

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XIV.

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No. 398.

AUGUST 11, 1883.

Entered at the Post-Office at Boston as second-class matter.

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THE concluding portion of the investigation into the conduct of the Supervising Architect's office has brought out some testimony which shows how easy it is, in technical matters, to give an unfavorable construction to circumstances which might bear a very different one. The evidence taken was in relation to the heating apparatus for the Chicago Custom-House, and the first witness examined was a disappointed bidder for the work, whose testimony, "stripped of its technical character," is reported by the New York *Evening Post* to have shown in substance that "the apparatus differed in almost every particular from the requirements of the specifications;" that "the iron was not of the required thickness or quality," "the bolts were smaller and inferior," and the apparatus "was not adequate to warm the building." It turns out, from the testimony of the engineer in charge of the apparatus, that this last fault is due much less to the apparatus than to the building, which is so badly constructed that the cold wind blows in through the ill-fitting frames and sashes; but even this, in the *Evening Post's* opinion, "shows that the building is a bad job."

IT would be more fair for the *Evening Post*, if the building of the Chicago Custom-House is "a bad job," to lay the blame upon the earlier Supervising Architects, under whose care it was constructed, instead of connecting it with the subject of the present investigation. In regard to the heating apparatus, we have in another paper a report of the testimony, not "stripped of technicalities," which to the expert conveys a very different idea of the work from that gathered by the editor of the *Evening Post*. From this it seems that the first fault found by the rival heating contractor was that the boilers had ninety-two tubes, instead of ninety-seven, as specified, which, as he said, reduced their heating capacity, as well as their cost. As the arrangement of tubes is a very nice matter in a large boiler, and too many of them may seriously injure its efficiency, we venture to say that a variation of five per cent in an arbitrary number of tubes is properly within the discretion of a heating engineer, and could not be considered in any sense a violation of his contract unless the variation should be proved, by much better evidence than this, to be an injury. Another criticism made by the witness was that the pipes were "of thinner metal than the specifications called for," and it was only on cross-examination that he admitted that the thin pipes cost more than the thick ones, so that the contractors did more than was required of them in this respect, apparently for the sake of quickness in heating, since all experts know that radiation takes place more rapidly and effectively through a thin pipe. The third accusation was even more trivial than the others. The specifications called for hexagonal nuts to the bolts which secured the flanges of the cast-iron pipes, and inspection showed that square nuts were used instead, making a saving, as the witness estimated, of ten per cent of their value. We imagine that there are few persons who have ever used a monkey-wrench on a small hexagonal nut who would not gladly ex-

change that form for the square, at the same price, and it is strange to find an accusation of conspiracy based on the substitution, for an inconvenient and unsuitable form of nut, which was probably specified by an accidental slip, of the usual and best kind. In addition to these faults, the same witness found that certain pipes were shorter than the specifications required, and that the tanks in the attic were of a different shape, and of poorer material, than that called for by the contract. Concerning these matters we may suspend judgment, since we cannot tell whether extra radiating surface in one place may not have advantageously replaced that omitted in another, or whether the tanks may not have made up in capacity what they lost by the substitution of tank-iron for boiler iron, and of a square for an angular shape; but it will do no harm to remember that all the changes were authorized by the superintendent in charge of the building, and that some, at least, of them were necessitated by modification in the arrangement of the rooms after the contract was made.

THE telegraph announces the death of a man whom the daily papers call, perhaps with justice, the most distinguished architect in Europe, the Baron Foerstel of Vienna, whose works, including the beautiful votive church of Maximilian, the Museum and the University, gained for him the applause of the artistic world, together with honors such as rarely fall to the lot of architects. He was an honorary member of all the great professional societies, including our own Institute, and enjoyed, if we are not mistaken, the still higher distinction of membership in the Institute of France. His energetic and useful life was a comparatively short one, as he was but fifty-five years of age at the time of his death, but he will long be remembered as one of the most conspicuous figures in the artistic world during the present century.

A GOOD deal of writing is to be seen in the daily papers just now about the dangers of elevators, and of a kind calculated not only to cause unnecessary alarm, but, by its obvious exaggeration to draw the attention of the reasoning part of the public away from the risks which actually exist. It is true that several elevators have recently fallen, and a reporter in New York seems to have hit upon the idea of going about among the elevator manufacturers to learn from each the defects of the machines made by his rivals. It might be expected that a picture made up by such means would be dark, and in the gloomy descriptions given by the manufacturers of each other's devices all gradations of demerit seem to have disappeared. The truth is that, as with other things, elevator safety-catches vary in certainty of action, as well as in thoroughness of construction, and while some kinds are much better than others, the best may fail under unfavorable circumstances. Persons unfamiliar with such apparatus would be surprised to learn how frequently the safety-catches are called into action, to respond, in most cases, with perfect precision; and failure, when it occurs, is quite as likely to often follow from some settlement or derangement of the posts, or from some other accident beyond the manufacturer's control, as through any defect in the apparatus itself. The Springfield *Republican*, in an editorial on the subject, speaks of a trial of an elevator air-cushion in Boston, where the force of the compressed air blew out the side of the tank at the foot of the shaft, as a "disgrace to engineers, who ought to be able to calculate and provide for the force of falling bodies." The fact is, however, that the Boston trial was made upon an elevator running in a shaft partially enclosed in the basement by a plastered stud partition. The engineer, seeing no difference in appearance between this and the brick walls near it, naturally concluded that the whole was brick, but on the fall of the elevator the frail structure gave way. For all that, the resistance which it presented was sufficient to check the motion of a heavy car, falling from a height of eighty or ninety feet, so that the persons in it were not injured. Of many other safety appliances now in constant use the same may be said. They are constructed by the best makers with great care, and thoroughly tested under all the conditions which they can think of, and so far from "usually failing at the crucial moment," they miss their intended effect only in rare instances.

THE *Republican* quotes from a New York paper the queer opinion that "the man who succeeds in solving this problem must abandon outside appliances." "The brake should be managed from within, perhaps by the elevator man himself." As the *Republican* thinks that the inventors of safety appliances "utterly fail to grasp" "the knowledge that a falling body accumulates a momentum," it would be interesting to learn from its superior wisdom what the velocity of a falling car would be, by the time that the boy in it had succeeded, after the parting of the rope, in collecting his wits enough to pull a lever, or apply a brake in some other way. The elevator manufacturers know by experience that the conductor of the car is almost always panic-stricken at the suspicion of an accident, and often brings upon himself the very fate he dreads by his frantic jerks at the shipper rope; and even the coolest man would find difficulty in groping about for and applying a brake within the twentieth of a second or so, after which nothing in the shape of an appliance attached to the car would be of the least avail. It is a little singular that some of the best safety appliances include a provision for dropping the car at will, by a pull on a handle hanging inside, which disconnects the hoisting-rope, and lets the car fall, to be caught by the safety wedges. If the makers of these thought that their inventions would "usually fail" in action, it would be criminal to put such a temptation to use them within the reach of the elevator boy, but in actual practice this device is found of great value in preventing the car, if the operator should lose control of the machinery, from being either drawn up against the top of the shaft or lowered with dangerous speed to the bottom.

A NEW bridge is to cross the Niagara River within a few months, very near the two suspension bridges which already exist. The new bridge, however, is to be of very different construction from either of the old ones, and will possess an unusual interest as being the first example of the modern "cantilever" system to be completed in the United States, although another is now building in British Columbia which will be finished at about the same time. The principle of the cantilever bridges may be illustrated by comparing them with a structure formed of two overhanging beams, projecting toward each other, with a third beam hung between them. Each of the overhanging beams is supported in the middle upon a pier, the weight of the shore end serving to counterbalance that of the end projecting over the river, together with its half of the additional weight of the intermediate beam which hangs between them. Of course, all the beams, instead of solid pieces, are trusses of steel and iron, of such immense transverse strength that two piers only are required in the entire span of eight hundred and ninety-five feet. The first, and only example of this construction yet actually completed, was the ill-fated Tay Bridge in Scotland; but its advantage in point of economy, the bridge being simply built out from each end until the chasm is spanned, is so great as to lead engineers to regard it with much favor, and the Tay Bridge itself is to be rebuilt in the same manner.

