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WE have received, through the kindness of a correspondent, copies of the plan and elevation of the new building for the Congressional Library, to be erected at Washington, on a magnificently situated plot of ground, facing the Capitol. The plan, which is said to have been the result of much study and consultation with professional librarians, comprises a central reading-room, octagonal in shape, and one hundred feet in diameter, from which radiate seven rectangular halls, or "corridors," each of which is divided into alcoves on each side. Three of these corridors are longer than the rest, and are crossed by what may be called transeptal corridors, also filled with alcoves, and extending to very considerable lengths. Special reading-rooms, administration rooms, copyright-record offices, and halls for "graphic arts" occupy the remainder of the block, which is lighted partly from the outside, partly from the top, and partly from twelve interior courts. The elevation, as shown in a rude engraving from the *Washington Post*, presents a mass of Victoria Gothic, somewhat undisciplined, but well divided, and capable with sufficient study of being made rich and effective. That it can hardly be more than this is not the fault of the architect, as we understand, but of the committee, who forced upon him, for some reason of their own, the employment of an extravagantly costly, inconvenient, and almost obsolete style, in place of the much more appropriate Renaissance which he had intended to use; and any beauty which he can bring out of the materials before him will add the more to his credit. The structure is calculated to accommodate six million books, and will suffice for the accumulations of a century more. Mr. Smithmeyer, the designer, was a successful competitor in the trial of nine or ten years ago, and has since studied assiduously the subject of library construction.

THE Cincinnati Smoke Inspector has at last been compelled to use the power committed to him in bringing to account a rebellious citizen who refused to purchase or use a smoke-consuming appliance as the law requires. This is the first case of the kind, and we are glad to see that action was promptly taken against the offender. The progress of the case will be watched with interest, as whatever question there may be about the validity of the ordinance against smoke will be settled for all future time by the decision; and if this supports the law Mr. Olhaber's hands will be materially strengthened for his good work. In some places it is reported that the engineers either wilfully or through forgetfulness, omit to put in use the smoke-consuming apparatus provided for them, and the inspector intends to deal summarily with them, unless they begin quickly to follow the prescribed rules.

THE discussion in the New Jersey Legislature in regard to the bills for handing over to the railroads the water-front of Jersey City and Hoboken came to an untimely end through the disclosure of the fact that some of the members had been induced to favor the bill by the exercise of very questionable influences on the part of the railroad corporations. A committee was appointed to investigate the matter, and prepared an interesting

report; but the clerk of the Assembly was prevented from reading it by intentional confusion and noise, kept up until the time of final adjournment, so that we shall probably remain ignorant of the particulars of what is certainly one of the most discreditable affairs which ever occurred in the State. The most disgraceful part of it, to our mind, although the newspapers generally take a different view, is the fact disclosed by the evidence, that at least one of the great railway companies keeps at the capitol a permanent agent, of questionable character, expressly for the purpose of forwarding its interests by appeals to the basest instincts of the worst members of the Legislature. Of all bodies, a railroad corporation should be held most strictly to perfect openness in its transactions. Its privileges and modes of operation are so bound up with the interests of the public that while any fair endeavor to increase the profits of its stockholders is permissible enough, an attempt to gain by secret corruption the advantages which the public, by whose sufferance the railroad exists, would never think of conceding if openly asked for, is an act of treachery for which a railroad might justly forfeit its franchise. No doubt a great part of the current talk about the influence of railway companies in state governments is without foundation, but if any of it is true, it is quite time that the corporations which undertake to steal by corruption the privileges which they cannot obtain by honest means, as well as the legislators who perjure themselves to serve them, should be brought to grief by severe and summary means.

THE manufacturers of the Parmelee Automatic Sprinklers have written a sensible letter to the editor of the *Spectator*, which although intended simply to correct the common impression that such sprinklers were liable to do damage on slight occasions by drenching valuable goods with water, contains several statements of value to the owners and architects of mercantile or manufacturing structures. That the old-fashioned open-pipe sprinklers were liable to flood rooms with water without necessity the writer of the letter acknowledges, but the Parmelee sprinklers act only locally, in the place where they are needed, and still further to prevent the probability of damage from them, it is customary to use in combination with them an electric alarm which will sound a bell or a whistle at the moment when any one of the sprinklers begins to operate, so as to summon intelligent aid. As our readers know, the Parmelee Sprinkler is set in motion by the melting of a fusible plug in a revolving pipe filled with water under pressure; but it is sometimes desirable to employ a more sensitive apparatus, and a new variety called the Grinnell Sprinkler is now made by the same company, which acts in a fraction of the time needed for the other, and is described as being superior to it in several respects. In conclusion, the letter asks a question which we also should be glad to have satisfactorily answered—whether, since fire losses are increasing, and the profits of the insurance business diminishing year by year, it would not be the part of wisdom for underwriters to take counsel from the successful practice of the manufacturers' mutual insurance companies, and endeavor to "look at improved fire appliances as something better than impertinent intruders aiming to cut down their already slender profits," and "to encourage in every reasonable way the introduction of any device which will protect alike their business and that of their customers."

THE stockholders of the Keely Motor Company, after so many years of patience, trustfulness, and, perhaps we may say, credulity, have at last resolved to ascertain whether there is any element of real value in the invention upon which they have spent so much money. Mr. Keely, as is well known, has never patented his invention, for fear, as he says, that some one else may learn the secret from the published specification of the patent, and secure to himself profit from some particular application of it. That this danger exists may be true, but most prudent men would consider that the risk of the reinvention and patenting of the original motor by some one else was much greater and more pressing; and the stockholders have begun to take the same view. As Mr. Keely refused to make any disclosures, suit was brought against him in the Philadelphia Court of Common Pleas by the stockholders who have supported him so long, to compel him to divulge the secret of his motor, and to secure a patent upon it at once. Mr. Keely re-

sisted, and his counsel brought forward the singular plea that since the secret belonged only to the inventor, and was still hidden in his own brain, he could not be made to disclose it. The force of this argument the judge was quite unable to understand, and issued an order that Mr. Keely should reveal his secret to two of the stockholders. That there is an excellent reason why Mr. Keely does not explain the principle of a motor which is to develop from the vapor of cold water a power far greater than that derived from any other known substance we can easily believe, but we are not so much disposed to credit the assertion that his failure to do so depends entirely upon the fact that he is the only one who knows the secret.

A DISTINGUISHED Austrian engineer, Herr von Hesse Wortegg, has again brought forward the suggestion that the periodical inundations of the Mississippi might be made much less destructive by the "canalization" of the stream; this operation consisting in straightening it and protecting its banks in some way, until the river should wear away a deep channel for itself, through which the current would find its way to the ocean with sufficient regularity and speed to prevent the choking of the stream in the narrower parts, and the consequent flooding of the low lands above. According to his own observations and those of others the Mississippi even now constantly tends to straighten its own course, so that the distance by the river from New Orleans to Cairo, which in 1721 was twelve hundred and eighteen miles, is now but nine hundred and seventy-five miles; and when swollen by freshets it is often found that the stream cuts for itself a new and more direct channel towards its outlet. With each successful effort at breaking through a new and straighter course the high-water level of the river above the break is lowered, as, for instance, by the formation of the Bonnet-Carré outlet, which saved one hundred and forty-two miles in the distance to tide-water, and reduced the height of the water at Vicksburg and Memphis, five hundred miles above, more than eight feet. By the canalization of the river, on Captain Cowdon's plan, the same effect would be made use of for forming and maintaining a deep, straight and permanent channel. The present levee system under which the artificial embankments follow the tortuous natural course of the stream Herr von Wortegg believes to be worse than useless. All the causes of obstruction and irregular erosion remain unchanged, notwithstanding the erection of levees, unless the course of the stream is rectified, and the freshets of a single season will deposit sediment enough in the obstructed places to make it necessary to raise the levees again, while the force of erosion of the river at the curves is far too great to be resisted by mere banks of earth.

SOMETHING, whether patriotism or alcohol is not yet apparent, has moved certain citizens of Rockland County, N. Y., to repeated attacks upon the monument raised at Tappan, opposite Tarrytown, to commemorate the execution of the brave and courtly André. For some reason, the inhabitants of New Rochelle, a village some distance away, toward the border of Connecticut, have particularly interested themselves in the matter, and not long ago a meeting was held there, at which André was denounced as a "traitor," and the names of those who had contributed toward the monument were held up to public scorn. The report of this meeting probably encouraged all the idle destructives far and near to distinguish themselves by an assault upon the unoffending memorial of a man concerning whose history they were perhaps as ignorant as the members of the New Rochelle assemblage, and it was not long before a loud nocturnal explosion announced that an attempt had been made to destroy the monument with dynamite. The effort was partially successful, a large piece having been blown out of the shaft. Another fragment had been broken away a few nights before, by other patriots, and if these attempts are continued with patience and perseverance the citizens of that part of New York will ultimately be able at once, not only to ruin the stone which serves to recall the hard fate of the most accomplished gentleman, the truest born, the bravest and most self-sacrificing soldier who ever trod the soil of New York in the uniform of an enemy, but to erect in its place a memorial, "more lasting than brass," of their own ignorant and boorish brutality.

CAPTAIN EADS, not relishing the manner in which some of the daily papers have chosen to refer to him and his actions, publishes a letter addressed to the editor of the *Chicago Tribune*, intended to correct some misstatements which have been widely copied throughout the country in regard to his supposed

methods of exerting influence upon members of Congress in aid of his ship-railway bill. The silly stories about his paying for the principal Washington dinner-parties are easily refuted, but the more plausible assertions, that Captain Eads continues to draw money from the United States Treasury for services in maintaining a channel at the mouth of the Mississippi which he does not perform, are met by a plain and interesting statement of the facts in the case. It seems that the original suggestion of the Mississippi jetties was made when the construction of the Fort St. Philip Canal had been determined upon by the Government, and an appropriation of eight million dollars had already been made to commence the work. The estimated cost of the canal was thirteen millions, but Captain Eads, confident in the success of his plan, and anxious to save the Government the great, and as he thought, useless expense of the canal, offered at his own risk, and with his own resources, to deepen the water in the South Pass to thirty feet, on condition of receiving five and a quarter millions for the work if successful. The depth of water on the bar at the head of the Pass was then eight feet, and until this depth had been increased to twenty-two feet, Mr. Eads neither asked nor received any pecuniary favors from the Government. At that time, the practical success of the undertaking being fully demonstrated, Congress, in answer to his request, authorized the payment to him of one and three-quarter million dollars on account of the contract, although by the terms of the agreement it was not yet due. After the channel had reached the stipulated depth of thirty feet, an allowance of one hundred thousand dollars per annum was to be made for maintaining it at that point, and this allowance Captain Eads continues to receive, expending, however, most of it in dredging, repairs, and other necessary works. That he has failed to preserve the agreed depth of channel he absolutely denies, saying that through the jetties and over the bar there is nowhere less than thirty feet of water. The shallowest place is in the Pass itself, far beyond the bar, and out of the range of his operations or of his contract; but even here the depth is twenty-seven or twenty-eight feet.

THE special correspondents of the *New York World* are not always as conspicuous for the scientific accuracy of their expressions as is desirable in the *personnel* of so excellent a newspaper, and we are a little at a loss to understand a despatch published from a reporter in Boston, announcing the granting of a patent to Mr. Charles E. Buell of New Haven for an invention for the "absolute storage" of electricity for lighting purposes. "By his process," the account goes on to say, "the electrical force becomes as portable as kerosene oil," while "the perils to life and property incident to a current produced by a dynamite machine are entirely obviated." Probably some reminiscences of that brave warrior, Mr. O'Donovan Rossa, occurred to confuse the writer's mind in mentioning the sort of machine usually employed for the production of electrical currents, but in point of "peril to life and property" we should imagine that there would be little to choose between a "dynamite machine" and a barrel of "absolutely stored electricity." The primary currents on Mr. Buell's plan will be generated by force derived from the movements of the winds and tides, and as recent investigations certainly indicate that before long these great natural forces will be utilized at a distance by means of electrical transmission, it is very possible that the new invention may prove to be a valuable one.

A NEW process is described in the *Century Magazine* for preserving articles of cast-iron from the effects of rust. The process depends upon the presence in the iron of dissolved or rather suspended carbon in the form of graphite, which, as is well known, gives the gray color to the broken surfaces of many varieties of the ordinary cast metal. By immersing the articles to be defended against oxidation in a bath of dilute acid the metal is dissolved, leaving the surface of the object covered with projecting particles of graphite, which have not been attacked by the acid. The "pickling" is arrested at this point, and all traces of free acid or iron salts washed away. Then the object is dipped in pitch, melted resin, enamel, or other protecting substance, which is entangled in the interstices between the projecting graphite crystals, and firmly held. The only novelty about this operation seems to consist in the prolongation of the "pickling," so as to remove enough of the metal to leave the graphite sensibly projecting; but with gray cast-iron, containing a large proportion of carbon, this may be a valuable improvement on the usual methods of enamelling.

THE SEPARATE SYSTEM OF SEWERAGE.—II.



THE small sewers of the separate system are more easily cleansed by flushing." Mr. Clarke enumerates as the substances which need to be flushed out of sewers, household refuse of various sorts, some manufacturing refuse and fine sand, which works its way through joints. In addition to these in the combined system, "road detritus, gravel, leaves, twigs of trees," etc. He describes the action of the flush-tanks at Memphis, and says that "if, instead of these six-inch sewers, larger ones for rain had been built on the same inclinations and with their bottoms shaped like those of the six-inch pipes, the same quantity of water applied in the same manner would have produced a precisely similar effect." In this he overlooks the added matters to be flushed out in the case of sewers connected with streets which, it is fair to presume, would prevent "a precisely similar effect." He shows that a flushing velocity may be produced in a twelve-inch pipe at a depth of three inches, with a moderate increase in the amount of flushing-water, and that this effect may be produced at a somewhat lower inclination. He does not say that the effect would continue for so great a distance,—and it would not. He says that at the usual inclinations twelve-inch pipes have the great advantage over six-inch pipes, that, by increasing the quantity used until they are made to flow half full, a flushing velocity may be secured with slopes about one-third as steep. The amount of water needed will be about four times as much, and where economy of water is important the flush-tanks may be worked with sewage. All this is true; but the point at which the ordinary flow of house-waste would have a sufficient depth to carry ordinary solids would in the twelve-inch pipe be removed to a very much greater distance, and the quadruple quantity of flushing-water delivered at the head of the sewer would have lost its flushing effects long before this distance was passed. He says that large sewers may have their flow dammed back by gates to the height of the house-drains, but not much higher, for fear of setting back the sewage into cellars, and that, therefore, the larger the sewer, the greater the flushing head. This does not necessarily hold, for if the small sewer is laid at the same depth as the large one, its flow may be dammed back even into man-holes and house-drains to the same height above the grade, as in the case of the large sewer. That is, it is not the diameter of the sewer, but the distance between the bottom of the sewer and the level of the cellar which regulates the flushing head. It is true that flushing by this means will act for a shorter time and for a shorter distance (below the gate) because of the less quantity of water retained; but it is also true that the occasion for flushing is less with the small sewer than with the large one. He says: "After placing a dam in either sewer, on removing it the sewage accumulated in the larger sewer falls four times as far, and is opposed by only one-fourth as much surface in proportion to the amount of falling water, as in the smaller one. Neither the main nor the branch sewers, therefore, of a separate system can be as effectively flushed as the larger one of a combined system." This assumes that the head must be regulated by the diameter of the sewer. As it is to be regulated by the difference of elevation between the sewer and the cellar it does not hold. The main and lateral sewers of the separate system require much less flushing than do those which receive street rubbish, and they can be as effectively flushed as the larger ones. Referring to the use of the "pill" he says: "This method is said to have worked well, both in large siphons and in pipe-sewers, but it has hardly been in use long enough to afford definite conclusions as to its general applicability and effectiveness. It is equally adapted to the sewers of either system." This method is said to have worked well by all who have tried it, including Belgrand who used it in the Paris siphons years ago, Major Humphreys, who has used it regularly in Memphis, and Mr. Fowler, who has adopted it as a main reliance in the flushing of the sewers of New Haven. Simple devices demonstrate their efficiency at once, and this system of cleansing circular sewers has been in use long enough to demonstrate its efficiency. The demonstration is instant. One need only to observe it once to be convinced of its utility. It is not equally adapted to combined sewers although used with them, because these much oftener contain solid obstructions which require the pill to be helped in its passage. Among the substances causing obstructions in sewers, Mr. Clarke mentions those which catch on projecting pieces of cement: in pipe-sewers with gasketed joints, as in Memphis, there are no such projecting pieces of cement. In all my experience I have known of no instance in which grease runs in a liquid state "a hundred feet or more" to congeal on reaching the sewer. In the discussion on Odell's description of the Memphis work at a meeting of the American Society of Civil Engineers, the distance to which grease passes in the house-drain before congealing was limited to a few feet.

