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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

A CIRCULAR has been sent to us, with a request that we should give it "such notice as we might deem it worthy of," containing an invitation to architects to supply plans for primary school buildings for the city of Brooklyn, New York. Three varieties of school buildings are required, one to cost fifteen thousand dollars, the second twenty thousand and the third twenty-five thousand. Separate and complete working plans and specifications are to be made for each building, showing drainage, provision for heating, and so on; and the express stipulation is made that no plans will be returned. The recompense offered to the profession for the contribution of an indefinite number of working-drawings is, for the twenty-five thousand-dollar building, one hundred and fifty dollars, — that is, six-tenths of one per cent on the cost; a little more than one-sixth the price which would have to be paid to an architect of any character for *one* set of drawings. The "prizes" for the smaller buildings are somewhat more munificent, amounting to two hundred dollars, or one per cent, for the twenty-thousand-dollar school-house, and two hundred and fifty for that to cost fifteen thousand dollars. The committee which is to award the laurels of the contest consists of the President of the Board of Education, the Chairman of the School-house Committee, the Superintendent of Public Instruction, the Superintendent of Buildings of the Board of Education, and the City Building Commissioner. We see nothing about the submission of the plans to the judgment of an architect, that is, a man whose business it is to understand plans, to see through draughtsmen's tricks and errors, to estimate with precision the effect of ventilation and heating flues, and to set a proper value on artistic effect; and we therefore infer that this is not intended.

A GOOD deal of indignation has been excited in New York over the conduct of a certain hotel proprietor, who certainly does not appear to be gifted with that spirit of self-sacrificing benevolence which is so desirable in men of his profession. It seems that this summer he had opened a hotel at Seabright, on the New Jersey coast, which was soon filled with boarders and promised to bring him in a good profit, when suddenly two of his guests were seized with typhoid fever, and as usually happens in such cases, most of the others packed their trunks at once and gave notice of their intention to leave the place. It was in evidence before the Board of Health, which afterwards investigated the matter, that the lavatories of the hotel had been in a foul and offensive condition during a considerable part of the season, and the tank in the roof, to which water was intended to be pumped for flushing the closets, is said to have remained empty for six weeks at a time. Nevertheless, the proprietor chose to consider that the two unfortunate patients, rather than his own neglect, were responsible for the untimely end of his prosperous season, and having perhaps no other way of showing his resentment, he announced that his establishment was to be immediately closed, and that the invalids must find accommodation elsewhere. The attending physician in vain represented that removal would probably be fatal to one or both of them; the landlord was obdurate, and might have proceeded to carry out his threat had not the happy thought occurred to him that if their friends would pay him "the expenses" of keeping the house open until they could be moved he might be induced to relent. On further inquiry it appeared that the sum needed for this purpose would be five thousand dollars, to be paid in advance in cash, and rather than see the helpless invalids turned out, perhaps to die at the door, the brother-in-law of one and the husband of the other drew their checks for twenty-five hundred dollars each, which the landlord, after requiring that they should be certified, to make sure "that no game was being played on him," was graciously pleased to accept as consideration for his clemency.

THE New York *Times* states that the extensive operations of excavation which have been in progress for some months in the lower part of that city, where the steam and electric mains of the Edison and the New York Steam Companies are being rapidly laid, have been accompanied by a remarkable increase of malarial diseases in the neighborhood, and in view of this circumstance it suggests a theory of the causation of malaria which is, to us at least, quite new. "It has," as it says, "long been suspected by the most acute observers that there is an intimate relation between the development of malarial diseases and the setting free of the carbonic acid in the soil; in other words, that intermittent fever and kindred complaints are only another name for slow carbonic-oxide poisoning." We confess that the chemistry of this hypothesis is not quite clear to us, and it is not made any more intelligible by a sentence below, which says that "It is a curious fact, also, to be noted in this connection, that carbolic acid in small doses, long continued, produces a type of periodical fever that can scarcely be distinguished from legitimate malarial disease;" but we do not wish to be too critical, and we are glad to warn our readers that if they perceive any carbonic acid, or carbolic acid, or carbonic oxide coming out of holes in the ground, they will do well to recollect that one of these — we are not quite sure which — "is a narcotic poison of the most silent and insidious kind," and that by taking promptly to their heels they may save themselves from an attack either of "periodical fever" or of "legitimate malarial disease."

BY the omission, as is supposed, of some of the bolts which hold together the lining-plates of the Hudson River Tunnel, a "blow-out" occurred on Sunday evening, allowing the water to penetrate and fill the excavation on the New York side as far as the air-lock. No one was injured, the entrance of the water being so slow that all the men at work in the tunnel had time to escape, and operations will probably be resumed in a few days. Considering the difficulty of sustaining a bank of porous gravel, such as forms the New York shore of the river, by means of atmospheric pressure, the excavation of that end of the tunnel has been conducted with remarkable success. Before many days the gravel deposit will be passed and firm silt reached, in which boring is much more regular and safe, and it is to be hoped that the most serious dangers of the work will then be over. On the New Jersey side the tunnel now extends more than thirteen hundred feet from the shore, a greater distance by one hundred and twenty feet than the entire length of the Thames tunnel between the shafts.

IN mentioning the other day the fact that some of the illnesses which occurred last year at Nahant were traced by Mr. Bowditch, the expert who examined the water-supply, to ice cut from a body of impure water called Flax Pond, we took occasion to comment on the carelessness with which the choice of ice supply is often made. Since then we have noticed a statement that the fish in the same Flax Pond had died this season in large numbers, and that an investigation had traced the mortality to the large proportion of *arsenic* contained in the water, and derived from the waste of a manufactory of some kind on the shore. Whether this fearful poison formed an ingredient in the Nahant ice last year we have not learned, nor whether it is proposed to cut the next season's supply from the same source under these circumstances; but it will do no harm to repeat our suggestion, that some kind of inspection of the ice industry has become very desirable.

The "war-cloud" of the incandescent lamps is gradually becoming more threatening, and we may expect any day to hear the thunders which precede the mortal shock. The Brush Electric-Light Company has adopted an excellent scheme, by which houses and stores along the line of the streets where its arc-light is used at night are to be supplied with storage batteries and a full outfit of Swan incandescent lamps. Each storage battery weighs about a ton, and will furnish ample power for maintaining the usual number of lights in a dwelling-house for twelve hours at least. By means of a switch the current from the dynamo-electric machine can be turned either through the arc-lights or the storage batteries, and instead of stopping the engines at a given hour, they will run night and day, the power when not needed for the arc-lights being turned into the batteries, keeping them always well supplied with electricity, to be drawn upon as needed for the incandescent lamps in the houses. In preparation for the introduction of this system on an extensive scale the company is manufacturing the Swan lamps at the rate of five hundred per day, and has just begun the regular fabrication of batteries. Meanwhile, the Edison Company announces its intention, as soon as the sale of the Swan lamp begins, to commence action for infringement of the Edison patent, while the French Light-and-Force Company, the proprietor of the Faure patents, also gives notice of its purpose of entering a similar suit as soon as the first Brush storage battery is put upon the market. The impending struggle is likely to affect the public in an unexpected and disagreeable way unless precautions are taken beforehand, since the purchasers and users, as well as the sellers, of infringements of patented articles are liable for damages; and we would repeat the suggestion already made by Mr. Atkinson to the mill-owners, that whoever buys or consents to use storage batteries or incandescent lamps of any kind should secure himself by a satisfactory bond under seal from the company or individual from whom he obtains them, guaranteeing to hold him harmless from all royalties, costs and damages of every kind which may at any time fall upon him in respect of them.

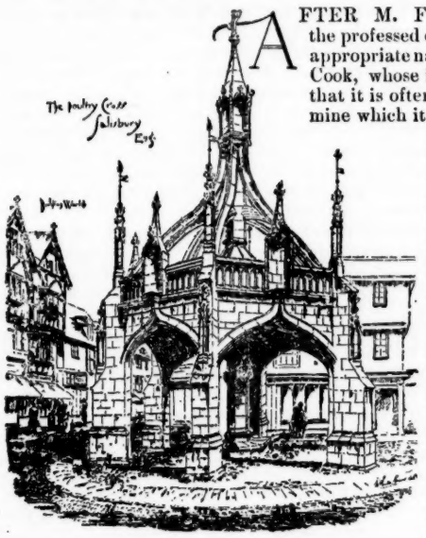
M. Ravon, the Secretary of the Committee of Jurisprudence, to whom are assigned the various questions upon legal matters asked by the correspondents of *La Semaine des Contructeurs*, makes some important suggestions in a recent reply to a letter written by a certain contractor. This contractor complains that he had made an agreement to do the work of restoring a certain church. During the progress of the operations, the architect, at the request of the building committee, and without the knowledge of the contractor, drew up an amended specification, striking out certain portions of the work described in the first one, and substituting other work, which had not been foreseen in the first specification, but was found necessary as the building went on. Other modifications were made in the course of the work, including the reconstruction of a large portion of the vaulting, upon the verbal order of the architect, who, however, furnished detail drawings for each portion. From time to time statements of the work done were furnished by the contractor, but without paying any attention to these the building committee demanded of the architect, who seems to have stood in mortal fear of them, that he should prepare an account, which he did, leaving out all the extra work done on his verbal order, and, according to the contractor's story, taking the quantities, not from the actual building, but from his own imagination, in such a way as to make them accord with his own preliminary estimate. In consequence of this, the contractor claims that a balance of twenty-eight thousand francs is still due him, of which he cannot obtain payment, and he asks, (1) whether the architect ought not to have communicated to him the specification which he substituted for that included in the contract; (2) whether the drawings delivered by the architect for the extra work were equivalent to a written order, and (3) whether he is not entitled to compel the architect to make a correct account in place of the fictitious one which he had presented to the committee.

In reply M. Ravon says, (1) that the architect, as agent of the building committee, is responsible solely to them, and that the contractor cannot concern himself about the mistakes of which he may have been guilty; (2) that the drawings given for the extra vaulting constituted a graphic order, which was equivalent to a written order, and even more binding because more precise, and (3) that the contractor has no power to compel the architect to correct his accounts. In the words of *La Semaine*, there is no legal connection (*lien de droit*) between the contractor and the architect, and the former cannot compel the latter to do anything whatever. In regard to the second question, we think that M. Ravon's answer should be taken with allowance, for this country at least, If a contract provides, as most good ones do, that no order for alterations which either increase or diminish the value of the work shall be valid unless given in writing, we doubt very much whether a drawing would be taken as legally equivalent to a written order. In fact it should not be; the intention of the clause requiring written orders for extra work is to permit the architect or owner to make trifling modifications of detail as a building goes on, without expense to any one, and without being annoyed by a shower of petty claims at the completion of the structure, after everybody has forgotten the circumstances of the modifications; as well as to protect the contractor, who is not obliged to incur any cost without a written order, and is furnished by it with the means of collecting payment with certainty for all the extra work which he does. Such an order as this is a virtual agreement that the work described in it shall be regarded as extra, and is a very different thing from a drawing, which would often be necessary to show an alternative arrangement of no greater cost than the one which it superseded.

The Fifth Annual Congress of German Architects and Engineers was to be held in the city of Hannover on Monday last. Professional societies are very popular just now in Germany, and the Congress was expected to call together a much larger number of persons than would be likely to attend any similar convention in this country, but the provisions for instruction and entertainment set forth in the programme are very similar to those customary here. The audience-room of the old Town-hall was lent by the city for the meeting of the architectural sections, while the various engineering sections were to occupy smaller rooms in the same building, and a General Inquiry Office for the convenience of strangers from a distance was to be kept open in the same place. On Sunday a public reception was given to the societies by the municipality of Hannover, and on Monday the business of the Congress began, with the consideration of various important professional topics. In the afternoon the members dispersed to inspect some of the more interesting buildings of the city, to meet again at six o'clock at a dinner in the Tivoli Gardens, finishing with a reception in the rooms of the Artists' Club. The next day, after the mornings' business, a special train was chartered to convey those who wished to the city of Brunswick, where the local Architects' Club had arranged to receive them, and after conducting them about the place to entertain them at dinner. The next two days were to be spent in much the same way, the excursions of the afternoon being to the suburb of Herrenhausen on Wednesday, and to Bremen on Thursday. Here another reception by the Bremen Artists' Club, and a banquet in the Town-hall, were to conclude the amusements of the Congress.

A trial has been made in Pittsburgh of an electric motor for common street-cars, which is said to have been quite successful. As in the Siemens and Halske railway, the current is conveyed to the car by means of a wire, suspended from brackets attached to posts set beside the track, on which runs a pulley connected by wires with the car. The electro-motor appears to be of the ordinary kind, and is said to be capable of driving the car at the rate of ten miles an hour. The main objection to this, as to all street railways operated by electricity, would naturally be the obstruction caused by the line of posts which carry the main conducting wire; and in most cases such an objection would prevent even the consideration of the plan. Another practical difficulty would undoubtedly be the liability to stoppage of the current by accumulations of mud or dust on the tracks. A very slight separation of the driving wheel from the rail by the interposition of a non-conducting substance would instantly stop the movement of the car, and unskilful attempts at restoring the current would be attended by great risk. Nevertheless, we hope that the experiment will be continued, not so much for the sake of its probable use on street-car lines as for the service of the elevated railways, which furnish the best possible field for the development of a system of locomotion requiring clean rails, a safe isolation of conductors and motors from the effect of curiosity or accident, and a regular supply of power.

MR. COOK ON AMERICAN ARCHITECTURE.



AFTER M. Francisque Sarcey, the professed critic with the most appropriate name is Mr. Clarence Cook, whose impetuosity is such that it is often difficult to determine which it is that is the most thoroughly done, the critic or the criticised. The career of the professional critic is an attractive one, for the influence a trained mind can exert through the medium of the public prints is immense, and correspondingly flattering to one's vanity. The place he fills in the social economy is both useful and honorable, and as it is rare indeed in this country that even the most unbridled causticity of language ever involves its author in other than a wordy warfare, and the private life of an American critic therefore lacks one of the elements of excitement and interest that in some countries attends that of his European confrère, we do not wonder there are so many willing to attempt the rôle.

If Mr. Cook's writing is sometimes less polished than that of the eminent Frenchman, to whom we have for the moment compared him, it is never less uncompromisingly direct and emphatic. There is never any possibility of misunderstanding what is the attitude of his mind — at the moment of writing. It is this attribute quite as much as his general reputation as a critic that will make the architectural world turn with interest to his paper on American Architecture in the last *North American Review*, only we fear to be disappointed, for they will find instead of the quiet and well-ordered analysis that one would look for in a paper written for that magazine, a rather vituperative article, which would have been better placed in a daily paper. The impression it leaves is that a brilliant general writer has, at request, attempted a subject without having taken the trouble even to book himself up on it, trusting to his own special skill as a writer, and the superficial knowledge that every one has of architecture to satisfy his editor's demands and command the applause of the unthoughtful of his readers; for it is only necessary for some one, supposed to speak with the voice of authority, to cry "harry" in order to raise up quite a respectable hue-and-cry against any of the professions. Doctors, lawyers, clergymen, like members of some of the humbler crafts, are in turn, as a class, the subject of public clamor: men whose individual capacities and conduct are as varied as those of the same number of business men,— the majority of men in the same social rank, — who alone seem to be exempt from public criticism and censure. Just at present it is the fashion to cry out upon the architects, and why? Largely because they are doing the very thing they are so often exhorted to do: trying to disembarrass themselves from the restrictions of precedent, seeking to be original,— too often, alas! succeeding,— striving to evolve that typical American style, which we think is already a more developed entity than most people imagine.

The profession can afford to shrug its shoulders at such apothegmatical utterances as: "Where architects abound the art of building always deteriorates!" or such sweeping statements as: "It is to architects that we owe all the ugly building that offends us in our large cities and in our country towns and fashionable summer quarters!" qualified as this last condemnation is by the subsequent admission that "it is to architects that we owe, now-a-days, the few, the very few buildings on which our eyes can look with any pleasure." We could wish that some of these buildings which the public may be allowed to respectfully admire had been mentioned; but to such a service as this the critic who approaches his subject in the mood of the writer rarely stoops: for the time being he is an iconoclast only, not a reformer.