ANOTHER and still more novel form of bridge construction has been suggested for the River Thames. It has long been evident that some better means of crossing that river below London Bridge than is now afforded by the two tunnels must soon be provided, and a great number of plans have been discussed. It is very important to the prosperity of London that the navigation of the Thames, as far as the city, should not be interfered with, and the general opinion seems to be in favor of a high-level bridge in preference to any kind of draw-bridge. The City Architect, Mr. Horace Jones, however, proposes a scheme which would, while providing a low-level roadway, do away with many of the disadvantages of the ordinary drawbridges; and even if impracticable in London, the idea may be found available for other places. The proposed bridge, according to the description, would consist of a main span, covered by immense arched girders, rising far above the river, and two side spans, crossed by ordinary trusses. On a level with these, under the arched girder, would be two other straight lattice girders, hinged at the ends nearest the shore, and meeting in the middle, their outer ends being hung by chains from the arched girders overhead. To open the draw it would only be necessary to wind up these chains, which could be quickly done, when the two halves of the draw would rise,

leaving a wide, clear waterway between them. This could hardly be called an economical construction in itself, but in the case of the Thames at London a great saving would be made in the cost of the piers and approaches by retaining a low level; while if a draw of any kind is to be used, this, which could easily be made to give a passageway a hundred feet wide for the tallest ships, would be infinitely preferable to the swinging draw, with its huge pier in the midst of the channel, its slow movement, and the narrow passage which, at best, is all that can be obtained through it.

A NEW set of building regulations has been prepared for the city of Berlin, but in order to enable the citizens to bring their minds to them at leisure, they are not to be enforced until next year. As in other places, the problem of lofty buildings, particularly for apartment-houses, has engaged the attention of the authorities, but is solved with a facility hardly possible elsewhere, by the simple process of forbidding absolutely the erection of any structure for dwellings more than seventy-eight feet high; or the renting to tenants of more than five stories in any apartment-house. Most houses in Berlin are built around interior court-yards, and after the new rules go into force no court-yard can be built with a less area than six hundred square feet; nor can the smallest dimension in any case be less than sixteen and one half feet. The present law requires that every dwelling shall have one fire-proof staircase, but this is to be improved upon by providing that in all new houses every floor above the second must be accessible by at least two fire-proof staircases.

THE matter of the second Suez Canal seems to be settled for the present, and it must be confessed that of all the persons concerned in the recent discussion, M. de Lesseps comes out with decidedly the best appearance. On the English side, one hardly knows whether the Prime Minister, standing in an agony of deprecation before Parliament to explain a perfectly reasonable and business-like transaction, or the leader of the opposition, with his blustering inquiry, as if the great French engineer had made the isthmus, instead of the canal, "whether M. de Lesseps had the right to intercept the traffic between two seas," presents the more pitiable spectacle; and it is pleasant to turn from the account of the proceedings at Westminster to the quiet common-sense of the persons most interested on the other side of the Channel. After conceding everything that could reasonably be asked of the company in the original contract with the English Government, M. de Lesseps, observing, no doubt with sincere astonishment, the commotion raised in England over the transaction, has, with the utmost courtesy and good feeling, written to Mr. Gladstone to beg him, in the interest of national friendship, not to consider himself bound in any way to carry out the agreement, or even to press it upon the notice of Parliament; saying also that the Canal Company will find elsewhere the money which the British Government had promised to lend it, and proceed at once to complete the second canal; and will, moreover, when it is finished, carry out the same stipulations in regard to a reduction of dues that were promised in the contract. What more than this could be expected of the "obstructor of the passage between two seas," it is difficult to imagine.

A VERY gratifying statement is made to the Government in regard to the present condition of the channel at the Mississippi jetties, concerning which we have had so much conflicting testimony. According to the inspecting officer, there is now a continuous channel from the river proper to the Gulf of Mexico, having a minimum depth of twenty-six feet, and a width of one hundred and sixty feet at the narrowest place. Between the jetties themselves is a channel ninety feet wide, and varying from thirty to thirty-one feet in depth, while at the head of the South Pass the thirty-foot channel is four hundred feet wide. The unimproved passes seem to be gradually closing up, the bar at the mouth of the Southwest Pass having only a twelve-foot channel through it, while the Pass à l'Outre is inaccessible for any vessel drawing more than eight feet of water. The main object of the jetties seems to have been fulfilled, in the gradual improvement of the entire South Pass by the action of the river; the general depth and width of the channel having decidedly increased.

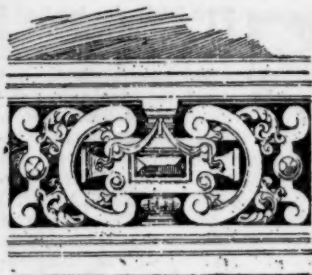
FROM BAYREUTH TO RATISBON.—NOTES OF A HASTY TRIP¹.—XII.

ILLUSTRATION FROM A HOUSE IN PARIS
(reproduced) L. MAGNE, Architect

ON the road from Munich to Ratisbon we pass at least two towns where it would be more than worth one's while to stop. One is Schleissheim—so near Munich, by the way, that it can well be taken in an afternoon's excursion—where there is a splendid Renaissance palace and a large collection of fine old pictures. The other is Landshut, a small town lying in an open country but at the foot of wooded hills. It is full of monuments of earlier periods but its great attraction is the Martinskirche—which is one of the finest extant examples of brick building in all Germany, begun in 1492 and finished about a century later, its architect being Hanns Stethaimer von Burghausen, to whom are also credited many excellent works in other Bavarian cities. It is a large *Hallenkirche*, said to be finished with a greater wealth and nicety of detail than most of the brick churches in the neighborhood; but its great glory is its extremely bold and lofty spire, which measures four hundred and forty-three feet, and is therefore exceeded in height by less than half a dozen existing spires, whether old or new. Even from the railroad it is very striking and, apparently, very well proportioned—seeming all the taller, rising as it does from the flat plain and in the midst of only a little city; but we had no time to give to its examination, barely enough being left of our holiday to grant us a glimpse of the greater marvels of Ratisbon.

And a marvellous place it is indeed. Full as all these German towns are of historical mementoes, far back as goes the mystery of most of them, and crowded as this history is with picturesque events and famous figures, the life of most seems short and barren if compared with that of Ratisbon. Nowhere in Germany is historical knowledge more important if the student would taste the full flavor of the spot. Nowhere else are the monuments of all ages so entwined with human life-histories, or mixed together in a confusion so inextricable to him who is not an expert in the traces of architectural styles and in the dates and names of times gone by. Furnished with such information weeks might be spent in Ratisbon with ever growing delight and ever growing knowledge; but only a typical German *Historiker* could be expected to have his material all at his finger's end in such a place. Even the exceptionally well instructed foreigner will find that he knows only just enough to perceive the main outlines of Ratisbon's history, and the average tourist must resign himself to studying most of the monuments for their own intrinsic sakes alone. Even thus he will have plenty to occupy and to attract him. I know of no one city in Germany where a student might better come than here to see traces of every building epoch from the days of the Romans to our own. Few examples, perhaps, are of the highest possible artistic order, but many of them are most beautiful; all are very interesting; we get fragments of very early periods such as are hardly to be found elsewhere; and perhaps the most instructive lesson of all is found in the noting the way all times and styles are mixed and mingled together, showing that in its days of truest life architecture was a living useful art, which its builders bent to their immediate purposes and needs, caring little for the intact preservation of older monuments, but caring still less to destroy or renovate these in order that the result might be all of a piece. What was good enough to use they left as it was, and the new was built in the fashion of the day with no thought of unity or even harmony. Of course this is a truism and can be proved from almost any European city; but I never saw it so fully, so convincingly proved, or with so many diverse elements as here. The aspect of the town is very different from that of Würzburg, which I have described as being a striking architectural medley. It shows profuse remains of much earlier days than those which are prominent in Würzburg, and these give its general character to the town, while at Würzburg the general character is given by the seventeenth and eighteenth century buildings which so abound. These are not absent in Ratisbon but are inconspicuous. Much as later builders have done to the city its general effect is in many streets probably more nearly that presented by a town in late Romanesque or early Gothic days than we could easily find elsewhere. I may add that one is fortunately able to supplement one's own lacking historical knowledge by means of a good local hand-book written by Count von Waldersdorff, and his volume is still more useful as a guide amid the labyrinths of Ratisbon's antiquities. Architectural students seem to have been rare in the place, for no one is able to give a very clear direction as to where to find the chief objects of interest—still less to suggest what these may be. Without enough knowledge of German to follow the learned Count's clear little book the traveller must be lost indeed in such a town as this.