"If the sewers are large enough to enter, that is over two feet in diameter, there is little difficulty in removing obstructions; if smaller the work must be done by means of rods and chains, pushed or drawn from one man-hole to another, at an expense many times greater than

that of flushing. In either case the work will be more easily accomplished in the larger sewers of the combined system." From a report of the discussion of the Memphis system at the meeting of the Sanitary Institute of Great Britain, 1880, I quote the following as to the remarks of the President of the Engineering Section, Robert Rawlinson, Esq., C. E.:—

"They were told by one of our present great engineers that sewers should be large enough for men to get into to clean them out. Well, all he could say was, that the Legislature had passed a law to prevent boys going up chimneys, and he hoped a law would be passed to prevent men from going into sewers to clean them out. He, for one, would not have the blood of men who were killed in this work upon him. He mentioned instances of places sewered on the principle laid down in the paper with marked success. He moved a vote of thanks to Col. Waring."

"4. Large sewers develop and contain a greater quantity of noxious gas than small ones, and are not so easily ventilated."

This would be properly stated if the expression were "small flushed ones." Mr. Clarke bases his argument in opposition to this statement on the fact that the objection to sewer-gases, or rather their offensiveness, depends on concentration, large sewers having an advantage over the small ones because of the longer volume of air to be contaminated by a given amount of exhaling surface. This would be correct if both sewers were closed. Supposing both to be ventilated by the same openings, it would then be rather a question of the rapidity with which the whole atmosphere of the sewer is renewed, and this certainly must be greater with small sewers than with large ones. "It is possible that small sewers may be more easily ventilated than large ones, but there has been little experiment to verify theories on this point." He seems always, when the indicated probabilities are not favorable to large sewers, to fall back on the shortness of time during which experiments opposing his theory have been carried out. There has been ample experience during many years to show that clean, small sewers,—often clean because small,—contain a much less offensive atmosphere than do larger ones. The sewers of Memphis have now been in use for two years; for nearly this period they have been very largely used. There have been frequent occasions, as in making new house-connections, to open them, and the condition of their air is perfectly known to all who have had to do with them. From the "sewer-gas" standard they are absolutely pure. As they carry offensive matters, they have, of course, a perceptible odor; but in no part and under no circumstances do they give off the least odor of decomposition or anything even suggesting the smell of an ordinary sewer. That the system of ventilation through soil-pipes, which is there universal, would enormously modify the atmosphere of any tolerably clean sewer is undoubted. Mr. Clarke says that such ventilation "is not usually considered good practice." In this I cannot agree with him. For the sake of the house-pipes themselves as well as of the sewers, I think it is easily demonstrable that such thorough ventilation is always desirable.

New light has been directed to this question by the report of Mr. James I. Gardiner, Director of the New York State Survey, and member of the State Board of Health, who considers the question in the light of recent physiological investigations. He says, speaking of storm-water sewers:

"The storm-water falling per hour in violent rains over an acre of closely built up city land is nearly fifty times the amount of the waste-water and sewage produced per hour on the same area. The sewage is, therefore, ordinarily a mere trickling thread in the bottom of a sewer large enough to carry off great bodies of storm-water. In time of rain the sewer will be nearly or quite full of dilute sewage, which is absorbed by the bricks, and leaves a coating on them as the water falls. The powerfully flowing stream of storm-water on subsiding deposits silt in the bottom of the sewer, which obstructs the flow of sewage, giving it time to decompose. Foul gases are then emitted, and it has been popularly assumed that these gases, called 'sewer-gas,' are the cause of disease."

"Physicians are agreed upon the fact that air from sewers passing into a dwelling is very likely to produce serious disease. That this illness is due to a gas from decomposing sewage is a mere assumption unsupported by proof. But the hypothesis was hastily adopted by engineers, who naturally inferred that the healthfulness of large sewers would be secured if they could only drive out or sufficiently dilute this gas by ventilating the sewer, or prevent its formation by keeping the stream of sewage flowing uninterruptedly. The discussion of the subject by Mr. Elliot Clarke, in the Massachusetts Board of Health report, and the opinion of other engineers who favor large sewers, seem to be based on this idea."

"It is time, therefore, to call attention to the fact that no such gas as 'sewer-gas' exists, and that there is absolutely no proof that the diseases which attend the admission of sewer-air into a dwelling are produced by gases. On the contrary the whole tendency of modern investigation is to show that the zymotic diseases are produced by bacteria, whose germs are developed under favorable conditions. It is well known that the most favorable conditions for the growth of these low organisms are heat, moisture, darkness, and the presence of ammonia. The damp walls of sewers present, therefore, all the requirements for the most flourishing growth of bacteria, whose germs may float off on the sewer-air and be carried into dwellings by mechanical action, as dust is borne on any air current."

"It is, therefore, most probable that sewer-air brings the germs of disease into dwellings as dust is blown into the window. The foul gases of decomposition may or may not be present. The fatal power over life lies, probably, in the little plant-seed, odorless and invisible, floating upon the sewer-air."

"Large sewers are, then, plantations for the propagation of deadly

organisms, the moist, porous walls forming most favorable soil, the ammonia of sewage supplying the manure essential to full development, and the warm, damp air stimulating to the utmost all processes of growth.

"The occasional flushing of sewers, while it may clear out silt and accumulated filth, and thus decrease the amount of heat and ammonia from decomposition, can never prevent the growth of bacteria on the sewer walls, nor will ventilation prove efficient. Every device of engineering has been exhausted to keep large sewers clean and well ventilated, but the air from them is still deadly. Experience, therefore, teaches that there is some radical defect in the system of large or combined sewers, while modern investigations of the origin of zymotic diseases and the mode of growth of bacteria seem to show that sewer-walls are almost ideal hot-beds for the production of fatal organic germs. Perfect plumbing may prevent sewer-air from entering dwellings, but perfect plumbing will always be the rare exception.

"In view of these facts I am forced to conclude that from a sanitary point of view the combined system of sewerage is a failure.

"I visited in London the sanitary department of the Local Government Board which has general supervision of the sanitary affairs of England. The Chief Engineer, Mr. Robert Rawlinson, C. E., and the principal medical inspectors, Dr. Ballard and Mr. Radcliffe, are perfectly agreed that the combined system of sewers is radically defective from a sanitary point of view. In this opinion Dr. Richardson and other prominent sanitarians concurred. At the meeting of the British Association for the Advancement of Science, in York, the leading civil engineers whom I met had abandoned their belief in the 'combined' system of sewers, being convinced that it could not be made healthful.

"While all were agreed as to the failure of the 'combined system,' some of the medical men favor the general introduction of the 'pail system' of Manchester of 'dry removal' of the excreta in tubs, and the use of sewers entirely disconnected from dwellings, to carry off only waste and storm-water; while Mr. Rawlinson and other engineers advocated water carriage by the 'separate system.' Referring to the Memphis sewers, he says: 'The sewers being so small and so well filled by the flow of sewage there is very little exposed wall-surface on which bacteria can germinate, and very little space for storing up germ-laden air. The gases and heat of decomposition, which so powerfully stimulate the growth of organic life, are prevented by thorough daily flushing, which is only possible in small sewers. The smooth glazed surface of pipes is unfavorable soil for vegetable growth, compared with porous bricks moistened with sewage.

"It will therefore be seen that the separate sewers do not afford those favorable conditions for an extensive and rapid growth of bacteria, which are the fatal defects of the large combined sewers. The smaller pipes move rapidly all sewage from dwellings, without connecting them with foul caverns whose sides produce low organic life. Where the separate system, with flush tanks, is in operation, I can learn of no complaints of 'sewer-gas.'

"The 'separate system' is therefore greatly to be preferred for sanitary reasons."

"Although a number of English towns have wholly or partially adopted a separate system, and the results have been so good that the engineers of the Local Government Board advise its general use, yet I was informed by the Chief Engineering Inspector, Mr. Rawlinson, that nowhere in England had the separate system been so completely developed and applied as in America, in the city of Memphis. He assured me that English engineers and sanitarians were watching with great interest the working of the Memphis sewerage, considering its results to be a thorough test of the principles involved.

"On further investigation of the small sewerage plans of Oxford and Dover, which I visited, and other English towns where modifications of the separate system are in use, I was confirmed in the opinion that the separate system of Memphis, designed by Col. George E. Waring, Jr., is much the most thorough and complete which has yet been built on a large scale. Instead, therefore, of describing imperfect English examples of the system, which, although great improvements over the combined sewers, are inferior to the American plan, I shall give the results of a recent examination of the Memphis sewerage, made for the city of Baltimore by Mr. C. H. Latrobe, C. E., a copy of whose report to the mayor and city council I have just received." Then follows the substance of Mr. Latrobe's report, including the following:

"In summing up my impressions as to the separate system as developed at Memphis, I would say that it is well planned and well executed, and fully answers the purpose for which it was intended and which I conceive to be primarily the object of all sewerage, viz.: to carry off all human and industrial waste with rapidity and cleanliness to its ultimate destination.

"The accompanying system of tile drains has also thoroughly drained (as far as I know) the very tenacious subsoil of the city. As to the storm-water at Memphis, it can safely be left, from all I learn, to take care of itself." Mr. Gardiner concludes thus:

"I am of the opinion that the separate system of small sewers avoids in great measure the inherent sanitary difficulties of the combined plan; and that it is an efficient and economical method of removing the sewage of towns. I therefore recommend the State Board of Health to advise the adoption of the separate system of sewage in those towns which have asked for information on this subject."

Acting upon his report the State Board of Health at its last quarterly meeting passed a series of resolutions, including the following:

"6. That towns having proper water-supply should be provided with a system of small sewers adapted to carry only sewage, including excreta, slops, and waste-water, and excluding storm-water, which should be taken care of separately.

"7. That the costly plan of large combined sewers for carrying sewage and storm-water together has proved a sanitary failure both in England and in this country; while the 'separate system,' when properly constructed, avoids in great measure the evils from sewer-air, now so common, and is much less expensive for most towns.

"8. That the 'separate system of sewers,' with flushing-tanks, is hereby recommended for general use in this State."

GEORGE E. WARING, JR.

WATER-COLORS IN NEW YORK.



H E Water-Color Society's exhibition was far finer this year than ever before. Comparing it with the shows of a few years ago—even with those of 1880 and 1881—are remarkable advance was visible. There was much quite first-class work from a number of different hands; the general average was unusually good; and there were astonishingly few things

that were less than tolerable. This was the more noteworthy as some of the men who have done the best work in former years were actually or practically absent. Mr. Currier, for example, whose place no one else can fill, sent nothing whatever, and Mr. Winslow Homer, instead of the original and spirited studies he showed last year, exhibited only a couple of large figure-pieces done in England and quite foreign to any of the styles he has hitherto affected,—laboriously treated, highly and crudely yet conventionally colored, and neither individual nor attractive. Figure-drawing was as usual less in quantity than landscape work, but some of the finest things on the wall were in this department. The great picture of the exhibition was the Two Sisters, by Mr. Abbey, who astonished everybody by his skill as an aquarellist, though everybody had long known his clever work in black and white. It was a large drawing showing the low-ceiled interior of an English rural home with the figures of two girls at the piano. Charming in every way and very able in execution, perhaps the chief excellencies of this drawing were to be found in the composition and in the treatment of a very difficult and complicated scheme of light. Another picture by Mr. Abbey, showing a girl's figure against a mass of autumn foliage, was less striking in theme but most beautiful in color. Next I should perhaps note Mr. C. Y. Turner, a recent graduate of the Art Student's League, who sent a fine figure, more than half-life size of a Dordrecht milkmaid with her great copper pails. Admirable in drawing and strong in character, it was a thoroughly capable and artistic piece of work, and similar skill was shown in the rest of Mr. Turner's numbers. Mr. Leon Moran sent several groups of French peasant girls, dainty alike in sentiment and in treatment, and his brother Percy several drawings in which the most noteworthy point was an extreme skill in the rendering of textures. Mr. Blum's Venetian studies were as fascinating as ever, masterly, though very slight in treatment and full of life and character in their tiny figures. They showed, we were told by some, the influence of Whistler in rather too evident a manner. But whoever may have inspired them, they remained, to my eyes at least, fresh and individual and genuine. And the work of an imitator can hardly so affect us. Mr. Eakins sent two of the most capable things in the rooms, two small pictures of Delaware fishermen, complete in their bold yet accurate modelling on so small a scale, and in their strong local flavor. Mr. Theodore Robinson sent a number of out-door scenes with rustic figures, to be praised for many qualities. It is impossible, however, here to go through the list of all that deserved attention. Suffice it to say that while the need of our water-color art, as of our art in other branches, is still the need of more capable figure-painters, the recent advance in this direction has been such as to warrant the best anticipations for a near-approaching future.

In the department of landscape there was even more good work, so nearly equal in excellence that it is hard to pick out the best examples for a word of comment. Those which seemed to me most valuable were such as had dealt with local material of a so-called prosaic sort. If our artists are to develop a truly national school it is with such materials that they will most often have to cope. And any one who shows us how it may be done with high artistic success gives us, I think, more cause for gratitude than the man who treats, though with equal ability, themes alien to our own lives and interpreted a thousand times by other brushes. From this point of view

the first honors, after Mr. Eakins has been named, should be accorded to Mr. Muhrmann and Mr. Alden Weir. Mr. Twachtmann, who has shown us things of a similar kind in former years, sent us at this time studies from Holland and Venice, of course of admirable quality, and—so strong is the force of artistic individuality, even when Venice is the theme—apparently almost as homely in their material as when he painted the New York docks or the outskirts of Cincinnati. Mr. Bunker sent a number of charming beach views, and numerous other young artists made good beginnings in the way of locally characteristic work. Mr. Lungren's studies of New York streets at night were wonderfully clever. If they were a trifle exaggerated in their effects that is a privilege allowed an artist so long as he makes a result which is good as art. Mr. Tryon is a comparatively new painter who has studied in French schools and who puts into his landscapes, by means of an accomplished hand, an artistic sentiment proper to himself, and so most valuable. The stand-bys of the society—such men as Messrs. Hopkinson Smith, H. P. Smith Farrar, W. T. Richards, F. S. Church, Gifford, Quartley, the elder Morans, and many others—were present in full force with work that was not below their average achievement and in many cases was decidedly above it. Mr. Hopkinson Smith's large picture of the Brooklyn Bridge seen from below deserved especial praise; but still the chief interest of the exhibition was found in the work of the younger men, so many in number and so promising in various ways.