It would be a possible thing to weaken the effect of the assertion that "if architects had been needed to build the better sort of structures [the colonial mansions] the lesser sort [the cottages] would never have been so good as they are," or the historical discovery that "architects may have designed the bad ones [the houses of Venice], but never the good ones," by simply proving that they were designed by architects.

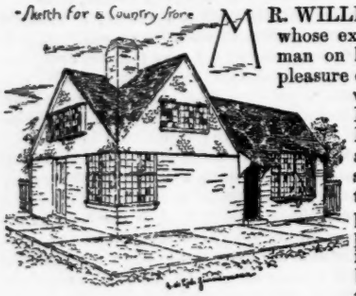
Professor Huxley's brick-layer has found a new champion, who, however, bases his conclusions not on facts or inductive reasoning, but *believes* that all the fine old houses of Gloucester, Portsmouth, Hingham, Newport, and the old New Jersey towns were "the work of simple 'builders' who knew their trade and never cared to give themselves a finer name." The name—it really seems as if the name were the chief matter of offence—is an inferior consideration, but it is absurd to imagine that these buildings were devised by men of the simple training of the Englishman's pet brick-layer. If trained in design, what matters it whether they styled themselves builders, master-builders, or architects? They thought about their work, they studied it, they refined it. What more do architects do—or try to do? and in what were the authors of these buildings not architects, even if they lacked the offending title? That we do not know who were the architects of those old-time buildings of all countries and ages which, according to the predilection of the exhorter, are held up as examples before the back-sliding architect of to-day, does not prove that their authors were not themselves architects. Human nature then was probably very similar to what it now is, and it is not unlikely that the owner in those golden days told his architect "just what to do," and "really designed the house himself, you know"; that the public prints, or public rumor, placed on record the names of the masonic dignitaries who laid the corner-stone, of the orator of the occasion, and of the building committee before all; gave minute account of the character of the building as appreciated by the reporter of those days, but forgot in quite a modern fashion that there had been one controlling mind in charge of all, and made no mention of the architect. So short-lived, indeed, is the fame of an architect's performances even in these days of recordings and public prints that our critic is unable to discover—or has not taken the trouble to—the name of the author of one of the stock laughing-stocks of the superficial critics of American architecture,—the Stewart down-town store,—but contents himself with styling him a "man."

Unfortunately, we cannot take exceptions to the matter of Mr. Cook's criticisms as much as to the manner, and the manner could better have been overlooked had the matter more depth. The fact that they might be the quoted remarks of any chance passer does not detract from their truthfulness, though it may somewhat dim their freshness and originality. The Vanderbilt houses are not what they might — should have been; the Boston Museum of Fine Arts does look like the work of a man whose inspirations were largely derived from books and photographs, and "finikin fine" may not be an inappropriate phrase to apply to it; a competent critic could have picked out worse things about the Harvard Alumni Hall than the sculptured roundels of the Sanders Theatre; the present architects of the Albany Capitol can never make that building a consistent piece of architecture; the fine tower of the Brattle Church is open to the objection that its striking sculptured frieze is the work of Bartholdi, "a man whose works seem by some fatality to have been unloaded upon this bedeviled land"; and there can be no doubt that the Brimmer houses are an offence to Beacon Street, "enjoying her dowager respectable slumber"; but the fact is overlooked that these same houses are the last word—and fortunately — of the Neo-Grec style, the one style, or sub-style, which modern architects may fairly claim to have created, as a consequence perhaps of all the abuse that has been showered upon them for adopting or adapting the good points in whole or in parts of the styles in which their fore-goers worked. We regret as much as any one that our clever young architects "invite us to a feast of scraps," and do not succeed in managing their picturesque effects with more sobriety; but we believe they are in the right track: the contracting grasp of precedent is loosened, and with freshly awakened perceptions they are all conscientiously seeking to do in those works which they acknowledge to be their best work, and not mere pot-boilers designed to satisfy the owner's pet hobbies, just what all the critics would have them do, — plan the building for its real uses and build it as it is planned, honestly, simply, and appropriately.

It is the fashion now to admire the old colonial work and apparently it is this particular style of building that our critic would have architects copy. Copy! and yet why so denunciatory of copyists of other styles? We suppose the outward appearance of these charming old buildings is what we are to follow, for another lay-critic would hardly dare to invade the preserves which Mr. Atkinson shoots over with such success — the criticism of modern construction; and as for the planning of a building, we not only hold that few critics or building-committees are able to appreciate that portion of an architect's work, but we believe that the layman's idea of an architect's work is so entirely that it begins and ends with the "drawing of pictures" of the outside, that the plan never occurs to him when he makes a criticism. If our inference is true we are to reproduce the external attributes of the cottages and small houses of the last century which "are the true type of a domestic architecture fitted to our climate and to our general mode of living." This they distinctly are not. They are plain, straight-forward, charming now, with a quaintness lent them by age and fortuitous surroundings and they possess many admirable features, but a long residence in one of them proves that they are not suited to our climate, unless the inmates lead the same active hardy lives that the original builders led, and that their arrangement is wholly foreign to the general mode of modern living and can never be other than inconvenient. But to study these old buildings as buildings of accepted styles in older countries are studied, until an insight is obtained of the faithfulness and uprightness with which they were wrought, to appreciate their good points and then to adapt them to modern requirements is an exceedingly proper and praiseworthy thing to do, and it is just this that the younger school of architects, especially, is doing, and, novelty waning, the later work of these men will show that the good points have been assimilated to modern usages and that an American style of architecture will then begin to be discern-

ible to critics, as it now is to architects. To say these things in a journal which is read chiefly by architects may not avail much, but we trust that in this case the editor of the *North American Review* has followed his usual policy and has already requested some member of the profession to reply to Mr. Cook's impeachment; if this has been done we trust that a writer will be found who will understand that it is possible to write for the people in other than what is usually understood as a "popular style."

A COMPENDIUM OF SANITARY APPLIANCES.[1]



MR. WILLIAM PAUL GERHARD, whose excellent little work in German on house-drainage we had the pleasure of noticing some time ago, was employed by the Rhode Island State Board of Health last year to prepare a general paper upon the sanitary appliances suitable to dwelling-houses. This paper, prepared with great pains and very plentifully illustrated with cuts, has been recently reprinted in the form of a pamphlet of about a hundred pages, and furnishes the best and most modern treatise on the subject with which we are acquainted.

The writer omits any consideration of the various methods of sewage disposal, which would much increase the size of his book, and confines himself strictly to the interior arrangements by which liquid and semi-liquid wastes are removed as quickly from the dwelling as possible, the return of foul gases from sewers or cesspools through the outlet channels prevented, and the house-drainage system opened to thorough purification by that greatest of oxidizing and cleansing agents, atmospheric air. Beginning with some advice about the laying and jointing of pipe-drains, a natural transition leads to the consideration of other waste and soil pipes, thence to the principles of trapping, and finally to the various forms of fixtures in common use. In all these departments the treatment is characterized by a directness and clearness of statement which indicates practical as well as theoretical knowledge, and the counsel given is infinitely more valuable on that account.

For ourselves we should be glad to see this independence of assertion carried still farther, and the results of the writer's experience stated without any deference whatever to the opinions or feelings of patentees or others, but this is not always possible without doing injustice, and Mr. Gerhard is too modest, as well as too considerate, to run the risk of doing injury by unguarded statements. On the selection of earthenware drain-pipes, for instance, he does not venture to offer any suggestions except some general ones as to the need of strength, good and smooth glazing and perfect form, which have little value to the ordinary householder unless he has also some rules given him by which he can estimate these qualities in the pipes which his contractor brings him, without having to rely wholly on the latter's asseverations. Mr. Gerhard, for instance, says that vitrified pipe is better than cement pipe, which is undoubtedly true, taken as referring to the best vitrified pipe; but immense quantities of earthenware pipes are sold which are inferior to those of well-made cement composition. Every architect meets occasionally with straight, well-formed pipes, generally of unusual thickness and apparent strength, and shining with a smooth glaze, which decay rapidly in the ground, and are very brittle, showing a soft, clayey fracture. Such pipes as these are unfit for use, and to our eye a few curvatures in a load of pipes, showing the thoroughness of their vitrification, give more satisfaction than a suspicious perfection of form, especially as the evil effects of a slight bend can be quite eliminated by laying the pipe so as to bring the curvature in a horizontal plane, or rather in one parallel with the general inclination of the drain. Again the excellent Akron pipes answer the requirement of smooth glazing less perfectly than many inferior kinds, and there are qualities, such as depth and form of hub, which need consideration as well as the perfection of manufacture. A little too much complaisance, we think, has in the same way led the author to give a reluctant countenance to the practice of clay jointing for drains, which was once, for what reason we cannot conceive, advocated by certain English writers on the subject. One look at a line of clay joints after a year's use would, we think, lead Mr. Gerhard to substitute a total condemnation for his mild deprecation. To speak briefly, such joints, though cheap, are worthless, and therefore dangerous. The alternate shrinking and swelling of the clay from the water, which it absorbs like a sponge, speedily disintegrates it; the joint falls away in scales toward the outside, and the small amount of resistance which it presented at first to the passage of liquid soon disappears. The elasticity of the joint, which is the theoretical virtue of the clay luting, is under ordinary circumstances of no use whatever. With good hard pipes, properly bedded and jointed with fresh Portland cement, there should be no settlement, nor should the superincumbent weight be worth a moment's thought. In bad soils, where movement is inevitable, the Stanford pipes with flexible joints, which, as Mr. Gerhard informs us, have been used in Norfolk, Va., answer the best purpose. The practical direction for wiping out the cement joints with a rag tied to a stick, which is given in speaking of the proper mode of laying, needs, we think, to be taken with caution. A very quick workman might be able to get all the joints wiped out in this way before the cement had set too hard to yield to the soft cloth, but with good Portland or Rosendale cement, in hot weather, the portions which protrude into the pipe harden in a few minutes to so firm a consistency that forcible scraping is necessary to detach them, and a semicircular wooden disc, well secured to a stout handle, forms a much more reliable tool than the rattan and rag.

Concerning the proper size for house-drains, Mr. Gerhard pronounces in favor of four-inch pipe, as being "ample for an ordinary city dwelling, including all the rain-fall." "For a larger lot and residence a six-inch drain is all that is needed." We should be inclined to put this quite differently. City houses, built in compact blocks, are apt to be among the most trying of all buildings to drain properly. While in country houses the water from the roof is almost always either collected in cisterns or allowed to escape upon the surface of the ground, without entering the drains at all, leaving to these only the waste from the house-fixtures, which is very insignificant in amount in comparison with the rain-fall; a city house-drain must carry away, in addition to the sink, bath, basin and closet wastes, all the storm-water from roof, yard and areas. The total of this from a lot of twenty-five by a hundred and fifty feet, for instance, will at times charge a four-inch pipe so nearly to its full capacity that a comparatively slight obstruction may cause the backing up of the liquid through the basement fixtures. Moreover, if no other exists, an obstruction quite sufficient to bring about this result in a small pipe is often found in the air-trap which is formed in storms between the main house-trap, just outside the cellar-wall, and the lower end of the pipe, if this is entered at so low a level into the sewer as to be sealed by the flow. It was once very common, and is sometimes necessary, to make the junctions of house-drains with sewers below the usual water-level, and where an additional house-trap is employed the intermediate space encloses a cushion of air, whose elastic movement, when irregularly compressed by a storm-flow, will sometimes raise the water in the house-pipes to a height of a foot or two, overflowing cellar-drains and hoppers. For this reason, among others, we should hesitate to recommend a main-drain of less than five inches calibre for ordinary city houses, and even for country mansions we confess our preference for the same size.

Attention is called in describing the various kinds of iron pipes to the dangerous carelessness with which the heaviest soil-pipe is cast, and we hope that the manufacturers of such goods will not resent our seconding Mr. Gerhard by a direct appeal to them to improve its quality. Nominally, the extra-thick four-inch soil-pipe, weighing thirteen pounds to the foot, should have a shell of a uniform thickness of about $\frac{5}{16}$ of an inch. Practically, the shell often varies in thickness from nearly half an inch on one side to one-eighth or less on the other. The reason of this is said to be that the extra-thick pipe, being of a limited sale, is made with less care, but whatever the cause may be the result is most discreditable to the manufacturers.

Next to these general remarks upon drain and waste pipes, which could hardly be improved, comes a diagram of plumbing-work for an ordinary dwelling-house, which will probably excite more discussion among plumbers than anything else in the book. The diagram is very clear and well drawn, is dated 1882, and shows the most modern forms of apparatus; but while two water-closets and a slop-hopper are indicated with S-traps and back vents, none of the other fixtures, including a water-closet of the siphon-jet kind, with S-trap, and various baths, sinks and bowls with mechanical traps, are vented at all. The mechanical traps shown are generally Bower's rubber-ball traps, but although these are excellent in their way, we should much prefer to have the branch-wastes with which they are connected aërated, where practicable, by back vent-pipes like the others, to say nothing of the possibility of siphonage in such traps when unfavorably placed. The open connection of the bath and basin overflows with the wastes, although usual with the Bower traps, is open to some objection on account of the opportunity which it gives for a circulation of air to and fro through this yard or so of slimy pipe and thence into the room, and the wash-tray wastes are still more exposed to the same criticism. The pantry sink presents the novelty of having, apparently, no overflow, an arrangement, which, although effectual in preventing odors from that source, might be objectionable for other reasons.

Concerning traps Mr. Gerhard's views are eminently just. We are hardly prepared to go so far with him as to say that the ordinary Boston round trap "very often" chokes up, having known but one case of the kind, and we are sure that the claim made for the Bower trap, that the elasticity of the rubber ball "allows the water in the chamber to freeze without danger of the bursting of the cup," is too sweeping, for the reason that one tested in our office burst at the first hard frost; but with these exceptions the chapter could hardly be more satisfactory.

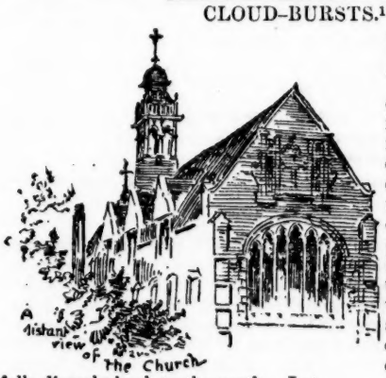
The descriptions of apparatus which occupy most of the remaining pages of the book are as discriminating and sensible as could be desired, and are admirably and fully illustrated. The only criticism which we can make upon this portion is one to which any work on

[1] *House- Drainage and Sanitary Plumbing*, by William Paul Gerhard. Providence: 1882.

plumbing appliances becomes subject, in these progressive times, within six months after its publication, — that it is a little behind the age, omitting all mention of many forms of apparatus whose excellence has within a short time brought them into general notice. In speaking of kitchen-sinks, for instance, the author advises the use of soapstone, or galvanized or enamelled iron, which were not long ago the only serviceable varieties. Now, however, sinks can be procured, at a moderate price, of earthenware, either white or yellow, running in size up to 24″ x 48″, and presenting an appearance infinitely preferable to that of soapstone or iron, one of which gradually takes on a nauseating greasiness, while the other loses its protecting coat of zinc or enamel, and requires painting to preserve it from rust. Slop-sinks, too, for the old forms of which Mr. Gerhard proposes the substitution of an earthenware bowl with flushing-rim, set into a lead or iron hopper, are now sold in the shape which he suggests, in solid white earthenware, the upper portion of the bowl being expanded into a rectangle of considerable size, to make sure that nothing will drip over the edge, furnished with a flushing-rim of the most improved form, supplied from a cistern in the same way as the best closets.

Such little omissions as these would undoubtedly be remedied in a later edition of what is already the most complete book on the subject, so that they are in no way to be regarded as faults. The value of the work for reference is increased by the addition of tables for calculating the capacity of sewers of various sizes and laid at different grades, which will be of occasional use to architects, and of great service to engineers and landscape-gardeners.