Curiously enough the foreign name of the city—Ratisbon in English and something similar in every other language except German—is its oldest historical appellation. It was called *Radasbona* by its first, apparently Celtic, founders. Adjoining it the Romans built a camp

which they called *Regina Castra*. This appellation has been turned into the German *Regensburg*—probably because the original town was destroyed in the barbarian inroads and the newer one grew up around the Roman site. Marcus Aurelius is mentioned as having repaired the fortifications of this last, and from his day to our own there are few years when history has not something to tell us of Ratisbon. In the seventh century the body of the martyred missionary St. Emmeran was buried here and one of the chief churches still bears his name. Charles the Great is a familiar name in local chronicles; and the last of his German descendants, Lewis the Child, died here in 911 and was also buried in the church of St. Emmeran. Not a local duke, not a German emperor of later days but sojourned here, or fought, or sat in council, or was in some way bound up with Ratisbon's life. Henry II, whom we already know as the founder of Bamberg, was as active here in the far south, richly endowing the cathedral. The crusaders passed through more than once. It became one of the foremost of the free imperial towns and the favorite place, as every one knows, for holding great imperial assemblies—the *Reichstags* of those days. Many an emperor was here elected, many a one here crowned or married. And when we come down to the Napoleonic wars it is the same thing—Ratisbon is always coming to the front, always playing a part of great importance as the chosen seat or assembling place of the powers that have been or that are. Only in the present century, since the city's independence has been lost, and it has become merely one among the many towns of Bavaria, does the lively picturesque chronicle cease. To-day the place is quiet enough. It is hard to believe it was the very centre of aristocratic military life in Southern Germany for so many years. It was Sunday when we arrived and we walked through the chief streets, to find them, it is true, well filled with people; but it was a curiously provincial looking crowd. No one seemed above the rank of peasant or small provincial. There was not a sign of wealth or of enterprise, still less of aristocratic life.

Ratisbon is off the highway of commerce to-day and has no university to keep it alive like Würzburg. It was the beloved town of princes and kaisers and we see how entirely it owed its importance to them, seeing how entirely it has died into obscurity now that their days are practically over. In my introductory chapter I said, I think, that Ratisbon looked like a sulky disrowned monarch, and I know of no better illustration. The narrow, gloomy streets, the old, old houses which, though color-washed and modernized as far as possible, still look stern and mediæval enough with their small windows and their great round-arched doorways, would need a far brighter population than that of to-day to enliven them. I don't doubt the town once looked gay and brilliant enough, but to-day it is as gloomy looking as one well can picture. It has not the dull placid deadness of provincial towns which have not a very brilliant past behind them. It seems, I repeat, distinctly, almost oppressively sulky, brooding, and dispiriting to the visitor. All the gay pictures his imagination calls up but serve to increase the dismal effect of the present. There is a sort of banquet-hall-deserted look about Ratisbon unequalled in any other town I have ever seen which is not in the least ruined or fallen into material decay. But this the student will soon forget when he comes to examine its treasures in detail. Or perhaps, like ourselves, he will delight in it, preferring the fine historical flavor of the depression of spirit it induces, to the commonplace jollity he may feel in more cheerful, more modern towns. Perhaps I am insisting too much on generalities, but it is because this general effect of Ratisbon is one of the most interesting of its qualities. It has a stronger individuality, a more peculiar local color, so to say, than any town I know. It casts its own mood over the visitor so instantly, transports him so entirely into a past age or into sentimental regrets at the disappearance of that age, that he can hardly believe that twelve hours ago he was in the hideous, but cheerful, crowded, cosmopolitan streets of Munich. To live in Ratisbon would be the most awful of fates—to stay there a few days and let the grave-like historical aroma of the place possess one's soul, would be an experience worth the getting. It is the tomb of the old German Empire, and gives one much the same feeling that is given by some splendid mortuary chapel fallen into oblivion and neglect. The royalties are dead—that is depressing enough; but no one cares whether they are dead or not, and that is worse. No one thinks of them or looks at their relics but ourselves; the outside world goes on its merry way quite unconcerned. This is something the feeling we have in Ratisbon, where we did not see a single foreign tourist, and where we felt, in trying to study its monuments, a little as though we were prying into desecrated sepulchres.

Our hotel stood in an irregularly shaped little square into which streets ran at every angle. It was the same old *Goldenes Kreuz* where Charles the Fifth was wont to stop, and where in 1547 his famous son, Don John of Austria, was born to the daughter of his host—all of which is duly related in a curious poetical inscription painted on the front of the house. From this square we start to seek first the cathedral. Our way takes us along a very narrow street bordered by tall houses portions of which at least are of great antiquity. The name of the street is *Zum Goliath* and comes from an immense fresco of the giant Goliath which covers the front of one of its houses. The weatherworn relics we see to-day are from a modern hand, but the original painting is said to have been executed in 1573 by a painter named Bocksberger who decorated the Rath-Haus and St. Emmeran.

The Cathedral stands on a square and is lifted on a high foundation

¹ Continued from page 40, No. 306.