Not the least attractive rooms were the two occupied by the exhibit of the New York Etching Club. Nearly three hundred numbers were shown, with very few exceptions all the work of our own men. In no department of our art has the advance been so astonishing within recent years as in this. Even two years ago such an exhibition was not only out of our power but out of our anticipations. Within two years our men—artists previously known in other departments or persons whose names first became popularized by their plates—have given us work that in amount, in quality, and in variety, is truly astonishing. And it is, moreover, almost always local or at least national in sentiment. In the first rank stands Mr. Stephen Parrish, whose large, beautifully composed, and strongly-handled coast-views might be the pride of any exhibition. Mr. Platt works only less well along a similar line, but the line is so similar that one's appreciation of his power cannot but be a little lessened by the fact. Mrs. Thomas Moran is another artist of quite first-rate ability. Her *Twilight* is a magnificent plate, and her work all through is eminently strong, individual, and accomplished. It resumes all the qualities we are accustomed to express by the term "masculine," while her husband's is so delicate and refined as to deserve what is implied in the best interpretation of the word "feminine." Mr. Pennell sent a number of admirable plates, chiefly studies of old bits in Philadelphia streets. Mr. Farrar is a stronger workman with his needle than with the brush, and excels where an effect of brilliant skies is in question. Mr. Harry Chase was represented by some clever coast-studies, and Mr. F. S. Church by a number of his original and artistic though fantastic creations. Altogether the collection was of noteworthy excellence, and the fact that \$2,500 worth of etchings were sold goes far to prove that the bad days of the American etcher, the days when he could look for appreciation only to the professionally interested—and often unmonied—few, are now quite past. The sales in the water-color rooms were about as large as those made last year, but more high-priced works went to make up the total. Mr. Abbey's Sisters—it will rejoice all his fellow-laborers to learn—brought no less a sum than \$2,000.

The rooms of the Academy building were especially attractive during this exhibition for they were decorated with great taste so as to produce a charming general effect without injuring the appearance of the water-colors themselves. The visitor was particularly grateful for the fact that no pictures were hung so high upon the wall that it was difficult to study them or to realize their quality. But surely the lot of hanging-committees is a hard one. For years they have been told that it was their duty to hang only such pictures as could be shown to advantage, and that an artist felt insulted instead of pleased to find his picture in the fourth row above the floor or to see it crammed into some shadowy corner. The committee of the Society acted this year upon such advice. The public and press applauded, but an enemy arose upon the other side. The rejected artist—and he, or rather his pictures, stood this year in the proportion of one and a half to every one that was accepted—lifted up his voice and cried aloud. There was a plenty of room left, he protested, for many more pictures to have been hung, and he darkly hinted, moreover, the Hanging Committee had gone outside of its prerogatives and had not regarded the marks placed upon the backs of all contributions by the Committee on Admissions to regulate the way in which they should be treated. This last matter regards, it seems to me the Water-Color Society only. The outside public has no right—the Society being a private association and not a publicly-sustained endowment like the Academy of Design—to do more than ask that it may have the best possible exhibition that can be made from the offered material. How it is made concerns only the body itself. But unfortunately many people did not take this view. There was a good deal of rather impertinent newspaper gossip about the Society and its officers, and a good deal of effusive sympathy expressed in some quarters with the disappointed artists. They were encouraged thereby to open at the American Art Gallery, a *Salon des refusés*, which it was prophesied would afford plain proof that the Society had done well by its own members rather than by

the public. But it proved no such thing. It proved, on the contrary, that, considering the fact that nearly 1800 pictures were passed upon, astonishingly few mistakes had been made, astonishingly few good pictures excluded or bad ones accepted. There was, indeed, scarcely a nice picture in the secondary exhibition save such as were signed by the men who had had other works accepted by the Society. Of course, some artists who were not admitted at the Academy may have had no inclination to appear in this collection of the disaffected; but judging by the works that collection *did* contain, the public realized, I think, that it might trust the Society in future years, and need never greatly desire to see what might lie back of its offered wares.

M. G. VAN RENSSELAER.

JOHN SINGLETON COPLEY.¹



THIS gossip volume is entertaining enough, but is hardly of public interest, and adds nothing or barely nothing to our knowledge of the only American painter of real skill that this country could boast prior to the Revolution. Unfortunately the domestic life is made of more importance than the artistic life, and "the father of Lord Lyndhurst" is not suffered to assume so prominent a position as "the son of Copley, the painter." We must admit that

we are disappointed with Mrs. Amory's book. From her preliminary paper in *Scribner's* for March, 1881, together with the current report that she had a large accumulation of material bearing upon the subject, we anticipated a really valuable addition to our history of the early development of the Fine Arts in this country. On the contrary, there is the most remarkable and curious ignoring of Copley's American career—only twenty-six pages are given to it, including considerable outside matter—although he was our only important native colonial artist. Why this should be in a work written by an American and a lineal descendant of the subject, is most unaccountable, especially as his career in this country redounds much to his credit as an artist, and shows him to have been truly a man of conspicuous talent.

Copley is the only early American painter who executed really meritorious work, until after having been under foreign influence, and he is said by competent authority never to have surpassed some of his early pictures. Indeed, Mrs. Amory says, "According to his own estimate, his best portraits were painted in America, and so highly did he value his early productions in this country that he endeavored to purchase such as could be obtained after his residence and fame were established in England." Yet, with this admission, we have in these pages reasserted the old story, which seems to have been originally set afloat by Lord Lyndhurst, that Copley "was entirely self-taught and never saw a decent picture, with the exception of his own, until he was nearly thirty years of age." But these propositions are incredible. There were plenty of good pictures in the colonies in those days—especially in portraiture which was the line he followed and became famous in—brought over from the mother country or produced here by Blackburn, Smibert, and other artists; and when Copley was but ten years old his mother married Peter Pelham, an English painter and engraver in mezzotint, who had resided here a score of years, and it is irrational to imagine that the boy Copley received no instruction from his step-father with whom he lived for four years—until his death in December, 1751—and who in all human probability instilled into his youthful mind the taste for art and the ambition to become a painter. That Copley received some instruction from Pelham seems almost proved by the fact, not mentioned by Mrs. Amory, that at sixteen he engraved a portrait of the "Rev. William Welsteed of Boston, in New England *Æ*. 58, 1753, J. D. Copley *pizit et fecit*. Printed for and sold by Stephen Whiting at ye Rose and Acorn in Union Street." "This first step" says Mr. William H. Whitmore in his "Notes concerning Peter Pelham" (1867) "in his artistic life bears so plainly the mark of Pelham's style, that we may be sure it was to his step-father that Copley owed much valuable rudimentary instruction." That Copley's success was due in a large part to his own perseverance no one can for a moment question, when they consider the state of the arts at that period in the colonies; and his pictures with all their merit show the result of much hard labor expended upon them. The many stories, which have been handed down, of the impatience of his sitters at the length of time he required to paint them, have become enrolled among the permanent *ana* of art, and show that he attained his ends, not by any flights of genius, but by deliberate pains-taking work.

John Singleton Copley was born in Boston, July 3d, 1737. He was the son and apparently only child of Richard Copley and his wife Mary Singleton, natives of Ireland, who emigrated to this country the year preceding the artist's birth. It would seem that snuff and tobacco formed an æsthetic atmosphere for embryo artists to breathe, for as in Stuart's case, Copley's parents were tobaccoists. Richard Copley having died soon after his son's birth, his widow married on the 22d of May, 1748, Peter Pelham, artist and school-teacher,

¹ The domestic and artistic life of John Singleton Copley, B. A., with notices of his works, and reminiscences of his son Lord Lyndhurst, Lord High Chancellor of Great Britain, by his granddaughter, Martha Babcock Amory. Boston: Houghton, Mifflin & Co. 8vo, pp. xii, 478.

and it is from him doubtless that the future artist received, not only his elementary artistic training, but also the ground-work of his general education. At sixteen, Copley produced his only known copper-plate print, and the same year the earliest canvas that has been found bearing his name and the date. The size of this picture is twenty-five inches by thirty, and represents a child with hair powdered, a blue coat and a yellow waistcoat. In the back-ground are rocks and the sea. The boy holds in his hand a wreath of flowers. It is a portrait of Dr. De Mountfort, and is said by Mr. Perkins, to be "well drawn and quite good in color." The next year he painted an allegorical picture of Mars, Venus and Vulcan. He was careful and judicious enough not only to sign the majority of his pictures, especially his early ones, but to date them also, by which means we are enabled to follow his progression in his works and they evidence a rapid advancement; but not quite so rapid as Mrs. Amory would have us believe. She says, "In 1760 Copley sent, without name or address an exquisite portrait of his half-brother, Henry Pelham, known as 'The Boy with the Flying Squirrel,' to Benjamin West, a member of the Royal Academy, with the request to have it placed in the Exhibition Rooms." The italics are, of course, ours.

Now this pretty story and all that follows on the same subject would be very nice if it were only true, but dates show that it is pure fiction. It so happens that the Royal Academy was not founded until December 10, 1768, and its first exhibition was not held until the spring of the following year. In addition, Benjamin West did not leave this country until 1760, and did not visit England until August, 1763, so that in 1760, he was neither in England, nor a member of an association that had no existence. That the picture was exhibited at the Royal Academy is quite possible, but if so it must have been at least ten years later than the impossible date given by Mrs. Amory. Mr. Perkins gives the date at about 1773—but the catalogues of the exhibitions would show. In this connection it is well to note a curious blunder she makes in styling Sir William Chambers, the architect, President of the Royal Academy. There have been so few presiding officers of this institution, and they are so well known, that an error like this is inexcusable carelessness.

In 1769, Copley married Susannah Clarke, a daughter of a wealthy Boston merchant and a lineal descendant of Mary Chilton, the first woman to set foot on Plymouth Rock from the Mayflower. Owing to the disturbed state of the colonies and his desire to see some of the art-treasures of Europe, Copley left his family and sailed from Boston in June, 1774, for England, never again to return to the land of his birth. From England he visited Italy where he studied for some time, returning to London in the summer of 1775, to find his wife and three children awaiting him, they having left Boston towards the end of May in "the last ship which sailed out of Massachusetts Bay under the British flag." In 1783, Copley was elected a Royal Academician and from this time was borne along by the full tide of success. He died in London, September 9, 1815, from the effect of a paralytic stroke, leaving his wife and three children to survive him. These three children, all American born, Mrs. Gardiner Greene, Lord Lyndhurst and Mrs. Mary Copley, are remarkable instances of longevity, their united ages amounting to two hundred and eighty-five years.

Mrs. Amory seems to have set out in her work with the determination not to make use of any facts that had been garnered and used before—thereby omitting even the date of the artist's birth—which would have been well enough if she had been provided with a storehouse of new and more correct facts to take the place of the old ones. But not being so provided she has failed to give us as good a pen-picture of "Copley the artist" as her kinsman, Mr. Augustus Thorndike Perkins produced, in his privately printed volume, issued in 1873, entitled, "A Sketch of the Life and a List of some of the Works of John Singleton Copley." In this work of Mr. Perkins, and the three supplements to it, since issued, we have some detailed account of three hundred and twenty-five pictures by Copley in this country, done either in oil, pastel or miniature; yet with the exception of some family portraits, Mrs. Amory passes them all over in silence. She says, "Excepting a visit to New York in 1771, there are few events to relate of our artist's early professional career;" while it is a pretty well-assured fact that in 1772-73 Copley visited Philadelphia, and then journeyed farther south, remaining awhile in both Savannah and Charleston. In all three of these cities he painted portraits which now repose as heirlooms with the descendants of the worthies depicted.

Copley's art was hard and cold, exhibiting very little feeling or sentiment. His technical qualities were high and his rendering of different textures, silks and velvets, metals and woods, was very skilful. In some of his portraits the flesh tints are remarkably good, but as a general thing they lack warmth and life. He paid strict attention to the accessories of his pictures and labored assiduously over some minor detail which he required for the unity of the composition. His portraits as a general thing have that indescribable air about them that indicate close resemblance to the original, and it is much to be desired that a special exhibition of his works should be held ere long by the Boston Museum of Fine Arts.

In a journal of the character of the *American Architect* we have, of course, nothing to do with the career of a Lord Chancellor of England, and we regret that the volume before us from our standpoint is so unsatisfactory. Possibly its posthumous character—Mrs. Amory died before the work went to press, but she had completed her manuscript—may have something to do with it. We

will hope that had she lived she would have seen the advisability of telling more about the father and less about the son, although we must not forget that her chief object in issuing the volume seems to be to defend Lord Lyndhurst from the "persistent calumnies" of Lord Campbell, in his "Lives of the Lord Chancellors."

CHARLES HENRY HART.

THE ILLUSTRATIONS.

HOUSE FOR CHARLES SHELDON, ESQ., AUBURN, N. Y. MESSRS. GREEN & WICKS, ARCHITECTS, AUBURN, N. Y.

COMPETITIVE DESIGN FOR A COUNTRY HOTEL. BY MR. J. W. H. WATTS ("Vermont"), OTTAWA, CANADA.

"Vermont." This composition has been ingeniously rather than wisely studied. Its pretensions belong to a fashionable hotel in a large seaside town. The general disposition of rooms is good, but complicated in detail, and the halls and central portions of the building are insufficiently lighted, as are also the corridors on the second floor. The oblique arrangement of the billiard-room is somewhat affected, but may be accepted perhaps as a concession to some unexplained requirements of the site rather than as a recognition of a peculiarity of some old English houses lately published. There seems to be no ladies' bath-room. The perspective is carefully and skilfully drawn, but the left-hand tower is as bald and ugly as it is unnecessary, and adds nothing but expense to a design already exceeding the cost permitted. Both the drawings and designs are full of clever work, and reveal an experienced designer and skilful draughtsman. We regret that "Vermont" has in this case slipped off the right track.

SCOTTISH SKETCHES BY MR. J. W. SMALL, F. S. A. SCOT., EDINBURGH.—ROOM IN THE PALACE BUILDING AT CULROSS; SHUTTER BOARDS, ETC.

THE CONSTRUCTION AND ARRANGEMENT OF THE-ATRES.—II.¹



From the British Architect.

By this they desire to say that the curtain must be a fire-proof screen, running in an iron casing, which, because always in use, shuts off the stage at once and unfailingly from the auditorium in case of fire, and by means of which the fire may be localized on the stage, which must be sacrificed under any conditions. Supposing such a screen to exist, one-half of the theatre, the auditorium, might be preserved perfectly intact, a condition never before attained. But by this means a very much greater advantage might be obtained, namely, that in future, fires in theatres would occur without a loss of life. The greatest guaranty would be offered by the knowledge of the public that there is no danger, in consequence of which the excitement and anxiety to get to the doors, easily explained under present circumstances, would disappear, and the theatre be emptied in an orderly manner. This condition of a permanent fire-proof curtain has been specially treated by Mr. Carl Pfaff, and the committee are able to refer to the result obtained by that gentleman as a practical solution of the theoretical problem proposed by them. At the request of Mr. Pfaff, this matter was

It is fully well known that the existing arrangements of sheet-iron or wire curtains fail almost without exception in the hour of danger. The value of wire curtains, moreover, remains problematical. The committee have, therefore, come to the conclusion that only a permanently-acting, perfectly fire-proof screen, which keeps out the gases of combustion, will offer sufficient security.

¹ See *American Architect* for March 25. Report of the Committee appointed by the Austrian Society of Engineers and Architects (Vienna).