CLOUD-BURSTS.[1]



IN order to account for the immense amount of rain which often falls in a tornado in a short time, it is necessary to have an estimate of the amount of aqueous vapor carried by the ascending currents of the interior part up through the base of the cloud into the upper regions, where it is condensed, and also of the depth of rain arising from its condensation if it all falls directly back to the earth. Let

e = the elastic force of aqueous vapor at the base of the cloud;
d = the depth of rain resulting from the condensation in the ascending current, supposing that the current extends so high that the vapor is all condensed.

Then, with an ascending velocity, u, the weight of aqueous vapor carried up per second, measured by the mercurial column, is $0.623\,eu$: 7989. Multiplying this by 13.6, the specific gravity of mercury, we get

$$d = .00106\,eu$$

for the depth of rain given by the condensation per second. With a temperature of 27° at the base of the cloud, as in our assumed example, No. 1, we have from Regnault's table, $e = .0265^{m}$ for the elastic force of saturated air, and with this value the preceding formula gives for an ascending velocity of 60 metres per second $d = .00168^{m}$ per second or 0.101^{m} (about 4 inches) per minute for the depth of rain, if it were to fall directly back.

Our problem is too complex, taking into account friction and all other circumstances, to determine the relation between the radial and vertical velocities; but we know that the radial component must be toward the vortex in the lower part of the atmosphere in order to supply the draught of the ascending current, and greatest very near the earth, where they are least counteracted by the centrifugal force of the gyrations. But somewhere above, it may be at a great altitude or not, according to the rate of diminution of temperature with increase of altitude in the surrounding quiescent atmosphere at the different altitudes, there must be a flowing out of the air above, so that in the ascent of the air there is an inclining toward the vortex below, and from it above. The vapor, therefore, above a certain altitude is gradually dispersed, and, if condensed into rain, it falls at some distance from the vortex of the tornado. With an ascending velocity of 60 metres per second the rain would all be carried up to an altitude where it would be carried out from the vortex, and hence none of it would fall directly back. Such a velocity would keep suspended in the air, at an altitude where the density is diminished one-half, a globe of water, if such could exist, with a diameter $D = 1.8^{cm}$ (about 7 inches). With such an ascending velocity, therefore, no rain could fall directly back, but there would be an immense fall of rain around about in the vicinity, especially if the tornado in its irregular progressive motions should remain stationary, or nearly so, for several minutes over the same spot. That an ascending velocity of 60 metres per second is no unusual velocity in tornadoes, will be shown from the observed mechanical effects of tornadoes.

If the velocity of the ascending current is not so great that the rain is all carried up to where the currents are outward from the vortex, and where consequently the water is dispersed, and yet great enough to prevent its falling back, then in the whole lower part of the cloud, up perhaps to the altitude of 3,000 metres, there may be an accumulation of rain, prevented from falling by the ascending currents, and from being dispersed by the inflowing currents from all sides toward the vortex. Of course the sustaining of this water in the cloud uses up the energy of the tornado and hastens its breaking up. . . .

If we suppose that the energy of the tornado and the velocity of the ascending currents are being gradually diminished, either by the accumulation of water in the cloud, or the effect of friction, this accumulation of water may all fall to the earth in a very short time, and give rise to what is called a *cloud-burst*. This is especially liable to occur in mountainous regions; for if we suppose that a tornado heavily charged with water is moving toward the side of a mountain, its coming in contact with the mountain would interfere very much with the gyrations of the tornado and the inflowing currents below, and tend to break up the whole system almost at once, and let the whole accumulation of water drop suddenly down. Hence cloud-bursts usually occur on mountain-sides.[2]

The water in cloud-bursts does not generally fall as rain, but is *poured down*. Long before the ascending currents are so reduced as to allow the water to fall in drops it seems to collect together at certain places and force its way downward through the ascending current in a stream. This it would naturally do, since we cannot suppose that the water is ever evenly distributed over any given place, or that the velocities of the ascending currents are everywhere in the same vicinity the same. A considerable mass having been collected at certain points, it is then enabled to force its way through, and draws into its train much more from all sides on its way down, so that it may amount to a continuous stream kept up for several minutes. Of course, having once made an opening for itself, its velocity is gradually accelerated, so that on reaching the earth the velocity may become immense and the stream strike with great force. Each one of these descending streams may make a great hole or basin in the ground; and on a steep mountain-side, if the stream continues for a short time, it may give rise to a mountain slide, or at least to a great ravine, carrying rocks and trees with it down the mountain-side.

Immediately after the great tornado at Hollidaysburg, Pennsylvania, on the 19th of June, 1838, Espy visited the vicinity and examined the sides of the ridges and mountains. He found a great many holes eight or ten metres in diameter and one or two in depth, according to the nature of the soil and depth to the rock, the sides often cut almost perpendicularly down on the upper side, but entirely washed out below, so as to form the commencement of a ravine. Sometimes the current seemed to strike with so great force that it made a great hole or basin, and rebounded so as not to strike the ground again for a considerable distance. A considerable number of these holes in the earth were often found close together in the same vicinity, indicating that the water was poured down through various openings at the same time. With regard to a ridge a half-mile west of Hollidaysburg he says: "On examining the northern side of this ridge, large masses of gravel and rocks and trees and earth, to the number of twenty-two, were found lying at the base on the plain below, having been washed down from the side of the ridge by running water. The places from which these masses started could easily be seen from the base, being only about thirty yards up the side. On going to the head of these washes they were found to be nearly round basins from about one to six feet deep, without any drains leading into them from above. The old leaves of last year's growth, and other light materials, were lying undisturbed above, within an inch of the rim of these basins, which were generally cut down nearly perpendicularly on the upper side, and washed out clean on the lower. The greater part of these basins were nearly of the same diameter, about twenty feet, and the trees that stood in their places were all washed out. Those below the basin were generally standing, and showed by the leaves and grass drifted on their upper side, how high the water was in running down the side of the ridge: on some it was as high as three feet. It probably, however, dashed up on the trees above its general level." (Philosophy of Storms, p. 375.) In an account of a remarkable storm which occurred at Catskill, July 26, 1819, it is stated that "the rain at times descended in very large drops, and at times in streams and sheets." Again, another observer "particularly noticed that he could see no drops of rain, but the water seemed to descend in streams and sheets." It is evident from these, and many other similar paragraphs which might be cited, that the water in such cases is poured down in streams and does not fall as rain, especially since the lightest materials were not washed away close to the margin of these basins on the upper sides referred to above; and the reason of this, evidently, is that the accumulated water in the cloud is poured down in streams while the ascending currents are, as yet, too rapid to allow the largest drops to fall as rain.

It may be supposed by some that an ascending velocity as great as 60 metres per second is not only extremely rare, but one which

[1] From a paper on Meteorological Researches, by William Ferrel, in Appendix No. 10 of the Report of the Superintendent of the United States Coast and Geodetic Survey.

[2] This agency of mountain-sides in causing cloud-bursts was first suggested by Professor Trowbridge, of Columbia College, on hearing my explanation of the manner in which rain can be kept suspended in the cloud, in a paper on this subject read before the National Academy of Sciences, in April, 1878.

never occurs in any tornado. This requires a barometric depression in the interior of the tornado of about 30^{mm}. By examining column P′ in the table of § 102 it is seen that with the assumed conditions of our tornado the theoretical tension of the air near the centre nearly vanishes, and the interior becomes almost a vacuum; but of course very great allowances must be made for friction so near the centre, where the theoretical gyratory velocities almost become infinite. For since the air of the ascending current in the vortex is mostly supplied by the current near the earth, where friction is great and the gyratory velocity much diminished, this affects the gyratory velocities very greatly all the way up, so that they may differ very much near the centre from those given by (*d*), in which the effect of friction is neglected. But that the tension of the air is very much diminished in the middle of tornadoes, much more than the assumed amount of 30^{mm} is obvious from the explosive effects often observed in the passage of a tornado. The walls of houses are thrown outward in every direction, cellar doors are burst open against the force of a hurricane wind, corks fly from bottles, and explosions occur wherever air is confined, which denote a great and sudden diminution of the outside tension of the air from the diminished pressure in the tornado, so that ascending velocities may, no doubt, be often much greater than that which would arise from a depression of 30^{mm} only in the interior of the tornado. This may also be inferred from the powerful force of the ascending currents in sustaining and carrying in the air large and heavy bodies to a great distance. Of the many examples which might be given it is only necessary to cite one well-authenticated case: During the tornado at Mount Carmel, Illinois, June 4, 1877, we read that "the spire, vane, and gilded ball of the Methodist church were carried fifteen miles to the northeastward." Nothing is stated with regard to the material of which it was constructed, but we must infer that the ascending currents which could keep it suspended in the air for at least fifteen or twenty minutes must have had an enormous velocity. The ascending velocity required to keep a sphere one metre in diameter and of the specific gravity of water suspended in the air is 135 metres per second. On account of the probably greater surface, in proportion to the weight, in the case of the church steeple, the velocity required was perhaps much less than this, but this estimate in the case of the sphere enables us to judge better with regard to what was required in the case of the church steeple. One reason why heavy bodies are not more frequently lifted from the earth and carried up is that at the earth's surface the velocities are necessarily horizontal only, and the vertical components of velocity are naught. If heavy bodies were generally in the situation of church steeples they would be more frequently carried off. . . .

Tornadoes and water-spouts originate only in an unstable state of equilibrium of the air, which requires an unusually rapid decrease of temperature with increase of altitude. This can take place only when the strata nearest the earth are unusually heated, and this never occurs in the night or during the winter, and but rarely in cloudy weather. Tornadoes and water-spouts, therefore, take place mostly, if not always, in the summer season and during the day, when it has been clear at least a short time before their occurrence. If any agitation of the air, such as that arising from the discharge of a cannon, tends to break up these meteors, then any considerable disturbance of the air from any cause must tend to prevent their formation, and hence they do not occur when there is more than a feeble wind. This, however, does not apply to land-spouts which are formed in the interior of a tornado, having their origin in a state of unstable equilibrium in the cloud region, and commence there, but rather to water-spouts on seas and lakes, originating in a state of unstable equilibrium of the lower unsaturated strata of the atmosphere. . . .

Water-spouts and sand-spouts are *hollow*. In the case of both water-spouts and sand-spouts, therefore, if there is not an absolute vacuum of particles in the central part, the particles are so exceedingly rare there that it must be regarded as sensibly a vacuum.

The circumstances under which observations of such a vacuum can be made are very rare. M. Boué, in the year 1850, observed three water-spouts at the same time on Lake Janina, from the top of a high mountain. The weather was entirely clear, without clouds or wind, but very oppressive and hot. The spouts seemed to rise up from the lake, and he could look down into the top of them and see that they were hollow in the middle. (Bulletin Soc. Géologique de France, t. viii, p. 274.)

Of a whirlwind observed at Schell City, Mo., in the summer of 1879, Professor Nipher says: "There were no surface winds strong enough to bear dust along the surface of the ground, but the dust carried up in the vortex was collected only at the vortex of the whirl. The dust column was about two hundred feet high, and perhaps about thirty or forty feet in diameter at the top. The direction of rotation was the same as of storms in the northern hemisphere. Leaving the road the whirl passed out on the prairie, immediately filling the air with hay, which was carried up in somewhat wider spirals, the diameter of the cone thus filled with hay being about 150 feet at top. It was then observed also that the dust column was *hollow*. Standing nearly under it, the bottom of the dust column appeared like an annulus of dust surrounding a circular area of perfectly clear air. The area grew larger as the dust was raised higher, being about fifteen or twenty feet wide when it was last observed." (*Nature*, September 11, 1879.)

THE ILLUSTRATIONS.

PROPOSED DECORATIONS, STEINWAY HALL.

[From the *Building News.*]

THIS hall, seating about 600 for concerts and entertainments, forms part of the London premises of Messrs. Steinway & Sons, the well-known piano-forte manufacturers. The contemplated decorations include the clothing of the present plain piers by pilasters, the dividing up of the ceiling into panels with cove and cornice under, and the removal of the large looking-glasses, which now cover almost the whole surface of the walls, substituting the architectural features shown on the drawing. The existing colored glass in the inner skylight will be replaced by more suitable stained glass, while occupying a large proportion of the area.

RAMBLING SKETCHES BY MR. T. RAFFLES DAVISON. SOME VILLA RESIDENCES.

[From the *British Architect.*]

None of the subjects here illustrated are amongst the latest productions of their authors. In fact, so far back in the era of "revived taste" does poor "Hopefield" date, that it passed the first years of its existence under the title of "Bell's Folly." However, it bore up bravely, and the architect and owner of it has had the good fortune to sell it favorably, and another exactly like it, erected on nearly as pretty a site at Bowdon, near Manchester. And as to quality, perhaps I shall not be singular in the appreciation I have always had of these simple diagonal chimney shafts, and a general character about the house of simple unpretentiousness and picturesque design. The clever wood gate-post, worthy of mediæval times in its simple effectiveness, which I found at "Hopefield"— an inviting bay and veranda for sunny days, in Mr. Collecutt's design— a gable with gilded balls from "Fair Oak"— an effective house for its position on a corner site, by Mr. Douglas — and two or three other bits, complete this mixture of summer and winter sketches.

SIDEBOARDS SHOWN AT THE BRADFORD [ENG.] TECHNICAL SCHOOL EXHIBITION.

[From the *British Architect.*]

"CLASSICAL POESY." DESIGNED BY HERR EDMUND VON HOFFMANN.

[From the *Builder.*]

The allegorical figure of "Classical Poesy," intended for the new Burg-Theatre of Vienna, was one of the best works to be seen in the Austrian section of the International Art Exhibition held in the Vienna Künstlerhaus. The carefully executed figure testifies by its pure lines and the high standard of its conception to a not common talent. Edmund von Hoffman was born on November 2, 1847, and is consequently a young artist, who, independently of the future which is still before him, has already a remarkable past, having distinguished himself by a number of excellent works. The figure of "Classical Poesy" is intended for the central projecture of the Löwelstrasse façade of the new Hofburg theatre, its counterpart being the statue of "Romantic Poesy," also to be modelled by Hoffmann. With the figures, by Kundtmann, of Melpomene, Thalia, and Apollo, the two statues of Hoffmann's will be the largest which will adorn the new edifice. They are to be eleven feet high, and in Marzono stone, a hard limestone. The block of stone for "Classical Music" had a weight of thirty tons. Edmund von Hoffmann received his education at the Vienna Academy of the Plastic Arts, under the supervision of Professor Zumbusch, whence, having obtained the Roman Prize Stipend, he proceeded to Rome. He has executed some effective sculptures for the new Vienna Town-hall and the new University.

INTERIOR OF THE STAIRCASE OF THE CHATEAU CHATEAUDUN.

[From *Le Moniteur des Architectes.*]

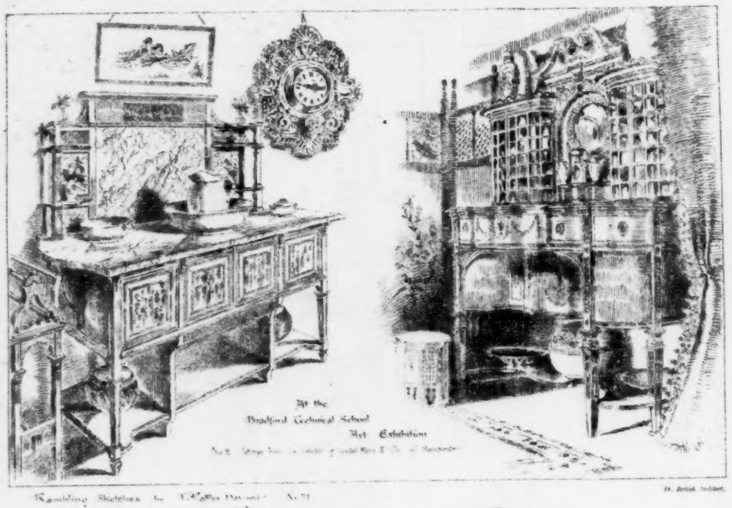
A STREET IN COLOGNE, DRAWN BY MR. A. H. HAIG.

[From the *Architect.*]

HOUSE FOR W. D. BLACK, ESQ., NEAR MILFORD, CONN. MR. CARL PFEIFFER, ARCHITECT, NEW YORK, N. Y.