in the most fortunate manner. All its sides save the north can be seen well from the street and the latter from a garden which contains the ruins of cloisters and older structures mixed together in the most confusing manner. The west front is too well known to need description. Its faults of design—its multitude of small features and lack of dominant motive or emphasis—are even more apparent, however, when we are in face of it than when we study reproductions. The present structure was begun in 1273, and to this century belongs the apse with its immense windows. The southern side dates from the fourteenth century, but the façade only from the fifteenth, not having been completed, indeed, till after the year 1500. The great towers are the work of our own generation, having been completed in 1871 after old designs. They are in such perfect harmony with the older portions, not only in form and detail but already in color, that it is with difficulty we realize their newness. I know of no modern addition to an ancient church which seems so perfectly satisfactory as these towers at Ratisbon. If the west front were equal in design to the rest of the building few churches in all Germany could surpass it. Even here some of the details are charming in themselves and I must not forget to mention the porch, which is too small for the façade, but with its triangular plan and double entrance arches is very lovely. It is the interior, however, for which one cares the most. Strictly judged,—by the standard, for example, of the most perfect French churches,—it has faults and deficiencies not a few. It is criticised for its proportions as well as for its details by more than one writer, but the fact remains that it is among the most delightful and poetical of buildings. Its pictorial charm is perhaps its greatest title to admiration. As in the Lorenzkirche of Nuremberg, the painter and the lover of the picturesque in architecture will be more enthusiastic perhaps than the purely professional student. The color of the interior is marvellously warm and mellow, and it has apparently never suffered much at the hands of the restorer. The light is very rich and the glass windows, though not absolutely of the finest periods, have, taking their number with their beauty, no equals in South Germany. The nave is almost as wide as that of Cologne though much less long. Each aisle ends in a polygonal chapel, and is not continued around the choir. The transepts have no projection beyond the walls of the aisles. These arrangements, together with the fact that the height of the nave is not great, judged by that of French examples, combine to give an expression of breadth as opposed to height or length which is the chief fault found with the building by the purists. But it is only the purists, I think, who feel justified in cavilling. The triforium and clerestory are finely designed. The windows of the latter are very spacious and some of their ancient glass is still in place. The lack of a good west window is felt, however, as much inside the church as out, and the smaller ones which take its place are filled with vile modern glass which looks for all the world like an old-fashioned ingrain carpet in crude tones of green and red, and yellow. This, however, is but a small blot, and when our eyes have once found the apse which, together with the clerestory windows of the transepts, contains most of the old glass, we forget all faults that may exist in other portions of the structure. The apse is five-sided and the three wide central divisions are simply open walls of tracery and glass with no solid spaces whatsoever. The design does not show the usual unbroken tall lights, but a succession of three rows placed one over the other. That is to say, we have first, broad square-headed openings to which the tracery gives the pointed form; above these comes a narrow gallery—a triforium, so to speak—of many little arches also filled with glass, and above this again, great pointed openings or clerestory lights. It is a most fortunate arrangement when we remember that the breadth of the walls is very great as compared with their height. No plain spaces of wall are introduced and yet architectural stability of appearance is secured. To further enhance this the lower range of windows is set back a little in niches the fronts of which are filled with open tracery. The upper, or clerestory, range of lights is continued along the side walls of the choir, thus uniting it admirably with the open lightness of the apse itself. The glass, as I have said, is not of the very best period; it has not the deep gorgeousness of Chartres or of the roses in the transepts at Cologne. But it is true stained and not painted glass and is largely from the first half of the fourteenth century when design was still good, and color, though lighter in tone and less striking than before, was still exquisite in beauty and harmony. Some of the side windows in the choir are not perfect in color, a rather disagreeable dark blue being prominent. But the aisle chapels show some exquisite pieces of *grisaille* work, and the apse is, I repeat, quite perfect in its way—all its glazing being, I believe, of the fourteenth century. A more enchanting piece of art work, a more impressive, a more bewilderingly fascinating I have never seen. One lost the thought of how it had been executed, by masons and glass-workers with mere brute materials, and gazed at it as at some marvellous, unexplained vision in which human hands could have played no creative part.

M. G. VAN RENSSLAER.

OLD BELLS FROM CUBA.—The brigantine *Julia Blake* has discharged at Dickinson Street wharf a number of curious old bells which have been cracked in the service of the Catholic Church on the island of Cuba. Every year about this season these old and useless bells, many of them cast hundreds of years ago in Italy and Spain, are collected in Cuba by a gentleman doing business with Philadelphia, and shipped here to be disposed of at the market rates for old bronze. Many of the bells are fine specimens of the best workmanship of Europe's oldest and most celebrated foundries. — *Philadelphia Record*.

WATER-CLOSETS.¹—XVI.

HOPPER-CLOSETS.



FONTA CHÉRENG. FRANCE

UNDER this heading I have thought it best to group all closets that have a simple bowl and no mechanical device other than a water-seal between them and the soil-pipe. (Article IV, No. 373.) This branch of the subject may with advantage be treated under the two types of long and short hopper-closets.

The long hopper is connected with a trap which is placed beneath the floor, while the short hoppers have their trap, which is often formed in one piece with the bowl, placed above the floor.

Long Hopper-Closets.—This type of closet being apparently the simplest form, we would naturally expect to find it the earliest kind put into use, but although this may have been the case there is no evidence to that effect; and if it was so, it was considered until recent years too simple to put on record.

The opportunity for invention in this class is limited to the shape of the closet, the shape and position of its water-supply device and flushing-rim, or to the manner adopted for ventilating it.

Long hopper-closets are manufactured by all the firms making plumbers' supplies, and may be obtained of iron, plain, painted or enamelled, as well as in solid earthenware or porcelain.

The most common form is what is called the Philadelphia hopper. This has a bowl at the top, which suddenly changes to a diameter about the size of the soil-pipe. This closet is the cheapest and most objectionable form of its class. The sides are liable to become foul, the water being introduced in such a way that it can only flow around the bowl in a stream insufficient either to cleanse the sides of the bowl, or to empty the trap properly. The trap is connected with the bowl just below the floor line.

Foley's Closet.—A good type of an improved form of long hopper-closet was invented in 1883, by J. Foley. This closet as well as



Fig. 159.

Philadelphia Hopper.

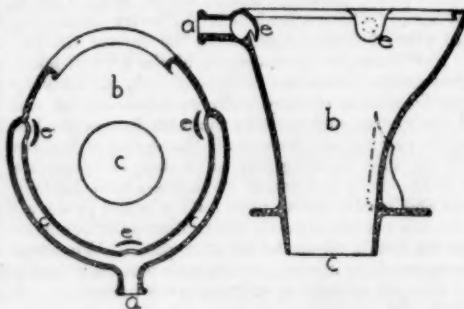


Fig. 160.

Foley's Closet.

Fig. 161.

a, Inlet for water.

b, Bowl.

c, Outlet.

e, Fans.

This conductor extends about half-way around the top of the bowl. The water is admitted to the bowl through three openings, one being at the back and one on each side. The water is distributed over the surface of the bowl by means of fans, instead of a flushing-rim, as is the case in other closets of its form. I think a good flushing-rim washes the bowl more thoroughly than any arrangement of fans.

Demarest Long Hopper.—The long hopper-closet furnished under this name by J. L. Mott & Co., is either round or oval in shape, and has one of Demarest's patent flushing-rims, the same that is used on the Hygeia closet (Fig. 138). This is in one piece of earthenware, and forms a very neat and effective closet when supplied, as it is intended to be, by a tank or cistern.

Myers's Niagara Closet.—A. G. Myers, of New York, manufactures a closet of this type and class. This hopper has Myers's patent zigzag flushing-rim, described in connection with the same firm's "All China Closet" (Fig. 155). It is useless to enumerate the many different closets which are



Fig. 162.

The Niagara Closet.

a, Bowl. b, Outlet. c, Flushing-rim.

¹ Continued from page 28, No. 395.

similar to the ones named. All the prominent firms in England and America manufacture closets which vary from the ones illustrated only in the mode of flushing, or in a slight variation in their form. The long hopper-closet is the best form for exposed situations, where it is necessary to place the trap some distance below ground, according to the severity of the climate. It is necessary in a case of this kind to have the supply-cock placed at the same distance below the surface, opening it by means of a long key or rod.

Maddock's "Wash-Out" Closet.—The Maddock's "Wash-Out" closet is of the long hopper class, and has a projecting lip formed on the upper and front part of the rim, to better adapt it for use as a urinal.



Fig. 163.
Maddock's Hopper.
a, Bowl.
b, Flushing-rim.
c, Outlet.
d, Projecting lip.

Rhoads's Closet.—The Rhoads long hopper-closet was invented in this country in the year 1877. This closet is intended to be used without either a wooden casing or seat, in this manner avoiding the accumulation of, or collections of filth on, in, or behind the wood-work. A closet arranged in this manner is excellent for use in hospitals and prisons. In the first case the wood-work might absorb and communicate infectious diseases, in the latter case the wood-work would become foul from careless usage.

A large number of this form of hopper-closets have vent-pipes attached to the lower part of the hopper just before it is connected with the soil-pipe or trap. Among closets with the vent, may be mentioned the "Worcester" closet, and I have been informed by Mr. O. W. Norcross, that it was in use in the city from which it takes its name a number of years previous to the year 1876. This and a vented closet invented by R. D. O. Smith, of Washington, D. C., are described by Prof. Clark in his articles on "Modern Plumbing" (*American Architect*, 1878, No. 140). In these closets the arrangement of the vent is for the same purpose, and in principle they seem to be identical. The receiver is a decided objection in the Smith closet, acting as a collector of filth: it is almost as objectionable as a receiver under a pan-closet.

