost, $45,000.

Brighton, Mass. — The management of the Brighton National Market Bank have decided to build a new bank building near the Brighton railroad station. The new building is to be of brick, 33′ x 43′, one-story high; cost, $6,000. Work will begin as soon as the contracts are awarded.

Bloomville, O. — Mr. N. B. Bacon, of Toledo, O., is preparing drawings for the new town-hall which is to be built of brick and stone.

Cleveland, O. — Proposals for building an addition to the Hicks St. school-house will be received June 14.

Columbus, Ind. — The plans and specifications for McCormick & Sweeney's new hotel have been received. The building will contain sixty-five rooms and will be three stories in height.

Corsicana, Tex. — The new court-house is to cost $40,000.

Detroit, Mich. — The corner-stone of the Universalist church was laid June 1.

Easton, Pa. — Work has commenced on the foundation walls for the new church edifice for St. John's Evangelical Association.

Frankfort, Ind. — Wm. Wolever is preparing to build an Italian villa on Jackson St., from plans prepared by J. W. Hammond, architect; contract not let yet.

Mr. Hammond has also made plans for a two-story cottage, cost, $2,000, for Prof. R. S. Boone.

Hagerstown, Md. — Mr. E. T. Littell, of New York, has drawn plans for a memorial tower and spire for St. John's Episcopal Church. It is to be built of stone, at a cost of about $5,000.

Hartford, Conn. — Mr. F. C. Withers, of New York, is preparing plans for a handsome brick and stone residence, to be built for Dr. G. Pierrepont Davis.

Holyoke, Mass. — T. L. Keough is to build a 28′ x 55′ brick block on Depot Hill. It will be three stories high, to contain six tenements.

Jefferson, Ind. — The United Brethren are building a church, 32′ x 58′, with tower; cost, about $4,000; complete, with bell; J. W. Hammond, of Frankfort, Ind., is the architect.

Juliette, Ind. — Mr. J. H. Stem, architect, of Indianapolis, is to build the new church here.

Kansas City, Mo. — A frame house for M. Benas, Esq.; from plans by F. T. Camp, architect, New York.

Kensington, Ill. — The Allen Car-wheel Works buildings are being rapidly pushed forward.

All that the Pullman Company is doing is putting up a frame structure, 62′ x 48′, as a boarding-house.

The foundation for the new car-works will be begun soon.

The Michigan Central is accumulating the material for its new freight depot, which is to be 800′ x 24′, and two stories high.

Lindsay (Ontario), Can. — Town hall, red and white brick and stone; F. T. Camp, architect, New York.

Residence, Wm. Duffus, Esq.; F. T. Camp, architect.

Bids and Contracts.

Columbus, Ind. — The contract for building the American Starch Works has been awarded to Farman & Pearce, of Indianapolis, their bid being $36,221; McCormick & Sweeney's bid was $39,000. The works are to be completed by September 15th. The above figures are for the work only, the company furnishing the brick and timber for the corn crib.

Harrisburg, Pa. — The contract for Harris Park School has been awarded to Mr. Joseph Ball, of Harrisburg, for $16,875; Mr. Frank E. Davis, of Baltimore, is the architect.

Jackson, Minn. — J. M. Daniels has the contract for building a $1,500 Methodist church.

Middletown, Conn. — The complete list of the awards for building the addition to the Insane Asylum is as follows: mason work, Watson Tryon, Enfield, $52,557; carpenter work, J. W. Hubbard & Co., Middletown, $32,811.63; slating, M. F. Clark & Co., Hartford, $4,700; plumbing and gas fitting, George Maehl, Hartford, $3,720; boilers, Peter Amerman, Hartford, $1,750; steam heating, Walworth Manufacturing Company, Boston, $7,985.75. Jasper D. Sibley, Middletown, is to be foreman of the work.

Philadelphia, Pa. — Proposals for iron work were lately received as follows by the Commissioners for the new Public Buildings: Jones & Benner, $76,890; Phœnix Iron Company, $68,750; Stewart & Stevens, $77,952.80. The contract was awarded to the Phœnix Iron Company.

Upper Marlborough, Md. — Mr. Joseph Williams has been awarded the contract for the Court House in Prince George County, for $15,800; Mr. F. E. Davis, of Baltimore, is the architect.

West Warren, Mass. — Flint & Co., of Monson, have the contract for the new mill at West Warren, and will put on about one hundred men from the Willimantic mill, July 1. The structure is to be 316′ x 79′, with tower and entrance at each end.

Industrial.

Auburn, Mass. — Dunn's Mills are to be rebuilt, for the manufacture of shoddy, by the New England Bedding Co.

Methuen, Mass. — The stockholders of the Arlington Mills have voted to build a fine cotton warp mill, of thirty thousand spindles.