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THE work upon the Indiana State-House, which was virtually suspended for a time after the discovery was made by the contractors that they could not finish the building for the price agreed upon, is, according to the *Commercial Gazette*, to be resumed at the expense of the bondsmen of the contractors. It will be remembered that the latter made their price for the work at a time when wages and materials were low, and the sudden rise in both which took place two years ago not only swept away their profit, but involved them in losses, which continually increased as the building went on, and it was not until their property had been exhausted in making up the difference between their receipts and their expenditure that they appealed to the State-House Commissioners, and through them to the Legislature, for a modification of the contract, by which they might be paid the actual cost of carrying on the building. The contractors offered to give their own time and skill to the State, without pay, until the completion of the work, provided they could be relieved of the necessity for involving themselves still further in debt. We expressed at the time a hope that the Legislature would be magnanimous enough to consider it unworthy of a great State to take advantage of the mistakes of its citizens, and would accede to the contractors' modest petition, but, no doubt for good reasons, it decided otherwise. For some months it seemed uncertain whether the terms of all the agreements were drawn with sufficient skill to hold the contractors and their bondsmen strictly to their promises, but after what we may presume to have been a diligent search for loopholes of escape, the expectation of finding any appears to have been abandoned, and as the contractors' money is entirely gone, the sureties must, to save themselves from a forfeiture of their whole bond, complete the building themselves.

THE struggle between the managers of the Amalgamated Building-Trades Union, in New York, and the master-builders, has continued during the past two weeks without much change, the contractors generally remaining firm, and, if anything, gaining a little, while the Union dictators have grown more and more unscrupulous in their efforts to coerce their opponents and their own subjects. Our readers will remember that Mr. Power, the plasterer at the Dakota apartment-house, was placed under the ban of the Union for refusing to discharge two of his men who declined to join it, and will also recollect that, finding him disinclined to submit to their orders, the delegates of the Union applied to the trustees of the estate which owns the Dakota building, threatening to call out all the men from a row of houses building not far off for the same estate, but by different contractors. The trustees of the estate happened to be gentlemen of honor, and declined to be used as cat's-paws for coercing free citizens, and the delegates thereupon called out every Union man at work upon the buildings belonging to the estate. For two weeks the houses remained deserted, but at the end of that time signs of discontent showed themselves among the men who had so meekly laid down their tools at the word of command. A society of German framers, as might perhaps have been expected, was the first to rebel, and resolved in full meeting to notify the Executive Committee of the Amalgamated Union of their intention to resume work; and the next day the members of the society who were employed on the buildings of the proscribed estate returned to their task. With them came also a number of members of the Tin-Roofer's Union, actuated by similar motives, and justifying their disobedience on the ground that the strike, which was ordered solely for effect upon contractors and men in another building, was unfair and wrong.

IT is very evident, as the contest progresses, that a little more courage on the part of the contractors would have secured for them an easy victory. The Executive Committee of the Amalgamated Union, notwithstanding the stringent oaths and enormous penalties by which they bind their victims, cannot drive those who have families to support beyond a certain degree of compliance, and their success in ordering large bodies of men to drop their work at their bidding depends very much on their ability to find employment for them elsewhere. For this reason the attack is made only upon one or two contractors at a time, and a week or so ago, the burden having evidently become rather too heavy to be handled, a "compromise" was undertaken with the contractors for a large building, by which the men might continue at their work. Such "compromises" would quickly have become the rule if other contractors had emulated the manliness of Mr. Power and Mr. Tucker in befriending their non-Union workmen, and the first strike would probably have been the last. As an expedient for distressing contumacious contractors, without assuming the burden of finding work for men called out on strike, the indefatigable managers of the Amalgamated Union have recently hit upon the idea of inducing Messrs. Eidelmeyer & Morgan, the proprietors of the admirable little hod-elevators now much used in New York and other places, to remove their apparatus from buildings where a strike had been ordered by them. The firm is said to have been threatened, in case of refusal, with the ordering of a general strike in all buildings where its elevators are in use. It is very unlikely that this threat would be carried out, but the transaction sufficiently shows the malicious ingenuity of the men who exercise such absolute authority over a large part of the population of New York.

AT a recent conference between the Executive Committee of the National Association of Master-Plumbers and a number of manufacturers and dealers in plumbing material a remark was made in relation to price-lists of such material, by one of the best and most sensible plumbers in the United States, which we commend to the attention of every person interested in the subject. After referring to the absurd method of preparing price-lists and catalogues now used, in which there is no relation whatever between the list prices and those deduced from the discount-sheet, the speaker went on to urge the adoption of a rational plan by which the net and the "long" prices should be placed in some sort of proportion to each other, saying that such a system would conduce to the interest of the plumber, and would promote more amicable relations between him and his customers. We are glad, from the architect's standpoint, to confirm this opinion in the strongest manner. With all our good will toward the most useful, as well as the most scientific of all the trades concerned in building, we must confess that we never see a plumber's bill for what is ostensibly a day's work job, containing items of materials charged by the list price, at a profit to the plumber of one, two or three hundred per cent over the net cost, without a conviction that the Plumbers' Association need not look far for one of the reasons of that public contempt and dislike of which it took early occasion to complain. Nor do the careful concealment of the discount-sheets by dealers in materials from all but plumbers, or the anathemas of the trade associations against all dealers who sell goods to the consumers without their intervention, tend to increase our confidence in the honesty of those who desire to resort to such expedients; on the contrary, we can say, for ourselves at least, that the more assiduously the discount-sheets

are hidden away by the dealers, the greater is the effort which we make to obtain them, or, failing that, the more rigidly do we exercise our judgment and experience in cutting down the list prices on plumbers' bills to such as will afford a fair and honest profit.

THAT a plumber is entitled to a reasonable profit on the materials which he keeps and handles we do not for a moment deny, but no one can charge his unsuspecting customers with a profit of two hundred per cent, or can even show a desire to put himself in a position for making such profits without detection, and retain his reputation as a man of honor and integrity. Plumbers will understand what we mean, but for the benefit of those who are not plumbers we will cite the example of a bill which we had the pleasure of examining a few years ago, in which a considerable amount of iron pipe and fittings, among other items, was charged at the list price. Iron pipe was cheap at the time, the discount being seventy per cent, so that the profit on that portion of the bill alone was, or would have been if it had been paid, two hundred and seventeen per cent. No doubt the plumber thought he was simply following the custom of the trade in making out his bill in this way, and in fact, judging from our experience, he was; but the reason for mentioning this particular case is that the person for whom the work was done, taking the view of this method of doing business which, when its peculiarities are pointed out to them, we have found most people, not in the plumbing trade, to adopt under similar circumstances, forthwith transferred his confidence, and with it a jobbing business of eight thousand dollars a year, to a plumber who was willing to show how he earned his money. That other plumbers will, as General Locke says, find a fair and open system of profits and charges in the end the best for them, as it has been found to be for every other trade, we are firmly convinced, and we can moreover assure them that until they abandon their secret discount-sheets, and cease their screams for "protection" from dealers, to adopt such a system, they must be content to remain objects of distrust on the part of the community, and the butt of the silly wit of those who only express that distrust.

ONE of the ablest sanitary and drainage engineers in the world is now Sir Robert Rawlinson, baronet, the Queen having been pleased to confer that rank upon a man who has well earned it. Although thus honored by a recognition which falls to the lot of few professional men in England, Sir Robert Rawlinson owes nothing of his success to circumstances or connection. Brought up to the humble trade of a stonemason, his passion for acquiring and using knowledge led him, after many years of application, to a high rank among engineers, and in 1848 he was appointed Engineering Inspector under the first Public Health Act. In performing the duties of this office he visited and examined every important town in England, and seven years later, on the breaking out of the Crimean War, he was sent to the Black Sea as the engineer member of the famous Sanitary Commission. The work done by this Commission will be remembered as long as sanitary science is studied, and from that time Mr. Rawlinson has been constantly in the public service. In 1863 he was sent as Commissioner to Lancashire to devise modes of employment for the distressed mill-operatives of that district, thrown out of employment by the blockade of the Southern ports during our civil war, and under his care an immense amount of road and sewer building, paving and drainage, was executed for the Government by the poor cotton spinners and weavers. Since then his attention has been constantly occupied both with public and private business, and even now, at the age of seventy-three, his influence in the profession is as extended, and his enthusiasm for progress as sincere, as at any period of his life.

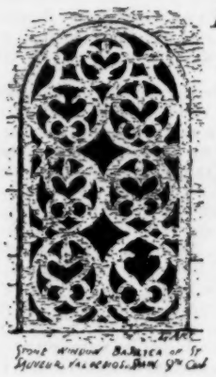
THIS is the season of "recompenses" in the French School of Fine Arts, and the award of the grand prize has just been made. The subject assigned was a "necropolis" for the burial of the founder of a great state; and the first grand prize was awarded to M. Fernand Redon, pupil of M. André. The second grand prize was given to M. Léon-Eugène Quatesous, pupil of M. Pascal; and the third to M. Alphonse-Alexandre Defrasse, pupil of M. André. Among the lesser prizes, the grand "medal of emulation," given to the student in the school who has received the greatest number of honorable mentions during the year, was awarded, in the department of architecture, to M. Duret, pupil of M. Guadet; and the "Prix Abel Blouet," for the student in the first class in architecture who has maintained the highest standing since his entrance into the school, was given to M. Devienne, pupil of MM. Coquart and Guérard. The "Prix Jay" for construction was awarded to M. Lechevallier, pupil of M. Guadet; and another pupil of the same distinguished architect, M. Duray, obtained the first "Prix Jean Leclaire," for general excellence during the year, while the second prize of the same name, awarded to the student passing in the shortest time from the second to the first class, was carried off by M. Pillette, pupil of M. André.

THOSE architects who may be called upon to design buildings for New York should take notice that hereafter no bay or oriel window, projecting beyond the building-line of the street, can be constructed under any circumstances; and plans submitted to the Bureau of Buildings, which show any such projections, will be at once rejected. This will be bad news for those who expect to live in the apartment-houses of the future. Hitherto, the designers of such buildings have availed themselves to the fullest extent of the regulations permitting the projection of bay-windows into the street, and many pleasant apartments are in consequence rendered still pleasanter by their outlook up and down the length of Fifth or Madison Avenues. Of course, those now built will not be affected by the change in the law, and their owners will value all the more their monopoly of a charming feature in city dwellings.

A CORRESPONDENT of the New York *Sun* writes from Florida a sharp criticism upon the proposition for cutting a canal across the upper end of that peninsula. The cost of making the canal he considers to have been very much under-estimated, and believes that it would amount to two hundred and fifty millions of dollars, while its value to navigation would be very small. The distance which such a canal would save coasting vessels in the voyage between the Gulf ports and the North he estimates at from three hundred to five hundred miles, but the time consumed in the passage through the canal, with that required for entering port at one end, and leaving it at the other, would be more than that necessary for taking the longer route, while the cost of towage, the canal tolls, the port dues at each end, pilotage and insurance, would far exceed the saving made by shortening the distance sailed. The dangers of the Florida reefs, which the canal route would avoid, the *Sun* correspondent believes to have been greatly exaggerated. It is true that many vessels have been lost upon them, but he asserts that a "vast number" of these have been intentionally cast away by their dishonest captains or owners for the sake of the insurance money and a share of the salvage. It is hardly possible for any one not intimately acquainted with the circumstances to judge of the correctness of these opinions, but it would at least be worth while to make further investigations before much money is spent on the work.

FOR some reason, the luminous paint made and used in England seems to be of a much more brilliant quality than that sold here. Several of the railway companies on the other side of the Atlantic have tried it for painting the roofs of tunnels, and a car on the South-eastern railway is said to have been recently painted with it inside. A good coat was given to the walls and ceiling, and the light emitted from it is said to have been so bright that the passengers were able to read by it while passing through tunnels. As the sudden change from daylight to shadow on entering a tunnel adds tenfold to the apparent darkness of such places, an artificial light capable of dispersing such gloom must indeed be bright, and if the luminous paint can really accomplish the result claimed for it, a simple coat of it, without expense for renewal or attendance, would be superior, for lighting railway trains, to any lamps now in use for that purpose. Another common application of the paint abroad is in making luminous lettering upon guide or sign boards, and from our own experience of a wall painted with it, which, after the lapse of two years, still shines at night as brightly as ever, we should suppose that it might be very well adapted for such illuminating tablets in a sheltered position. In country towns, for instance, where street lamps, if used at all, are extinguished at midnight, the cost of an application of luminous paint to the guide-boards would be trifling, and its advantages very considerable.

PRESIDENT WALTER'S ANNUAL ADDRESS BEFORE THE A. I. A.



FELLOWS AND ASSOCIATES: — In pursuance of the resolve of the last Annual Convention, we find ourselves to-day in the historic home of a people whose names will never die. Around us are scenes that move the noblest instincts of our natures, as they carry us back to the founders of this time-honored State — a State that has given to all parts of our country men of sterling worth, whose names have continued to be household words through more than two hundred years, among whom that noble champion of soul liberty, Roger Williams, stands conspicuous. Under the shadow of these ever-abiding influences we do now congregate.

More than a quarter of a century having elapsed since our present organization was effected, it will be interesting to notice the tendency of architecture to a formative condition in this country, during these early years of our corporate existence, and to observe the progress we have made in developing the possibilities of our art. Previous to the year 1857 there were no specific bonds of union between American architects, nor any tendency to cultivate professional relationship, other than that which naturally results from the pursuit of a similar occupation. It therefore became self-evident that the formation of a guild or a society for the promotion of mutual intercourse and the advancement of professional knowledge constituted a necessary accessory to progress in the development of the principles that govern architecture.

Moved by these considerations, the American Institute of Architects was duly constituted on the 19th of February, 1867, and incorporated on the 4th of March of the same year. Having been thus organized by our own action and by the civil law, it becomes us to hold ourselves ever ready to promote the objects for which we have associated by using our best efforts to extend the usefulness of our organization throughout our membership, and by employing all proper means to promote in the public mind a just appreciation of the civilizing and refining influences that result from a successful practice of our art. It is therefore important to the profession that a closer intercourse be cultivated throughout its membership, and that such measures be adopted from time to time as may give stability to our calling. To accomplish these objects and to record a more perfect organization, as well as to increase the influence and power of the Institute, we first met in annual convention in October, 1867, and we have continued to hold similar meetings annually, with the exception of two years. These meetings have proved to be of incalculable service in promoting the advancement of architectural science in all centres of civilization throughout the country.

Being now about to enter upon the celebration of another annual Convention, with an additional year's experience, we are not without fresh subjects for profitable discussion; let us therefore give expression to a free interchange of thought in whatever may come before us bearing upon our art and the sciences that underlie it.

We must bear in mind that knowledge is accumulative, that we all know more than we did a year ago, that every one of us has some added wisdom to impart. We have all been moving onward in the pursuit of our calling, realizing fresh achievements to the domain of architectural development, and are well prepared to give life and vigor to the Convention.

We have labored, as before remarked, in a corporate capacity more than a quarter of a century, and are not without evidences in every portion of our country that "we have not labored in vain, nor spent our strength for nought." The building community is undoubtedly imbued with juster conceptions of the sciences on which our art depends for its stability, its permanency and its possibilities, than it ever was before, and the noble sentiments that bring the creations of well-studied architecture into the realm of the fine arts are ever inspiring the cultivated mind with refining and elevating emotions of beauty, proportion and propriety.

Critics, whose appreciation of the beautiful in art is limited, and whose habits of thought are crude and unscholarly, are occasionally to be met with, who contend that architecture is not a *fine* art, but simply an aggregation of the *mechanic* arts. It is, however, obvious, upon the slightest reflection, that so far from architecture being outside of the category of the fine arts, it embodies the sentiments of all of them: — though not aiming at any real, or positive imitation of natural objects, imitation, in a limited sense, comprises some of its principal charms — it expresses, by means of material forms and proportions, the moral qualities indicated by nature, thus resting its powers to awaken agreeable emotions of taste, on its own rational and original principles.

In the words of Addison, "Architecture is an art, more than any other, that is capable of directing national taste. As a fine art its immediate tendency is to produce the primary pleasures of imagination, and is therefore capable of laying hold of the mind." Vitruvius opens his work on art by stating that "Architecture is a science by whose principles all works which are effected in other arts are examined." A closer analytical study of the relations of architecture, as a fine art, to other arts of the imagination would no doubt result in greater purity of design.

I now ask your attention to a few suggestions in reference to the present *status* of the Institute. We found by experience that the vast extent of our country renders it difficult to impart a desirable degree of vigor and efficiency to a National Association of professional architects. This difficulty has, however, been in a measure overcome by the organization of Chapters in some of our large cities; and if these useful adjuncts to the Institute could be rendered more efficient by greater activity, and their number increased, the usefulness of our organization would be greatly enhanced, and its intellectual force as an educator of the public mind be promotive of the advancement of all that relates to the comforts and the conveniences of human life, and of the harmonizing influences of the beautiful in art, by which the sphere of intellectual enjoyments is elevated and purified.