The intention was to use these closets without a trap, in which case the vent near the soil-pipe, as in the Worcester closet, would be advantageous; but they are also intended to act as a vent for the room: for this purpose the Smith closet would have a slight advantage.

The Philips Closet.—In 1882, a closet was invented which is a combination of the Worcester and Smith closets. The bowl is formed separately to set into a small hopper. The vent-pipe starts near the floor, runs along the side of the hopper, and has an opening into it near the bottom of the bowl. This closet instead of having a metal hopper into which the bowl is set with the same objectionable

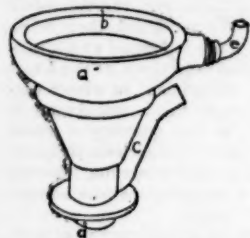


Fig. 165. — Perspective.

Philips Closet.

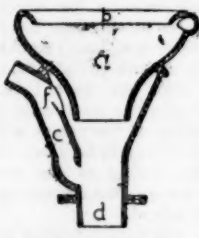


Fig. 166. — Section.

a, Bowl. b, Flushing-rim. c, Vent-pipe. d, Outlet. e, Supply-coupling. f, Upper opening into vent-pipe.

putty-joint described in connection with the pan-closets, has the bowl-hopper and vent-pipe made in one piece of earthenware.

Watson's Closet.—Another closet of this kind, designed by Watson, is so arranged, by curving the outlet from the bowl, that the trap and its contents will be out of sight. This closet has a vent or a



Fig. 167. — Oval Bowl.

Watson's Closet.

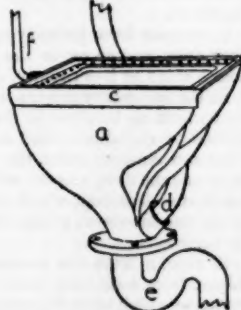


Fig. 168. — Square Bowl.

a, Bowl. b, Vent. c, Flushing-rim. d, Trap. e, Supply.

socket for a vent-pipe just before it joins the trap or soil-pipe. The bowls of this closet are made oval or square, and are much larger than

this portion of the closet usually is. They can thus be used as slop-hoppers or urinals to better advantage than if the bowl were small.

There is no objection to using a vent-pipe in the position shown in the preceding closets; and it might be found advantageous in taking off odors from the room, or odors created while some one was at stool. It must be remembered that a vent-pipe can never be a substitute for a proper siphon-trap under the closet. Patentees sometimes claim that there is no further necessity for a trap, as the vent-pipe opening into a hot flue would carry off all noxious gases generated in what Mr. Eardley F. Bailey-Denton¹ properly calls the inside sewerage system of the house.

The purpose which a vent-pipe of this kind is intended to fulfil—to carry off odors from the closet bowl or room—would be better served by an annular ring with slots in it, extending around the top of the bowl, and connected with some heated flue or pipe, and made either of metal separate from the closet, or of earthenware formed in one piece with the bowl.

Fowler's Closet.—Baldwin Latham describes a novel form of long hopper-closet in the one designed by Fowler. The novelty in this closet consists in the trap being connected with the drain-pipe from the yard, sink, wash-basin, or other fixture.

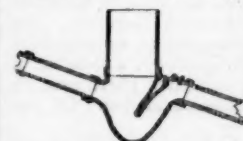


Fig. 169. — Fowler's Closet.

a, Hopper. b, Trap. c, Drain. d, Inspection-cover.

is to be preferred. It has less distance between the bowl and trap, and thus less surface to become foul.

It appears to have been conclusively proved by the experiments of Messrs. Edw. S. Philbrick and E. W. Bowditch made under the auspices of the National Board of Health² (see *American Architect*, No. 350, 1882, p. 123), that the momentum of the water created by the distance between the top of the bowl, and the water in the trap was sufficient to force sufficient water out of the trap to break the seal. The vent-pipe (2") seems to have very little effect in preventing loss of seal by momentum, which must not be mistaken for siphon action. So it can be seen that a closet of this kind might lose its water-seal, and the party using it be none the wiser. The trap is such a distance from the closet seat, that it is impossible to see whether the trap has lost its seal or not.

THE SEWERAGE OF PARIS.—I.



THEODORE BARRIERE
TOMB OF THEODORE BARRIERE - CEMETERY
PERE-LACHAISE PARIS FRANCE. ARONT

AN important technical commission has been employed during the past year in considering the best manner for relieving the city of Paris of its renowned odors—odors which

prevail not only in the public streets, but almost universally within houses of all classes. The projects under investigation are of two classes: one proposing the entire removal of faecal matter and household and industrial wastes by sewers (*tout à l'égout*); the other proposing the emptying of vaults and cesspools by improved processes, or the removal, by the Berlier or Liernur systems, of foul wastes only, conveying these to suitable points without the city, and then converting their organic contents into artificial products, to be used for agricultural or chemical purposes.

At present every house has its cesspool or vault, in which all waste organic matter is retained for long periods, during which its fermentation acts as a source of great contamination of the air, and, presumably, of a serious infection, originating epidemics of typhoid fever and other zymotic diseases. The Liernur system of daily removal by

¹ A Hand-book of House Sanitation; Eardley F. Bailey-Denton, London, 1882.
² Also in *Sanitary Engineer*.

pneumatic process would withhold from the vaults the solid matters of kitchen waste, and the total products of the water-closet, leaving the liquid kitchen wastes to flow to the present sewers. The Berlier system would remove all household wastes, but the solid portions only after they had, through putrefaction, assumed a liquid form.

The discharge of all wastes directly to the sewers would lead to the entire suppression of vaults, cesspools, and other seats of deposit within the habitation. This complete removal receives the approval of the best authorities on the subject; but in Paris it is met with the difficulty that most of the sewers — all except the large collecting sewers — are so large, and carry such limited flow, as to cause deposits and local putrefaction, which would only transfer to the sewer and to the street the offensiveness now originating in the house and in the cesspool. There is the further difficulty that only a relatively small portion of the rapidly growing city is now provided with sewers of any sort: a recent report of the Director of Works estimates the length of unsewered streets at about 220 miles, requiring for construction, if the existing system should be extended, an outlay of seven million dollars.

These facts are now being carefully considered and discussed by the Technical Commission, which has ordered the trial, on an extensive scale, of the system of sewerage carried out in Memphis. The latest feature of the discussion, which has been going on actively since November last, is a paper submitted by M. Vauthier, a member of the Commission, and also of the Municipal Council of Paris, read on the 28th of March, 1883, before the first Sub-Commission. Of this paper we furnish the following translation:—

The exposition¹ made by M. Poutzen, C. E., on the 10th of last January before the Second Sub-Commission, on the subject of the system of removing water-closet matters and household wastes, that Mr. Waring applied for the first time in the city of Memphis, United States, seems to offer a new solution of the question of the sanitary improvement of Paris (*de l'assainissement de Paris*).

The greatest difficulties that arise, not only from the universal discharge of water-closet matter into the sewers, but henceforth, also, in connection with the maintenance of the sewers in a proper state of cleanliness, seem to relate chiefly to the *primary* sewers of the system; that is, to those which begin in the streets in which they lie, and which M. Humblot, Engineer-in-Chief, calls the *direct* sewers. According to the ideas and mode of construction followed up to this time in Paris, these direct primary sewers are always of rather large dimensions. The invert has a width always of 40 centimetres, and lately we have had occasion to see, in a number of sewerage projects submitted to the Municipal Council, that the tendency is rather to augment than to diminish the size. In a great number of these projects for primary sewers or for sub-main sewers having the same character, the original "Type 12" has been supplanted by "Type 13," which carries the invert from 40 centimetres to 50 centimetres (16 inches to 20 inches).