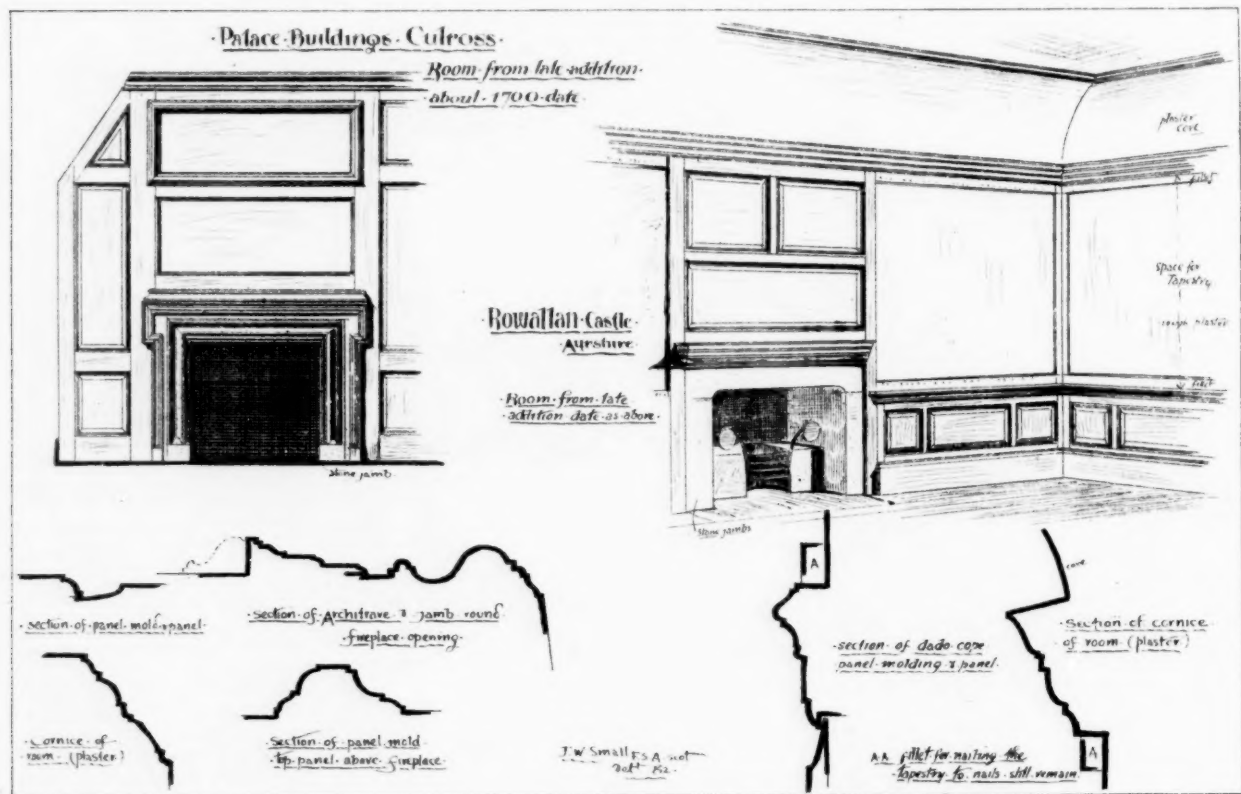
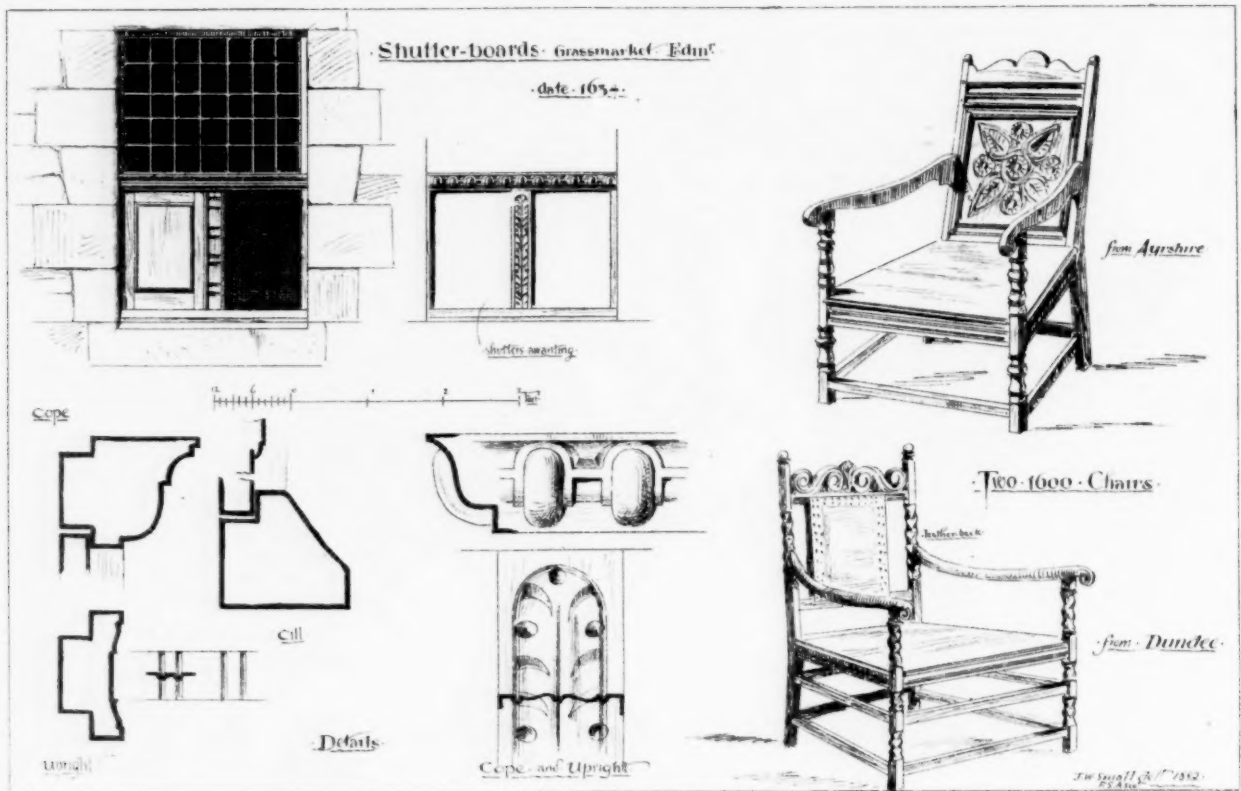
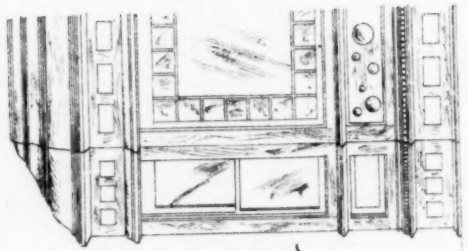
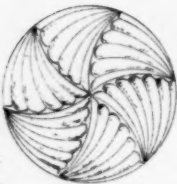
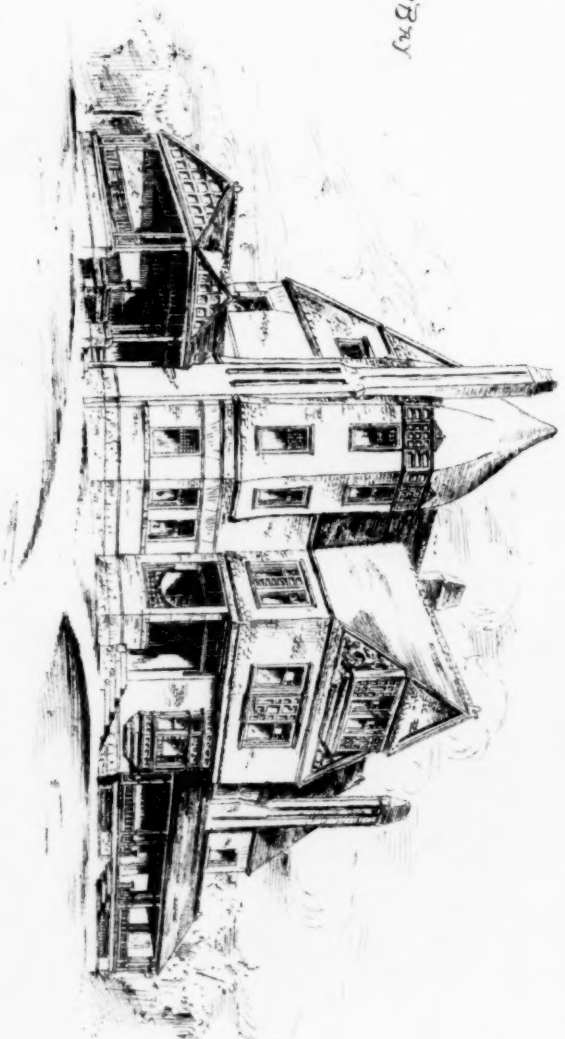


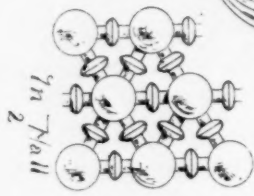
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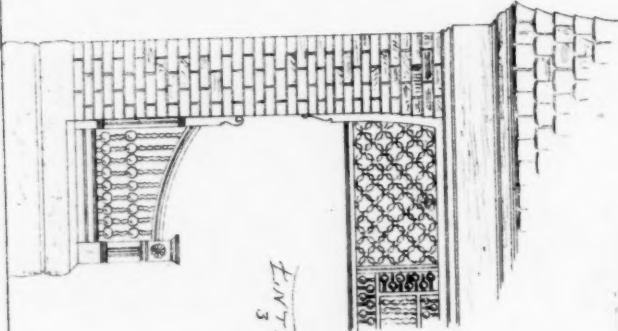
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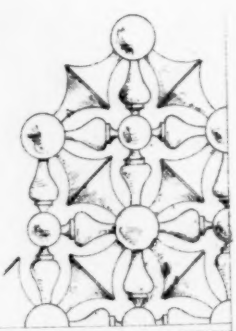
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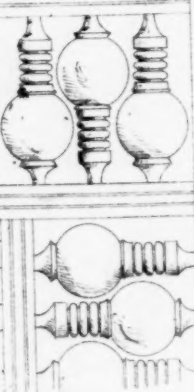
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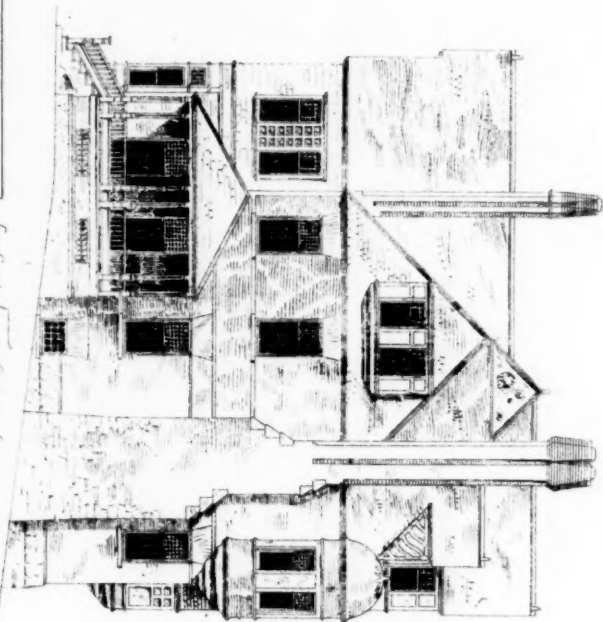


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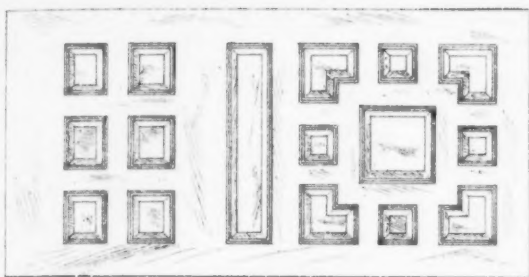


House for Charles Sheldon Esq.
at Auburn N.Y.
Messrs Green & Wicks = Architects
Auburn N.Y.

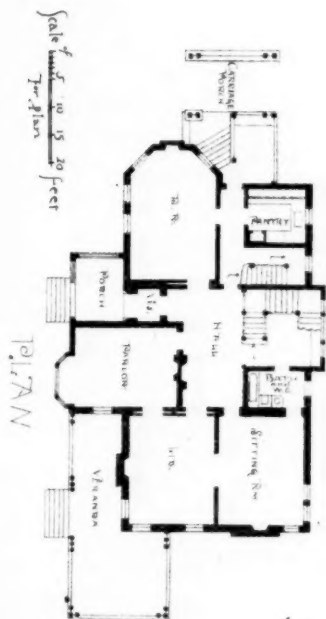
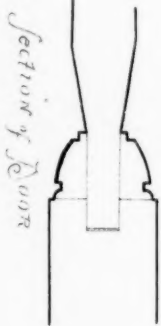
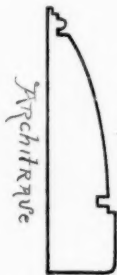
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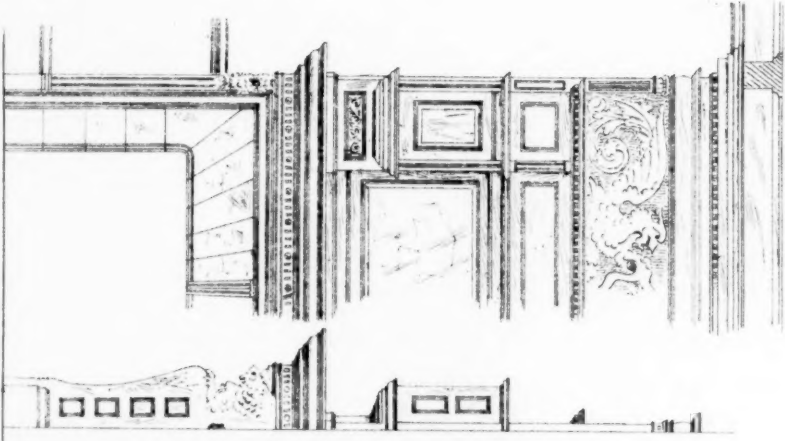


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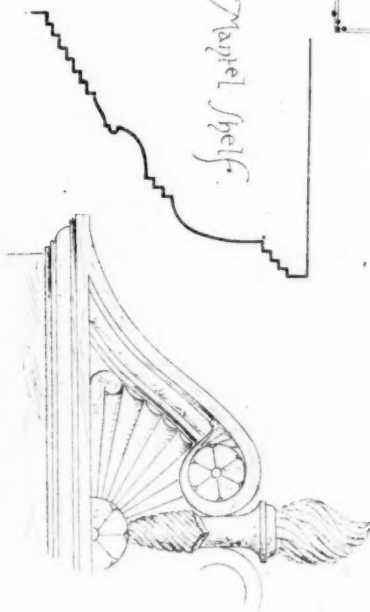
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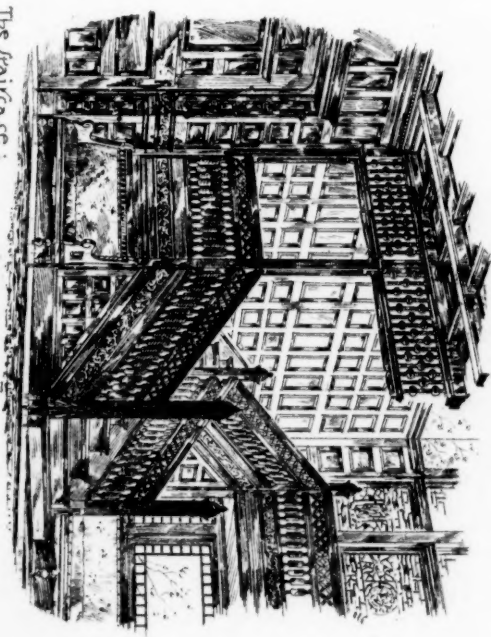


PARLOR MANTEL

Mantel Shelf



WINDOW CAP



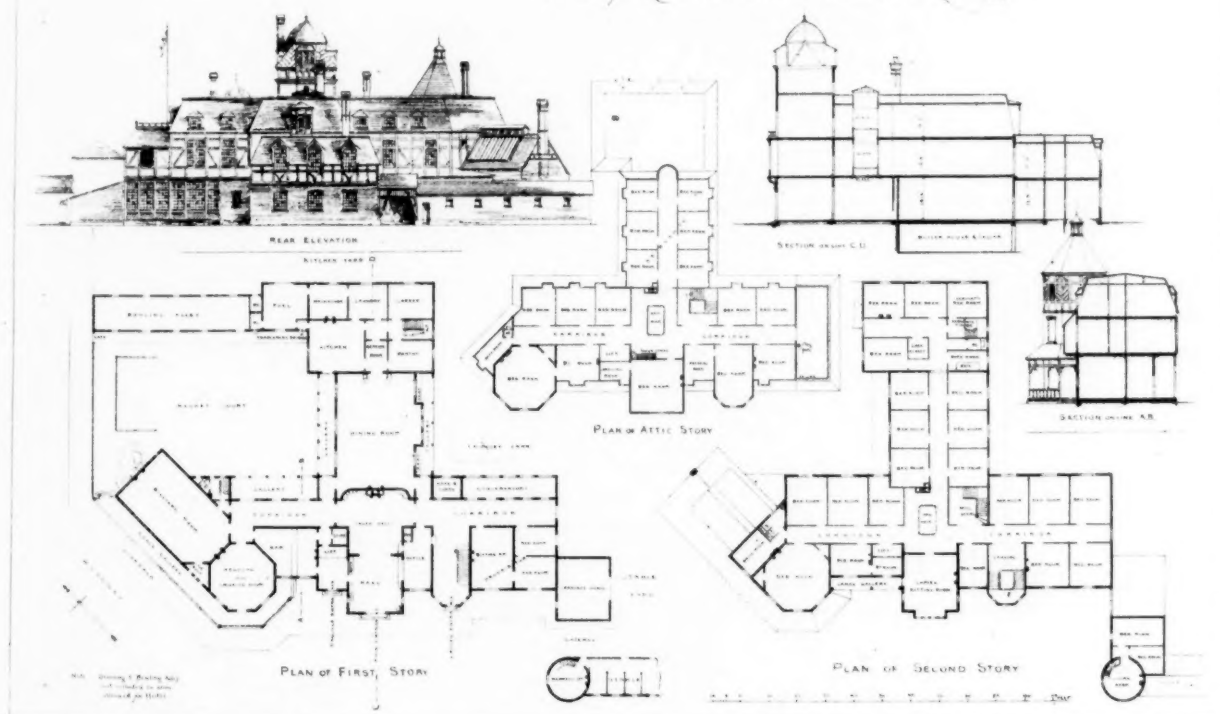
The Staircase

House for Charles Sheldon, Esq.
at Auburn N.Y.
Messrs Green & Wicks Architects
Auburn N.Y.



