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THE government of the Massachusetts Institute of Technology has made arrangements for a regular and thorough course of instruction in electrical engineering, including the theoretical studies in mathematics, chemistry and physics necessary to equip the student for original investigation, as well as practical training in all the modern applications of electricity. So far as we know, this is the first recognition on the part of a school of science of the great work which waits to be done in that important field, and practical electricians will be quick to appreciate the value of the opportunity which it offers for enlarging the views, and promoting the success, of those who will follow them in the exploration of the domain of electrical knowledge. How little is already known in comparison with what remains to be learned is every day more evident, and wonderful as are the telegraph, the telephone and the electric-light, experience only serves to convince us of their present imperfection. To take a single example of the problems which remain to be solved in telephony alone, it is a matter of daily experience to those who use that instrument that the signals rapidly lose their distinctness as the distance to which they are sent increases; and conversation is in practice rarely possible in the daytime between stations more than twenty or thirty miles apart. At night, however, the confusion of noises which prevents long-distance conversation is hushed, and perfect signals are received over lines two or three hundred miles long. The explanation of this is found in the induction which one electric current exerts upon all others near it, and which the sensitiveness of the telephone instruments renders peculiarly troublesome. If two telephone wires are suspended in the air twenty feet apart, a conversation transmitted over either line will be distinctly heard on the other; and telegraph or electric-light wires exercise a much stronger influence. Even the cut ends of the wires at the splicings of a telephone line are said to act as small transmitters, and to receive and forward the natural sounds which may be produced around them, such as the singing of birds or the croaking of frogs, so that a conversation over a wire of considerable length has, as it were, to run the gauntlet among the scraps of talk imparted from neighboring lines, the crackling and hammering due to induction from telegraph and electric-light wires, and the vague murmur compounded of an infinite number of lesser disturbances; and it is not surprising that it is soon overwhelmed by so many adverse influences. The obvious remedy for these inconveniences would consist in the employment of a wire so insulated as to be proof against all induction from without, but no method of securing such insulation has yet been devised. The problem must be solved sooner or later, for all material advance in telephony depends upon its solution. With a wire protected from induction the multiplication of the present telephone system a hundred-fold would be a question of a few months, and it is not too much to say that the discoverer of a method of effectual insulation will reap a reward greater even than that of the inventor of the telephone itself.

THE managers of the Lynn Steam Heating Company, some of whose pipes recently exploded under the street, have adopted a singular theory of the cause of the catastrophe. Although threatened with a total loss of their business through the action of the city officials, who notified them to remove their pipes from the streets forthwith, they seem to have taken no pains to ascertain and remedy the defects which led to the failure, but contented themselves for some weeks with vague excuses. Now, however, they have aroused themselves sufficiently to announce the offer of a reward of one thousand dollars for the detection and conviction "of the person or persons who caused the explosion." They profess, moreover, to have learned of the existence of a conspiracy to injure their prospects by means of explosions in their pipes, to be brought about by some secret means, and say that a fortunate accident only prevented a second catastrophe more serious than the first. The nature of the devices by which the pipes were to be surreptitiously destroyed is not explained, although the suggestion is made that the result was to be accomplished by introducing "cold water" into them. This surmise resembles a theory advanced just after the explosion, that the "rising of the tide" into the pipes caused their destruction, and of the two the latter seems decidedly the more probable. We do not see just how the hypothesis of a conspiracy improves the position of the company in relation to the public. If anything, a corporation unfortunate enough to be pursued by such reckless malice is a worse neighbor than one which merely employs careless and ignorant servants, and it seems more prudent than ever to insist on the removal of the pipes.

ANOTHER failure of underground steam-pipes took place last week, this time in New York, where a considerable number of very large pipes have been laid through various streets in the lower part of the city. One of these, in Broadway, not far from Wall Street, which had only been laid about a month, gave way in the night, apparently under a very slight pressure, so that the roadway was not torn up, and no inconvenience resulted to the passers-by further than the necessity of encountering clouds of vapor, which filled the street. Probably a defective joint was the source of the trouble, but it is not pleasant to think of the consequences of a more serious explosion in lower Broadway by daylight.

THE committee having in charge the matter of the equestrian statue of Paul Revere, to be erected in Boston, have not shown, if we may trust the report of the daily papers, that exceptional comprehension of the best mode of obtaining a design which we had hoped for from them. The cost of the monument is estimated at twenty thousand dollars, and according to the *Transcript* the committee has voted to invite artists to submit models in competition for this important work, on the condition that the authors of the three best designs shall receive equal premiums of two hundred and fifty dollars each. As it is not yet too late to modify these terms we trust that the committee will not be offended at our saying that not a single first-rate, or even second-rate design will be received in answer to such an invitation. Even if such sculptors as Mr. St. Gaudens, Mr. Olin Warner, and one or two others, would enter into a competition on any terms, neither they nor any others of reputation would give a moment's thought to a trial of skill in which the honor and profit of the execution of the statue, at a fair compensation, was not unreservedly promised to the one who should be awarded the highest place, not by the suffrages of a jury of amateurs, but by experts, whose judgment would command the respect of the whole artistic world. With this essential condition secured, the offer of supplementary premiums might as well be dispensed with. No one who knew anything of the difficulties of the sculptor's art would dream of undertaking the long and arduous study necessary for producing even a small model of an equestrian statue for the trifling sum of two hundred and fifty dollars, and there is no advantage in offering temptations to tyros who have no conception of what sculpture means. If the committee, or the subscribers to the statue, wish to obtain for their money a work of art which shall cast honor upon them and their city, there is one, and only one, way of doing so,—that is, to secure a good artist to design and execute it; and the only way of securing the services of a good artist in these days is to pay for them. It is true that by

a skilful appeal to the feeling of emulation, which is so strong among artists, it may be possible to engage several in a contest for a single prize; but such emulation must be excited by the prospect of high and public honor, not only to the winner, but to the other contestants, and without this it is worse than useless to propose competitions.

THE unfortunate inhabitants of Newark and Jersey City, who are compelled to drink the water of the Passaic River, have now the prospect of finding a new and most unpleasant ingredient added to the mixture which flows in the channel of that stream. A few days ago, persons living on the upper waters of the Passaic, near the mouth of a small tributary called Saddle River, noticed considerable quantities of oil floating on the water. The official inspector of the Jersey City and Newark Water Boards was notified, and found on investigation that a stream of coal oil was flowing into Saddle River at a little distance from its mouth, sufficiently copious to cover the water in some places to a depth of four inches. The oil made its appearance at the intersection of the course of the river with the pipe-line of the Standard Oil Company, and was found to issue from a break in the pipe about a mile and a half from the river, making its way thence through the loose earth around the pipe. About two thousand barrels of oil were found to have escaped, most of which was floating slowly down the current. At the latest advices the oil had reached the Newark pumping station, and its taste was plainly perceptible in the water delivered in the city, but the inconvenience of this was somewhat overshadowed by the fears of the inhabitants lest the oil should take fire as it passed by. The quantity is large enough to cause a great and uncontrollable conflagration if accident or malice should kindle it, and even the people of New York, twelve miles away, are not without anxiety as to the result.

WE publish with pleasure in another place the announcement of an exhibition and fair which is to be held in the Rotunda of the Capitol at Washington, under the auspices of the Society of the Army of the Cumberland, in aid of the project for erecting a monument in Washington to the memory of President Garfield. The exhibition will occupy several adjoining rooms as well as the Rotunda, and is intended to comprise works of art, specimens of ladies' fancy-work, and manufactures of many kinds. It is hoped that contributions will be made by artists and amateurs throughout the country of articles to be sold for the benefit of the monument fund, and there seems to be every reason for believing that an ample response will be given to the invitation. The occasion is a particularly memorable one, and the regard of the country for the martyred President, which has as yet lost nothing of its warmth, will eagerly embrace the opportunity which the fair will give for expressing itself in kind action.

A NEW elevator has just been patented which is likely to prove the first of a series of similar ones, as it presents certain elements of safety which are wanting in those of the ordinary kind. The essential peculiarity of the new elevator is that the car or platform carries its hoisting machinery with it, in the shape of a small electric motor placed on top of the car, and arranged to drive two vertical endless screws at the diagonal corners of the platform, which are geared into ratchets, or rather sections of corresponding hollow screws, secured to the posts which form the guides. The current is conveyed to the motor by a flexible insulated wire, which coils and uncoils on the top of the car as it ascends or descends. The great advantage which a screw elevator presents over all other kinds lies in the impossibility of its becoming detached from its supports. Even the breaking of several teeth of the ratchet will not release the screw, and nothing short of the complete disconnection of this from the frame of the car will allow the load to descend. The old-fashioned Tufts elevators secured this result by impaling, so to speak, the car upon an enormous screw, extending the whole height of the shaft, and driven by an engine at the foot; but the apparatus in the middle of the car was inconvenient, and as there was no other simple mode of operating a screw attached to the moving car from a stationary engine, the dangerous rope elevators soon had the field to themselves, with the exception of the direct-acting hydraulic elevators, and Miller's hoist, in which screws on top of the car, working in ratchets attached to the guide-posts, were moved by means of a belt extending the whole height of the

shaft. Both of these present some inconveniences, particularly with lofty hoists, but the transmission of electric force through flexible wires has solved the problem, as it will many others.

A CASE of some importance to mill managers was recently decided by the full bench of the Supreme Court of Massachusetts on appeal from the decision of a single justice. It seems that a certain woollen mill in Plymouth changed owners about two years ago, and the new proprietors placed a large steel bell on the mill, which they caused to be rung at five o'clock on the morning of every working day in winter, and again at various hours during the day. Two persons who occupied houses near the mill, one three hundred feet and the other a thousand feet away, complained that the ringing disturbed the quiet and comfort of their homes, and represented that the bell was unnecessarily large, that it was of no use for any purpose of trade or manufacture, and that it was rung at unreasonable hours and unnecessarily long. The mill proprietors replied that it was necessary to employ some means for calling the operatives to their work, and that the bell was of suitable size, and was rung at suitable hours for the purpose, and in a proper manner. The plaintiffs applied for an injunction to prevent the ringing of the bell, and the two questions presented to the court were, whether it was proved that the ringing was a nuisance to the plaintiffs, and whether it was such a nuisance that the court should interfere to prevent it by injunction. Both these questions were answered in the affirmative, and such bells in Massachusetts must henceforth be rung in a different manner, or not at all.

WITHIN a year or two an important modification has taken place in the views of certain French experts in regard to the proper mode of lighting school-rooms. Every architect knows that for the last ten years the invariable rule for school buildings on the Continent, followed also very generally in England and the United States, has been to restrict the windows of the rooms to one side, and to seat the pupils so that the light should fall upon their desks only from the left; this being supposed to be less fatiguing to the eyes than the illumination resulting from the admission of light from two sides; and the planning of school-rooms with windows arranged so as to give cross-lights has been generally regarded as conclusive evidence that the designer was ignorant of the first elements of school architecture. In 1879 or 1880, however, Dr. Javal, the Director of the Ophthalmological Laboratory of the Sorbonne, undertook a protracted inquiry, the results of which were embodied in a report made to the Biological Society, on Myopia in Schools. A considerable portion of the report was devoted to the question of the proper orientation and lighting of school-rooms, and he was led to prefer, for all school-rooms of greater width than thirteen feet, a plan by which light was admitted from two sides instead of one. In rooms of greater width than this, when lighted only from the left, the illumination of the most remote desks was at times inadequate for clear and comfortable vision, and of all the schools examined those which showed the greatest proportion of short-sighted pupils were some of recent construction where the accepted theory of fenestration had been most rigorously carried out. On the other hand, the statistics obtained did not indicate that any injurious effect of this kind was produced upon the eyes by cross-lighting, provided that the illumination was ample, and that the windows were situated at either side of, or behind the pupils, but not in front of them; and the school most free from myopic pupils was one in which the rooms were furnished with large windows in two sides.

ANOTHER careful trial of the new process of blasting in coal mines by means of quicklime was made the other day in what is known as the Silkstone colliery in England. A hole three inches in diameter and four feet deep was drilled in a solid mass of coal, and after clearing out, a perforated iron tube was first inserted, and then a charge of compressed quicklime, formed into a cartridge about three inches long. After forcing the cartridge into place and tamping the hole, water was pumped into the tube, and the coal immediately began to give way; and in thirty minutes a mass weighing about ten tons separated almost unbroken. The waste in dust and small coal was only six per cent, a much smaller proportion than is usual where powder is used for extraction, and the new process seems likely to become popular.

THE SIPHONAGE AND VENTILATION OF TRAPS.¹—II.

D—EXPERIMENTS WITH THE FOUR-INCH WASTE OR SOIL PIPE OPEN AT THE TOP.



water respectively $\frac{1}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", and $\frac{1}{2}$ ". The discharge of the water-closet, hopper, and bath together, six times in succession, lowered the trap-water from $2\frac{5}{8}$ " to $2\frac{1}{2}$ ", destroying the seal every time.

(2) The vent-hole $\frac{1}{4}$ " in diameter in this trap was then opened. The water-closet, hopper and bath were then discharged simultaneously ten times in succession, with the loss of only $\frac{1}{8}$ " of water from the trap in any instance.

(3) This same experiment was twice repeated with the top of the soil-pipe closed, showing a loss of only $\frac{3}{8}$ " of water from the trap in any case.

(4) The water in the large trap at *j* on the plate was observed with discharges of water from above similar to those noted in the last three experiments and with results so essentially similar that they are hardly worth reciting in detail.

(5) An S-trap of $\frac{1}{2}$ " calibre and $1\frac{1}{2}$ " depth of seal was attached to the branch marked *J* on the plate, on the second floor, with no vent in the trap. Water was discharged ten times in succession from the bath and water-closet above for periods of five to eight seconds each. The trap was unsealed four times and lost from $\frac{3}{8}$ " to $1\frac{1}{8}$ " of water at the other six trials.

(6) The same experiment was repeated with an opening in the crown of the trap $\frac{1}{4}$ " diameter, with loss of the trap-water as follows: $\frac{1}{4}$ ", few drops, $\frac{3}{8}$ ", $\frac{1}{8}$ " twice, few drops twice, $\frac{1}{16}$ " twice, few drops.

(7) A Bower's trap was attached at the same place, with no air-vent in it. The water-closet above was discharged while the bath-waste was running ten times successively. The trap lost its water-seal four times and lost at the other six trials from $\frac{1}{4}$ " to $1\frac{1}{4}$ " of water.

(8) A Cudell trap was then substituted, at the same branch, marked *J*. The water-closet was discharged above, while the bath-waste was flowing, ten times in succession. Nine times the water was all taken out of the trap, and once there was about $\frac{3}{8}$ " left.

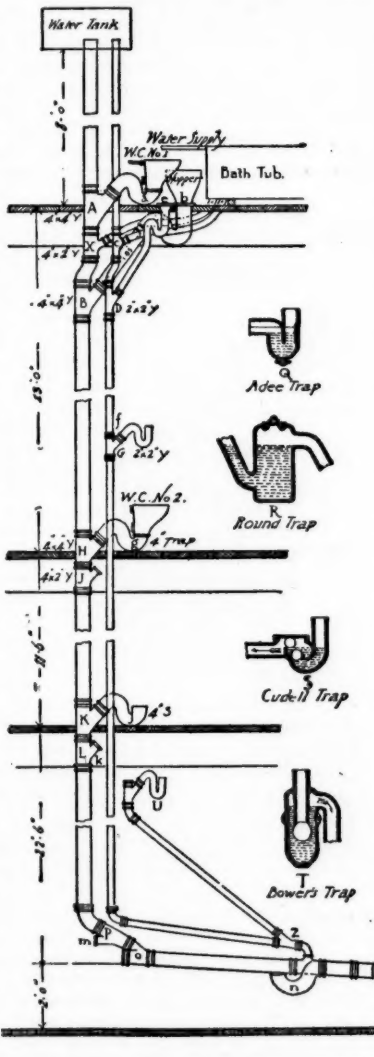
THE four-inch trap at *g* on the plate, having two inches depth of seal, was observed. The vent-hole in the trap was at first closed.

The discharge of a pailful of water at the hopper above lowered the trap-water $\frac{7}{8}$ ".

The simultaneous discharge of the hopper and water-closet above lowered the trap-water $2\frac{3}{8}$ ", destroying the seal.

The discharge of the hopper while the bath-waste was flowing lowered the trap-water $2\frac{1}{8}$ " and broke the seal.

The discharge of the water-closet above six times in succession lowered the trap-



(9) A round trap, having $2\frac{1}{2}$ " seal, as shown at *R*, was then substituted at this branch *J*. The discharge of water-closet No. 1 lowered its water $\frac{1}{4}$ ". The discharge of same closet and the hopper together lowered it $\frac{3}{4}$ ". Further trials of this trap showed that the discharge of the largest volumes of water possible at once from the three fixtures above could not unseat it, for though quantities of air were drawn through it, as seen through the glass in its sides, there was so much space for the air to pass by the water that the seal always remained efficient. It would be instructive to try such a trap after it had been encumbered with grease and other rubbish, as is often the case, and when this space for air to pass by the water might perhaps not be found.

Before deducing any rules for practice from these experiments it must be remembered that they were made with new, clean, enamelled pipes, while those in ordinary use are always more or less encumbered with scales and tubercles of rust and with the grease and slimy coating deposited by the sewage. Even in vertical pipes such collections often reduce the diameter $\frac{1}{4}$ of an inch, thereby reducing the sectional area of a 4" pipe about $12\frac{1}{2}$ per cent, and of a 2" pipe about 23 per cent: while in sloping waste-pipes, like those under wash-trays and bath-tubs, the accumulation of solid matter from the sewage often amounts to a permanent occupation of one-half or three-fourths of the whole section.