Having at the beginning of our corporate existence resolved ourselves into a scientific and professional body of a national character, it is proper that we should seek to realize our earliest thoughts in this direction by bringing into professional relationship with us, as far as may be practicable, all architects in good standing throughout the country. To impose onerous conditions, and unnecessary checks to the admission of members, and to invest the processes of election with too much "red tape" would undoubtedly circumscribe our influence and interfere with the good we might otherwise accomplish. If every respectable practitioner in the United States, who is honorably pursuing the practice of architecture, were to-day a member of this Institute, we would be none the worse for the connection, and he would undoubtedly be all the better for it. The addition of minds well trained in the profession, broadens its influence on the public taste, and enlarges its sphere of knowledge and of usefulness.

Important changes in our by-laws, relating to the admission of members, will be laid before you by a special committee appointed for that purpose at the last Annual Convention, and such conclusions will no doubt be arrived at, as will tend to the best interests of the Institute in that direction.

I take occasion to remark, in conclusion, that the unlimited freedom that characterizes the composition of architectural forms, at the present day, demands a far greater amount of study, and a higher degree of cultivation in the perception of the beautiful in art, than ever existed in the past.

The simple and artistic forms of the pagan world have yielded to the inspiration of a higher civilization. The fetters that held architectural forms to classic models for centuries have been broken, and the fact has become patent, that progress is the life blood of architecture.

Mediæval art, glowing with the benign influences of Christianity, emancipated the processes of design from the trammels of formulated methods, and led to the subsequent development of the beautiful creations of the later Gothic school, which still claims our highest admiration, and our profoundest study.

By tracing the mental processes by which the human mind has been led onward, from the first rude attempts of our race, to impress an artistic character on the art of building, up to the highest architectural developments of the present day, the student is prepared to abnegate all conventional trammels; and in view of the treasures of the past, laid at his feet by an exhaustive literature, he has acquired the habit of thinking for himself.

PLUMBING AND HOUSE DRAINAGE.

SO many changes have been rung upon the scale that it is difficult not only to say anything new about house drainage, but to say old things in a new way. The only justification for further reference to the matter, save for a few recent modifications, is to be found in the injunction "Line upon line and precept upon precept."

While the community is much exercised concerning sewerage and house drainage, and while the subject is one of interest and of frequent discussion, it is thus far very imperfectly "formulated" in the public mind. All are agreed that their towns and their houses should be well drained; bad sanitary condition is a universal bugbear; ailments of all sorts are eagerly ascribed to mechanical sanitary defects, and zymosis is the fetich of the day. Despite all our enthusiastic conviction, however, we are willing to make but little sacrifice to secure immunity from what we so greatly apprehend; we prefer to eat our cake, and have it too.

It is not possible, in the present state of the art of house draining, to have a stationary wash-stand in every bedroom of the house, a bath, sitz-bath, water-closet, urinal and wash-stand in each of the several bath-rooms on every floor, to have a slop-hopper in every dark closet, with sinks and laundry-trays, and servants' closets scattered here and there at whim, and at the same time to protect the household against all of the possibilities of "bad drainage." A most important

step in sanitary reform is to be sought in the subjection of house-building fancies to sanitary security. In this case "security" is very largely a synonym of "simplicity." It is convenient, of course, to have water-supply and waste-pipe at every turn, but here an excess of convenience is to be purchased only with an increase of risk. In old houses, which are to be altered, or into which drainage works are to be introduced, it is not always easy to bring plumbing within a compact and easily-inspected compass. Pipes must pass through rooms and passages where they must be covered from sight, and under floors where they must be covered for convenience. Long horizontal runs are not always to be avoided, and generally we are reduced to make the best of a bad job. In this case, especially, the judicious builder will hold a firm rein on the desire for a luxurious diffusion of conveniences.

The architect has, as a rule, not been a leader in sanitary reform. He is sometimes too slow to give up his old habit of leaving the details of plumbing arrangements to the plumber. Though not the first to move and though still slow, he is now beginning to realize that, in addition to his other multifarious and important duties, he must, in response to a growing popular demand, and in obedience to better understood requirements, take an immediate and direct control of at least so much of the plumbing as relates to the removal of waste matters from the house. Those engineers who have devoted themselves to sanitary drainage have been, and still are, almost as useful as they have been aggressive, but their most important office relates to the creation and direction of public opinion, leading to a demand for improved methods, and for improved control on the part of architects and plumbers. Our best hope for universal reform must depend almost entirely on this; a professional sanitarian will not be consulted in one case in a thousand, nor will his advice be followed, without the approval of the architect and plumber, in one case in a hundred. He has performed very well — one is almost tempted to say over-well — his duty of arousing popular apprehension. His future useful influence will be largely exerted in calling attention to matters of detail, and in marking out the general lines which the architect and the plumber are to follow. In this work, as in that which he has thus far done, he must look for the means of enforcing his teachings to the apprehensive intelligence of those for whom houses are to be built or remodelled. There are several principles which should always be kept in mind. These have become so trite that one almost hesitates to restate them. They are, however, these: —

The production of waste is an inevitable incident of human life. The excretions of the person, the discarded portions of food, the water of ablutions and of the laundry, and the various organic dust and offal of the household are all of them liable to become a nuisance dangerous to life unless properly removed. They are rarely dangerous when first produced, but they become increasingly dangerous and offensive as they enter into the decomposition which is the fate of all discarded organic matter.

This refuse must, in one way or another, be removed before decomposition develops its power for mischief. Whether the rough garbage of the kitchen, the drippings of the sink, or the dejections of the body, all must, in one way or other, be sooner or later removed from our presence — the earlier and more completely the better. It is hardly worth while to occupy time in the enforcement of this general principle; it is worth while to call attention to the fact that there can be no perfect sanitary condition unless removal is not only prompt but complete. Within certain limits it is true that filth is objectionable in proportion to its volume, but very limited volumes may become pernicious, and even such traces of filth as adhere to the walls of receptacles and of outlet chambers have sufficient capacity for mischief to command careful and serious consideration.

In applying these remarks to existing domestic conditions we shall be justified on this occasion in confining our attention to houses which are to be provided, with reasonable completeness, with what are known as "modern conveniences." So far as garbage is concerned it is enough to say that there has been thus far no general adoption of a civilized method for its removal.

When we speak of the drainage of a house, or of its sanitary condition, we generally have in mind the manner in which it is relieved of such of its waste matters as can be transported in running water, and it will suffice now to consider the methods by which such removal may best be carried out, including in our review the character of the receptacles into which the wastes are discharged, whether sinks, slop-hoppers, or water-closets. Regarding the waste-pipe, the first and simplest rule is that it should be of such material and so constructed that it will permanently carry away all water that may reach it. This has always been understood. The next is that the joints of this conduit should be secure, not only against the leakage of water but equally against leakage of air. This rule has been understood theoretically for a good while, but practically it is rarely adhered to. I have tested few soil-pipes, under a head of water, in which leaks through imperfect joints have not been developed.

The interior of the conduit should be as nearly as possible in the same atmospheric condition as the air outside of the house, that is to say, there should be a constant circulation to facilitate the rapid decomposition of the inevitable sliming of the walls, and the immediate dilution and removal of the gaseous products of such decomposition. In working toward this condition we first carried up small vent-pipes from the tops of our soil-pipes; later, we continued the pipe full bore to the top of the house; later still, we introduced a supply of fresh air at the foot to maintain a complete circulation; and last of all we enlarged the soil-pipe at its top to increase the draught.

As with the conduit itself, so with the receptacles and connecting-pipes leading to it. These should be sufficiently ventilated in every part, and all closets, and sinks of every sort should be so freely exposed to the open air that no suspicion of "closeness" can ever attach to them.

At every point the water used for the transportation of the wastes that are to pass through our pipes should be used in the most effective way. A thread of water running from an imperfect faucet is practically of no value whatever. It follows a narrow and uncertain course along the side of the soil-pipe or drain with no power to wash its general surface, and with no power to remove accumulations. It is pure and unadulterated waste. Incidentally it may be said that in very many houses its total volume is far greater than that of all of the water *used*, and that in many towns, including New York city, the aggregation of these ineffective dribblings is almost the sole source of insufficient water-supply. It is hardly practicable under any ordinary head, especially on the upper floors of houses, to deliver into a water-closet, or into a slop-hopper or sink, a sufficient *stream* of water to secure the efficient cleansing of its waste-pipe. It is in this direction that one of the most important of modern reforms is being exerted, working rapidly toward a most effective improvement on the whole practice of house drainage. The watchword of our best present movement is the word "flushing!" It will not be long, we may be sure, before it will be universally understood that, after pipe ventilation, the great secret of good drainage lies in the use of abundant volumes of water delivered in a mass along with each contribution of filth. A perfect system of drainage and water-supply would be one where at all ordinary times not a drop of water flowed through the outlet channels, only occasional dashes of several gallons lubricating the walls of the pipes, and carrying along completely and with velocity substances which, under the old system, smeared their sluggish road along the pipe, and left material for infectious decomposition at every step.

However perfect may be our channels, and however complete and instantaneous may be our flushing, we see as yet no way, nor are we likely to see a way, by which the insidious effect of the slight local decomposition within the drainage channels may be entirely obviated. Even were it obviated by the application of devices of which we as yet have no knowledge, there would still attach to our drains at least the suspicion of unpleasantness. For this reason our receptacles of waste matter must be sealed or shut off from the interior drainage system by the most perfect and continuous means of separation that can be secured. Here is a point on which I find myself, unfortunately, at variance with most of the authorities, and I confess that while I have little faith in the almost universal specific of trap ventilation I am by no means clear as to the best substitute for it in all cases — only clear that a substitute must be found. In my opinion, all that we can safely say is that in one way or another, either by a permanent and secure water-seal of good depth, or by the interposition of mechanical obstacles to the return of the air of the drain, we must manage in all cases to separate the air of the soil-pipe from that of the interior of the house. While no universal recipe can be furnished for this, there is no case in which, by one means or another, the desired result cannot be obtained.

In the foregoing review of the requirements of a properly constructed drainage system we have an indication of all that it is absolutely essential to compass. In the treatment of the various points referred to the cardinal rule of *great simplicity* should ever be borne in mind. Drainage works may be introduced into a house in such a manner as to be to all intents and purposes absolutely safe. The shade of apprehension which they may justly cause is, in the case of simple and well-arranged work, practically not to be considered. It is, however, a case suggesting something like the mathematical expression, "inversely as the square of the distance." If a certain amount of piping is in the least degree dangerous, twice that amount is four times as dangerous, and four times that amount is sixteen times as dangerous, and so on — not absolutely, of course, but relatively. In other words, while we make all of our drainage works as perfect as possible let us limit ourselves in all cases to the very smallest amount of piping, the least amount of ramification, and the smallest number of water-closets and other vessels consistent with reasonable convenience. A stationary wash-stand in a bath-room having a short and well-flushed connection directly with the main soil-pipe need never be objected to. A stationary basin ten, or twenty, or thirty feet distant, with a long connection-pipe should always be avoided. The luxury of an abundant flow of water in every bedroom seems at first blush to be worth all its cost. If we mean cost in money this is true; if we mean cost in risk it is by no means true. Practically, it is one of those luxuries in which no considerate person appreciating all the bearings of the case would think of indulging himself. One of the leading arguments of the trap-ventilation school is that such ventilation leads to the complete aeration of long lateral wastes. My remedy would be to abandon, as we always may in New York, the use of long lateral wastes. I should give an abundant supply of water at one convenient point on every floor. In larger houses where bath-rooms and water-closets may be required at considerable distances from each other I should give each its independent soil-pipe. Wherever a soil-pipe was constructed I should permit a good deal of license as to the conveniences in its immediate vicinity; but the moment the question arose of giving a wash-stand, or a sitz-bath, or a urinal to an

apartment, even ten feet away from the soil-pipe, I should exert all of my authority and influence in opposition to it; I should even oppose too generous a distribution of soil-pipes themselves, bearing always in mind the cardinal principle that the more we concentrate our discharge of wastes through single channels the better. One water-closet is better then two, if it will afford reasonable convenience. A bath-waste is kept in better condition the more frequently the contents of the tub are discharged through it; therefore, the fewer bath-tubs the better, and so throughout the whole range of plumbing appliances. Many "sanitary engineers," and more plumbers, will tell their clients that this is pure theory, and will advise, or consent to a wealth of conveniences all about the house. Plumbers are proverbially slow to learn, but they learn nevertheless, and they will in due time accept the pure theory as the wisest practice. Their clients will do well to anticipate them.

My own present idea is that if we can get rid of lateral waste-pipes longer than are needed for the connection of the most distant fixture in a bath-room there will be a sufficient change of the atmosphere of these pipes resulting from their open connection with a thoroughly ventilated soil-pipe. Assuming this to be so, then, the question of traps is the only important one that is not yet satisfactorily solved. As I have already indicated, I do not regard the system of "back ventilation," or the venting of water-seal traps as satisfactory. Although accepted and vigorously recommended by well-known authorities on house drainage it seems to me only a makeshift, and a makeshift that is attended with possible dangers at least equal to those which it is intended to remove. Mechanical traps are a makeshift also, though, on the whole, much less objectionable than the venting device. So far as I can judge from all that has yet been said and done, the best solution of the difficulty will be, if it can be made practicable, to allow the use of no trap of any kind, nor in any position which is not in full view whenever the fixture is used, excepting, perhaps, certain subsidiary traps on kitchen and laundry wastes. If we can trap our wash-basins in such a way that the top of the water-seal shall be always in view on looking into the bowl, and our bath-tubs in like manner, we will, I think, have secured the necessary safeguard, and we will have gained the further advantage, that persons of tidy disposition will see to it that a sufficient amount of fresh water is always passed through them to insure their constant cleanliness. In its present position the trap of a wash-bowl is out of sight, and generally out of mind. Unless frequently and copiously used it becomes the seat of a decomposition which makes it an offensive neighbor. The question of overflow-pipes for wash-bowls is still to be solved, and it cannot be denied that a wash-bowl overflow is almost universally a nasty thing. Bath-tubs may be, and in the best work they generally are, provided with standing overflows, which are quite free from objection; so far as I know they are the only ones that are free from serious objection. In the case of water-closets it seems to me now entirely feasible, and most important, to insist that there shall be no trap used in connection with it, except in the bowl itself, or in the outlet-pipe within plain sight from the bowl. There are now to be found a goodly number of closets of this character, beginning with the very simple and efficient plain hopper. I think that all of the "Gale" side-plug closets, of which the old "Jennings" is the type, should be rejected. If we retain closets of the old "Bramah" pattern, in which the water is held in the bowl by a valve at the outlet, we should make sure that this valve will be permanently efficient, so as to justify the entire abolition of the water-seal trap below. Invention has not yet gone very far in this direction, and we are only at the threshold of the success that is in time to be obtained, but we have gone far enough to demonstrate, in my judgment, the absolute wisdom of rejecting, not only the pan-closet, which all condemn, but the whole range of devices which depend for their separation from the soil-pipe on a trap of which the water is not in full sight.

Another point to be considered is the almost universal advisability of abandoning the use of slop-hoppers, constructing the water-closet in such a manner that it may serve the double purposes in the most perfect way, that is, by setting a clean earthenware closet-bowl on a tiled floor entirely open, at least to the front, with its cover so arranged as to facilitate ventilation as much as possible. The whole business of close carpentry about water-closets, used in connection with lead flashings, or the much better earthenware tray at the top, ought to be abandoned for good and all.

Again, all the devices for arresting and storing the grease of kitchen and pantry sinks, with a dependence on hand cleansing, that is, the old system of grease-traps, should also be discarded. In one way or another it should be provided that the waste of the sink shall all be retained in a mass until a considerable quantity has accumulated, and until its greasy content is chilled, allowing never a drip into the waste-pipe; only from time to time the discharge of a strong flushing volume sufficient to keep the channel perfectly clear, and to carry forward through the house-drain the burden of material which, when discharged in driblets, is sure to adhere to the walls of the pipe.

The soil-pipe ought never to be built into the wall, or in any manner covered from view. Especially should all openings in floors, through which pipes pass from one story to another, be hermetically closed against the possible passage of air. In much of the better house drainage that I have been called to examine, even very recently, the soil-pipe is hidden; no attempt is made to prevent the passage of air from floor to floor, there being an open channel beginning at the cellar, continuing through the soil-pipe casing and through the different floors, taking up its quota of the exhalations of putrid urine, and slops and leakage, almost inevitable with the tightly-cased closet, through to the top of the house. Ordinarily, the passage of the pipe through the roof is the only one that is carefully secured, and this only to prevent the entrance of rain-water. Under this arrangement the atmospheric impurities of one story are transmitted to the next, and as a perfect joint can, with difficulty, be made between a soil-pipe casing and a finished wall, there is ample opportunity for exhalation throughout the whole course, and especially about the casing of the water-closet, etc. This defect is a serious one in most of the best work now done, but it is one which can be and which should certainly be completely removed.

It is already pretty well understood, and the principle is very generally adopted, that the soil-pipe in its course from its vertical portion to the outlet-drain should always be in plain sight throughout its whole length, and should all be of the best and most durable material, jointed in the most careful manner. Under no circumstances should earthenware pipes be used within the walls of the house, nor for a certain distance beyond them, and never, except under the most imperative conditions, should any kind of drain be laid under the cellar floor. In this case as in all others every effort should be made to have the whole thing in plain open sight, where the least leak or defect may be detected at once. Very few houses are built with reference to their drainage works, and it cannot be expected that many will be so built. The drainage is for the house, not the house for the drainage. At the same time a few words of advice may be offered to architects, and especially to those owners — above all those house-building women—who are determined to combine the greatest convenience with the greatest safety.