AMERICAN ARCHITECT COMPETITION

DESIGN for COUNTRY HOTEL SUBMITTED BY J. H. ROSS



submitted to a sub-committee for examination, who have dealt with it in detail. Their report is published in an appendix.

The theatre being thus divided into two perfectly isolated parts, there remain only those arrangements to be considered which provide for the safety of those who, in case of fire, are present in either half. As regards the stage, where a fire is almost sure to originate, it would be necessary to separate it completely and fire-proof from the rooms used by those engaged on the stage. This object may be attained by enclosing the stage itself on all sides by fire-proof walls; in this manner the fire would be confined within that space, and it might be allowed to burn itself out, the efforts of the fire brigade being directed towards rescuing persons engaged therein. At the same time, the roof for this part of the theatre ought to be of very light construction, and the whole well ventilated, so as to permit the flames to find a ready outlet. From this point of view, and looking upon the square formed by the stage as the seat of the fire, it would be advisable to provide the three walls not turned towards the auditorium with as many fire-proof passages as there are floors; the dressing-rooms, wardrobe-rooms, and other accessories to the green-room, which would require daylight, would be ranged around the stage, outside the fire-proof walls. On each side of the stage at least one flight of stairs for the corridors ought to lead into the open. Should a back stage be required, it would be necessary to establish a fire-proof communication between the corridors on both sides of the stage above it.

In the auditorium, which may be supposed to be constructed perfectly fire-proof at least in its communications, the latter are of first importance. The passages ought to be constructed with regard to the number of persons assembled in the various parts of the building; but provision ought also to be made to guard against undue crowding in cases of sudden evacuation. The task imposed upon the architect from this point of view will induce him to design the building in such a manner as to dispose of the crowds, which vary in different parts of the house, most effectually. He must divide them into as small bodies as possible, each of which should be able to reach the open as quickly as possible, by the shortest route, without encountering obstacles, and without coming into collision with other parties leaving the house. If we examine existing theatres from this aspect, it will be found that they supply that accommodation in very rare instances to the extent required. Leaving old theatres quite out of the question, in which much arose from accident, and a greater part from other considerations than those here mentioned, it is only too often found that demands are made upon a given site of limited dimensions which render it impossible for the architect to provide communications corresponding to the number of spectators in the sense here pointed out. But most of the theatres are faulty in that there is a want of direct ventilation.

As theatres are intended only for illumination at night, it is frequently thought that daylight may be dispensed with; but where daylight is absent, fresh air may be procured only at a heavy expense, and yet it will not be denied that fresh air cannot be dispensed with in theatres. The fact alone that most of those who have perished during fires in theatres have been suffocated, ought to prove the necessity of throwing as much daylight as possible into the communications. But the want of fresh air shows itself also in another way. Let us examine the obstacles which oppose themselves to a plentiful supply of air under such conditions: in most theatres corridors, stairs, and vestibules are grouped round the auditorium, and are again surrounded by other rooms receiving their light direct. Under such conditions, the hall formed by the auditorium and the passages attached thereto not only supply increased danger in case of fire, but they also become a source of various diseases for the thousands of people who are nightly crowded together there in a heated atmosphere. As a plentiful supply of air in theatres cannot be given by artificial ventilation without great expense, natural ventilation offers itself as a ready means of solving the difficulty. If once the principles of safety and sanitation, hitherto neglected, are thoroughly recognized in the construction of theatres, and more particularly in the part in which the public assemble, old-established habits will give way and improvements will follow as a matter of course.

Hitherto the communications in theatres have been planned on a system of centralization; its place will have to be taken by decentralization. With this view, a sufficient number of staircases and passages connected with them will have to be provided, in the first place; in the second place, however, account must be taken of a suitable division of the communications, corresponding to the movements of people in theatres, the largest number of staircases being placed in those parts where the public are congregated in largest numbers. The definition of those requirements by itself presents great difficulties. What is meant by sufficient communications? How many doors of exit are to be provided for a certain number of people, and in what proportion ought the number and dimensions of staircases to be to the number of doors and the people present respectively? It will be difficult to give exact figures, as various changing factors, such as the length of the passages, the form and winding of stairs, the width and steepness of steps, exert a great influence upon the rapidity of the movement of bodies of people. The true solution of these problems in each special case will depend upon the architect, who will have to take due note of such points as are contained in his instructions. He will have to keep to the programme laid down for him as nearly as possible, as a matter of

course; but he will do well to adapt his conditions as much as possible to the classic theatre, with its well-devised system of numerous stairs and passages. We do not mean to indicate that he should simply take the classic theatre as a pattern, and entirely break with our present system of boxes. The communications required must be made conformable to the plan of the theatre; but it seems desirable, for this very reason, to refer to the classic theatre, because the same advantage achieved by ancient architects ought to be attained in the modern theatre.¹ If full cognizance is taken of these conditions, changes in existing arrangements and the elaboration of a new system will follow by themselves. It would be unadvisable to lay down hard-and-fast rules, but the following particulars may well serve as a guide, referring, as they do, to practical requirements. They would, of course, not be acted upon in the case of grand staircases, nor apply to dispositions made for special comfort.

(a) The communications for the various tiers, each of which ought to have at least two sets of stairs, should be independent of each other. They should be in the right proportion to the number of people which each tier will accommodate, and be as short as possible.

(b) The communications should be on a more extensive scale in proportion to their length—that is to say, the upper tiers ought to be provided with more staircases, because they contain a larger number of people.

(c) A larger number of staircases of moderate width (say six feet) is to be preferred to a less number of very broad stairs.

(d) The turnings should be uniform, and should be easy. Steps and landings should be on a uniform scale. The height of rise should be of the same proportion throughout.

(e) Single steps should be entirely avoided.

(f) Direct staircases are to be preferred to spiral ones.

(g) The passages destined for the public must in no case be intruded upon by the cloak-rooms. The latter may be constructed along the passages for the purpose which they serve, but they must have their exits placed in such a manner as to enable people using them to leave them without entering the general stream.

(h) All doors must open outwards: a police regulation made at Vienna long ago.

If communications were constructed as above pointed out and other precautions adopted, crowding dangerous to life and limb would be an impossibility. The masses would, by natural impulse, try to gain the doors, and even the largest theatre might be emptied in a very few minutes. Even in the case that smoke were to enter the auditorium and passages, which, however, is to be prevented by other measures, the stairs or passages leading to the open air might be at once ventilated by opening the windows or smashing them, and the danger of suffocation would be avoided. Absolute darkness would also be prevented, as such passages would be partially, however slightly, lighted from the street lamps.

In summing up what has been stated, the committee express it as their opinion that the greatest guarantee for the safety of the theatre-goer is offered by the construction of a sufficient number of staircases, simply and practically arranged, and corresponding to the number of spectators and their distribution in the theatre, as well as by the possibility of ventilating them and the corridors connected with them. They, however, deprecate all make-shifts in the form of balconies, ladders, iron safety-stairs, and other precautionary measures, excepting so far as they may be necessary for improving the condition of existing theatres. The same principle which the committee have laid down for the iron curtain applies also to the other arrangements. They must possess stability, and the public must be acquainted with them by their daily use. It is only in this manner that the public will acquire confidence in them, which can only be expected if a conviction of the perfect safety afforded by them gains ground. The behavior of the public, however, who, in the hour of danger, must help themselves, will be of greater value than all measures of safety devised for cases of emergency, and which generally fail. To make a virtue of necessity was the beginning of all art. We may be convinced that also in the case given necessity will lead in the right direction.

The preceding inquiry has resulted in the formulation of a series of principles which might in the future become rules for the construction and arrangement of theatres. In continuing to test those conditions, a number of determinations of detail may be evolved from those general principles which may increase the safety and comfort of the public. The committee, considering that at the present moment it is only required to set things generally right in this highly important matter, think that they may properly exclude from their labor every detail which would result, as a matter of course, from the due observance of generally valid principles. It is true that there are other points of inquiry not at all or only slightly touched upon here, which are of essential importance in the construction of theatres, such as their warming and ventilation, lighting, water-supply, and the extinction of fires. Notwithstanding their great weight, the committee thought it better to abandon a closer treatment of those questions for the following reasons: The far-reaching claims which may be made in the construction of theatres upon the arrangements for warming and ventilation, as well as the effect which they may have upon fire-risks, while, on the other hand, that peril may be greatly diminished by suitable contrivances

¹ The references in our columns to the classic theatre appear to have reminded inquirers in all parts of Europe of the lessons to be learned from it. — *Ed. Builder*

for ventilation, could hardly be defined in such a manner as is required by the object which the committee have in view. They think, on the contrary, that the more minute treatment of this branch of the inquiry may be safely left to the investigation of the many experts of our society who have made that department of technical science their special study, and who are, therefore, best fitted to deal with the reforms required. But the question of lighting is of such extreme importance that the committee deem a brief reference to it necessary.

Two reasons suggest themselves for entering into the lighting of theatres: in the first place, the present mode of lighting the stage is the principal cause of fire; and, secondly, it must be most imperatively insisted on that the lighting of the auditorium and the communications must, even in the case of fire, never wholly cease. It may be remarked with regard to the first point that the great number of gas-lights fixed on the stage, often very closely to or between easily inflammable materials, raise the temperature on the stage generally to a very high point, which, especially by radiation, reaches a very dangerous local intensity, and completely prepares for ignition the already very easily ignitable materials forming the scenery, etc. It is here that the danger lies which is inseparable from a stage lighted by gas, and it is, therefore, highly desirable that the stage, in its principal parts at least, should in future be lighted by electricity. The committee are not at present in a position to make definite proposals for a particular system of electric-lighting, but they expect from the progress with which electrical engineering is continually surprising the world that the want here expressed will soon be met. A solution of this question may all the sooner be expected, the more managements of theatres are willing to lend a helping hand to experiments, to which they are most earnestly invited. Although, on the one hand, electric-lighting must be decisively recommended as highly desirable for the stage for reasons of safety, the lighting of the auditorium and communications may be left as at present. In that part of the theatre electric-lighting may heighten the effect, and may also reduce expense, but would not increase its safety.

Whatever system of lighting may be adopted for the auditorium and its approaches, it must never be confined to a single source of light and exposed to complete extinction by accident. It must be expressly emphasized that this demand is made, not only for the case of a calamity, but also for daily routine; for the sudden collapse of the lighting arrangements in a theatre otherwise perfectly in order and filled with spectators would, without further aggravating circumstances, prove by itself a lamentable catastrophe on account of the confusion caused thereby and its consequences. The committee are of opinion that an emergency system should be entirely done away with, and that there must be a supplementary system of lighting. The committee understand by this an arrangement for lighting the auditorium and its communications by means of oil lamps or candles, which forms such a large part of the regular lighting by gas or electricity that it cannot be dispensed with also for daily use, but is necessary for obtaining the full lighting effect under all circumstances. This supplementary system of lighting would thus be placed under the most efficient control — that of the public. Care should be taken that managers of theatres do not hide the absence of a well-acting, but to them inconvenient, supplementary system by a too brilliant lighting by gas or the electric-light, and thus withdraw it from the control above pointed out altogether. On the other hand, it would appear perfectly admissible to light that part of the theatre exclusively by oil lamps or candles. On stairs and in passages, in vestibules and lobbies, the lights serving the supplementary system ought to be ventilated from outside. Entrances and doors must be distinguished by recognizable lights belonging to that system. As long as a theatre possesses, besides the supplementary system, one for gas, the pipes of the latter leading to the stage, the green-room with its passages, and the auditorium with its approaches, should not be connected with each other, but should have independent communications with a main, and not be interrupted by any intermediate contrivances.

As regards all further measures for the general safety, especially the extinction of fires, the committee are of opinion that they would exceed their function were they to treat that question; but they are perfectly convinced that the competent authorities who have hitherto administered such measures would be best able to suggest desirable reforms.

The principles above stated might form a guide in the construction of new theatres. In adapting old theatres, these fundamental maxims should be applied as far as possible. The same principles should also serve as a guidance in framing or amending existing building regulations for theatres. How far by legislation alone the safety of the public may be provided for, and how far it may be commendable to determine the construction of theatres by law — in order not to restrict the liberty of technical science and art too closely, and to avoid making the object legislated for appear merely the expression of existing regulations, as is the case already in many other departments, requires careful consideration. But under all circumstances, it appears to them of the utmost necessity to encompass theatres by a number of measures of safety of a technical nature, and to co-operate in insuring to theatres at least that proportion of safety which is provided in the working of railways and steam-ships. But even in existing theatres provision must be made for affording an increased degree of safety to the public by adapting them to the necessity of the case.

This object might perhaps best be attained by the appointment of a central commission of experts at Vienna, which ought to examine all plans for new theatres or for adaptations of existing ones, and to pronounce upon them.

In concluding their report, the committee think it incumbent upon them to add a few general remarks, which have reference to the Austrian system of public architecture, and which may serve to throw additional light upon the question treated. The committee have drawn attention, to the best of their knowledge, to the evils connected with theatres, for they felt that the means for improving existing shortcomings could be provided only by acknowledging and fearlessly stating the truth. As it might appear from what has been stated as if the architect were responsible for many of the defects exposed, the committee consider it their duty to direct attention to the conditions which exonerate the Austrian architect from the responsibility for numerous mistakes, errors, and omissions in the construction of buildings, or very nearly hold him blameless in such matters. It has often been pointed out, and with regret, that the architect in the Austrian Department of Public Buildings enjoys no independence: he is merely the subordinate of administrative officials. The architect, or engineer, is used only where and how he may be considered fit to be called in. He does not enjoy the authority such as the exercise of technical instructions requires, nor is he permitted the initiative for independent dispositions which may appear to him advisable. He is the organ whose advice is asked in each individual case, without being sure that it will be acted upon. In most important technical matters it may happen that the view of the layman prevails over that of the expert.