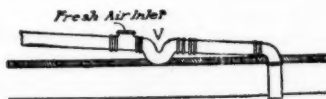
It needs but a casual reference to the above experiments to prove, what is generally known and admitted already, that the difficulty of retaining water in traps increases as the size of the waste-pipe decreases, so that we must expect with pipes that have been used for any considerable period much more tendency in the traps to lose their seal by unequal air-pressure than in the cases recorded above under conditions which are otherwise similar. Two causes combine to produce this result, viz.: The smaller pipe is filled by a less volume of water, which acts like a piston as it passes downward, while the air that follows from the vents above finds in the smaller pipes less room to flow in, and a consequent increase of friction, which, by impairing its velocity, leaves the unequal pressure that we complain of.

Moreover, there are various conditions affecting the stability of water in traps which may not have been foreseen and covered in these experiments. The various results actually arising, when repeating the same experiment under conditions apparently identical, show how unsafe it is to make general deductions from a small number of trials. These variations may be accounted for in part by the various paths taken by the water when poured at different times from one vessel to another, and when running down a vertical pipe. There is always a tendency to follow a spiral course. When such a twist is given to the water at the start, in the hopper, it generally checks the velocity so as to prevent the unsealing of the trap attached to it. When occurring in the vertical pipe, as it passes by the connections of other branches, it makes a great difference whether the path of the spiral happens to hit exactly across the opening of such a branch, or happens to pass on the other side of the main.

It would require much more time and labor than we have spent upon the subject to exhaust any considerable part of such possible variations which are likely to occur in daily practice. The relative size and position of the different branches, the quantities of water passing through them, and the endless number of combinations of flow from different fixtures, which occur daily in any large house or hotel, all tend to vary the result to a degree which should induce a prudent man to allow a large margin on the side of safety. The risks are known to be considerable in case of exposure of untrapped drains in dwellings.

It should also be remembered in this connection that we live in a climate where artificial heating of houses, warm chimneys, and the careful closing of wall and window cracks, combine to produce a decided pressure of air from without the house inward, acting through all our house-drains through several successive months every year, and that we know of no method, as yet, so satisfactory for resisting this pressure as the use of water-sealed traps. We are aware that a large number of ingenious devices have been introduced to supplement the water-seal by mechanical valves with moving cups, balls and flaps, but we have never seen one of these devices which could be relied upon to shut out air after the apparatus had been used and defiled for a few months by a flow of ordinary house-drainage, whether from laundry, kitchen or lavatory.

CONCLUSIONS AND RECOMMENDATIONS.



E.—When hopper water-closets are used for the emptying of slops, and when the trap is placed below the floor, it is difficult to pre-

serve the seal in the ordinary form of S-trap, even by a vent-pipe attached thereto, unless this be applied directly at the crown of the trap and be as large as four inches in diameter for at least a foot above the trap. The momentum of the falling water helps the draught to do the mischief. An abrupt change of direction may impair this momentum; but since it is manifestly useless to try to control the direction in which the water is emptied into the hopper, we should endeavor to check it by the form of the apparatus. We

¹ A Report to the National Board of Health, by E. W. Bowditch and E. S. Philbrick, C. E.

must assume that the water will generally be emptied in the most convenient manner, and this is quite as likely to favor the loss of the trap-water by momentum as otherwise, unless the form of the fixture controls it. An increase of the depth of the seal and a decided, quick upward turn at the bottom of the trap will both operate in this direction. But there are limits to the advisable depth of water-seal, arising from the tendency of deep traps to retain their filth. Moreover all angles, and very abrupt changes approaching the form of an angle, should be avoided for the same reason. The proper medium is only to be attained by the use of good judgment in any case.

F.—When a short hopper is used for emptying slops, with a trap above the floor, though the momentum of the falling water is considerably reduced by the diminished distance through which the water falls from the pail to the trap, there is still no security for keeping the water in such a trap, unless supplied by a special air-vent. This should be at least $1\frac{1}{2}$ inches in diameter if more than a few feet in length, and even larger if passing to other floors above.

G.—Other forms of traps which, like the one referred to in experiment D (9), might save and retain their water by means of a lateral expansion of their basins are objectionable, owing to the amount of filth they retain, subject to decomposition. The ordinary S-trap alone, with ample air-vent, is therefore recommended for use under water-closets, and also for all other fixtures where its proper ventilation can be secured within reasonable limits of expense. The proper size and length of such vent-pipes must be largely a matter of judgment, and will be referred to again. Their combinations admit of such a great diversity of conditions that we can only urge that every one should be severely tested by repeated trials, applying larger vents, or making the small sizes shorter whenever any doubt arises as to their efficiency.

H.—The above precautions are of more importance, and should be observed with greater care when waste-pipes are used of smaller size than four inches to carry the flow for more than one or two feet in distance. The difficulties arising in such cases are illustrated by the experiments A and C, above noted.

I.—Whenever branch inlets are connected to a line of waste or soil pipe that is vertical or approaching that direction, above which branches other fixtures are used for discharging water into the same main, there is great risk of losing the water from the traps attached to such branches whenever the upper fixtures are used. No form of trap without special air-vent has come to our notice which is not likely to lose its water-seal under such circumstances, even when the top of the soil or waste pipe is open, except those which, like the round trap above referred to, are objectionable for retaining filth. This form of trap shown at R, on the plate, is largely used about Boston for the reason that its seal is difficult to be broken. The objection above alluded to is intended to be met by providing a large capped opening at the top for the removal of filth. In practice this is seldom done, and if done without the help of a mechanic the cover would rarely be closed tightly, as now constructed, so that the frequent cleaning of such traps is very difficult to accomplish and an annoyance when done. The risk involved by the use of such small cesspools in the house would be small if perfect tightness could always be insured at the joint of the cover. Air-vents are sometimes applied to them, but are of doubtful utility. Experts differ in opinion, according to their individual experience, as to their liability to become choked with filth in their upper part. The writer has seen them so far encumbered with grease, etc., as to lose most of those advantages in ability to retain their water-seal. We can, therefore, recommend with less reservation the use of a well-ventilated S-trap wherever the vent-pipe can be applied without unreasonable cost. The round trap may often be properly used, however, in old houses, in places where the introduction of a vent might be very inconvenient or costly.

J.—The best and most simple remedy for the siphoning of traps, in most cases, is undoubtedly to be found in the introduction of air at the normal pressure at the crown of the trap. The reason for preferring the crown to any other place can be found in the above record. [See experiments B (2), (3), (4), (5), (6), (7).]

No definite rules can be given for the size or length of vent-pipes; see paragraph C, above. Yet it may be said that it is not safe to trust to a vent-pipe of less size than that of the trap it is to serve until we get above two inches diameter, except they be of only a few feet in length, before they join those of a larger size. The greater efficacy of a vent applied directly at the trap, as compared with the air-supply through the top of the main soil-pipe, is shown by experiments B (11), and D (2) and (3).

K.—There is still another risk arising from change of air-pressure in drains besides that of siphoning traps. The latter is the result of lack of pressure, while an excess of pressure is also to be avoided. The following experiment may illustrate this point. It is applicable to all house-drains having an exterior main trap, or discharging into a cesspool at a point below the water-line by a dipping inlet pipe, as is often done for the sake of checking the back flow of gas from the cesspool.

(1) The trap at the lower end of the system, at the point marked V on the plate, was filled with water, and the air inlet just above it was capped. The trap at (n) on the basement floor was then filled with water and a pailful emptied at the hopper on the third floor, connecting with the 4" main. The air was so compressed ahead

of the falling water that it was forcibly blown out at the trap (n), carrying with it a good deal of water, showing how foul air from a drain can thus be ejected into the apartments of a house in considerable volumes. The fixture connected with such a trap may generally be able to collect and restore to the trap enough of the water expelled to save its seal, and thus no apparent defect would be found unless the blowing out of the foul air through the trap happened to attract attention.

(2) On removing the cap from the air-hole near V and repeating the experiment, no apparent disturbance followed in the trap (n).

(3) Another experiment was tried to illustrate the retarding effect of friction and consequent change of pressure in small waste-pipes as follows: An ordinary S-trap of $1\frac{1}{2}$ " and seal $1\frac{1}{2}$ " calibre was attached in the basement to the branch marked U of the 2" waste-pipe. This represents a combination frequently occurring in the waste-pipes of pantry-sinks. This trap was filled with water, and a pailful emptied into the 2" waste on the third floor above. The air was forcibly blown out of the trap at V by the compression of the air ahead of the descending charge, even when the 4" air-hole near V was open in the main below. This result was plainly due to the friction caused by the air rushing through the abrupt bend at the connection marked Z. It shows the risk incurred by branching small waste-pipes into one another when used on several floors, and the impropriety of using a quarter-bend and T-branch at Z instead of a Y-branch.

Though condemned by most English authorities it is doubtless a safer way to connect the waste-pipes of baths, bowls, etc., used on upper floors directly to the large soil-pipe by Y-branches as near as practicable to the fixtures drained, than to erect long lines of smaller sized wastes separately for such purposes. Certainly the larger the pipe, the less is the risk of any abnormal air-pressure occurring by its use, so long as the wastes are not likely to become encumbered seriously by accretion of solid matter. The provision of separate wastes for baths, etc., all the way to the basement is considered important in England, probably because of a dislike to make inlets in the soil-pipe used for water-closets; but the risks arising from the use of a small-sized waste through such distances are thus proved to be considerable and should not be ignored: while those arising from the common use of a 4" or 5" pipe for water-closet and general refuse water on several floors may have been over-rated in England.

EDWARD S. PHILBRICK,
ERNEST W. BOWDITCH.

BOSTON, MASS., June 12, 1882.

MUNICIPAL ABUSES IN BALTIMORE.



Statue of Charles MacNeil, now in the Jardin des Tuileries Paris. MM. Rochet Freres Sculptors.

THIS city is one of the best examples of the condition to which all American cities will be sooner or later reduced by the unrestricted use of overhead electric wires. There are two rival electric-lighting companies, one of which has contracted for lighting a large part of the business district, and has planted great numbers of huge wooden posts about 18 feet high, upon which their lights are supported. Both of these companies have erected their poles wherever they saw fit, and together with the telephone, district and regular telegraph, and the fire-alarm systems, have succeeded in disfiguring all our streets to the last degree. American cities generally are famous for utter neglect of effect, in the arrangement of their streets and of the buildings upon them, but nothing tends more to mar the little good we have than this subversion of the public comfort to private greed. There can never be any true advance in art until the public voice demands that our streets shall be utterly freed from the detestable poles and wires which now everywhere obstruct them. The streets of this city have been for more than a year at the mercy of any corporation which chose to destroy them.

We have been subjected to a war of rival gas-companies, which rode rough-shod over our liberties and tore up our streets in every direction. This has at last ceased, leaving many a sunken furrow to mark the imperfect filling of the trenches, when lo! another company, owning two lines of pipe, proceeds to mine for its hidden but unavailable wealth on Charles Street, the chief retail thoroughfare of the city, and once more are we subjected to upturned pavements and the smell of filthy earth, saturated by exposure for years to leaking gas-pipes. Now comes the edict that the cobble-stones of 1776 shall be replaced by "Belgian blocks," at the expense of the owners of property bordering on the street to be repaved, instead of being paid for out of the general tax-levy, raised from the public, who are

mainly benefitted. The streets are therefore again subjected to the attacks of an army of Hibernians, this time, we trust, to leave them better and not worse than they found them. Howard Street has been repaved for a dozen blocks when some individual, discovering that a private sewer, leading directly through the newly paved street, would be to his advantage, forthwith tears up the work at will, and marks the track of his ill-advised efforts by the long-drawn furrow which Baltimoreans have learned to know so well. This lack of foresight is further shown whenever one of the typical "rows" of houses is constructed, and the footway smoothly paved, as though no such conveniences as gas and water existed. This lasts for perhaps a week, when the upheaval occurs, and the neatly paved walk is scattered to the winds, that pipes may be carried to each house, and the cross-furrow, fatal to axles and comfort alike, be produced.

Another upheaval, through which we are now passing, is caused by the new horse-railway tracks. The last State Legislature reduced all fares to five cents for adults, and strange to say, several new companies were at once formed. The first horse-car was run on our streets in 1859. The companies now have 151 miles of track, and employ 1352 men, 2,830 horses, and 304 cars. One of the new lines has been brought to a sudden check by the tracks of two of our principal steam-railroad lines, which it has essayed to cross at grade. In the argument asking for an injunction it was stated, by counsel for the steam roads, that several hundred crossings by engines were made at the disputed point daily, and he very pertinently remarked that in case of collision the locomotive would not be the sufferer. The day has undoubtedly passed for grade-crossings of steam railroads. Edmondson Avenue, now being completed in the county, the property-owners along its city line, desirous of finishing it by connecting with the county extension, caused the grade to be established crossing the Baltimore and Potomac Railroad by a bridge. This required heavy filling in a small portion of the avenue, and called forth an appeal for a grade-crossing from two owners who fancied themselves greatly damaged. It was discovered, however, that one of the appellants nearly lost his life, only escaping with a demolished carriage and a broken leg, at a grade-crossing recently, and the other was actually deriving a revenue by allowing his low land to be used as a dump for surplus earth. The decision was unanimously against them.

Quite a remarkable squabble is at present going on, regarding the location of a monument to General Armistead, the defender of Fort McHenry during the bombardment of 1814. The city appropriated \$1,500 for the work, and it has been completed by a stone-cutter unknown to fame. The committee having charge of the matter selected Eataw Place as the site, and were about to lay the foundation when a remonstrance, numerously signed by residents of the aforesaid "Place," was presented to the Mayor. The reasons given are: That they do not want a grave-yard made of the locality, and that the effect of the marble would be out of keeping with the shrubbery and flowers, and the contrast "glaring." This from people who see little else during their waking hours beside the reddest of brick and the whitest of marble, in the miles of dwellings surrounding that neighborhood, is a little too much. One gentleman said he had secured \$2,000 toward the erection of a bronze equestrian statue of Colonel John Eager Howard, to stand on the spot selected for the Armistead monument, and to cost entire, \$10,000. In reply, the chairman of the Armistead committee very pertinently remarked, that "the sum named would hardly procure anything of a higher order of merit than a wooden Indian before a tobacco-shop!" Both sides talk of placing the matter before the courts: so the end is not yet.

CIVIS.

MORE ABOUT THE BOOLAK MUSEUM.



LITTLE did we suspect when some few weeks since we spoke of the scheme which had been determined on to explore the Delta of the Nile,¹ that the march of political events would render any such undertaking impossible, perhaps for many years to come; and now it seems that it is not alone the further researches of the archaeologist that will by recent events be arrested. The collections of a generation of diligent antiquaries are threatened, if not with absolute destruction, with the scarcely better fate of dispersion. The announcement has gone the round of the artistic world that it is the intention of Arabi Pasha to dispose of the Boolak Museum. Stories have reached us of the courageous conduct of the director, M. Maspéro (who succeeded, it will be remembered, the late lamented Mariette Bey), who, in the midst of the utmost danger, has, captain-like refused to abandon his ship. All who are aware of the exceptional value of the contents of the museum must have trembled to hear of the imminent danger which the collected treasures of twenty years' toil are at present running. Coupled with the threatened fate of that storehouse of Arabic art, the city of Cairo, the dispersion of the Boolak Museum, which has revealed so many secrets of the unknown past, adds only a further horror to the many that have accompanied the recent outbreaks in Egypt. Should such a thing occur at Cairo nothing can replace its treasures of architecture and decorative art, as delicate as any

that flourished contemporaneously with our exquisite Gothic. Some knowledge of the pecuniary value of the contents of the Boolak Museum promises, it would appear, to prove the safety of the collection, and in this hope we must thankfully trust.

The story of the formation of the Boolak Museum affords in itself a not unrepresentative chapter of modern Egyptian history; the indifference and apathy with which the collection has at all times been regarded by the natives, by the late Khedive Ismail Pasha himself — without whose aid, however, it is frankly admitted the museum could never have been formed — are only too characteristic of the nation among which the late lamented Mariette Bey passed so many years of his life in the organization of the museum which remains a monument that will do more to honor his memory than even the costly statue, which, within a few days past, has been unveiled in his native town of Boulogne. The museum, installed in a series of warehouses, is far from being lodged in a suitable manner. Ismail Pasha had, it would appear, originally intended that it should be sumptuously housed, and many thousands of francs — bondholders' francs, we suppose — were expended some years ago in the erection of a house for the museum; a mass of ruined walls, lying on the road from Cairo to the Pyramids, is the sole result of this expenditure. In its present quarters the museum is, it appears, in dangerous proximity to the Nile, and had not recent changes been made with a view to raising the floor-level, the annual inundations of the Nile could not have failed in time to have seriously injured the collection. As it is, the objects are much affected by the prevailing dampness. There seems, however, a certain fitness in the situation of the museum, the Nile floating majestically by, as it has done century after century, with its river life the same that the Egyptians of the days of the Pharaohs and the Israelites saw. Those who have visited the spot all agree in speaking in unmeasured terms of the beauty of the situation of the museum, pleasantly removed from the bustle, the noise, and the luxury of Cairo, to the city of the Thousand-and-One Nights.

It is the especial feature of the Boolak Museum that it differs materially in its character from every other museum of Egyptian antiquities. It is a museum organized specially with a view to aid the study of Egyptology.² The mode in which the collection was formed gives it this special character. Apart from a small gathering purchased by Said Pasha, it is entirely the result of the excavations conducted during twenty years past under the direction of the late Mariette Bey. The European museums, as every one knows, have mostly been formed in a far from consecutive manner. The Boolak Museum, on the other hand, is the result of a series of researches made on a regularly organized plan, directed by one man, and that man Mariette Bey. Of each period of history the museum contains all the information which research has been able to gather. In his invaluable catalogue Mariette Bey has shown how the greater part of the European museums have been formed by the purchase of collections gathered largely without any coherence. No idea can be formed, he urges, of the Egyptian excavations, if it be imagined that their sole result has been the collections that form the pride of the European museums. For every relic there exhibited, twenty others have been left behind as imperfect or too difficult to move. At Boolak, on the contrary, all the fragments found have been specially studied, and, however mutilated, are regarded as worthy of being placed in the museum. The result may be found by the general public to be somewhat solemn and severe, but to the student the collection is invaluable.