What is generally regarded as necessary to luxurious and entirely convenient living is, as I have indicated above, inconsistent with absolute security. It is well within the power of the plumber to distribute his fixtures and their supply and waste pipes in wild ramification throughout the whole building, and to make the whole *pretty nearly* safe; it is not, in my opinion, possible for him to make such widely distributed work *entirely* safe. My advice to all intending house builders would be to provide an abundant supply of hot and cold water, at least on two floors of even the most ordinary house, on every floor of houses of a more generous character, and perhaps at two or more points on each floor of very large houses. I would absolutely ejeet all water-closets, wash-bowls and baths from every bedroom, and from every closet opening into a bedroom, concentrating them all in one or more bath-rooms on each floor. The proper furnishing of clean water and removal of foul water in different rooms is a matter of little labor if the supply may be drawn, and if the waste may be discharged without going up and down stairs, while the cleanliness and absence of fetid organic decomposition is so much more easily compassed with the movable wash-bowl and pitcher, that this alone is a sufficient compensation for the slight additional service. The slop-hopper, almost always an abomination, located in a dark and unventilated closet, should find no place in any part of the house, nor should the ordinary urinal. A properly arranged water-closet will, as I have already said, serve both purposes in the most perfect and convenient manner.

The location of the bath-room is to be determined by several considerations. It must be conveniently placed, it must be protected by its position or by artificial warming against the inroads of frost, and it must, absolutely, be supplied with efficient ventilation, and with a ventilation that it is very difficult to secure unless it is placed against an outer wall of the house, and furnished with a direct opening to the outer air. A frequent position of the bath-room in New York houses, between the front and rear bedrooms, and opening into one or both of them, and into the hall, is probably the worst that could be devised. I do not, however, regard even such a position as absolutely inadmissible. If the drainage works are thoroughly well constructed, and if all of the indications that I have given concerning simplicity of arrangement, freedom of access, and absence of carpentry are followed, and especially if the principle of a copious flushing, and the entire abolition of dribbling are insisted on, perfect ventilation of the apartment will be a matter of comfort rather than of health.

GEORGE E. WARING, JR.

THE METALLIZATION OF WOOD. — *Les Mondes* describes the following process, invented by Mr. Rubennick, for metallizing wood: The wood is first immersed for three or four days, according to its permeability, in a caustic alkaline lye (calcareous soda) at a temperature of from seventy-five to ninety degrees. From thence it passes immediately into a bath of hydrosulphite of calcium, to which is added after twenty-four or thirty-six hours a concentrated solution of sulphur in caustic potash. The duration of this bath is about forty-eight hours, and its temperature is from thirty-five to fifty degrees. Finally the wood is immersed for thirty or fifty hours in a hot solution (thirty-five to fifty degrees) of acetate of lead. The process, as may be seen, is a long one, but the results are surprising. The wood thus prepared, after having undergone a proper drying at a moderate temperature, acquires under a burnisher of hard wood a polished surface, and assumes a very brilliant metallic lustre. This lustre is still further increased if the surface of the wood be first rubbed with a piece of lead, tin, or zinc, and be afterward polished with a glass or porcelain burnisher. The wood thus assumes the appearance of a true metallic mirror, and is very solid and resistant.

BARTHOLDI'S STATUE OF LIBERTY.[1] — I.

St. Charles Borroméo.

IN a few weeks will be finished the colossal statue of "Liberty enlightening the World," which, in the form of a lighthouse at the entry of the harbor of New York, is to symbolize the mutual goodwill of France and the United States.

This work is as remarkable as a matter of pure art as when regarded from the point of view of actual execution. From both points of view it does honor to our country. The sculptor who conceived the idea is M. Bartholdi, the valiant and sympathetic creator of the "Lion of Belfort." To M. Eiffel, the well-known engineer who constructed the Douro Bridge, and who is at the present moment engaged on the Garabit Viaduct, has fallen the difficult task of making the calculations for the iron skeleton of this gigantic figure. The shell of *repoussé* copper has been executed at Paris in the workshops of MM. Gaget, Gauthier & Co. The manner of beating out the copper has been unique; the difficulties have been overcome with ability; and the perfected work will make of the statue an immense *chef-d'œuvre* of the kind of those which, at a much smaller scale, were formerly used as the final test-piece of the artisan who was striving to acquire the title of master.

The public already knows the general facts relating to this work. That which is less known, and which is not less interesting are the practical conditions of the manufacture of this monument, which is 46 metres [148′ 6″] high; so let us describe it at some length as it is always possible to extract instruction from an industrial *tour de force* of this importance. The conception of monumental work seems to be characteristic of a certain degree of advancement in the civilization of nations. Without mentioning monuments properly so called — dolmens, menhirs, columns, and pyramids — we generally discover in the history of all great nations mention of some one colossal statue. Its conception often marks the apogee of local progress. The ancients erected many immense works in honor of their divinities. With them the omnipotence of a god often appeared to depend on the magnitude of his image, which, however, they always sought to endow with all possible force and majesty. The most imposing figures we recognize as their most powerful and most venerated gods.

In ancient Egypt the colossi formed an essential decoration of the grand temples and palaces. They were represented in an attitude calm and uniform, whether sitting or standing; the face full front, legs drawn together, the arms glued to the body, the hands extending along the thigh, or placed on the knees. All useless details were suppressed without disguise, in order to make the simplicity of the lines and the extent of surface stand out with more vigor. The style was sober, broad and severe; and if they represented individuals, it was always some man who had already shaken off his earthly character, and to a certain extent had entered the divine state. Besides its magnificent pyramids, its obelisks 100 feet in height, its gigantic tombs, its innumerable and enormous sphinxes, Egypt was covered with statues 50 and 60 feet high, cut from single blocks of stone.

Herodotus mentions the colossus of Osiris, which was 75 cubits [92 feet] high. At Memphis a few years ago, there was exhumed the statue of Rameses II, which was 49 feet (15 metres) high. Before the entrance of the palace of Luxor were seated four similar colossi 40 feet high. Near Gournah can still be seen the fragments of a gigantic seated statue of Rameses the Great, cut from a single red granite stone. It must have measured 17½ metres in height, and weighed more than a million kilogrammes [1,100 tons]. We will mention finally the two colossi of Memnon, which, although seated, measure more than 19 metres each [62 feet], and with their pedestal weigh more than 1,305,000 kilogrammes [1,436 tons]. Also the four seated statues 61 feet high (20 metres), which decorated the façade of the great temple of Isamboul.

The Egyptians employed stone almost exclusively, although they had acquaintance with the art of founding and working in bronze, of which several specimens have been discovered.

The Greeks, also, erected many statues to their divinities: they were most frequently of bronze, or covered with plates of gold and ivory. Their most celebrated sculptors adopted the colossal type, and did not disdain to join splendor of material, maintaining always the grandeur of their lines, to the artistic and ideal impression deriving from beauty of form and harmony of proportion.

The Minerva of Phidias was 39 feet (12 metres) high. In reality it was a wooden statue, supported on the inside by iron-work, and covered with beaten and sculptured sheets of gold, and plates of ivory finely carved. This was all put together with so much nicety of handling that it was impossible to discover the joints. When such a statue was erected in a very dry place, the humidity necessary for its preservation was maintained by sprinkling water about the pedestal. In the neighborhood of marshes, however, the injurious influence of the humid exhalations was counteracted by rubbing the statue with oil. The celebrated Jupiter Olympus by the same sculptor, was also of gold and ivory. The god was represented seated, and was 42 feet (13 metres) high.

Phidias made several other colossal Minervas, one of which, the "Athena Promachos," was entirely of bronze, and measured 50 to 60 feet (17 to 20 metres) in height. The famous colossus of Rhodes, the work of Chares of Lindos, was erected 300 years B. C., in honor of Apollo. We have only very vague information as to this statue, which must have been 40 to 43 metres high, though certain authors allow it only 30 metres; it was of bronze, and probably weighed 1,500 quintals, and cost 300 talents ($330,000). To assure its stability, it was filled with large stones. Nevertheless, it was overthrown about 50 years afterwards by an earthquake. It is difficult to admit that it was, as commonly stated, placed at the entrance of the harbor, with a foot on either side of the channel. The spread of its legs, calculated in harmony with its height, could not have been sufficient to allow the passage of vessels. Besides it would have been plunged into the water when overthrown; whereas, for several centuries it lay upon the ground and was destroyed, according to report, by the Arabs about the year 672 A.D.

Rome, especially under the Empire, erected many colossal bronze statues, most often representing Cæsars deified during their lifetime. That of Nero, by Zenodorus, was 110 feet high. Pliny particularly admired the manner in which all the little pieces which formed the skeleton of this statue were put together.

In Japan can be seen a bronze statue of the great Buddha, seated, which is 50 feet (16½ metres) high. In China and India the greater part of the gigantic idols are of masonry or of wood roughly carved. Wood, except in rare cases, as the wooden horse of Troy, has hardly ever been employed in colossal statuary, save in the interiors of temples. In the Middle Ages there were the St. Christophers which were erected at the entrance of many churches, and also the large statues of Roland.

In modern times, colossal statues have been executed only when the distance of the point of sight rendered an increase of dimensions necessary. Nevertheless, several celebrated artists have often felt the need of joining material grandeur to grandeur of expression; first among these is Michael Angelo. We will only mention his marble "David," more than 5 metres [16 feet] high; his bronze "Julius II," thrice life-size; and especially his "Moses," the *chef-d'œuvre* of modern sculpture. At the Pratoline Villa, near Florence, we admire the Apenninus, in the guise of a "Jupiter Pluvius," cut by Jean de Bologna. Nearly all the latest colossal statues have been cast in bronze. We will mention the equestrian statue of Peter the Great, by Falconet (1766), at St. Petersburg: the figure of the Czar, 3m. 66, and his horse 5m. 60 in height, the entire group weighing 18,000 kilogrammes. The "Bavaria," near Munich, erected in 1850. This statue is 15m. 80 [51 feet] in height, and weighs 1,560 quintals. The final plaster model was divided into fifteen portions for casting, for which process about six years were required. The "Virgin of Puy," the work of the sculptor Bonassieux, erected in 1860: its height is 16 metres [52 feet], and its weight about 100,000 kilogrammes [110 tons]. The plaster cast was divided into several fragments to facilitate the operation of casting at the foundry of M. Prenat at Gisors, cannon captured in the Crimean war furnishing the material. The different castings were adjusted and finished with the burin, then taken apart and transported to Puy, where the statue has been erected on the cliff Corneille, which rises 132 metres [430 feet] above the city. Finally the colossal statue of "Arminius" erected in 1875, on the summit of the Grotenburg, near Detmold, in Westphalia: its height is 20 metres [65 feet], not including the sword, which measures about 8 metres [26 feet]. It weighs about 237 quintals.

The most remarkable instance of the employment of *repoussé* work in colossal statuary is unquestionably the "St. Charles Borroméo," the work of the sculptor "Il Cerano," which was erected in 1697, near Arona on the banks of Lake Maggiore. In its construction this monument approaches nearly the work of Bartholdi, and consequently deserves special mention. Its height is 23m. 40 [76 feet], or, including its pedestal, 35m. 10 [114 feet]. The length of the arm is 9m. 10 [29′ 6″], that of the nose 0m. 85 [33 inches], and that of the forefinger 1m. 95 [6′ 4″]. The statue is formed of an envelope of copper *repoussé*, supported by means of clamps and bands of iron on an interior mass of masonry, which is almost tangent to the copper shell, and rises to the neck. The sheets of copper are only 1mm. 5 [.06 inch ?] in thickness. They were not hammered on the mould, but fashioned directly by hand. These plates are quite imperfectly joined by large rivets 40 millimeters apart, and the whole adjustment is coarse. They are directly connected with the masonry by means of iron clamps and ringbolts. In order to increase the rigidity of the shell, there have been used armatures of flat iron, 65mm. x 5mm., which cross each other vertically and horizontally about a metre apart, but are not connected with each other at the points where they cross. Here and there an occasional large copper rivet connects them with the envelope. The right arm, which is in an almost horizontal position, is supported by a large oak beam, 0m. 35 [13 inches] square, built into the masonry; this beam is strengthened like a ship's yard by flat irons, and is supported by tie-rods let into the stone. All the joints are keyed together in the roughest way. To-day the wood is completely rotten, and only the iron armature remains; it ought to be replaced by an iron beam. The left hand,

[1] Translated from *Le Génie Civil.*

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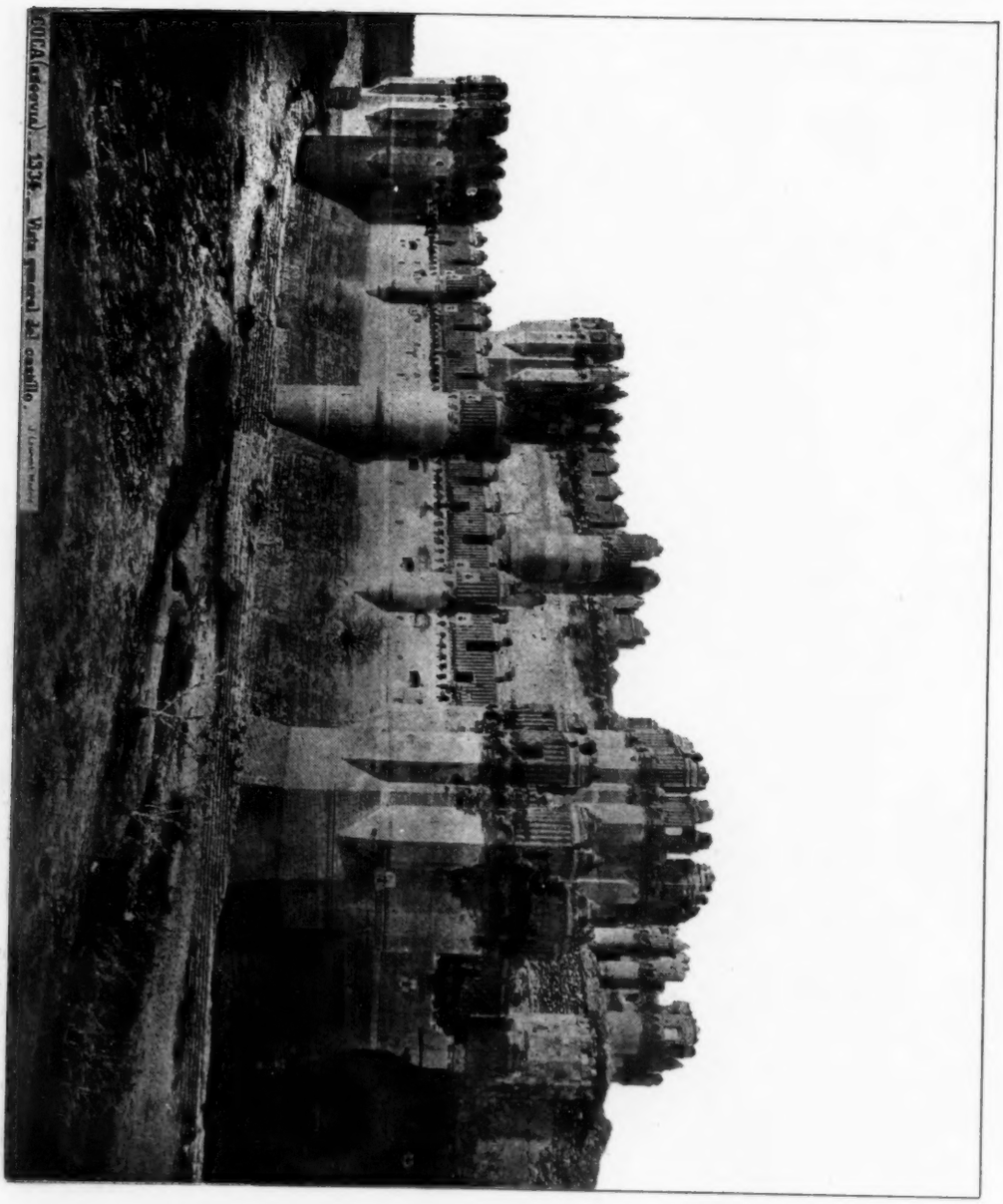

