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THE experts consulted by the special joint committee to consider the best means for providing suitable quarters for the Congressional library, Messrs. Clark, Smithmeyer and Esty, have agreed to recommend the erection of a separate building, in which the main portion of the books will be placed, and the copyright business carried on, reserving a reference collection of about seventy-five thousand volumes in the present rooms, where they will be readily accessible to the members of Congress; and also a library of documents for the use of each House. Mr. Clark, who, as architect to the Capitol, is familiar with the accommodation which can be obtained within its walls, has calculated that if the library increases during the next sixteen years at the same rate as in the past sixteen, the accumulation of books would, in 1896, fill, in addition to its present rooms, all the available space now occupied by the Senate and the House of Representatives, besides the Rotunda. As to the best site for the new library building, the experts refrain from making any recommendations. Judiciary Square has been proposed, but perhaps a better place might be found. It is evident that a piece of ground should be appropriated to it large enough for the needs of the remote future; and if it is desirable, as it seems to be, to restrict the height of the building, the area which it must cover will in time become so large as to exceed possibly even the limits of that site. There should be no trouble in finding vacant land enough in Washington for any imaginable purpose, and there is a large territory which is much more in need of improvement with fine buildings than Judiciary Square. Mr. Spofford, the present librarian, has, it is well known, given much attention to the study of such structures, and it is to be hoped that his suggestions will have their full weight, if the recommendations of the experts are adopted, in deciding upon the form and position of the new edifice.

A MEETING, the nature and result of which we cannot quite understand, is reported by the *New York Evening Post* to have been held a few days ago in that city, at the call of Professors Chandler and Janeway, "for the purpose of discussing the proper plumbing of tenements and dwellings; and to see how far it would be proper for the Board of Health to dictate details of construction." The following points were said to have been "agreed upon": First, that all plumbing should be of good materials; second, that only good workmen should be employed; third, that all soil-pipes should be of iron; and, fourth, accessible throughout their entire length; and, fifth, should extend through the roof, of the full calibre; sixth, that all "sewer-pipes" should be of iron; and, seventh, be laid above the cellar floor; eighth, that all joints in sewer and soil-pipes should be gas and water tight, and caulked with lead or iron-filings and sal-ammoniac; ninth, that basins, sinks, etc., should have traps; tenth, said traps to be ventilated; eleventh, that there should be no traps on vertical soil-pipes; twelfth, that safe-wastes and refrigerators should not connect directly with the sewer; thirteenth, that all service-pipes be placed beyond danger of freezing; and fourteenth, "that there be no pan water-closet, but either hop-

pers or improved water-closets." We hope the Board of Health is not about to attempt to "dictate the enforcement" of these rules; if so, we can promise it abundance of business. It is easy enough for a party of amateurs to "agree upon" these points, but their enforcement, however desirable, would be quite a different matter. In applying the fourth rule, for instance, it would be found that very many soil-pipes in New York houses are built into the wall of the drawing-room, and necessarily so, unless a radical change is made in the planning; so that the Board will have either to persuade the architects to change their plans, or the owner to put up a board casing through the middle of his costly decorations. To require "sewer-pipes," again, to be "laid above the cellar floor" would, in many cases, prevent the use of plumbing work in basements, and cause endless annoyance, while the authorized use of rust or sal-ammoniac joints would lead to many evils, such joints, unless skilfully made, being liable to swell, so as to burst off the end of the pipe, while in any case they hold so firmly that the pipes, when repairs are needed, cannot be separated without breaking. The wholesale prohibition of pan-closets, too, would be a serious matter. Although we are fully conscious of the defects of that form of apparatus, an economical and reliable substitute, for the use of the careless and slovenly, has yet to be found.

THE question of rapid transit for the city of Boston is again being agitated, probably as a preliminary to a third attempt at obtaining a charter from the Legislature of Massachusetts next winter. It is not surprising that the project is pushed with such persistency in that city; no other offers, in some respects, such exceptional advantages. The New York elevated roads, for instance, cannot well terminate their lines at the points where the business ceases to be remunerative, but must push on into a comparatively thinly settled region, at an enormous expense, and trust to time and the gradual movement of population for ultimate profit. Boston, on the contrary, lies in the centre of a great suburban district, populous enough to furnish at present a very lucrative business to a large number of railroad, stage, and horse-car lines, but not so much so as to require that future roads should be banished either underground or into the air, and a comparatively small length of costly elevated or tunnel-road only would be needed through the city proper, before open regions would be reached, from which a system of inexpensive narrow-gauge roads arranged to run their cars upon the city tracks, might at once pour a vast business over the central lines. Between the ordinary railways, running long trains perhaps once an hour, and landing their passengers at some inconvenient corner of the town, and the new lines despatching a few cars every five minutes or so, and conveying their patrons to any spot in the city, no suburban would hesitate long, while the business of collecting the crowds which daily enter and leave Boston, and transporting them to the points they wished to reach, would be a profitable one, independent of strictly local traffic.

COMPLAINT continues to be made of the unsatisfactory condition of insurance business, and unless some improvement takes place, much of the capital invested in the companies will before long be withdrawn to seek employment in more promising enterprises. The National Board of Fire Underwriters has issued a circular inviting those interested to meet in convention later in the season to form an organization for the purpose of making the facts of insurance economy more widely known to underwriters and policy holders than is now the case, and it seems likely that the invitation will be accepted. We have before had occasion to speak of the good work which this organization has done in collecting observations and statistics on matters concerning what one would suppose to be an interesting subject to insurance companies,—the protection of buildings against fire. Its last report, particularly, is full of information in which architects as well as underwriters might find much that would be interesting and valuable. If the depression of the business should have the effect of making the companies more ready to listen to and act upon the advice of such wise counsellors, in regard to exercising a proper control over methods of construction, their stockholders will have reason hereafter to be thankful for their temporary reverses, and still more, though indirectly, will the public, which pays in the end not only for all property destroyed by fire, but for the salaries and expenses

of all the underwriters besides, gain by a return to common sense in insurance methods.

THE long expected obelisk having arrived in New York, a lively, but rather belated discussion is going on as to the position in which it shall be placed. It seems to be taken for granted that it must be set in the Central Park; why, we cannot see. To our mind its quiet and mysterious simplicity would have an effect far more striking by contrast in the middle of a crowded and busy street, — such a position, for instance, as the triangular area at the junction of Sixth Avenue and Broadway, at Thirty-Fourth Street, or in Union Square, or the Bowling Green, — than it could possibly have simply as an item of the heterogeneous assortment of monuments, statues, trees, fountains, kiosks, wild animals, restaurants, museums, dairies, grottoes, gondolas and bridges, with which the park is already nearly choked. As to its exact location on the ground, no decision has yet been reached. One of the Park Commissioners and the citizen who generously paid the cost of transporting the monument to New York, have selected a little knoll towards the upper end of the enclosure, but another Commissioner's taste leads him to prefer a different position. Of course the newspapers have their theories, one having discovered that the form of an obelisk is intended to contrast with a level surface, and that it is therefore wrong to place it on an eminence, however slight. It therefore prefers a site in the Plaza at the Fifth Avenue entrance. All this seems rather pitiable to us. There are men in New York who have studied such subjects as thoroughly and can judge of the conditions to be fulfilled as wisely as any in the world, and the spectacle of a number of editors, officials and amateurs settling the matter for themselves, without even thinking of consulting these experts, is as deplorable as it would be to see them, armed with mallets and chisels, attacking the obelisk on its arrival with a view to improving its form in accordance with their theories. At least, however, if there is nothing better to be hoped for, we trust that the ancient stone will not be made ridiculous by surrounding it with American sphinxes, and adornments "in the Egyptian style," as has been the fate of its English counterpart. It will be far more noble and venerable, even in a state of utter neglect, than decked out with architectural accompaniments, although the most erudite and genteel.

It seems as if it might be a good thing to provide an arena in some part of the New York Central Park, where the State and City officials who quarrel over the government of the metropolitan district might settle their differences by single or multiple combat, and allow the business of the city to be carried on meanwhile by obscure deputies, or committees of citizens. The nice question as to whether there is or is not at present a Department of Buildings in that city is beginning to assume considerable importance, not only to the lawyers, for whom such an opportunity of reaching the public pockets on both sides rarely presents itself, but for the citizens in general, besides the poor inspectors and employés of the department who are kept at work without knowing whether they are to be paid or not. Eighty-three of them have concluded that they will not be unless they take legal measures, and have commenced suits against the city for their wages. At the same time a somewhat similar misunderstanding has arisen between the Board of Education and the School Trustees, as to who shall take charge of the repairs on the school-houses of the city. As usual, each side is encouraged by legal opinions, and the consequence is that the vacation is slipping away, and no repairs are made, so that it is feared that the pupils will have to go back in the fall to rooms as dirty, unwholesome, ill-aired and squalid as they left them in June. However, it is not to be supposed, judging from past experience, that official dignity will suffer the comfort, or even the lives of a few children to stand in the way of its asserting itself, and the citizens will either have to submit patiently or take the matter in hand themselves.

A RECOVERY in the iron market, which prudent men have long been expecting, has decidedly begun. A large volume of business having been transacted during the past week, and prices having risen, for some qualities of iron, from five to ten per cent, with a large demand. It is said by the *Metal-Worker* that the aggregate amount of iron sold in Pittsburgh last week was the largest, with one exception, ever known in the history of the city in the same period. This is a very different condi-

tion of the market from that which existed two or three weeks ago, when scrap-iron, that indispensable requisite for many manufactures, was sold in this country for much less than its price in London, and a large quantity was exported, at the very time that thousands of tons of English rails, made with the help of scrap-iron precisely similar, were lying on our wharves, the owners having paid heavy duties, besides transportation charges, and even then hoping to sell their goods here at a profit. The furnace-men, however, still complain that at present prices iron in many districts cannot be produced at a profit, and a large number of furnaces, notably in the Hocking Valley in Ohio, have discontinued operations, preferring to incur the heavy expense, some ten to fifteen thousand dollars each necessary for putting them again in blast, rather than keep on with their business at a loss. It seems a little strange that the English should find it profitable to produce iron and sell it at a price not much more than half that which is necessary to remunerate our furnace-men, although no doubt they have some advantage in matters of wages. Perhaps there may be something in the explanation given by a recent French writer on the subject, that the Americans secured by their tariff against foreign competition, do not care to spend money or thought on improved processes, or economy in manufacture, but content themselves with old, cheap and inferior appliances, sometimes even utilizing machinery discarded by foreign makers because of its unfitness to compete with the newer contrivances of their own rivals.

Most people have heard of the French custom, in case of fires, of regarding the person in whose rooms the fire starts as delinquent towards his neighbors and the public, and subjecting him to a fine or other penalty, and some have perhaps wondered at it as a relic of mediæval tyranny. Such persons will be surprised to learn that the law, even in this easy-going country, takes a very similar view, at least of those who, besides being careless in respect to their own property, disregard the danger into which their folly may bring those about them. At the time of the great Chicago fire of 1871, a certain Wright owned a stable adjoining the freight depot of the Chicago and Northwestern Railroad Company. In the freight depot were stored benzine and other explosives, which took fire, burning so furiously and dangerously that Wright could not reach and remove his stock. He therefore brought suit for damages, and the Illinois Court of Appeals has just given judgment in his favor. In the words of the Court, — "If a person in possession of premises shall wrongfully or negligently place and keep, or continue on such premises, highly inflammable or explosive fluids or substances, in such quantities and in such manner that they are naturally liable to become ignited, and cause an uncontrollable fire and explosion, and they do become ignited and burn, and cause an explosion, and as a proximate result the property of others in the exercise of ordinary care is injured, such person is liable for all the natural necessary consequences."

THE extraordinary enterprise and enthusiasm which have been manifested in the conduct of the journal, *L'Art*, since it was started, not very long ago, are now apparent in a new field, one wide enough to satisfy any reasonable ambition. M. Léon Gaucher, one of the proprietors of *L'Art*, (as we learn from a letter of Mr. James Jackson Jarves to the Boston *Sunday Herald*,) who has passed the winter in Florence as manager of the San Donato sale, impressed with the native artistic capacity, as well as by the vast wealth of artistic material in and about the city, has succeeded in organizing an association under the name of the "Donatello Society," for the purpose of encouraging the practical study of the fine arts as applied to industry; to facilitate the study of the great works of Italian genius by artisans and workmen and to found a free museum for the exhibition and arrangement of models, tools, materials and other objects which may be useful to the industrial classes, in other words, a kind of Florentine South Kensington, it would seem. Instruction is to be given in various branches of art-workmanship, and *L'Art* has established a series of annual prizes, ranging from fifty to three thousand francs, for meritorious works in the different departments. Three exhibitions are at once to be held in Florence, one of "retrospective art," a second of modern, and the third of industrial art, and to the two latter the French Government will lend its aid. Membership in the society is open to all, Italians or foreigners, of either sex, on payment of the trifling annual subscription of one franc.

THE TENEMENT-HOUSE PROBLEM.—I.

WITHOUT attempting to discuss all the aids which may be brought to the rescue, the problem as it presents itself to the architect, is one of exceeding interest. Upon the thought which he gives to it depends much of the success of the solution. By his labor the frame-work of the home is erected. His work has not alone a negative value; it does not alone give free play to the possibilities of the household, by its attention to convenience, comfort and health. If he cares so to do, he has it in his power to become an active educator. He has at his command the æsthetic influence, with its far-reaching suggestiveness, and capabilities of constant application. Beyond this, what has been called the "everlasting dovetailedness of things" comes to his aid. We all know how a large south window, with an ample seat, never fails to suggest to the average mind the possibility of growing flowers; how an empty recess almost compels a book-case, as does a blank wall a picture; and how the great many-cornered attics in the roof give to the children a play-ground full of ever-to-be-remembered delights. A further step is taken in the right direction when the builder learns not only how to make like suggestions toward development, but to make those which are in accordance with the individual needs of his clients.

Outside of our large cities the field is thrown freely open to him. Notwithstanding our migratory tendencies, we are learning to dislike, even for the brief period of our stay in any given place, to be housed precisely as are housed our neighbors. We are fond of novelty, we are still more fond of independence. With all his willingness to have his doings bulletined in the daily papers, with his growing indifference to fences, and his delight in gathering his family around him upon his front piazza for the vision of whosoever will, the American citizen still clings to his faith in his own undivided and individual freehold. He is perfectly willing that the public shall be cognizant of his whole life, provided he can, in return, gaze upon the public from the vantage ground of his own domicile. It is a tendency essentially American, which has assured the wonderful success of the Philadelphia Building Associations, with their thousands of independent homes. Unfortunately, certain inherited habits, and certain other circumstances not easy of control, such as the geographical conformation of Manhattan Island, have militated against this instinct of independence which portended so much good to the people at large. In consequence, we have our endless, formal rows of stupid city houses; we have, what proves almost a relief, the "flat" system now coming into vogue; and, thirdly, that which is really an ancient form of the latter,—the tenement-house system. In struggling toward the individualization and development of these three types, the architect has indeed a task before him. It is in the third class of objectionable forms, that of tenement-houses, that he finds the most serious difficulties, as well as the most crying needs. To those denizens of our cities who are bound down by the inexorable limitations of poverty, is left no choice save that between life and death. They must yield to the evils of the present conglomeration, for the sake of the absolute necessities of shelter and subsistence. All enterprise is exhausted in obtaining these wretched substitutes for homes, and between these dens of misery and the gin shops are contained all the opportunities of the workman's leisure.

The architect has here a battle to fight almost single-handed, and against all the powers of darkness. The surroundings of the home give to the inhabitants their first, almost their only impulse toward unknown but higher possibilities. With him rests the development of this impulse.