Not long since great changes were made in the museum with a view to insuring its greater security from the possibilities of inundation. The interval was taken advantage of to re-arrange many of the objects, in spite of the very restricted and inadequate quarters in which the museum is lodged. With the laudable desire of arousing in the native mind a proper interest in the productions of their ancestors, Mariette Bey arranged his gathering in a popular rather than exactly scientific order, but the changes were taken advantage of to effect a re-arrangement. Great difficulties had to be grappled with in the organization, according to a chronological order; even greater difficulties presented themselves in the way of dividing the collection, as is the case in Paris, and more particularly in Berlin, into separate "civil," "religious," and "funerary" rooms. The largest gallery is filled with thousands of the statuettes, bronze objects, gold and silver vases, and various other relics such as are to be found in every public collection; but, it may be observed, nowhere in such profusion or in such a state of preservation as here. In two other rooms are disposed a series of mummies, scarabæi, amulets, arms, etc., found in the tombs, the *bric-à-brac* of a civilization whose every relic possesses to us its value. The real interest of Boolak is not centered in these objects, specimens of which every museum possesses. The collections of busts and statues is one of the features of the greatest originality.

We possess, it is evident to all students, but very indifferent specimens of the sculptor's art in Egypt. Herodotus and Diodorus Siculus assure us that the Egyptians did not produce their statues as Greek traditions have directed. They divided the figure into twenty-one and a quarter different portions, the execution of which was confided each to a different workman. The result was so precise that the parts when put together exactly corresponded. Where

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must assume that the water will generally be emptied in the most convenient manner, and this is quite as likely to favor the loss of the trap-water by momentum as otherwise, unless the form of the fixture controls it. An increase of the depth of the seal and a decided, quick upward turn at the bottom of the trap will both operate in this direction. But there are limits to the advisable depth of water-seal, arising from the tendency of deep traps to retain their filth. Moreover all angles, and very abrupt changes approaching the form of an angle, should be avoided for the same reason. The proper medium is only to be attained by the use of good judgment in any case.

F.—When a short hopper is used for emptying slops, with a trap above the floor, though the momentum of the falling water is considerably reduced by the diminished distance through which the water falls from the pail to the trap, there is still no security for keeping the water in such a trap, unless supplied by a special air-vent. This should be at least $1\frac{1}{2}$ inches in diameter if more than a few feet in length, and even larger if passing to other floors above.

G.—Other forms of traps which, like the one referred to in experiment D (9), might save and retain their water by means of a lateral expansion of their basins are objectionable, owing to the amount of filth they retain, subject to decomposition. The ordinary S-trap alone, with ample air-vent, is therefore recommended for use under water-closets, and also for all other fixtures where its proper ventilation can be secured within reasonable limits of expense. The proper size and length of such vent-pipes must be largely a matter of judgment, and will be referred to again. Their combinations admit of such a great diversity of conditions that we can only urge that every one should be severely tested by repeated trials, applying larger vents, or making the small sizes shorter whenever any doubt arises as to their efficiency.

H.—The above precautions are of more importance, and should be observed with greater care when waste-pipes are used of smaller size than four inches to carry the flow for more than one or two feet in distance. The difficulties arising in such cases are illustrated by the experiments A and C, above noted.

I.—Whenever branch inlets are connected to a line of waste or soil pipe that is vertical or approaching that direction, above which branches other fixtures are used for discharging water into the same main, there is great risk of losing the water from the traps attached to such branches whenever the upper fixtures are used. No form of trap without special air-vent has come to our notice which is not likely to lose its water-seal under such circumstances, even when the top of the soil or waste pipe is open, except those which, like the round trap above referred to, are objectionable for retaining filth. This form of trap shown at R, on the plate, is largely used about Boston for the reason that its seal is difficult to be broken. The objection above alluded to is intended to be met by providing a large capped opening at the top for the removal of filth. In practice this is seldom done, and if done without the help of a mechanic the cover would rarely be closed tightly, as now constructed, so that the frequent cleaning of such traps is very difficult to accomplish and an annoyance when done. The risk involved by the use of such small cesspools in the house would be small if perfect tightness could always be insured at the joint of the cover. Air-vents are sometimes applied to them, but are of doubtful utility. Experts differ in opinion, according to their individual experience, as to their liability to become choked with filth in their upper part. The writer has seen them so far encumbered with grease, etc., as to lose most of those advantages in ability to retain their water-seal. We can, therefore, recommend with less reservation the use of a well-ventilated S-trap wherever the vent-pipe can be applied without unreasonable cost. The round trap may often be properly used, however, in old houses, in places where the introduction of a vent might be very inconvenient or costly.

J.—The best and most simple remedy for the siphoning of traps, in most cases, is undoubtedly to be found in the introduction of air at the normal pressure at the crown of the trap. The reason for preferring the crown to any other place can be found in the above record. [See experiments B (2), (3), (4), (5), (6), (7).]

No definite rules can be given for the size or length of vent-pipes; see paragraph C, above. Yet it may be said that it is not safe to trust to a vent-pipe of less size than that of the trap it is to serve until we get above two inches diameter, except they be of only a few feet in length, before they join those of a larger size. The greater efficacy of a vent applied directly at the trap, as compared with the air-supply through the top of the main soil-pipe, is shown by experiments B (11), and D (2) and (3).

K.—There is still another risk arising from change of air-pressure in drains besides that of siphoning traps. The latter is the result of lack of pressure, while an excess of pressure is also to be avoided. The following experiment may illustrate this point. It is applicable to all house-drains having an exterior main trap, or discharging into a cesspool at a point below the water-line by a dipping inlet pipe, as is often done for the sake of checking the back flow of gas from the cesspool.

(1) The trap at the lower end of the system, at the point marked V on the plate, was filled with water, and the air inlet just above it was capped. The trap at (n) on the basement floor was then filled with water and a pailful emptied at the hopper on the third floor, connecting with the 4" main. The air was so compressed ahead

of the falling water that it was forcibly blown out at the trap (n), carrying with it a good deal of water, showing how foul air from a drain can thus be ejected into the apartments of a house in considerable volumes. The fixture connected with such a trap may generally be able to collect and restore to the trap enough of the water expelled to save its seal, and thus no apparent defect would be found unless the blowing out of the foul air through the trap happened to attract attention.

(2) On removing the cap from the air-hole near V and repeating the experiment, no apparent disturbance followed in the trap (n).

(3) Another experiment was tried to illustrate the retarding effect of friction and consequent change of pressure in small waste-pipes as follows: An ordinary S-trap of $1\frac{1}{2}$ " and seal $1\frac{1}{2}$ " calibre was attached in the basement to the branch marked U of the 2" waste-pipe. This represents a combination frequently occurring in the waste-pipes of pantry-sinks. This trap was filled with water, and a pailful emptied into the 2" waste on the third floor above. The air was forcibly blown out of the trap at V by the compression of the air ahead of the descending charge, even when the 4" air-hole near V was open in the main below. This result was plainly due to the friction caused by the air rushing through the abrupt bend at the connection marked Z. It shows the risk incurred by branching small waste-pipes into one another when used on several floors, and the impropriety of using a quarter-bend and T-branch at Z instead of a Y-branch.

Though condemned by most English authorities it is doubtless a safer way to connect the waste-pipes of baths, bowls, etc., used on upper floors directly to the large soil-pipe by Y-branches as near as practicable to the fixtures drained, than to erect long lines of smaller sized wastes separately for such purposes. Certainly the larger the pipe, the less is the risk of any abnormal air-pressure occurring by its use, so long as the wastes are not likely to become encumbered seriously by accretion of solid matter. The provision of separate wastes for baths, etc., all the way to the basement is considered important in England, probably because of a dislike to make inlets in the soil-pipe used for water-closets; but the risks arising from the use of a small-sized waste through such distances are thus proved to be considerable and should not be ignored: while those arising from the common use of a 4" or 5" pipe for water-closet and general refuse water on several floors may have been over-rated in England.

EDWARD S. PHILBRICK,
ERNEST W. BOWDITCH.

BOSTON, MASS., June 12, 1882.

MUNICIPAL ABUSES IN BALTIMORE.



Slave of the Republic, Charles Macdonald, Paris Exposition Universelle 1889. Sculptors: MM. Rochet, Freres.

THIS city is one of the best examples of the condition to which all American cities will be sooner or later reduced by the unrestricted use of overhead electric wires. There are two rival electric-lighting companies, one of which has contracted for lighting a large part of the business district, and has planted great numbers of huge wooden posts about 18 feet high, upon which their lights are supported. Both of these companies have erected their poles wherever they saw fit, and together with the telephone, district and regular telegraph, and the fire-alarm systems, have succeeded in disfiguring all our streets to the last degree. American cities generally are famous for utter neglect of effect, in the arrangement of their streets and of the buildings upon them, but nothing tends more to mar the little good we have than this subversion of the public comfort to private greed. There can never be any true advance in art until the public voice demands that our streets shall be utterly freed from the detestable poles and wires which now everywhere obstruct them. The streets of this city have been for more than a year at the mercy of any corporation which chose to destroy them.

We have been subjected to a war of rival gas-companies, which rode rough-shod over our liberties and tore up our streets in every direction. This has at last ceased, leaving many a sunken furrow to mark the imperfect filling of the trenches, when lo! another company, owning two lines of pipe, proceeds to mine for its hidden but unavailable wealth on Charles Street, the chief retail thoroughfare of the city, and once more are we subjected to upturned pavements and the smell of filthy earth, saturated by exposure for years to leaking gas-pipes. Now comes the edict that the cobble-stones of 1776 shall be replaced by "Belgian blocks," at the expense of the owners of property bordering on the street to be repaved, instead of being paid for out of the general tax-levy, raised from the public, who are

mainly benefitted. The streets are therefore again subjected to the attacks of an army of Hibernians, this time, we trust, to leave them better and not worse than they found them. Howard Street has been repaved for a dozen blocks when some individual, discovering that a private sewer, leading directly through the newly paved street, would be to his advantage, forthwith tears up the work at will, and marks the track of his ill-advised efforts by the long-drawn furrow which Baltimoreans have learned to know so well. This lack of foresight is further shown whenever one of the typical "rows" of houses is constructed, and the footway smoothly paved, as though no such conveniences as gas and water existed. This lasts for perhaps a week, when the upheaval occurs, and the neatly paved walk is scattered to the winds, that pipes may be carried to each house, and the cross-furrow, fatal to axles and comfort alike, be produced.

Another upheaval, through which we are now passing, is caused by the new horse-railway tracks. The last State Legislature reduced all fares to five cents for adults, and strange to say, several new companies were at once formed. The first horse-car was run on our streets in 1859. The companies now have 151 miles of track, and employ 1352 men, 2,830 horses, and 304 cars. One of the new lines has been brought to a sudden check by the tracks of two of our principal steam-railroad lines, which it has essayed to cross at grade. In the argument asking for an injunction it was stated, by counsel for the steam roads, that several hundred crossings by engines were made at the disputed point daily, and he very pertinently remarked that in case of collision the locomotive would not be the sufferer. The day has undoubtedly passed for grade-crossings of steam railroads. Edmondson Avenue, now being completed in the county, the property-owners along its city line, desirous of finishing it by connecting with the county extension, caused the grade to be established crossing the Baltimore and Potomac Railroad by a bridge. This required heavy filling in a small portion of the avenue, and called forth an appeal for a grade-crossing from two owners who fancied themselves greatly damaged. It was discovered, however, that one of the appellants nearly lost his life, only escaping with a demolished carriage and a broken leg, at a grade-crossing recently, and the other was actually deriving a revenue by allowing his low land to be used as a dump for surplus earth. The decision was unanimously against them.

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CIVIS.

MORE ABOUT THE BOOLAK MUSEUM.



LITTLE did we suspect when some few weeks since we spoke of the scheme which had been determined on to explore the Delta of the Nile,¹ that the march of political events would render any such undertaking impossible, perhaps for many years to come; and now it seems that it is not alone the further researches of the archaeologist that will by recent events be arrested. The collections of a generation of diligent antiquaries are threatened, if not with absolute destruction, with the scarcely better fate of dispersion. The announcement has gone the round of the artistic world that it is the intention of Arabi Pasha to dispose of the Boolak Museum. Stories have reached us of the courageous conduct of the director, M. Maspero (who succeeded, it will be remembered, the late lamented Mariette Bey), who, in the midst of the utmost danger, has, captain-like refused to abandon his ship. All who are aware of the exceptional value of the contents of the museum must have trembled to hear of the imminent danger which the collected treasures of twenty years' toil are at present running. Coupled with the threatened fate of that storehouse of Arabic art, the city of Cairo, the dispersion of the Boolak Museum, which has revealed so many secrets of the unknown past, adds only a further horror to the many that have accompanied the recent outbreaks in Egypt. Should such a thing occur at Cairo nothing can replace its treasures of architecture and decorative art, as delicate as any

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² Before going further, we should desire to express our indebtedness to the interesting notes of M. Gabriel Charney on the Boolak Museum, published in the pages of the *Revue des Deux Mondes* in September, 1880.

the work was of exceptional importance the different parts would be executed in precious metals, the head in gold or ivory, the rest of the body in bronze or alabaster. All traces of such statues have, it can easily be understood, long since vanished, or what few have been spared are but very inferior specimens. Many of the statues discovered possess the strong evidence of being portraits, some so markedly that a foreign type is recognizable in the features. Egypt we know was never an entirely self-governed country: its national life in the past, as in the present, was continually subjected to foreign influence. Too rich and beautiful not to excite the envy of neighboring nations, it has ever been a prey to foreign invasion, but while under alien rule the people, it is to be remarked, none the less preserved unchanged their marked character.

One of the heads of the Boolak Museum,—a fragment detached from its trunk,—M. Mariette has not hesitated to regard as the portrait of Menephtah, the son of Ramses II, the Pharaoh who perished in the Red Sea. The bust of his father serves as a pendant, while round these two are clustered the granite features of Thotmes III, Queen Taia, and many other interesting Egyptian rulers. It would, indeed, be a task beyond the limits of our space to describe all the curious relics of the Boolak Museum. The jewels of the Queen Hah-Hotep have been often described; of the scarabæi there is but little to be said: they rarely possess interest except when bearing some historic name. Of the papyri of the Boolak Museum it requires a *savant* to speak; some are in a marvellous state of preservation, and are decorated with all the delicacy of skill and color that give such a beauty to the Mediaeval missals of Europe. The Egyptian Pantheon is, of course, represented at Boolak by an immense collection of gods and goddesses, in bronze, granite, porphyry, wood, and porcelain, facts which give some idea of the condition of the industrial arts in Egypt. The technical skill of the workmen, we have evidence, was great; of their processes—they enamelled in a manner which, if it has been equalled, has never been surpassed—as of their tools we know nothing. All this portion of the museum, however, may be said to possess only a secondary interest, though it is impossible to pass over in silence the table of Saqqarah, which confirmed on its discovery in so remarkable a manner the dynastic lists of Manetho, or, again, the stèle of Sâh or Tanis, a “document” scarcely the less precious than our own treasured Rosetta stone.

Perhaps the chief interest of the Boolak Museum may be said to centre in the two rooms,—devoted, one to the relics of the Ancient Empire, the second to those of the Hycsos or Shepherds.

The “Salle de l’Ancien Empire” is in itself a museum, containing, as it does, the oldest relics, perhaps, of human art. Twenty years ago the ancient empire was almost completely unknown. The studies of the Egyptologists stopped short at a great distance from this far-distant past. M. Mariette may be looked on as the Columbus of this new old world—the oldest, perhaps, of which we possess any traces. His researches brought to light a series of “documents,” as our French neighbors would say, of the utmost interest. To judge by the specimens we so far possess, civilization under the ancient empire had no infancy. Like Topsy (if so flippanant a comparison may be permitted), it seems, 6,000 or 7,000 years ago, to have “grown” on the banks of the Nile with the rapidity of the river-plants which come to perfection in a few years and then die down. From its first commencement this civilization seems to have arrived at perfection; but it disappears as it came. At the end of the sixth dynasty Egyptian civilization collapses suddenly, only to reappear, four centuries and a half later, in the eleventh dynasty. During this long lapse not a relic or a fragment shows us the existence of the Egyptians. It would seem as if the Nile had, during those long generations, uninterruptedly covered the country up, as it does for the few months annually. Nothing is stranger than this long interlude in the history of a people, the most industrious builders of the whole of mankind. No invasion explains the gap, for no ruined buildings of an earlier date attest the passage of an enemy. “Egyptian civilization,” as Mariette puts it, “sank in a cataclysm only the more inexplicable as it has left nothing standing, not even ruins.” When, four centuries later, civilization holds up again its head its character is deeply changed: it is no longer the genial spirit of the earlier days; in its artistic creations we can trace the grimness of the new ideal. After the representations of the happy scenes of earthly life, we have brought before us the painful travels of the soul in its journey to immortality. Mystery, therefore, it will be seen, shrouds the origin and the close of the so-called ancient empire.

It is strangely characteristic the art of this period as we see it at Boolak; it is essentially what we have come to call realistic; it is the crude representation of facts robbed of any of that high-souled ideal that forms the characteristic of Greek art; and this is the reason of the indifference with which so many regard all Egyptian art. In no manner can its inferiority be shown more strikingly than when by luck one may chance to light upon some creation even only feebly influenced by Greek teaching. Egyptian art is not beautiful in the ideal sense of the word. We are astonished at its creations; it is, as it has been described, “seen” art—not “thought” art; but the antiquity of its creations, and the spell that time throws round all it touches, place Egyptian art beyond the reach of criticism. In these rooms at Boolak it requires but a feeble gift of imagination to picture the sixty centuries that are gathered about one, and to imagine the gods those distant people adored, the poems they learned,

the arms with which they fought, the wives and daughters they loved and wept for.