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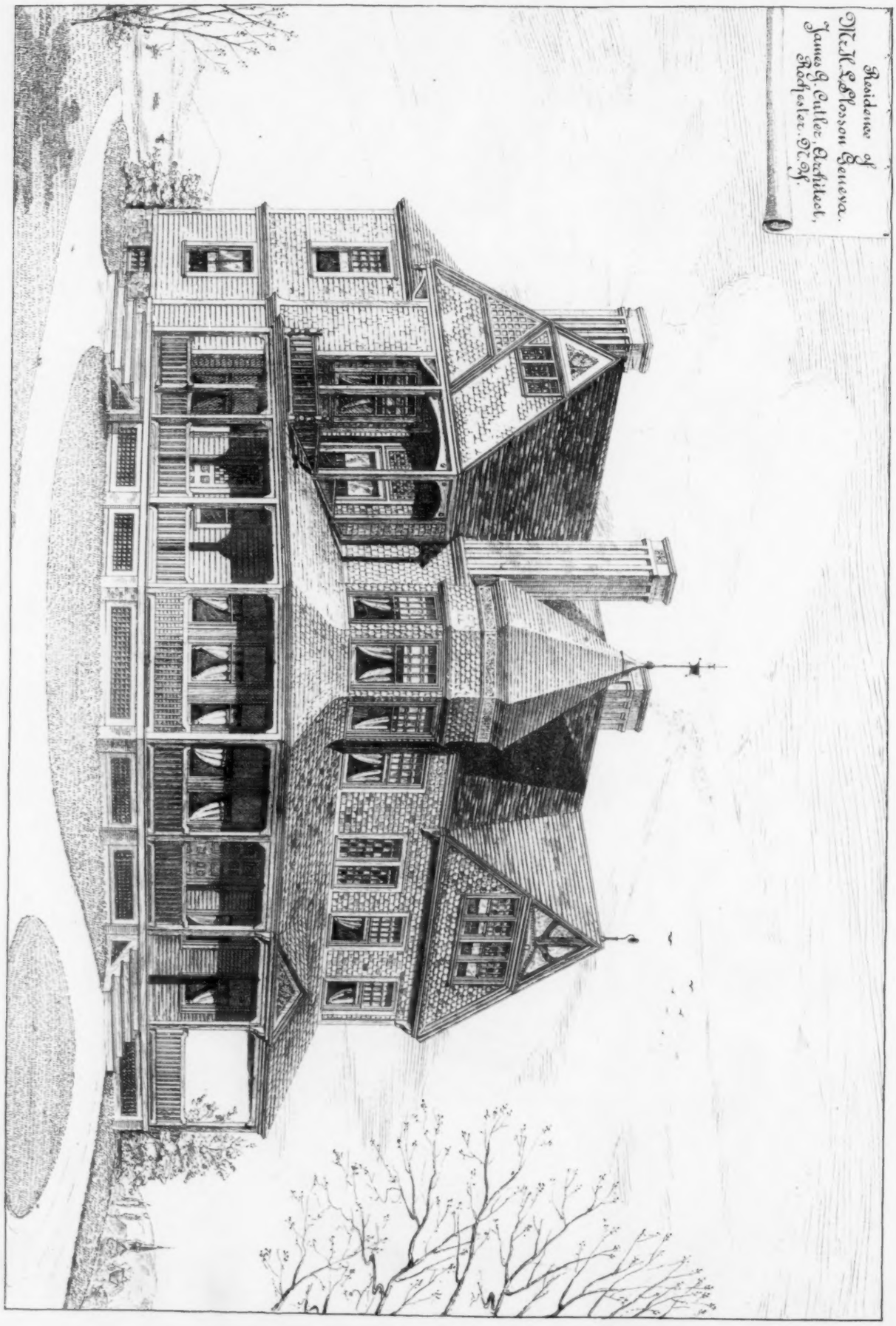

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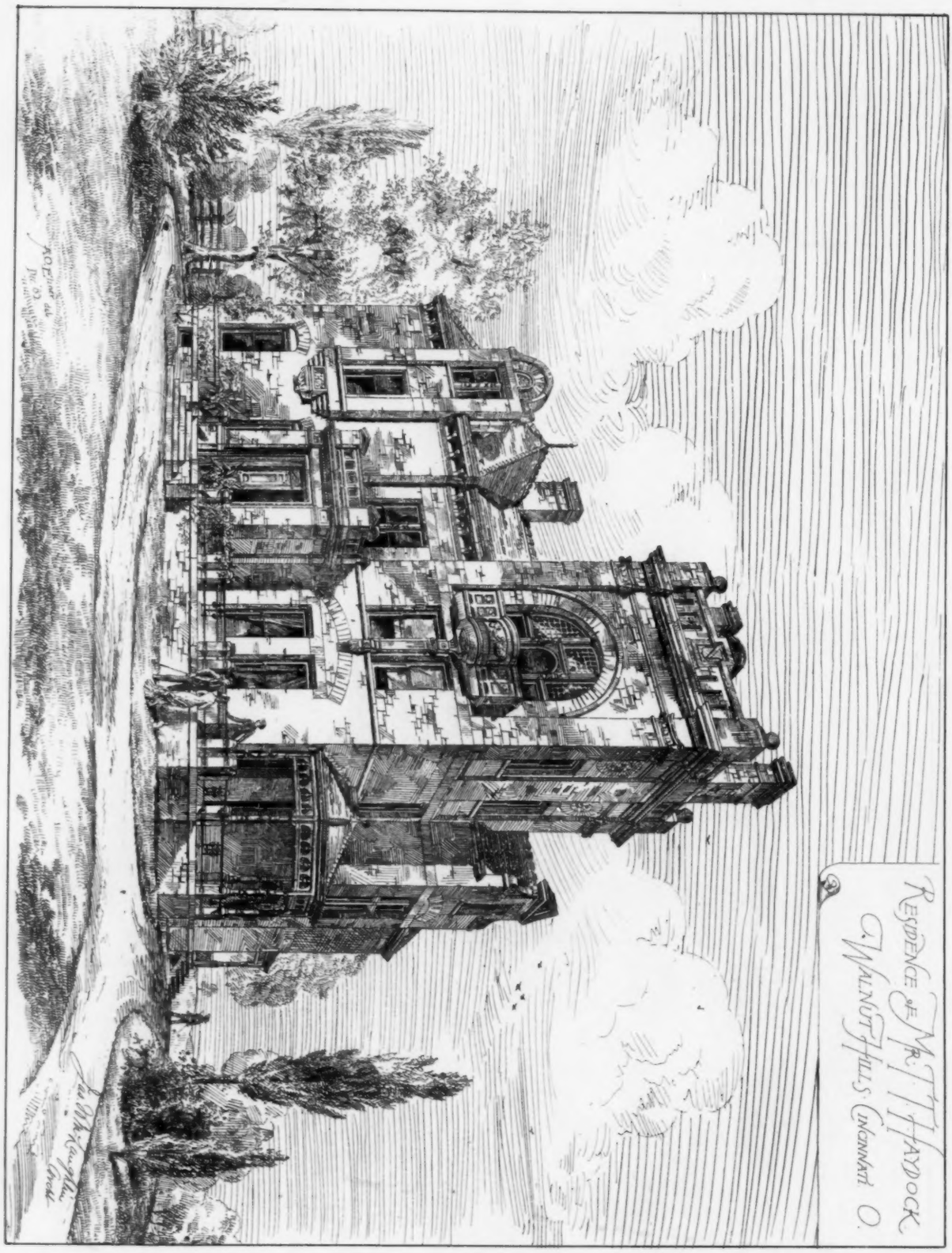

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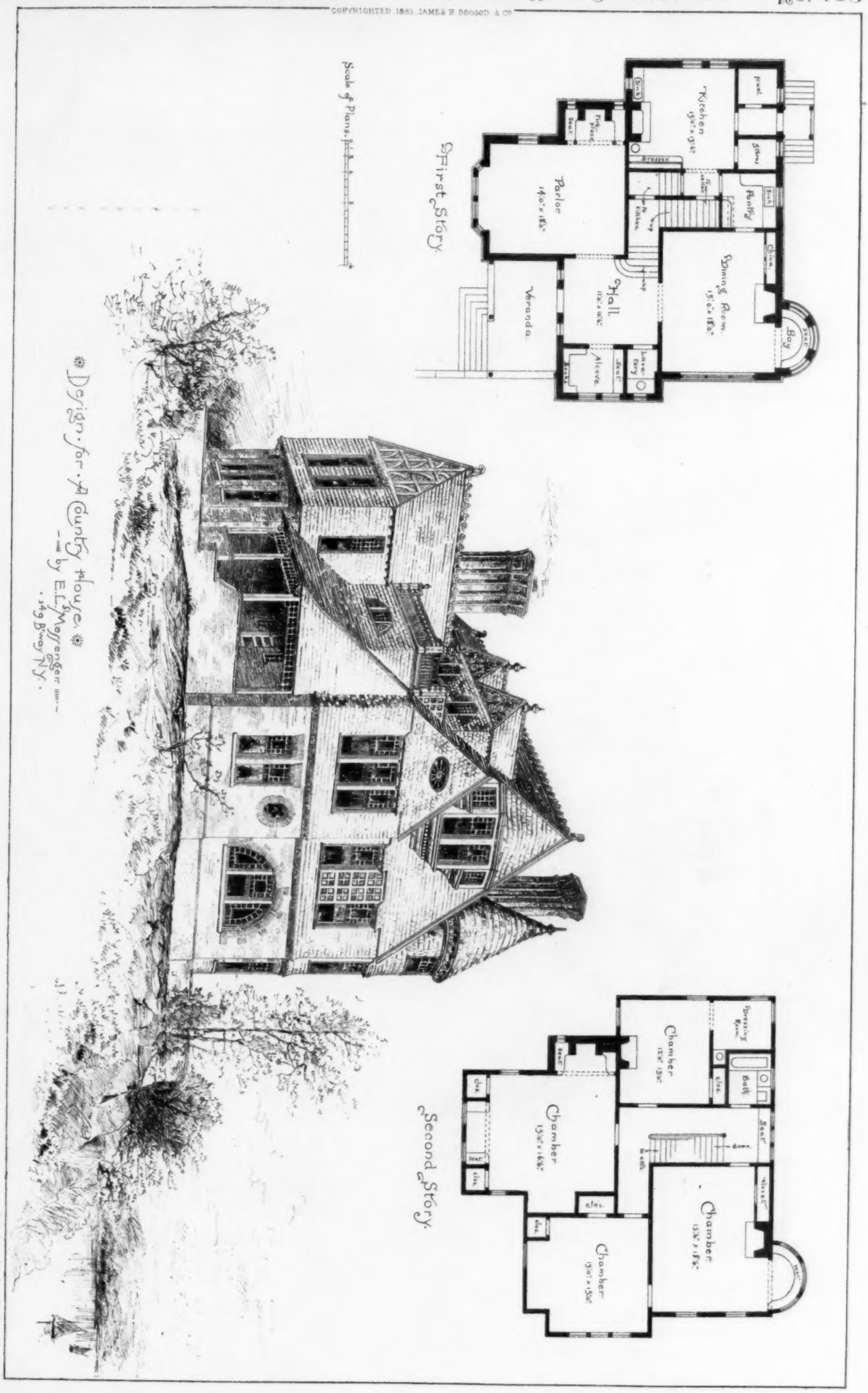

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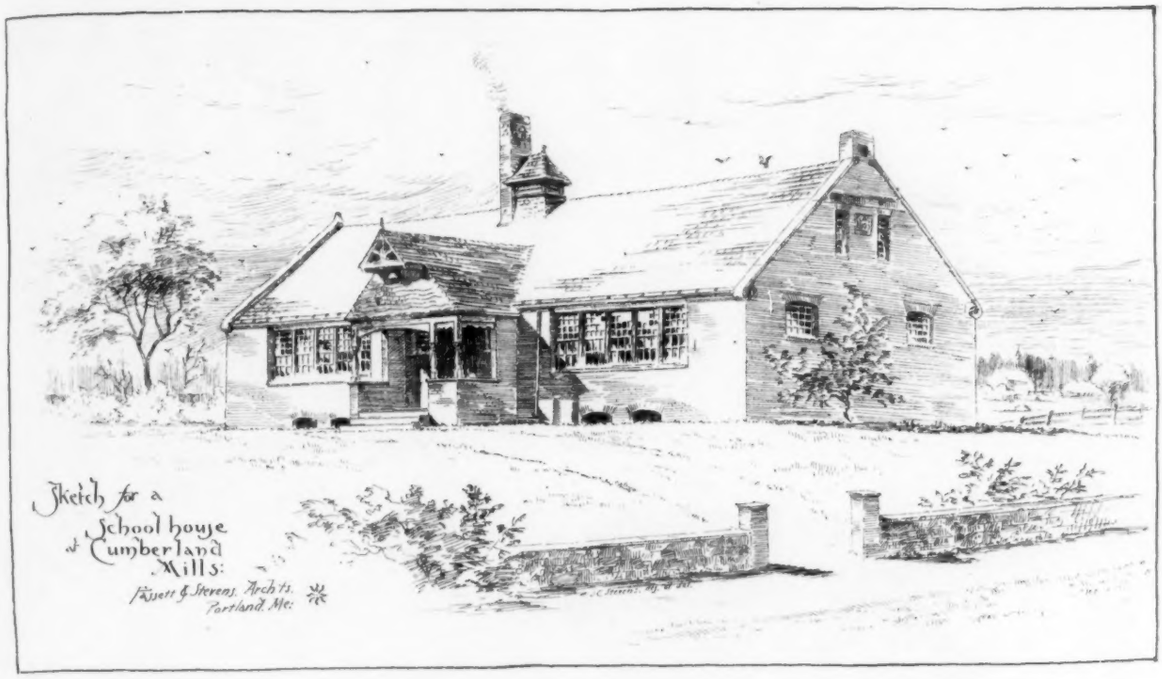

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which holds a book, is supported by three rods of round iron suspended from a horizontal iron bar let into the masonry. Entrance to the statue is had through an opening concealed under a fold of the alb, which is reached by ladders. The ascent inside is sufficiently difficult; it is necessary to climb a kind of chimney-flue, and mount by the aid of the iron braces which connect the envelope with the masonry. It has often been wrongly stated that the head and hand were of cast bronze. The statue is entirely of hammered copper.

In the matter of other statues recently constructed of *repoussé* copper, we have merely to mention that erected at Alise-Sainte-Reine, in honor of Vercingetorix, the heroic defender of the Gauls. The height is 7 metres, and it was through the advice of Viollet-le-Duc that the sculptor Millet decided to execute it in copper. It was constructed in 1865, by MM. Monduit & Bechet, the predecessors of MM. Gaget, Gauthier & Co.

THE ILLUSTRATIONS.

STUDY FOR THE CLUB-HOUSE OF A LITERARY SOCIETY. MR. W. M. AIKEN, ARCHITECT, BROOKLINE, MASS.

THE design shows a building located on a steep hillside which gives opportunity for rooms of differing levels. The library, and over it, the stage with its dressing rooms (or committee rooms, as occasion may require) are on the lower side; the hall being on the upper side of the incline. The floor of the auditorium is on a level. A frieze of windows over the panelled wainscot, six feet from the floor and three feet high, lights the hall. The ceiling is sheathed between the rafters up to the level of the collar-beams. The flues are all collected into one stack by an arch over the proscenium opening, which opening may be enlarged or diminished by folding-doors; the tympanum of the arch is permanently filled with panelled work. Stone is used in random courses up to level of the cornice, also in topping out the chimney and throughout the tower, shingles being used in the triple overhanging gable. This sketch is from the study made in clay.

SKETCH FOR A SCHOOL-HOUSE, CUMBERLAND MILLS, ME. MESSRS. FASSETT & STEVENS, ARCHITECTS, PORTLAND, ME.

THE building is to be of brick laid in red mortar, and will cost less than $5,000. The two school-rooms will be finished in white-pine, natural finish.

THE CASTLE AT COCA, SEGOVIA, SPAIN.
[From a photograph.]

STORE OF R. H. WHITE & CO., BEDFORD ST., BOSTON, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS.

DESIGN FOR A COUNTRY HOUSE. MR. E. L. MESSENGER, ARCHITECT, NEW YORK, N. Y.

HOUSE OF H. L. SLOSSON, ESQ., GENEVA, N. Y. MR. J. G. CUTLER, ARCHITECT, ROCHESTER, N. Y.

HOUSE OF T. T. HAYDOCK, ESQ., WALNUT HILLS, O. MR. J. W. MCLAUGHLIN, ARCHITECT, CINCINNATI, O.

ARTISTIC EMBROIDERY. — WORK BY THE "ASSOCIATED ARTISTS." — I.

SOME embroideries recently produced by the "Associated Artists," under the direction of Mrs. T. M. Wheeler, seem to me to call for description in a paper devoted to art, and anxious to recognize the best that is produced in any department in our country. However it may be with other branches of decorative art, it is certain that in embroidery as in stained-glass we have no foreign rivals at this moment. Good work is done in many places, of course, and much improvement has been shown of late years; but on the Continent it runs chiefly to the imitation of old examples, and in England, though there is an earnest effort after greater originality, and though the South Kensington School has set an admirable example of skilful design and clever workmanship, yet its artists do not seem to have the true creative impulse which brings something novel and characteristic as well as good out of the intelligent study of the products of former times; and so great is the influence of South Kensington that no one in England seems willing to start out on an individual line and in a fresh direction. Here and there of course one may see fine specimens of handiwork which have been produced in accordance with personal likings, and not with school tradition. But these have usually been made for private purposes — under the eye of an artist not specially devoted to such work, or by the needle of some clever "amateur" embroiderer. Such examples are sporadic merely — cannot be held characteristic of the general movement of the day as may the products of a school like the "Associated Artists."