If the present high point of excellence of architecture in Austria is here referred to, this fact must be supplemented by the statement that this eminence in detail is the result of a decided art influence, while there is an absence of great architectural principles and of a generous care for architectural interests. Having regard to this much-felt want and to the abnormal condition existing between the tasks imposed upon architecture and the organization of the Austrian Department for Public Buildings, the committee feel bound to insist most strongly upon the necessity of reform, long asked for, in that department, and upon the appointment of a superior authority, consisting principally of experts, with independent powers. In carrying out such reforms, an organization would be called into existence which would formulate a number of useful regulations, and which should be specially referred to in this case.

In all countries where architecture is cultivated, each completed building is placed under the supervision of its architect, as well as each public edifice under the care of a duly qualified expert, who appears to be responsible for its preservation and appropriate use, and for all architectural alteration and arrangement. This is not considered necessary in Austria, and the work is handed over to a subordinate technical official or even to a layman. In this manner its preservation, which depends upon the permanent supervision of its architect or a qualified successor, is not only considerably jeopardized, but the most valuable buildings and monuments are sometimes exposed to accident from a technical and art point of view. There is also the risk that well-meant dispositions and arrangements do not come into action at all, in consequence of the absence of the necessary care, or are misapplied; and just this fact might be fully illustrated by the experiences gained at the burning of the Ring Theatre. From what has been stated, it is self-evident that the sole security for carrying out in a reliable manner the reforms required in Austrian theatres consists in regulating that last-mentioned question. The best and well-weighed advice acquires value only in its correct application. As long as there is a disinclination to confide technical matters to men specially trained for the purpose, and as long as the latter are only looked upon as the tools of other authorities, the question here treated, or any other technical matter, will never be satisfactorily solved.

The above report is dated Vienna, January 15, 1882, and is signed by Herren J. Dörfel, F. Fellner, H. von Ferstel, E. von Förster, Haberkorn, Th. von Hansen, Baron Hasenauer, H. Helmer, C. Pfaff, and Fr. Schmidt, all well-known names and prominent members of the Austrian Society of Engineers and Architects. It was read at the meeting of that society on January 21, and unanimously adopted.

A NEW METHOD OF EXPLODING BLASTS. — Alexander Watson, of San Francisco, has recently patented a new appliance for exploding blasts, the method of firing the explosives being specially adapted for that class known as high explosives, such as nitro-glycerine and its compounds. The invention consists in the employment of a metallic cylinder, having in its lower part an anvil to receive an explosive cap, while a piston or hammer slides within the cylinder directly above it, being actuated by a stout spring. The hammer has a stem or spindle, the upper end of which is secured at the upper part of the cylinder when the hammer is drawn up, by any solder or composition which may be acted upon by quicksilver. A cap screws down over this joint. The cap has a drop of quicksilver placed within it, and the device is kept bottom up until needed, so that the quicksilver may not touch the joint. When it is to be used, the cap being placed on the nipple or anvil, the apparatus is reversed so that the quicksilver may rest upon the joint, when it will attack it and loosen it, so that the hammer may fall and explode the cap and the charge. The time of the explosion is determined by the amount of the material used as a solder, and this may be regulated so that the explosion will occur at the exact moment desired. — *Iron Age.*

VILLAGE IMPROVEMENT.—I.



It is always beneficial and usually pleasurable to contemplate improvement, even though an actual outside change for the better fail of being accomplished. It awakens our interest in a healthful manner, and the field of nature is inexhaustible. Yet why should it be so difficult to keep the public mind interested in so-called village improvements? That this is an extremely difficult task all those who have made attempts at a general cohesion can abundantly testify. The answer would seem to be easy,

yet it is generally lost sight of by the superficial observer. The great majority of men and women are compelled to view the world through the blue spectacles of necessity, and everything consequently is to a greater or less degree colored accordingly. Therefore, generally speaking, the poorer the village, the less possibility of the accomplishment of what is understood by improvement. The entire public and individual energy is concentrated on utility. This latter product may or may not embrace also improvement to some slight extent, but it has no special regard for it, and will at once drop it if unprofitable.

A wealthy village in the hands of a few owners may on the other hand present a far more deplorable sight than many of the poorest country places, yet there is always the possibility that some one or more of these wealthy capitalists may suddenly change its appearance, by discovering that a generous supply of wholesome drinking water for the working thousands, with restful shade trees to ameliorate the summer heat, an invigorating play-ground for the rising generation of both sexes, and tidy lodging-houses with a tidy garden-spot attached to each, are not only profitable investments in the long run, but constant sources of pleasure as real improvements; and all the more pleasurable because they can be well afforded. No man can long enjoy the luxury of surroundings that bear too heavily on his purse.

To state the idea then more tersely, we are ready to assume that where a community as a whole, is not wealthy, that is comfortably above want, it is useless to expect much from it in the way of village improvement: in other words, village improvement is a luxury which not all can afford to indulge in.

It is undeniably true as indicated above that a judicious expenditure of thought, time, and money in rural improvement may actually be reimbursed to the giver in the increased value of land so treated, yet the former proposition still remains true, that without capital or wealth this first expenditure is impossible. Borrow the money you may say! Yes, it is too often done in this manner with a short-sighted disregard to the necessary payment of ever recurring interest, and the future maintenance of the new establishment, so that unless an abundant capital of brains engineers a safe result the loss is tremendous. It has been said that nothing succeeds like success, yet also is it true that nothing fails like failure.

Well-considered individual effort is then far more to be depended on than society action. Individuals may and oftentimes do join hands in a movement of more than ordinary importance, but generally speaking the town or village as a whole cannot be depended on, except the case is clearly proven to be one of utility, i. e., a question of gain in dollars and cents, in the pocket significance of the term.

Perhaps the most serious drawback to all village improvement, next to extreme poverty, lies in the fact that although work of this kind would at first blush appear to be peculiarly within the province of the countryman's own grasp and ability, yet it actually fails of being accomplished because he is so busy about his own affairs at the very times when such improvement can best be accomplished. Much of the villager's time is lost for outdoor work by the inclemency of our climate, but when spring does open he feels that moments are too precious to waste in village-improvement schemes. Planting, cultivating, haying and harvesting take the snap and zest for any similar additional work pretty much out of him, and unless you can afford to pay him for his time (which eliminates the romance at once) he must be counted out altogether.

Yet again a difficulty presents itself in the guise of a wide-spread diversity of opinion as to what constitutes improvement. The business man who goes to the city daily, yet has his home in the country, has a sensible leaning toward city conveniences, and if he carry the day at town meeting, his ideas will rule so far as public action in the matter is concerned. Improvements under this head will generally consist of better streets, sidewalks, lighting, water and sewerage; each very important and desirable, yet still by no means embracing all the requirements and desires in a community. These kinds of improvement are only visible, and you may say from an artistic point of view, permissible near a city. No one expects them in the country at large, because they at once strike the beholder as unnecessary and uncalled for.

In order to exemplify this more clearly, let us now go one step farther and consider a village practically in the hands of a few wealthy men, who have selected it as their summer residence.

A summer resort implies ease and affluence among the temporary residents, and leisure for a more careful study of the æsthetic standard of taste apart from that of ordinary utility. A roadside fringe of wild roses will be most jealously guarded from the encroachment of any attempt at pedestrian pathway, while a curbstone sidewalk would be deemed supremely ridiculous. Yet the roads or drives must be perfectly built, because the pleasure drivers demand a fine road-bed with freedom from dust, therefore, country roads that cannot be watered should have grassy waterways with the natural herbage kept sufficiently in check to prevent interference with the passing. This roadside coloring is usually finer than the common field growth (except in very dry weather) because it constantly receives a gentle manurial stimulus from road washings.

Meanwhile the native resident secretly laughs at the egregious folly of the inconstant devotees of wealth and fashion, who, instead of building sensible dwellings on the smiling plain below, with water and supplies generally at the very door, vie with each other in seeking most inconvenient heights and crags whereon to erect expensive villas at disadvantage on every side except as regards the view. And what countryman cares much for the view? He has a quasi respect for it as regards its evident pecuniary value, but he seldom if ever is entranced by its beauty, because it has become so indissolubly associated in his mind with the daily drudgery of farm work that any proposition from an intending purchaser, whereby this work may be sensibly diminished, is generally met with favor and finally accepted. It is what a man does not have always before him that he desires for a change. Improvement like pleasure is relative: what is one man's trouble, is another's delight. The city man rejoices in his excellent bargain for view and fresh air, while his country cousin also rejoices in the sale of an hitherto unprofitable portion of the farm at ten times its agricultural value; and prospects brighten for a surer and nearer market for garden and farm products.

This is truly village improvement raised to the highest power, and so long as mutually friendly and interested relations exist, nothing can be more elevating or prosperous. There is but little need of outside or inside exhortation to well-doing; the landscape smiles of necessity simply because everything is working in its favor. E.

AGRA'S MOGUL MONUMENTS.



IF Benares be the Mecca of India, Agra may be fairly called its Rome; for as the city of the Tiber contains all the grandest monuments of the Cæsars, that of Jumna concentrates in itself all the masterpieces of the Moguls.

On the bank of the great river, scowling down at the iron railway bridge and the neat little station beyond it like the past defying the present, rises a vast red battlement of hewn stone, a perfect city in itself, the stern unornamental simplicity of which makes it almost unique among the marvels of Asiatic architecture. This is the famous Agra Fort, which, built three centuries ago by the Mogul Emperor Akbar and his renowned son Jahangir (Lord of the World), has served, by a singular irony of fortune, to protect against men of their own race and religion the "white-faced unbelievers" who were threatened by the great rising of 1857. Far down beneath its foundations, according to local traditions, the countless treasures of the Great Mogul lie awaiting their discoverer. This legend, — which, however, is not wholly without some basis of fact — seems to be to the European occupants of the fort what the buried hoards of Captain Kidd are to the school-boy citizens of America. Whenever a new fosse has to be dug, an old one to be cleared out, a moldering wall repaired, a ruined vault put in order for serving as a storehouse, or anything whatever done which entails the slightest trenching up of the earth inside the fort, every man concerned, from the colonel of engineers down to the lowest sapper, is at once filled with dreams of massy gold and silver ingots, pearl necklaces, diamonds as large as pigeons' eggs, and other nice little articles familiar to all readers of "The Count of Monte Christo." Once, indeed, a startling discovery was made. A large mass of one of the inner walls having given way, a party of men was told off to clear away the rubbish. The officer in command of it, looking down into the deep hollow thus exposed, suddenly espied a number of sacks, to all appearance well filled, lying heaped together in its inmost recess. "The Mogul treasure at last," was his instant thought; and he ordered his men, who were as enthusiastic over the "find" as himself, to drag it forth at once. They obeyed with a will, despite bruised hands and eyes filled with dust, and tugging forth the precious sacks to the light, tore them open in frantic eagerness and found them full of sand.

But the ancient fortress contains other and more accessible treasures than these. Passing under the vast tunnel-like archway of the Delhi Gate and winding up the steep zigzag ascent beyond, you emerge suddenly from between the two huge flanking walls upon a wide, empty square, along the farther side of which, above a massive rampart of dark-red sandstone, rise like snow-crested mountains the

three marble domes of the beautiful Moti Musjid. It is, indeed, as its name denotes, a pearl among mosques, and its long vista of snowy arches and dazzling white pillars might seem like a fairy palace of ice reared by King Winter himself in the heart of this scorching land; but it is only one among the countless marvels with which this famous citadel is absolutely crowded. Descending the stair that leads downward from the eastern gate of the Moti Musjid, you enter another space equally wide and desolate, in the centre of which stands ranged a formidable park of English cannon. Facing the guns appear the pillared colonnade and smooth white platform that extend in front of the main entrance of the palace of Akbar. Just beside the door stands a low throne of polished marble, upon which the great Emperor was wont to sit in state while his heralds proclaimed to the multitude that thronged the court-yard, "Who is there among men who has suffered wrong? Let him come to Akbar and he shall have justice."

At the back of this hall of audience, overlooking the Jumna and the boundless plain beyond it from a height of more than a hundred feet, is a small terrace upon which stand two thrones, one of white marble, intended for the Wuzir or Prime Minister of the Mogul Court, and the other of black marble, reserved for the Emperor himself. The latter is declared by popular tradition to have manifested a sensibility which marble thrones rarely exhibit, leading it to mark the downfall of its renowned masters with an omen like that of "Grandfather's Clock."

"Many monarchs it bore when Mogul Princes wore
The crown in their glory and pride;
But it split up, never to mend again,
When the old race died."

The crack which ran through the ancient throne, and the blood which is said to have issued from it when the usurping Rajah of Bhurtpur planted himself on the seat of the Moguls, in 1765, are still shown by conscientious native guides to all such as can contrive to believe in them. Along with this curiosity they exhibit another, viz.: a pair of curiously-carved wooden gates in one of the inner courts of the palace, which are set down in the guide-books as "The sandal-wood gates of the great temple at Somnauth, brought away by Mahmud of Ghazni, the first Afghan conqueror of India." This interesting statement is indorsed by more than one historian, but meddlesome modern research has discovered three slight inaccuracies in it, to wit: The gates are not sandal-wood; they are not from Somnauth, and they were not brought by Mahmud. In other respects the story is probably correct enough; and after all, what's the odds so long as the British tourist is happy?

But to describe the zenana, or ladies' quarter of the palace, would be to write parts of the "Arabian Nights" over again. Everywhere the same artistic delicacy of finish, strangely and incongruously blended with a riotous prodigality of luxury and splendor thoroughly Oriental. One might wander for weeks among these marble cloisters and echoing colonnades; these dainty pavilions peeping through dark masses of tropical foliage; these breezy terraces separated only by a low carved parapet from the tremendous depth below; these polished white walls studded with precious stones or inlaid with flowers of carnelian and lapis-lazuli; these luxurious baths in which the beauties of the imperial seraglio beheld their lovely faces flashed back from wall and ceiling in a thousand tiny mirrors; these stern arches of dark red sandstone; these screens of perforated marble, delicate as the finest lace, masking galleries, which, though now voiceless and lifeless as the grave, were once alive with soft whispers and girlish laughter. But the sceptre has passed from the house of Timour, and now

"In the lordly halls of Azamat
Her web the spider weaves."

English soldiers scribble their names in the arbor of "the gazelle-eyed Nur-Mahal," and Cockney tourists knock off pieces of the marble throne of Jahangir.

But who can describe the Taj Mahal, the crowning wonder of Agra and of all India, the fame of which has drawn crowds of travellers from the ends of the earth? Photographs, paintings, engravings, sketches, ivory carvings, models in wax or clay, and countless other imitations of the inimitable, have striven in vain to reproduce the unsurpassed mingling of grace and strength in its four towering minarets, its broad smooth platform of polished marble, its sculptured lace-work of marble screens, its wonderful inner gateway, whose fairy-like delicacy of execution almost masks its magnificent breadth and height; its Persian verses inlaid in slender arrowy black letters on the white surface of the arch, its two flanking mosques of dark-red stone, and the great white central dome which hovers like a summer cloud between earth and heaven. All this, seen through the long vista of dark glossy green and shining gold and flaming crimson formed by the central avenue of the beautiful garden in which it stands, is beyond the power of description.

The first glance, however, shows you only a tithe of the unmatched splendor of this mighty monument of the past. Every inch of its sculptured cornices, its battlemented roofs, its dainty kiosks, its inlaid columns, and the marble flowers that cluster in endless variety over its stately walls is worth long and careful study. It is a singular thought that at the very time when Christian England was breaking cathedral windows and demolishing altar screens, heathen India should have been rearing such a glorious structure as this. Never, surely, was any woman so honored; but a fitter offering might well have been found for the gentle spirit of that gracious Princess,

who was so justly named "Light of the World," than a monument of which every stone has been wet with the blood of men and the tears of widows and orphans. How many thousand native workmen perished during the seventeen years of its construction (1631-48) that Shah Jehan might blazon the pride which intermingled itself even with his life's greatest sorrow, none but God can tell, but assuredly the meanest headstone that crumbles amid the wind-swept moors of Scotland or the spray-lashed cliffs of Orkney is more precious in the sight of Him who is plenteous in mercy than this splendid memorial of human tyranny and human suffering.—*Correspondence of the New York Times.*

MONTHLY CHRONICLE.