The more closely the creations of this mysterious ancient empire are studied, the more clearly it becomes evident that they were far from being the products of a civilization in its infancy. Plato would seem to have been aware of this: when he spoke of seeing paintings and sculptures executed, he states distinctly, 10,000 years previous to his time. But all is conjecture. Our prehistoric studies are too uncertain to allow of any positive statements respecting a period of which we possess such few remains. Perhaps it is to these distant days that belongs the Sphinx, and besides it the equally mysterious temple which in form resembles no other building in Egypt. It is simply an enormous cube of masonry formed of blocks such as even in Egypt have no equals. The mode in which this mysterious temple is built is an enigma: the stones are laid without order, and the interior seems to have been hewn out. It has been suggested that the work is the production of the period of transition between the time when man inhabited the caves, and that in which architecture first makes its appearance. In the days of Cheops, we learn from a stèle, the temple required restoration. The oldest monument, the date of which is known, is the stepped pyramid of Saqqarah of the first dynasty; it bears, however, no trace of being the production of a half-fledged civilization. The “Salle de l’Ancien Empire” is certainly by far the most interesting portion of the Boolak Museum: it shows us a glimpse into the history of a world undreamt of till within a few years.

The “Salle des Hycsos” is scarcely less interesting. The fate of Egypt, as has been justly remarked, has been inevitably to find itself under foreign rule. The researches of archaeology only tend further to prove this fact, at the same time that it becomes evident how surely and completely their conquerors were absorbed by the Egyptians and their civilization. Thus it is with the great invasion of the Hycsos, who, on the authority of Manetho, spread over the land at the close of the fourteenth dynasty devastating everything,—the Huns and Vandals of ancient Egypt. Twenty years ago this character given to the Shepherd invaders was accepted implicitly, in spite of the evident exaggeration of the historian, whose statement that the invaders destroyed everything before them is amply disproved by the existence to this day of numerous monuments erected long before the advent of the Hycsos. These pretended iconoclasts research proves were humble worshippers at the Egyptian shrines.

It is in the “Salle des Hycsos” in the Boolak Museum that the story of these shepherd conquerors can best be followed. There we learn that, like their captives, they erected huge monuments. At Tanis Mariette discovered numerous remains of the work of their day, and more than one strongly stamped with the peculiar character of the foreign race.

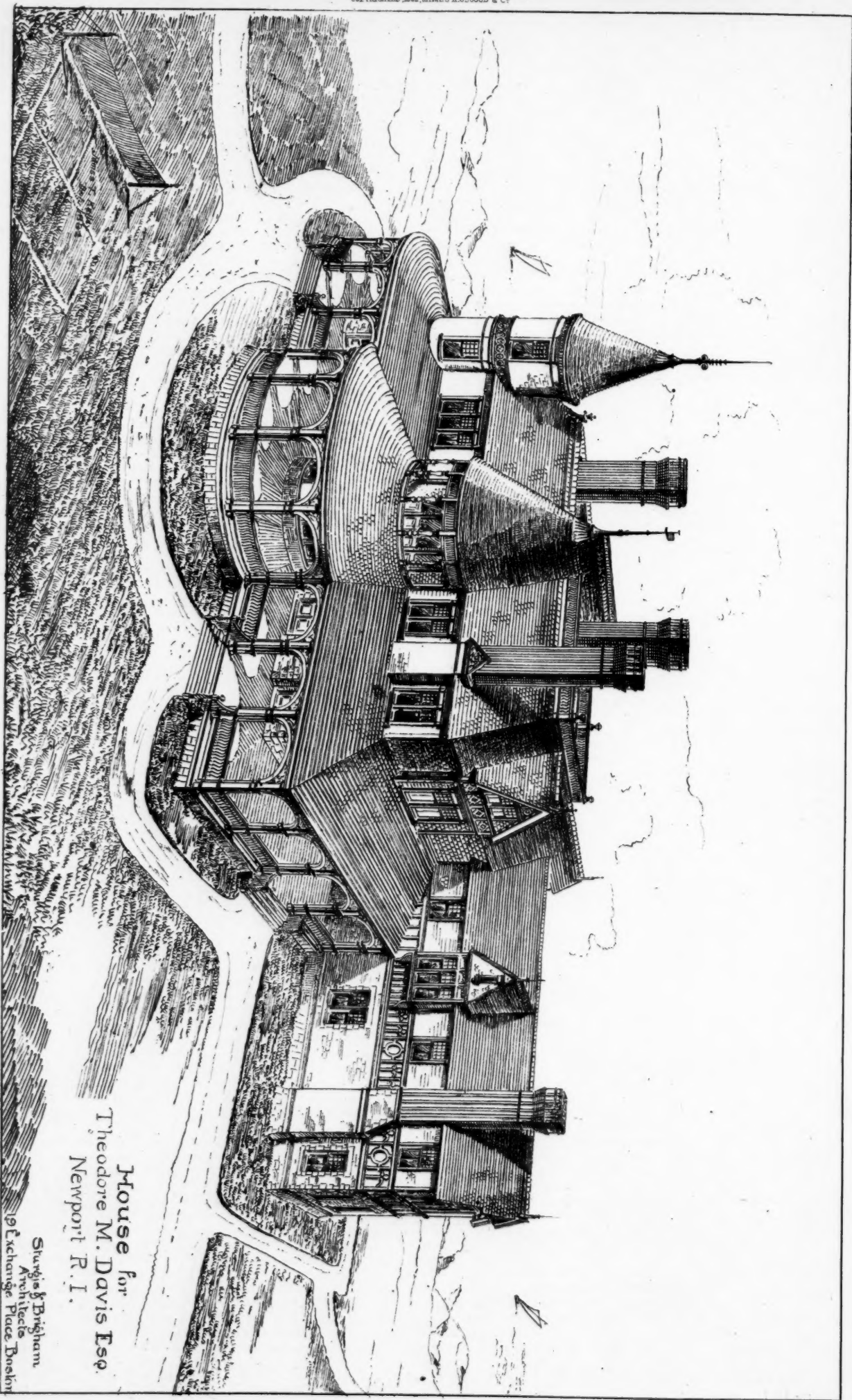
The importance attached to the two rooms containing the relics of the ancient empire and the rule of the Hycsos will be at once seen. It was in the arrangement of these rooms that the most important modifications were introduced at the time of the recent changes made at Boolak just previous to the death of the late director. Mariette gathered in the former of the two rooms everything connected with the mysterious epoch in which civilization made its first appearance on the banks of the Nile, and, perhaps in the world. In the second room he gathered together the relics of a period which till recently has been utterly misrepresented.

The Boolak Museum is not, it will be understood, merely a collection of archaeological objects gathered without an aim and shown without system: it is the result of a long period of learned and earnest research, doggedly followed out and amidst the most trying difficulties; the work of a single man who in twenty years brought to light these treasures, buried for so many centuries under the dust of time. It is scarcely remarkable that the collection should bear a strong idiosyncrasy. And yet the Boolak Museum is but a small portion of Mariette’s labors scattered over the length and breadth of the land. Mariette Bey was, indeed, a true archaeologist.

Historic archaeology is a science, which, as he plainly showed, requires followers not alone merely intelligently strong, but gifted with exceptional energy of character and firmness of will. Egyptology is a branch of archaeological research which demands in a large measure these qualities; it is the study of a history which carries us back farther than the researches of the Indian, the Assyrian, the Chaldean, and the Sanskrit scholars. But much yet remains to be discovered. It is only in its general features that the subject has been so far approached: the details are each day being filled in. Even those historical periods with which the Egyptologists are comparatively familiar contain many an unfilled gap. Egyptian art, religion, and philosophy only offer so far a series of unsolved problems. The elements of the science exist, the foundations have been laid, the progress of erection is determined on, but that is all; there yet remains much to be done before Egyptology can venture to place itself beside the great discoveries of the century. It is, perhaps, alone in Egypt, on the spot, that the subject can be fairly studied in all its bearings, and it is in such a museum as that at Boolak that more can be learned in the course of a few hours’ study than elsewhere could be acquired after much laborious research.

Placed as it is at Cairo, on the banks of the solemn Nile, the Boolak Museum is a bond which unites the living present with the distant past. It is an institution, though of foreign organization, purely Egyptian. It contains the history of a land interesting to every

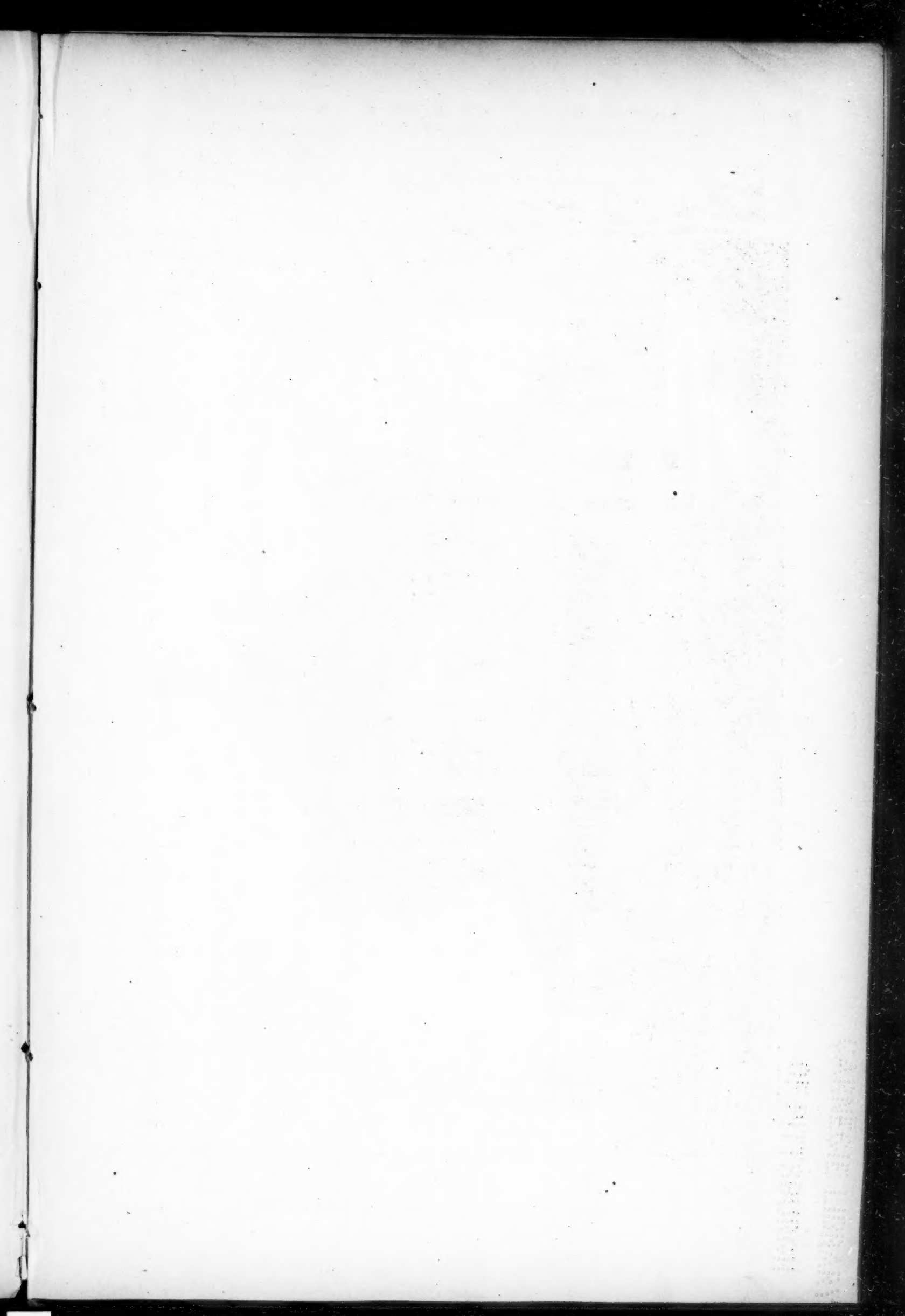
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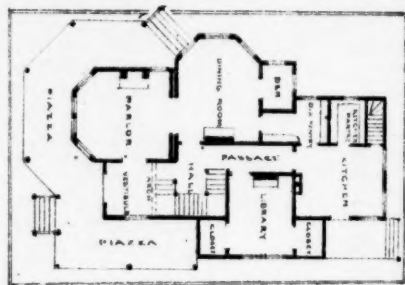
House for
Theodore M. Davis Esq.
Newport R. I.

Sturges & Brigham
Architects
19 Exchange Place Boston

The artist is indebted to Mr. J. H. Brown for the photograph.



The Building Plan by J. R. OGDEN & CO.

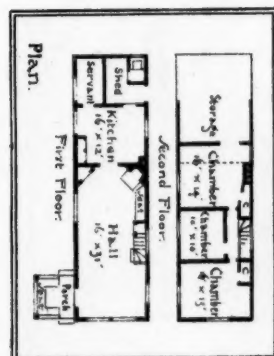
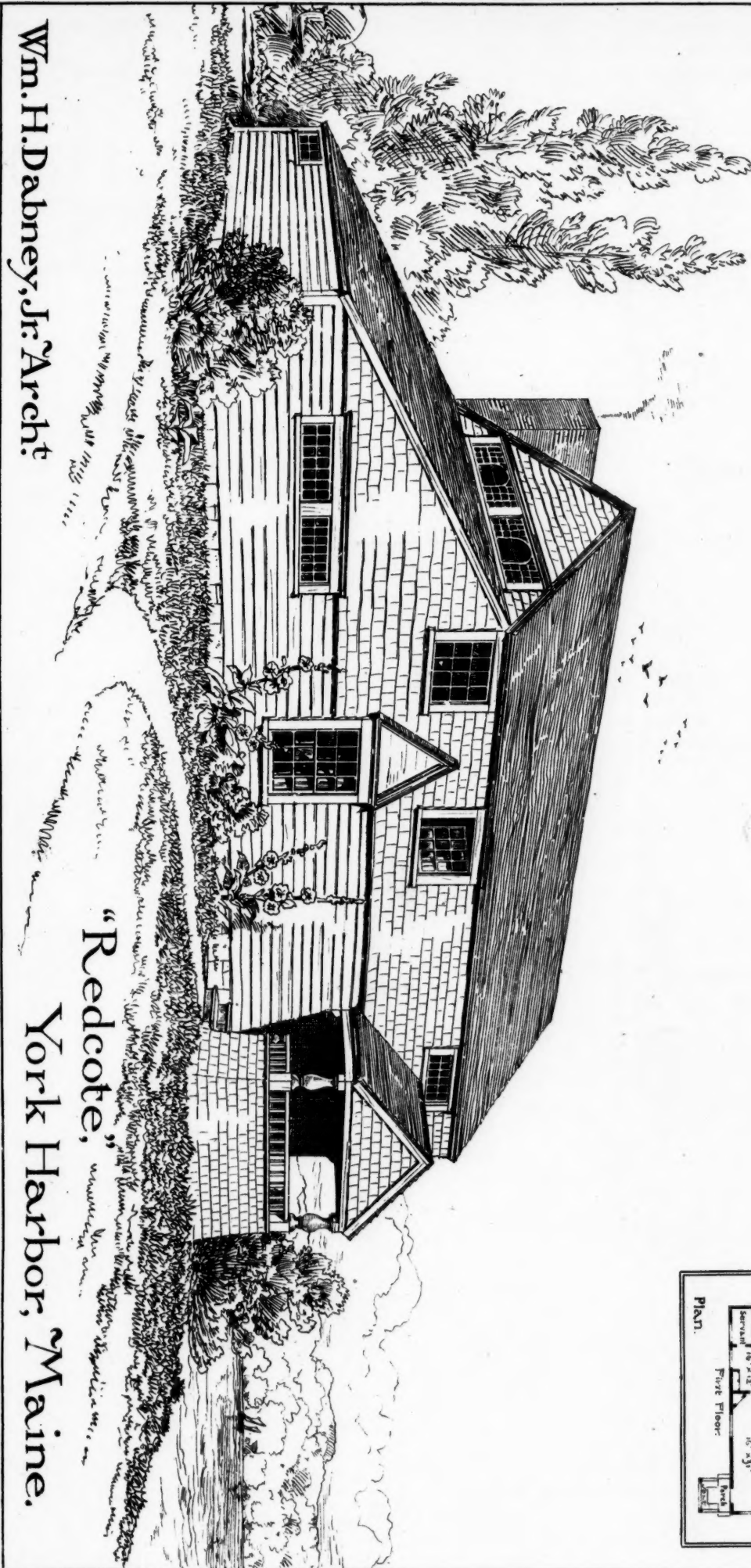


House For H. W. Thayer Esq.
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"Redcote,"
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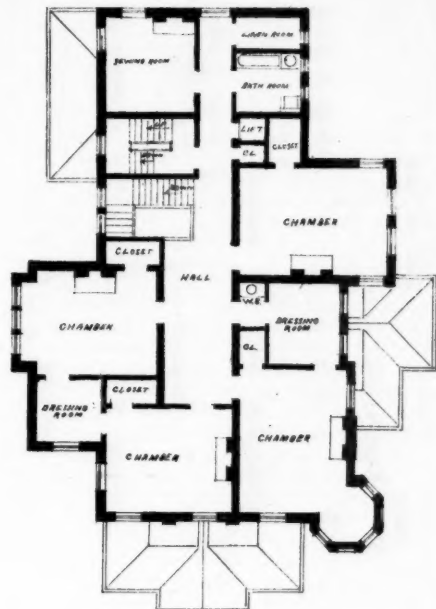


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HOUSE FOR
W.H. BLYMYER, ESQ.
WALNUT HILLS
CINCINNATI.