The necessities of the case are well known. The typical tenement-house has been drawn for us again and again. We wonder at the horrors revealed to us. Filth, misery, disease, crime, well-established in their strongholds, lift up their heads in scorn, and mock at our endeavors to withstand their might. All the social questions of the day meet us here and demand a solution. Here must be made the beginnings of the repression of crime and disease, in the evolution of healthful independence from indifferent misery. Here must be carried on the struggle against the intellectual and spiritual degradation, which comes from our lives of machine labor, and against the narrowness which besets each specialist, from the mechanic to the teacher. Here, in fine, is an opportunity for a grand development of true co-operation, bringing the benefits of a higher life,—out of the reach of the single poverty-stricken wretch as he stands alone,—within the grasp of each one of the many, while robbing none of his birthright of individual strength. But while we all stand aghast, thrilling at the thought of work undone, it is given to a few to act. Among these few is the architect, called to a noble calling. The tenement-house is the type of the living struggle in which he should find his chief inspiration; an inspiration which may be as earnest and absorbing as the devotion which raised temples and cathedrals. Like that devotion, it takes hold upon an eternal and noble impulse, which thrills through the life of the age, lending to each worker the strength of the multitude. When he has taken hold upon this, has he not touched the hem of the garment from whence comes a living power? Let him talk about a new style, if he must. Let him exalt the glories of his calling, and study with reverent thought those which the ages have left him. But, forgetting self and self-analysis, let him give his utmost, inmost strength humbly, simply, and entirely, to an honest effort toward the solution of these problems which stand at our door and wait. From such labor springs greatness.

It is not many years since the first public agitation concerning the

homes of the poorer classes. Unfortunately for our estimate of human nature the motive which inspired to action was one born of self-interest.

In 1832, England was ravaged by cholera; in 1837 by fever. In the midst of national desolation the eyes of the English were opened to long unheeded causes of pestilence. Associations for inquiry were formed, and a royal commission was instituted. The discussion finally culminated in the incorporation of several societies, of which the Metropolitan Association for Improving the Dwellings of the Industrial Classes, and the Society for Improving the Condition of the Laboring Classes, were the first. By the latter was erected, in 1844, the first English model tenement-house. Private enterprise became excited. Large owners and manufacturers lent the influence of their example. Among the best results attained were those arising from a long series of experiments undertaken by a well-known London builder, Mr. Matthew Allen. Books and pamphlets were published, architectural, philanthropic and sanitary associations discussed the subject, members of Parliament devoted to it their energies and their oratory, and the Prince Consort himself superintended the erection of certain model cottages, which attracted much attention at the exhibition of 1851. These cottages aroused the foreign public to further activity; Belgium sent two government architects, France, M. Chevalier, and Italy, Count Cavour, to investigate English methods of housing the poor, with a view to imitation in their respective countries.

Already, good work had been done abroad. The first society on the Continent, that under royal patronage at Berlin, had been formed in 1847. In 1848 another society had sprung up at Florence, under the direction of the Marquis Torrigiani. And in 1849 had been erected the first *cité ouvrière* of Napoleon, who stirred vigorously in the matter even in his presidency. Still earlier, in 1838, the Belgian Parliament had appointed a commission of investigation; and in 1845, it had placed at the disposal of its commission the sum of £80,000. Plans and rumors of plans by government architects were rife; the French and Belgian papers were full of criticisms and suggestions by those who were not government architects. These plans, however, proposed for the most part villages of small houses, to form distinct quarters of the town. Against the great barracks which the Emperor favored a loud protest was raised, and the current set strongly in the direction of separate houses.

In England this feeling against conglomeration grew still more intense, and the Prince Consort, as we have seen, lent his countenance to the cottage system,—one applicable to large estates as well as to town suburbs. In spite of the many advantages to be urged in favor of the separate domicile, the necessities of the case compelled that, in the great cities, some refuge should be provided for workmen within easy reach of their work; and, as time went on, the tenement-house question and the cottage question became recognized as two distinct problems. In the development of both, the English still maintained the lead. Co-operative bodies of workmen, gathering themselves together in villages,—as at Mulhouse in Alsace in 1853,—succeeded admirably upon the continent; but still, from Russia and Sweden to the Italian principalities, all turned to England for information. The foreign periodicals quote almost exclusively and with curious submission from English plans and experiments; while the only foreign example mentioned in the English papers—with the exception of the co-operative villages—is that of the deservedly famous *familistère* of M. Godin, at Guise. In the Health Congress held at Brussels in 1852 and 1856, the discussions upon this subject were led by an Englishman, Mr. Henry Roberts; and to his energetic efforts was due the maintenance of the interest manifested by Napoleon III, as well as what success attended the Emperor's undertakings.

It was not without many struggles, however, that the English attained their experience. Wide discussion, even the example of the Prince Consort, did not enable them easily to break up fever dens, or to erect model tenements at a reasonable cost. Little by little, legislation was brought to their aid. Lodging-House Acts, and the authorized supervision of Boards of Health, enabled them to hold the terrors of the law over careless or unrighteous landlords. As the railways entered London, they also came, though unconsciously, to the rescue, buying up and demolishing many of the worst quarters. But to make the erection of their own buildings financially possible was an extremely difficult thing. To obtain the land necessary, subjected the societies to much litigation and extravagant expenditure; they were inexperienced in the necessary building economy; and, many times, when they had thrown open their gorgeous dwellings to the artisan, the artisan refused to enter into possession, being moved partly by a dull apathy, and partly by a dread of being made the object of patronizing charity. They were obliged to suffer as all innovators, and all associations must suffer; they were unpopular as innovators, divided amongst themselves and subject to internal fraud as are all associations.

But public spirit was awakened. The old *laissez-faire* commandment of "Thou shalt not kill; but shalt not strive officiously to keep alive," gave way before the eager exertions of philanthropy. Realizing that in many cases private enterprises had proved more successful than associated undertakings, and that in all cases large and bold expenditures had been necessary to obtain even small returns, proprietors like Miss Burdett Coutts and Mr. Hilliard, with vast sums to back them, took up the battle; and Mr. Peabody, a further noble example, left in 1869, £150,000, the last addition to a fund

aggregating £500,000 given in his name for the erection and maintenance of improved dwellings for the laboring classes. Workers like Miss Octavia Hill, threw into the enterprise the personal element, and proved the possibility of success by the quiet and inexpensive renovation of old houses. And the workmen themselves, seeing the advantages of the improvements, but unwilling to accept them at the hands of charitable patrons, and also having that intense desire for individual ownership before alluded to, took pattern after the co-operative societies of the continent, and formed themselves into Building Societies. These have as yet, however, paid but little attention to the possibilities of the co-operative tenement.

Legislation, moreover, has become more and more effective. In earlier times the discussion as to the extent to which government should interfere waxed furious; and, although many prominent men, John Stuart Mill among them, were moved to state their belief in its necessity, interference by government was considered a questionable policy. Even any abrogation of the window tax, which weighed so heavily upon the earlier builders, and which was not abolished until 1851, was refused. But of late the government, although denying subsidies, has pursued an eminently reasonable policy. In 1875 was passed the much needed Artisans' and Laborers' Dwellings Improvement Act, which gives power to the authorities of all large cities to declare unhealthy all districts so reported by health officers, to demolish existing tenement-houses in such districts, and to reconstruct them according to schemes submitted to Parliament for approval. The act also provides for the financial management of such undertakings. It has been of great assistance, though not considered wholly satisfactory.

These four agencies, viz.: those of legislation, of public charitable organizations, of private charitable enterprise, and of co-operation among workmen themselves, having multiplied and grown strong, are working side by side in England to-day.

PERGAMON. — II.

THE gigantomachia of Pergamon is the most extended antique work of the kind known. The artist does not seem to have been influenced in his composition of the scene by any local mythological peculiarities; it may indeed be doubted whether the subject was in this instance entirely conceived as a religious representation. It seems rather to have been characterized as a symbolization of the memorable victory of the dynasty of Pergamon, so dependent upon the intellectual life of Hellas, over the wild hordes of barbarians, devastators of Greek civilization. The fury of the combat, which is said to have seized the army of Pergamon in the decisive struggle almost before the city gates, is reproduced in the passionate and dramatic action of the gigantomachia. Although these sculptures are in many respects closely related to those which have hitherto been known as works of the school of Pergamon, some of the positions having a striking analogy with the Laocoön group and the so-called Dying Gladiator, they yet present an aspect of realism which is comparable to modern tendencies and has hitherto rarely been observed in antique art. The heads of the giants are almost disfigured by their expressions of bestial rage. This would speak for a late date of execution, and corresponds well with the conclusions derived from an inscription found upon a block presumably belonging to the altar which names the "son of King Attalos" as dedicatory of an anathema to Zeus and Athene Nikephoros which is supposed to be the altar with its sculptured decorations. It seems from every consideration far more probable that the work was created under Eumenes II., from 197 to 157 B. C., than during the reign of any of his predecessors. The execution of the design in stone was evidently entrusted to hands of very different ability, that of the central group being better than any of its neighbors. Perhaps the chisel of the actual designer may have been more thoroughly applied in retouching the most prominent parts of his work than elsewhere.

There now lie in the accessible rooms of the Museum, several Ionic capitals of late but graceful and effective form. With them there is a fragment of a corona and a well-proportioned and carefully cut architrave corner. The skirting of the ascending staircase, before referred to, is so well preserved that it and the steps are just being placed together. It was not allowable to make sketches of any of these members. Sufficient remains of the columns which stood upon the platform of the substructure have been found to permit a restoration of its elegant details. Three shafts with their light entablatures have been carried to Berlin, and will be erected in the Museum. The pteroma was roofed by a horizontal coffered ceiling, the exact extent of which is not clear. The exterior intercolumniations, as in the monument of Xanthos and the Mausoleum of Halicarnassos, were taken up by colossal figures, of which a number of torsos and heads have been found. The characteristics of some of these statues seem to point to an earlier date than that assigned to the frieze: it is quite possible that Greek works of other schools and better workmanship may have been brought to Pergamon by the art-loving rulers. A complete review of the results cannot be made until the remains are all unpacked and systematically arranged in Berlin, or are published with ample illustrations. It is to be regretted that architectural details of the altar platform, and its colonnades have not been more thoroughly explained in the official notices which have appeared as yet.¹

¹ Paper read by director Alex. Conze on the 29th of January to the Akademie der Wissenschaften. Berlin, printed as a monograph. 1880.—Archaeologische Zeitung. 1879. Heft IV.

A thorough publication of all the results of the excavations is promised, but the appearance of the bulky volume cannot be expected for two years or more yet. It will lend a new importance to the work at Pergamon if exact topographical plans, with the position of every recognizable antique ruin marked upon them, be given with all the general architectural information attainable. It is left doubtful for the present in what manner the Ionic order of the altar platform was roofed, and how the clouds of smoke from the burnt sacrifices upon the altar, known from Pausanias to have been formed of the ashes of the bodies consumed upon it, ascended from beneath the canopy of the horizontal coffered ceiling which one is led to suppose over the entire great square. Within the columns there was a balustrade, surrounding what is considered the position of the altar, ornamented upon its inner side with reliefs of less projection than the outer frieze. Thirty fragments of these, about 1.57 m. in height have been recovered. The subjects here represented seem in part to have been connected with the myth of Telephos, a hero especially honored in Pergamon, as the dynasty conceived that son of Heracles to be their progenitor. One of the blocks belonging to it is interesting, as showing that the great monument was never wholly finished, and that the completion of the carving was effected after the stone was in position,—the chief masses of the figures upon it were only roughly blocked out. This smaller frieze cannot yet be well judged as its blocks are not yet all unpacked and arranged, but it seems to be inferior to the exterior ornamental relief both in design and in execution.

The Prussian excavators did not leave Pergamon without a certain examination of other buildings upon the acropolis. On the summit was discovered the remains of a lavishly ornamented Corinthian temple, identified with the Sebasteion represented upon the coins of the city. A conglomeration of walls on the southern slope of the cone proved to be a Roman gymnasium. It is to be hoped that these investigations, conducted by the architects Bohn, Raschdorff and Stiller, may be fully published.

The exact extent of the knowledge gained by digging upon the acropolis is uncertain, but it may be presumed with reasonable security that the chief results of the Prussian work at Pergamon consist of the sculptured reliefs they have carried off. The period in which the buildings were erected was not one from which important architectural gains could be expected.

The school of sculpture of Pergamon, an entire epoch of late Greek art, hitherto known only by a few scattered notices in ancient writers, and by examples, the authenticity of which is highly doubtful, is now fully represented. Much light will also doubtless be thrown upon the civil history of the later Hellenic States by the monuments now discovered. But the filling of the Museum of Berlin is, as has been said, the most striking result of the excavations. The condition of many of the stones is such as to prevent their being immediately put in place for the inspection of the curious public. For these an adequate restoration is projected,—the more justifiable and desirable, as the art of to-day compares more favorably with these realistic reliefs of Pergamon than with earlier works of Greek sculpture—to which modern additions have proved little else than a disfiguration. The value of the discoveries in their awakening a new activity in the ateliers of Berlin may perhaps also be taken into account.

The cost of transportation of the marbles from the coast of Asia, as an item of mere expense, will show what quantities of stone have been carried off; it is estimated at 30,000 marks, (more than \$7,000), exclusive of the great assistance rendered by the German war-vessels stationed in the Mediterranean, which took the burden free for nearly three-quarters of the distance it had to traverse. But including this, the cost of the excavations and salaries, and the moderate sum paid to the Turkish Government by the diplomatic purchase of the *irade*, the total cost of these original Greek works of sculpture to the Prussian Government has only been about 120,000 marks, a little over \$28,000. It is not strange that the English looked jealously at the "hundreds of statues and reliefs," of which a writer in the London *Times* complainingly noticed the shipment, at a time before the Prussians had deemed it wise to break their politic silence. The investigations which the English have carried on more or less regularly in Asia Minor for the last forty years, might well have been crowned by the extensive booty of Pergamon now brought into security by the Germans. Since the time when the frieze and other fragments of the Parthenon were sold by Lord Elgin for \$165,000, no work of approximately equal extent has been removed from its site in the Hellenic world. Though a comparison between the artistic quality of the sculptures is impossible, the fourteen statues and sixty reliefs of the Elgin marbles are far surpassed in quantity by the works of Pergamon which have reached Berlin. J. T. C.

THE METROPOLITAN MUSEUM OF ART, NEW YORK. THE LOAN COLLECTIONS. — II.

PASSING now to the foreign pictures, we see a number of those popular canvases which one may expect, I fear, to still meet in force at picture-sales and loan-collections for many years to come. Meyer Von Bremen is prominent, and Carl Becker, and Bouguereau with several large paintings, of which the worst is surely the pretentious *Art and Literature*. When M. Bouguereau keeps to the rendering of subjects and the representation of persons in themselves insipid and unpretentious, his admirers have much to say in defence of their liking for him. Every one else who tries to do the same sort of thing

certainly does it much worse. How good his drawing is, how pretty, if waxy and unnatural, his flesh tints, how inoffensive his color, how graceful, if mannered and self-conscious, his attitudes, one may perceive by contrasting him with the portrait studies of children by Mr. Bellows and Mr. Baker, which the committee have been kind enough to hang in close proximity with one of his. But if M. Bouguereau is sickly-sweet when he treats his most modest subjects, he falls below himself when he applies the same style of work to would-be ideal and allegorical themes such as this Art and Literature. It is somewhat the same with Knaus, who is a better artist, however, than Bouguereau. Some of his small heads are most lovely, if one likes his miniature polish of result. But when the same brush makes its small figures full-length and poses a number of them for a "sweetly pretty" Holy Family, the result suggests one of those copies on porcelain which are to be bought in the Dresden shops. If one imagines the original to have been a Murillo, one has a very fair idea of Knaus's picture. It is decorative certainly, — pretty, as I have said, — but the color is not true and natural, much less strong. It is as affected as the composition and as the expression of the heads down to that of the smallest baby-angel who flutters about with the most modern self-consciousness.