FLOODS, disaster and distress throughout the Mississippi Valley during the entire month.

February 27. Cyclone at Valley Mills, Tex., almost entirely wrecking the town.

March 1. Fall of the roof and second story of the planing-mill of W. H. Reed & Sons, at Chillicothe, O.

March 1. The side wall of an unfinished building at 163 West One Hundred and First Street, New York, falls onto the next building and crushes it. One person badly hurt.

March 1. Fall of a four-story stone mill at Manayunk, Pa. The walls were just ready for the roof. Loss, \$25,000.

March 8. Reported earthquakes in Costa Rica, causing serious damage.

March 10. Fall of one span of a railroad trestle over Newark Avenue, Jersey City, together with eight loaded cars of a passing freight train.

March 15. Heavy winds at Little Rock, Ark., destroying a few houses.

March 18. Burning of the Crystal Palace Theatre, at Marseilles, France. Loss, \$200,000. No lives lost.

March 20. Tornado and heavy rains at Lexington, Ky., destroying the round-house of the L. & N. R. R., and many other buildings.

March 20. Fall of a new bridge of the Des Moines & Osceola Narrow Gauge R. R., at Lathrop, Io., under the first train of cars that tried to pass over it.

March 26. Burning of a large number of tobacco factories at Richmond, Va.

March 27. Heavy wind near Waynesboro, Ga., destroying trees and houses. One life lost.

March 27. Hurricane at Monroe, La. Buildings destroyed. Several negroes killed.

March 27. High wind at Cleveland, O. Trees and unfinished buildings blown down.

March 27. Heavy wind causing damage along the Central R. R., as far as Sandersville, Ga.

March 28. Cyclone near Loachapoka, Ala. Two men killed.

March 28. Tornado at Enfaula, Ala. Churches and buildings destroyed, and at least twelve lives lost.

CHEAP COUNTRY HOUSES.

NEW YORK, March 21, 1882.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—As you do not mention probable cost with your designs, where can be found pretty designs for country houses with appropriate price, that a person desiring to build a wooden house in the country can form some idea of probable cost, where amount is limited, before applying to an architect?

Also where can Butcher's Patent Composition be bought, and can it be used on floors that have been waxed before? X. Y.

[We have published some designs for small houses which have been carried into execution, giving also the actual cost. Vaux's Villas and Cottages, and Holly's Modern Dwellings (Harper & Bros.) give very many pretty designs, with estimates of cost, which although perfectly reliable for their own time and place, can be only very vaguely approximate for any other. The best way is to apply to a good architect in the first place, and tell him the location and style of house wanted. He will be able to give a tolerably accurate estimate of the probable cost per square foot of area on plan. Then divide the sum to be expended by the price per foot, and the quotient will give the limit of the surface to be covered by the plan, which the owners may please themselves by dividing up to suit their fancy, without the unpleasant feeling that they are working completely in the dark as to cost.

The expense of building the same house may vary in different localities more than a hundred per cent: certain materials which are cheap and plenty in one place will be extravagantly dear in another; methods of building which are perfectly safe and satisfactory in a dry, rocky district, may be absolutely dangerous in another; and last, but not least, the character and circumstances of the builders among whom it will be necessary to select a contractor, count as a very large factor in the price; so that an experienced architect, who thinks of all these points at once, is a far safer guide, both in estimating and in adopting the plans and specifications to suit the peculiar conditions, than any book can be.

Butcher's patent finish can be had of the inventor, Charles Butcher, 61 Haverhill Street, Boston.—EDS. AMERICAN ARCHITECT.]

THE NEW PROFESSION.

489 Fifth Avenue, N. Y., March 22, 1882.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

In a recent trip in Europe I was delighted to learn that young persons are studying Electrical Engineering. This is the new profession and therefore has not yet become overcrowded. Great fortunes have been made in Europe and this country in this new field. If

any of the younger readers of your valuable journal are interested, I will cheerfully give them any information in my power.

Women are eminently fitted for this profession.

Yours very respectfully, MARY ELIZA GREER.

"A STUDENT'S QUERY."

INDIANAPOLIS, March 30, 1882.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In reply to "A Student's Query" in your issue of the 25th inst. I would suggest the following as the simplest process (even more so than that which the editors suggest.)

Draw a line from the corner, bisecting the angle, and where it intersects the circle draw a tangent, which will intersect the square sides of the spandrel and thus produce a triangle, inscribe a circle in the same according to rule, and you will have the required solution. (Rule: bisect the three angles and the common point of intersection will be the centre of the inscribed circle.)

Yours respectfully, ANOTHER STUDENT.

NOTES AND CLIPPINGS.

FORETELLING STORMS BY AID OF THE TELEPHONE.—*Les Mondes* reports that M. Dufourcet has in the exposed court of his house two bars of iron planted in the earth, to each of which is fixed a conductor of coated wire, terminating in a telephonic receiver. He consults the apparatus twice or thrice every day, and it never fails through its indications of earth currents to give notice of the approach of a storm twelve to fifteen hours before it actually arrives.

THE ARTISTIC FEELING OF NATIVE MEXICANS.—A Mexican correspondent says the skill of the natives in making little figures in clay is astonishing. They are by nature artists and sculptors. They will produce your own portrait for you in pottery, or cloth, or wax,—a bust or a bas-relief, with a fidelity which is remarkable. To "see yourself as others see you," you have but to say to one of these Indians that you desire your "counterfeit presentment," and he will produce it in a style which, if not flattering, will at least be faithful. If cultivated, what might not this talent which, in fact, amounts to genius, produce?

IVY.—Who does not remember the town-loving old lady who expressed her horror of a country life "because the ivy made all the houses damp"? The old lady did but express the common idea upon the subject; but it is a very erroneous idea nevertheless. The attachment of ivy to walls, so far from injuring them and causing dampness, is an advantage. If the walls are dry when planted ivy will keep them so. If damp, as the plant overspreads their surface the dampness will disappear. Where dampness prevails ivy sucks out the moisture, and its thick foliage will prevent the access of rain to the structure; and thus it is not only a remover but a preventive of dampness. The only danger attending the planting of ivy on buildings is where fissures occur in the walls, in which case the shoots and roots will enter, and, if left undisturbed, their growth will soon begin to tell upon the building, and will, by increase of growth, push against the sides of the opening, thereby enlarging it, and eventually so weaken the wall as to cause it to fall. Where the wall is sound there is no such danger, for the plant does not make fissures, although quick to discover them.—*Land*.

LONDON FOG.—*The Lancet* declares that it is simply absurd to attribute the fogs of London to smoke, and asserts that the fogs of forty or fifty years ago, when the consumption of coal was much smaller than it is now, were vastly blacker and denser than those of to-day. "Dwellers in the metropolis," says *The Lancet*, "whose personal recollection extends as far back as the dates specified will remember that it was no infrequent experience to rise in the morning with a fog so dense that even the flowerpots on the ledge outside the windows could not be seen, and the panes of glass had the appearance of being painted with a deep dirty yellow pigment. If the railings across an ordinary area—say in Guilford Street or Russell Square—could be seen, the fog was deemed none of the worst. If the foot-passenger could discern his hand held extended before him he was surprised. To be able to grope his way, almost as a blind man walks with his stick, was a triumph. The stock material of the fog would at that time, to judge by the taste, seem to have been entirely composed of sulphurets. Its effect on the air-passages was so irritating that the cries of the link-boys and hackney coachmen were almost drowned in the chorus of coughings with which the street perpetually rang."

CREMATION AND THE PRESENT BURIAL SYSTEM OF PARIS.—The question of cremation will probably be agitated in France with renewed activity in view of the recent report upon the condition of some of the cemeteries of Paris. The space available for temporary concessions—that is to say, rented for limited periods—and for free inhumations in the cemeteries of Ivry and of St. Ouen was, on the 1st of January, 1881, something over nine hectares—the hectare is almost two acres and a half—and during the year space was conceded for 13,615 interments and for 34,258 free burials, leaving at the end of the year less than one and a half hectares unoccupied. The ground conceded in 1876 and falling in 1882, brings up the disposable area for the current year to a trifle over six and a half hectares, while, allowing the mortality not to exceed that of last year, seven and two-thirds hectares' space would be required. The Government will have to do as it did last year, and enforce the law of the minimum period, reëntering into possession of the lots rented in the first half of 1877—a measure which, though naturally painful to the thousands of lessees, is indispensable. This will carry things on till March, 1883, if nothing out of the common happens; but the very slightest epidemic would compel a collapse of the system and leave the poorer class of Paris literally unable to bury their dead.—*New York World*.

ST. SOPHIA IN DANGER.—For some time past the condition of St. Sophia, the largest and most magnificent of Constantinople's three hundred mosques, has been such as to inspire considerable anxiety in the breasts of true believers. During the reign of Abdul Medjid this monumental edifice, which at that time exhibited alarming symptoms of decay, was submitted to an elaborate and costly process of restoration under the direction of the Italian architect Fossati, and the completion of its repair was celebrated on the 19th of July, 1849, by the present Sultan's father, who reopened the sacred building for public worship in person and caused a large number of golden medals to be struck and distributed among the faithful in commemoration of that auspicious occasion. Fossati's work, however, has not stood the test of time, and it appears that the huge cupola of "Aja-Sophia" is at the present moment threatened with collapse. A few days ago the committee of architects appointed by Subhi Pasha, the Evkaf Naziri, or administrator of ecclesiastical property, to investigate the state of the venerable mosque reported to his Excellency that the cupola might fall in any day, crushing to death hundreds upon hundreds of those who daily offer up prayers within the precincts of Justinian's colossal structure. It is stated that Abdul Hamid, before whom the report in question was at once laid by the Evkaf Naziri, has decreed that "Aja-Sophia" shall be closed to the public until its thorough renovation, which will be undertaken without delay, shall have been effected. His Majesty, doubtless, is not unmindful of the old Mussulman prophecy, which predicted that "when Aja-Sophia shall fall the destruction of the Ottoman Empire will be hard at hand."—*London Daily Telegraph*.

THE TATTIE.—The tattie in India is a large curved or sloping screen which accurately fits into each door or window facing the west, and is made of the roots of the khushkus grass (*Andropogon muricatus*), which singularly combines strength and porosity with the most delicious and refreshing fragrance. These screens are about an inch in thickness, and, during the hot and dry west wind, are saturated from outside with water, which immediately commences evaporating under the fierceness of the blast; and as evaporation always implies cold, the wind, which, in the veranda, would raise the thermometer to 120 degrees Fahrenheit, passes into the house at 75 or 80 degrees, laden with a delicious fragrance. While tatties are in working order all other cooling appliances are unnecessary. Unfortunately the west wind, commencing about 10 A.M., dies away about sunset, and then we resort to our punkahs and theriantidotes. In some parts of India—for instance, in the neighborhood of Gwalior and Jhansi—we have another delightful form of tattie. A small creeping, thorny variety of the bér (*Zizyphus jujuba*) is largely found in the jungles; this is collected and dried, and at the proper time, the whole west veranda is inclosed with thorny walls nine to ten inches thick, and these being saturated from the outside, all doors are thrown open, and a delightful temperature secured. Tatties are of no use during the easterly wind, which ushers in and accompanies the rains: laden with moisture, it is a damp wind, and therefore retards evaporation.—*Chambers's Journal*.

FRENCH ARCHITECTS' FEES.—An important decision has lately been delivered by the Third Chamber of the Civil Tribunal of the Seine, which determines the much-disputed point, whether the fee or honorarium of an architect should be reckoned on the limit price fixed before competition or on the amount of tender accepted. M. Bourdeix, architect, had been commissioned to prepare the plans of a house for M. Jacobi. Various contractors submitted tenders more or less below limit price, the reduction in one case amounting to over 35 per cent. As a rule, in France, the construction of a building is not undertaken by one, but by several contractors, each taking his own particular branch, such as masonry, carpenter's work, plumbing, etc. When the time for payment came, M. Bourdeix, to whom all accounts were submitted, settled with the contractors at the price of their tenders, but claimed from M. Jacobi 5 per cent, on the original limit price (*devis*). This claim was contested. The owner paid into court 5 per cent upon the sums actually disbursed. The Tribunal, however, decided that M. Bourdeix was entitled to percentage on the full *devis*, basing its judgment on the ground that all the contractors, having tended considerably below the limit, more care and supervision were necessary on the part of the architect to insure good quality in the work. This decision will no doubt be accepted as regulating fees, and will make a considerable difference in the incomes of many French architects.—*London Architect*.

RELATIVE NON-CONDUCTIVITY.—Mr. Charles E. Emery, of New York, recently made some experiments upon relative non-conductivity, with reference to the needs of the New York Steam Company. His apparatus consisted of a boiler 12 ft. long and 4 ft. in diameter, with three 10-inch flues passing through it. Inside these flues were smaller tubes, through which the steam passed. The non-conductors surrounded the inner tubes, and water was kept circulating around the flues in the outer shell. A layer of hair-felt 2 inches thick gave the best result, and using equal thicknesses of the other materials the following results were obtained:

Material.	Non-conductivity. Per cent.
Hair-felt.....	100
Mineral wool, No. 2.....	83.2
Mineral wool, No. 2 and tar.....	71.5
Saw-dust.....	68
Mineral wool, No. 1.....	67.6
Charcoal.....	63.2
Pine wood, across grain.....	55.3
Loam.....	55
Gas-works lime, slaked.....	48
Asbestos.....	36.3
Coal ashes.....	24.5
Fuel coke.....	27.1
Air-space, 2" deep.....	13.6

The low result from air-space no doubt is due to the unimpeded circulation of the currents.—*Engineering News*.

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.]

- 255,436. SKYLIGHT.—Frederick H. Leadley, St. Louis, Mo.
 255,437. PAPER-HANGING OR WALL-PAPER.—Edward Leissner, New York, N.Y.
 255,453. ELECTRIC ANNUNCIATOR.—Henry B. Porter, Chicago, Ill.
 255,459. SCREW.—Charles D. Rogers, Providence, R. I.
 255,471. CORNICE HOOK OR BRACKET.—Charles D. Stone, Brooklyn, N. Y.
 255,485. WATER-CLOSET.—James D. Boyle, Brooklyn, N. Y.
 255,489. ICE-FLOOR FOR COLD STORAGE-HOUSES.—Homer C. Cain, Cleveland, O.
 255,511. ILLUMINATING GRATING.—Thaddeus Hyatt, Brooklyn, N. Y.
 255,516. INSIDE BLIND.—John Krehbiel, Lockport, N. Y.
 255,535. HEATING BATH-TUBS BY STEAM.—James Reilly, Brooklyn, N. Y.
 255,538. INSIDE BLIND.—Franz Rühr, Teplitz, Austria.
 255,571. SPRING CURTAIN-ROLLER.—George T. Bettencourt, Providence, R. I.
 255,584. FIRE-ESCAPE LADDER.—Richard F. Bridwell, San Francisco, Cal.
 255,590. VALVE FOR FIRE-EXTINGUISHERS.—Albert M. Burritt, Waterbury, Conn.
 255,595. CONSTRUCTION OF BUILDINGS.—Andrew J. Chase, Boston, Mass.
 255,608. CONSTRUCTION OF HOUSES FOR PURPOSES OF VENTILATION, ETC.—Peregrine G. Eaton, Springfield, N. Y.
 255,646. SELF-ACTING ELEVATOR SAFETY APPARATUS.—James McCarroll, New York, N. Y.
 255,663. AUTOMATIC HATCHWAY-DOOR OPERATOR.—John L. Peters, New York, N. Y.
 255,664. CEMENT-PIPE WELL.—George D. Pettin-gill, Asbury Park, N. J.
 255,682. VALVE FOR WATER-CLOSES.—William Scott, Malden, Mass.
 255,699. BLIND-SLAT HOLDER.—John S. Thompson, Brooklyn, N. Y.
 255,700. BESCH-VEISE.—John Thomson, Brooklyn, N. Y.
 255,721. SASH-BALANCE.—Frederic B. Cochran, Boston, Mass.
 255,722. BURGOLAR-ALARM.—George P. Conant, Geneva, Wis.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report 27 permits have been granted, of which the following are the more important:—

- D. T. Haynes & Co., one-sty brick building, 38' x 124' 6", s w cor. Nicholson and Decatur Sts.
 C. A. Pindell and J. A. Frisby, 12 two-sty brick buildings, 11' 6" x 26' each, Rutter Alley, bet. Lanvale and Dolphin Sts.
 Walter W. Rowles, Jr., three-sty brick building, Druid Hill Ave., n of Hoffman St.
 Caroline Krouse, three-sty brick building, Poca St., bet. Hamburg and Sterrett Sts.
 Edw. Heffner, Jr., 2 three-sty brick buildings n e cor. McKim and John Sts.
 Wm. McCoy, 3 two-sty brick buildings, Gilmor St., bet. Baker and Calhoun Sts.
 Bartlett, Hayward & Co., one-sty brick building, 60' x 242', s e cor. Bartlett and McHenry Sts.
 Leopold and Bro., five-sty brick warehouse, No. 334 Baltimore St., bet. Howard and Eutaw Sts.
 E. Langhammer & Son, three-sty brick warehouse, No. 350 Aliceanna St., bet. Chester and Boston Sts.