This tendency is understood if we consider the notion which has thus far controlled the establishment of large sewers (*galeries d'égout*). Indeed it seems to be economical reasons only that have prevented a further enlargement. These sewers are convenient subterranean passageways, where the hand of man is considered an indispensable auxiliary to cleansing, and where there may be placed the bundles of wires for telegraphs, telephones, etc., and pipes for the supply of water. For a long time the house branches have been constructed according to the same ideas, being intended to be utilized as passageways in the emptying of vaults, etc.

But the better these primary sewers satisfy the *desiderata* in view of which they have been constructed, the less are they adapted to receive, without inconvenience, faecal matter and household wastes.

The water used in washing the public streets — the only water on which we can depend for cleaning the sewers, in view of the intermittent character of the rain-fall — produces only a momentary current. Some portions of the sewers indeed escape even this street water and the rain-water — those parts which are above the first inlet of the sewer, when this is inclined in the same direction as the street, as is most frequently the case. It would doubtless be possible, by delivering water into the sewer which had been used for washing the gutters, to remove this last objection; but if it were proposed to change the present intermittent current to a continuous one, we should be obliged either to employ an exaggerated amount of water, or we should secure only an insignificant current.

This vice of the primary sewers has already struck everybody. It has been proposed to correct it by establishing a reservoir at the head of each sewer; but we are always met by the objection stated above: either we must use a great amount of water with this special object, or we shall have but an insufficient palliative.

The defect indicated is fundamental. It depends essentially on the fact that the primary sewers are intended, as are the others, for passageways for workmen — not only as channels for the removal of water. The invert is too large, and it is in vain to reduce it by adopting, as at Brussels and in London, the oval form. This would only render walking more difficult, without essentially ameliorating the conditions of the flow of water.

The fact cannot be disguised: in the primary sewers there is a contradiction between the two functions. It is impossible that sewers of the Types 12 and 13, for instance, having, so far as current is concerned, to depend on their own supply, should not retain in their inverts, whatever may be their inclination, all or much of the substances

delivered to them by private drains. The difficulty is augmented if through the inlets these sewers receive sand and other heavy detritus from the public streets. The best plan is, when one is confronted with a system that is fundamentally defective, to change it completely rather than to attempt by ingenious devices to correct it.

What has just been said of these primary sewers is applicable, with more force, to private drains.

Hear what M. Humblot, Engineer-in-Chief, says in his exposition of the 15th of December, before the First Sub-Commission:—

"On leaving the house," he says, "we find the private branch drain leading to the public sewer the waters of the property."

"In these branch drains the outlet-pipe generally ends at the exterior line of the property, and terminates in an hydraulic trap which cuts off all communication between the air of the sewer and that of the house."

"Sometimes the pipe is extended to the junction of the private branch with the public sewer."

"Under the first arrangement the house waters soil the invert of the branch drain; and when the quantity of water and the inclination are insufficient, they deposit ordure which gives out offensive odors. We may imagine," says M. Humblot in passing, "how great would be the infection if faecal matters were thus arrested."

"Under the second arrangement the pipes are often obstructed, especially when their inclinations are slight and their outlets subject to periodic or almost constant submersion by the waters of the sewer, which often deposit solid matter in the mouth of the pipe. The workmen employed by house-owners to remove these obstructions often succeed in doing so only by breaking the pipes. This difficulty, which is rare," M. Humblot finally says, "in sewers deep enough to allow the house-drain to reach them with a steep fall, is almost inevitable in those central districts where the inverts of the sewers of the old type are at little depth below the surface of the street; in these central quarters the outlet pipes generally stop at the side of the house."

So far as private drains are concerned, we have nothing to add to these suggestions. Let us remember only the circumstance that the hydraulic traps have to be broken to effect their cleaning. This is one of the objections to complicated apparatus, and this complication is made imperative by the need for withholding from the house the vitiated air of the sewers.

We might stop our citation here, but it will not be without use to follow M. Humblot a little farther. He goes on, in the apprehension with which the delivery of faecal matter into the sewers inspires him, to confirm, with regard to the primary sewers, what we have already expressed.

"Now we see," he says, "these matters delivered into the public sewer. If this is a direct sewer, that is to say, beginning in the street in which it is laid — and this is the case for more than one-half of the sewers — it generally receives only the water of the houses, for its inclination is almost always in the direction of the inclination of the street, and the water used for washing the gutters only reaches the sewer at its lower end. Also, when there are no industrial establishments on the street, such as laundries, baths, etc., the volume of water flowing into the sewer is but slight. We must ask, then, what becomes of faecal matter so delivered? If there is formed at the outlet of each private drain a little cone of faecal dejections, as the Commission may see at those points where the experiment of direct discharge has been made, it is necessary to remove this accumulation of ordure at least once a day. What would be the quantity of water necessary to facilitate the dilution of these matters, their removal, and the rinsing of the sewer? What would be the minimum interval between two successive washings? These are questions which must be solved."

The demonstration seems complete. In the actual state of things, the sewers which receive, aside from the water of extended rains, only the water of the washing of the street under which they are placed, and the liquids derived from the houses which border the street, have a current which bears no proportion to the dimensions of the channel which they afford; these sewers are thus placed in a most unfortunate condition, whether from the point of view of cleanliness or that of general salubrity, and to remedy this essential defect, the quantity of supplementary water necessary to use would be extremely great. M. Humblot tells us that more than one-half of the sewers are of this character.

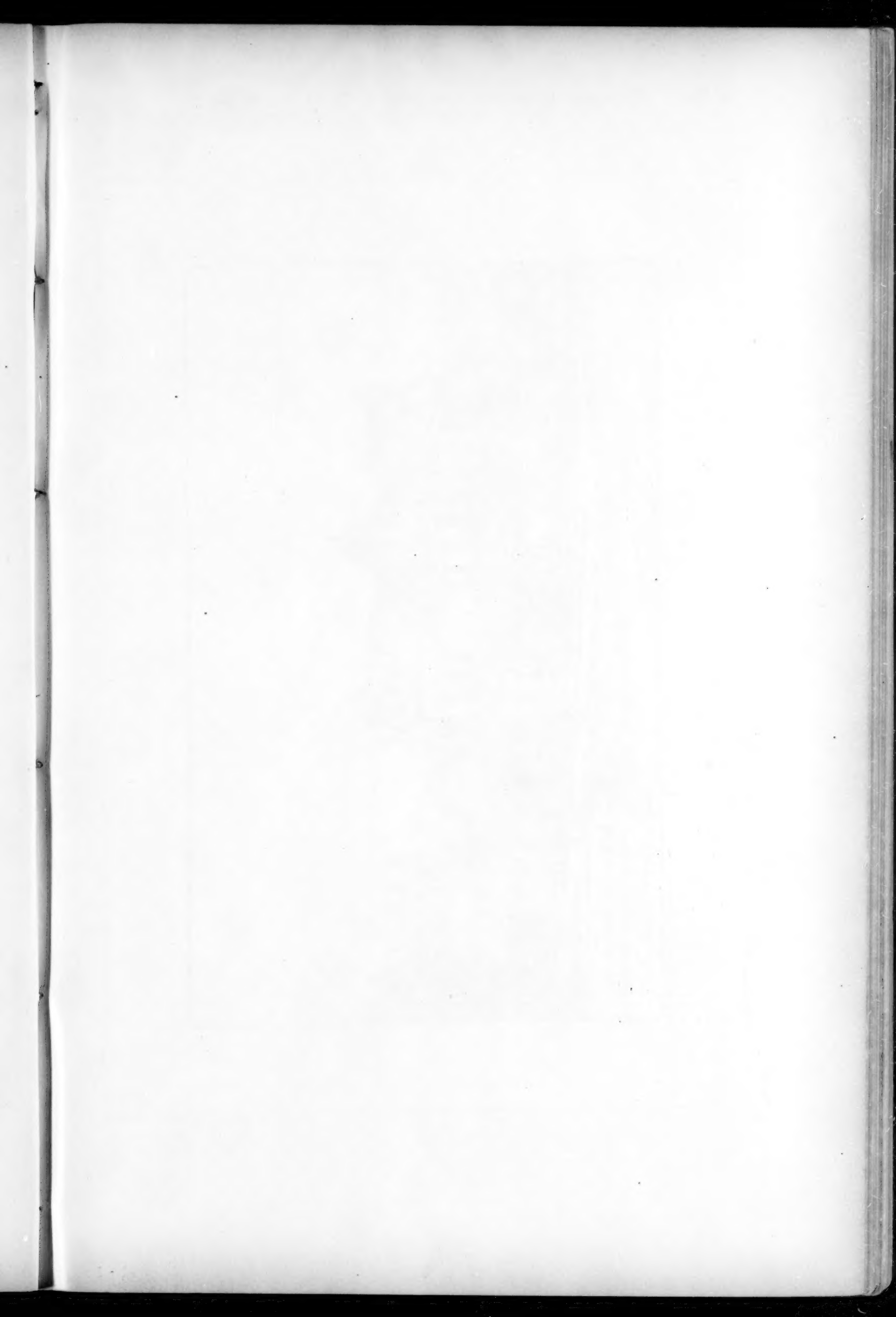
If we pass from primary sewers to secondary ones, and then to tertiary ones, and so on to the collectors, the objections cited above decrease more or less rapidly, according to circumstances.