Leloir's Temptation of St. Anthony also makes us regret his more congenial themes. His talent is fitted for anything rather than such a subject, and in the attempt to deal with it he is not only sensational but unimpressive and a little vulgar. It is needless to say, however, that there is much good painting on any canvas of his.

Kaulbach's Crusaders before Jerusalem is as uninteresting a work as one can well imagine, but all the same, it is well done in the true academic style. And it is impossible to feel a very vivid sensation of any kind before Piloty's Death of Cæsar.

Chelmonski's Travelling in Russia, of which I spoke last autumn, will here win, I am sure, a wider public admiration for its tremendous skill and energy than it could in the semi-seclusion of Goupil's gallery. And those who like it will probably pause as long before two fiery canvases by Josef Brandt, Tartars in Flight, and A Polish Post. Demanding all admiration, furthermore, is a superb Troyon (No. 20.) Cattle in a Field; I do not think he ever could have painted anything better. Similar in merit is a canvas by Robbe of Brussels, Cow and Sheep, with a wonderful golden tone. Troyon rarely did better, and Van Marcke would look crude beside it. One notes also two Rosa Bonheurs, not of unusual importance.

A small Millet and a somewhat similar Frère hang near enough together for us to contrast the simple strength of the one with the equally naïve effeminateness of the other. With all the talk about Couture in this country one does not often come upon his pictures, at least in New York; it is therefore a delight to find a portrait head of his in this exhibition.

The so-called Spanish school is represented by such as Madrazo, Kaemmerer, Zamacois, Alvarez, Villegas, Jimenez, Rico and Tapiro. The most lovely of their very various works here shown is Kaemmerer's Love Making, with its exquisite faint pinks; the most striking for composition and color-mosaic is Alvarez's Diversions of our Forefathers; and the strongest, perhaps, Villegas's Turkish Guard. What color there is here — note the beauty of the blues made warm by the southern atmosphere, — and what vitality and power!

The French landscapists, — Rousseau and those who came after him, — are well represented. There is an especially good Corot with dancing nymphs, and some lovely Duprés. But the pride of the whole collection is undoubtedly its eight pictures by Diaz. They are all first-class with the exception of the Turkish Children, which was in the Spencer sale last year, if I am not mistaken. To complete one's impression of the artist one might perhaps wish for one or two of his delicate little landscapes, but cannot complain in the presence of the famous Mare aux Grenouilles and another large canvas of very similar design called the Clarière de la Reine Blanche. It is almost an impertinence to try to find something new to say in praise of such works as these. The remaining five of his pictures are figure subjects, two small and three of larger size, though none as large or quite as fine as the superb Nymphs in a Forest that Mr. Schaus imported last autumn. To be second to such a nineteenth century Correggio as this, is, however, to be very lovely indeed. One could not ask to see anything more fascinating than the little Diana and her Nymphs, (No. 28,) or the two Boccaccio-like groups, Nos. 77 and 198.

To conclude this part of my subject, I may note a beautiful piece of color by Valentini, Italian Children Fishing, and a large single figure by Jacquet, called Going to the Races. It is not in the least insipid or over-elaborated as Jacquet's things are apt to be. On the contrary it is a little hard and aggressive, if I may say so. It reminds one somewhat of certain things of Mr. Carroll Beckwith's, — being realistic in conception with no pains taken to make the realism at all picturesque, and seeking vitality by a sort of overdone relief. I should not venture to quote what was told to me casually while looking at the picture, — that Mr. Beckwith greatly admired it and said it "did him good" to look at it, — were it not for the sake of adding that in my judgment some of his work is equal to it in its own line. That an individual critic does not like the line, cannot, all the same, blind him to the fact that it is undoubtedly a clever and effective one, or to the talent of an artist so young as Mr. Beckwith, but so well able to realize his aims.

I must give a word, finally, to a little landscape by Michel, and a small Don Quixote by C. R. Leslie, much better in color than the

things from which we in New York usually judge him, — the canvases at the Lenox Library, — two landscapes by Maris, and an exquisite Still-Life by Blaise Desgoffe, who is the prince of modern painters of minutiae, or who was, more correctly, in days gone by when he painted such things as this, simple in composition and good in color. His more recent works are apt to be crowded in effect and inharmonious in color, so, with the same dexterous imitation of textures, their artistic value is infinitely less.

The old pictures loaned on this occasion, — about thirty in number, — have with propriety been separated from the modern work. There are some valuable things among them, though not certainly done, in some cases, by the brush to which they are credited. There is a head of the Saviour when a child, for example, said to be by Tintoretto, which, if a non-expert may be allowed to express an opinion, could not possibly have been painted by him, though it might very well have been by Veronese. At all events it gives a fair idea of the latter's work, in so far as such a small sample can do so, while it is intensely uncharacteristic of the style and color of Tintoretto. A colossal head, credited to Correggio, is a noble thing, whoever did it. Paul Potters are too rare for such a picture as the one we see here to gain much credence for its pretensions. The little so-called Cuyp is a beauty, with its stiff childish figures, well-done cow, and fine tone. The blue velvet frock is a perfect piece of workmanship. But it does not make one think of Cuyp, — still less is it an imitation or copy of him or of any one else. The Napoleon, only attributed to Paul Dalaroche, — why, by the way, is it among the old pictures? — is apparently a copy, and not a very good one, of the original at Leipzig.

The gem of this room is, of course, Mr. Kellogg's well-known Herodias's Daughter. The owner and many of the critics claim for it the distinction of being not only a genuine Leonardo, but the best preserved canvas of his that is now in existence. There are others who say it is a copy, or a copy of a copy. It is undoubtedly old, undoubtedly in beautiful preservation, and undoubtedly a superb picture. It is idle for any but professed experts to pass upon its having been brushed by Leonardo himself or not. Suffice it to say that it will convey to any observer a trustworthy idea of Leonardo's technique, and a good suggestion of the peculiar type of face and peculiarly fascinating expression he was so fond of painting, the most perfect rendering of which he gave to the world in the Mona Lisa, faded and worn to-day to a shadow of itself, but holding us with a spell beyond that of any other face that was ever wrought with colors.

There remain to be noticed among the pictures only those of Mr. Hunt. They are more than fifty in number, and comprise some of his best works, such as the two portraits of himself, done in 1860 and 1879 respectively, the portrait of Mrs. Adams, the Mother and Child, done, I believe, from Mrs. Nutt, and three pictures of Niagara. I do not intend at this time, when so much has been written about Mr. Hunt's painting, to venture on so superfluous a thing as a critique of him as an artist, or, indeed, of any work of his individually. They are better known by descriptions already than any other American pictures, and now is the time, not to write still more about them, but simply to recommend that this unique opportunity for examining them be profited by, and that in their presence the flood of words that has been poured over them be carefully tested by their silent and most impressive speech. I may say, however, that no one can fail to be struck by the variableness of these pictures, not only in the kind but in the degree of their artistic value. Some are the perfection of portrait. Note No. 1, called the Daughter of Corning; and then look at No. 2, also a portrait of a girl. It is almost impossible to believe that they were done by the same hand. And among the superb masculine heads we find the brickly and disagreeable one owned by Mr. Schlesinger. And there are two or three small canvases, moreover, which prove that even Mr. Hunt could not paint a Corot. Is it very ungracious to note partial failures rather than magnificent successes? I think not, when there has been so much praise given very recently that the artist's defects may, perhaps, by the docile student be included in the worship of his excellences; and by the unreflecting student, indeed, may possibly come to be preferred to them.

Let us pass from the pictures and give a few lines to the other articles in the loan collections. The fine French and Flemish tapestries which hung at first from the galleries over into the main hall, had been removed at my last visit, whether temporarily or not I do not know. They are included in the catalogue of the loans. There is not a great deal of very good china. I noticed a fine breakfast set loaned by Mr. Prime, — Dresden of the Marcolini period. Also, from the same epoch, a vase owned by Mrs. Barlow, decorated in brown and gold. It is very fine, but I should say that the cover with which it is now fitted was not the original one. In Sèvres one notes a large pair of vases from the same collection with decorations by Mille de Maussion. There are a few good majolicas, especially a Pesaro dish with sketchy figures. Some fine large specimens of silver-work would be more interesting and valuable if marked with their seventeenth and eighteenth century dates, which are very patent to those familiar with the times. One such specimen properly dated would serve more effectively to fix the characteristics of a decorative style in a student's mind than pages of printed comment and description. It is therefore doubly unfortunate when a date is attempted to have it run as one runs in Table Case XVII, "Rococo work of the seventeenth century." Some small gold ornaments from the Chiriqui

finds in New Granada show decorative motives curiously like early Celtic work.

There are a number of very good ivories exhibited, a large collection of watches, a number of miniatures, mostly copies of small value, and some enamels of various sorts. Interesting also are the varied specimens of book-making and engraving. While admiring, by the way, the skill and taste of the mediæval illuminator, one cannot but see that however the Arabic workmen fall behind him by their neglect of figure-subjects, the general decorative effect of their pages is far superior to the very best of his.

It is not to be understood that with the one or two objects noted here, I have indicated all that there is of value in these loan-collections, or even the things which are of greatest value. They contain, on the contrary, a vast number of curious and beautiful objects impossible to particularize in a general notice, but such as will repay close examination.

I may say, in conclusion, that awnings of some sort should be provided for the sky-lights, as it is a pity ever to be obliged to cover the table-cases and conceal their contents in order to protect them from the sun.

M. G. VAN RENSSLAER.

LEANING TOWERS, SPIRES, AND OTHER ARCHITECTURAL CURIOSITIES.

THE most striking anomalies in building and architecture are doubtless the many instances of *leaning* towers and spires. Dr. Arnott thought that they were intentionally so constructed, in order to strike the eye, and to excite feelings of wonder, if not of admiration; but we shall see that in most, if not all, of the instances which we shall describe, the inclination of the structures is due entirely either to bad workmanship, such as the use of unseasoned timbers, or to a settlement of the foundations, or to some accident which has happened to the building after its erection.

We need not, of course, enlarge upon the theory deduced from the law of gravitation, that a body will be supported, or will stand, provided its line of direction or axis falls within its base — or, in common language, provided it keeps its balance. It is sufficient to say that, provided the centre of gravity of the structure is supported, the whole will stand; so that if, as is the case with these leaning towers, a perpendicular from the centre of gravity falls within the area of the base, the building is safe so long as the different parts of it cohere; but as soon as ever the perpendicular, by further settlement or any other cause, comes to fall outside the base, it will collapse.

The most remarkable examples of these structures are found in Italy. Every one is familiar with the general appearance of the Campanile at Pisa, which is a solitary belfry, just behind the cathedral. It was erected somewhere about 1174, of granite and marble, and is 187 feet in height, but leaning actually more than fourteen feet out of the perpendicular. It is composed of eight separate stories, and forms a cylinder, surrounded near the ground with a wall, and with half-columns and arches. On each tier above this we have arches, leaving open galleries between them and the cylindrical body. Three of the stories incline equally with the ground story, where the lowest rows of pillars are sunk into the earth; the fourth story is but little rectified; the fifth and sixth are in one line, but inclined at an angle to the work below; the seventh is very nearly erect. The tower is mounted by 355 stairs, which are remarkably dislocated, and give one the sort of feeling of walking on the ladder of a ship in a rolling sea. In fact, the whole inclination of the tower has been caused by a settlement of the foundations in the soft soil, in which water-springs occur everywhere at the depth of six or eight feet. That this has been the case is evident, not only from the fact that the Observatory, in the next street, has also declined from the perpendicular, as well as a neighboring belfry, but we have also a sort of record of the alteration, for there are frescoes on the wall of the Campo Santo, a neighboring cemetery, which were executed about the year 1300, and which give a representation of the well-known tower, but in a perfectly upright position. So that it appears to be quite clear that the inclination has taken place gradually since that date, by the erosion of the ground through the action of springs, and the consequent settlement of the structure.

Equally remarkable for their great inclination from the perpendicular are the two watch-towers of Bologna. They were probably erected by private families for purposes of defense. One of them, the Torre degli Asinelli, is a very slender tower, more than 300 feet high, composed of work of different periods, though begun probably about 1109. It is ascended by 500 steps, and leans out from the base as much as three feet two inches, according to a measurement taken many years ago. It does not seem to have been injuriously affected by the great earthquake, but to have settled into its present state soon after its erection. The other, the Torre degli Garisendi, is only 140 feet in height, but leans six and a half feet towards the south, and one and a half feet to the east. It is a thicker tower, and the fact of its settlement is proved by the inclination of the courses of bricks, and the position of the holes for the timbers of the floors. A few feet at the top of the tower, like the top story of the Pisa tower, are quite erect, and were probably added at a later period, after a fall of the upper portion had occurred.

Saragossa, in Spain, gives us another instance of these isolated and leaning belfries. The Torre Nuevo was erected in 1594, of brick, and is ascended by 280 steps. It leans over considerably towards the church, which is on the opposite side of the street. In this case

it has been supposed that the foundations sank during its erection, and that the architect carried on his work, counterbalancing the weaker side in order to give it due stability.

Besides the above-mentioned cases, there are many others on the Continent — as, for example, the belfry of St. Mary Tibernica, at Venice, at Ravenna, and others between Ferrara and Venice, most of them being isolated bell-towers connected with cathedrals, like the Domstoren at Utrecht, which is the belfry for the Domkerk. In fact, we may say that there are very few buildings indeed of any antiquity in any part of the world, which do not lean out of the perpendicular, if they are sufficiently lofty to depress the foundation by their weight, and to make it manifest to the eye by their height or slender proportions. The Monument in London is a case in point, for it is by no means quite erect; and many other towers and spires in England, and especially in Norfolk and Suffolk, will be found to be more or less inclined from the upright position. We will give some examples which we have come across in our travels.

Some instances are evidently cases of settlement. Thus, if we stand beneath the spire of Salisbury Cathedral, we shall notice that the pillars near the entrance to the choir have been bent by the weight of the masonry, and are now propped by inverted arches of fifteenth-century work, and of great elegance. In fact, the spire here was an addition not contemplated by the original architect, and its weight has bent the two western piers twenty-three inches out of the perpendicular. No further settlement has, however, been detected during the last 200 years, when the test of the plumb-line was repeated in 1858. The Temple Church at Bristol, near the railway-station, has its tower separated from the church, and leaning, from a similar settlement, nearly four feet out of the perpendicular. Other instances of settlement and leaning of the tower occur in Spalding, Surfleet, and Weston, in the Lincolnshire Fens, and at Beer Hackett, in Dorsetshire. The latter tower is seen from the railway, near Yetminster station; but we understand that the church is soon to be restored, and the tower re-erected.

In some cases it is said that the inclination of the building has been produced by lightning. Under this head we may mention the steeple of Glasgow Cathedral, which was struck in 1756, and that of Linthwaite in Yorkshire, struck in 1835. It is remarkable that some of the many crocketed pinnacles which adorn All Souls' College, in Oxford, are bent away, and this is said to be due to the passage of electricity down them, which has twisted them out of their original position.