Mrs. Wheeler was one of the very first in this country to give serious attention to the art when decorative work of all kinds was coming into favor and fashion. It was largely owing to her knowledge, her energy, and her good taste that the New York Decorative Art Society's embroidery department was started on such a solid basis, and in such a good direction — that it did not become such a slavish adherent of South Kensington models as did certain other similar institutions in our country. From the beginning Mrs. Wheeler endeavored to form a school of design as well as of needle-work, and to secure originality as well as excellence; but it was only after she severed her connection with the Society and established her own place of business under the name of the "Associated Artists," that she was able fully to carry out her ideas. Much excellent work is done in other places in New York, but everywhere the credit is, I think, largely hers; some of those who execute it having been associated with her for a time, and all having been stimulated by her example; taught by her productions, and encouraged by her success. And no other work yet equals hers for variety, for originality, and especially for exquisite results in color. As such work usually goes at once to private houses without first coming before the public as do the majority of pictures, for example, it is known to a comparatively small circle, and so there seems a double reason why it should now and then be described in print. I am painfully conscious, however, of the difficulty of the attempt. Words can do so little to convey an idea of that which depends for its beauty not upon materials or processes which can be named, but upon felicities of form and color.

Mrs. Wheeler's establishment is a school in the true sense of the word, not a mere manufactory where the work is directed by an artist, perhaps, but executed more or less mechanically by subordinates. Mrs. Wheeler's aim is to instruct all who work under her in their various departments as fully as possible; to enable them not only to copy faithfully, and embroider beautifully, but to design for themselves and to educate themselves in artistic feeling, and in that sense of color which plays the major part in the success of their work.

What first strikes one, I think, in looking at her productions is their great variety and their independence of tradition, formula, or previous example. All the fine work of other days and of other countries has been carefully studied, and the principles which have their good results are thoroughly understood. Hints, of course, are taken from all quarters, from Oriental as well as from mediæval work, and the dainty examples of the last century; but in the majority of cases it is impossible to credit any of the work to definite outside inspiration. It is her own and not a copy — more original than current work in almost any other department we now succeed in. It is nature and not the art of another which is her chief teacher. When one examines her work this fact is seen to be of peculiar importance. To an intelligent study of natural forms and colors is owing both its originality and its constant variety. Of course natural forms have always been the basis of all good work in this branch, but except in certain Oriental products they are usually at the present day "conventionalized" to a far greater degree than Mrs. Wheeler finds necessary. To adapt as far as needful the natural motive to the exigencies of her design while preserving as nearly as possible both the forms and the hues of the models may be given as her formula. Whether she treats figures or floral motive the same is true. There is none of the stiff mathematical conventionalizing in either outline or hue which we have so long been told is the prime necessity, if "decorative" work is to be artistically successful. Her protest against this doctrine seems to me not the least important part of the work she has accomplished. When some fifteen or more years ago, a revival of interest in decorative work was started, the cardinal doctrines of the reformers was this of obligatory conventionalizing. No teacher was more potent than Mr. Eastlake, and none was a more uncompromising enforcer of this precept. At the time when he first spoke there was some virtue in his lesson. We had been accustomed to using natural forms in such grossly inartistic and inappropriate ways that a wider, truer doctrine could hardly have been preached with good effect. The hideous full-blown roses on our carpets; the absurd statues with which the stone-cutter decorated our mantel-pieces; the grotesque figures and flowers which covered our wall-papers, began to distress our eyes. But to turn at once from them to good organic design might well have been an impossibility. Had Mr. Eastlake preached his doctrine of conventionality merely as a temporary lesson; had he said that mathematical design was more easily learned, less ambitious, and therefore less likely to be unsuccessful than a truer, closer adherence to nature, he would have done the world better service. The first essays which followed his instructions were undoubtedly far preferable to those which had gone before. It was indeed a boon to see walls, and floors, and ceilings covered with delicately toned, inoffensive diaper patterns, or stiff and tedious, but not exactly ugly adaptations of nature's leaves and blossoms; but in saying that such work was the be-all and end-all of decorative art, in teaching that there must be an essential difference in aim between "art which produces a beautiful thing, and art which ornaments a useful thing," he did, it seems to me, an infinity of harm. The distinction was tersely put and had that apparent clearness and logic which always appeal to the mind of the young student. But the more we learn of art, the more we find that such cut-and-dried definitions are quite useless or positively harmful; the more we find that no artist worthy of the name in any age has ever worked by formulas so exclusive and so strict. That "decorative art" should never vie with

"representative art," should never look to the same results or work with the same ends in view, is a precept which sounds at first very rational, and is certainly very grateful to the ear of the would-be decorator who is excused by it from all the severer efforts of design. But if Mr. Eastlake had depended for the success of his teaching on anything but his own unsupported word and the natural avidity of his readers to adopt so easy a programme; if he had attempted to back up his precepts by any reference to the decorative work of former days, he would have found himself in difficulties. From the days of the Egyptians downwards, decorative art has always used natural motives in the frankest and freest way. And just as it has used them frankly and freely — with of course that necessary degree of adaptation which differs very widely in different branches — but not with the least desire for wilful "conventionalizing," it has been successful and valuable. It would be almost absurd to cite examples, had not the opposite pernicious lesson eaten so deeply into the conscience of most modern workmen, at least in English-speaking countries, where the books of Mr. Eastlake and his fellows have found their audience. Happily a reaction seems imminent, and it is, I repeat, Mrs. Wheeler's influence in its direction which seems to me the most important part of her activity. It seems strange that one should have to preach again a doctrine which has every great artist in the world for its exponent. The greatest mural decorators, for example, that we have known were the Florentines and the Venetians; the one with their frescoes in which, as with Michael Angelo, in Rome, and Signorelli, in Orvieto, the human form treated in the most purely "representative" way, forms the main subject of their brush; the others with their great canvases for wall and ceiling which have similar aims and motives, and equally great results. Of vase-painting, of porcelain and pottery of all sorts, of metal, and wood, and ivory, and of embroidery as well, the same facts are true. The nearer decorative work can come to strictly "representative" effects, the better is the result. Of course the necessities of form and material, and of use must never be forgotten; and the art must be so adapted that it will not travesty the one or interfere with the other. But the limits set by this necessity are far less narrow than some would have us think; so wide indeed, that organic design of one kind or another is almost always well in place. Furniture marks the extreme point of the preponderance of use over mere beauty; but even here we find the most artistic examples — as the stalls in old churches and the marble or bronze articles of the ancients — have always resulted from a frank incorporation of natural motives. It is not the necessities of "decorative art," but the weakness of decorators which has made it seem to certain writers and to certain practitioners that conventionalizing methods are the best to use. And it is only a wilful shutting of the eyes to history and to common sense that has enabled some to say that they are the *only* legitimate ones. It is easier, I repeat, to paint a wall or to embroider a curtain with arabesques, or with diapers, and not to make a hideous result, than it is to employ the human figure, or the forms of vegetable life in their purity and nobility. But it is a distinctly lower art which so proceeds; an art so low, indeed, that it cannot rank as more than an intelligent handicraft.

This is a rather long introduction with which to preface an account of a few of Mrs. Wheeler's recent embroideries; but I wished to explain her methods and her aims, as well as to describe their individual results. The latter will be but dimly perceived through my words, but the former should, I think, be laid to heart by all who aspire to work with her in her own branch, or in any other.

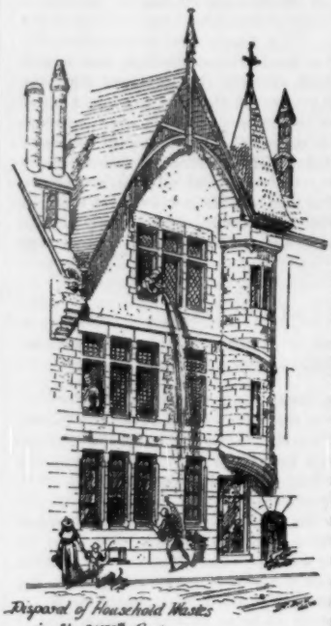
A few more words as to the methods actually followed in her school may not be uninteresting. Material for future use is constantly being accumulated by means of paintings in color made directly from nature. All sorts of natural forms are carefully studied by her artists, who strive in the first place merely to preserve the fleeting beauty of their models with as much exactitude as possible. When a new work is contemplated, the motive is selected from these studies, and color and form decided upon. Then the sketch is given to a designer who puts it in proper shape, adapting it as I have said to the particular requirement of the moment; but preserving with as much exactitude as possible both the outlines and the hues of nature. Then a drawing to scale is made for the use of the workwomen; while in its execution constant reference is made to the color sketches as a guide. Color being so largely a matter of pure instinct, however, Mrs. Wheeler sees fit to follow the last stage of the process with the utmost care. As the lines grow beneath the tool her constant supervision is required, at least so far as to hint and suggest what effects should be secured from day to day; but that such inevitably good results should be secured where so great an amount of work is under way presupposes that she is assisted by trained and sensitive eyes as well as by skilful fingers.

No small part of the beauty of her results is due to the excellence both in color and texture of her materials. Many of these are manufactured in this country from her own designs or ideas, and are marvels of artistic weaving. Sometimes the material is plain and only to be noted for its satisfactory tone as a mere background. Oftener it is woven in more than one tint which gives it a play of light and color skilfully seized upon and emphasized in the embroidery. Sometimes again the woven substance contains the rudiment of the desired design both in form and in hue, and needs only to be assisted and enhanced by the needle.

But my chapter is already so long that I must leave a description of individual results for another day.

M. G. van Rensselaer.

SANITARY PLUMBING.[1]—II.



Disposal of Household Wastes in the XIVth Century.

The Efficiency of the Water-Seal.

THE disposal of the organic wastes of our dwellings through water-carriage has been found, after long, careful and impartial trial in all parts of the world, to be, on the whole, the most satisfactory from both a sanitary and an economical point of view, where sufficient water is to be obtained. Even when these wastes are carried directly into the ocean, and their value as fertilizers apparently lost to mankind, this loss is more than compensated for by the rapidity, convenience and economy of the transportation.[2] But the fact of its superiority having been generally admitted, and the conditions accepted, practical methods have now been discovered of separating the valuable matter from the water by precipitation, partly by direct chemical agencies and partly through irrigation. As these methods are from year to year multiplied and improved, it is reasonable to suppose that eventually all the advantages of the water-carriage system may be enjoyed without incurring the loss of the valuable manurial components of the sewage, or the inconvenience occasioned by the pollution of our water-courses.

Coincident with the improvements in the methods of *disposal* of the sewage after it has once been carried beyond the walls of our houses, great progress has of late been made in the art of its safe and speedy *removal*, so that now it is possible in a well-plumbed house not only to insure the entire removal automatically of all wastes the instant they are produced, and long before decomposition has had time to set in, but also to prevent any return of sewer-gas through the channels of removal.

This perfect interception of sewer-gas is accomplished by the simple water-trap, acting in combination with a thorough system of sewer and soil-pipe ventilation. Without the assistance of ventilation the trap would be insufficient, and if this fact had been borne in mind many long discussions and doubts as to the efficiency of the water-trap would have been avoided.

It has been shown by Dr. Carmichael and others that if a water-seal be properly maintained against evaporation and siphonage, or destruction from any cause, the amount of sewer-gas that can pass through in twenty-four hours, even under the worst conditions, but with a ventilated soil-pipe, is infinitesimal and absolutely harmless, and that disease germs cannot pass at all through water at rest at normal temperatures. Dr. Carmichael also experimented with an unventilated soil-pipe, and found here that the quantity of carbonic-acid gas, the largest component of sewer-gas, given off from the trap in twenty-four hours was less than that obtained "when a bottle of lemonade was opened," and less than that which is exhaled by a man in five minutes.

As for the ammonia, sulphuretted hydrogen, and other gases or vapors which accompany the carbonic acid, their combined amount, even under the unfavorable conditions of a foul sewer and unventilated soil-pipe, was hardly equal to the one-thousandth part of that of the carbonic acid, and this amount diffused in twenty-four hours through the atmosphere of a house is evidently absolutely insignificant and harmless. With a ventilated soil-pipe the quantity which can pass through the water-seal was found to be about four times less, probably far less than what would come into our city houses through the doors and windows from the ventilation openings in the streets of the public sewers. Dr. Carmichael,[3] Pumpelly and Smyth, Naegeli,[4] Wernich,[5] Miquel,[6] and others have shown that disease germs and bacteria generally have the same "mechanical affinity"

[1] Continued from page 111, No. 402.

[2] Of late the disposal of household wastes through subsoil irrigation has begun to be extensively practised in small towns and detached houses. The method has been found to work even in cold climates in winter, and has been ably described, perfected and carried into successful execution by Col. George E. Waring, Jr., Mr. Edward S. Philbrick (see Waring's "*Sanitary Drainage of Houses and Towns*," and Philbrick's "*American Sanitary Engineering*"), and others. A sufficient supply of water for flushing the water-closets and drains is easily obtained in country houses, where a public supply has not as yet been provided, by pumping by hand, wind or water mill into a large cistern at the top of the house.

[3] "*An Experimental Investigation into the Trap and Water-Closet System and the Relation of the Same to Sewage Products, Gaseous and Other*," by Neil Carmichael, M. D. C. M., in "*The Sanitary Journal*," of Glasgow, Scotland. Published by Alex. Macdougall, 66 Mitchell St., 1880.

[4] Naegeli: *Die niederen Pilze, U. S. W.*, München, 1877.

[5] Wernich: *Ueber verdorbene Luft in Krankenräumen, No.* 179, *Sammlung Klin. Vorträge*, Februar, 1880. Volkmann.

[6] Miquel: *Epuration des Eaux d'Egouts par le sol de Gennevilliers*, Journal D'Hygiène, etc., 188), 5e Vol.

for water which we observe in all solid particles, particularly of organic nature. They cannot rise spontaneously from the surface of water at rest, and at the normal temperature of our houses. It is only when the surface is violently agitated, or when gaseous bubbles rise to the top and burst that these particles are released and dissipated in the atmosphere. With a ventilated soil-pipe no such effervescence in the water of a trap can take place, and the agitation of its surface caused by properly arranged flushing does not throw the water out of the trap, nor allow of the escape of any germs of disease, for any water which may be washed up on the sides of the trap above the normal water-line is quickly carried down again by the upper flushing stream, and swept into the sewer.

Mr. Baldwin Latham says, in his work on "*Sanitary Engineering*," "One thing is certain, with reference to malaria, that all authorities are agreed that it is never extricated from a water surface," etc. The able paper of Dr. Carmichael, above referred to, a paper which should be read by all who care to have their anxiety on this score completely set at rest, describes the crucial tests made by him to prove the above statements regarding the action of disease germs in water. These experiments resemble absolute demonstrations, and may be accepted as final and conclusive.

Pumpelly and Smyth in their report to the United States National Board of Health, in 1881, on "The Relation of Soils to Health, and the Transmission of Germs from a Liquid to the Air," confirm the observations of Carmichael and others, and state the results of their careful experiments as follows: "At normal temperature no germs were given off from the decomposing liquids whenever their surfaces remained unbroken, even though in some of the experiments the air was continually conducted over them in a slow current. When the surfaces of the liquids were broken, however, by the bursting of bubbles, germs were invariably given off, and the sterilized infusions infected, no matter how slowly the aspiration was conducted."

Relating to the researches of Naegeli and others, this report says, "It has of late years been affirmed by many writers that germs are fully given off to the surrounding air through the evaporation of a liquid. The researches of Naegeli and the still more recent investigations of Carmichael, Wernich, Miquel and others, published during the present year in various scientific journals, have, however, conclusively proved the falsity of this view, their experiments clearly showing that, under normal conditions of temperature, at least, germs are never given off from a liquid at rest, or from a thoroughly moistened sand or solid matter of any kind."

Dr. Carmichael concludes the description of his experiments with the following: "Water-traps are, therefore, for the purpose for which they are employed, that is, for the exclusion from houses of injurious substances contained in the soil-pipe, perfectly trustworthy. They exclude the soil-pipe atmosphere to such an extent that what escapes through the water is so little in amount and so purified by infiltration as to be perfectly harmless, and they exclude entirely all germs and particles, including, without doubt, the specific germs or contagia of disease which we have already seen are, so far as known, distinctly particulate."

The source of danger in our plumbing is, therefore, not in the inefficiency of the *water* in the trap to keep out the enemy. A man walking by an ordinary sewer-vent in the street runs more danger of sewer-gas poisoning than one who sleeps with a sound water-trap, properly connected with a well-ventilated and well-made drain, at the very head of his bed.

The danger lies in the trap itself, its faulty form, material or connection, or in the want of means to prevent the loss of its water, or in the defects in the pipes or fixtures with which the trap is connected or surrounded. A defect no larger than a pin-hole on the sewer side of a trap, or in any waste-pipe may, in the limited atmosphere of a bedroom or dwelling-house, form the source of a serious and positive danger.

MR. RUSKIN ON ART IN TOWNS.