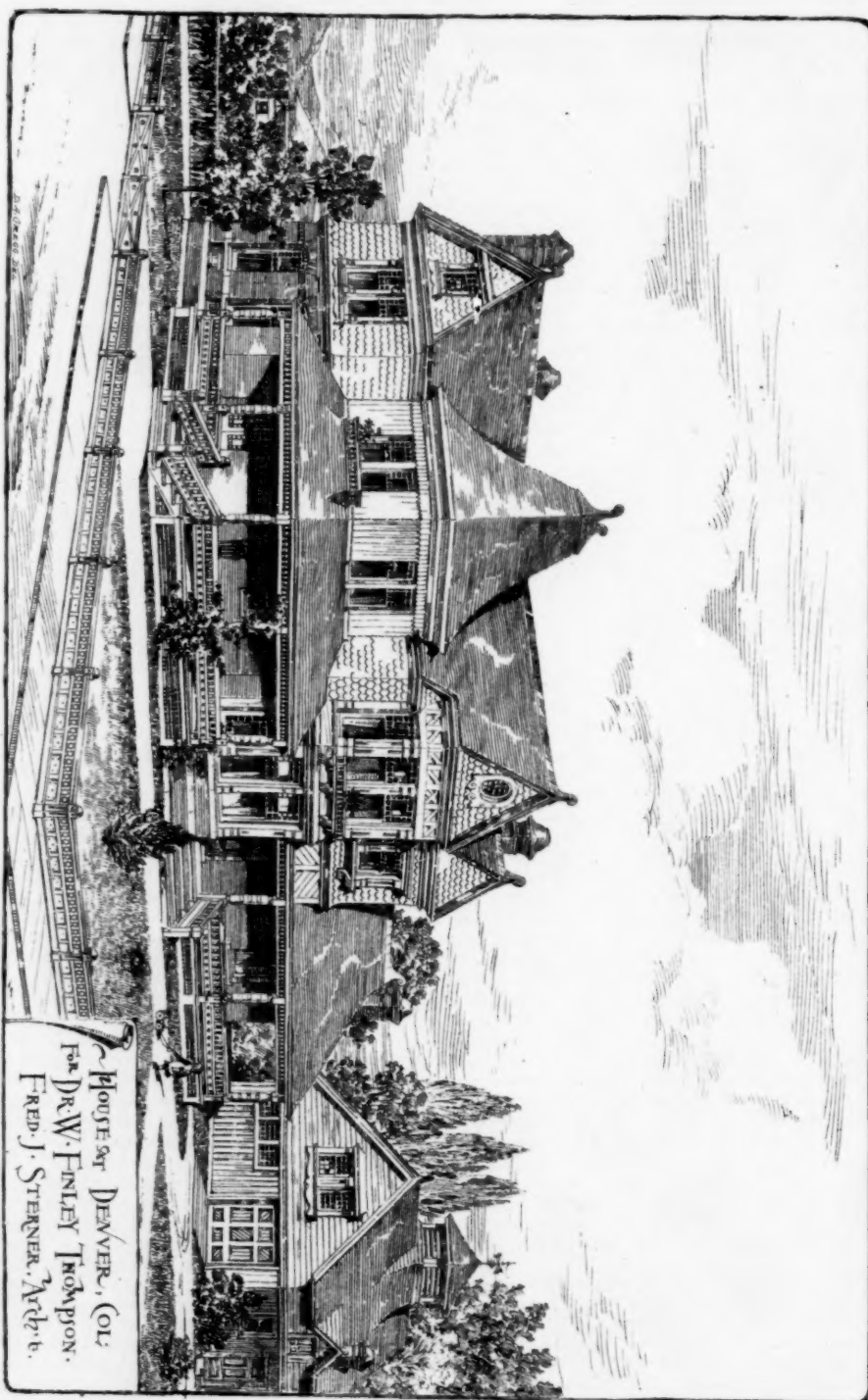
In the secondary sewers the flow increases and becomes more regular without an increase in the size of the invert. Therefore the conditions of cleanliness and salubrity are better, and the improvement continues until we reach the collecting sewers, which carry constantly an abundant flow, and to which there is also applied apparatus for automatic cleansing, which could not without exorbitant cost be made to operate in sewers of less importance, which are thus far ill adapted for their use.

It results from the present conditions that in the actual state of things, from a sanitary point of view, it is the sewers of the least importance which offer the greatest difficulty; that it is in these that the difficulties are the hardest to correct; and that it is in these, also, that the causes of infection to which they are already subjected would be the most increased by the discharge into them of domestic wastes.

Everything, then, leads to the conclusion that for the evacuation of domestic wastes it is necessary to seek some arrangement which may

¹ See *American Architect* for April 21, 1883.





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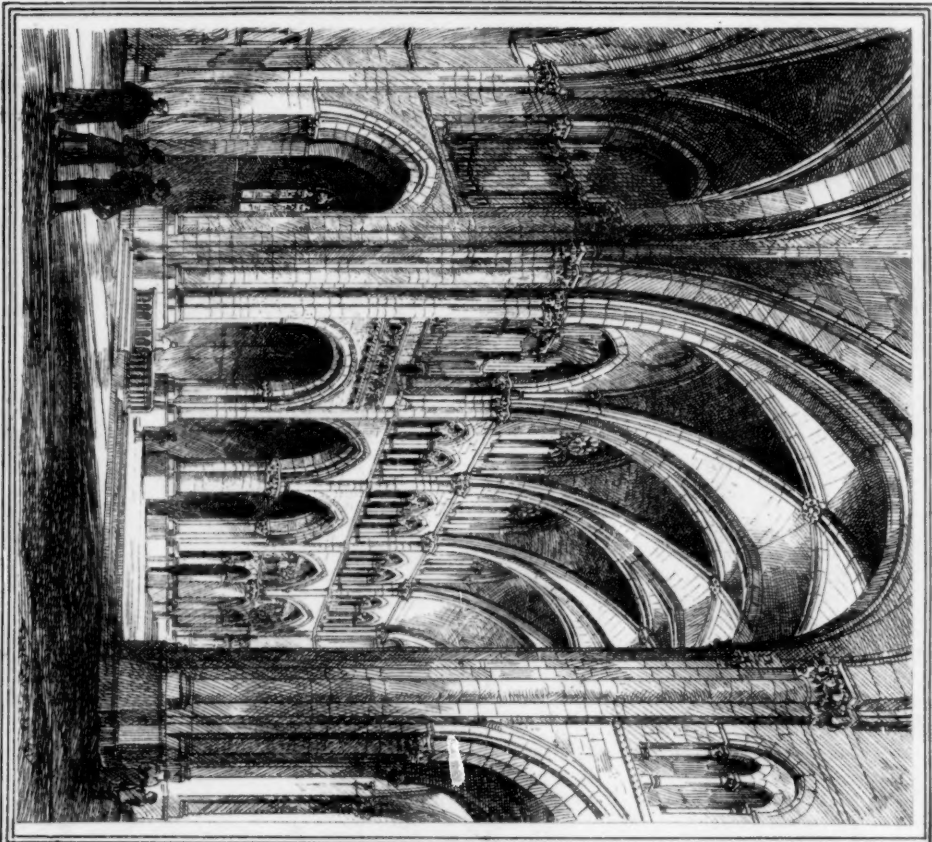