Not a few instances occur where the deflection of the spire has been produced by the warping of unseasoned timber, as is the case at Lowestoft. But the most remarkable example of this kind, and the most striking case in England of a leaning spire, is that of Chesterfield. This structure is 230 feet high, and leans six feet towards the south, and four and a half towards the west. In a paper read before the Institute of British Architects in 1855, we are told that the timber had evidently been used in a green state, and that the oak planks supporting the framework of the spire were much decayed in consequence on one side (probably the south-west or rainy side), and that the sun had thus warped the timber and made the spire crooked. There is, indeed, a legend among the townspeople to account for the distortion, but this we shall refer to in a future paper.

Several towers owe their leaning propensities to the effect of accidents. Thus, the tower of Caerphilly Castle, in Glamorganshire, built about 1220, is only seventy feet high, and yet is eleven feet out of the perpendicular. This was occasioned by the explosion of hot metal in water at the siege in 1326, and it is a remarkable instance of the care and skill with which both architects and builders in those days did their work; for the tower is now kept from falling altogether, not so much by the stability of its base, as by the wonderful strength of the cement used, which has made it like a mass of solid stone. Bridgnorth Castle, in Shropshire, and Corfe Castle, in Dorsetshire, are similar examples produced by the explosions of gunpowder during sieges in the civil wars.

Gloucester boasts two spires which are remarkable. One, which is near the centre of the city, appears to lean considerably; and the other, that of St. Nicholas, has only a portion remaining, the frustum being terminated by a mural coronet. Stanwell Church, near Staines, has also a leaning spire. The steeple of St. Nicholas, at Great Yarmouth, used to lean, but we understand that it was rebuilt upright at the beginning of the present century; while that of Wybunbury, in Cheshire, which was also formerly an example of a crooked spire, was set upright without rebuilding it, by an effort of considerable engineering skill, in 1834. This spire used to lean five or six feet out of the perpendicular, and had become very unsafe. Since 1834, it has remained quite erect.

We should be tempted into far too wide a field were we to endeavor to describe all the eccentricities and curiosities of building and architecture, from the Tower of Babel and the Pyramids downwards; we must content ourselves for the present with a brief mention only of several more scattered examples. We might refer to bridges, and point out curious instances, such as the famous early triangular bridge, at Croyland in Lincolnshire; or the covered bridges like the Bridge of Sighs at Venice, and its namesake at St. John's College, in Cambridge; or the fine old structure still existing of the thirteenth century over the Thames at Radcot and Newbridge. We might collect instances of singularity — or perhaps we should say "duality" — such as the existence of two separate and perfect churches in the same church-yard, like Hackford and Reepham in Norfolk, where the

east wall of the north aisle of the one forms the west wall of the nave of the other; or like Alvingham and Cockerington in Lincolnshire, and Willingale Doe and Willingale Spain in Essex. But space forbids our indefinitely multiplying our phenomena. We will conclude with one or two curiosities which we have examined very lately.

In the church of East Hagbourne, in Berkshire, occurs a very good instance of a not uncommon form of anomaly, viz.: the use of fragments of an older structure embedded in a later edifice, and thereby put to a very different use to that for which they were originally destined. This church has a side-aisle on the south side which is, in all its details, Perpendicular, with one exception. A brass in memory of the founder (now, however, as is so often the case in modern restorations, shifted from its original position to another aisle) informs us that it was erected in 1413. The one exception is the piscina, which is Decorated, and belongs evidently to the preceding century. On close examination it will be found that the arch of this piscina is really a fragment of the sloping side of a window, cut out from an earlier aisle, and having its grooves for the glass still remaining. Another piscina, in the opposite aisle, has a beautiful carving above it, of an anchor surmounted by a cross and star.

Perhaps a paper on *curious buildings* would hardly be complete without some slight reference to our modern *mausoleums*. No doubt the original Mausoleum, erected by Artemisia, with the assistance of four or five architects, about 353 B.C., in memory of Mausolus, King of Caria, was worthy of its fame as one of the seven wonders of the world; but some of our modern structures are so unsightly—either by their enormous size, far exceeding that of the neighboring church, or by their want of symmetrical design, or badness of situation, or poverty of detail—and yet have had so much pains and so much expense lavished on them, that we feel inclined to echo the famous saying of Anaxagoras, when he saw the first mausoleum, "How much money changed into stone!" We shall not now refer to examples like Frogmore, which is worthy of much praise, or like some of those in Kedsal Green and Abney Park, or in places like Fawley, near Henley-on-Thames, which are quite the contrary. We will describe briefly a specimen of each kind, which we have lately examined with some minuteness.

In Holnest church-yard, in Dorsetshire, is a large mausoleum, erected, in 1867, by J. S. W. S. Erle Drax, Esq., M. P. for Wareham, the decorations of which have been executed by Messrs. Simpson, of the Strand, London. It is built of local stone, with Ham Hill dressings, and is adorned externally with granite and black marble pillars. The design is after the chapel of St. Ferdinand, at Neuilly, but it has rather too much the appearance of a heavy wagon-engine, and quite hides the small church. It has a round roof of iron girders covered with lead, and a stone vaulting inside. It is floored with tiles and marbles in geometrical patterns. Round the walls is a dado of red-veined marble, edged at the top and bottom with a course of gray marble. At the west end, opposite the entrance, is a beautiful mosaic of large size, representing the Assumption of the Virgin. There are four principal windows, each of three lights, filled with stained glass representing the different virtues. A raised platform in the centre is intended to support a sarcophagus of Sienna marble, whenever a single block of sufficient size can be procured. The mausoleum of the Digby family, at Sherborne, is somewhat different. It has a stone vaulted roof, but underneath the floor is a handsome crypt, with a hydraulic lift for lowering the coffins from above, so that it is a mortuary chapel as well as a mausoleum. The entrance doorway is beautiful in both form and ornamentation. The architects were Messrs. Slater and Carpenter, and the whole structure is a fine example of what may be done by good taste and architectural skill applied to a most difficult and unmanageable class of buildings. — *The Building World*.

THE ILLUSTRATIONS.

ARTISTS' HOUSES, CHELSEA, ENGLAND.

TITE Street, Chelsea, is already known as an artists' quarter. We reproduce from the *British Architect* a view of that side and portion of it which commences with Mr. Whistler's studio, over the door of which he wrote on his departure for Venice, "Except the Lord build the house they labor in vain that build." The building which abuts on Mr. Whistler's to the extreme right of the view was in contemplation for the Hon. Slingsby Bethel, but we believe the design is at present in abeyance. The portion next in order is a studio erecting for Frank Dicey, Esq., and the corner house and studio in the foreground of the view is building for Mr. Stuart-Wortley, M. P. for Sheffield. Mr. Dicey's studio is from the designs of Mr. R. W. Edis, F. S. A., and the remaining houses for Mr. Stuart-Wortley, Mr. Slingsby Bethel and Mr. Whistler are designed by Mr. E. W. Godwin, F. S. A.

STAIRCASE, HALL PLACE, ENGLAND. MR. GEORGE DEVEY, F. R. I. B. A. ARCHITECT, LONDON, ENGLAND.

CARLTON HOUSE, SPRING LAKE, N. Y. MR. BRUCE PRICE, ARCHITECT, NEW YORK, N. Y.

DESIGN FOR A COUNTRY CHURCH. MR. W. HALSEY WOOD, ARCHITECT, NEWARK, N. J.

HOUSE DRAINAGE.—II.

MR. E. F. GRIFFITHS made the following reply to the Sanitary Committee of the Society of Arts on the question of house-drainage:

In the examination of a house, in diagnosing it, so to speak, what is your particular course of practice?—I usually commence by making a very careful examination of the basement, as far as possible tracing separately the course of each drain or pipe. I then have the main drain opened at the point where it leaves the house (in London houses this is usually in the front area), and by pouring water down the various closets, sinks, bell-traps, rain-water pipes, etc., I am enabled not only to trace the various pipes, but can also form an opinion as to the state of the drains. I also ascertain the velocity of the water flowing in the drain by pouring some water down at any point, and accurately noting the time it takes to reach the opening, should it do so. Where necessary, I have several openings made: one, however, is usually sufficient for the preliminary examination; and if the house is occupied there is considerable objection to making more than one opening on account of the smell. After having thoroughly examined the basement, I proceed to examine in detail every closet, sink, bath, etc., tracing each waste-pipe from floor to floor. To do this it is necessary to have the wooden casings, seats of closets, etc., removed. By this means I am enabled to trace how each closet, sink, bath, etc., is supplied with water, how the soil-pipes from the closets, and the waste-pipe from sinks, baths, overflows of cisterns, waste to safes, etc., discharge. I then proceed to test the drains, which is done in the following manner, viz.: A small iron box, made specially for the purpose, is fixed in the house-drain, at the opening in the front area already mentioned, after first having been filled with live coals. Into this box are thrown two or three handfuls of sulphur, after which the opening into the drain must be immediately closed with clay or some suitable material provided for the purpose. The test usually proves most efficient, since it enables you to ascertain immediately what soil, rain, or waste pipes, etc., are trapped under ground. Should there be any rat-holes or leakages from any of these pipes underneath the floors it is very apparent, and if foul air can escape into the house, otherwise than by water-traps, it is at once perceptible. There are very few houses in London, in which, if this test be properly applied, it cannot at once be shown where the drainage arrangements are defective. It can also be determined in many instances whether the drains are trapped, by ascertaining if there is any draught from the bell-traps in the sinks, etc.

Dr. Richardson: Have you used the ether test in comparison with the sulphur test, which you have just described?—No.

In what condition, as regards the sanitary arrangements, do you generally find houses of the best class?—Except in houses which have been recently drained, there are very few which are not in direct communication with the sewer, or into which sewer-gas does not enter under certain conditions, such as evaporation of water in traps, suction of the siphon trap, heavy rainfall, causing the sewers to fill quickly, thereby forcing foul air through the water-traps, or absorption of sewer-gas by the water-traps. If the following rules are correct, I doubt whether you would find one hundred houses in London in which they have been strictly adhered to, and the omission of any one of which would allow foul air from the drain to escape into the house, or contaminate the water supply, and in the majority of houses few of these principles, simple as they are, are carried out:

1. Communication between main sewer in street and house-drain should be disconnected or severed by an open air-space being left between house-drain and sewer.
2. The house-drain should be laid to such a fall as to be self-cleansing, free from deposit, and ventilated, besides which it must be air and water tight.
3. The soil-pipe should be fixed outside the house and taken up full size above the roof.
4. The waste-pipes from the safes of all closets should discharge into the open air instead of into the soil-pipe or D-trap.
5. There should be no means of drawing water from the cistern or cisterns supplying closets, other than through the closets.
6. The waste-pipes from sinks, baths, lavatories, etc., should be trapped underneath, and made to discharge immediately into the open air over trapped gullies.
7. There should be no connection or branch with the main house-drain where laid underneath the house, except outside the main walls of the building.
8. "Pan-closets" with "D-traps" should never be used, nor should "D-traps" be fixed under sinks, etc.

Dr. Richardson: In how many cases have you found a London house in which there is no deposit of sewage matter in the drain within the house?—Four or five.

After your examination of an ordinary London house, what course do you usually recommend?—If I am instructed to place the house in a thoroughly sanitary condition, I first make a plan of the house, showing exactly how the new drainage can be laid, and then proceed to have all the old drains and contaminated earth removed. Unless absolutely necessary, I never lay a new drain underneath the house. Should it be necessary to lay a new drain under the house, I use an iron pipe, laid perfectly straight, from a disconnecting man-hole constructed in the front area to a man-hole in the back area. Between these two man-holes, the iron pipe is laid perfectly air-tight and water-tight, and no branch drain or waste-pipe is discharged into this iron drain between these two points; beside which, it is laid to a good fall, which will ensure its being self-cleansing. This iron drain is completely severed from the main sewer in street by the dis-

connecting man-hole which is constructed in front area. All the branch drains discharge into a man-hole, and every pipe is laid perfectly straight from point to point, a man-hole, or turning chamber, being constructed where a change of direction takes place. Every drain and waste-pipe is so laid that, in case of stoppage, it can be cleaned out without opening the ground, removing the paving, or cutting about the walls, either inside or outside the house; besides which, every drain and waste-pipe is thoroughly ventilated. I fix the soil-pipes from the closets outside the house, and take them up full size above the roof. The closets would be fixed against outer walls only, and the soil-pipes from them would discharge direct through the wall into the iron soil-pipe fixed outside. In each closet some permanent ventilation would be made. The waste-pipes from all sinks, baths, lavatories, etc., would discharge direct through the wall over the trapped gullies, or if above ground-level into rain-water pipes, which pipes would discharge over trapped gullies at the foot. The overflows from cisterns would discharge direct through the wall into the open air, so that in case of the ball-valve in the cistern being defective, the overflow water would immediately attract attention, and by this means would prevent the waste of water which now often takes place, and in many cases continues for months without being remedied. The valve and waste-pipe of the bath are made of such a size that whenever used it will flush the house-drain. The cistern or cisterns which supply the closets would be so made that no water could be drawn from them except through the closets.

Why do you prefer cast-iron drains underneath the house?—Stoneware pipes laid on a bed of good concrete can be used, but there is more chance of leakage through defective workmanship than with cast-iron drains with lead and yarn joints.

Dr. Richardson: What fall would you give to drains in houses? What to a 4-inch, 6-inch, and 9-inch?—All house-drains should be so laid that they are self-cleansing, not when running half full as is usually calculated, but self-cleansing when they have only about one inch of sewage flowing in them. I never lay a 4-inch drain to a fall of less than 1 in 30, a 6-inch to a fall of less than 1 in 40, and a 9-inch to a fall of less than 1 in 60. When these falls cannot be obtained, then automatic flushing arrangements should be made. All houses, in my opinion, should be so drained that where water is discharged into the house-drain from any sink, bath, closet, etc., the said water should be discharged in a body or volume so as to flush the drain.

Dr. Richardson: What kind of material is best for construction of house-drains?—I generally use glazed stoneware pipes outside the house, and cast-iron pipes underneath it.

Dr. Richardson: What, in your opinion, should be the diameter of a drain of a house, in proportion to the number of persons resident in the house?—You cannot determine the size of the house-drain by the number of people living in the house; it usually depends upon the amount of rain-water it has to take. A 4-inch circular pipe, laid to a fall of 1 in 30, would discharge 170 gallons per minute, or, say, 10,200 gallons per hour.

Are new houses of the best class now being built, drained on the latest known sanitary principles?—Very few. It is very seldom you find all the waste-pipes properly disconnected, and seldom, if ever, is the house-drain severed or disconnected from the main sewer.

Dr. Richardson: How many persons do you find (householders) who know the plan of their houses?—It is very seldom you find a householder who really understands how the drains are laid.

Dr. Richardson: What plan would you adopt for preventing the deposit of fat in a house drain?—Fat is the most difficult matter to deal with in house drainage. If, however, all the sinks are made with plugs, so that the water is discharged in a volume, it will prevent in a great measure the deposit of fat in the drain, supposing the latter is properly laid. The best method is to fix one of Mr. Rogers Field's patent flush-tanks, which not only collects the fat, but also flushes the drain.

Dr. Richardson: In making an opening into the air, between the trap and the house in the area, is it absolutely necessary to have the large man-hole of which you have spoken, or can the same good result be carried out without incurring the expense of the man-hole?—In the better class of houses this disconnecting man-hole should certainly be constructed, as it is not only more efficient, but the drain underneath the house can always be examined; besides which, if a stoppage should occur, it can be removed from this man-hole without pulling up the basement floor. It is, however, not the slightest use constructing this disconnecting man-hole, should the house-drain be a drain of deposit, as in this case the ventilators from the man-hole would discharge foul air, and become so offensive that it would be necessary to stop them up. Besides this, the syphon between the disconnecting man-hole and the sewer in the street would also become choked. Should the house-drain be laid to a proper fall, a very simple form of disconnection can be made for small houses, by taking a branch pipe off the house-drain, on the house side of the syphon, and bringing this branch up to the surface of the ground, at an angle of about 45°; this branch not only acts as a ventilator, but the syphon can also be cleaned from it in case of stoppage.