QUINCY MARKET COLD STORAGE WAREHOUSE, BOSTON, MASS. MR. W. G. PRESTON, ARCHITECT, BOSTON, MASS.

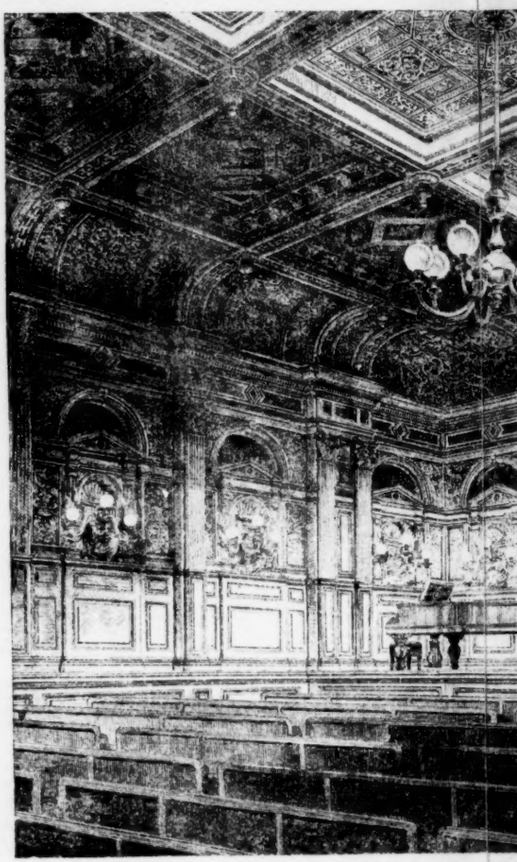
The Quincy Market Cold Storage Company's building is located on the corner of Commercial and Richmond Streets, Boston, a spur-track of the marginal railroad reaching it upon one side. The building is 80′ x 160′, and has a water-proof cellar, and four stories above, devoted to the storage of butter, cheese, meats, poultry, etc. The fifth story is nineteen feet in the clear, and is to be stored full of ice for the artificial cooling of the rooms below. The load consequently upon the ice floor will be about 1,000 pounds per superficial foot. Iron columns are placed in the cellar, and hard-pine selected posts above, those in the first story being 14″ x 14″, with iron cap and base plates, planed and fitted. The ultimate load on these posts is about 110 tons each. A very large quantity of one-inch-thick hair-felt is used in the construction and insulation of the interior of the building. All the walls are built hollow, and a portion with double air-spaces; windows are in triplicate, doors felted, and special precautions taken with rendering the roof non-conducting. Three freight elevators are provided within the packing-rooms, for the delivery of goods and also for raising the five thousand tons of ice to the upper floor each winter for the year's supply.



Rambling Sketches in [illegible] — No. 71

OUR FOREIGN EXCHANGES — VII.

A STREET IN COLOGNE

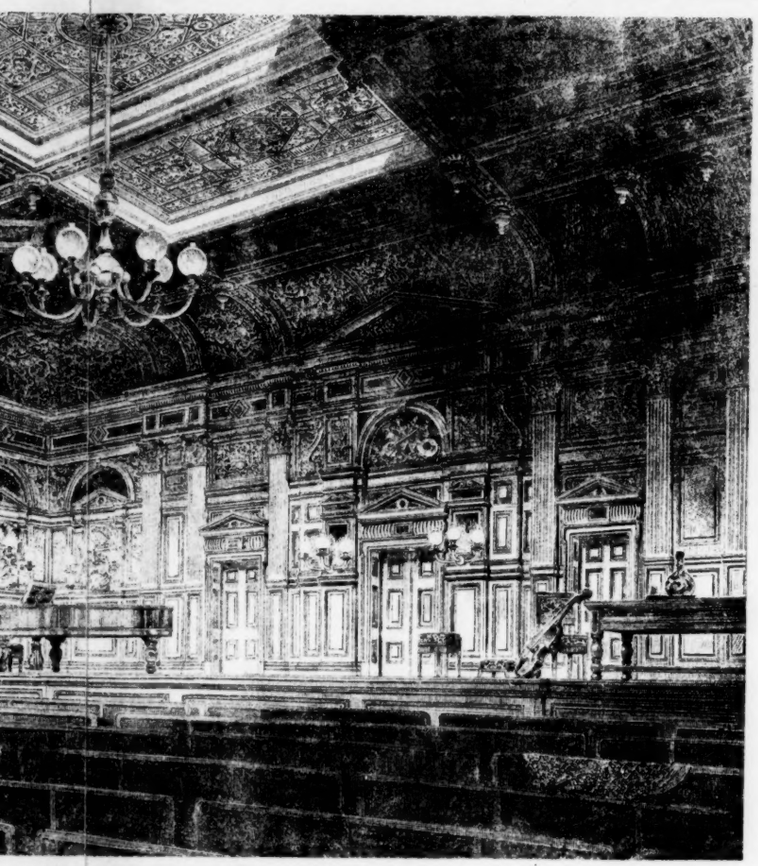


BUILDING NEWS

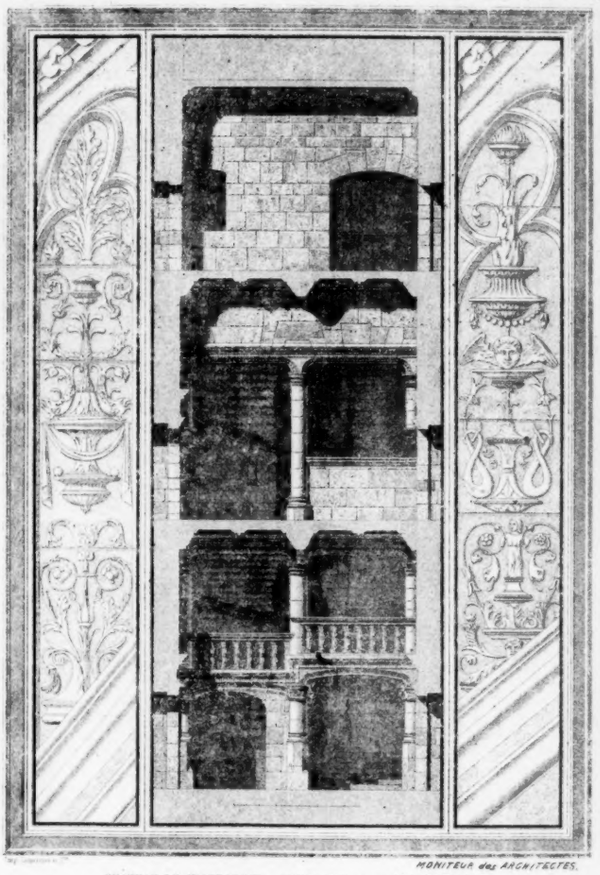
PROPOSED DECORAT
WALTER

BRITISH ARCHITECT

PUBLISHED 1882 JAMES R. OSGOOD & CO



ED DECORATIONS STEINWAY HALL LONDON
WALTER HENSMAN ARCHITECT

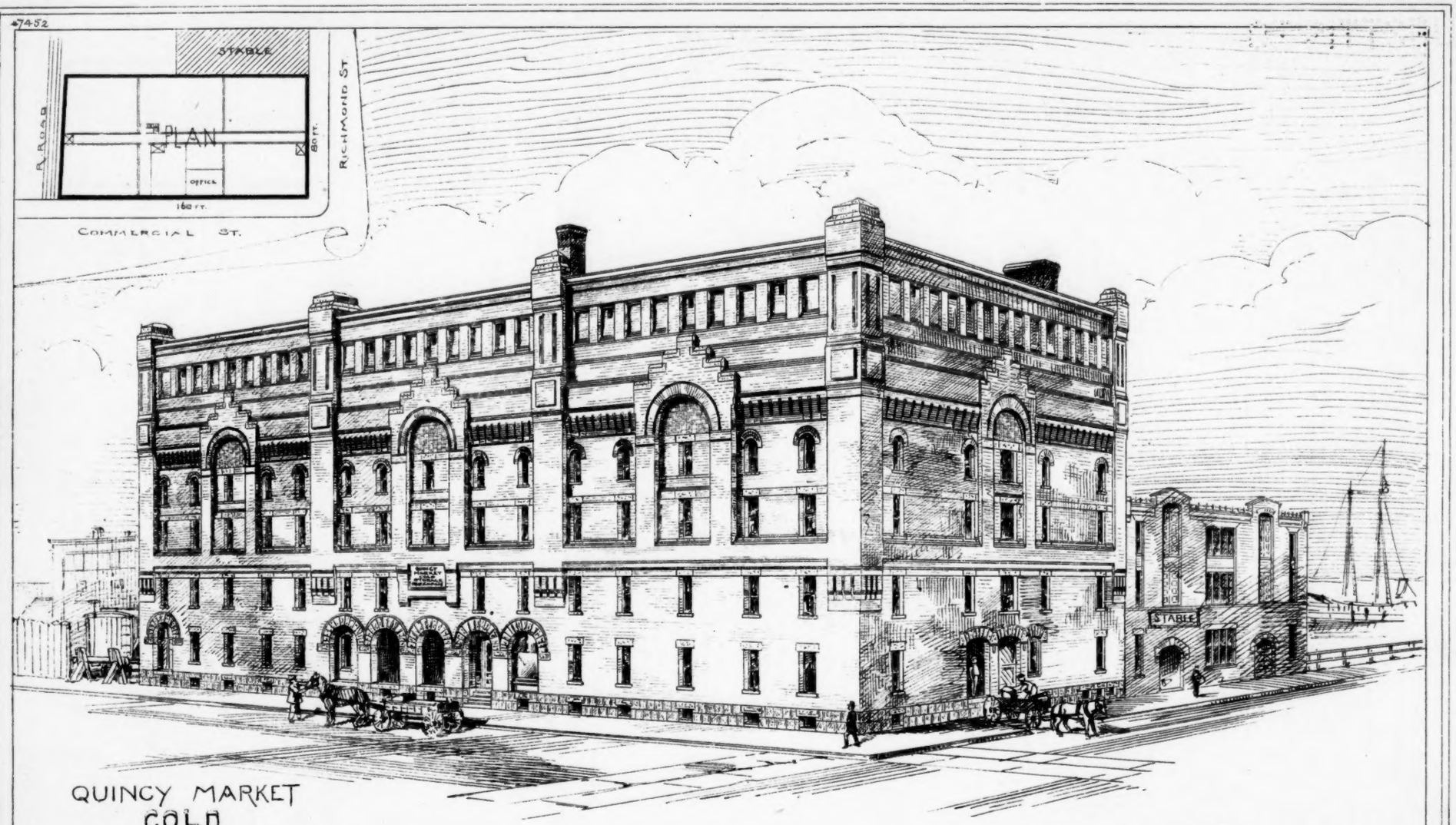


MONITEUR des ARCHITECTES.

CHATEAU DE CHATEAUDUN. COUPE SUR LE GRAND ESCALIER.

"CLASSICAL POESY," ALLEGORICAL FIGURE FOR THE NEW BURGTHEATER, VIENNA.
MODELLED BY EDMUND VON HOFMANN.

AMERICAN ARCHITECT AND BUILDING NEWS. AUG. 26, 1882. No. 348



QUINCY MARKET
COLD
STORAGE WAREHOUSE
BOSTON.

W.G. PRESTON,
ARCHITECT.

A CHAPTER ON CHIMNEYS.

WITH the exception of the Great Pyramid of Egypt (Cheops) and the spires of the cathedrals of Strasburg and Cologne, the tallest buildings in the world are chimney-stalks. Nevertheless, the interest which many may take in chimneys will most likely rest not on their size, but upon their universality, upon their commonness and usefulness. Every one, be he who he may, with whatever grand historical personages he may be otherwise connected or disconnected, has relations more or less with some chimney-stalk or other.

Chimneys are the nostrils of a house, and we know how necessary to the life of any object is the breath of its nostrils. In Chambers's "Encyclopædia" it is stated that before chimneys assumed their present form these nostrils of the house were placed at the back of the fireplace, not far above the grate; the vent or flue was short, and turned at the top towards the outside of the wall, through which the smoke found its passage in slits made for the purpose. In those Mediæval times smoke, not of cannon, might every day be observed issuing from the sides of the castle wall. Now the smoke invariably reaches the open air through perforated columns placed upon the top of the walls of the house, so that instead of looking like the nostrils of a building, the chimneys seem rather to occupy the place of ears, as on a horse's, zebra's, or lion's head. You can give expression to the look of a house by them, as in the case of the heads of these animals by the make of the ears. You can fix the character of a house by the arrangement and regulation of the height of the chimneys as much almost as by the order of the design of its front. For all that, comparatively little attention is paid to this part of the building. Up among the chimneys is the last place we look for order or classification, or even for symmetry in a land or street of houses, and when we discover the elegant and symmetrical up there we are as much surprised as when we find silver spoons in an ash-pit. It is curious to observe that while in general it is thought requisite to have the end of all towering and pointed erections finished ornamentally, the chimney-head should so frequently be left an exception to the rule. The pillar has its capital, the post its cap always, — the top concludes with a button, — the spire is invariably crowned with a gilded vane or cross, the tower has a cope and pinnacles, the top of the buttress is turned to pomegranate; the chimney-head alone, with rare but honorable exceptions, concludes, even when otherwise elegant in itself, most generally with the old time-battered, weather-streaked, familiar red tile pot or can.

Most people consider a "chimney hat" or "tile" an ugly thing on a man's head. I consider a brick an equally ugly thing on the top of a chimney-head. It is especially ugly when the wind blows it over, and it falls and hits somebody in the street.

Often these tile cans are hanging over to one side, like Willie with his wig agee. Some of them are high, some low; the more reputable are duplex, and have a long lower and short upper part; the less reputable are devoid of the top appendage; they have either lost it in scrimmages or never possessed it. Sometimes two or three are piled up in a line, and the toppling figure they form seems ever ready for decline and fall. Sometimes you observe one which has been halved by accident and which presents a broken and jagged edge to the sky. On rare occasions you may happen to come across one which has been honored by having two or three upper portions shoved over it, like the old clothesman of caricature, with his multiplicity of hats, or the fashionable lady described by Goldsmith: —

> "Skill'd in no other art was she
> But dressing, patching, repartee,
> And, just as humour rose or fell,
> By turns a slattern or a belle.
> 'Tis true she dress'd with modern grace,
> Half-naked at a ball or race;
> But when at home, at board or bed,
> Five greasy nightcaps wrapp'd her head.
> Could so much beauty condescend
> To be a dull domestic friend?"

Sometimes one stands alone like a sentry. More frequently they are found clubbed together on a stack, like a row of the awkward squad, short and tall, lean and fat, high-colored and cadaverous; some in the attitude of attention, others standing at ease, veterans of the smoke and storm in broken rank and file.

It is no doubt the case that there is a class of old-fashioned and homely buildings the chimney-heads of which the old red tile-pot suits, and which nothing else would suit so well. Let it remain and hold high holiday on the top of the thatched cottage and the country manse forever-and-a-day; but for town buildings and for all mansions that make any attempt at architectural display, the red tile is an anomaly not in keeping, and some funnel of a different pattern, if not of different materials, should be substituted for it. It is pleasant to observe that earthenware funnels of really elegant form have been introduced in some instances. There are other forms recently introduced which are not so elegant, and little bits of white or cream-colored cylinders (like elephants' toes) are among the number which I cannot admire.

To what extent, in fine, are the chimney-heads to be treated ornamentally? Should they, in the general design, be made to occupy a conspicuous or only a subordinate place? Are they just to be made passable so as to escape criticism, or are they to be made notable so that the eye may be attracted to them as an object to rest on? These are questions the architect may put to himself, and which he must answer according to his lights. It will always be safe for him, however, to put some tidy work upon them in preference to running over them in a slovenly way. When there are a number of heads to be placed on one building he should also ask whether they are to be placed at random, to suit convenience merely, or are to assume geometrical positions and be placed as the points of a mathematical figure; whether he will have them put up without due respect to the site or height of each other, or will have them arranged in order say, like the couples in a dance. I have sometimes seen an old chimney placed so awkwardly that it seemed as superfluous as a third ear on the head or a sixth finger on the hand. The chimney-heads on an elegant building should, to use as a paraphrase words intended for another subject, "possess grace and naturalness, delicacy and strength, balance and order; they should combine freshness of conception with perfect accuracy of execution, and be both familiar and sprightly."