S. E. DESJARDINS, ARCHITECT
PIKE'S BUILDING, CINCINNATI, O.



1941

1942

1943

1944

civilized nation. The refined portion of the world would deeply regret to see the Boolak Museum dispersed. Years ago its fate caused constant pangs of fear to its director; but of this fact we may be sure, that should Boolak lose its museum, Cairo, with all its romance, its beauty, and prestige, would lose one of its brightest gems. Beside the grandeur of its mosques, its shady picturesque streets, and its over-towering historic Pyramids, Cairo would be wanting in one of its greatest features were the city of the Thousand-and-One Nights to lose its museum at Boolak. — *The Builder*.

THE ILLUSTRATIONS.

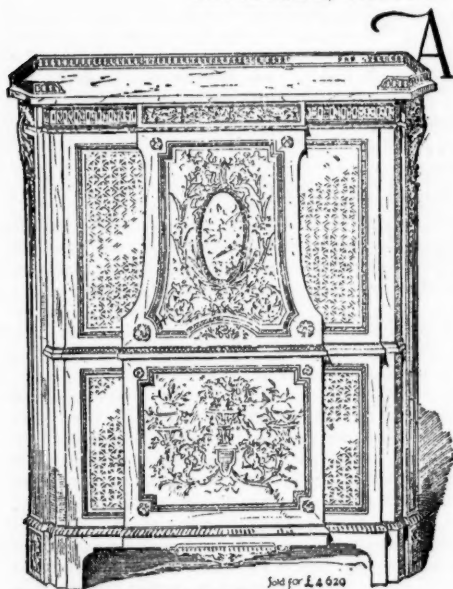
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"REDCOTE," YORK HARBOR, ME. MR. W. H. DABNEY, JR., ARCHITECT, BOSTON, MASS.

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HOUSE FOR W. H. BLYMER, ESQ., WALNUT HILLS, CINCINNATI, O. MR. S. E. DES JARDINS, ARCHITECT, CINCINNATI, O.

ST. MARK'S, VENICE.¹



THE FACADE, ANTONETTO, OCCASIONALLY BY WILKINSON COLLECTION.

AFTER the first row in a gondola from the station to his hotel, giving just a glimpse of the Grand Canal as he crosses it in his main reach, midway between the palace of the Foscari and the Rialto bridge, every visitor, I suppose, provided he arrives by daylight, goes straight to St. Mark's. It is a building which has, perhaps, greater fascination for most travellers than any other, and this is, no doubt, due mainly to its supremacy in colored decoration, but partially also

to the unique position it occupies in the history of architecture, so that there exists no other church with which to compare it. It is not surprising, then, that its restoration should have occasioned a good deal of feeling; but though much has been written deprecating what has been done, not many persons, probably, are aware of what it amounts to, and some account of it may be interesting to them.

The greater part of the work is external. The only parts of the basilica which are visible outside are the west front facing the Piazza, a short return of two bays on the south side towards the Ducal Palace, facing the Piazzetta, and on the north side as far as and including the end of the transept. All the eastern part is surrounded by other buildings, and has never been faced with marble. Of these three fronts the two side ones have been entirely renewed, and the workmen are at present engaged upon part of the façade itself. Where the restorer has been the marble facing and the small mosaic patterns introduced into it are completely new, hardly a slab of the ancient covering having been left or replaced in its original position, and it is difficult to believe that anything but a liking for the glistening aspect of the new stone can have caused this wholesale change, for it is to be remembered that the external covering is of absolutely no structural value: a cracked stone would in no way endanger the fabric, it would only require to be firmly fixed to the wall behind and all would be well, or if the wall itself was in a dangerous condition it might have been rectified, and the marble then replaced as it stood before. I am unable to compare the new work with that which previously existed in its place, but it is fair to presume that a similar method was followed there and in the west front, and any one may note the great contrast between the new and the old work at present existing. First in the color, the old marble is (or was, at present it has a yellowish tinge) mainly white, with few but well-defined veins: the new is traversed by an immense number of parallel veins so as to give an effect more gray than white. Secondly, in the arrangement in the old work the slabs are placed so that the veins run diagonally across them, often more nearly horizontal than vertically, and in the adjoining slabs the veins run in the opposite direction, so as to form a rude zigzag pattern, and to mark every

joint clearly: in the new the slabs are, indeed, similarly opposed to each other, but the lines are placed so nearly vertically that the eye does not at once catch the change, and the joints are nearly invisible, so that the effect is as though the external wall was of one piece, covered with regular up-and-down streaks. The old builders appear to have aimed at getting as great variety as possible in a small space, the modern ones to desire a perfect uniformity. There is another very marked difference, which, however, may not fairly be made a charge against the restorers. Mr. Ruskin and Mr. Street, the teachers of truth in architecture, have upheld the Venetian system of veneering, on the grounds that the slabs are generally placed so that their height considerably exceeds their width, while bricks and building stones are almost invariably placed with their greatest length horizontally, and that they are fixed to the wall and to each other by conspicuous rivets, so that no observer is likely to be deceived, and suppose the wall built of the precious material. Now, no rivets occur in the restored work. In parts of the old it is true that they are very conspicuous; but, again, there are wide tracts in which there are none at all, especially on the internal walls. The detection of this difference of workmanship naturally led to a closer examination of the parts which appear, at first sight, glued onto the wall, and this revealed the fact that every slab was fixed by a row of nails along the lower edge, and usually a few at intervals up the sides, the upper edge being presumably dovetailed under the lower one of the succeeding slab, for there are never any nails there. And this system of fastening prevails everywhere, both where there are also rivets and where there are none. The rivets, on the other hand, are to be found very thick over some parts of the building, especially in places where the slabs have been cracked, in which case the cracks are riveted in similar fashion to the adjoining joints, while in other parts there are not only no rivets, but there are no holes left by rivets which have fallen out; in fact there never were rivets. It is clear, in fine, that wherever rivets occur they are a subsequent addition — a patching up of the original fabric where it was failing, and, in fact, they were applied precisely as is now done to a broken plate. Consequently, the want of rivets in the new work is no fair subject of complaint. There are no nails either: the method of fixing is entirely concealed; but, inasmuch as the original builders certainly intended to reveal no truth by their nails, making them, indeed, as little conspicuous as possible, there is no objection to modern science dispensing with them altogether. But the two facts mentioned before, trivial as they may seem to some, serve to differentiate the new work strongly from the old. It may possibly be considered an open question whether the present action is not improving the appearance of the building; but that is altogether a different matter from whether it is a good and faithful restoration. After finding fault with what the restorers have done it seems hard to complain also of what they have not done; but there is one piece of restoration I should much like to see taken in hand. In the Academy at Venice there is a picture by Giovanni Bellini, dated 1496, of a procession in the Piazza. The square as he draws it is much smaller and more unpretending than the splendid one we see to-day; but what concerns us at present is his representation of St. Mark's, whose front occupies the whole background of the picture, and is so accurately painted that we may fairly trust the picture where it differs from the present building. And it does differ considerably, not in the architecture, but in the general appearance. In the picture gilding is laid on freely where there is none now; the rings of sculptured foliage round the central doorway are gilded, leaving the figures which occur among the leaves white; so are the four celebrated horses above (and these retain fragments of the gold still); so are the glorious crockets over the gables, again leaving the figures standing out white; also the pinnacles, and canopies between the gables, and the figures which surmount the gables have golden glories. What a magnificent addition all this gold would be to the building again, which sadly wants it to carry off the strong colors and gilding of the mosaics which appear at present so many spots of light in the sunshine! What is intended to be done with these mosaics I do not know. To the left in the lower series is a very interesting one, representing the conveyance of the body of St. Mark into the church, and the church is shown as it existed in the thirteenth century before any of the crockets or statues were added. This has been slightly restored, and is now quite sound. All the others are of the seventeenth century or later, and the upper row very dilapidated; but they are by no means worth restoring, and should be replaced by others if better can be obtained. Almost in all cases the old caps and other sculptured decorations have been respected and retained, so that we can conclude this review of the external restorations with a word of praise. But there is another restoration going on on the other side of the Piazzetta — that of the Ducal Palace — and in a very wholesale manner. Much of it, however, it is plain, is absolutely necessary. The great weight of the upper story has crushed many of the stones in the two arcades beneath, and the famous capitals of the lower one have especially suffered. Many of them have previously been bound by iron rings with the intention of preserving them; but the expansion and contraction of the metal has probably contributed to their decay. Accordingly, many of them have had to be replaced by modern copies, and the carving has for the most part been admirably done, though some of the heads look as though they must be caricatures of the old work. The foliage, however, is very good throughout.

¹ From a correspondent of the *Guardian*.

Inside St. Mark's the restoration appears to have been confined to the ceiling and the floor. There is peculiar difficulty in restoring these old mosaics, which contrive to unite decided faults of drawing with a great deal of expression and dignity of form; modern copies are apt to exaggerate the grotesqueness and eliminate the nobility. But in the church itself the work has been mainly patching, the most prominent being in the four Evangelists on the pendentives of the central dome, and the effect is by no means bad. In the baptistery, however, where the roof appears to be entirely new, these faults are very marked, though, perhaps, this may be due more to the comparative closeness of the mosaics to the eye than to any difference of workmanship. One of the indictments brought against the present restorers is that they are actually making the floor level; and it has been held on high authority that the present wavy form of the floor was deliberately copied from the sea the builders were so familiar with. But this is clearly a mistake. The floor of St. Donato also has waves at the west end, but the rest of the church is flat, and the pavement of the Piazza is laid in long regular sweeps; but this was probably copied from the church. But in the church itself it is to be observed that the floor everywhere leaves the walls and piers in a horizontal line, and only begins to curve where it gets away from them; and also that, although most of the floor consists of small pieces of mosaic, there occur besides large slabs of marble, and wherever the undulations cross them they have broken into several pieces to accommodate themselves to the curve. This is especially noticeable under the central dome, where the pavement consists of six such large white slabs, which are traversed by a deep valley running across from transept to transept. All these slabs have a continuous crack along what may be described as the water-shed, with branches running out on either side, and others also along the slopes. Whatever form, then, the floor was laid in, it certainly was not the present, and as these large stones were originally flat, there can be little doubt that the rest of the floor was so also. But it has been asked if the floor has settled so badly, which is subject to very little weight, how is it that the rest of the building is sound? The fact is that the conditions of building at Venice were very peculiar; the soil is entirely alluvial deposit, and the only foundation possible to build upon was one formed of wooden piles driven into the treacherous soil; and it seems probable that while no pains were spared to make the foundations of the walls and piers secure, something less may have been thought sufficient under the floor, so that this has failed, while the other stands firm. A source of constant irritation in all restorations is the question to what previous stage the building shall be restored. In England the choice often lies between an existing Perpendicular window and the lancets it has displaced: so here it may be open to doubt whether it is wise to restore the original flatness of the floor; but it cannot be denied that it is a restoration and not an innovation. But of the badness of the floor itself there can be no question. All that has been laid at present is the north aisle of the nave, and the most prominent feature in it consists of four peacocks. Any one who looks at these birds and then crosses over to the opposite aisle to see their prototypes must be indeed astounded at the difference. The peacocks are arranged in two pairs, and in the old work each pair is very differently drawn, and surrounded by quite different foliage; but the variety in the coloring is greater still: all four have different colored tails, with the eyes composed also of rings of different colors; and similar changes, though less marked, are to be found in the wings and the rest of the body. In the new floor all four might have been turned out of a machine, and the worst of the old forms has even been selected for them, and that has deteriorated in the copying; the colors are not exactly those of any of the old ones; but worse than any, the work is in coarser pieces, and fewer shades have been employed. It is needless to follow this comparison further, though much more might be said on the subject. It is sincerely to be hoped that no more will be done to the floor in this style.

A kindred subject is that of the changes wrought on the building by time, and there has been one very remarkable one. The marble coating inside extends to about half the height of the walls; above that all is mosaic, and the general tint of this marble is at present a deep ruddy brown, which with the ancient mosaics overhead, gives to the church a quiet red and gold coloring. But if you bring your eye down to the floor-level, you may see that constant rubbing has kept the lowest four or five feet in a state of perfect polish, which displays the natural colors of the marble, and reveals the remarkable fact that the great part of it is white, with blue veins, varied, indeed, by reds and greens, but decidedly predominant: so that when the church was new it must have been mainly white below with bright gold above, with other colors dispersed throughout in marked contrast to both the white and the gold, and the effect would have been quite different from what it is now, though it may be doubted whether its present subdued tones are not more lovely. But it would be interesting to know what has caused this change; in the porch the walls are white still, and in external work the white fades to yellow. Can it be due to the smoke of the incense? It is true that the walls of the choir are darker than the rest of the building, but it seems improbable that that could have so much effect down to the end of the nave.

Those who are fortunate enough to spend Easter at Venice, or to be there for another of the great feasts, have an opportunity of seeing the church to the best possible advantage. It is only on rare occasions that the reredos is uncovered—a rich work in gold and precious

stones, known as the Pala d'Oro, and part of the spoils of Constantinople. A brass frontal is also brought out, and the altar laden with silver ornaments, so that the whole forms a glittering mass which completely subdues the permanent decoration of floor and walls and roof, and gives a motive and a centre to the general scheme. At other times the altar is too inconspicuous, and the eye is attracted in every other direction by preference. The extra decoration for the festival has much the effect of converting the building from a show-room into a cathedral. It is to be seen at its very best when the slanting rays of the setting sun enter at the great west window, lighting up the whole nave and choir, but falling especially direct upon the altar and its surroundings.

STRAW LUMBER.



LIKE ourselves the *Northwestern Lumberman* has discovered that people are taking a good deal of interest in straw lumber and the whereabouts of its manufacture; and as from the nature of its connections it is much better able than we are to keep posted on such matters, it has been able to publish in its last issue the following detailed account which we believe it will not object to our republishing for the benefit of our many inquirers:

From time to time more or less has been said about the manufacture of straw lumber, a material likely to come into use as a substitute for wood. About two years ago, as set forth in the *Lumberman* at the time, Mr. S. H. Hamilton, of Lawrence, Kansas, began the manufacture of straw boards by a process by him invented and patented, and the results were watched with considerable interest. This gentleman, however, was so unfortunate, it will be remembered, as to have his establishment, which was limited in extent, burned at about the point when his machinery was in good working order. Something over 1,000 feet of straw lumber had been made when the fire occurred, and was mostly scattered among interested parties as samples. Though this product was necessarily imperfect, as the result of early efforts largely experimental, it was found to be a most valuable invention, and in many ways capable of taking the place of ordinary lumber.

But since that time little that was definite has been said about the enterprise, except in a local way, and it has been a subject of conjecture as to whether the disaster met with had put an effectual quietus upon further operations in that direction. Such was not the case, however. Some little time afterward the patentee succeeded in getting men of capital interested in the matter, who, being practical men, were readily impressed with the importance of the industry. The overtures made resulted in the formation of the Hamilton Straw Lumber Company, with the following officers: S. H. Hamilton, president; C. W. Hilliard, vice-president; F. C. Clark, secretary. Mr. Hilliard is a Chicago gentleman, and two other prominent Garden City representatives are stockholders, namely, H. H. Porter, president of the Chicago, St. Paul, Minneapolis & Omaha railway, and R. R. Cable, vice-president of the Chicago, Rock Island & Pacific road.

The company began operations in a preliminary way, with a capital of about \$25,000. A new mill was built at Lawrence this year, which was gotten under headway in May. After running about a week it was ascertained that the steam presses were inadequate, and new ones of greater power were put in. After some little delay operations were resumed, and the mill is now in thorough working order, and turning out a limited supply of a remarkable product. The mill is 36' x 150' in extent, and the storehouse for drying the straw lumber is 25' x 50'. The machinery is, in the main, constructed especially for the purpose, but a part of it is in some respects similar to that commonly used in paper making. All kinds of straw are used, the raw material being first made up into pulp by the ordinary process, and then rolled into thin sheets, about twenty-four of which would make an inch in thickness. While wet and hot, and in a condition to readily absorb liquids, these sheets are passed through a vat of chemicals heated to 280 degrees Fahrenheit; the excessive temperature being sufficient to scald the liquid into the sheets till they have become thoroughly impregnated with the chemicals, wherein lies the great secret of preparation, and by which satisfactory results are secured. After this the sheets pass through ten pairs of polished iron rollers, drawn so closely to each other by means of powerful steam-pressure that the space between them is not perceptible. The sheets are forced through apertures which apparently do not exist. Cement is applied by the operation of mechanism to which a system of brushes is affixed, and a further pressure is applied, ultimately resulting in the production of a hard and firm substance, comparatively fire-proof.

After being made the lumber must be permitted to dry thoroughly, which requires from a week to a month. A storehouse free from dampness is required. Kiln drying probably would not answer. If used before it is dry the lumber will warp, but will not when dry, which fact has been demonstrated by use. So far the lumber has been made principally into flooring, ceiling, blackboard strips, and friction-wheels. The present machinery can only turn out boards of different thicknesses, thirteen feet long and three feet wide, which can be sawed into any shape, the same as common lumber. The boards cannot be split into less thicknesses, but must be made the right thickness for the use intended. More extensive machinery could be had, so that the lumber could be made any length, width or thickness likely to be desired in any practical use. While the capabilities of the straw lumber, when fully perfected, seem limitless, the manufacturers make no extravagant claims for it, only seeking to have it applied to the more simple and practical wants till experience and results shall extend its sphere.