You have spoken of sewers, it is presumed, regarding them as sources of noxious gases and putrid deposits, recipients of the gases and putrid matters from the house-drains. Cannot you insure conditions of sewers and drains of a general system free from deposit and smells?—Yes, if the house-drains are laid under the supervision of a thoroughly competent engineer, and no connection be allowed to

be made to the sewer unless the house is drained upon the best sanitary principles. The chief cause of the foul condition of many sewers is that the house-drains, being almost invariably drains of deposit, discharge putrid sewage into the new sewers, and, consequently, no amount of ventilation will keep these sewers pure, however well they may be laid out and constructed.

MONT SAINT MICHEL.

LEAVING Jersey in a raging rain-storm, fog and general nastiness, we go back to Granville without incident, except general feminine seasickness. At Granville the rain stopped, and we took a *voiture supplémentaire* to Avranches. The jolly hotel was all lighted, with flowers in front, and little café tables outside. Such a nice room and curtained bed. The town is on the top of a high hill, with two rivers and valleys on either side leading to the sea or sands near by—it is one of the prettiest of French towns. We sketched, and hated the fate which carried us off in the train to Pontorson, and then by diligence across the lowest country you ever saw, nine kilometres, to Mont St. Michel. But we could only ride part way on account of the tide, which is everything in this curious place. Suddenly, far out on the sands which stretch for miles around, we saw the wonder of the Western world, the Mont rising out of the waste of sand—one of the most astonishing places. The church is on the top of the rock, cut out of, and built against it; and all around is an enormous abbey, flanked with towers and buttresses, all rising five hundred feet above the sands. You can imagine my feelings; no description can do it. I walked out on the *digue* which is being built across the sands. The fellows went in a boat, it being *haute marée*, and the tide came up round everything, covering the sands, which are generally bare save at the high run of tides. As you go out you make out the *enceinte militaire* which surrounds all but one side of the island, with the most picturesque machicolated towers at the angles rising out of the water or sand, and the houses with quaint roofs straggling up the sides of the rock, with dark trees massed in among them;—walls everywhere, and high, high up at the top of the huge mass, the church, inside the abbey-walls, which rise *sheer* up more than one hundred feet, with picturesque towers, narrow and graceful wall-arches, and little windows, and the opening where the wheel is which the Revolutionary prisoners amused themselves by treading round, to hoist up the food over an almost perpendicular railway. The *digue* is a government work, and a great one, which mars the effect greatly, but will be very convenient. There is but one gate through the walls, and to this and the stone steps or paved way I was ferried by the most picturesque old fisherman with the finest colored legs I ever saw. There the crowd of picturesque fishermen and women stood, to guide you to the hotel, which you couldn't miss if you tried. You pass in through the old round arch, with low, round, flanking towers on either side, under two other most picturesque gates, the last with an old portcullis hanging half open, and you are in the *vile*. The "Lion d'Or" is the first hotel, which I didn't enter, as the landlady of the "Hotel de Mont St. Michel" is a noted beauty. The street is very narrow, there is only one row of houses between it and the walls—and in the street the people seem to do everything but sleep,—eat, live, and wash dishes.

The whole rock up to the abbey is one mass of stone houses and gardens stuck against the rock, like so many snails, and to wander up and down, discovering new steps, new back-yards, new arched doorways, new quaint old roofs—why, it makes the architectural mouth water. The views from the walls off across the sands, the views of the town—the low-roofed houses under the walls, the quaint old women, who are numberless, the fishing-nets on the walls, hanging gracefully over the once fierce fortifications—all are picturesque; then, climbing innumerable steps, you find the back or seaward (north) side, one grand, buttressed wall, rising up from the rocks, and a grove of poplars, and far away the ocean, between the distant shores of Normandy and Brittany. All the long winding flights of stone steps and the ever-changing views of the grand old buildings and the picturesque houses below make it an ideal place. Now a few monks stay here to pray, and make money by selling crucifixes, medals, shell-stuff, photographs and such—all blessed, and so, very dear. The work is very good. The Norman work is grand and impressive, and the outside Gothic, fifteenth century, very rich and beautiful. I know nothing of the inside, as I have yielded to the temptation of making water-colors out-of-doors, rather than sketching the beautiful detail inside. The grand old columns, the vaulted halls, the fire-places, its immense size and historical interest, make it a place every one ought to see, particularly an architect.

We are very comfortable here at the hotel, and everything is so quaint—except the visitors who come and go at all hours of the day. The dishes are washed across the street in a cave built in the wall, and at night they have little Venetian lanterns to hang up; and to see people going up the long flights of steps each carrying one of these is very pretty. The kitchen, the dining-room, and the street seem one, including the dish-washing cave, and the flock of ducks always under foot. When the diligences arrive, the people have to go into the houses, there is no room for both. Up on the hill it is such a pretty sight, the wet sands give such lovely changing coloring and the low shore of France with the two diked rivers, coming down through the sand and passing close by. Then you see the quaint old fisherwoman with her basket and bare legs striding across the sands, wading the streams with long strides, her quaint figure reflected in the water. Off, off she goes to some nets,

till she grows small as an ant, and you see another coming to meet her from the other shore as far away as you can see anything, — or a speck — two, three specks, and a very fine speck moving ahead; it is a number of diligences from Avanches, with a guide ahead to pick out the way, for the sands are changing and dangerous. All is ideally picturesque. . . .

When I last wrote you, Sunday, I was full of enthusiasm for Mont St. Michel. It was an ideal place full of many interests and so picturesque and quaint. Monday morning, we were out by seven, and another beautiful day made us still more regret that we were to leave. The crypt there is beautiful, old low Romanesque columns with such fine old "caps," and the most effective light streaming into the crypt from a single window in the massive wall. Then, in one corner is an altar with a funny old virgin, a few chairs, and all around, beautiful ferns growing. *La Salle des Chevaliers* is very fine, called the finest of its kind (Gothic), with two grand hooded fire-places on the side. But it is hard to do any satisfactory sketches in such an imposing place. I wished I had sketched less out-of-doors, and more indoors. At two we left, and drove across the sands to Pontorson. I was very unwilling to go but we had to move on. The grand old buildings looked finely in the afternoon light, and I could hear Marie Annette's merry laugh and invariable "*toute de suite*" when she knew she couldn't get any of that delicious omelette for which Madame Pontaro is so justly famous, for some time to come. It was a jolly place, the crowd the only drawback. . . .

At Vitré we staid two days, two busy, happy days, out-of-doors, sketching all the time, roofs, dormers, wood-work, details, everything, and only wishing that the days were twice as long. They couldn't have been finer. The houses were full of interest, with great gables, projecting out over the street, whole rows resting on enormous wooden posts. Then some slate-work was very ingenious and pretty. One half-timbered house with a quaint little late Gothic doorway with the serpent in an apple-tree on top, and on either side a pinnacle, with an Adam and an Eve that would have made you die laughing. Eve's hair was fine. The whole conception was truly naïve. Vitré was the most interesting place we visited. The people were very kind and pleasant. I know, because I have no portable stool, and go about borrowing chairs of the pleasantest women I can find, and I find a good many. Going up a long hill-street across the river where the poorer people live, I counted one hundred women sitting on the shady side and all knitting; sometimes ten in a line knitting for dear life. Why, a New England knitter would be nowhere. They knit shawls and everything, for the city markets I suppose; but the gay colored worsted piled in little baskets makes the scene very picturesque, and I never saw anything so rapid as their movements; babes almost can knit. They do nothing else in Vitré. But the prettiest sight was three girls in line walking down the street, with baskets of pretty wool on their plump, brown arms, talking and laughing, but all knitting. I wonder if they sleep and knit, I know the old women can. They have splendid, rich colors.

The Chateau, like most of the old Chateaux of France, now belongs to the Government, and they have in the old rooms, the town library, museum, etc. *Le musée* was small, but fascinating with its tapestries, old carved panels, bric-à-brac, etc. "*C'est vacance à present*," the concierge said, but there was a member of the Society of Natural History who came round and bothered us. He was slightly intoxicated and wanted to know what right we had to sketch there. Then he wanted to show us something wonderful, but we were making water-colors. — *Extracts from a private letter.*

CANVAS ROOFS.

A correspondent of the *Metal Worker* some time ago wrote the following letter on the practicability of superseding tin with canvas for covering flat roofs:

"I have watched the discussion of the subject of canvas and paint as a covering for roofs with a good deal of interest. I expected to see the tinnmen bring forward some really serious objections to the use of canvas, and really supposed that they would have some especial advantages in favor of tin to present. I have been greatly surprised, however, at their arguments, and have come to the conclusion that they do not know much about the matter. Certainly they do not know anything about canvas. Now, I have had not a little experience with canvas, and when I look over the letters which your correspondents have sent, I begin to think that the tinsmiths not only do not know anything about canvas, but do not wish to. It would seem that they are bound not to touch any other material than tin, whether it is good or bad. However, I shall venture to give them a little of my experience and observation, and hope that they may profit by it.

"In the first place, canvas roofs are not new. I remember cases where canvas and paint formed the external covering of roofs which were put on at least twenty-nine years ago. I can call to mind steamboats whose upper decks were covered with canvas almost as long ago as I can remember. Now, the way the decks of these boats stand wear and tear would astonish a tin-roofer. These are simply canvas roofs and nothing else. Most of them have the disadvantage of narrow cloths, but in spite of seams and of the travel of thousands of people across them, they last for years. Why, the best tin roof ever laid would not last three weeks under such wear as the upper decks of dozens of our harbor steamers get every summer. These decks are simply canvas, covered with paint. They are laid upon the thin deck boards, which are often so light that they spring per-

ceptibly under a crowd. If they had no more wear than the roof of a house, they would be good for seven or eight years without so much as a coat of paint.

"If I remember rightly, all your correspondents have said that a tin roof must have a coat of paint once in four years. Upon asking a gentleman who has been using canvas for roofing purposes for a great many years, what was the longest life of a canvas roof that he had ever known without paint, he said eight years. This is a great deal better than could be said of the best tin roof in the same locality. If your readers wish to see other examples of canvas roofs, they have only to look at horse cars, where there is almost every kind of strain which a roof has to contend with. Years ago, tin was used for the purpose, but it would not answer. Mr. John Stephenson, of this city, put tin or metal roofs upon street cars. Some of his roofs were of German sheet zinc — a very tough and ductile metal as compared with that at present in the market. He soon abandoned metal and resorted to canvas, which he has used successfully ever since. The reason for this is easily found. Mr. Stephenson says of them that they do not suffer as much in any way as metal. They do not expand with heat to any perceptible extent, nor do they contract with cold. This is a flat contradiction of one of your correspondents, who said a canvas roof would expand and contract to such an extent that it would pull out the nails with which it was fastened, apparently thinking that canvas behaved just like metal. The durability of canvas depends, of course, upon the method by which it is put on. If laid in the best manner, it is independent of the roof-boards. The old system was to cement it fast to the boards by means of a paste. This is not the best plan, because the boards are more or less affected by atmospheric changes and "go and come" with dryness or moisture, and are constantly tending to strain the canvas if the two are firmly fastened together all over. The cementing plan is especially objectionable upon car roofs, of course, but it has no advantages upon ordinary roofs, where the shrinkage and swelling of the wood is as bad for adhesion as upon a car.

"The canvas roof gives no more trouble at the joints or edges than a tin roof. In both cases these are the weak points. Proper precautions will make them tight. There is one point of advantage for tin that I was surprised the tin-roofing men did not mention, and this was one of the things that made me think they did not know their business. None of them that I remember said one word about tin being fire-proof. This is something of an advantage, I admit, but in cities it does not amount to much, nor is it very important in the country. Its value is greatest, of course, in the towns and villages which are mostly built of wood, and have scanty fire protection. As the tin-roof men did not think of this point, I do not suppose it will count very much on their side.

"Now, in laying a canvas roof we begin with a material which is within itself water-proof; an ordinary rain will not go through it. No. 6 or No. 8 canvas may be used, although fully as heavy as is needed. This comes of various widths; a very convenient one, which is much used for some purposes, is 104 inches; this has cost, in the past few months, from \$1.10 to \$1.15. Taking the lower figure, because the grade is rather better, I think, than is absolutely needed on house-roofs, the cost per square, figures out about \$4.25 for the material. Now, I would like to know if this is not very much cheaper than the material for a tin roof? I have not the exact cost of the labor, but suppose the cost per inch of seam is as great in one case as in the other, we shall have in the case of the canvas less than 21 feet. The number of feet in a square of tin roof, laid with the largest size of tin commonly used (20 x 28") is, I believe, not less than 116 feet, and perhaps more, according to the sizes of the roof.

"Even if the canvas seam is no better than that of the tin — a point which I am by no means willing to admit — the danger from the leakage is much less. The seams, however, are not difficult to make, nor are they costly. If it is not desirable to use a sailmaker's lapped seam with both parts sewed together, the canvas can be lapped and secured with a double row of nails. The seam is then covered with a batten or molding which should be bedded in white lead. This makes a cheap and durable seam. Roofs of this kind are not to be pooh-poohed at, for they have been in use for years under the most severe tests, and have stood in a most satisfactory way. What their actual life is it would be hard to say, for they appear to wear beyond all expectation. I think that the tin-roofers ought to study up the subject of roofing a little, and find out something more in regard to the merits of the different materials."

A CASE OF OPEN PIRACY.

DUBUQUE, IO.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Wishing some information and advice on a point of general interest to the profession, and knowing of no one in better position to advise, I take the liberty to lay the matter before you.

The point in question is this: I furnished plans for a hotel building which was erected last year in one of the northern towns of this state; when the building was completed, the builder took the plans away with him and kept them in his possession. This spring he fell in with a party that wanted to build a hotel in another part of the state, showed him the plans, and the party went and looked at the building and closed a contract with the builder to put up a hotel the same as shown by the plans except that it was to be a few feet larger. They also changed some matters of detail, but to all intents and purposes the buildings were duplicates. As soon as I heard that the

parties had or were about to make a contract, I wrote to the party that was to have the building put up, saying that I claimed all right in the plans, and that if he erected a building in accordance with them, that I should hold him for pay for the same, and some weeks ago I sent him my bill for the use of the same, but in neither case did I get any response. Now what I would like to know is this:

1st. Am I, or am I not, entitled to pay for the second use of plans?

2d. If so, should it come from the owner or the builder?

I have reasoned to myself all the time that it should be from the owner.

3d. Do you think I could collect pay from either of them if the matter was taken into court?

Can you cite me to any case or cases where such has come to trial?

I have as yet taken no further steps towards collecting than to send my bill. I was about to write him saying that if I didn't hear from him in the next ten days that I should put the matter into parties hands for collection, but thinking that you might be able to give me some good advice in the matter, thought I would wait until I heard from you before taking any further steps.