"The chimneys of Venice," says an acute observer, "are not the least remarkable part of her architecture, and no two are alike. There are many with a slender stem of perhaps a yard in length, and calyx-like top resembling a tulip; others almost precisely like the watch-towers on the corners of ancient castle walls; others of strictly Gothic style; and some of Doric design and classical proportions. Occasionally there is one with such a slender stem and overgrown top, loaded with a redundancy of ornament, that it is the very insanity of a chimney. They catch the last rays of the setting sun and reflect the opal glories of its tints."

The head of the chimney may be said to consist of four parts: the plinth or the base, the stalk or column, the cope or capital, and the funnel or chimney-pot. The inner and concealed parts of the chimney likewise may also be said to consist of four parts: the fireplace, where the grate stands; the throat, immediately above that; the vent, or smoke-channel, which succeeds in the order of ascent; and the chimney-top, or lum-head, as it is termed in Scotch, which is the conclusion of the whole affair.

With regard to the *enceinte* of chimneys: it is better to have the chimneys of a house placed in the inner or partition walls than in the outer and carcass walls. There are two reasons for this; one is that they vent better. The hotter the sides of a chimney are the stronger the draught up it will be, and the chimney sides are kept hottest when in the inner walls of the house. The other reason is that heat is economized by having the chimneys in the partition-walls. When the chimney is in the outer wall the side towards the street or open air is generally very thin, sometimes not more than 4" thick, and a considerable portion of heat passes through this slender side into the open air. After a shower of rain that part of the gable of a house through which the chimney runs dries more rapidly than the other parts. This shows that the heat is coming through the side of the chimney and getting out of the house. When the chimney is situated in an inner wall the heat radiates from it into the house on both sides.

Now that the practice of young sweeps riding through the chimneys is discontinued, and there is no longer any demand for projections and roughness in their interiors, to make stirrups for their little feet, the inner lining of chimneys should be smooth throughout. There should, moreover, be no abrupt turns, no knees or sudden bends, and no level reaches, but the smoke-channel should be made as easy, direct, and flowing as possible. The cross-section of that channel should never be oblong or oval, for as the smoke inclines to circle in mounting the chimney opportunity should be given to allow of it rising in this way; the cross-section ought therefore either to be round or square, or of some concentric polygonal figure.

It will not and cannot be denied that many chimneys are defective and do not fulfil their office as they should. Some smoke more regularly into the house than into the air: others have an occasional down-blast in certain acts of the wind. Some others cannot be made clean by any amount of sweeping, and when these are kitchen chimneys the auld wife's cakes are threatened with a deluge of soot and certain destruction, whenever she puts on the griddle to bake. If there comes a soft or thawing day, especially, the premonitory colliery drops never fail to come down upon the first griddleful, and splatch the cakes with black.

There are chimneys, again, which require fires like furnaces to rouse them up before they will vent at all.

Perhaps some one may remember being shown at night into a spacious but dingy bedroom, where the furniture had a pall-like

look, and where, when the final bow was made, and he was left to himself, he saw that there was a new lighted fire in a large grate under a frowning mantelpiece. This fire, which consisted mostly of black coal, was flaring and smoking a deal, but there was little red in it. There was at the same time, he found, a cold draught moving across the room at the rate of fifteen miles an hour. The feeling of the atmosphere was raw and chill, and the visitor became shivery-shakery. The fire seemed to be drawing out the cold damp which always harbored in the corners of the apartment, and the visitor had left a room which was overheated with fire, light, and fumes. He gets into bed as quickly as he can, puts out the auxiliary light, and trusts to the company of the fire for relief. It proves but a false friend, casts a feeble light on the hangings, becomes less, but at last succumbs to that cold draught travelling across the room between the bed, and it flutters and flitters as if uncertain what to do, — flares up, and goes out.

The fact is that a fire may be drowned out by having too much cold air violently forced upon it. Fireplaces which are too large, grates which are too open, have the fault besides of allowing the air to play about everywhere but upon the point where it is wanted; blowers and newspapers held up in front of fireplaces correct this, and direct the air to the points where the fire is lighted.

When complaints are made of chimneys not venting, it should be borne in mind that the smoke goes out from the chimney-top into an uncertain, changeable, and sometimes tempestuous element. Lieut. Maury, in the "Physical Geography of the Sea," says, — "There are many abrading surfaces, irregularities, etc., which produce a thousand eddies in the main stream of the atmosphere," and also, "Each valley, every mountain range, and local district, may be said to have its own peculiar system of calms, winds, storms, etc."

Count Rumford's assertion that every chimney can be made to vent perfectly, must be taken with some deductions. It is well understood that hills, buildings, and such like large objects, in the neighborhood of a chimney, are apt to affect its venting. In certain acts of the wind they may direct the air obliquely upon the chimney, and with a dip downward, so that it is blown into the mouth of the chimney, and the smoke is driven back into the vent, like a man forced to eat his own words. Placing a slab above the mouth of the chimney may serve to correct this. Or, where the chimney and a building close to it are the same height, or nearly so, the wind which comes over the building, cutting across its ridge, comes straight and sharp as a razor along the mouth of the chimney, when it is blowing keen, slices away the smoke as it ventures out, and when blowing hard and all compact it acts like a lid, off and on, and stops the mouth of the chimney. The cure for this, of course, is lengthening the chimney and raising it considerably higher than the adjoining building.

With regard to what is called back smoke, that is, smoke from one chimney getting into an adjacent chimney, and through it into the apartment connected with the first chimney, I am told that the routine is this. When a chimney is going the draught in it is upward and skyward; but when a chimney is empty the draught is downward and houseward, the heat of the apartment in the last case causing the cold outer air to gravitate down the cold chimney. When there are two chimneys standing side by side, one of which is going, while the other is empty, the smoke from the going chimney is at times, in certain acts of the wind, blown across the mouth of the empty chimney, and being caught by the current of cold air running down that chimney, is carried with it into the apartment with which it is connected. The way to cure this and get rid of back smoke is to seal up the empty chimney. In old and frail houses, where the chimneys are shaken, back smoke may be caused by smoke passing from one chimney to another through rifts and chinks in the party-wall between them. There is no cure for this,— the disease in this case, like Mr. Pecksniff's complaint, is chronic.

It may not be out of place to sum up by stating the three approved methods of curing chimneys which do not vent well, applied by Count Rumford and all smoke-doctors since his time. The first is lengthening the chimney at the top: this increases the quantity of heated air in the chimney, and gives more power or head by increasing the difference between the weight of the air per foot, in and outside of it; the second is contracting the chimney at the throat: this increases the speed with which the heated air passes through it, and gives a heightened initial velocity to the smoke when beginning its course up the chimney. The third is when there is a deficiency of air in the apartment to feed the flame and blow up the fire, putting ventilators into the sides of the apartment, or into the windows or doors.

This imperfect chapter will indicate in a small degree how important for comfort the right construction of chimneys is, and how neatly and correctly all these parts should be built from bottom to top.— *W. Y. B. in the Builder.*

Strawberry Hill. — Matthew Arnold, in one of his "mixed essays," gives expression to the opinion that ere long the whole world will be Americanized. Events seem likely to verify the prediction. What would Horace Walpole say if he were to be told that Strawberry Hill, Twickenham, would, less than a century after his death, be purchased by an American company for the purpose of converting it into a hotel conducted upon American principles? Yet such is the fact. — *London Truth.*

FRENCH SCHOOL BUILDINGS.[1]

THE ground appropriated for the normal school shall be situated rather toward the centre of a city than toward its outskirts. It shall possess good air, be easy and safe of access, removed from noise-producing, unhealthy or dangerous establishments, and 200 metres at least from existing cemeteries.

3. The orientation of the building shall be determined according to the climate of the region, taking into account the hygienic conditions of the locality.

4. The site shall have the minimum area of a hectare (almost 2½ acres), including the courts, yards, and gardens.

5. The normal school buildings shall be used for no other purposes than those of the school proper and the cognate annexes — the primary school and nursery school.

6. The whole site shall be enclosed by a wall.

7. The normal school shall include the following departments: Administration, Instruction, Habitation, and Nourishment of the pupils, dwellings of the masters and directors, and the necessary dependencies.

12. The library of the school shall be placed near the office of the Director. It shall be arranged so as to serve as a hall of meeting for the School Committee.

The school-building proper shall include the school-rooms, class-rooms, amphitheatre for the lectures in physics and chemistry, the drawing-rooms, music-rooms, work-rooms for mechanical instruction, and, in the normal school for girls, a sewing-room.

14. The school-rooms shall be at least three in number, in schools for 60 pupils. This number may be reduced to two in those schools containing less than 60 pupils.

The rooms must be rectangular.

The area shall be calculated in the proportion of two square metres per pupil (21 square feet).

The height shall never be less than 4 metres (13 feet).

15. Three distinct class-rooms shall be provided for the three grades.

They shall, so far as possible, be adjacent but independent one of the other.

They shall be rectangular.

The minimum area shall be calculated in the proportion of 1½ square metres per pupil (16 square feet).

The height shall never be less than 4 metres (13 feet).

One of the three class-rooms shall be especially arranged for instruction in history and geography.

16. The furniture of the school-rooms shall consist of separate tables and seats for each pupil.

The table shall be fixed securely to the floor, and be provided with a drawer.

The top of the table shall be inclined like a desk, with a narrow horizontal surface at the top.

The tables and seats shall be proportioned to the stature of the pupils.

The passage reserved between two rows of tables, the passages between the walls, the *casier* and the tables shall be about 65 or 70 centimetres (2 ft. to 2 ft. 3 in.) wide.

The interval between the back of the chair and the table next behind it shall be at least 20 centimetres (8 inches) wide.

The space between the front row of desks and the wall shall be at least two metres (6½ feet) wide.

The master's platform shall be raised 30 to 45 centimetres (12 to 15 inches) above the floor, and shall contain a table and a chair.

The *casier*,[2] which is intended to contain the books of the pupils, shall be fixed against the wall fronting the master's chair. Each *casier* shall measure internally 35 x 40 centimetres (14 in. x 16 in.), and shall be 50 centimetres (20 in.) high. The compartments may be arranged one over the other.

17. The furniture of the class-rooms shall be double bench-tables.

The space allowed for each pupil shall be at least 65 centimetres (26 in.) wide.

The seat shall have a back, and its depth shall be about 35 centimetres (14 in.).

The writing tablet shall be fixed and inclined at an angle of 15 or 18 degrees.

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[1] Regulations for the construction and furnishing of normal schools published by the French Minister of Public Instruction and Religion.

[2] The *casier* can be replaced by little cupboards arranged at the right of each table, and forming a part of it.

The passage between the rows of tables shall be about 55 centimetres (22 in.) wide, and that between the wall and the tables at least 65 centimetres (2 ft.) wide.

The space between the back of the bench and the front of the next table shall be at least 15 centimetres (6 in.).

The space in front of the front row shall be at least 2½ metres (7 ft. 9 in.) wide.

The master's platform shall be raised about 30 centimetres (1 ft.).

The wall fronting the pupils shall bear a blackboard.

18. The amphitheatre for physical and mechanical lectures shall be arranged *en gradin*.

The top of each step shall be at least one metre wide; upon them shall be the benches, with backs, and writing tables.

The benches shall be double, and the space allowed to each pupil shall be 60 centimetres (2 ft.) wide.

The passage between the rows of benches shall be 50 centimetres (20 in.) wide.

As far as possible there shall be no passage in the middle of the amphitheatre.

A free space of four metres (13 ft.) shall be reserved in front of the *gradins* for the professor's table and the necessary apparatus.

The profile of the *gradins* shall be so arranged that the visual ray of each pupil looking at the table of the lecturer shall pass above the head of the spectator placed immediately in front of him.

The height of the ceiling above the last step shall be at least equal to one-half the width comprised between the two lateral walls, the walls admitting light to the hall.

To facilitate this disposition the amphitheatre may be placed in the upper story of the building.

19. To the amphitheatre shall be annexed a cabinet for collections, a chemical laboratory for the professor, a chemical laboratory for the experiments of the pupils, a storeroom for glass-ware, and a sink-room for washing.

No communication will be allowed between the physical cabinet and the chemical laboratory.

20. The school shall be provided with a special room for instruction in drawing (sketching from the object and geometrical drawing).

This hall shall be so arranged as to accommodate pupils of two grades.

Its area shall be calculated in the proportion of 2½ square metres (27 square feet) per pupil.

A little room for the storage of models must be annexed.

21. Two or three rooms, according to the importance of the school, shall be arranged near the covered play-ground, for practice upon the cabinet-organ or piano.

22. The workshop shall be placed as far as possible from the school and the class-rooms. It shall be fitted up for working in wood and iron.

In normal schools for girls there shall be a special room for instruction in needlework.

It shall be arranged so as to receive two grades of pupils at the same time.

Its area shall be calculated in the proportion of a metre and a half (16 sq. ft.) per pupil.

24. There shall also be provided dormitories, the chambers of the overseers, shoe-rooms, linen-rooms, infirmary, kitchen, dining-rooms, bath-rooms, and laundry.

25. Dormitories shall never contain more than 30 beds.

They shall be lighted and aired by means of windows fronting each other and pierced in the longitudinal walls.

The height shall be at least 4 metres (13 feet), the depth about 7½ metres (24 ft. 4 in).

They shall have a wooden floor.

The space between the beds shall be at least one metre wide.

The windows shall be rectangular casement windows.

The window-stool shall be one metre and ten centimetres (44 in.) above the floor.

The beds shall be separated by movable curtains.

The wash-bowls shall be in an adjoining room.

Each dormitory shall have a coat-room.

26. The chambers of the overseers shall be arranged at the extremities of the dormitory, with a glass door permitting them to see all the beds.

The servants' chambers shall be near the chambers of the overseers.

27. A large room fully ventilated shall be provided on the ground floor for shoes, which shall be arranged in open pigeon-holes in the middle of the room.

28. The linen-room shall be divided into three parts: one for the storage of linen, arranged with open cupboards, one for the mending and ironing, and the third for the sempstress in charge of the department.

A special room for soiled linen shall be arranged within easy reach of the linen-room.

29. The infirmary shall contain a common chamber, two isolated chambers, a room for the hospital attendant, a cabinet for consultation and medical supplies, a room for the preparation of herb-tea, a bath-room and water-closets.

The infirmary shall, so far as possible, be a distinct and isolated pavilion.

In any case it shall be separated from the other portions of the school.

It shall be easy of access, and occupy the healthiest and most favorably exposed position, sheltered from the noise of the court-yard and the movements of the pupils.

The common room shall be calculated in the proportion of one bed for every twenty pupils, and shall contain about 35 to 40 cubic metres for each invalid in the room.

The nurses' rooms shall be placed between the common room and isolated chambers.

30. The kitchen department shall contain the kitchen proper, a scullery, a servants' hall, a wine-cellar, a fruit-room, a cellar for provisions, and a fuel room.

The kitchen may be placed in the basement if it is sufficiently high and well ventilated. In this case it must be put into communication with the dining-room by means of a dumb-waiter.

Apparatus for the heating of the baths must be provided.

A chimney-shaft for exhausting the bad air and odors must be provided.

The area of the dining-room must be calculated in the proportion of 1½ metres (16 sq. ft.) per pupil, must be perfectly ventilated and lighted, the floor laid in tile or brick, and the part under the tables provided with a carpet or movable flooring.

The table-tops must be of hard wood or enamelled iron or marble.

There must be a special table for the masters.

A china-closet must also be arranged near the dining-room.

32. The number of bath-rooms must be calculated in the proportion of one bath to every 10 pupils.

Each bath-room must be lighted direct from the outside, and must be separated from neighboring bath-rooms by a partition two metres high.

The floors shall be tiled or laid in cement, and provided with an outlet for water.