All that the *Lumberman* can say for the material will be to present the facts given as a result of the application and tests that have been made of it so far, for time will best prove its merits. When finished it looks what it is,—a slab made out of straw. The surface has an appearance of unevenness which is deceptive, for while it looks rough it is found to be smooth. The materials and fibres of which it is composed give it a streaky appearance. It is very hard, compact and firm, saws perfectly smooth, and a nail can be driven through it very cleanly and without disturbing the surrounding part—that is, it neither cracks, splits nor tears, as wood sometimes does. It is claimed it can be worked without difficulty or injury. So far as grain is concerned, it has none; the layers cause a sort of grain on the edges, but of course it counts for nothing there. The proposition is that it can be readily polished, finished and decorated upon the surface in any conceivable or desirable manner, or sawed, planed, and worked the same as wood.

It is believed it has an endurance equal to or greater than most wood, and satisfactory tests are said to have demonstrated it to be fire and water proof to an extraordinary degree. It can hardly be soaked or burned. It is claimed a roof constructed of it could not burn through in less time than twelve hours, while the drier it is the greater its power of resistance to fire.

It has been used for floors and ceilings and appears to have substantiated all that is claimed for it in that direction. It has also proved a success when made into friction-wheels, and this is a good test of the wear and tear it can withstand. Paper friction-wheels are made which soon give away, and sole-leather wheels, though much better, cannot stand the grief long. A wheel 1 $\frac{3}{4}$ " thick, costing 20 cents, has outlasted three sole-leather wheels, 5" thick, and costing \$1.50 each. The slabs, when of the same thickness as ordinary lumber, are a large per cent heavier, and for that reason can not be so well used in certain directions. This objection arises as to table-tops, buggy bottoms, and in various other uses. In many cases a less thickness and consequently less weight would answer all requirements. It is proposed to use it extensively for veneers.

There are so many articles made out of paper or materials manufactured from straw, that the question naturally arises as to the real difference between straw lumber and the more durable kinds of paper-board. Now-a-days nearly everything is made out of paper. Everybody has heard of paper car-wheels—we ride over them every day. It might then be reasoned that a substance which could be made into a car-wheel would do for a floor to walk on. The point needs elucidation. Car-wheels and straw lumber are not made alike, else there could be no patent on the latter. We have given a general idea of the manufacture of the lumber. Car-wheel stuff is made in a much more simple way in all the establishments regarding which the *Lumberman* has any knowledge. In the first place six sheets of ordinary brown paper are pasted together and subjected to a hydraulic pressure of 400 tons weight. Then these sheets are taken to the thickness of half an inch and subjected to the same pressure, and the layers thus formed continue to be so pressed till of the right thickness and firmness. This is the process in the abstract. There is no chemical preparation. When made into the right shape iron plates are placed on each side of the paper interior, and all are firmly fastened together by a system of rivets, then an iron band or tire is added, and this constitutes the car-wheel. One, which had made revolutions sufficient to the travelling of 250,000 miles, when taken apart showed the paper portion to be twice as compact and serviceable as at first, and worth twice as much for a new wheel. The same theory, it is thought, will apply to straw lumber. It will be observed, however, that the whole of a car-wheel is by no means made from paper, as many no doubt have supposed was the case.

Reference has been made to different kinds of straw lumber, but it appears that the patent under consideration is the only one that has been taken out. The gentlemen interested took great care to look the matter up thoroughly and ascertain the full facts. A patent office expert was retained, who made an elaborate investigation and submitted a report, covering the last 100 years, upon all inventions pertaining to the manufacture and use of any substance or material of which straw was the basis. Nothing touching the subject of lumber was found by the research, and the company is satisfied that theirs is the only patent for straw lumber.

A test regarding the strength of the lumber demonstrated that a

slab $\frac{3}{4}$ " thick, supported at each end, would bear up, before giving away, the same weight which would break down a pine board 1" thick, supported in the same manner.

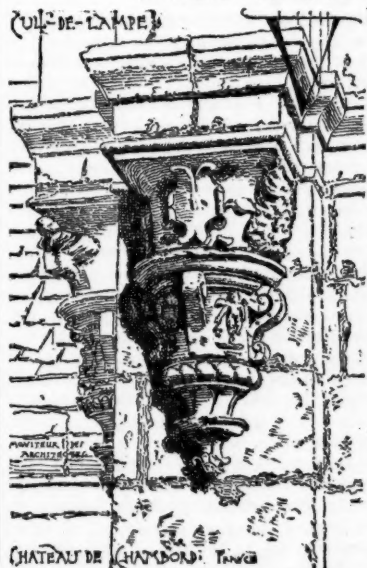
It is naturally important to know how readily the raw material for this lumber could be supplied. An acre of ground will average about three tons of straw, and 1,000 acres, or 3,000 tons of straw would make about 1,606,000 superficial feet of inch-thick slabs. The manufacturers have no fear about securing all the straw necessary, but if enough could not be obtained within a reasonable radius of territory, so that freights must be added, the cost of manufacture would become considerable. Upon the question of cost present facilities will not permit of the product being manufactured quite as cheaply as pine of the same thickness, but it is regarded as worth more than that lumber, and equal to hard wood. The great value of the invention is understood to rest in the fact that it will furnish a substitute for lumber when that commodity shall become, as it will, decidedly less plenty than it is now. But the projectors do not believe that the exhaustion of timber will make itself particularly felt for a half century into the future.

This lumber is now to be introduced in Chicago in the most practical manner. Mr. John V. Farwell, who is widely known as a heavy dry-goods operator, has decided to use it in a large new building now being erected, corner Market and Monroe Streets, six stories high, and covering an entire block. He, in company with Mr. William Edgar, who has charge of all the building permits issued under the city fire regulations, and Mr. J. M. Osdel, the architect of the new building, visited Lawrence recently and subjected the Hamilton lumber to all the necessary fire tests, to the satisfaction of all parties. An order was then given for 100,000' of flooring, 480,000' of ceiling, and a large amount for counters, doors, etc. Only 60,000' were ready for shipment, which amount is about the capacity of the mill for a week. With this order and others now taken, the mill will be pushed for some little time. Several orders for friction-wheels have been refused.

The company is proceeding cautiously and will increase facilities as soon as the value of the lumber is established, and at the right time it is intended to add some \$50,000 to \$75,000 to the capital.

It is by no means absurd to presume, figuring upon the basis of present operations, that in the course of time straw lumber will become so perfected as to enter generally into building and manufacturing economies, though there would always be some question about trusting a straw block in place of an oak sill or stud. It is now proposed, however, to press the material into rails, balusters and newels.

A VISIT TO THE TUILERIES.



VISITORS to Paris will in a few years seek in vain for the ruins of the Tuileries, built on the plain of the Sablonnières, and deriving its name from the tile kilns which surrounded the house of the Sire de Villeroy, pulled down afterward to make way for the château Catherine de Medicis, built when she refused to reside within the precincts of the old Louvre. Guide-books and historians will tell the tale of the Tuileries. Cicconi will point to the secret passage which leads to the Place de la Concorde and served to protect the flight of Louis Philippe and the Empress Eugénie. M. Francisque Sarcey will be able to tell future generations all about the palace where the guests of the Empire had met, where

many a stirring incident had taken place, and the chronicles of which have been handed down in the secret memoirs of Mérimée, which are to be published shortly. The history of King, Emperor, and people is under the charred ruins, which are to be carted away. There is the picture painted by Meissonnier, limned *con amore*, which is to be hung up in the museum the city of Paris will erect on the site of the Tuileries. The painting will recall the ruins, and show the tumbling walls of the chapel, which was used as a place of meeting by the members of the Convention, and where the dread Committee of Public Safety held its assizes. Louis XVI left the Tuileries to go to the Temple, and he was guillotined in front of the Palace on the Place de la Revolution. Robespierre, with his jaw all bleeding, was taken to the Tuileries before he was pursued to the scaffold amid the shouts of execration of those who dreaded him when he was all powerful. Architects have examined the walls of the Tuileries, and have arrived at the conclusion that the whole of the building must come down, and as the people do not care to rebuild a new palace, the idea put forward by Janin in 1830

will be carried out, and a museum will hide from future visitors to Paris the blackened stone which attests the horrors of a civil war.

Offers have been made to the Government for the disposal of the ruins of the Tuileries. Certain sanguine speculators proposed to form companies for the purpose of excavating and discovering the treasures they felt certain were hidden. An Englishman wanted to pull down the building at his own cost, without any expense to the Government, on condition that he might be allowed to dispose as he liked of the materials and anything he might find. This proposition was declined, and the promoters think that the refusal of the stranger's offer confirms the opinions they have entertained as to the secret treasures. M. Sardou is to have some of the marble columns from the Salle des Maréchaux, and M. Picart, the Government contractor, promises that he will not have to wait too long. Before M. Picart commences his work of destruction, it is well for those who can boast of friends at court to visit for an hour or two the ruins where, during twenty long years of prosperity to France, the Empire was installed; where Napoleon III dispensed his favors to all who had the slightest claim on him, and where the Empress was worshipped by all who knew her. Care has to be taken in visiting the ruins, as the least vibration, such as that produced by a cart passing along the street, is quite enough to unsettle some portion of the charred stone-work, while the stairs leading from one part of the building to another are not over safe. Entering by the principal door facing the Champs Elysées, the work of destruction appears to be complete. There are heaps and heaps of débris, charred marble, iron twisted and warped with the heat, pieces of looking-glass half liquefied by the action of the flames, portions of some of the statues which formerly ornamented the palace—in fact, odds and ends of every description, including old boots and shoes worn, or rather cast off by the precious scoundrels who formed the armed bands of the Commune and commenced the work of destruction by firing the Tuileries.

The grand house is in ruins; the least movement from the birds which quit their nests and fly out at the approach of any stranger brings down a shower of plaster and stones. The ground is covered with rank weeds knee-high, with here and there some bush, which has grown out defiantly from among the ill-smelling vegetation. The mouldings on some of the ceilings are hardly scorched by the flames, but the walls and windows have been charred and well-nigh consumed. The chapel where the Convocation met is burned out, and care has to be taken in treading the flooring, which almost threatens to precipitate the visitor into some oubliette. The colonnade of the chapel is intact, as also the iron and marble staircase of the main building leading to the vast Salle des Maréchaux. The bronze and ornate balustrading has been destroyed, and the long trains of court dames would hardly look well sweeping over the thick dust which has accumulated nearly a foot deep on the grand staircase. Here and there the last tenants of the Tuileries—the mob of Communists, who delighted to hold their saturnalia in the palace of King and Emperor—have written up obscene remarks or galling allusions to the fallen régime, proving by their orthography that those who attempted to inaugurate a second Age of Reason had commenced by banishing the school-master. The word "Badinguet," the name of the bricklayer whose place Louis Napoleon took when he made his escape from the fort of Ham, is to be found frequently on the walls with the famous inscription, "*Mort aux voleurs*," which might have been further embellished with the proviso "when caught." There is the grand banquet hall where most of the reigning sovereigns who visited Paris during the great exhibition were received by the Emperor. The handsome gilt columns have not been much damaged, but the flooring cracks and yields under the feet of the visitor, and the marble bust of the Emperor, which once adorned the niche, lies shattered on the floor. The Salle des Maréchaux has suffered greatly from the fire. The place where Mme. Agar stood and declaimed, swathed in the blood-red banner of the Commune, "*La Marseillaise*," is in ruins.

The names of the victories achieved by the Napoleons can still be read in the vast room where, on the 15th of August each year, Napoleon III, surrounded by his Marshals, received the homage of the Army, and where the legend of the Legion of Honor, "*Honneur et Patrie*," was emblazoned in letters of gold on the walls, surrounded by such glorious souvenirs as "Jena," "Marengo," etc. The flames have worked ruin in the private apartments of the Empress, but the ceiling in the boudoir where Mme. de Galiffet, with the Princess de Sargan and others, met to discuss some new fashion with the imperial leader of *ton*, has remained intact. The private apartments of the Emperor have been spared. They have been boarded up to prevent the incursions of those who wander at nights, and a long detour has to be made to reach the balcony where the last of the Napoleons sat and smoked his legendary cigarette, watching the setting sun gild the dome of the Invalides, where the great captain lies sleeping his last sleep on the banks of the Seine, in the midst of a people the page of whose story, the brightest or blackest, was filled with his fame. There is the lobby and the ante-chamber, where Marshal St. Arnaud drew his sword on his companion, Gen. Cornemuse, and killed him, and there is the study where the third Napoleon sat looking over the proof-sheets of the "*Life of Cæsar*," or reading listlessly the prophetic poetry of the man he called "*Monsieur*" Victor Hugo, and whose "*Châtiments*" made him the Josephus of the Commune. The visitor can-

not help pausing from time to time to reflect over the past. Each piece of marble disturbed by the foot brings to mind mournful reminiscences. The history of the Third Empire is written in the dust which lies on the ground, and may be built up from the fragments of busts which are scattered here and there, as if all the King's horses and all the King's men could never put together the pieces of that empire which sank into the dust at Sedan.—*London Globe*.

AN ART AND INDUSTRIAL EXHIBITION IN THE CAPITOL AT WASHINGTON.

A NATIONAL Bazaar, Art and Industrial Exposition will be held in the rotunda and adjacent halls of the National Capitol, at Washington, D. C., November 25th to December 3d (inclusive), 1882, as authorized by joint resolution of the Senate and House of Representatives, August 7, 1882. The object of this undertaking is to raise funds with which to erect a statue in this city to the memory of General James A. Garfield, late President of the United States, which work is in the hands of a committee of the Society of the Army of the Cumberland, who have already collected for this purpose some twenty thousand dollars, and expect, with the results of the exposition, to have a sufficient sum with which to erect a work befitting the great name it is proposed to commemorate.

The art exhibition will be under the direction of the leading artists resident in Washington. It is hoped that artists throughout the entire country, professional and amateurs, will aid the work by contributing some one work—as a gift to the fund—to be sold for its benefit, and be willing to exhibit others, under such rules and regulations as may be determined by the Board of Direction. All persons desiring to contribute in any way to this great work are cordially invited to do so, and to proceed in such manner as their judgment may dictate.

Contributions from the ladies in the way of needle and fancy work are especially invited and anticipated as one of the more prominent features of the exposition.

To manufacturers this exhibition offers opportunities second only to the Centennial Exposition. Occurring on the eve of the assembling of Congress, and at the season of the year when all the foreign representatives are at their legations, every exhibit will have the attention, not only of our own representatives, but of the representatives of all the civilized nations, as well as the representatives of the Press, who will gladly make full mention of all worthy exhibits; this, with the fact that each donation or exhibit contributes so much to a work that must commend itself to every patriotic citizen. All exhibits will bear the name of artist, manufacturer, etc., and will remain in place until the close of the exposition. Arrangements for transportation of exhibits are being made, and details will be given on application to the Board of Direction, rooms 90 and 96, Ebbitt House, Washington, D. C.

THE SIPHONAGE AND VENTILATION OF TRAPS.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I notice in your last paper, on page 119, a reference by Col. Geo. E. Waring, Jr., to my report to the National Board of Health, which is so inaccurate that I can only infer that the gentleman commented on the paper before he had read it. He says, "While Mr. Philbrick caused the siphonage of traps—not always but sometimes—with a thoroughly ventilated soil-pipe, he did so with a combination of discharges from different vessels that would very rarely, if ever, occur in practice." If Col. Waring will refer to the report which was published in the *Sanitary Engineer* on the 31st of August, and also in your last issue, he will find at B—1, 2, etc., that a 4-inch trap connecting with a soil-pipe open at the top lost its seal four times out of five when but half a pailful or even less water, was poured into it, with no "combination" whatever of flow from other places; also, other instances under headings "C" and "D," quite at variance with the reference quoted above.

Yours, etc.

EDW. S. PHILBRICK.

NOTES AND CLIPPINGS.

CLOTH TRACINGS.—A correspondent of the *Moniteur Industriel* refers to the difficulties encountered in tracing upon cloth or calico, especially the difficulty of making it take the ink. In the first place, the tracing should be made in a warm room, or the cloth will expand and become flabby. The excess of glaze may be removed by rubbing the surface with a chamois leather, on which a little powdered chalk has been strewn; but this practice possesses the disadvantage of thickening the ink besides, it might be added, of making scratches which detract from the effect of the tracing. The use of ox-gall, which makes the ink "take," has also the disadvantage of frequently making it "run," while it also changes the tint of the colors. The following is the process recommended: Ox-gall is filtered through a filter-paper arranged over a funnel, boiled and strained through fine linen which arrests the scum and other impurities. It is then placed again on the fire, and powdered chalk is added. When the effervescence ceases the mixture is again filtered, affording a bright colorless liquid, if the operation has been carefully performed. A drop or two must be mixed with the Indian ink; and it also has the property of effacing lead-pencil marks. When the cloth tracings have to be heliographed raw sienna is also added to the ink, as this color unites with it the most intimately of any, besides intercepting the greatest amount of light.

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.]