Any information or advice you can give in the matter will greatly oblige, Yours truly,

F. D. HYDE.

[Mr. Hyde's case is a pretty hard one, but we are very much inclined to think that he will get no real benefit from going to law about it. Attempts have often been made to gain some kind of protection to architects' designs by means of the copyright laws, and perhaps if he had copyrighted his design, as he might have done, he could make out a tenable position, but a very small variation on the part of the dishonest owner and builder from the original plans could be made to defeat even that, and without a copyright we do not think he would have any standing in court whatever. A very similar case was decided in a Philadelphia court, and reported in the *American Architect* for October 25, 1879. If he had stamped upon the plans, or written in the contract with the builder, that all drawings were to be returned to him, or if he could prove an understanding that the builder was not to use them again, he might possibly pursue him for unlawful conversion of his property. The reasoning of courts seems to be that there is no law or custom at present, outside of copyright protection, to prevent a man from making an exact imitation for himself of any building which strikes his fancy. If his builder has stolen the plans, that is his own affair. It is common to make the last payment to a contractor conditional upon his return of all the drawings entrusted to him. We suggest that Mr. Hyde adopt this practice in future, but content himself for the present with noting the names of these and any other plan-stealers he meets with,—they are by no means rare,—for the benefit of his professional brethren. —EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

LARGE SHEETS OF PLATE-GLASS.—The "*Société Anonyme des Manufactures de Glaces et Produits Chimiques de St. Gobain, Chauny, et Cirey*," owns the works of St. Gobain, Chauny, Cirey, and Montluçon, in France, and Mannheim and Stolberg in Germany. There are two other factories besides at Jeumont and Aniche. The following plain white and silvered plates were exhibited by these firms, says Mr. C. Cloné, in his report on glass, at the Paris Exhibition:

	Pounds.
St. Gobain; 1 plate 21.15 ft. x 13.48 = 285 10 ft., white, 7-16 in.	1,573
St. Gobain; 1 plate 17.90 ft. x 9.94 = 177.92 ft., silvered.....	770
Jeumont; 1 plate 17.81 ft. x 11.51 = 205 ft., white.....	1,100
Jeumont; 1 plate 17.22 ft. x 10.82 = 182.12 ft., silvered.....	770
Aniche; 1 plate 15.76 ft. x 10.43 = 164.38 ft., white.....	660
Aniche; 1 plate 14.76 ft. x 9.05 = 132.58 ft., silvered.....	550

The St. Gobain Works furnished a number of mirrors to the new Opera House of Paris; among others one 21.29 x 9.67 feet; others from 45.12 to 52.48 feet long.

THE NEW TAY BRIDGE.—The North British Railway Company have lodged the plans for the rebuilding of the Tay bridge, as required under the Parliamentary notices. The whole bridge, from shore to shore, has been reduced in height, so that over the middle of the fairway, where the high girders fell, the height of the girders above high-water mark, ordinary Spring tides, will be reduced from 88 feet to 57 feet. The spans in the southernmost portions of the bridge still remaining are not to be altered in width, but the 13 wide spans of 245 feet, which were in the centre of the bridge before it fell, are to be narrowed to about one-half the width by the introduction of additional piers. The first five 245-foot spans, counting from the south end of the present gap, are to be divided into 10 spans of 109 feet each, and will be at the height of 57 feet above high water, ordinary Spring tides. Between the fifth and sixth fallen piers there will be two spans 100 feet wide and 57 feet in height; between the sixth and eighth fallen piers four openings 109 feet wide and 57 feet in height; between the eighth and ninth fallen piers two spans 100 feet wide, and gradually falling in height from 57 feet to 54 feet 9 inches; then from the ninth fallen pier to the first standing pier on the north side there will be eight openings 109 feet in width, and gradually falling in height from 54 feet 9 inches to 43 feet. The spans of the portion of the bridge still standing at the north end are not to be altered in width, but the girders are to be lowered to suit the falling gradient of the line toward the north shore, the height of the large bow-string girder being reduced to about 26 feet, and the similar girder over the esplanade to about 18 feet. It is not proposed to make a double-line bridge, but the new piers to be erected in the middle of the river will be of such a width as will be sufficient to carry a double line of rails should that be deemed necessary. As the result of the recent inquiry into the causes of the fall of the bridge, power will be asked to enable the company to stop the traffic from crossing the bridge when the weather may be so severe as to cause reasonable apprehension of danger. —*Pall Mall Gazette*.

ANOTHER CHANCE FOR ELECTRO-MOTORS.—A French engineer named Parodi claims to have discovered a method of conveying large quantities of electricity over long distances and distributing it at any number of points on the way, exactly like gas or water. Electricity of sufficient tension is produced in the ordinary manner, but instead of transmitting it by the usual wires or cable, it is conveyed through immense truncated pipes having the same qualities as Leyden jars. The tension is uniform throughout, and it is thus possible to divert the fluid as may be required at different points for various industrial purposes. The invention dispenses with steam engines. Steam may be replaced by water-falls and great economy in the production of electricity is effected. The inventor believes that the Niagara might be utilized, and electricity transmitted from the Horseshoe Falls to New York or Boston.

GLASS-MAKING IN THE SOUTH.—A correspondent of the New Orleans *Democrat* has been investigating the resources of St. Tammany parish, in the southeastern part of Louisiana, which he says offers peculiar advantages for the manufacture of glass. Upon the banks of rivers are immense mounds of pure white silica, which, on being subjected to chemical analysis, has been found to contain no qualities injurious to the successful making of glass. Here is a new industry to which the *Democrat* thinks the capitalists of the city would do well to direct their attention. Hitherto, little of this sort of manufacture has been done in the South. Statistics show that Pennsylvania has for some years taken the lead in glass-making. The manufacture in 1860, in this country, employed a capital of upward of \$6,000,000, producing work valued at very nearly \$9,000,000. The manufactories were then placed as follows: Thirty-six in Pennsylvania, twenty-two in New Jersey, most of which were owned in Philadelphia, twenty-three in New York, eighteen in Ohio, eleven in this state, three in Connecticut, and one or two in each of several other states. The purest sand found thus far in this country is said to come from Lanesboro', Mass., while that used in England is imported expressly from Austria.

ELECTRO-DEPOSITION AS A SUBSTITUTE FOR CASTING.—We find, in the London *Nature*, an interesting reference to the process of electro-deposition lately referred to in this department of the *Journal*, and which, in the hands of an electro-metallurgical company of Brussels, promises to become a practical substitute for casting in the production of bronze statuary. Our contemporary confirms our previous statement that this company had succeeded in producing a colossal statue of Van Eyck by the deposition of copper electrically upon the clay model. The same authority notices a simple procedure by which the production of bronzes on a small scale may readily be carried out. Take any plaster figure or group, boil in stearine, then coat well with black-lead, and place in the copper bath as in ordinary electrotyping. Attach a very weak battery and deposit very slowly a thin coating of copper. Then remove from the bath and bake in an oven until the plaster model shakes out in dust. There remains now only a thin copper shell of the model. Varnish this on the outside to prevent further deposition there, and replace in the bath with a much stronger battery power. The copper will now deposit on the inside, and when the same becomes thick enough the process is finished. —*Engineering Journal*.

ANECDOTE OF W. M. HUNT.—A little incident in the life of Mr. Hunt will serve to illustrate one phase of his character which has not appeared in all that has been said and written about our great artist—we mean the tender, loving, sympathetic part of his nature. His heart when stirred to sympathy was like a great well-spring bubbling over; he would do anything, sacrifice anything, to comfort a sorrowing heart. A lady quite unknown to Mr. Hunt wished him to paint a portrait of her deceased daughter. She had only a small photograph, and Mr. Hunt had said with great emphasis that he would never paint from a photograph. The lady approached him cautiously and with faint heart. "I wish," said she, "a portrait of my daughter, and I wish you to paint it; I will tell you about her character and spirit, and leave it all with you; I will not dictate; and I will not complain if you should fail to get a likeness." After a moment's thought he replied in a kind and sympathetic tone: "I will paint a picture for you. Nothing would give me more pleasure than to paint a picture for one who will trust me, and leave me to work out my own ideas. I will not paint for people who dictate to me. I do not wish people who know nothing about art to tell me how to paint a picture! Why not go to a preacher and tell him how to make his sermons, or to a lawyer and tell him how to construct his plea? Yes! yes! I will paint you a picture at once." He was faithful to his word; the picture was completed in a very short time, and proved perfectly satisfactory. When Mr. Hunt was asked how he could have succeeded in giving the right form and pose to a person whom he had never seen, he replied: "I tried many forms, and when I hit upon this I said, 'I have found it! I have found it! This is just the form for that spirit!'" The beautiful picture was finished, framed, and ready to send home, when the great fire came, and Mr. Hunt's studio, with all it contained, was destroyed. All his studies and many finished pictures were reduced to ashes. His loss, of course, was irreparable, and his heart was broken; his treasures—the work of his life—consumed in an hour. It so happened that the charcoal sketch which had been drawn to paint from had been sent to the family for a few days, and that alone was saved from the flames. So great was the sympathy felt for the artist who had labored many days to produce a satisfactory picture, with only a small photograph to work from, the lady said to him: "Mr. Hunt, if you wish me to be satisfied with the charcoal sketch, I will not ask you to paint another picture." Without a moment's hesitation he replied: "I do not wish you to be satisfied with the charcoal. I will repeat my work as soon as possible." The portrait was again completed, and the family pronounced it quite as satisfactory as the first. When Mr. Hunt parted with the picture over which he had spent so much time and thought he burst into tears, and said: "It is too much to believe; I did not expect them to be satisfied. It is hard to part with that picture; I have given a good deal of heart work to it." —*Boston Commonwealth*.

BUILDING INTELLIGENCE.

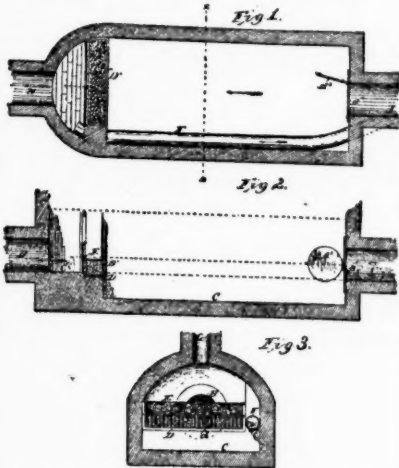
(Reported for The American Architect and Building News.)

[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.]

226,620. SEWER CATCH-BASIN. — Patrick Markey, Milwaukee, Wis. This invention consists of a device by which all of the solid matter from the sewer-pipes will be detained and the fluid strained before it passes out of the sewer. Figure 1 is a horizontal section; Fig. 2 is a vertical longitudinal section; Fig. 3, a transverse section on line x x, Fig. 1. The catch-basin is to be placed at suitable intervals along the sewer, generally at points just beyond the intersection of streets,



or after the entrance of branch sewers or pipes. A is the inlet, and B the outlet. C is a depression about two feet deep, which extends to about four-fifths the length of the basin, when a platform C', on a level with the exit begins. This platform has a depression on its inner edge, in which is imbedded a flange plate, D, for receiving a basket, D', composed of a solid bottom and vertical bands d. This basket is filled with charcoal, broken bits of granite, and other filtering substances, and is covered with a lid which is hinged to open from the outlet. Just beyond the filter is a sluice-gate, E, working in suitable ways. To take care of the drainage while the basin is being cleaned, a supplemental pipe, F, is provided, which, branching out from the inlet, where it is provided with a door, f, is carried along one side of the basin through the masonry, and out onto the platform C' beyond the filtering-basket. The upper part of the basin is arched, and a man-hole, G, is built through it just above the centre of the depression. In operation, the drainage entering the sewer at A will fall into the depression C, which it will fill and overflow, the fluid passing out through the filtering-basket, leaving all the solids in the depression C, and after this has continued until the depression has been about filled with solid matter the door A' may be closed and f opened. The drainage will thus flow directly onto the platform, the sluice-gate having been shut to prevent any backflow. The basin may now be entered and its contents removed through the man-hole by a sand-pump or any other means, hose let down, and the basin thoroughly cleaned, after which the sluice-gate may be raised, door A' opened and f closed, when the basin will resume its functions. The filtering substance in the basket D' should be washed and changed as often as necessary. The matter taken from the basins will be of sufficient value as a fertilizer to pay for the trouble of removing it, and the drainage before it reaches the river or other body of water into which it empties, will have been so purified and freed from putrefying matter as to not be injurious to the fish or the health of the inhabitants along its banks.

229,795. RIVETING MACHINE. — John F. Allen, New York, N. Y.
229,800. COMBINED LATHE AND PLANER. — F. W. Gustav Poettcher, Watertown, Wis.
229,811. LIME-KILN. — Robert Dunlop, Jamesville, N. Y.
229,829. PERMUTATION-LOCK. — Daniel J. Kenny, Cincinnati, Ohio.
229,840. METAL PUNCH. — Isaac P. Richards, Providence, R. I.
229,842. WARMING AND VENTILATING. — Alexander C. Rideout, Hillsdale, Mich.
229,848. TILE-KILN. — Wm. Wickers, Louis Wickers and Barny Wickers, Lebanon, Ind.
229,851. SAW-CLAMP. — William S. Winterbottom, Philadelphia, and John Murray, Conshohocken, Penn.
229,855. LATHE-CHUCK FOR TURNING POLYGONAL BODIES. — Siegfried Block, Boston, Mass.
229,856. COMBINED SASH-FASTENER AND BURGLAR ALARM. — Martin Bourke, Youngstown, Ohio.

229,860. SUSPENSION-SLIDE FOR CHANDELIERS. — John F. Brown, Brooklyn, N. Y.
229,873. CORNICE-HOOK. — John Day, Brooklyn, N. Y.
229,884. SASH-FASTENER. — Noah Haynes, San José, Cal.
229,894. FASTENING FOR THE MEETING-RAILS OF SASHES. — Adam Kolb and Charles Osberghaus, Sandusky, Ohio.
229,908. SCROLL-SAWING MACHINE. — Edward Nunan, San Francisco, Cal.
229,924. ROOFING-CEMENT. — Terence Sparham, Brookville, Ontario, Canada.
229,925. ROOFING COMPOSITION. — Terence Sparham, Brookville, Ontario, Canada.
229,935. FURNACE FOR HEATING SOLDERING-COPPERS. — William G. Alexander and George A. Wells, Oskaloosa, Iowa.
229,951. ICE-HOUSE. — Richard Bullymore, Buffalo, N. Y.
229,953. CASTING APPARATUS. — Carl A. Caspersson, Westanfors, Sweden.
229,962. COMBINED RULE AND SCALE BRACKET. — G. Corser, St. Johnsbury, Vt.
229,963. WATER-PROOF COMPOUND. — Paul Crippen, Bronson, Mich.
229,972. VALVE FOR WASTE-PIPES. — John C. Daggett, Boston, Mass.
229,973. PAINT-MILL. — William Daniels, Brooklyn, N. Y.
229,975. DRAG-SAW. — Cyrus S. Dean, Crowland, Ontario, Canada.
229,982. ELEVATOR. — Albert C. Ellithorpe, Chicago, Ill.
229,988. LEAD-PENCIL. — John Eberhard Faber, Port Richmond, N. Y.
229,992. TIME-LOCK. — Edwin H. Flint, Cincinnati, Ohio.
229,995. FASTENER FOR MEETING-RAILS OF SASHES. — Simon J. Freeman, N. Y.
230,005. VISE. — James F. Hall, Havana, N. Y.
230,006. SAFETY APPLIANCE FOR ELEVATORS. — Alfred H. Hall, Boston, Mass.
230,008. PARALLEL RULER. — John H. Harden, Philadelphia, Penn.
230,018. PIPE-COUPLING. — David B. Hand and Ephraim H. Reitzel, Columbia, Penn.
230,024. WINDOW-SASH. — Herman Knueppel, St. Louis, Mo.
230,026. SHUTTER-WORKER. — Lydia J. Lanphere, Waterloo, Iowa.
230,043. PROCESS OF COATING AND FINISHING WALLS. — John W. O'Bryan, Petersburg, Ill.
230,062. DOOR-FASTENING. — Charles H. Roloson, Baltimore, Md.
230,063. SHADE-ROLLER. — Charles P. Rose, Allentown, Penn.
230,070. SHINGLE-MACHINE. — Charles C. Schermerhorn, Alder Creek, N. Y.
230,088. BENCH-PLANE. — William F. Wainwright, Dry Sawmill, Penn.
230,096. BLIND-FASTENER AND SLAT-OPERATOR. — Wm. L. Wooster, Harvard, Ill.
9,293. HOLLOW AUGER. (Reissue) — Geo. N. Stearns, Syracuse, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — The following building permits have been issued since the last report: —
Frederick Bauer, three-story brick building on Bolton St., near Linden Ave.
Robert Hodges, three-story brick building, Mansard roof, on St. Paul St., between Biddle and Chase St., 21' x 75'.
John Costeller, four-story brick buildings on Bethel St., between Orleans and Mullikin Sts.
Clinton Paine, three-story brick building on St. Paul St., near Biddle St., 25' x 85', Mansard roof.
Dr. Wilmer Brinton, 6 three-story brick buildings, on Chase St., near Greenmount Ave.
CHURCH. — The buildings on the corner of South Exeter and Stiles Sts. are being torn down, to make room for the new Catholic Church of St. Leo. It will be 63' x 95', with foundation and basement of stone, and upper story of brick, and will be of the Byzantine order of architecture. Mr. E. F. Baldwin is the architect.