Boston.

Y. M. C. A. BUILDING.—Work has begun on the Y. M. C. A. Building, at the corner of Beylston and Berkeley Sts.; Messrs. Sturgis & Brigham, architects.

REPORT FOR 1881.—The following items are taken from the recently published report of the Inspector of Building for the year 1881:—

Permits issued for brick, stone and iron buildings, 308; for wooden buildings, 787; and for additions, alterations and repairs, 2,485.
 103 brick buildings were completed, and final reports made, at an estimated cost of \$1,521,852; 300 wooden buildings completed at a cost of \$686,643, and 1,957 completed alterations, etc., at a cost of \$935,765.

Among the brick buildings erected there were 174 dwellings, 20 family hotels and stores, 1 banking institution, 23 mercantile, and 5 public buildings.
 1872 violations of the statutes and ordinances were investigated and reported on.

1242 examinations were made on buildings with reference to their means of egress in case of fire or panic, and 108 fire-escapes were completed, at a cost of \$10,284. 371 buildings were damaged by fire during the year, total loss by which was \$132,653.

BUILDING PERMITS.—*Brick.*—Huntington Ave., Ward 11, for Frank W. and C. F. Kittredge, family hotel, 12' 6" and 68' x 102' and 122', five-sty and mansard.

K St., near East Ninth St., Ward 14, for Edward S. Winchester, machine-shop, 70' x 200', and ell, 60' x 70'.

Wood.—*Bellevue St.*, near Columbia St., Ward 14, for Chas. A. Uppam, 2 dwells., 24' x 30'; ell, 15' x 20', two-sty; Wm. Eadie, builder.

Putnam St., No. 69, Ward 1, for Cyrus H. Taggart, dwell., 20' x 30'; ell, 15' x 27', two-sty mansard; Davis Davison, builder.

Rutherford Ave., near, nearly opposite Miller St., Ward 5, for J. H. Pote & Co., blacksmith shop, 21' x 25'; Chas. B. Erskine.

O St., near East Broadway, Ward 14, for L. D. Robinson, dwell., 19' 6" x 31', two-sty mansard; L. D. Robinson, builder.

O St., near East Broadway, for Chas. S. Judkins, dwell., 19' 6" x 31', two-sty mansard; L. D. Robinson, builder.

C St., cor. Baxter St., Ward 13, for Thos. Kehoe, dwell., 21' x 35', three-sty; Coveney & Hanlon, builders.

East Fourth St., Nos. 705 and 707, and 118 and 120 Emerson St., Ward 14, for W. G. Doe, 2 dwells., 22' x 32', two-sty mansard; Wm. T. Eaton, builder.

Hudson St., near Clifton St., Ward 20, Lyman Titus, dwell., 23' x 48', two-sty mansard; Lanning & Drisco, builders.

Harvard Ave., cor. Fairington Ave., Ward 25, for A. S. Richardson, dwell., 37' x 41'; ell, 21' x 32' 6", two-sty; C. W. Bowers, builder.

Bird St., near Ceylon St., Ward 20, for John J. Merrill, dwell. and stores, 29' 6" x 35' 6" x 39' and 41' 6", three-sty; Noyes Bros., builders.

Tremont St., cor. Parker St., Ward 22, for P. T. Hanley, dwell., 38' x 38'; ell, 17' x 28', two-sty mansard; Wm. Hunt, builder.

Rockview St., cor. Green St., Ward 23, for Dr. Elizabeth C. Keller, dwell., 40' x 45', two-sty; John D. Wester, builder.

Southwood St., Ward 21, for J. C. and E. A. Loud, 2 dwells., 16' 6" x 50', three-sty; John J. Murphy, builder.

Fuller St., rear, near Dorchester Ave., Ward 24, for Wm. H. Morrison, stable, 22' x 26'.

Euclid St., cor. Withington St., Ward 24, for Joseph M. Pike, dwell., 21' and 29' x 31', two-sty; Chas. Stinson & Co.

Howland St., near Warren St., Ward 21, for S. S. Campbell, dwell., 23' 2" and 28' 2" x 42' 8", two-sty.

Cabot St., Ward 19, for Wm. Gaston, 2 dwells., 23' 11" x 41' 11", three-sty mansard.

Brooklyn.

BUILDING PERMITS.—*Jara St.*, n s, 225' w Manhattan Ave., two-sty frame dwell.; cost, \$4,000; owner, C. Murray, 19 Dupont St.; architect, James Mullhall; builder, John Fallon.

Oakland St., n s, 225' n Norman Ave., three-sty frame tenement; cost, \$3,300; owner, Louis Delte, Oakland St.; architect, Fred. Weber; builders, P. Newman and J. J. Randall.

Floyd St., No. 309, n s, 325' e Sumner Ave., three-sty frame tenement; cost, \$4,000; owner, Cath. Straub, 340 Floyd St.; architect and builder, Geo. Straub.

Willoughby Ave., s s, 340' e Nostrand Ave., 3 two-sty brownstone dwells.; cost, \$5,500 each; owner and carpenter, Arthur Taylor, 822 De Kalb Ave.

Belvidere St., No. 36, s s, 75' s Beaver St., two-sty frame dwell.; cost, \$3,000; owner, Julius Muth, cor. Siegel and Ewen Sts.; architect, Th. Engelhardt.

Second St., No. 431, w s, 50' n North Eighth St., three-sty frame tenement; cost, \$3,800; owner, Fr. Loeffel, 418 Second St.; architect, Th. Engelhardt.

Montrose Ave., s s, 100' e Lorimer St., three-sty frame store and tenement; cost, \$5,000; owner, F. Schumann; architect, J. Platte; builders, Wm. Dafelecker and C. Weiber.

St. John's Pl., n e cor. Seventh Ave., one-sty Martinville stone church; cost, \$43,000; owner, Grace M. E. Church; architects, Parfitt Bros.; builder, T. W. Rollins.

Shirley Pl., n s, 90' e Seventh Ave., 3 three-sty brownstone dwells.; cost, \$19,000; owner, William Gubbins, 20 Seventh Ave.; architect, T. F. Houghton.

Berkeley St., n s, bet. Seventh and Eighth Ave., 6 three-sty brownstone dwells.; owners and architects, J. Doherty & Son, 280 Flatbush Ave.

ALTERATIONS.—*Myrtle Ave.*, Junction Hamburg Ave., interior alterations; cost, \$2,000; owner, Loftus Wood, Broadway; architect, W. B. Ditmars; builders, Geo. Hughes and C. L. Johnson.

Nassau St., No. 109, three-sty brick extension; cost, \$2,000; owner, Louis Fischer, on premises; architect, C. F. Kisenach; builders, O. Nolan and W. Zang.

Cincinnati.

BUILDING PERMITS.—Since our last report the following building permits have been issued:—

Aug. Meinsmeyer, two-sty brick dwell., s w cor. Ludlow and Nixon Sts.; cost, \$5,000.

A. Levi, two-sty stone front dwell., Eighth St., near Cutter; cost, \$3,000.

D. Foster, addition to three-sty brick dwell., 355 West Sixth St.; cost, \$2,000.

E. L. Harper, addition to four-sty brick dwell., 131 Race St.; cost, \$5,000.

E. Kugeman, two-sty brick dwell., Ohio Ave., near Calhoun St.; cost, \$5,000.

12 permits for repairs; total cost, \$3,300.

New York.

CHURCH.—Messrs. D. & J. Jardine have prepared the plans for the Cornell Memorial Church, 70' x 100'. The church which is to be built of two kinds of stone is to be built on the n side of Seventy-sixth St., bet. Second and Third Aves. It will have no columns, the interior being arranged so that all seats shall have an uninterrupted view of the pulpit.

OFFICE-BUILDING.—Mr. Orlando B. Potter has decided to erect a lofty office-building on Park on the site of the recent disastrous fire; Messrs. Starkweather & Gibbs will be the architects.

FLATS.—Mr. Benjamin F. Spink is to have built on the s side of One Hundred and Twenty-fifth St., 180' e of Fifth Ave., a four-sty flat building, to cost \$40,000.

000. It will be 45' x 85', built of brick with stone trimmings; Messrs. D. & J. Jardine, are the architects.

APARTMENT-HOUSES.—A first-class apartment-house is to be built at the cor. of Broadway and Sixty-second Sts., from designs of Mr. Emile Grewé.

Mr. Mason is to have two apartment-houses, one 20' front, and one 30' front, built on Ninetieth St., near Third Ave. They will be five-sty, the first floor to be brownstone, above brick with brownstone finish; cost, about \$50,000; Mr. L. B. Wheeler, architect.

HOTEL.—For Judge Hilton, a two-sty brick hotel, 46' x 54', is to be built in the rear of Nos. 31 and 33 Lafayette Pl., at a cost of \$15,000.

ALTERATIONS.—Alterations are to be made in St. Theresa's Church, at the cor. of Rutgers, and Henry Sts.; the alterations are to cost \$10,000, and to consist of lowering the basement, building of retaining walls, building foundations for marble altars, and entirely slating the roof of the structure; Mr. Laurence J. O'Connor is the architect.

No. 6 East Eighteenth St., is to have a story added at a cost of about \$2,500; Mr. Chas. Yandell is the owner; Mr. James Stroud the architect.

BUILDING MATERIALS show no change; the demand is only moderate, but prices are firmly maintained. **LABOR MARKET** is very uneasy; the hod-carriers this week demanded \$2.50 per day, which in some instances has already been allowed them.

RESIDENCES.—5 residences are to be erected on Thirty-sixth, bet. Lexington and Third Aves. They will be of brick with brownstone finish, four-sty, with fronts varying from 17' to 23' and a uniform depth of 60'. The cost will be in the neighborhood of \$30,000; Messrs. Chas. Buck & Co., architects and owners.

WAREHOUSE.—A large tea warehouse is to be built on the cor. of Greenwich and Vesey Sts., from designs of Mr. Hugo Kafka.

DWELLING.—Mr. Wm. H. Vanderbilt has invited Messrs. D. M. Atwood, Carl Pfeiffer, Jas. Renwick and J. B. Snook, to prepare competitive plans for the residences he intends to build for his daughters on Fifth Ave. cor. Fifty-fourth St.

BUILDING PERMITS.—*Greenwich St.*, No. 164, cor. Cortlandt St., five-sty store and lofts; cost, \$15,000; owner, William Schermerhorn, 68 Wall St.; architect, H. J. Hardenbergh.

Baxter St., s w cor. Walker St., five-sty brick store and tenement; cost, \$10,000; lessee, Jacob Cohen, 100 Baxter St.; architect, Julius Hoeckel.

Baxter St., w s, 58' s Walker St., 3 five-sty brick stores and tenements; cost, each, \$8,500; lessee and architect, same as last.

Walker St., s s, 30' w Baxter St., four-sty brick dwell.; cost, \$5,000; lessee and architect, same as last.

Third Ave., n e cor. One Hundred and Ninth St., four-sty brick store and tenement; cost, \$12,000; owner and builder, John W. Warner, One Hundred and Sixth St., bet. Fifth Ave. and Madison Ave.; architect, Wm. Graul.

Third Ave., e s, 20' n One Hundred and Ninth St., 2 four-sty brick stores and tenements; cost, each, \$11,000; owner and builder, same as last.

Third Ave., e s, 75' n One Hundred and Ninth St., one-sty store and tenement; cost, \$11,000; owner and builder, John W. Warner, One Hundred and Sixth St., bet. Fifth and Madison Aves.; architect, Wm. Graul.

Seventh St., No. 208, five-sty brick tenement; cost, \$10,000; owner, Nathan Langschus, 208 Seventh St.; architect, F. W. Klem.

Elizabeth St., No. 9, three-sty brick factory; cost, \$7,000; owners, Fowler & Rockwell; architects, Kerby & Archer.

Sixty-third St., n s, 75' w Fourth Ave., 7 four-sty Connecticut brownstone dwells.; cost, each, \$20,000; owner and builder, William H. Browning, 411 East Seventy-seventh St.; architects, Thom & Wilson.

Fifty-seventh St., s s, 150' e Second Ave., three-sty brick tenement; cost, \$11,000; owner, Mark Rinaldo, 220 East Thirty-third St.; architect, A. B. Ogden.

Seventy-seventh St., n s, 30' w Lexington Ave., three-sty brick stable; cost, \$8,000; owner, Daniel D. Brinkerhoff, 29 East Seventy-seventh St.; architect, A. B. Ogden.

Seventy-second St., n s, 300' e Second Ave., 2 five-sty Connecticut brownstone apartment-houses; cost, each, \$28,000; owner, Samuel Simmons, 13 Sheriff St.; architect, Chas. Baxter.

Seventy-second St., n s, 360' e Second Ave., 2 five-sty Connecticut brownstone apartment-houses; cost, each, \$19,000; owner and architect, same as last.

Second Ave., n w cor. Seventy-third St., five-sty Connecticut brownstone apartment-house; cost, \$25,000; owner, A. H. Jonas, 13 Sheriff St.; architect, Chas. Baxter.

Seventy-third St., n s, 80' w Second Ave., five-sty Connecticut brownstone apartment-houses; cost, \$14,000; owner and architect, same as last.

Seventy-third St., n s, 105' w Second Ave., 10 five-sty Connecticut brownstone apartment-houses; cost, each, \$20,000; owner and architect, same as last.

Seventy-third St., n s, 355' w Second Ave., 2 five-sty Connecticut brownstone apartment-houses; cost, each, \$30,000; owner and architect, same as last.

Seventy-third St., n s, 415' w Second Ave., 2 five-sty brownstone apartment-houses; cost, each, \$20,000; owner and architect, same as last.

Seventy-second St., s s, 270' w Second Ave., 2 four-sty Connecticut brownstone apartment-houses; cost, each, \$18,000; owner, Samuel Simmons, 13 Sheriff St.; architect, Chas. Baxter.

One Hundred and Twentieth St., s s, 200' e Third Ave., 4 four-sty brick tenements; cost, each, \$12,000; owner, Laurence Wieher, 324 East One Hundred and Twenty-first St.; architect, Chas. Baxter.

One Hundred and Twenty-first St., s s, 183' e Second Ave., four-sty brick apartment-house; cost, \$25,000; owner, Patrick McCormick; architect, Chas. Baxter.

One Hundred and Twenty-eighth St., n s, 225' w Sixth Ave., three-sty brick stable; cost, \$30,000;