- 263,670. SLIDING-DOOR. — Robert Bauch, Rockford, Ill.
- 263,696. WATER-SINK. — William J. Granlees, Philadelphia, Pa.
- 263,702. BORING AND TENONING MACHINE. — Chester A. Hodge, Beloit, Wis.
- 263,705. HEATING-STOVE OR FURNACE. — Maurice B. Hull, West Orange, N. J.
- 263,713. AUTOMATIC WATER-ELEVATOR. — George W. McKenzie, Harrington, Me.
- 263,714. WIND-MILL. — George W. McKenzie, Harrington, Me.
- 263,723. FIRE-ESCAPE. — Benjamin F. Pike, Leadville, Colo.
- 263,734. DUMB-WAITER. — George F. Skinner, Poughkeepsie, N. Y.
- 263,736. MOLD FOR MANUFACTURING CEMENT PIPE. — N. W. Stowell, Los Angeles, Cal.
- 263,739. STEAM-HEATING APPARATUS. — Eduard Werner, Grimma, Saxony, Germany.
- 263,752. MORTISING-MACHINE. — Algernon S. Bangs, Augusta, Me.
- 263,771. DOOR-OPERATOR. — Clarence V. Derr, Cumberland, Md.
- 263,773. SAFETY ATTACHMENT FOR ELEVATORS. — William Edson and Nathaniel M. Lowe, Boston, Mass.
- 263,775. FIRE-ESCAPE. — Ezra Emmert, Dixon, Ill.
- 263,793. CHIMNEY-TOP. — John G. Lindemann, New York, N. Y.
- 263,794. WRENCH. — Dolphus S. Maynard, Auburn, N. Y.
- 263,823. TILE-MACHINE. — John F. Stephenson, Edgar, Ill.
- 263,835. ROOFING TILE OR PLATE. — Thomas B. Atterbury, Pittsburgh, Pa.
- 263,841. RECIPIVER FOR DISINFECTANTS. — James W. Burkett, Brooklyn, N. Y.
- 263,782. VISE. — John Dennis, Lowell, Mass.
- 263,783. MANUFACTURE OF HYDRAULIC CEMENT. — Edw. J. De Smedt, Washington, D. C.
- 263,877. WATER-CLOSET ATTACHMENT. — Sigmund Edinger, New York, N. Y.
- 263,903. FIRE-EXTINGUISHER. — Alphonso S. Harris, Chelsea, Mass.
- 263,914. BRICK. — Edwin A. Kern, Girard, Ohio.
- 263,922. BURGLAR-ALARM. — Ferdinand A. Lange-wald, Chicopee, Mass.
- 263,947. ELECTRIC BURGLAR-ALARM. — Horace F. Neumeier, Macungie, Pa.
- 263,950. LOCK-HINGE. — William C. Peckham, Troy, Ohio.
- 263,952. FIRE-ESCAPE. — Thos. Penn, New York, N. Y.
- 264,053. DEVICE FOR HANGING VENETIAN BLINDS. — Chas. M. Young, Lockport, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-three permits have been granted, of which the following are the more important: —
Annie C. Johnson, two-sty brick stable, in rear of Hollis St., between Calhoun and Stricker Sts.
Alexander R. Horner, five two-sty brick buildings, Vincent Alley, west of Lorman St.
Thomas E. Masson, two-sty brick building, Wolf St., north of Madison St.
C. W. Rockafeller, 15 three-sty brick buildings, George St., east of Arlington Ave.
Catharine Falvey, two-sty brick building, Ring-gold Alley, between Ramsey and McHenry Sts.
James P. Byrne, three-sty brick building, Gay St., between Front and High Sts.
E. Feinour, three-sty brick building, Pearl St., north of Franklin St.
Henry Vots, two-sty brick building, rear of Broadway, bet. Aliceanna and Lancaster Sts.
J. M. Getz, 14 two-sty brick buildings, Wilcox St., bet. Chase and Biddle Sts.
Henry Hulseman, 2 two-sty brick buildings, Luzerne St., north of Lancaster St.
James P. Rook, 2 three-sty brick buildings, Liberty Alley, bet. Madison and Monument Sts.
Joseph B. Cook, two-sty brick stable, Booth St., bet. Schroeder and Oregon Sts.
Dr. Theo. Cook, two-sty brick building, n e cor. Randall and Patapasco Sts.
Francis H. Shallus, three-sty brick building, n w cor. John and McKim Sts.
John Walfrum, two-sty brick blacksmith shop, York St., east of Light St.
Elizabeth Landin, three-sty brick building and two-sty brick building, n w cor. Clement and Town-son Sts.
Elizabeth Dill, three-sty brick building, s e cor. Sterrett and Ramsey Sts.
Francis McCann, two-sty brick building, in rear of s e cor. Eastern Ave. and Cannon St.

Boston.

BUILDING PERMITS. — *Brick.* — Commonwealth Ave., No. 403, Ward 11, for G. G. Crocker, four-sty dwell., 30' x 66'; Woodbury & Leighton, builders.
Wood. — Rogers Ave., near Ruggles St., Ward 22, for Boston & Providence R. R. Corporation, storage for cars, 12' x 200'.
Eastern Ave., near Fort Point Channel, Ward 12, for Boston Wharf Co., freight-shed, 75' x 575'.

Cambridge St., opposite Perkins St., Ward 4, for Wm. F. Parks, three-sty mechanical, 50' x 80'; J. G. Parker, builder.
Melrose Ave., rear, near Washington St., for Ed-win T. Merrihew, stable, 16' 6" x 27' 8" and 27' x 35' 6"; Edw. McKechnie, builder.
Medford St., rear of, nearly opposite Corey St., Ward 3, for Palmer, Parker & Co., three-sty saw-mill, 60' x 97'; Mead, Mason & Co., builders.
Rand St., near Randlett Pl., Ward 20, for Ber-nard Foley, two-sty dwell., 15' x 20' and 20' x 30'; Henry J. Bartlett, builder.
McGee St., near Norfolk Ave., Ward 20, for J. P. Fenno and J. C. Talbot, two-sty dwell., 20' x 20'; Wm. Tasker, builder.
Tremont St., No. 1491, rear, Ward 22, for Magnus Lepstrom, two-sty mansard dwell., 24' x 32'; Peter Hutchinson, builder.
Auburn St., No. 17, Ward 19, for Kendall Brooks heirs, two-sty dwell., 22' x 30'; Henry J. Bartlett, builder.
West Cottage St., opposite Woodville Sq., Ward 20, for Silas W. Browning, two-sty dwell., 24' x 45'; Henry J. Bartlett, builder.
Bremen St., near Putnam St., Ward 1, for J. W. Hunnewell & Co., storage, 30' x 40'; E. W. Archey, builder.
Burroughs St., near Centre St., Ward 23, for John D. Rendall, two-sty carpenter-shop, 22' x 30'; John D. Rendall, builder.
East Fourth St., near Jay St., Ward 14, for How-ard Clapp, three-sty dwell., 30' x 45'; Howard Clapp, builder.

Brooklyn.

BUILDING PERMITS. — *Fulton St.*, n s, junction Hull St., near Howard Ave., 6 two-sty frame dwell.; cost, each, \$1,500; owner, J. B. King, 5 Bainbridge St.; builders, E. Mullen and O. H. Hoffses.
Halsey St., s s, 100' w Marcy Ave., 10 two-and-a-half-sty brownstone dwell.; cost, each, \$4,000; owner, architect and builder, John S. Frost, 574 Franklin Ave.
Sackett St., cor. Nevins, Degraw and Canal Sts., middle of block, one-sty brick condenser house; cost, \$8,000; owner, the Fulton Municipal Gas Co., 342 Fulton St.; architect, J. F. Harrison; builder, R. Deeves.
Wallabout St., s s, 200' w Harrison Ave., one-sty brick warehouse; cost, \$4,000; owners and builders, Charles Phizer & Co., 11 Bartlett St.; architect, M. J. Morrill.
Hart's Alley, s s, between John and Bridge Sts., two-sty brick stable; cost, \$2,100; owner, David W. Maines, 195 Nassau St., architect and builder, O. K. Buckley, Jr.
Bergen St., n s, cor. Dean St., s s, 150' w Clason Ave., 6 three-sty frame tenements; cost, each, \$3,000; owner, Mr. Williamson, 18 Court St.; archi-tect, Thos. McCormick; builders, G. Brazell and W. Wood.
Plaza St., s s, 22' 8" w Butler Pl., three-sty brick and brownstone dwell.; cost, \$4,000; owner, E. P. Rogers, 165 Stirling Pl.; architect and builder, F. B. Rogers.
Fifth St., s e cor. North Eighth St., three-sty frame store and dwell.; cost, \$3,500; owner, Henry Muller, on premises; architect, A. Herbert; build-ers, H. Bruckhauser and Jos. Friese.
Carroll St., n w cor. Hoyt St., 5 two-sty brown-stone dwell.; cost, each, \$3,000; owner and builder, Chester Bedell, 337 Smith St.; architect, Theo. Pear-son; mason, W. L. Rountree; carpenter, Theo. Pear-son.
Hart St., Nos. 176, 178 and 180, 3 two-and-a-half sty brownstone dwell.; cost, each, \$5,200; owner and carpenter, M. C. Baker, 194 Hart St.; architect, J. D. Reynolds; mason, E. N. Wood.
De Kalb Ave., n e cor. Bushwick Ave., 4 two-sty brick dwell.; cost, each, about \$4,000; owner, John W. Howard, 1211 De Kalb Ave.; architect, D. T. At-wood.
Willoughby Ave., s s, 205' w Marcy Ave., 2 three-sty brownstone dwell.; cost, each, about \$5,500; owners, R. & E. W. Phillips, 109 Kosciusko St.; architect, E. W. Phillips.
Franklin Ave., s s, 60' s Atlantic Ave., three-sty brick tenement; cost, \$5,000; owner and mason, Philip Sullivan, 409 Decatur St.; architect, T. F. Houghton.
Sackett St., No. 724, between Fourth and Fifth Aves., two-sty brick dwell.; cost, \$3,000; owner, architect and builder, Peter Donlon, 720 Sackett St.
Eighth St., s s, 300' w Third Ave., three-sty frame tenement; cost, \$2,000; owner, W. Nelson, 128 Eighth St.; architect, T. McCormick; builders, G. Brazell and W. Wood.
Suydam St., s s, 120' e Broadway, 3 two-sty brick dwell.; cost, each, \$2,500; owner and builder, Fred. Herr, 778 Broadway; architect, Th. Engelhardt.
Flushing Ave., No. 676, s s, 100' w Throop Ave., three-sty frame dwell. and store; cost, \$3,000; owner, John Bosch, 708 Flushing Ave.; architect, Th. Engelhardt; builders, W. Rauth and L. Fieger.

Chicago.

HOUSE. — The Rev. T. H. Spinner is about to build a house on North Halsted St., to cost \$8,500, from plans by W. L. B. Jenney, architect.
FLAT. — Thomas Parker is having plans made for flats at 1011 West Monroe St., by S. M. Randolph, archi-tect. Ground to be broken next week.
BUILDING PERMITS. — F. W. Campbell, two-sty brick dwell., 20' x 34', 350 West Monroe St.; cost, \$3,600.
Mrs. J. Shekuff, two-sty and basement brick dwell., 22' x 52', 158 Larrabee St.; cost, \$4,000.
D. H. Small, two-sty brick dwell., 22' x 36', Mil-lard Ave., near Twenty-second St.; cost, \$2,500.
John Gillespie, two-sty and basement brick dwell., 22' x 64', 470 Congress St.; cost, \$5,000.
James Clare, one-sty and basement brick store, 43' x 50', 276 and 278 Fifth Ave.; cost, \$12,000.
H. R. Wilson, two-sty brick dwell., 22' x 56', 90 Laffin St.; cost, \$4,000.
Kee & Chappell, two-sty brick milk depot, 27' x 40', 343 North Franklin St.; cost, \$5,000.
J. F. Gillette, 8 two-sty and basement brick dwell., 60' x 150', 3431 Vernon Ave.; cost, \$30,000.
Theodore Hagedorn, two-sty and basement brick dwell., 23' x 50', Twenty-fourth St. and Westworth Ave.; cost, \$4,000.

Cincinnati.

STORES AND FLATS. — Mr. Frank Armstrong, agent for the Armstrong estate, has commenced the erec-tion of a building 40' on Race St., and 100' on Court St. The first story to be used for stores, and the upper floors as flats or dwellings; cost, \$30,000; Mr. Henry Bevis, architect.
WORK OF THE PLANING MILLS. — The product of the Cincinnati planing mills for the past year aggregate \$4,000,000. 1,100 men are employed in these mills.
BUILDING PERMITS. — Joseph Smith, three-sty brick dwell., Tremont St., near Clark St.; cost, \$5,700.
Eagle Insurance Co., four-sty frame building, Third St., near Vine St.; cost, \$2,700.
Mrs. Ebert, three-sty brick dwell., Bank St., near Freeman Ave.; cost, \$5,800.
Jas. C. Harrel, two-sty frame dwell., Colrain Pike, near Arlington St.; cost, \$5,000.
Wm. Miller, four-sty stone front stove works, s e cor. Eighth and Sycamore Sts.; cost, \$50,000.
M. Carmickle, two-sty brick dwell., Calhoun St., near Ohio Ave.; cost, \$3,800.
McLane & Shiegal, four-sty brick dwell., Law-rence St., near Pearl St.; cost, \$5,500.
W. S. Merrill & Co., addition to two-sty brick dwell., cor. Sixth and Eggleston Ave.; cost, \$2,000.
Jas. S. Armstrong, four-sty stone front dwell., s w cor. Court and Race Sts.; cost, \$30,000; Henry Bevis, architect.
Geo. Criss, 3 three-sty brick dwell., cor. Kemper Lane and Curtis Sts.; cost, \$10,000; Chas. Crapsey, architect.
H. Hoffman, three-sty brick dwell., Henry St., near Race St.; cost, \$2,800.
Seven permits for repairs; cost, \$3,700.
Total permits to date, 560.
Total cost to date, \$1,655,100.

New York.

PARTNERSHIP. — Messrs. Bruce Price and Geo. A. Freeman, Jr., architects, have formed a copartner-ship.
STORE. — At the cor. of Chatham and Worth Sts., a six-sty and basement triangular store, 53' and 65' x 63', of brick, iron and stone, is to be built, at a cost of about \$40,000, from designs of Messrs. H. J. Schwarzmann & Co.
TENEMENT-HOUSE. — A five-sty tenement-house, 25' x 20', is to be built at No. 72 Forsyth St., of brick with stone finish, at a cost of about \$16,000; from designs of Messrs. H. J. Schwarzmann & Co.
EXTENSION. — A large extension is to be made to the residence of Mr. Anderson Fowler, from designs of Messrs. D. & J. Jardine.
ADDITION. — An extensive addition is to be made to the residence of Mr. Anderson Fowler, No. 60 East Sixty-eighth St., from designs of Messrs. D. & J. Jardine.
CONTRACTS. — The contract for building the extension to the Hoffman House has been awarded to Messrs. R. L. Darraugh & Co.
The contract for building the Washington Land Co.'s edifice at the foot of Broadway has been awarded to Mr. Barney Spaulding.
BUILDING PERMITS. — *West Nine tenth St.*, Nos. 544 and 646, three-sty brick factory; cost, \$6,000; own-ers, John and Robert B. Stewart, 539 West Eight-eighth St., architect, W. H. Walton.
Horatio St., Nos. 110 and 112, six-sty brick and terra-cotta factory; cost, \$30,000; owner, F. W. De-ville, Fulton St., cor. William St.; architects, Kim-ball & Wisedell; builders, M. Reed and Steele & Costigan.
One Hundred and Twenty-fourth St., s s, 225' w Eighth Ave., 2 four-sty brick and brownstone ten-ements; cost, each, \$20,000; owner, Charles W. Pinekney, 273 West One Hundred and Twenty-fifth St.; architect, T. E. Thomson.
One Hundred and Forty-first St., n s, 230' w Eighth Ave., three-sty frame tenement; cost, \$4,200; owner, F. Kappelman, Eighth Ave., between One Hundred and Thirty-eighth and One Hundred and Thirty-ninth St.; architect and carpenter, William Kusche; mason, — Kraft.
Ogden Ave., s s, about 100' s Birch St., 4 two-sty frame dwell.; cost, each, \$1,500; owner, Andrew Anderson, St. Augustine, Fla.; architect, J. B. War-ren; builder, E. B. Nicholas.
Cornelia St., No. 30, five-sty brick and stone tenement; cost, \$26,000; owner, Jacob Varian, 22 Leroy St.; architect, C. E. Hadden.
West One Hundred and Twenty-sixth St., No. 122, s s, between Sixth and Seventh Aves., four-sty brownstone dwell.; cost, \$22,000; owner, Emma Ar-nott, 448 West Twenty-fourth St.; architect, G. B. Pelham.

Philadelphia.

BUILDING PERMITS. — *Kensington Ave.*, s e cor. Som-erset St., three-sty store and dwell., 18' x 52'; Dick-son Bros., contractors.
Josephine St., s s, e of Oxford St., dye-house, 83' x 150'; Greenwood & Hault, owners.
Wharton St., Nos. 1820 and 1822, 2 two-sty dwells., 16' x 50'; John McConaghy, owner.
Girard Ave., n s, w of Nineteenth St., three-sty store and dwell., 18' x 54'; Jno. M. Sharp, wner.
Nineteenth St., w s, s of Girard Ave., three-sty store and dwell., 18' x 54'; Jno. M. Sharp, owner.
Moore St., s s, e of Broad St., 8 two-sty dwells., 16' x 44'; James E. Conroy, owner.
Capewell St., s s, e of Gaul St., two-sty stable, 18' x 30'; A. T. Richards, contractor.
Brown St., n s, e of Front St., 8 three-sty dwells., 14' x 26'; Thomas A. Lynch, contractor.
East Dauphin St., No. 622, three-sty dwell., 16' x 45'; Daniel Register, contractor.
Fountain St., n s, between Washington and Ogle Sts., 2 three-sty dwells., 15' x 44'; Chas. Bartie, con-tractor.
Orthodox St., s w cor. James St., 2 two-sty dwells., 16' x 40'; Jas. McLea, owner.
East St., s s, between Terrace and Cresson Sts., 2 two-sty dwells., 15' x 28'; Jas. McLaughlin, owner.

St. Louis.