STORES. — Mr. Joseph H. Rieman is about to build four new buildings on Pearl St., near Lexington, to be used as stores and dwellings, to be four stories high, including Mansard roof, and covering an area of 69' front by 72' deep; Mr. Wm. F. Ferguson is the contractor.

Boston.

BUILDING PERMITS. — *Brick.* — Washington St., No. 1940, for Geo. W. Knight, 1 office, 8'6" x 15'; E. M. Jones, builder.
Dorchester Ave., No. 363, for Naylor & Co., building for manufacture of gas, 27' x 38', one story; Rufus W. Gifford, builder.
Columbia St., No. 16, for Edw. I. Brown, 1 mercantile building, 20' x 60'; four stories, flat roof; Webster & Dixon, builders.
Bowker St., No. 7, for J. Trull, 1 manufactory, 36' x 90', one story; Thomas J. Whidden, builder.
Commonwealth Ave., near Exeter St., for Annie B. Matthews, 1 dwell., 26' x 55', three stories.
Commonwealth Ave., near Gloucester St., for J. W. and S. M. Shapleigh, 3 dwells., 24' x 60', three stories and mansard; J. W. & S. M. Shapleigh, builders.
Commonwealth Ave., near Gloucester St., for Sumner K. Mead, 1 dwell., 27' x 68', two stories and mansard; A. H. Caton, builder.
Wood. — *Earl St., for J. & H. Sweeney, 1 stable and wagon-shed, 12' x 40'.*
Tremont St., No. 1278, rear, for Jos. Woodward, 1 stable, 16' x 26'.
Murdoch St., near Sparhawk St., for Mrs. Catherine L. Marion, 1 stable, 36' x 36'; Sam'l N. Davenport, builder.
Maverick St., for Boston Forge Co., 1 wagon-shed, 18'6" x 22'6".

Pleasant St., near Commercial St., for L. E. H. Jones, 1 dwell., 22' x 29'.
Greenwich Place, near Commercial St., for John Reiley, 1 dwell., 22' x 28', two stories; S. D. Ramsdell, builder.
Parlier St., No. 681 and 683, for John Baimard, 2 dwells., 23'6" x 26', three stories, flat roof; Robert D. Ward, builder.

Brooklyn.

BUILDING PERMITS. — *Sackett St., three four-story brick flats, 22' x 50'; cost, \$8,000 each; owner and builder, M. Sherman; architect, R. Dixon.*
Vernon Ave., Nos. 116, 118, 120 and 122, 4 two-story brown-stone dwells., 20' x 42'; cost, \$3,800 each; owner, etc., P. Sheridan, 775 Myrtle Ave.
Verona Place, cor. Macon St., 4 two-story brick dwellings; owner, Chas. N. Peed; architect, Paritit, Bros.; builder, Levi Fowler.
Paulist St., 1 three-story brick factory, 20' x 40'; cost, \$3,500; owner, Eliza A. Harlan, 453 Marcy Ave.; builder, J. H. Smith.
Sixteenth St., 7 two-story brick dwellings, 17' x 36'; cost, \$2,700 each; owner, Mary C. Wood, 28 Fifteenth St.; architect, T. McCormick; builders, W. Corrigan and W. Wood.
Lynch St., 3 three-story frame tenements, 20' x 40'; cost, \$4,000 each; owner, Nanno Brown, 123 Lynch St.; architect, M. Brown; mason, T. Shine.
Ninth St., five three-story brown-stone flats, 19' x 65'; cost, \$5,000 each; owner, Henry Lansdell; architect, C. B. Sheldon; builder, Charles Long.
Floyd St., 1 three-story frame tenement, 25' x 50'; owner, Mrs. N. Schneider, 162 Park Ave.; architect, J. J. Hoepfer.
Richard St., 1 three-story brick dwell., 25' x 50'; cost, \$6,000; owner, B. Zimmerman; builder, C. Detlefsen.
Gates Ave., 1 two-story brick store and dwell., 25' x 45'; cost, \$3,500; owner, R. Pullis, 380 Halsey St.; architect, Isaac D. Reynolds; builder, C. King.
Manhattan Ave., 1 one-story brick church, 53' x 100'; owners, Trustees Union Ave. Baptist Church; architect, L. B. Valk; builders, G. Roberts and John Fallon.
Van Brunt St., cor. Bowne St., 1 four-story brick factory, 50' x 70'; cost, \$8,000; owners, Richardson, Boynton, & Co.; architect, G. L. Morse.
Vanderbilt Ave., 2 three-story brown-stone dwells., 18' x 45'; owner, A. Purdy; builder, L. W. Seaman, Jr.
Rush St., 1 three-story brown-stone flats, 23' x 60'; owner, Eckford Webb; architect, W. H. Gaylor; builders, James Rodwell and S. M. Weekes.
Alterations. — *De Kalb Ave., cor. Tompkins Ave., two-story brick extension, 25' x 25'; cost, \$3,000; owner, John Deterling, on premises; architect, S. W. Osman; builder, S. C. Whitehead.*
Scholes St., cor. Leonard St., two-story frame extension, 85' x 25'; cost, \$4,000; owner, M. Baumgarten, on premises; architect, J. Platte; builder, Jno. Rueger.
Grand St., cor. Haron St., move buildings to front of lot and raised 12 feet; also three-story frame extension, 25' x 17'; cost, 2,000; owner, Stephen A. Donlon, on premises; builders, J. Gately and C. M. Moore.
Pacific St., one and two-story extension, 100' x 30'; cost, \$6,000; owner, Wm. Walters, on premises; architect, N. Whipple; builders, K. Whipple & Son.

Chicago.

BUILDING PERMITS. — *Western Toy Co., three-story brick engine-house, 25' x 66', Schiller St., near Wells; cost, \$4,000.*
J. Page, two-story brick dwell., 22' x 50', 88 Flour-nary St.; cost, \$2,500.
W. Marzenecke, two-story brick dwell., 20' x 56', Throop St., cor. Nineteenth; cost, \$2,500.
Chicago & Western Indiana Railroad Co., brick depot, 30' x 50', Archer Ave., cor. Stewart; cost, \$25,000.
Aug. Man, two-story brick dwell., 20' x 42', Twentieth St., near Ashland Ave.; cost, \$2,000.
J. Nerveen, three-story brick store and dwell., 24' x 76', Milwaukee Ave., cor. Mantene Ct.; cost, \$7,000.
Peter Hennes, two-story brick dwell., 22' x 51', Shober St., near North Ave.; cost, \$3,000.
Henry Dyck, one-story brick dwell., 20' x 50', Thirteenth St., near Wood; cost, \$3,000.
Potter Palmer, three-story brick store, 42' x 76', 74 and 76 Adams St.; cost, \$20,000.
Chicago Car Wheel Co., brick foundry, 116' x 63', Dearborn St., near Fifteenth; cost, \$10,000.
A. F. Cronkholm, three-story brick dwell., 21' x 48', 184 Sedgwick St.; cost, \$4,000.
C. Hearath, two-story brick dwell., 22' x 52', 566 West Fourteenth St.; cost, \$3,000.
L. Wolf Manuf. Co., four-story brick factory, 76' x 140', 108 Lake St.; cost, \$20,000.
C. Hasch, one-story brick dwell., 30' x 60', North Ave., cor. Leavitt St.; cost, \$4,200.

New York.

BUILDING PERMITS. — *Ninety-Second St., cor. Fourth Ave., 7 three-story brick (brown-stone front) dwells., 17' x 50'; cost, each, \$8,500; owner, J. Sullivan, 1365 Lexington Ave.*
Sixty-Fifth St., 1 four-story brick (brown-stone front) apartment-house, 16' x 65'6"; cost, \$6,000; owner and builder, Wm. H. Browning, 441 East Seventy-Seventh St.; architect, A. B. Ogden.
Sixty-Fifth St., 3 four-story brick (brown-stone front) apartment-houses, 28' x 57'; cost, each, \$10,000; owner, Wm. H. Browning; architect, A. B. Ogden.
Fifty-Seventh St., 4 four-story brick (brown-stone front) apartment-houses, 18' 9" x 64'; cost, each, \$20,000; owner and builder, John McCool, 166 East Seventy-Fourth St.; architect, John C. Burne.
Sixty-Sixth St., 1 four-story brick factory, 25' x 62', with one-story rear extension, 25' x 35'; cost, \$7,000; owner, Walter G. J. Wheeler, 21 to 27 Chambers St.; architect, John C. Burne; mason, James A. Frame.
Peek Slip, No. 12, 1 five-story brick store, 20' x 60'; cost, \$7,000; owner, John Simpson, Peekskill, N. Y.; architect, John B. Snook; masons, A. A. Andrus & Son; carpenter, David Hepburn.
South Fifth Ave., 1 five-story brick store, 61' 11" x

173; cost, \$30,000; owner, Amos R. Eno, 133 Fifth Ave.; architects, D. and J. Jardine.

Courtland Ave., 1 three-sty brick store and dwell., 25' x 46'; cost, \$5,000; owner, Frederick Campion, 526 Courtland Ave.; carpenter, Wm. Kusche; mason, — Ehemann.

Eighty-Fourth St., 5 three-sty and basement brick (brown-stone front) apartment-houses, each 19' 6" x 54'; cost, each, \$8,000; agents, Wm. H. and R. Johnson, 445 East Eighty-Fourth St.; architect, A. B. Ogden; builders, Cook & Higgins.

Third Ave., 3 four-sty brick stores and tenements, each, 25' 3" x 65'; cost, each, \$8,000; owner, R. H. L. Townsend, 171 Madison Ave.; architects, Thom & Wilson; builder, S. Stevens.

Eighty-Third St., 1 three-sty brick stable and dwell., 20' x 26'; cost, \$3,000; owner, John Shields, 143 East Eighty-Third St.; architect, John C. Burne; mason, John Bannan.

Seventy-Second St., 2 four-sty brick (brown-stone front) apartment-houses, each 30' x 65'; cost, each, \$12,000; owner, A. H. Jonas, 206 Broadway; architect, Charles Baxter.

Seventy-Second St., 2 four-sty brick (brown-stone front) apartment-houses, each 30' x 65'; cost, each, \$15,000; owner, A. H. Jonas, 206 Broadway; architect, Charles Baxter.

West Fifty-Seventh St., Nos. 41 and 43, 2 four-sty and basement brick dwells., No. 41, 32' 8" x 70'; No. 43, 34' x 65'; cost, each, \$75,000; owners and builders, O'Reilly Bros., 115 East Forty-Fourth St.; architect, Cornelius O'Reilly.

Seventy-Third St., six four-sty brick (brown-stone front) tenements, each 25' x 72'; cost, each, \$8,500; owners and builders, James H. Darrow and J. E. Babcock, 1000 Sixth Ave.; architect, John E. Babcock.

One Hundred and Sixty-Ninth St., 1 five-sty brick tenement, 35' x 70'; cost, \$10,000; owner, Jacob Stahl, Franklin Ave. and One Hundred and Sixty-Ninth St.; architect, Julius Kastner.

One Hundred and Fifteenth St., three-sty brick (brown-stone front) apartment-house, 20' x 55'; cost, \$10,000; owner, B. A. McChristie, No. 9 Pleasant Ave.; builder, Robert McChristie.

Alterations. — *West Fifty-Ninth St., No. 224*, engine-room, of brick, and a brick chimney, 75 feet in height, to be built on rear; cost, \$2,000; owner, I. Bernheimer; mason, Cornelius Callahan.

East Twenty-Fourth St., No. 223, one-sty brick extension, 19' 5" x 57'; cost, \$2,500; owner, Michael Gogerty; architect, John C. Burne; mason, Frank McIntee.

Laight St., No. 5, two-sty brick extension, 22' x 15'; cost, \$2,000; owner, H. R. Mount; mason, George Whitefield.

Sixth Ave., No. 514, front part of roof raised three feet, building to be extended seven feet on rear and one-sty brick extension, 21' 6" x 19', to be erected; cost, \$2,500; owner, Mr. Hewlett; architect and carpenter, J. Sproson; mason, W. Potterton.

Third Ave., cor. Thirty-Fourth St., five-sty brick extension, 24' 9" x 44'; cost, \$10,000; owner, Dederick H. Bultmann; architect, James E. Ware.

East Sixty-Fifth St., No. 121, one-sty brick extension, 8' 6" x 16', and internal alterations; cost, \$2,000; owner, Mr. Chamberlin; carpenter, James Brown; masons, J. & G. Ruddell.

Hudson St., No. 239, full story to be made of attic, three-sty brick extension, 25' x 35', and internal alterations; cost, \$11,000; owner, S. F. Jayne; architect, William H. Smith; mason, Owens & Canfield.

Eldridge St., No. 111, a fourth story to be added; cost, 2,000; owner, Hydr P. Oatman; architect, James E. Ware.

Second Ave., No. 2229 one-sty brick extension, 25' x 104'; cost, \$2,000; owner, A. Radline; architect, A. Spence.

BRICK MARKET.—The brick market is very depressed, and cargoes are moved with difficulty. It is probable that a future depreciation in price will take place. Building interests are about as reported last week, a few insignificant contracts and a few alterations comprise the week's list.

MINING EXCHANGE.—It is expected that a large exchange will shortly be built at a cost of \$800,000, in the vicinity of the Drexel Building. It is reported that the land has already been purchased and architects' plans accepted.

St. Louis.

BUILDING PERMITS.—Forty-eight permits have been issued since our last report, of which nine are for frame structures of slight importance. Of the rest, those worth \$2,500 or over are as follows:—

OWNERS NAME.	USE.	STORY'S	TIME	COST.
Union M. E. Church,	Church	2	5	50,000
J. A. Becker,	Dwell.	2	6	3,700
F. Berring,	Dwell.	1	8	4,500
L. Garrey,	Dwell.	2	8	4,000
Owners of Planters' House,	Hotel	6	6	5,500
H. L. Newman,	Dwell.	3	14	20,000
Wm. Schmitz,	Dwell.	2	6	2,500
L. Frentil,	Dwell.	1	12	2,600
B. A. Vicker,	Dwell.	2	6	2,800

General Notes.

ATHOL, MASS.—The Unitarian Society of this place is about building a brick church with Sutherland Falls marble or granite finish; size 56' x 100'; cost, about \$25,000; L. B. Valk, of New York City, architect.

BELAIR, MD.—Mr. Geo. Archer, architect, of Baltimore, is preparing drawings for the First Presbyterian Church to be built here, of stone with granite finish. Seating capacity 2,500; cost, \$6,000.