A mat or grate of wood or cork shall protect the feet of the pupil from contact with the tiles.

The walls and partitions shall be painted in oil paint.

There shall be a special room for foot-baths, and a cabinet for *douches*.

The room for foot-baths may contain at the same time one-third of all the pupils in the school.

These baths may be of stoneware or of metal.

The cabinet for the *douches* shall be preceded by a small dressing-room.

38. The laundry shall be in an outhouse or in an annex in the courtyard.

THE CASTLE OF PHAROS.

ONE of the buildings destroyed at Alexandria was the castle of the Pharos, which was practically the only specimen of Arab mediæval architecture in the city. It stood on the site of the celebrated light-house, by the ancient name of which it was still commonly known. Mr. H. C. Kay says that being at Alexandria in the spring of last year he desired to visit the building, and was fortunate enough to obtain permission to do so, which for a long time past has been rarely granted. His object, apart from motives of interest in the old building itself, was to ascertain, if possible, whether any signs could be discerned of its having been erected on the actual foundations of its more ancient and renowned predecessor. Mr. Kay's inspection was necessarily a very superficial one, but as far as it could go it confirmed him in the belief that some such indications are actually to be detected, and he noticed in a particular spot, near one of the corners of the building, where the wall could be perceived to run in a direction not widely but distinctly different from that of the presumably original foundation, with which it formed a gradually divergent angle. The Pharos was still in existence in A.D. 1326. It became a complete ruin between that date and A.D. 1349. The present building was erected by the Egyptian Sultan Kait-Bay, who reigned from A.D. 1468 to 1496. It may readily be presumed that, according to the uniform practice of the East, the ground continued until that time encumbered with the ruins of its predecessor. The name and title of Kait-Bay were imperfectly but unmistakably legible on one of two much decayed limestone tablets over the entrance gate. The latter was roughly formed by three massive blocks of granite, two of which, standing erect, served as jambs on either side, with the third forming a lintel across the top, the whole presenting a peculiarly Egyptian appearance. A wide passage, turning at an abrupt right angle to the left, gave access to a small mosque, consisting of an hypæthral court, with four arched recesses, one of which contained the kiblah and pulpit. The slight deviation of the walls of the castle from the lines of the ancient foundations may possibly have been made for the express

purpose of placing the mosque in the true line of direction towards Mecca.

The mosque composed but a very small portion of the building. The remainder, rising one story above the other, was occupied by innumerable rooms of various sizes, opening out of long and narrow passages, all empty and for many years apparently disused. Mr. Kay was informed that it was capable of lodging 5,000 men — a statement which was probably not exaggerated. The quarters intended for the commander and other superior officers were easily distinguishable by their superior look, and by some scanty remains of decoration and of ancient mosaic flooring of colored marbles.

On the flat roof rose a somewhat ruinous minaret, the upper portion of which had disappeared, but which contributed much to the picturesqueness of the massive square building, which, with its rounded towers at each of its four angles, formed so conspicuous a feature in the view of Alexandria, on its eastern side, both from the land and from the sea.

It is, of course, highly improbable that the castle will be rebuilt. We must, on the contrary, expect that its shattered fragments will speedily be removed. But it is to be desired that this may not be done without the presence of some competent person, able to ascertain, with some degree of precision, whether anything be really still in existence of the last remains of the widely-celebrated monument that once stood upon the spot.—*The Architect.*

NOTES AND CLIPPINGS.

An Old Stove. — One of the oldest stoves probably in the United States is the one that warms the hall of Virginia's Capitol in Richmond. It was made in England and sent to Richmond in 1770, and warmed the House of Burgesses for sixty years before it was removed to its present location, where it has remained for thirty years.

A Welsh Cure for the Ague. — Being in the new church of Aber, Carnarvonshire, lately, I was looking at the old font, brought from the ancient church there when it was demolished to make room for the present new edifice, and noticing four circular hollows on the rim, suggested that the ancient cover or canopy of the font probably sprang from them or fitted into them. "Nay," said the venerable rector; "my people say that they were caused by scraping away the stone; dust from the church font mixed in water and drunk early in the morning being considered a cure for the ague." — *Notes and Queries.*

Cooling Apparatus. — A new method of cooling rooms by what may be termed a chemical lung, or punkah, might prove useful in India and other tropical countries. The following is a description of the apparatus: Attached to the frame of the punkah is an endless blind, passing round rollers at the top and bottom. The bottom roller is a trough, which contains a solution of a caustic alkali. At every swing of this punkah a wheel and ratchet arrangement causes the rollers to revolve, thus drawing the sheet or blind through the solution. The wet sheet swinging to and fro takes up from the air the sulphurous and carbonic-acid gases, as well as some organic matter. Brought to the test of experiment, this plan appears to work successfully. In a small room, 15′ x 18′, and only 8′ high, fifty jets of a gas-stove were set burning for an hour, with the windows and doors of the room closed, and to make it still further unfit for animal life, a quarter of an ounce of sulphur was burnt in it. The punkah, charged with caustic soda, was here set to work, and in ten minutes the temperature was reduced from 85 degrees to 70 degrees, and the air was made sufficiently fresh and pleasant for twenty persons crowded in the room.

London Parks. — The public parks in London maintained by the Metropolitan Board of Works, not including the royal parks and a few open spaces on the outskirts of the metropolis, contain 1,676 3-4 acres, distributed as follows: Finsbury Park, 115; Southworth Park, 63; gardens on the Victoria, Albert and Chelsea embankments, and in Leicester Square, 14; Blackheath, 276; Hampstead Heath, 240; Shepherd's Bush Common, 8; London Fields, 27; Hackney Downs, 50; Well-street Common, 30; North Mill Field, 29; South Mill Field, 28; Clapton Common, 9 1-4; Stoke Newington Common, 5 1-2; waste land at Dalston Lane and Grove Street, Hackney, 1; Tooting Beck Common, 144; Tooting Graveney Common, 63; Clapham Common, 220; Bostail Heath, 55; Plumstead Common, 110; Shoulder-of-Mutton Green, 4; Wormwood Scrubs, 194.

The Statue of Liberty. — A few days ago M. Bartholdi, the designer of the colossal statue of "Liberty Enlightening the World," which is to be erected near New York in commemoration of the American War of Independence, entertained a party of his friends at luncheon. The table was laid in the lower folds of the drapery of the figure. MM. Gaget, Gauthier & Co, of Paris, the contractors for the erection of the statue, have been obliged to take a plot of ground adjoining their foundry, and covering 3,000 square metres, upon which the scaffolding has been fixed. The interior of the statue contains an iron backing, to which are attached the exterior parts, consisting of bronze plates, about one-tenth inch thick, by four feet seven and one-half square — the largest size made in the trade. The plates are kept together by rivets that are invisible from the outside. The plates of bronze are made to correspond with the contours of the model in an ingenious way. A skeleton of fine wickerwork was first formed, and this was covered with a thick coat of plaster moulded to an exact reproduction of the original. Upon the plaster six-inch templates of thin wood are adjusted, and are then given to the bronze-workers for models. The weight of the figure will be about 150 tons; the height from head to foot about 110 feet, and from the end of the torch raised in the right hand to the feet, 140 feet. The cost of execution will exceed £28,000, and the work will require five years for completion.—*The Architect.*

The Escambia Bay Bridge. — The Pensacola and Atlantic Railroad bridge over Escambia Bay, two miles and a quarter long, was finished August 15, at noon, and trains passed over it at one o'clock.

A Fire-proof Roofing. — A German paper says that a roof can be made fire-proof by covering it with a mixture of lime, salt, and wood ashes, adding a little lamp-black to give it a dark color. This not only guards against fire, it is claimed, but also in a measure prevents decay.

The Temple of Diana at Ephesus. — At a London meeting to raise money to complete the excavations at Ephesus, Mr. Wood, the explorer, told how he discovered the famous temple. No writings existed to afford him the slightest clew to the whereabouts of this wonder of the ancient world; but he hit upon an inscription from the wall of that theatre to which St. Paul would have entered, but "the disciples suffered him not." This described a procession in which certain images were carried from the temple through the city gates. After much search he found the gates, and then at length hit upon the paved way, worn into grooves by the wheels of chariots. Little by little he made progress at the City of Ephesus until he reached the temple of the great goddess Diana. The fragments of friezes and column drums give a glimmering idea of what the whole must have been. They are now in the British Museum.

A Natural Ball-Room. — About a mile from the market town of Adelsberg in Austria, and three miles from Trieste, is to be seen the most wonderful cavern in Europe, and possibly in the world, called the Adelsberg Cave, and which has been explored for a length of nearly 3,000 yards, as far as a subterranean lake. This cavern consists of several grottos from sixty to eighty feet high. The interior resounds with the noise of water, as a little river runs completely through it, forming many cascades on its way, and being finally lost to view in a fissure. This river continues its subterranean course for about eight miles; and after a time, it disappears into the caverns of Laase, whence it emerges as a navigable river called the Laibach. The entrance to the cave of Adelsberg is illuminated by hundreds of candles, and a transparent curtain, composed of large sheets of crystallized limestone, is seen hanging from the roof. The vast hall or ball-room is about 180 yards from the entrance. It is 300 feet long, and 100 feet high, and is adorned with transparent stalactites of every kind of fantastic shape and form. Until the year 1819 this ball-room was the only part known; but at this date the wall of stalagmite was broken through, and a series of chambers exposed to view possessing a cathedral-like appearance, from the stalactites in many instances forming vast columns, by meeting the stalagmites below. In the Adelsberg Cavern numerous specimens are found of the proteus, a kind of lizard that dwells in the bottom of cavern-lakes. — *Chambers's Journal.*

The Atkins Water-Softening Process. — The important question of the softening and purifying of hard water in bulk has received a satisfactory solution in the Atkins process, which promises to be of great public service in these respects. The process is a modification of, and an improvement upon, the Clark system of softening water, which consisted in adding lime to the water to be softened, and allowing the mixture to stand for twenty-four hours in large reservoirs or precipitating tanks before it could be used. In the Atkins process, however, the precipitating tanks are dispensed with and the water can be used as it is softened, the process being continuous and no time being required for it to stand and settle. The process essentially consists in chemically purifying the water, instead of mechanically as in ordinary filtration. In practice a small jet of lime-water is introduced into a portion of the water to be softened and the two are blended in a mixer, whence they flow into a softening tank, into which the bulk of the water is conducted. From this tank the water with the lime in suspension flows into the Atkins rotary disk filters, in which the solid particles are all arrested by an ingenious system of cloth-covered disks placed within a tank, and which present a very large area for filtration within a very small compass. The purified and softened water is conducted from the filters to the storage reservoirs ready for use. The effect of the lime-water is not only to purify and soften the water in bulk, but to cause any clayey matters that may be held in suspension to coagulate, thus facilitating their removal The water passes from the outside to the inside of the filters through the cloth-covered disks, the surfaces of which become in time coated with a deposit consisting of carbonate of lime and impurities. These surfaces are quickly cleaned by means of a series of brushes which are brought into contact with the disks. The brushes, which are fixed on a spindle, are rapidly revolved, as are also the disks, but in opposite directions, the result being that in a few minutes the filters are cleansed and ready for work again. The system has been successfully applied to private water-supplies in several instances, notably at the residence of the Duke of Richmond at Goodwood, and at that of Mr. W. H. Smith, Member of Parliament, near Henley. The first application of the system to a public water-supply is that of the Henley-on-Thames Water-Works, which were recently opened. It was introduced there by the engineer to the water company, Mr. Jabez Church, in consequence of the extreme hardness of the water which is to be obtained from the chalk, and is normally of about nineteen degrees of hardness. After treatment however by the Atkins process the hardness is reduced to nearly four degrees, which means a beautifully soft water. The apparatus is calculated to soften and purify rather more than 100,000 gallons of water per working day of ten hours. The softening apparatus was supplied by the Atkins Water-Softening and Purifying Co., of No. 62 Fleet Street, London. The system has been tried on the London & Brighton Railway by Mr. Stroudley, the Locomotive Superintendent, who is having an apparatus put up to soften and purify between 300,000 and 400,000 gallons of water per day for the supply to the boilers at the company's locomotive and carriage works at Brighton. The practical value of the system is therefore established as regards the treatment of waters containing the carbonate of lime. — *London Times.*

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.]

262,557. DOOR-CHECK. — Richard H. Barnard, Chicago, Ill.

262,558. APPARATUS FOR DRYING LUMBER, ETC. Alvin W. Barry, Corry, Pa.

262,569. PILE. — Henry Case, Brooklyn, N. Y.

262,583. BRICK-MACHINE. — Edward Fales, Keokuk, Iowa.

262,603. MANUFACTURE OF ARTIFICIAL MARBLE, STONE AND TILE. — John W. McKnight, Washington, D. C.

262,611. LATH-TRIMMING MACHINE. — George W. Nichols and William Taylor, Clinton, Iowa.

262,614. BRICK-KILN. — Stephen James Plant, York, Ontario, Can.

262,618. LOCK. — James Roach and Patrick W. Salmons, Terryville, Conn.

262,627. FIRE-ESCAPE. — William H. Souther, San Francisco, Cal.

262,671. SWINGING URINAL. — Clara E. Hooke and George D. Scott, New York, N. Y.

262,698. HANGING SAWS. — Walter H. Sawyer and Rufus J. Phelps, Fort Valley, Ga.

262,714. DOOR-HANGER. — William H. Wilder, Caledonia, N. Y.

262,715. STEAM HEATER OR RADIATOR. — Edwin A. Wood, Utica, N. Y.

662,730. FIRE-EXTINGUISHER. — Robert Briggs, Brooklyn, N. Y.

262,776-777. AUTOMATIC FIRE-EXTINGUISHER. — Charles L. Horack, Brooklyn, N. Y.

262,780. NAIL. — John Hyslop, Jr., Abington, Mass.

262,783. HATCHWAY-DOOR OPERATING MECHANISM. — Ernst August Jacobs, Chicago, Ill.

262,789. SHUTTER-WORKER. — William Kaufman, New York, N. Y.

262,801. CONNECTING THE WASTE-PIPES OF BUILDINGS WITH SEWERS. — Charles A. Loretz, Brooklyn, N. Y.

262,826. STEAM-RADIATOR. — William H. Page, Norwich, Conn.

262,837. FIRE-ESCAPE. — Philip S. Scovel, Bordentown, N. J.

262,840. WRENCH. — Richard Simmons and William Tyack, Beacon, Mich.

262,859. HAND-SAW. — John E. Tyler, Roxobel, N. C.

262,860. SEWER-FLUSHING APPARATUS. — William H. Vibbard and George H. Chandler, Kalamazoo, Mich.

262,861-862. SAFETY ATTACHMENT FOR ELEVATORS. — Frederick W. Voerde, Chicago, Ill.

262,885. REAMER. — Jabez K. Babcock, Phelps, N. Y.

262,887. COMBINED FIRE-ALARM AND FIRE-EXTINGUISHER. — Charles E. Buell, New Haven, Conn.

SUMMARY OF THE WEEK.

Atlanta, Ga.

BUILDING PERMITS. — The following list of buildings now in course of erection in this city and vicinity are being built according to the drawings and specifications of Messrs. Bruce & Morgan, architects, Atlanta: —

Jos. E. Brown, block of stores, brick and galvanized iron, 72′ x 120′, on Alabama St.

W. W. Simpson, stores, brick and galvanized iron, 44′ x 165′.

Capt. N. D. Grant, stores and boarding-house, brick and galvanized iron, 75′ x 185′.

Brick court-house on Hunter St.

Messrs. Adair & Alexander, brick store, 25′ x 185′.

Baptist Church, brick parsonage.

Trinity Church, brick parsonage.

Colored school, two-st'y frame building, 60′ x 70′.

Walker-street School, frame building, three-st'y addition, 40′ x 60′.

Residences for A. A. Shields, W. L. Traynham (2), Dr. H. H. Tucker (2), J. C. Kimball, F. G. Hancock, J. P. Manley, A. P. Adair, A. G. Howell, Col. L. M. Terrell, and W. A. Heath (3); all of wood.

Mrs. Kirbey, brick boarding-house, 50′ x 120′.