BUILDING PERMITS. — Thirty-six permits have been issued since our last report, fifteen of which are for unimportant frame houses. Of the rest, those worth \$2,500 and over are as follows: —

Jno. Rosevelt, two-sty brick dwell.; cost, \$9,000;
J. B. Legg, architect; Jno. Rosevelt, contractor.
St. Louis Mutual House Building Co. No. 3, two-sty brick dwell.; cost, \$2,600; Mortimer, architect;
J. O. Brockmeier, contractor.
H. C. Rodemann, two-sty brick dwell.; cost, \$6,000; H. Hussman, contractor.
Patrick Muldoon, two-sty brick dwell.; cost, \$3,500; Wm. Keane, contractor.
Walter S. Smith, two-sty brick dwell.; cost, \$4,000; Wm. Keane, contractor.
A. Bohstedt, 3 two-sty brick dwells.; cost, \$10,000; Goesse & Hemmers, contractors.
P. Casey, 2 two-sty brick dwells.; cost, \$8,000;
T. Annan, architect; C. Chapman, contractor.
C. P. Carrion, two-sty brick dwell.; cost, \$3,200;
A. Beinke, architect; Geo. M. Roder, contractor.
Missouri Malleable Iron Co., two-sty brick foundry; cost, \$21,000; A. Beinke, architect; R. P. McClure, contractor.
J. Kuntz, two-sty brick dwell.; cost, \$2,600.
Kemper, two-sty brick dwell.; cost, \$2,900;
N. Hemminghouse, contractor.
Mrs. Jeffermann, two-sty brick dwell.; cost, \$2,600; T. Furlong, architect; O'Malley Bros., contractors.
Jno. K. O'Heron, two-sty brick dwell.; cost, \$4,500; T. Gurgery, contractor.
S. C. Tiemeyer, four-sty brick store; cost, \$6,500;
A. Beinke, architect; S. Gurgery, contractor.
J. Brown, two-sty brick dwell.; cost, \$3,700; T. Roach, contractor.
Liggett & Meyer, one-sty brick storeroom; cost, \$8,000; Jno. K. Burden, contractor.

Washington.

BUILDING PERMITS.—The following are the permits issued since last report:—
Robert Downing, two-sty and cellar brick dwell., 29' x 46', Ninth St., between N and O Sts., n w; cost, \$3,500.
J. L. Atchison, three-sty and basement brick dwell., 21' 6" x 32', 1400 Q St., n w; cost, \$4,500.
John White, two-sty brick stable, 16' x 28', Eighth and P Sts., n w; cost, \$2,000.
E. M. Ware, two-sty brick dwell., 27' x 36', Rhode Island Ave., between Fifteenth and Sixteenth Sts., n w; cost, \$2,700.
James Robbins, three-sty and cellar brick dwell., 30' x 33', Q St., between Sixteenth and Seventeenth Sts., n w; cost, \$5,000.
L. Sands, 4 three-sty and basement brick dwells., 20' x 60', F St., between Seventeenth and Eighteenth Sts., n w; cost, \$25,000.
Gen. M. C. Meigs, three-sty and basement brick dwell., 25' x 40', N St., between Thirteenth and Fourteenth Sts., n w; cost, \$6,500.
Firemen's Insurance Co., five-sty and cellar brick office, 35' x 60', cor. Louisiana Ave. and Seventh St., n w; cost, \$17,500.
D. B. Groff, three-sty and cellar brick dwell., 19' 9" x 59', Fifteenth St., between T and U Sts., n w; cost, \$4,500.
D. B. Groff, 9 three-sty and cellar brick dwells., 17' 6" x 33', Fifteenth St., between T and U Sts.; cost, \$22,500.
Fisher & Carpenter, 3 two-sty and cellar brick dwells., 15' x 32', Sixth St., between Second and Third Sts., s e; cost, \$4,500.
B. Eichhorn, two-sty and cellar brick dwells., 19' 3" x 32', K St., between First and North Capital Sts., n w; cost, \$3,000.
Jas. Robbins, 11 two-sty and cellar brick dwells., 17' x 32', Pierce Pl., n w; cost, \$22,000.
Augusta Reiter, two-sty brick dwell., 24' x 3', O St., between Ninth and Tenth Sts., n w; cost, \$3,500.
Richard Rothwell, 3 two-sty and basement brick dwells., 17' 5" x 32', Tenth St., between B St. and Massachusetts Ave., n e; cost, \$4,500.
Shiloh Baptist Church, two-sty brick church, 53' 3" x 90', L St., between Sixteenth and Seventeenth Sts., n w; cost, \$15,000.
Mrs. S. C. Thorn, three-sty and basement brick dwell., 19' 6" x 32', New Hampshire Ave., between M and N Sts., n w; cost, \$5,000.
Robert A. Tucker, three-sty brick dwell., 22' x 38', Sixth St., between D and E Sts., s w; cost, \$3,000.
Chris. Christina, 3 two-sty brick dwells., 19' x 33', O St., between First and Second Sts., s e; cost, \$6,850.
D. B. Groff, 4 two-sty and basement brick dwells., 13' 4" x 37', Eighth St., cor. A St., n e; cost, \$8,000.
Gen. Watmough, two-sty brick stable, 18' x 53', Alley St., between Seventeenth and Eighteenth and H and I Sts., n w; cost, \$2,000.
A. A. Stewart, 3 two-sty and basement brick dwells., 13' x 34', Eleventh St., between Q and K Sts., n w; cost, \$3,600.
Mrs. Carrie Burrill, two-sty frame dwell., 14' x 36', County St.; cost, \$2,300.
W. C. Dodge, three-sty and cellar brick dwell., 22' x 38', B St., between First and Second Sts., n e; cost, \$5,000.
Joseph Lockey, two-sty brick store, 20' x 48', cor. O St. and New Jersey Ave.; cost, \$2,000.
R. H. Landale, two-sty and cellar brick dwell., 22' x 34', Q St., between Fifteenth and Sixteenth Sts., n w; cost, \$2,800.
J. L. Johnson, three-sty brick dwell., 29' x 32' 2", cor. Ninth St. and New York Ave., n w; cost, \$5,500.
John Just, two-sty and cellar brick dwells., 20' x 25', Seventh St., between M and N Sts., n w; cost, \$3,500.

General Notes.

ANSONIA, CONN.—The soldiers' monument is to have a remodelled pedestal and a bronze statue, the cost being \$25,000.
BAR HARBOR, ME.—A large hotel is to be built by Boston capitalists for the next season.
BATH, N. Y.—Jail and sheriff's residence in course of erection for Steuben County; to cost \$30,000; the jail portion fire-proof; Warner & Brockett, architects, Rochester, N. Y.
BETHLEHEM, PA.—Carriage house and stable for Captain James Wiley, to be of brick and stone; Hazlehurst & Huckel, architects, Philadelphia.
BEVERLY, MASS.—Joseph W. Lefavour will soon build a costly summer residence at Hospital Point.

BROOKLINE, MASS.—Mr. E. A. P. Newcomb of Boston is the architect of a house 40' square now being built for H. S. Chase, Esq. First story of Roxbury stone and above of open-timber and plaster. Mr. W. H. Bowker, contractor; cost, \$9,000.
BRYN MAWR, PA.—Stone house for R. F. Kennedy; cost, \$7,000; T. Roney Williamson, architect, Philadelphia.
CHARLESTON, S. C.—Mayor Courtenay announces that arrangements have been perfected whereby the will of William Euston can be carried out, which bequeathed funds for the erection and maintenance of a hospital for the honest, aged poor.
CHAUTAUQUA, N. Y.—It has been decided to erect a two-sty brick building for the use of the School of Languages.
CHESTNUT HILL, PA.—New tower for Presbyterian Church; cost, \$2,500; T. Roney Williamson, architect, Philadelphia.
COLUMBUS, GA.—Houses for J. W. Woolfolk and J. S. Garrett, and railroad offices and freight-depot, of brick and stone, 60' x 550'; Bruce & Morgan, architects, Atlanta, Ga.
DANVILLE, N. Y.—Plans are being prepared for the "Home on the Hillside," to cost \$150,000; six stories, absolutely fire-proof; Warner & Brockett of Rochester, N. Y., architects.
DECATUR, ILL.—The corner-stone of the Masonic Temple, which will cost \$25,000, was laid August 10.
DEBUQUE, IOWA.—W. L. Bradley, Esq., has begun a three-sty store and office-building, "Peerless" pressed and moulded brick front; F. D. Hyde, architect.
Wm. Ryan & Sons have begun a two-sty brick stable, 34' x 40', and a one-sty office-building of brick, 32' x 36', pressed brick and terra-cotta front, adjoining their packing-house at the foot of Jones St.; F. D. Hyde, architect, furnishes the plans.
EDGEWOOD, GA.—House and cotton-seed oil mill, of brick and wood, for Edward Holland; Bruce & Morgan, architects, Atlanta, Ga.
FEELANVILLE, ILL.—Proposals for the masonry of the north and south wings of the new St. Mary's training school for boys, at Feelanville, near Des Plaines, were received Saturday, August 26; G. V. Giegan, architect, Chicago.
FOWLER, O.—Addition and remodelling brick store-building; cost, about \$3,000; for D. Harpster; X. B. Bacon, of Toledo, O., architect.
GRAND RAPIDS, MICH.—Residence for Geo. W. Gay, Esq.; cost, \$10,000; T. Roney Williamson, architect, Phila.
HARTFORD, CONN.—A \$30,000 chapel of granite and in the English Gothic style is being built at the entrance of Cedar Hill Cemetery. It will be called the Northam Memorial Chapel.
HAVERHILL, MASS.—The new Catholic church, with seating for 1200 people, is to be built on the cor. of Winter and Primrose Sts. The foundation is to be put in this autumn.
HOLYOKE, MASS.—Isaac Tirrell, chairman of the building committee of the Second Congregational Society received bids on September 7 for building a granite church at the cor. of Appleton and Maple Sts.
JERSEYVILLE, ILL.—A Presbyterian church is to be built here; it is to be of Grafton stone, 50' x 64', in the main addition room.
LAGRANGE, IND.—The Presbyterians are building a new house of worship.
LAKE, ILL.—Mr. O. J. Pierce, of Chicago, is architect of the new school-house to be built here.
MACON, GA.—Houses for J. O. Wyner; Bruce & Morgan, architects, Atlanta, Ga.
MARICETTA, GA.—Houses for Mr. Brannan and J. R. Brunby; Bruce & Morgan, architects, Atlanta, Ga.
MILTON, PA.—H. N. Swartz is about building a three-sty block on Broadway. The front to be of Sutherland Falls marble.
MINNEAPOLIS, MINN.—It is the purpose of the Chamber of Commerce to erect a \$125,000 building.
MONROE, WIS.—Mr. C. P. Randall, of Chicago, is the architect of the new school-house, which will cost \$20,000.
PAWTUCKET, R. I.—The town has appropriated \$40,000 for a new pumping-station at Happy Hollow.
PITTSFIELD, ME.—A town-hall, 70' x 90', of brick; cost, about \$20,000.
RED BANK, N. J.—A cottage is to be built for Col. McClure; Messrs. Rossiter & Wright, of New York, architects.
ROCHESTER, N. Y.—Hayden and Haven's building, corner of Exchange and Court Sts., furniture manufactory and warehouses; cost, \$56,000; now in course of completion; Warner & Brockett, architects.
A commercial building for Mr. S. D. Walbridge, corner of State and Church Sts., six stories; to cost \$45,000; Warner & Brockett, architects.
RYE BEACH, N. H.—A new hotel is to be built in place of the Farragut house, burned last winter.
SAN FRANCISCO, CAL.—The First Presbyterian Society has purchased a site for a new church on the cor. of Van Ness Ave. and Sacramento St. It is expected that the church will cost some \$20,000 or \$25,000.
ST. PAUL, MINN.—The cost of the new high-school house will be about \$80,000; C. P. Randall, of Chicago, architect.
TAUNTON, MASS.—A frame house, 43' x 60', is being built for Mr. J. F. Montgomery. Messrs. Hartwell & Richardson, of Boston, architects.
TOLEDO, O.—Two-sty frame dwell., on Ashland Ave., for Rev. Mr. Toensmeier; cost, about \$4,000; E. O. Fallis, architect; A. Bentley, contractor.
Two-sty frame dwell., cor. Twelfth and Oak Sts., for Mr. Leland; cost, \$2,000; N. B. Bacon, architect; A. Lombard, contractor.
Two-sty block, containing 2 dwells., Huron St., near Walnut St.; cost, \$9,000; for Mrs. I. B. Waite; N. B. Bacon, architect; J. Arnsman, contractor.
It is rumored that a very large union depot for Vanderbilt lines is soon to be commenced in the Fifth Ward, thus doing away with the present old depot at Island House.
TORRESDALE, PA.—Presbyterian Church, of stone, to cost \$5,000; T. Roney Williamson, architect, Philadelphia.
ULYSSES, N. Y.—Residence for Arthur Hale, Esq., 32' x 36' 6"; Hazlehurst & Huckel, architects, Phila.
WALNUT GROVE, GA.—Brick house for S. H. Broadnax; Bruce & Morgan, architects, Atlanta, Ga.

WASHINGTON C. H., O.—A \$100,000 court-house is to be built in Fayette County.
WERNERSVILLE, PA.—Hotel building for Dr. Wolters, to be of stone, five-sty; Hazlehurst & Huckel, architects, Phila.
WEST CHESTER, PA.—Brick residence for M. R. Travilla, Esq.; cost, \$7,000; T. Roney Williamson, architect, Phila.
WILLIMANTIC, CONN.—It is proposed to build a depot near the freight-house on Railroad St.

Industrial.

BELLEVILLE, ONTARIO.—N. W. Brown will build a storehouse for agricultural tools, 40' x 75'.
BRISTOL, R. I.—The National Rubber Company is building a three-sty brick factory, 50' x 40'; Messrs. French & McKenzie, of Providence, are the contractors for the wood-work of this building, and Farrell & Cummings, of Pawtucket, for the brickwork.
Another building, about 150' long, and three-sty, is to be erected immediately.
CHICAGO, ILL.—W. A. Furber, of this city, is the architect in charge of the building of Morden, Frog & Crossing's new establishment at South Chicago.
EAST ST. LOUIS, ILL.—The Standard Oil Company of Pennsylvania will build large works.
FITCHBURG, MASS.—The Star Worsted Company will double the size of their mill.
HARTFORD, CONN.—A factory for the firm of Smith, Bourne & Co. is now building, cor. Sigourney St. and Capitol Ave. It is of brick, three stories, 45' x 130' and 155'; cost, \$50,000; Mr. John C. Mead, of Hartford, architect.
HOLYOKE, MASS.—The Newton Paper Company are to build another one-sty stock-house, 45' x 180'.
William Skinner & Son are to build a two-sty boiler-house, 25' x 33', at their silk-mill.
INDIANAPOLIS, IND.—Hetherington & Bernier are building an addition, 85' x 300'.
LELAND, ILL.—The Leland Fence Company are about to build a large addition.
MELROSE, MASS.—The new rubber company will build 15 tenement-houses for the use of employees.
MILFORD, MASS.—Plans for the second factory of Estabrook, Wires & Co. are in preparation. The building will be 30' x 85', one-sty, with monitor roof, with a section in the centre two stories.
MINNEAPOLIS, MINN.—Crocker & Fell are building large additions to their works.
NASHUA, N. H.—The Jackson Company will build a new storehouse.
NORTH ADAMS, MASS.—The Arnold Print Works are building a factory, 113' x 255'.
NORTH ATTLEBORO, MASS.—The Gas-Light Company are building a new gasometer. Its cost will be at least \$25,000.
PATERSON, N. J.—Mr. Jas. Walder is about building a large factory in Queen Anne style.
PEABODY, MASS.—N. H. Poor will build an addition to his shop, 30' x 60'.
ROCKFORD, ILL.—The Rockford Watch Company will enlarge their factory at a cost of \$10,000.
SKOWHEGAN, ME.—Keene Bros., of Lynn, Mass., will build a branch factory, 60' x 200'.
SOUTH CHICAGO, ILL.—The Chicago Forge and Bolt Company will make an addition, 50' x 60', to their present works.
TOLEDO, O.—The Vulcan Iron Works is building a new boiler shop, 80' x 100'.
UNION HILL, N. J.—A brick silk-factory, 50' x 100', is to be built for Messrs. John Erskine & Co., of New York, from designs of Mr. Wm. J. Merritt, of the same city.
WESTFIELD, MASS.—The Pierce Steam Heating Company, from Buffalo, N. Y., is building a 30' x 60' structure in the rear of the old foundry building of the Lavin Manufacturing Company, both of which buildings will be occupied by it.

COMPETITION.

BRONZE STATUE. [At Ottawa, Can.]
OTTAWA, August, 1882.
The Government of Canada propose erecting in the grounds of the Parliament Buildings, at Ottawa, a bronze statue, nine feet high, of the late Sir George E. Carter. Parties are invited to submit models, two feet three inches in height, which must be accompanied with proposals for the bronze statue complete. A premium of one thousand dollars will be paid the party whose model and proposal is accepted. The models must be delivered at the Department of Public Works, Ottawa, on or before the first day of January next. Copies of the conditions, etc., may be obtained on application at the office of the High Commissioner of Canada, No. 10 Victoria Chambers, London, S. W., England, and to the Secretary of the Department of Public Works, Ottawa, Canada.
F. H. KENNIS,
Secretary Department of Public Works.

PROPOSALS.

BRICKS. [At Cincinnati, O.]
The Cincinnati Gas-Light and Coke Company will receive tenders up to noon Saturday, October 14, 1882, for five million bricks, to be delivered at "East End Garden," situated between Eastern Avenue and Ohio River, and Main and Spencer Streets, First Ward, Cincinnati.
One million to be delivered between January 1 and March 1, 1883.
Two million to be delivered between March 1 and May 1, 1883.
Two Million to be delivered between May 1 and July 1, 1883.
Each bid to be accompanied by specimens of the bricks to be furnished, which specimens are to be made the standard to which deliveries must conform, in accordance with the provisions of the specifications on file at Gas office, corner Fourth and Plum Streets.
A good and sufficient bond in the sum of \$10,000 will be required, conditioned upon the faithful performance of the contracts.
Bids will be received for the whole lot, and also for separate deliveries.
The Company reserves the right to reject any and all bids.