OLD FARM BUILDINGS CALVADOS FRANCE

A PREFACE has been written by Mr. Ruskin to a pamphlet containing two papers read by Mr. T. J. Horsfall, of Manchester, on "The Study of Beauty," and "Art in Large Towns." Mr. Ruskin says: —

"I have been asked by Mr. Horsfall to write a few words of introduction to the following papers. The trust is a frank one, for our friendship has been long and intimate enough to assure their author that my feelings, and even practical convictions in many respects differ from his, and in some, relating especially to the subjects here treated of, are even opposed to his; so that my private letters (which, to speak truth, he never attends to a word of) are little more than a series of exhortations to him to sing—once for all —the beautiful Cavalier ditty of 'Farewell Manchester,' and pour the dew of his artistic benevolence on less recusant ground. Nevertheless, as assuredly he knows much more of his own town than I do, and as his mind is evidently made up to do the best he can for it, the only thing left for me to do is to help him all I can in the hard task he has set himself; or, if I can't help, at least to bear witness to the goodness of the seed he has set himself to sow among thorns. For indeed the principles on which he is working are altogether true and sound; and the definition and defence of them in this pamphlet are among the most important pieces of art-teaching which I have ever met with in recent English literature — in past art-literature there cannot, of course, be anything parallel to them, since the difficulties to be met and mischiefs to be dealt with are wholly of to-day. And in all the practical suggestions and recommendations given in the following pages I not only concur, but am myself much aided as I read them, in the giving form to my own plans for the museum at Sheffield; nor do I doubt that they will at once commend themselves to every intelligent and candid reader. But, to my own mind, the statements of principle on which these recommendations are based are far the more valuable part of the writings, for these are true and serviceable for all time, and in all places; while in simplicity and lucidity they are far beyond any usually to be found in essays on art, and the political significance of the laws thus defined is really, I believe, here for the first time rightly grasped and illustrated. Of these, however, the one whose root is deepest and range widest will be denied by many readers, and doubted by others, so that it may be well to say a word or two further in its interpretation and defence—the saying, namely, at page 22, that 'faith cannot dwell in hideous towns,' and that 'familiarity with beauty is a most powerful aid to belief.' This is curious saying, in front of the fact that the primary force of infidelity in the Renaissance times was its pursuit of carnal beauty, and that now-a-days (at least so far as my own experience reaches) more faith may be found in the back streets of most cities than in the fine ones. Nevertheless, the saying is wholly true; first, because carnal beauty is not true beauty; secondly, because rightly judged, the fine streets of most modern towns are more hideous than the back ones; lastly, and this is a point on which I must enlarge, because universally the first condition to the believing there is order in heaven is the sight of order upon earth; order, that is to say, not the result of physical law, but of some spiritual power prevailing over it, as — to take instances from my own old and favorite subject — the ordering of the clouds in a beautiful sunset, which correspond to a painter's invention of them; or the ordering of the colors on a bird's wing, or of the radiations of a crystal of hoar-frost or of sapphire, concerning any of which matters, men, so called of science, are necessarily and forever silent, because the distribution of colors in spectra, and the relation of planes in crystals are final and causeless facts, orders, that is to say, not laws. And more than this, the infidel temper which is incapable of perceiving this spiritual beauty, has an instant and constant tendency to delight in the reverse of it, so that practically its investigation is always, by preference, of forms of death or disease; and every state of disorder and dissolution — the affectionate analysis of vice in modern novels being a part of the same science. And to keep to my own special field of study—the order of clouds—there is a grotesquely notable example of the connection between infidelity and the sense of ugliness in a paper of the last *Contemporary Review*, in which an able writer, who signs "Vernon Lee," but whose personal view or purpose remains to the close of the essay inscrutable, has rendered with considerable acuteness and animation the course of a dialogue between one of the common modern men-about-town, who are the parasites of their own cigars, and two more or less weak and foolish friends of hesitatingly adverse instincts; the three of them, however, practically assuming their own wisdom to be the highest yet attained by the human race; and their only diversion on the mountainous heights of it being by the aspect of a so-called 'preposterous' sunset, described in the following terms: 'A brilliant light, which seemed to sink out of the landscape all its reds and yellows, and with them all life; bleaching the yellow cornfields and brown heath; but brandishing into demoniac energy of color the pastures and oak woods, brilliant against the dark sky, as if filled with green fire. Along the roadside the poppies, which an ordinary sunset makes flame, were quite extinguished, like burnt-out embers; the yellow hearts of the daisies were quite lost, merged into their shining white petals, and, striking against the windows of the old black-and-white checkered farm (a ghastly skeleton in this light), it made them not flare — nay, not redden in the faintest degree — but reflect a brilliant speck of white light. Everything was unsubstantial, yet not as in a mist; nay, rather substantial, but flat, as if cut out of paper and pasted on, the black branches and green leaves, the livid, glaring houses, with roofs of dead, scarce perceptible red (as when an iron turning white-hot from red-hot in the stithy grows also dull and dim). "It looks like the eve of the coming of Antichrist, as described in mediæval hymns," remarked Vere, "the sun, before setting never more to rise, sucking all life out of the earth, leaving it but a mound of livid cinders, barren and crumbling, through which the buried nations will easily break their way when they arise."' As I have above said, I do not discern the purpose of the writer of this paper; but it would be impossible to illustrate more clearly this chronic insanity of infidel thought which makes all nature spectral; while, with exactly correspondent and reflective power, whatever is dreadful or disordered in external things reproduces itself in disease of the human mind affected by them."

COLORING THE FINISHING COAT.

To the Editors of the American Architect: —

Dear Sirs, — Can walls (inside) be successfully colored or tinted by mixing dry colors with the materials used in a finishing coat of hard finish? Subscriber.

[Dry color mixed with the hard finish does not give a very good result, the evaporation of the water from the plaster causing a slight streaky efflorescence on the surface after drying. The best effect with colored plaster is obtained with one coat, or perhaps a scratch and brown coat, rubbed with a cork float to bring the sand to the surface. — Eds. American Architect.]

GLASS ROOFING TILES.

Youngstown, Ohio, August 24, 1883.

To the Editors of the American Architect: —

Dear Sirs, — In answer to the query of "Cluss & Schulze," in your issue of June 23, I would say the glass roof tiles which they mention are manufactured in Youngstown, Ohio, by Lane & Woodworth. The article is coming into quite general use for lighting and roofing work-rooms and various public buildings in the West. The St. Louis, Mo., Exposition Buildings are to be roofed with it. It is light, durable, not affected by the weather, and I do not see why it should not be a good thing. G. D. Pellett.

[Messrs. Atterbury & Co., Pittsburgh, Pa., are also making glass shingles. — Eds. American Architect.]

NOTES AND CLIPPINGS.

Charlemagne's Bridge over the Rhine. — Near the close of the eighth century, Charlemagne ordered the construction, over the Rhine, of a bridge resting on twenty-eight buttresses. The bridge was struck by lightning and burned to the level of the water. German engineers are now removing the remains of the old structure, on the Mayence side. They have already taken out fifty piles, with the lengths of five or six metres (5.468 to 6.562 yards). The wood, which is nearly eleven hundred years old, is so well preserved that it can still be used in building; the iron, which was riveted to the posts, can also be used, since it is covered only with a thin layer of rust. — *Chronique Industrielle.*

Pentelian and Parian Marbles. — Although Pentelian marble and all monuments made of it have at first a beautifully white and brilliant appearance, yet after a while, sometimes within a few months, sometimes not for years, they exhibit reddish-brown spots and stains, and marble columns of Pentelian marble gradually become covered with a reddish-brown film of oxide of iron. The color comes from sulphide of iron (pyrites) that frequently occurs in fine streaks in this marble and is oxidized in course of time by the action of air and water, and can then be recognized, very disagreeably, by their dark color. The spores of cryptogamous plants, such as fresh and salt water algæ, germinate in these red streaks. The new Academy at Athens was built of such Pentelian marble, and while hundreds of the blocks used still remain perfectly white and will probably remain so a long time, others already show yellow, brown, and even black spots. On the other hand, Parian marble, from which the old sculptors Praxiteles and Phidias chiseled their statues, has the property of remaining always white, because it contains no iron. Both kinds of marble have this excellent quality, namely, that they do not weather, lose their lustre, and look like the shells of boiled eggs, as is the case with Carrara marble. The name of marble, from its Greek derivation, signifies a stone that glistens on the broken or fractured surfaces. To impart to new marble the appearance of old, which is necessary in repairing injured antiquities, it may be painted over with a very dilute solution of chloride of iron, whereupon the new pieces acquire a fine yellowish-red color, similar to that produced by the influence of air and water for centuries upon the old marble. — *Austro-Hungarian Journal.*

American Society of Civil Engineers. — At a meeting of the Society held September 5, a paper by James L. Randolph, Member of the Society, and Ch. Engr. Baltimore & Ohio R. R., upon "Vibration, or the Effect of Passing Trains on Iron Bridges, Masonry, and other Structures" was read. Mr. Randolph refers to the fact that double-track bridges are moved in the direction of passing trains, and are consequently twisted and strains not provided for are produced; also that cattle-stops and open culverts, where built of rubble-work, have the walls shaken to pieces by vibration. The remedy he has supplied for these culverts and stops, has been to build them of large stone as nearly the same size as possible. The tall, thin bridge pieces and abutments on which iron bridges rest have their stones so much disarranged by vibration as to make it necessary to secure them with timber and iron straps. Iron bridges resting on stone pedestals vibrate in this manner, and receive a return blow from the vibration of the pedestal, particularly if the pedestal is a light structure, but as the iron and the stone do not vibrate in the same period, there must be times when the result is a movement in the direction of the force. The effect of this vibration has been particularly noticeable at the Harper's Ferry bridge, where there was a movement of four inches in four years. After the insertion of planks between the stone and iron, this movement ceased. Where the masonry of piers has a platform of timber between its foundation and solid rock, no displacement of stone has been noticed. Mr. Randolph contends that a monolith would be the best support for structures subject to vibration caused by strains, but that a monolith of the specific gravity of granite would give a damaging return blow. Timber would answer the purpose, but is perishable. The material which in his opinion is most serviceable is an artificial stone, which is about two-thirds the weight of granite, is compact, durable, and with very little elasticity. The paper was discussed by Messrs. Theodore Cooper, Chas. E. Emery, H. D. Blunden, and Wm. H. Paine.

The Excavations at Ephesus. — A statement has been prepared by Mr. Beresford-Hope, the chairman of the committee, respecting Mr. Wood's proceedings at Ephesus during the past year. In March of the present year, the sanction of the trustees of the British Museum having been obtained, Mr. Wood was authorized by the committee to proceed to Ephesus and resume the excavations which had been so long in abeyance for want of funds. The freehold of the site of the temple had been purchased by the trustees of the British Museum during the time of the former excavations. Their right to resume the work seemed accordingly to be clear, although the question of the privilege of removing the sculptures which might be found was more disputed. Mr. Wood, however, had not long resumed his work when the Mudir of the district visited the spot, and reported their recommencement to the Kaimachan of Scala Nova, who in his turn reported the same to the Governor of Smyrna, and in due time the Mudir received his written instructions to stop the excavations. In obedience then to the intimation of the Mudir, Mr. Wood suspended the work, which he had then carried on for eleven days, and took the first boat for Constantinople to obtain a fresh permit from the Ottoman Government. This interruption delayed operations for several weeks, but happily the required document was eventually obtained through the effectual good offices of Lord Granville and of the Embassy at Constantinople, and in three days from the time when the request was submitted to the Sultan the permit was handed to Mr. Wood by the Minister of Public Instruction. Mr. Wood then returned without delay and resumed the excavations. By this time the cool weather had passed away, and the hot season had set in, but as he was anxious to make some important discovery before abandoning the work till the autumn, Mr. Wood persevered until June 15, when he was forced to stop, for not only did the heat prevent the workmen from doing a fair day's work, but the water still stood in the excavations at a level which prevented the recovery of the stones which could be felt through the mud. Several interesting inscriptions and fragments of sculpture were, however, secured. The latter evidently belonged to the pediment at the east end of the temple. The most interesting of these was the leg of a male figure in high relief, somewhat larger than life. At a committee meeting held on July 24 it was decided to authorize Mr. Wood to return to Ephesus in September and resume the excavations. The committee was justified in this decision by the fact that a large area had been opened up to an average depth of 17 feet in the few weeks of work during the spring and early summer, while the stones which could only be felt at that time through the mud and water could be easily removed in the autumn after the water will have subsided for a depth of several feet. It is most desirable that the archæological public should subscribe liberally, if they desire the success of this most interesting exploration. If it is carried on as it ought to be to the extent proposed — namely, to the outer face of the colonnade which surrounded the temple — the result will probably be the unearthing both of beautiful sculptures and inscriptions possessing historical value. The discoveries which reach England will be placed in the gallery which is to be devoted at the British Museum to the Ephesian antiquities, and will be a great addition of permanent value to the national art treasury. — *The Architect.*

Ice Ingloos. — The natives of North Hudson Bay excel in a peculiar style of architecture, ice being the material with which they build their dwellings. Rectangular slabs, three to four by six or six and a half feet, are cut from some neighboring fresh-water lake where ice has formed to the depth of six inches. At a rough approximation these slabs may be said to be about the size of an ordinary door. The slabs are placed upright, resting on their ends and joined so as to form a circular pen of from ten to fifteen feet in diameter. Over the top of this the summer sealskin tent is spread for a roof, supported by tent poles crossing at convenient places and held in place by a lashing of sealskin about a foot below the top of the ice slabs. These ice ingloos are as transparent as glass, and before they are covered by the drifting snow, or their interiors are dimmed by the smoking of the sooty lamps, a night scene in one of these villages, especially if it be large, with brilliant burning stone lamps in full blaze, is one of the prettiest sights imaginable. These ice ingloos are, after all, only temporary dwellings, and as soon as the snow has collected in sufficient quantities for building purposes, huts are constructed of it, and the natives desert the ice houses as soon as the snow huts are completed. — *N. Y. Mail and Express.*

Glass for Flooring. — In many of the business houses in Paris, and especially in those of which the cellars are used as offices, glass is now being extensively employed instead of boards for flooring. At the headquarters of the Crédit Lyonnais, on the Boulevard des Italiens, the whole of the ground floor is paved with large squares of roughened glass embedded in a strong iron frame, and in the cellars beneath there is, even on dull days, sufficient light to enable the clerks to work without gas. The large central hall at the offices of the Comptoir d'Escompte has lately been provided with a similar flooring; and it is said that although its prime cost is considerably greater than that of boards, glass in the long run is far cheaper, owing to its almost unlimited durability. The material is cast in slabs about eighteen inches square by an inch and a half thick, and transmits a bluish light. — *St. James's Gazette.*

Shapira and his earliest "Find." — The first notable event in the career of Mr. Shapira, the inventor of the "Moabite" sheepskin decalogue, was his great discovery of Samson's coffin. "A few years ago," says the *Pall Mall Gazette,* "he made his appearance in London with this venerable relic of the period of the Judges, which he endeavored to persuade the authorities of the Palestine Exploration Fund to purchase. The genuineness of the article was vouched by the name of 'Sampson' legibly inscribed on the wood in archaic characters. Mr. Besant, we believe, consulted Dr. Neubauer as to the probable date of the inscription; and it was only when the Oxford savant pointed out that the Philistines had unaccountably misspelt the name of the Hebrew hero that Mr. Shapira and the coffin simultaneously disappeared."

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.]

284,162. WRENCH. — Henry William Atwater, Orange, N. J.

284,170. WATER-TIGHT JOINT FOR TILING, VAULT-COVERS, AREAS, ETC. — Emory Bosworth, Cleveland, Ohio.

284,180. FIRE-ESCAPE. — August Conrad Burghardt, Port Deposit, Md.

284,191. MOULD FOR CASTING PIPE OF PLASTIC MATERIAL. — Daniel H. Dorsett, Chicago, Ill.

284,203. VAULT COVER AND VENTILATOR. — August W. Herr, Chicago, Ill.

284,222. BLIND-SLAT OPERATOR. — Frederick Nelson, St. Paul, Minn.

284,253. BOLT. — Joseph N. Spencer and Thomas H. Dunn, South Manchester, Conn.

284,275-276. BIT-STOCK. — John Chantrell, Bridgeport, Conn.

284,279. VENTILATING-FAN. — Charles Cockson, Wigan, County of Lancaster, Eng.

284,281. FIRE-ESCAPE. — Edward Augustus Costigan, Boston, Mass.

284,282. PILE-DRIVER. — Roys J. Cram, Detroit, Mich.

284,299. ARTIFICIAL STONE. — Peter F. Haverty, Shenandoah, Pa.

284,305. FRICTION-CLAMP FOR FIRE-ESCAPES. — J. Thomas Jones, Utica, N. Y.

284,308. SCAFFOLD AND FIRE-ESCAPE. — Joseph Klein, New York, N. Y.

284,311. PNEUMATIC BELL-RINGING APPARATUS. — Robert Latowski, Oels, Prussia, Germany.

284,334. DEVICE FOR FASTENING DRAWING-PAPER TO DRAWING-BOARDS. — William Schonheyder, Shepherds Bush, London, Eng.

284,336. DOOR-LATCH. — Alfred L. Scranton, Rochelle, Ill.

284,352. ELEVATOR. — Emil Bachmann, New York, N. Y.

284,358. DOOR-BRAKE. — Warren S. Barlow, Paterson, N. J.