BELLE PLAINE, IO.—Work on the new school-house has begun,—building of brick and stone; cost \$13,000; Wm. Foster of Des Moines is the architect.

CLINTON, MASS.—Mr. John R. Foster is building a frame dwelling house and stable, corner Chestnut and Church Sts.; Henry M. Francis, Fitchburg, architect.

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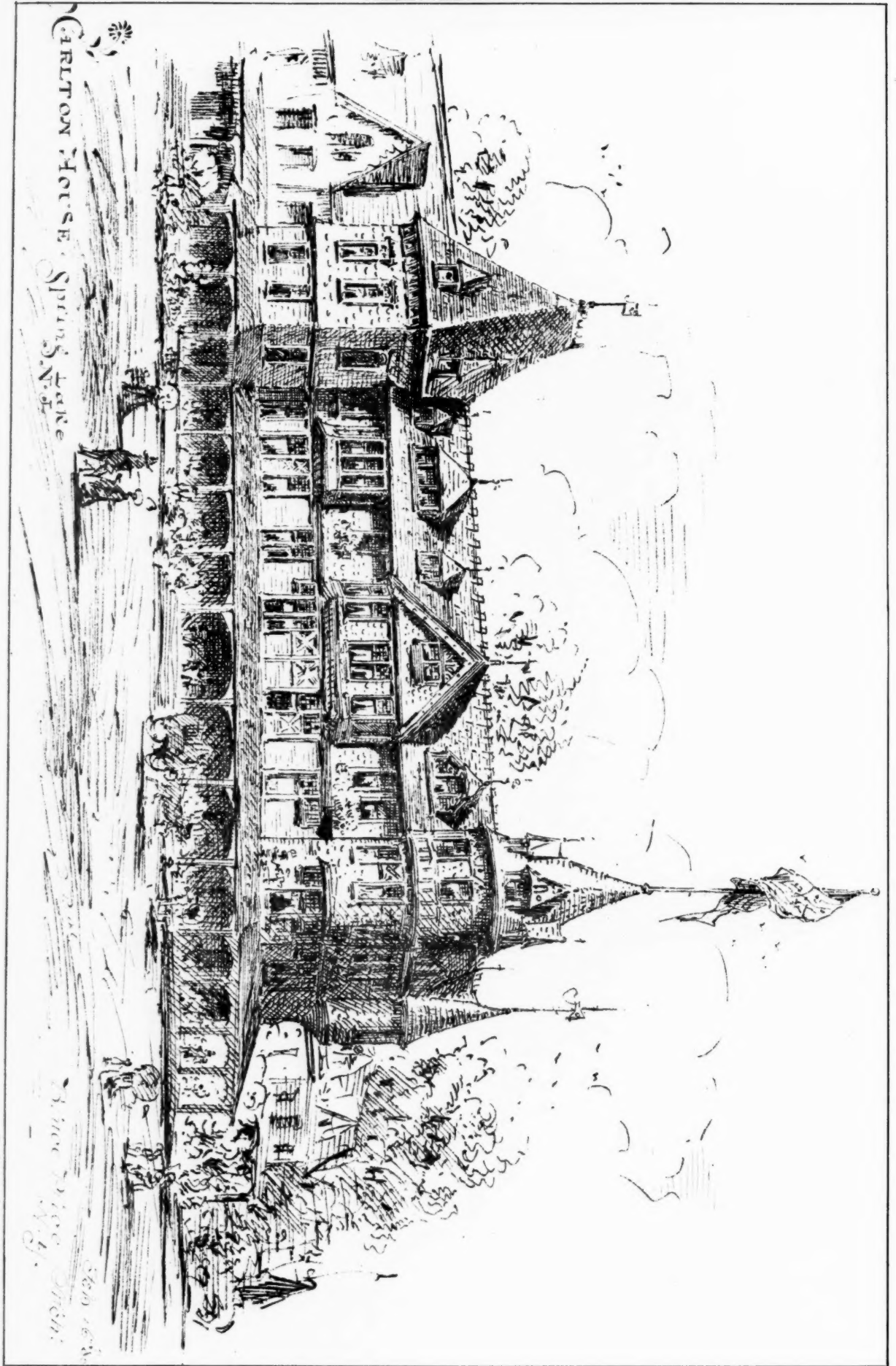
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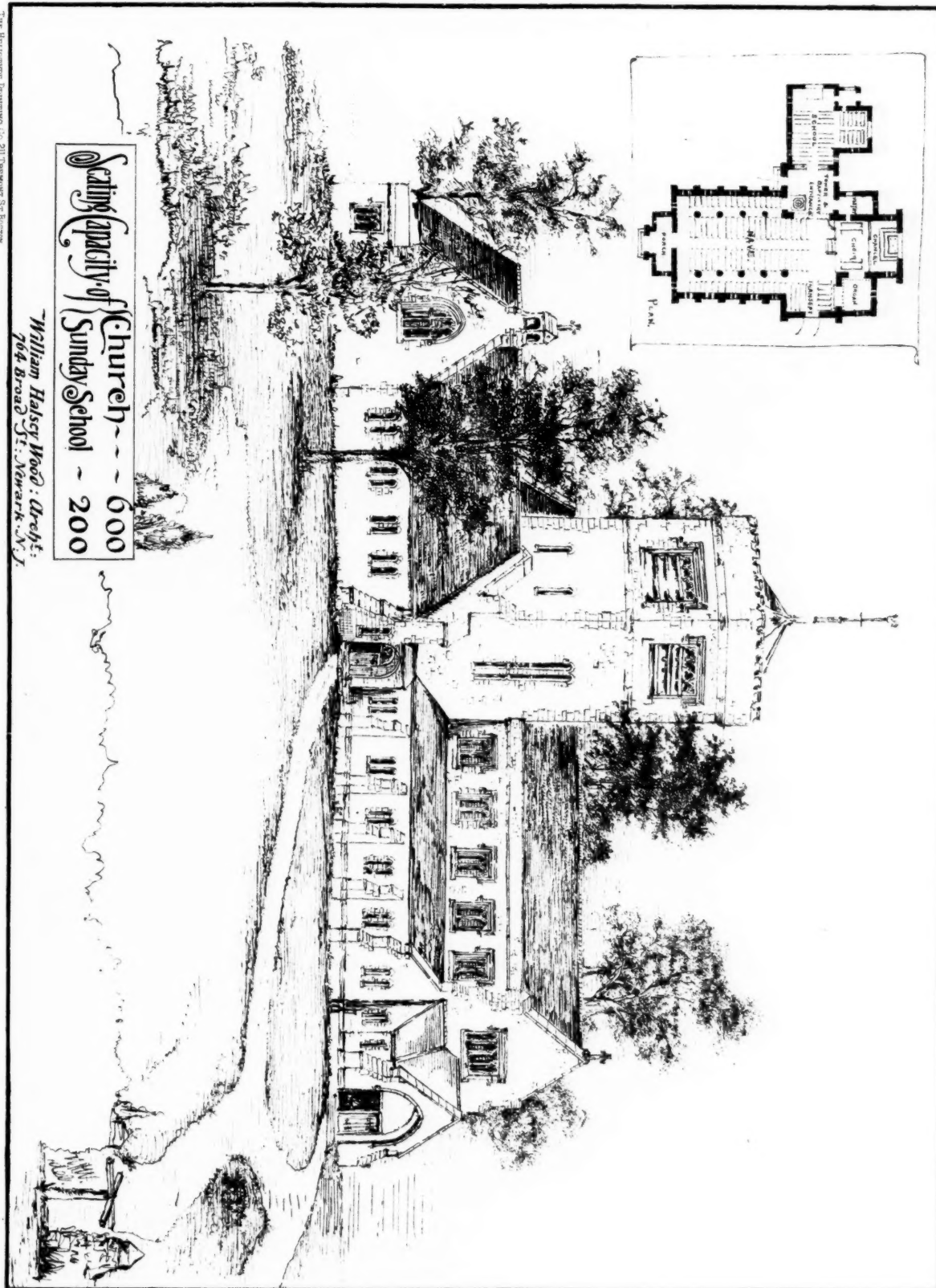
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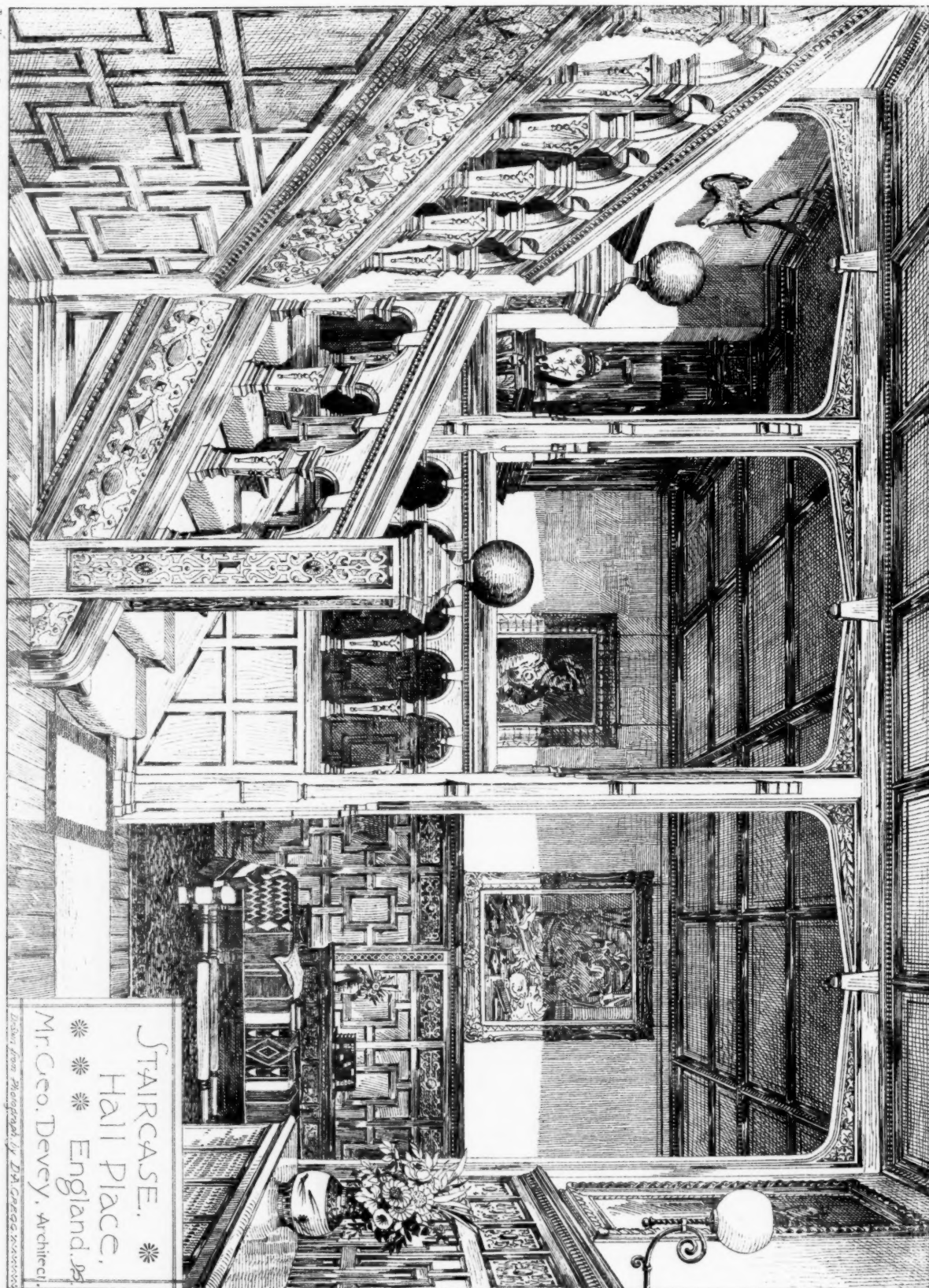


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Sunday School --- 200

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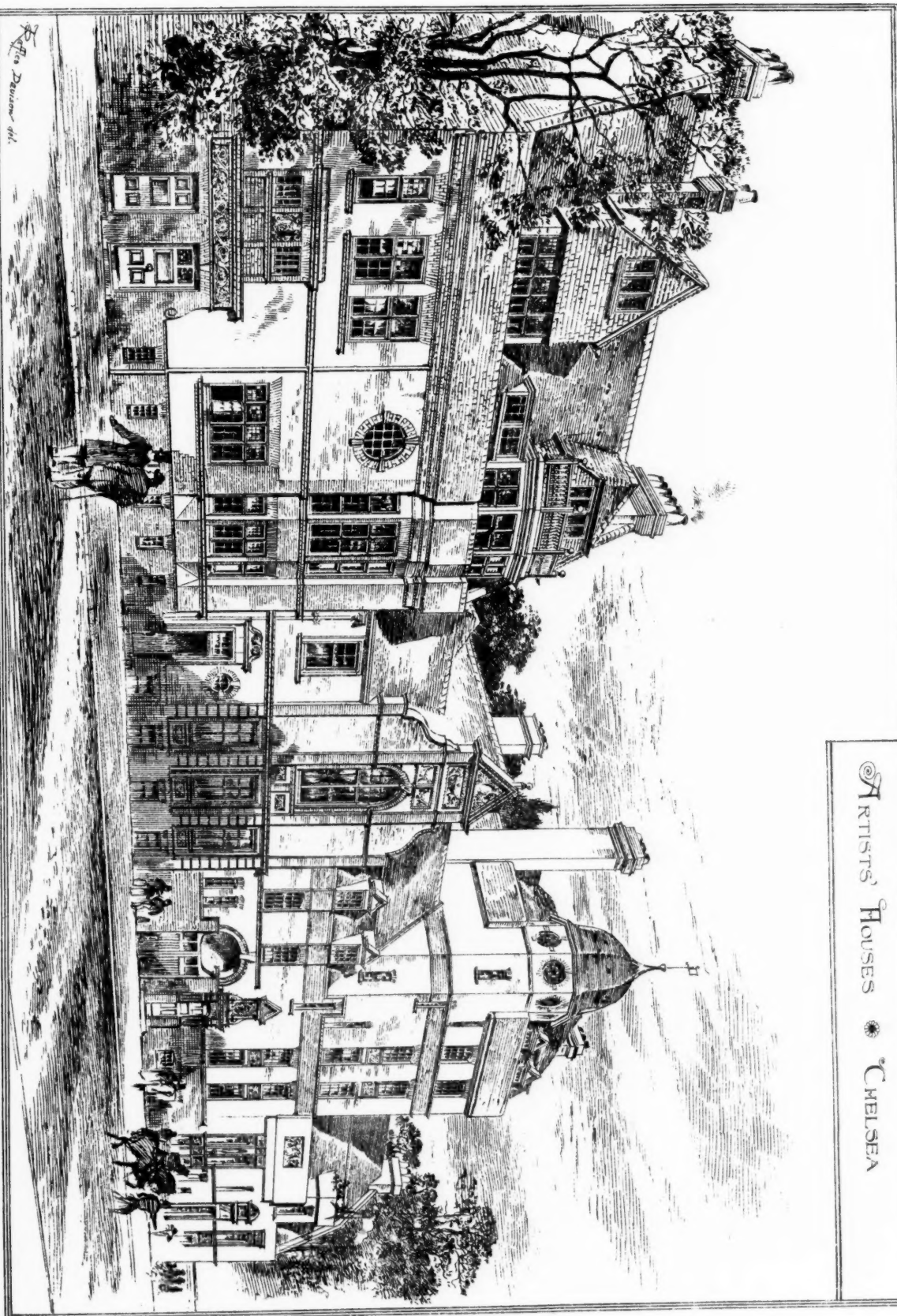
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