G. W. Adair, brick tenement-house.

T. N. Hall, brick residence.

The following are being erected for the clients of Messrs. J. Moser & Lind, architects: —

Smith Building, two-st'y dry-goods store, brick and iron front, 42′, on Whitehall St.

Capt. Henry Jackson, five-st'y brick, stone and iron building, 50′ x 100′, for stores and offices, cor. Alabama and Pryor Sts.

Atlanta Street Car Co., brick street-car shed, 140′ x 150′.

Meakin, brick residence, McDonough St.

Convent of the Immaculate Conception, Loyd St., additions, consisting of a third story and repairs.

Peter Lynch, 2 frame residences, on Foster St.

Col. B. H. Wilson, frame residence, West End.

St. Phillip's Church, cor. of Washington and Hunter Sts., brick and artificial stone building.

Gordon Residence, frame building, on Peachtree St.

The following buildings are being erected by Messrs. Fay & Eichberg, architects: —

Addition to C. J. Weinmeister's hotel.

Messrs. J. J. and M. L. Tolberts, storehouse.

Messrs. Langston & Crane, cotton warehouse.

A. Dittler, storehouse.

J. C. Peck, storehouse.

T. M. Cunningham, storehouse.

Messrs. Treadwell, Armistead & Co., cotton warehouse.

W. P. Inman, cotton warehouse.

Remodelling State Capitol.

Residences for M. Wiseberg, T. L. Langston, Jacob Haas, Moses & G. Kleinert; all of brick.

Additions to the residences of Messrs. George W. Harrison and Jas. H. Low.

Cottages for Messrs. H. C. Stockwell (2), Mrs. Pledger (8), J. Menko, A. Rosenfeld, Samuel Weil, Mrs. Down (2), J. M. Couper, and Jacob Haas (13); all of wood.

The following buildings are being erected by Messrs. Humphrys & Norrman, architects, Atlanta:

Gate City National Bank, five-st'y building, basement and first story of Chicamauga stone, other stories pressed brick with Ohio freestone trimmings, 59′ x 161′.

Atlanta University, three-st'y hall, pressed brick and Alabama stone, 160′ x 200′.

St. Luke's Episcopal Church, half timbered, Queen Anne style, 50′ x 100′.

Mr. Millidge, 3 tenement-houses under one roof.

Messrs. D. U. Speer and Julius L. Brown, brick dwell.

Messrs. R. D. Spalding, M. D. Ellis, C. J. Swift, John Millidge, and J. B. Davis.

Baltimore.

DWELLING. — Mr. George Archer, architect, has completed drawings for a dwelling for Mr. Charles D. Fenhagen, to be built on N. Broadway, 25′ x 82′, three stories and back building; to be built of brick with marble finish; cost, about $7,000.

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

Wesley Church Mission, three-st'y brick building, in rear of n e cor. Eden St. and Western Ave.

H. Classen, 4 two-st'y brick buildings, Charles St., s of Wells St.

John Masson, 5 two-st'y brick buildings, Washington St., beginning at s e cor. of Eager St.

John Masson, 12 two-st'y brick buildings, Eager St., between Washington and Castle Sts.

John Masson, 9 two-st'y brick buildings, Eagle St., between Castle and Chester Sts.

John Masson, 7 two-st'y brick buildings, Chester St., beginning at cor. of Eager St.

Patrick Bradley, two-st'y brick carriage-house, Wilson St., w of Druid Hill Ave.

Boston.

BUILDING PERMITS. — *Brick.* — *No.* 318 *Beacon St.*, Ward 11, for Henry A. Hildreth, stable, 24′ x 31′; N. B. Clapp, builder.

Hawkins St., near Chardon St., Ward 7, for City of Boston, mechanical, 46′ x 48′; J. S. Jacobs, builder.

Wood. — *Unnamed St.*, near Everett St., Ward 25, for Henry W. Longfellow, two-st'y stable, 35′ x 57′; H. M. Perry, builder.

Sumner St., near Gulliver Ct., Ward 24, for Henry L. Batchelder, stable, 20′ x 24′; F. W. Webster, builder.

Roslin St., rear, near Harbey St., Ward 24, for Chas. C. Dunbar, two-st'y stable, 25′ x 32′.

Westerley St., near Western Ave., Ward 25, for James Brown, two-st'y dwell., 21′ 6″ and 26′ x 30′; Christopher Leake, builder.

Ashford St., opposite Chester St., Ward 25, for Isaac Pratt, Jr., two-st'y dwell., 26′ and 34′ x 38′; D. J. Cameron, builder.

Southwood St., near Blue Hill Ave., Ward 21, for J. C. & E. A. Loud, three-st'y dwell., 23′ 6″ and 32′ 6″ x 49′ 6″.

Centre St., near Highland St., Ward 21, for Horace B. Sargent, Jr., three-st'y dwell., 20′ x 36′; Richardson & Young, builders.

Centre St., cor. Highland St., Ward 21, for Horace B. Sargent, Jr., and L. M. Sargent, three-st'y dwell., 21′ x 36′; Richardson & Young, builders.

Savin Hill Ave., near Robinson Court, Ward 24, for Jesse Mann Duncan, two-st'y dwell., 18′ x 30′.

Unnamed St., near Brooks St., Ward 25, for Edward Revett, three-st'y dwell. and manufactory, 25′ x 30′ and 17′ x 50′.

K St., No. 197, Ward 24, for Morton W. Wyman, two-st'y mansard dwell., 22′ x 30′.

Farnham St., cor. Gerard St., Ward 20, for Globe Chemical Co., storage, 30′ x 40′.

Smith St., near Phillips St., Ward 22, for Jeremiah O. Sullivan, three-st'y dwell., 27′ x 31′; Samuel Rantin, builder.

Gerard St., cor. Howard St., Ward 20, for Thomas F. Scanlon, stable, 40′ x 40′; Andrew Anderson, builder.

Whitney St., near Tremont St., Ward 22, for John F. Burns, 2 three-st'y dwells., 25′ 6″ x 26′ 6″; Samuel Rantin, builder.

Rockland St., nearly opposite Wakulla St., Ward 21, for J. V. N. Scults, 6 three-st'y dwells., 20′ and 21′ x 40′; Benj. F. Bean, builder.

Brooklyn.

BUILDING PERMITS. — *Warren St.*, s s, 130′ w Hicks St., four-st'y brick building for "Church Societies;" cost, $7,000; owner, J. Fransioli, 111 Warren St.; architect, A. Pauli; builder, J. F. Nelson.

Green Ave., n s, 400′ w Reid Ave., 8 three-st'y brick dwells.; cost, each, $2,500; owner, Patrick Barrett, 68 Underhill Ave.; architect and carpenter, C. B. Piper; mason, J. Barrett.

Court St., e s, 50′ 6″ n Bergen St., four-st'y brick tenement; cost, $12,000; owner, John H. Newman, 181 Court St.; architect, T. F. Houghton; builders, F. Curren and F. G. Turner.

Raymond St., n e cor. Willoughby St., rear, five-st'y brick factory; cost, $2,500; owner and carpenter, F. G. Smith; mason, C. Cameron.

Lefferts Pl., n s, 360′ e Grand Ave., three-st'y freestone dwell.; cost, $6,000; owner, architect and builder, Benjamin Liniken, 216 Greene Ave.

Hart St., n s, 100′ e Tompkins Ave., two-st'y brick dwell.; cost, $4,000; owner, architect and builder, S. Phillips, 691 Lafayette Ave.

Hancock St., n s, 470′ e Bedford Ave., 3 three-st'y stone dwells.; cost, each, $7,000; owner, architect and builder, S. E. C. Russell, 58 Hancock St.

North Eighth St., n w cor. Second St., four-st'y brick tenement; cost, $10,000; owner, John Brady; architect, T. F. Houghton.

Adams St., No. 91, n s, 133′ 10″ w Evergreen Ave., two-st'y frame dwell.; cost, $2,500; owner and builder, Fr. Herr, Broadway; architect, Th. Engelhardt.

Union Ave., No. 58, being 125′ n Powers St., three-st'y frame tenement; cost, $3,500; owner, Chas. Ferguson; architect, E. F. Gaylor; builders, Marinus & Gill.

Degraw St., s s, 37′ 6″ e Nevins St., one-st'y brick station meter house; cost, $3,500; owner, the Fulton Municipal Gas Co., 342 Fulton St.; architect, J. F. Harrison; builder, R. Deeves.

Kent Ave., s e cor. Rodney St., two-st'y brick factory; cost, $3,000; owners, G. F. & J. A. Simpson, on premises; architect, E. F. Gaylor; builder, Thos. Gibbons.

India St., Nos. 83 *and* 85, n s, 195′ e Franklin St., 3 three-st'y frame dwells.; cost, $4,000 each; owner, Henry Stiles, 115½ India St.; architect, F. Weber; builders, Henry Stiles and Thomas Davies.

Willoughby Ave., s s, 125′ w Tompkins Ave., 5 two-st'y stone dwells.; cost, $3,500 each; owner, Richard C. Addy, 594 Willoughby Ave.; builders, John Softy and Richard C. Addy.

Chicago.

STORE AND OFFICE-BUILDING. — The contracts for a building on the cor. of Wabash Ave. and Jackson St., for A. J. Averill, have been let by F. L. Charnley, architect; it will be six stories and basement, and will cost $60,000.

STORE. — C. O. Hausen has in hand plans for three-st'y and attic store and dwell., for P. Lagone, to cost $10,000.

BUILDING PERMITS. — A. P. Upham, two-st'y brick dwell., 21′ x 57′, 18 Evergreen Pl.; cost, $4,500.

John Arnold, two-st'y brick store and dwell., 24′ x 45′, 299 Mohawk St.; cost, $4,000.

L. L. Barbour, two-st'y brick store and dwell., 50′ x 80′, West Van Buren St., near Leavitt St.; cost, $10,000.

C. Marlow, two-st'y and basement brick dwell., 20′ x 46′, No. 12 Keith St.; cost, $3,000.

James Maher, 2 three-st'y and basement brick stores and dwells., 54′ x 75′, 3042 and 3044 Archer Ave.; cost, $10,000.

W. M. Baker, one-st'y and basement brick store, 30′ x 80′, Emerald Ave. and Thirty-first St.; cost, $4,000.

H. Staderman, three-st'y and basement brick store and dwell., 220 State St.; cost, $3,600.

W. F. Rems, two-st'y and basement brick dwell., 25′ x 60′, 666 La Salle St.; cost, $8,000.

Samuel Shackford, three-st'y and basement brick dwell., 21′ x 44′, 342 North La Salle St.; cost, $6,000.

Wm. Jackson, 2 two-st'y dwells., 34′ x 40′, 1409 and 1411 Jackson St.; cost, $3,500.

Fred. Greely, three-st'y and basement brick dwell., 26′ x 39′, 354 Huron St.; cost, $6,000.

J. C. Bauer, two-st'y brick store and dwell., 22′ x 40′, 1203 Fulton St.; cost, $4,000.

John De Vos, two-st'y brick dwell., 25′ x 48′, Racine St., near Belden Ave.; cost, $4,000.

Wm. Ward, one-st'y brick cottage, 20′ x 48′, Arthington St., near Centre Ave.; cost, $3,000.

C. Johnson, two-st'y brick dwell., 36′ x 44′, 78 Ohio St.; cost, $7,500.

P. McAuliff, two-st'y brick dwell., 22′ x 48′, No. 624 Twentieth St.; cost, $3,700.

Hugh Copeland, 2 two-st'y brick dwells., 24′ x 40′ each, 707 Congress St.; cost, $5,000.

Robert Excell, 4 three-st'y brick stores and dwells., 53′ x 80′, Nos. 68 to 74 Thirty-fifth St.; cost, $20,000.

J. C. Black, two-st'y and basement brick dwell., 30′ x 60′, No. 9 Walton Pl.; cost, $20,000.

Lawndale Congregational Church, 40′ x 40′, 1076 Central Park St.; cost, $5,000.; C. P. Randall, architect.

F. C. Heath, three-st'y brick dwell., 27′ x 60′, 2810 South Park Ave.; cost, $6,500.

Rev. P. W. Reardon, two-st'y brick sodality-house, 31′ x 71′, 2922 Wabash Ave.; cost, $9,000.

J. L. Campbell, two-st'y and basement brick dwell., 34′ x 62′, 373 to 377 South Hoyne Ave.; cost, $8,000.

W. Roemer, two-st'y brick dwell. and store, 22′ x 60′, 699 North Paulina St.; cost, $4,000.

August Meyer, two-st'y and basement brick dwell., 22′ x 52′, n w cor. Wood and Superior Sts.; cost, $4,000.

J. L. Waller, 6 two-st'y and basement brick dwells., 57′ x 119′, 190 to 200 Ashland Ave.; cost, $15,000; E. Bauman, architect.

Nic Holzer, two-st'y brick dwell., 21′ x 40′, 358 Thirteenth St.; cost, $3,000.

M. Meyer, three-st'y brick dwell., 31′ x 35′, 253 Rush St.; cost, $3,000.

Mrs. M. Neuberger, three-st'y and cellar brick dwell., 24′ x 39′, 292 North State St.; cost, $6,000.

D. H. Small, 2 one-and-a-half-st'y brick cottages, 22′ x 36′, Genesee Ave.; cost, $3,000.

J. P. Green, three-st'y and cellar brick dwell., 22′ 6″ x 93′, 3629 Ellis Park; cost, $11,000.

Wm. Thompson, two-st'y brick dwell., 25′ x 31′, 1713 Indiana Ave.; cost, $3,500.

Eich Bros., 6 two-st'y brick dwells., 50′ x 120′, 1074 to 1082 West Monroe St.; cost, $18,000.

J. Mosel, three-st'y and attic brick dwell., 24′ x 60′, 36 Crosby St.; cost, $5,500.

H. Smyth, two-st'y brick dwell., 22′ x 58′, 118 Hoyne Ave.; cost, $4,500.

Jacobson & Tolman, 20 one-st'y brick cottages, 20′ x 36′ each, Dania Ave.; cost, $20,000.

P. Malamy, two-st'y brick dwell., 22′ x 48′, 3141 Wentworth Ave.; cost, $3,000.

Geo. Misch, three-st'y and basement brick shop, 20′ x 80′, Washington St., near Franklin St.; cost, $3,500.

A. Kulp, one-st'y and basement brick dwell., 24′ x 54′, 577 Superior St.; cost, $3,500.

W. J. Breckbill, two-st'y and basement brick dwell., 24′ x 40′, 281 Webster Ave.; cost, $3,300.

Wm. Ryan, three-st'y and basement brick flats, 23′ x 60′, 140 Thirteenth St.; cost, $8,500.

Wm. Hoeppke, two-st'y brick dwell., 24' x 60', 455 Lincoln St.; cost, $3,100.

G. Lempke, two-st'y brick dwell., 24' x 60', 1079 Leavitt St.; cost, $3,200.

E. & L. H. Harland, 6 two-st'y and basement brick dwells., 37' x 96', Webster Ave., e of Clark St.; cost, $20,000.

George Watson, five-st'y and basement brick warehouse, 106' x 175', La Salle & Kinzie Sts.; cost, $70,000.

Real Estate Managers of Chicago Board of Trade, stone building, 173' x 225', on the block bounded by Jackson, Van Buren, Sherman Sts. and Pacific Ave.; to cost $1,000,000; W. W. Boyington, architect.

L. S. Dieler, two-st'y brick dwell., 32' x 95', 23 to 29 Diller St.; cost, $8,000.

St. Malachi Church, 60' x 110', Western Ave. and Walnut Sts.; cost, $25,000; James R. Willett, architect.

D. Hanrahan, two-st'y brick flats, 24' x 64', 964 North Clark St.; cost, $6,000.

C. Sheehy, 2 one-st'y brick cottages, 20' x 50' each; Thirty-first St., near Broad St.; cost, $3,000.

J. Hickson, two-st'y brick dwell., 24' x 50', Hurlbut St., near Belden Ave.; cost, $5,000.

F. Slivik, three-st'y and basement brick flats, 25' x 60', 94 Johnson St.; cost, $6,500.

Sister Vincent, two-st'y brick addition to school, 30' x 65', 199 North Paulina St.; cost, $7,000.