284,360. FIRE-ESCAPE. — Frederick E. Bauer, Danbury, Conn.

284,371. ROOFING COMPOUND. — Daniel Brobst, Portland, Mich.

284,381. KNOB ATTACHMENT. — John K. Clark, Buffalo, N. Y.

284,396. KNOB ATTACHMENT. — Thomas H. P. Dennis, Chelmsford, County of Essex, Eng.

284,402. TANK. — Moyer Fleisher, Philadelphia, Pa.

284,410. WINDOW-SCREEN. — Seymour Glass and George H. Noble, Clintonville, Wis.

284,421. GLAZING THE ROOFS OF HORTICULTURAL STRUCTURES. — Thomas W. Helliwell, Brighouse, County of York, Eng.

284,424. LEVELLING-INSTRUMENT. — William C. Holmes, Atlanta, Ga.

284,431. FIRE-ESCAPE. — Chas. Johnson, St. George, New Brunswick, Can.

284,434. FIRE-ESCAPE. — Daniel A. Keech, Cannonsburg, Mich.

284,451. FIRE-ESCAPE. — Saml. MacCarty, Aurora, Ill.

284,506. FASTENER FOR MEETING-RAILS OF SASHES. — Wm. E. Sparks, New Britain, Conn.

284,517. FIRE-ESCAPE. — Aaron Walker, Kokomo, Ind.

284,539. WEATHER-STRIP. — Henry Carter, Gold Hill, Colo.

284,542. FIRE-ESCAPE. — Alexander M. Dye, Minneapolis, Minn.

284,544. WATER-CLOSET. — Othniel B. Evans, Philadelphia, Pa.

284,559. SKY OR VAULT LIGHT ROOF AND ROOF-PAVEMENT. — Thaddeus Hyatt, New York, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

LAW SCHOOL. — Chas. E. Cassell, architect, has prepared drawings for a two-st'y building, to be erected cor. Green and Lombard Sts., for the University of Maryland. It will be built of brick, with stone and terra-cotta finish, 34′ x 86′, and cost $5,000; Philip Walsh & Sons, builders.

DWELLINGS. — Frank E. Davis, architect, has prepared drawings for the following: —

Three-st'y brick building, 20′ x 71′, for Goldsborough S. Griffith, Huntington Ave., near St. Paul St.; cost, $6,000.

Three-st'y brick building, (double) 40′ square, for Caspar Vocke, Huntington Ave., near St. Paul St.; cost, $10,000.

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

C. L. May, three-st'y brick building, e s Durham St., bet. Lancaster and Aliceanna Sts.

D. C. Howell, three-st'y brick building, n e cor. Light St. and Quay Alley.

John Greb, three-st'y brick building, s w cor. Lancaster and Bethel Sts.

Franz Thoerne, two-st'y brick stable, in rear of Nos. 205 and 207, w s Durham St., bet. Eastern Ave. and Bank St.

E. W. Gorman, 11 two-st'y brick buildings, e s Patterson Park Ave. com. s e cor. Fairmount Ave.

Wm. McLaughlin, 2 two-st'y brick buildings, w s Norris Alley, n of Ramsay St.

Alex. M. Briscoe, 6 two-st'y brick buildings, e s Vincent Alley, bet. Pratt and McHenry Sts.

L. German, three-st'y brick building, e s Valley St., s of Biddle St.

C. H. Pierson & Co., one-st'y brick building, 50′ x 56′, and two-st'y brick office, e s Jackson St., bet. Clement St. and Fifth Lane.

Geo. C. Hershman, 4 two-st'y brick buildings, s s Moyer St., bet. Chester and Barkard Sts.

Francis T. King, 3 three-st'y brick buildings, e s Park Ave. bet. Richmond and Madison Sts.

Robert F. Morrison, 2 three-st'y brick buildings, n w cor. Baltimore and Exeter Sts., 6 three-st'y brick buildings, w s Exeter St., n of Baltimore St.

Edwin S. Long, three-st'y brick building, e s Valley St., s of Biddle St.

Medical University of Maryland, two-st'y brick building, n s Lombard St., bet. Paca and Green Sts.

Jos. Thuman & Son, 12 two-st'y brick buildings, e s Hanover St., bet. Fort Ave. and Randall Sts.

Conrad Schuchart, 3 two-st'y brick buildings, w s Stirling St., bet. Chase and Eager Sts.

Boston.

CHURCH. — The drawings for the Church of the Messiah which is to be built on Huntington Ave., are being made by Mr. Henry M. Congdon of New York; estimated cost of building, $150,000.

BUILDING PERMITS. — *Brick.* — *Commonwealth Ave., No.* 271, Ward 11, for Asa H. Caton, dwell., 25′ x 63′, four-st'y mansard; Asa H. Caton, builder.

Wood. — *Unnamed St.*, off Cemetery Lane, Ward 24, for Mrs. Caroline Jackson, 2 dwells., 20′ x 30′, one-st'y pitch; J. H. Burt & Co., builders.

Cushing Ave., near Jerome St., Ward 24, for Timothy M. Roach, 3 dwells., 22′ x 30′, two-st'y pitch; Wm. Blazo, builder.

Hancock St., near Jerome St., Ward 24, for Timothy M. Roach, 3 dwells., 22′ x 30′, two-st'y pitch; Wm. Blazo, builder.

Norfolk St., near Withington St., Ward 24, for Mrs. Caroline Jackson, 3 dwells., 22′ 8″ x 33′; J. H. Burt & Co., builders.

Tewpinct St., near Cottage St., Ward 24, for Frank O. Nash 4 dwells., 27′ x 35′; Wm. A. Blazo, builder.

Warner Ave., near Coolidge Ave., Ward 24, for A. A. Westcott, 2 dwells., 24′ and 30′ 6″ x 31′; ell, 16′ x 18′ 9″; J. H. Burt & Co., builders.

Parkman St., near Dorchester Ave., Ward 24, for Lewis Eddy, dwell., 36′ x 42′, two-st'y pitch.

Unnamed St., off Western Ave., near Waverly St., Ward 25, for John M. Hollis, 4 dwells., 20′ x 30′, one-st'y pitch.

Arcadia St., near Adams St., Ward 24, for Georgiana S. Drake, dwell., 23′ and 27′ x 36′, two-st'y pitch; A. C. Drake, builder.

Washington St., rear, near South St., Ward 23, for Charles Whittemore, carriage-house, 28′ x 35′, two-st'y pitch; A. N. Greenlaw, builder.

Boston St., cor. Dorset St., Ward 5, for L. E. H. Jones, dwell., 24′ x 35′ and 18′ x 20′, two-st'y pitch; C. E. Ricker, builder.

Prospect St., No. 34, for Geo. W. H. Smith, dwell., 23′ x 29′, two-st'y flat; Geo. W. H. Smith, builder.

Highland St., near Marcella St., Ward 21, for Robert A. Watson, dwell., 25′ x 39′, three-st'y flat; Samuel Rantin, builder.

Taber St., No. 4, Ward 20, for H. S. Lawrence, saloon and restaurant, 20′ x 38′, three-st'y flat; — Merritt, builder.

Church St., near Brook St., Ward 1, for John F. Slattery, dwell., 20′ x 30′, two-st'y pitch; John F. Slattery, builder.

I St., No. 108, rear, Ward 14, for Lyman Locke, dwell., 20′ x 30′, two-st'y flat; Lyman Locke, builder.

Millett St., near Park St., Ward 24, for J. P. B. Carlton, 2 dwells., 27′ x 28′, two-st'y pitch; J. W. Hildreth, builder.

Evans St., near Thetford St., Ward 24, for Samuel T. Long, dwell., 20′ and 33′ x 30′, two-st'y pitch; Samuel T. Long, builder.

Adams St., near Codman St., Ward 24, for Arthur H. Pierce, dwell., 28′ x 36′, two-st'y pitch; Arthur H. Pierce, builder.

Adams St., opp. Malvern St., Ward 24, for F. H. Pierce, dwell., 21′ 6″ and 28′ x 30′, two-st'y hip; F. A. Pierce, builder.

Brooklyn.

BUILDING PERMITS. — *Degraw St.*, n s, 100′ e Hoyt St., 4 three-st'y brick dwells., tin roofs; cost, each, $3,500; owner, architect and builder, John A. O'Rourke, 78 Douglass St.

Quincy St., s s, 175′ e Patchen Ave., 3 two-st'y brick dwells., tin roof; cost, each, $3,200; owners and builders, Cardwell & Hawkins, 15 Lawton St.

Broadway, s e cor Park St., 2 three-st'y brick stores and tenements, tin roofs; cost, total, $14,000; owner, Herman Suttmeir, 172 Graham Ave.; architect, T. Engelhardt; builders, H. Grasman and G. Ross.

Chauncey St., s s, 250′ e Patchen Ave., two-st'y and basement frame dwell., tin roof; cost, $3,200; owner, J. Fritz, 456 Grand St.; builder, J. Pirruing.

Varick Ave., s e cor. Harrison Pl., two-st'y frame dwell., peaked roof of shingles; cost, $3,000; owner, Joseph Hurst, on premises; architect, T. Engelhardt; builders, A. Kunzweiler and P. Kunzweiler.

Central Ave., e s, 25′ s Troutman St., three-st'y frame double tenement, tin roof; cost, $4,300; owner, Julius Dewald, Central Ave., cor. Troutman St.; architect, G. Hillenbrand; builder, W. Bayer.

Boerum Pl., n s, 150′ w Graham Ave., three-st'y frame store and double tenement, tin roof; cost, $4,500; owner, G. Steinmetz, Montrose Ave., near Graham Ave.; architect, E. Schrumpf; builder, U. Maurer.

Union St., n s, 100′ e Hoyt St., three-st'y brick tenement, tin roof; cost, $6,000; owner, Jas. Belford, 431 Union St.; builder, J. Gallagher.

Eagle St., n s, 65′ e Manhattan Ave., four-st'y frame double tenement, tin roof; cost, $5,500; owner, Adam Shulze, Manhattan Ave., cor. Eagle St.; architect, S. Mullhaul; builder, J. Fallon.

ALTERATION. — *Third Ave.*, cor. Thirteenth St., raised one st'y; also three-st'y brick extension, gravel roofs, front and side walls of present building rebuilt; cost, $4,100; owners, Chas. A. Schieren & Co., 47 Ferry St., N. Y. City; architect, W. B. Tubby; builders, G. W. Buchanan and L. W. Seaman.

Chicago.

BAKERY. — Adler & Sullivan are architects for the addition to F. A. Kennedy & Co.'s bakery on Desplains St., to cost $20,000.

DRY-HOUSE. — The dry-house for the J.M. Brunswick & Balke Co., was planned by Adler & Sullivan; cost, $65,000.

FACTORY. — The factory-building to be erected for the Wright & Lowther Oil & Lead Mfg. Co., to cost $40,000, was planned by Adler & Sullivan, architects.

HOUSES. — Adler & Sullivan are architects for C. P. Kimball's house and stable, now being erected on Ontario St., to cost $45,000.

The same architects planned the house on Michigan Ave., for C. H. Schwab, to cost $18,000.

The dwelling house to be built for Mrs. A. Halsted on Lincoln Ave., to cost $14,000, was also planned by Adler & Sullivan.

Also by same architects 3 houses for M. M. Rothschild, to be built cor. Thirty-second St. and Indiana Ave., to cost $17,000.

The same are architects for M. Selz's house at 1717 Michigan Ave., to cost $30,000.

Adler & Sullivan, architects, prepared the plans for the stores and flats at 881 West Lake St., for R. Knisely, to cost $16,000.

Adler & Sullivan are architects for R. Rubee's store and flats, at 309 South Clark St., to cost $16,000.

The same architects planned the store and flats for F. Kaufman, on Lincoln Ave., to cost $10,000.

SCHOOL-HOUSE. — Adler & Sullivan, architects, made plans for the school-house at Marengo, Ill., to cost $20,000.

BUILDING PERMITS. — Wm. Lesch, two-st'y dwell., 78 Jay St.; cost, $3,000.

Townsend & Godfrey, four-st'y theatre, 72′ x 136′, 167 Halsted St.; cost, $50,000; architect, Oscar Cobb.

John Rohles, two-st'y store and dwell., 2439 Wentworth Ave.; cost, $4,500; architect, J. Frank; builder, John Rohles.

P. Conlan, three-st'y dwell., 369 Wells St.; cost, $4,000.

M. Dewon, two-st'y dwell., 30 Nebraska St.; cost, $4,500.

Chas. Wilotz, two-st'y dwell., 2713 Hickory St.; cost, $2,500.

M. E. Icharlan, two-st'y dwell., near North Ave.; cost, $3,500; architect, H. Meissner; builder, J. Lanstin.

H. Buschmeier, three-st'y factory, Huron St.; cost, $5,000; architects, Furst & Rudolph; builder, Geo. Schaffer.

J. E. Rogerson, two-st'y dwell., 195 Seminary St.; cost, $2,600.

F. Doorak, 2 three-st'y stores and dwells., 670-672 Throop St.; cost, $15,000; architect, P. W. Ruehl, builders, Benes & Sayer.

V. Kubin, three-st'y store and dwell., 777 Allport Ave.; cost, $7,500; architect, John Bessler; builders, Benes & Sayer.

Geo. Schert, three-st'y dwell., 519 Sedgwick St.; cost, $4,200.

J. Schnable, two-st'y dwell., 656 Superior St.; cost, $2,800.

Henry Sweet, two-st'y dwell., 1465 Milwaukee Ave.; cost, $2,000; builder, Geo. Peterson.

Saml. Simons, 4 two-st'y dwells., Elizabeth St.; cost, $8,000; architect, Ackermann.

American Express Co., freight-house, Bunker St.; cost, $5,000; architects, Treat & Folz; builder, E. Ernshaw.

A. A. Harris, two-st'y dwell., 449 West Congress St.; cost, $3,500.

John Smith, 3 two-st'y dwells., Thirty-third St. and Vernon Ave.; cost, $15,000.

Turner & Bond, 2 cottages, 3040 and 3045 Butler St.; cost, $2,500.

S. M. Slack, two-st'y flats, 3324 Dearborn St.; cost, $3,000.

Jas. McKeen, two-st'y flats, 3828 Dearborn St.; cost, $3,000; builder, B. Hawley.

Cincinnati.

HOUSES. — Albert Schwill, Esq., is to build a two-st'y frame dwell. on Mt. Tusculum; from plans prepared by Mr. Geo. W. Rapp, architect; cost, $10,000.

Mr. Geo. W. Rapp, architect, has prepared plans for two-st'y frame dwell., to be built for Mr. Chas. Wittsein on Kemper Lane; cost, $7,000; also for altering brick dwell. of Dr. Schueider, cor. Ninth and Vine Sts.; cost, $10,000.

Mrs. E. A. Horton will build two-st'y dwelling-house on Ashland St., costing $5,500; Chas. Crapsey, architect.

Detroit.

BUILDING PERMITS. — John McDuff, 4 brick stores, Nos. 668 to 674 Michigan Ave.; cost, $12,000.

M. W. Scovill, 2 frame dwells., Nos. 149 and 151 Russell St.; cost, $6,500.

G. A. Dupuis, brick church, Medbury Ave.; cost, $9,000.

Julius Hess, brick house, No. 65 East High St.; cost, $6,300.

Julius Hess, brick barn, Plumb St.; cost, $6,500.

A. Backus & Sons, brick warehouse, West Fort St.; cost, $4,000.

J. F. Weber, 6 frame dwells., German St., cor. St. Aubine Ave.; cost, $5,400.

F. B. Wittman, brick store, No. 525 Catharine St.; cost, $3,000.

W. E. Armstrong, 3 brick stores, West Woodbridge St.; cost, $4,500.

John Burt, brick barn, Woodward Ave.; cost, $3,000.

Wm. B. Wesson, addition to laboratory, Twenty-first St.; cost, $19,000.

John Da More, frame dwell., No. 205 Twenty-fourth St.; cost, $3,600.

W. F. Londers, brick church, Catharine St.; cost, $5,000.

E. A. Waterfall, brick dwell., No. 628 Cass Ave.; cost, $5,000.

Building dull at present.

New York.

FALL PROBABILITIES. — Little work of importance is talked of for immediate erection, and the outlook now looks slim for new fall work.

CHURCH. — Work on the new church of St. Cecilia, One Hundred and Sixth St., bet. Lexington and Fourth Aves. is rapidly progressing. Ground was broken last April, and the foundation of a substantial structure has been erected. The corner-stone was laid September 9.

DWELLINGS. — Thirteen brownstone houses, four-st'y high, varying in size from 16′ x 45′ to 18′ x 50′, on Fourth Ave. and Ninety-first St., at a probable cost of $250,000, are to be built by Mr. Andrew J. Kerwin;

BUILDING PERMITS. — *Fifty-eighth St.*, s s, 200′ w Ninth Ave., 5 four-st'y brownstone front dwells., tin roofs; cost, $20,000; owner, J. S. Howard, 121 Broadway; architect, Jos. M. Dunn; builder, J. S. Howard.

Thirty-seventh St., s s, 100′ e Tenth Ave., five-st'y brick tenement, tin roof: cost, $16,000; owner, Patrick McCoy, 534 West Thirty-fifth St.; architect, John Sexton; builder, John Smith.