A. Kreuger, two-st'y brick dwell., 21' x 50', 393 Maxwell St.; cost, $4,000.

F. Kreikenbaum, two-st'y brick store and dwell., 22' x 38', 1072 Milwaukee Ave.; cost, $3,500.

Cincinnati.

Depot. — The work has been let for the foundations for the new union depot to be erected corner of Pearl St. and Central Ave.; W. W. Boyington, of Chicago, architect; W. P. Thorp, local superintendent. The following are the contracts as awarded: Limestone work, H. Meiners & Son, $4,300; freestone, John Boyle, $8,900; carpenter-work, W. H. Stewart Sons, $1,300; M. Clements received the contract for the iron sheds, which will be glazed by the Rendle skylight.

Building Permits. — Since the last report the following building permits have been issued: —

Pat. Mahenny, three-st'y frame dwell., State St., near Liberty St.; cost, $2,000.

F. B. Kearney, two-st'y frame dwell., Elm St., between Vine and Chapel Sts.; cost, $4,000.

F. Dorman, two-st'y frame dwell., Dorman St., near Spring Grove Ave.; cost, $3,000.

J. G. Murdock, five-st'y brick factory, Home St., near Fourth St.; Henry Bevis, architect; cost, $4,500.

Andrew Burkhardt, three-st'y frame dwell., Charlton St., between Gest and Clark Sts.; cost, $5,000.

Nine permits for repairs; cost, $5,200.

Denver, Col.

Stores. — John Baker, two-st'y brick business house, 39' x 106', Twelfth St.; cost, $10,000.

Moritz Barth, four-st'y stone business block, 25' x 62' 6". Lawrence St.; cost, $20,000; R. S. Roeschlaub, architect.

Churches. — Central Christian Church, 60' x 84', Broadway; cost, $26,000.

First Baptist Church, Stout St., 75' x 120', brick, with stone trimmings; F. E. Edbrooke, architect.

Warehouse. — E. F. Hallack, brick warehouse, 42' x 200', Nineteenth St.; cost, $15,000.

Houses. — Wm. J. Barker, two-st'y brick residence, East Eighteenth St.; cost, $20,000.

J. W. Timmerman, block of 3 dwells., Twenty-second St.; cost, $8,000; F. E. Edbrooke, architect.

T. Drummond, double two-st'y brick dwell., South Fifteenth St.; cost, $7,000.

J. W. Shoekelton, block of dwells., 53' x 56'; cost, $9,000; J. H. Littlefield, architect.

J. W. Shoekelton, double two-st'y brick dwell., 41' x 52'; cost, $8,000; J. H. Littlefield, architect.

J. W. Shoekelton, 5 two-st'y brick dwells., Glenarm St.; cost, $17,000; J. H. Littlefield, architect.

J. M. Carico, block of two-st'y brick dwells., 33' x 100', Glenarm St.; cost, $9,000.

New York.

There has been little new work projected lately, we hear, however, of preliminary estimates being requested for some large buildings.

Bachelors' Apartment-House. — For Mr. Taylor of Jersey City, and others, a bachelors' apartment house, 23' x 96', is to be built at No. 501 Fifth Ave., at a cost of about $50,000, from designs of Messrs. McKim, Mead & White. The materials will be stone, brick and terra-cotta.

Church. — New plans have been drawn by Messrs. D. & J. Jardine for the Cornell Memorial Church, which is to be built of Ohio stone and brownstone, 77' x 98', and will cost about $40,000.

Building Permits. — *Fourth Ave.*, n e cor. One Hundred and Sixth St., 9 four-st'y stone tenements; cost, each, $14,000; owner and architect, Alfred Kehoe, 259 West One Hundred and Twenty-third St.; builder, John Askey.

One Hundred and Forty-first St., n s, 29' 8" w Morris Ave., 2 three-st'y frame tenements; cost, each, $3,000; owner, Elizabeth Dunn, 347 College Ave.; architect, E. F. Dunn; builder, not selected.

Madison Ave., n e cor. One Hundred and Twenty-fourth St., seven-st'y brick, stone and terra-cotta apartment-house; cost, $104,500; owner, Harvey Murdock, 82 Woodhull St., Brooklyn; architect, H. J. Dudley.

Thirty-third St., s s, 150' e First Ave., six-st'y brick warehouse; owners, Frederick C. Linde, et al., 164 Ross St., Brooklyn; architect, H. J. Schwarzman; builders, Robinson & Wallace.

Seventy-sixth St., n s, 153' w Second Ave., one and two st'y stone church; cost, $40,000; owner, Cornell Memorial Methodist Episcopal Church, 805 Broadway; architects, D. & J. Jardine; builder, E. Kilpatrick.

Fifth Ave., No. 501, seven-st'y stone, brick and terra-cotta apartment-house; cost, $50,000; owner, John D. Taylor, Jersey City; architects, McKim, Mead & White.

One Hundred and Thirty-second St., n e cor. Seventh Ave., one-st'y restaurant; cost, $5,000; owner, John B. Haskin, Fordham, N. Y.; architect, W. W. Gardner.

One Hundred and Thirty-fifth St., s s, 110' w Fifth Ave., 3 four-st'y brick tenements; cost, each, $13,000; owner, Patrick Whelan, One Hundred and Thirty-eighth St., e of Southern Boulevard; architect, J. F. Burrows.

East One Hundred and Sixteenth St., No. 176, one-st'y brick shed; cost, $2,500; owner, R. Huson, 218 East Fifteenth St.; architect, Chas. Baxter.

Jackson Ave., w s, 225' n One Hundred and Fifty-sixth St., two-st'y frame dwell.; cost, $3,000; owner, Clara Decker, 841 Forrest Ave.; architect, W. W. Gardiner; builder, P. P. Decker.

Alterations. — *East Seventy-first St., No.* 101, three-st'y brick extension; owner, Everett P. Wheeler, on premises; architects, Geo. F. Babb and Walter Cook; builders, D. Campbell and Hamilton & Henry.

East Sixty-fifth St., Nos. 41 *and* 43, three-st'y brick extension; cost, $3,000; owner, C. H. Raymond, Grand Hotel, Broadway and Thirtieth St.; architect, F. T. Camp.

East Ninth St., No. 16, general alteration; cost, $4,500; owner, Peter B. Olney, 140 West Forty-seventh St.; architect, C. C. Haight; builders, Robinson & Wallace and C. E. Hadden.

Philadelphia.

Club-House. — The Bachelor Barge Club are having a club-house, 47' x 58' 6", on the banks of Schuylkill River; Hazelhurst & Huckel, architects.

Building Permits. — *Huntingdon St.*, n s, w of Howard St., 7 three-st'y dwells., 13' x 28'; P. Thompson, contractor.

Chancellor Pl., n s, e of Thirty-third St., 11 three-st'y dwells.; 16' x 42'; A. Demmell, owner.

Thirty-second St., cor. Thompson St., elevator, 54' x 72'; Jas. B. Doyle, contractor.

Thirty-second St., e s, between Thompson & Master Sts., two-st'y wash-house, 42' x 74'; J. B. Doyle, contractor.

Filbert St., No. 910, four-st'y store, 17' x 80'; J. B. Doyle, contractor.

Thirty-first St., cor. Master St., three-st'y brewery, 40' x 60'; J. B. Doyle, contractor.

Fifth St., w s, s of Huntingdon St., 11 three-st'y dwells. and stores, three, 16' x 50', eight, 14' x 48'; H. M. Housekeeper.

Fourth St., e s, n of Walnut St., rebuilding building, 50' x 178'; A. A. Campbell, contractor.

Eleventh St., w s, n of Somerville St., two-st'y dwell., 18' x 90'; C. H. W. Keyser, contractor.

Mervine St., e s, n of Somerville St., two-st'y dwell. and two-st'y stable, 18' x 18' and 18' x 30'; C. W. Keyser, contractor.

Esther St., e s, n of Thompson St., two-st'y stable, 16' x 40'; Lewis Wolter, owner.

North Twenty-third St., Nos. 1900 *to* 1950, 26 three-st'y dwells., 16' x 56', on w s; 26 dwells. on e s, 26' x 56'; E. H. Flood, contractor.

Judson St., Nos. 1900 *to* 1950, 26 three-st'y dwells., 16' x 56', w s; 26 three-st'y dwells., e s, 16' x 56'; E. H. Flood, contractor.

Venango St., s s, e of R St., two-st'y dwell., 16' x 40'; D. C. Schuler, contractor.

Corinthian Ave., w s, between Brown and Parrish Sts., 20 three-st'y dwells., 17' x 55'; Jno. McGill, owner.

Fifteenth St., e s, n of Cumberland St., 4 three-st'y dwells., 18' x 60'; Benj. Ketcham, contractor.

West College Ave., w s, s of Thompson St., 2 two-st'y dwells., 16' x 45'; Wm. Peoples, owner.

Fifth St., e s, n of Butler St., 3 two-st'y dwells., 16' x 44'; Jacob Simons, owner.

American St., n e cor. Diamond St., two-st'y storehouse and two-st'y stable, 50' x 119' and 29' x 50'; Eldridge & Stewart, owners.

Third St., s e cor. Willow St., fourth-st'y addition to factory and gable wall, 40' x 70'; Thomas McCarty, contractor.

North Second St., No. 1425, fourth-st'y addition to dwell., 36' x 5'; Thos. McCarty, contractor.

Eleventh St., s e cor. Market St., four-st'y addition to the Bingham house, 44' x 103'; Benj. Ketcham & Son, contractors.

Johnson St., s s, between Germantown Road and Jefferson St., 3 three-st'y dwells., 15' x 34'; Wm. Kohl, contractor.

Terrace St., s e of Cedar St., 2 two-st'y dwells., 14' x 32'; Jno. & David Harper.

Race St., No. 1124, second-st'y addition to stable, 20' x 70'; Geo. K. Halloway, contractor.

Fifth St., s e cor. Eustis St., three-st'y dwell., 16' x 54'; A. M. Greene, contractor.

Palmer St., n s, between Thompson and Belgrade Sts., 5 two-st'y dwells., 13' x 40'; W. H. Rookstool, owner.

Twenty-eighth St., e s, s of Brown St., second and third st'y addition to building, 19' x 50'; Wm. Glass.

Wood St., s e cor. Grape St., three-st'y dwell. and store, 22' x 38'; S. S. Keely, contractor.

Ripka Ave., s e s, between Washington and Hamilton Sts., 2 three-st'y dwells., 18' x 32'; S. S. Keely, contractor.

North Fifth St., No. 2714, three-st'y dwell., 20' x 70'; Frank Gilbert, contractor.

Sixty-third St., w s, n of Vine St., three-st'y dwell., 18' x 48'; Lewis J. Leger, owner.

Pear St., w of Fifty-second St., 3 two-st'y dwells., 16' x 44'; Chas. Christine, contractor.

Paschall St., s s, w of Fifty-first St., two-st'y dwell., 16' x 44'; Chas. Christine, contractor.

Wissanoming St., n w s, between Friendship and St. Vincent Sts., two-st'y dwell., 18' x 40'; Crosta & Ploucher, contractors.

Rochester.

Contracts have been let for the following work: — Improvements to the "Church of the Epiphany;" Pike & Gould, contractors; cost, $4,000.

Improvements to residence of Edward Harris, Esq., East Ave.; Pike & Van Dorn, contractors; cost, $6,000.

Improvements to residence of Alfred Wright, Esq., West Ave.; Kooman & Kusse, contractors; cost, $6,000.

St. Louis.

Building Permits. — Forty-eight permits have been issued since our last report, seventeen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

Henry Stiften, 3 three-st'y dwells.; cost, $10,000; H. Heitmann, contractor.

George Becker, two-st'y store and dwell.; cost, $7,000; H. R. Becker, contractor.

Harrison Wire Co., one-st'y works; cost, $4,000.

Mrs. Wm. McKee, 4 two-st'y dwells.; cost, $20,000; Chas. E. Illsley, architect; Kerr & Allan, contractors.

Louisa Sievers, 4 two-st'y dwells.; cost, $2,500; J. H. Frye, contractor.

Wm. H. Niedringhaus, 4 two-st'y dwells.; cost, $3,400; Aug. Beinke, architect; J. Wharton, contractor.

C. C. Cowers, two-st'y dwell.; cost, $2,700; P. Child, contractor.

James Cummisky, 2 two-st'y dwells.; cost, $5,000; S. C. McCormack, contractor.

Mrs. E. A. Jennings, 2 two-st'y dwells.; cost, $10,000; Geo. Pipe, architect; L. H. Schaffner, contractor.

N. F. Hickmann & Son, three-st'y dwell.; cost, $6,500.

Mrs. M. Mohr, two-st'y dwell.; cost, $3,000; W. Klattus, architect; P. Sauerwein, contractor.

PROPOSALS.

Iron Foot-Bridge.

[At Boston, Mass.]

Office of City Engineer,
City Hall, Boston.

Sealed proposals for building an iron foot-bridge over the Boston & Providence Railroad at West Rutland Square and Durham Street, indorsed "Proposal for building an Iron Foot-Bridge," will be received at the office of the Superintendent of Streets, City Hall, Boston, **until 12 o'clock, M., of Thursday, August 31, 1882.**

Specifications may be obtained at the office of the City Engineer, City Hall, Boston, and the plans may be seen there on and after August 24, 1882.

The committee on paving reserves the right to reject any or all bids should it deem it to be for the interest of the City of Boston to do so.

LUCIUS SLADE,
348 Chairman Committee on Paving.

Artificial Pavement, etc.

[At Washington, D. C.]

Office of the Engineer Commissioner,
Washington, D. C., August 21, 1882.

By direction of the Board of Commissioners sealed proposals will be received at this office **until 12 o'clock, M., Wednesday, August 30, 1882,** for the improvement of various streets in the city of Washington.

The principal items and approximate quantities of work contemplated under this advertisement are as follows: —

Laying granite block pavement, 10,000 square yards.

Grading, 3,600 cubic yards.

Laying sidewalk of artificial stone or asphalt, 10,000 square yards.

Blank forms of proposals and specifications can be obtained at this office upon application therefor, together with all necessary information, and bids upon these forms will alone be considered.

The right is reserved to reject any and all bids or parts of bids.

G. J. LYDECKER,
Major of Engineers, U. S. A.,
348 Engineer Commissioner, D. C.

Sanatorium.

[At Dansville, N. Y.]

Sealed proposals will be received by the undersigned **until Tuesday, the 5th of September, at noon,** for the erection and completion of a five-st'y fire-proof brick building, 272' in length and about 50' in width, for a sanatorium, on the site of the one recently destroyed by fire in Dansville, N. Y. Drawings and specifications can be seen and information had on application to the architects, Warner & Brockett, 62 Powers Block, Rochester, N. Y.

The right to reject any and all bids is reserved.

Acceptable bonds for the faithful performance of the contract will be required.

PROPRIETORS DANSVILLE SANATORIUM.

Limestone.

[At Cincinnati, O.]

The Cincinnati Gas-Light and Coke Company will receive tenders **up to noon, Saturday, September 16, 1882,** for

Eight thousand perches of Blue Hill limestone, to be delivered at "East End Garden," First Ward, running from Front St. to Ohio River, between Main and Spencer Sts.

Five hundred perches of paving-stone, to be delivered between first of October and first of November.

Two thousand five hundred perches of building stone, to be delivered between first of November, 1882, and first of January, 1883.

Two thousand perches of building-stone, to be delivered between first of January and first of March, 1883.

Three thousand perches of building-stone, to be delivered between first of March and first of May, 1883.

Plans and specifications on file at the Gas Office. Company reserves privilege of rejecting any or all bids. 350

Piles.

[At Cincinnati, O.]

The Cincinnati Gas-Light and Coke Company will receive tenders **up to noon, Wednesday, August 30,** for furnishing and placing in position on river front of East End Garden, First Ward, in accordance with plans and specifications on file at the gas office:

Three hundred and sixty piles, from thirty to forty-five feet in length.

Piles to be on the ground ready for use previous to October 1.

Company reserves privilege of rejecting any or all bids. 348