Canal St., No. 69, —— five-st y brick tenement and store, tin roof; cost, $11,000; owner, Simon Liebowitz, 75 Hester St.; architect. Wm. Graul.

Crosby St., n s cor. Jersey St., seven-st'y brick store and factory, tin roof; cost, $110,000; owner, Leo Schlesinger, cor. Eleventh St. and Avenue D.; architects, H. J. Schwarzmann & Co.; builders, List & Lennon.

Second Ave., w s, 150′ 7″ w One Hundred and Twenty-third St., five-st'y brick tenement and store, tin roof; cost, $17,000: owner, John F. Dunker, s w cor. Tenth Ave. and One Hundred and Twenty-fifth St.; architect, James Barrett.

First Ave., s e cor. Eighty-eighth St., four-st'y brick tenement and stores, tin roofs; cost, $15,000; owner, Jacob Wicks, Jr., 508 e Eighty-seventh St., architect, John Brandt.

One Hundred and Forty-sixth St., s s, 175′ e Tenth Ave., three-st'y brick dwelling, gravel or tin roof; cost, $6,000; owner, Sam'l F. Warner, 16 e Fortieth St.

Tenth Ave., s w cor. One Hundred and Seventieth St., two-st'y brick dwell., slate and tin roof; cost, $24,000; owner, M. L. Stieglitz, 212 e Seventy-ninth St.; architect, H. Kreitler; builders, C. R. Terwilliger and Geo. Santer.

St. Ann's Ave., e s One Hundred and Twenty-fifth St., Westchester Ave., three-st'y frame dwell., tin roof; cost, $3,500; owner, Mrs. Ann Callahan, on premises; architect, W. W. Cardiner.

Third Ave., No. 1582, five-st'y brick tenement and store, tin roof; cost, $29,000; owner, Estate Wm. R. Renwick, Thos. Patton, exr. 113 e Fifty-seventh St.; architect, Geo. M. Huss; builders, Cornelius Callahan and Grisler & Fausel.

One Hundred and Thirtieth St., s s and n s One Hundred and Twenty-ninth St., 270′ e of Seventh Ave., 6 three-st'y brownstone front dwells., tin roofs; cost, $14,000; owner, Samuel O. Wright, 255 w One Hundred and Twenty-seventh St., architects, Cleverdon & Putzel.

Elizabeth St., No. 153, five-st'y brick tenement and store, tin roof; cost, $12,000; owners, Eliza D. Ogilby and Mary D. Hoyt, Roseville, Newark, N. J.; architects, Cleverdon & Putzel: builder, D M. Kennedy.

St. Mark's Pl., No. 104, five-st'y brick flat, tin roof; cost, $18,000; owner and architect, Jobst Hoffman, 153 Fourth Ave.

One Hundred and Seventy-eighth St., n s, 125′ e Grant Ave., 2 two-st'y frame dwells., tin roofs; cost, $3,000 each; owner and architect, Anthony Royce, 2026 R. R. Ave.; builder, Wm. Coogan.

One Hundred and Seventy-second St., n w cor. Madison Ave., 2 two-st'y frame dwells.; tin roofs; cost, $2,000; owner, Wm. Finger, Third Ave., bet. One Hundred and Seventy-third and One Hundred and Seventy-fourth Sts.; architect, John E. Kerby; builder, John Kerby.

Orchard St., s s, 225′ e Fleetwood Ave., 2 two-st'y frame dwells., shingle roof; cost, $3,000; owner, Mary Ann Lodge, 278 Alexander Ave.; architect, John E. Kerby.

ALTERATIONS. — *West Forty-sixth St., No.* 204, raise roof 4′; also a four-st'y brick extension, tin roof; cost, $7,000; owner, Kate L. Westerfield, 411 w Fifty-seventh St.; architect, John J. Brierly; builder, David Christie.

West Fortieth St., Nos. 346 *and* 348, two-st'y brick extension, tin roof; cost, $4,500; owners, Fred. F. Keller, 123 w Forty-seventh St., and Wm. G. Arms, 547 w Forty-sixth St.; architect, C. F. Ridder, Jr.; builder, not selected.

West Twenty-fourth st., No. 7, fitting up Russian bath-rooms in basement and first-st'y, and thorough repairs; cost, $12,000; owner, Edward T. Stokes, Hoffman House; architect, Paul F. Schoen.

Philadelphia.

ALTERATION. — On School Lane (Germantown), addition to residence of E. T. Steel, Esq., of library and conservatory, from plans by Addison Hutton, architect.

BOILER-HOUSE. — At Front and Lehigh Aves., boiler-house for the Episcopal Hospital, from plans by Wilson Bros. & Co., architects.

HOUSES. — On Thirty-fourth St., near Race St., a pair of semi-detached houses, 22′ x 80′ each, of Leiper stone, for Mrs. A. L. Baker, from plans by Addison Hutton, architect.

BUILDING PERMITS. — *Eleventh St.*, s Fisher Lane, two-st'y dwell., 14′ x 28′; J. McCartney, contractor.

Sunset Lane, w Chestnut Hill and Spring House Pike, two-st'y stable, 41′ x 50′; Jas. McCartney, contractor.

Passyunk Ave., s w Federal St., one-st'y foundry, 69′ x 96′; Jas. Lanning, contractor.

Front St., n Greenwich St., 4 two st'y dwells., 14′ x 28′; Chas. H. Clark, owner.

Morris St., s s, w Twelfth St., 3 two-st'y dwells., 16′ x 42′; W. J. Smith, contractor.

Tenth St., e s, n McKean St., 2 two-st'y dwells., 15′ 6″ x 38′; Arthur Miller, owner.

Dudley St., e Tenth St., two-st'y dwell., 14′ 2″ x 38′; Arthur Miller, owner.

Ontario St., n s, e Kensington Ave., two-st'y dwell., 14′ x 38′; J. Dowling, owner.

Sartain St., w s, bet. Huntingdon and Oakdale Sts., 50 two-st'y dwells., 14′ x 28′; Thornton & Norton.

Wilder St., No. 1931, two-st'y dwell., 14′ x 35′; J. H. Young.

Lawrence St., n e cor. Cumberland St., three-st'y dwell., 18′ x 60′; Robert Buchanan.

Eighth St., n Lehigh Ave., three-st'y dwell., 16′ x 50′; W. Bartholomew.

Ripka St., cor. Chestnut St., three-st'y dwell., 18′ x 40′; W. Goodfellow.

Kensington Ave., s e cor. Wellington St., two-st'y dwell., 19′ x 50′; J. M. Buchanan.

Belgrade St., e s, s Allegheny Ave., 6 two-st'y dwells., 16′ x 46′; Christian Schwaneberg, owner.

Hancock St., s Susquehanna Ave., two-st'y dwell., 18′ x 58′; Geo. Kersler.

Fifth St., e s, n Lehigh Ave., 2 two-st'y dwells., 18′ x 50′; Daniel Neveling, Jr.

Broad St., cor. Wharton St., three-st'y dwell., 20′ x 78′; A. H. Williams, contractor.

Tenth St., No. 738, three-st'y dwell., 15′ x 45′; A. Williams, contractor.

West of Frankford Road, n Master St., three-st'y store; Shegog & Quigley.

Front St., cor. Washington Ave., 3 three-st'y dwells., 14′ x 29′; S. Elliot.

Fairhill St., w s, n Dauphin St., two-st'y dwell., 15′ x 40′; H. Schneider, owner.

Uber St., w s, s Norris St., 2 two-st'y dwells., 13′ x 42′; G. H. Fritz.

Poplar St., e Canal St., addition to packing-house, 40′ x 150′; P. H. Somerset, contractor.

Dickinson St., No. 3121, three-st'y store and addition, 16′ x 32′; Mary Megary, owner.

Twelfth Ave., cor. Susquehanna Ave., addition to City Passenger Railway stable, 27′ x 80′; Cyrus Lewis, contractor.

Atmore St., No. 1233, three-st'y dwell., 16′ x 38′; H. S. Franks, contractor.

Filbert St., No. 1618, four-st'y factory, 18′ x 60′; W. Massey, contractor.

Twenty-ninth St., n Brown St., three-st'y factory, 80′ x 118′; J. B. Doyle, contractor.

Twenty-ninth St., cor. Wright St., 14 two-st'y dwells., one with store, one 17′ x 32′, thirteen 14′ x 32′; J. W. Sharp, owner.

Twenty-fourth St., cor. Jefferson St., 13 two-st'y dwells., 19′ x 45′; J. W. Sharpe, owner.

Fisher Lane (Tenth St. and Lindley Ave.), two-st'y dwell., 34′ x 50′, W. G. Smith, owner.

Sunnyside Ave., w Thirty-fifth St., 16 three-st'y dwells., 15′ 8″ x 44′; Geo. E. Abbott, owner.

Cottage Ave., bet. Nineteenth and Twentieth Sts., 2 three-st'y dwells., 18′ x 24′; Jno. McGill, owner.

West Chelton Ave., No. 66, two-st'y club-house, 30′ 6″ x 76′; T. W. Wright, contractor.

Gravers St., s s, n Township Line, two-st'y dwell., 50′ x 70′; Geo. Hearst.

Federal St., No. 1320, two-st'y stable, 16′ x 44′; Andrew White.

St. Louis.

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

George A. Owens, two-st'y brick dwell.; cost, $3,000; Patrick Mulcahey, builder.

Morris, Butts & Co., three-st'y brick pork-house; cost, $4,000; Henry E. Rosch, builder.

Weindel & Wirthlin Mf'g Co., two-st'y brick keg and barrel factory; cost, $10,000; L. Kledus, architect; sub-let.

J. G. Bremer, two-st'y brick dwell.; cost, $5,900; W. C. Slicer, architect; J. C. Flynn, builder.

L. H. Rumsey, two-st'y brick dwell.; cost, $4,000; S. F. Simmons, architect; L. H. Rumsey, builder.

Joseph Wigst, two-st'y brick dwell.; cost, $7,000; George Boettinger, builder.

Charles F. Lutz, two-st'y brick dwell.; cost, $2,500; Ellerbach, builder.

Anchor Milling Co., four-st'y brick warehouse; cost, $8,000; Jungenfeld, architect; sub-let.

J. J. Brodericks, 2 two-st'y brick dwells.; cost, $11,000: J. J. Furlong, architect; R. Shinick, builder.

G. W. Kaup, two-st'y brick dwell., cost, $5,000; A. Beinke, architect; Grunewald & Wind, builder.

A. Gehner, two-st'y brick bank building; cost, $10,000; W. C. Slicer, architect; sub-let.

Mrs. Pabst, two-st'y brick dwell.; cost, $4,963; J. Flamery, architect; P. F. Meagher, builder.

German Baptist Congregation, one-st'y brick church; cost, $2,600; sub-let.

General Notes.

ALMONT, MICH. — The Union School District No. 1 of Almont, has contracted with Wm. H. Myers, of Hillsdale, Mich., for the construction of a school-house; from plans by N. J. Gibbs, Mt. Clemens, Mich., for $15,000.

Almont will also have a new town-hall and engine-house; cost, $5,000; to be built by Wm. H. Myers, of Hillsdale, Mich.; plans by N. J. Gibbs, Mt. Clemens, Mich.

AURORA, ILL. — Adler & Sullivan, architects, of Chicago, have made plans for the factory-building for the Aurora Watch Co., to cost $35,000.

AUSTIN, MINN. — The large three-st'y block of Shaw & Hall, on the cor. of Main and Mill Sts., is to be rebuilt at once, the third-st'y taken off, new foundation put in, etc.

CLIFTON, O. — Mr. A. C. Nash, of Cincinnati, has prepared plans for a stone church for the Presbyterian Society; cost, $20,000.

CONSHOHOCKEN, PA. — William Stemple, Sr., will build 3 stores and a dwelling-house adjoining the row of stores just completed.

DENVER, COL. — Brick car stable on Blake St., for Denver City R.R. Co.; cost, $50,000.

DOVER, N. H. — Dover is to have a new court-house.

FIRE ISLAND, N. Y. — Another year will probably see a large hotel erected on Havemeyer's Point, opposite Fire Island, in charge of Mr. J. P. Colt, of the Argyle, at Babylon, L. I.

MT. CLEMENS, MICH. — Kracht & Co., are building a brick store; cost, $3,200.

J. E. Nellis & Son, Joseph Lonsby, and Dr. Lennant each a $2,500 frame cottage; from plans by N. J. Gibbs.

Wm. Fluemer, proprietor of the "City Flouring Mill" is erecting a brick elevator; cost, $12,000.

NEWARK, N. J. — The erection of a new synagogue has been begun in Bedford St., for the congregation Benai Israel.

NORTH ADAMS, MASS. — The plans for the new hospital have been approved by Drs. Polk and Loomis, of New York, and $15,000 have been raised by the town for the building.

RICHMOND, R. I. — At a recent town meeting held on Tuesday last, at the town-house in Richmond, it was decided to erect a new town-house. The committee appointed to superintend the erection of the new building is Messrs. Clark Barber, Ellison Tinkham, and Chas. J. Greene.

ROCHDALE, MASS. — Messrs. Reuben & E. I. Comins are building a new brick picker-house, 30′ x 52′, one-st'y; also new storehouse, 30′ x 50′.

SAVANNAH, GA. — The present year has been very active in the building line in this city, and all interested in building and the building trades have been quite busy. The following work is about to be commenced by J. J. Nevitt, architect: —

A residence for J. Ranus, Esq., St. Catherine Island, to cost $10,000.

Colored Odd Fellows hall; cost, $3,000.

The other architects also have had their share of work, and houses are in demand, and rents advancing.

SIOUX CITY, IO. — Normal school-house on Madison St.; cost, $7,000.

SPENCER, MASS. — The corner-stone of the Catholic church was laid August 5.

WHEELING, W. VA. — Brick factory for J. R. Bodley, on Eighteenth St.; cost, $8,000.

LATEST.

Brooklyn.

BUILDING PERMITS. — *Lafayette Ave.*, s s, 20′ w Grand Ave., 2 three-st'y brick dwells., tin roofs; cost, each $4,300; owner, Henry Blatchford, Montague St., near Court St.; architect, R. Dixon.

Gates Ave., No. 925, n s, about 150′ w Ralph Ave., two-st'y brick store and dwell., felt and gravel roof; cost, $2,700; owner, Chas. L. Applegate, Tenth St., New York City; architect and builder, J. N. Smith.

Seventh Ave., n w cor. Nineteenth St., 4 three-st'y frame double tenements, tin or gravel roofs; cost, each $3,000; owner and architect, J. H. or I. H. Herbert, 116 Gates Ave.; builder, not selected.

Park St., No. 13, n s, 25′ e Broad St., three-st'y frame double tenement, tin roof; cost, $4,500; owner, Ernst Hoffmann, Flushing Ave., cor. Yates Place; architect, T. Engelhardt; builders, — Kuhn and J. Rueger.

Twenty-sixth St., s s, 250′ w Fourth Ave., two-st'y frame dwell., felt and gravel roof; cost, $2,000; owner, Wm. Grun, Twenty-sixth St., bet. Third and Fourth Aves.; builder, not selected.

Hancock St., s s, 200′ w Nostrand Ave., 3 three-st'y brownstone front dwells., tin roofs; cost, each $8,500; owner and builder, S. E. C. Russell; architect, J. D. Reynolds.

Twenty-seventh St., s s, 300′ w Fourth Ave., 2 three-st'y brick tenements, felt and gravel roofs; cost, each $4,500; owner and architect, Jno. Kinney, 202 Twenty-first St.; builders, C. Long and P. Kelley.

Bids and Contracts.

BOSTON, MASS. — Joiners' work and wood flooring for post-office, etc., at Boston, Mass.: —

McNeil Bros., joiners' work, $18,894; wood flooring, $5,898 (*accepted*).

George A. Mills, joiners' work, $19,989.23.

E. B. Witherspoon, joiners' work, $21,000; wood flooring, $8,145.

Joseph Thomas & Son, joiners' work, $26,978; wood flooring, $7,540.

Jackson & Sharpe Company, joiners' work, $29,463.20; wood flooring, $5,728.60.

The bids of McNeil Bros., for joiners' work ($18,894), and Jackson & Sharpe Company, for wood flooring, ($5,728.60), the lowest, have been accepted.

HENDERSON, KY. — Holtzclaw Bros., of Washington, D. C., were awarded the contract for building the Henderson Cotton Mills, advertised in this paper some three weeks ago, for $75,000.

JACKSON, MISS. — Synopsis of bids for labor and materials for court-house and post-office: —

Rees Evans, $26,450, as per specification, five months; $32,280, Berea stone and terra-cotta; $42,514, all stone Berea.

M. A. McGowan, $35,950, as per specification ten months; $45,950, all stone, Fossick, Ala.

Kenderine & Paret, $38,319, nine months.

Belknap & Dumesnil Stone Company, $39,000, as per specification, ten months; $49,225, all stone.

Bowling Green, nine months, $46,825, plain modillion course.

J. N. Marshall, $40,834, as per specification, Fossick, twelve months.

D. J. Macarty, $42,690, as per specification, Oman & Stewart stone, eight months; $54,000, stone, Omah