New Cathedral of All Saints, ALBANY N.Y. *Interior looking East.*
 ROBERT W. GIBSON Architect, ALBANY.

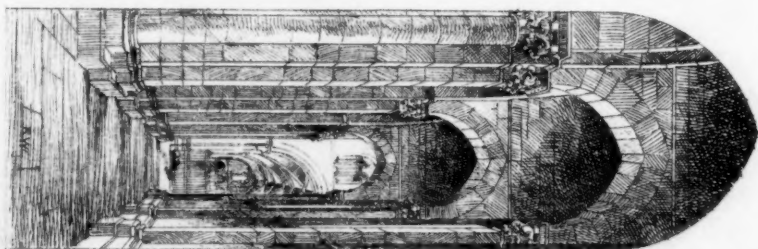
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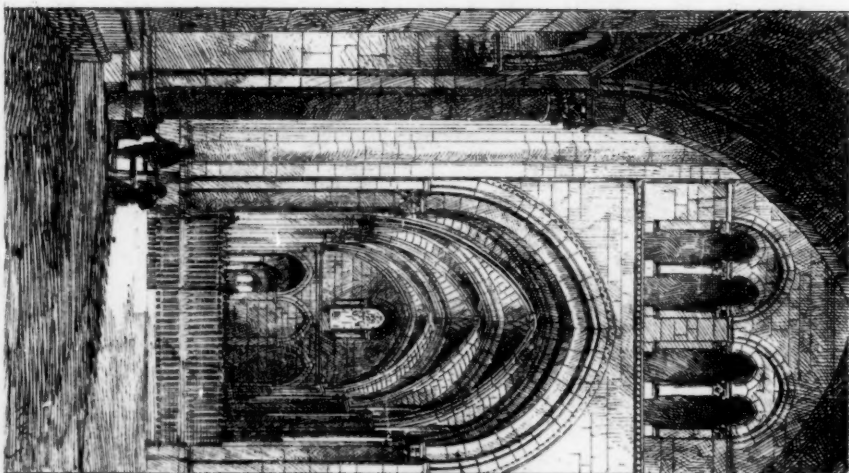
NEW CATHEDRAL OF ALL SAINTS, ALBANY, N.Y. NORTH SIDE OF CHORUS FROM TRANSEPT.



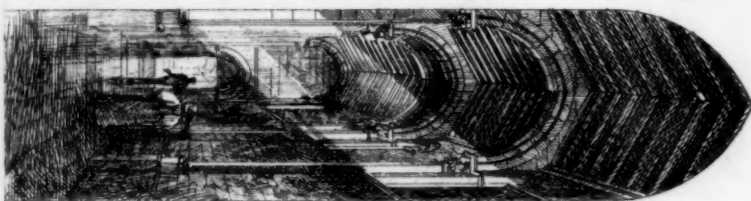
SOUTH AISLE



SOUTH CHORUS AISLE

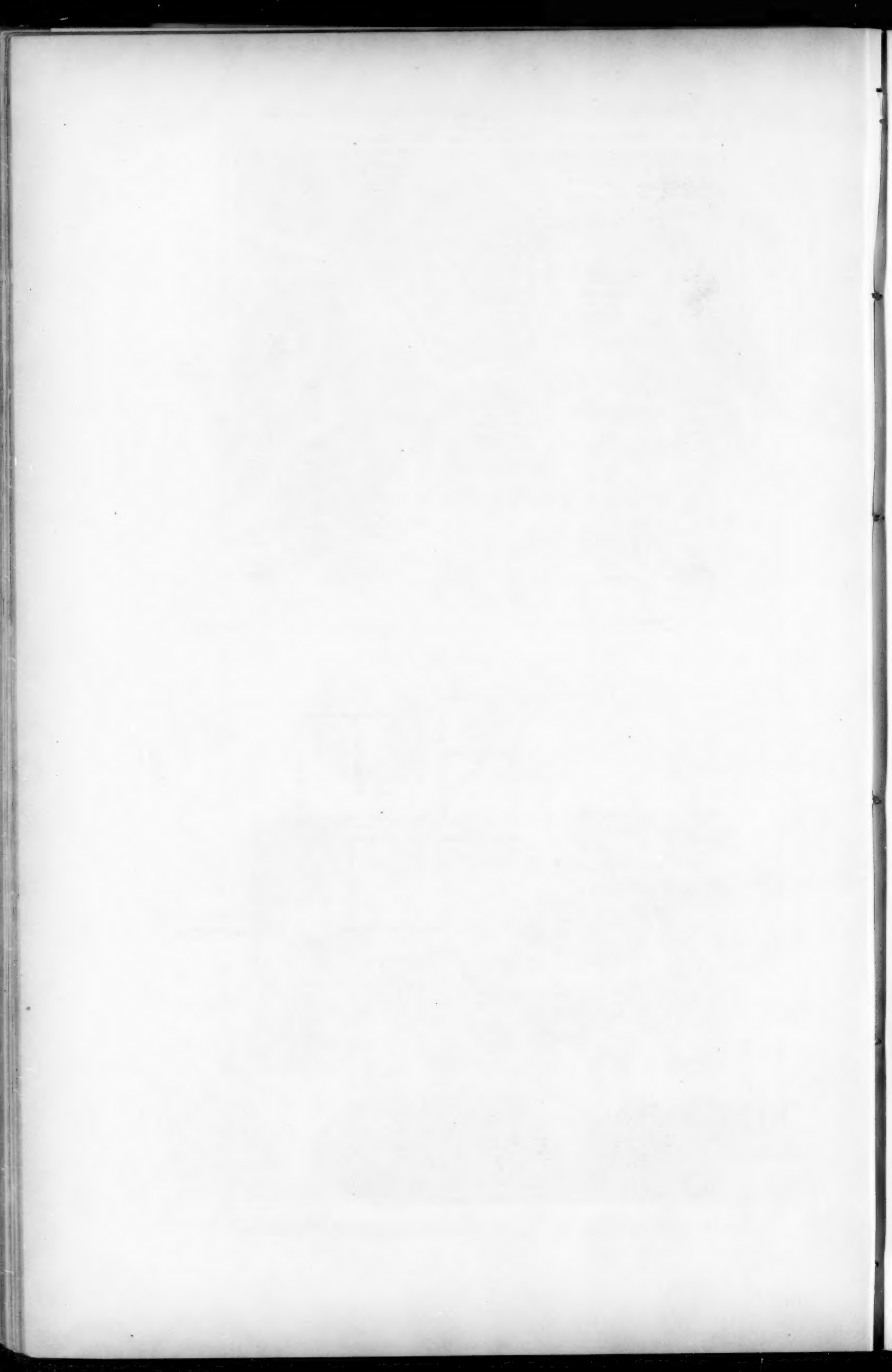


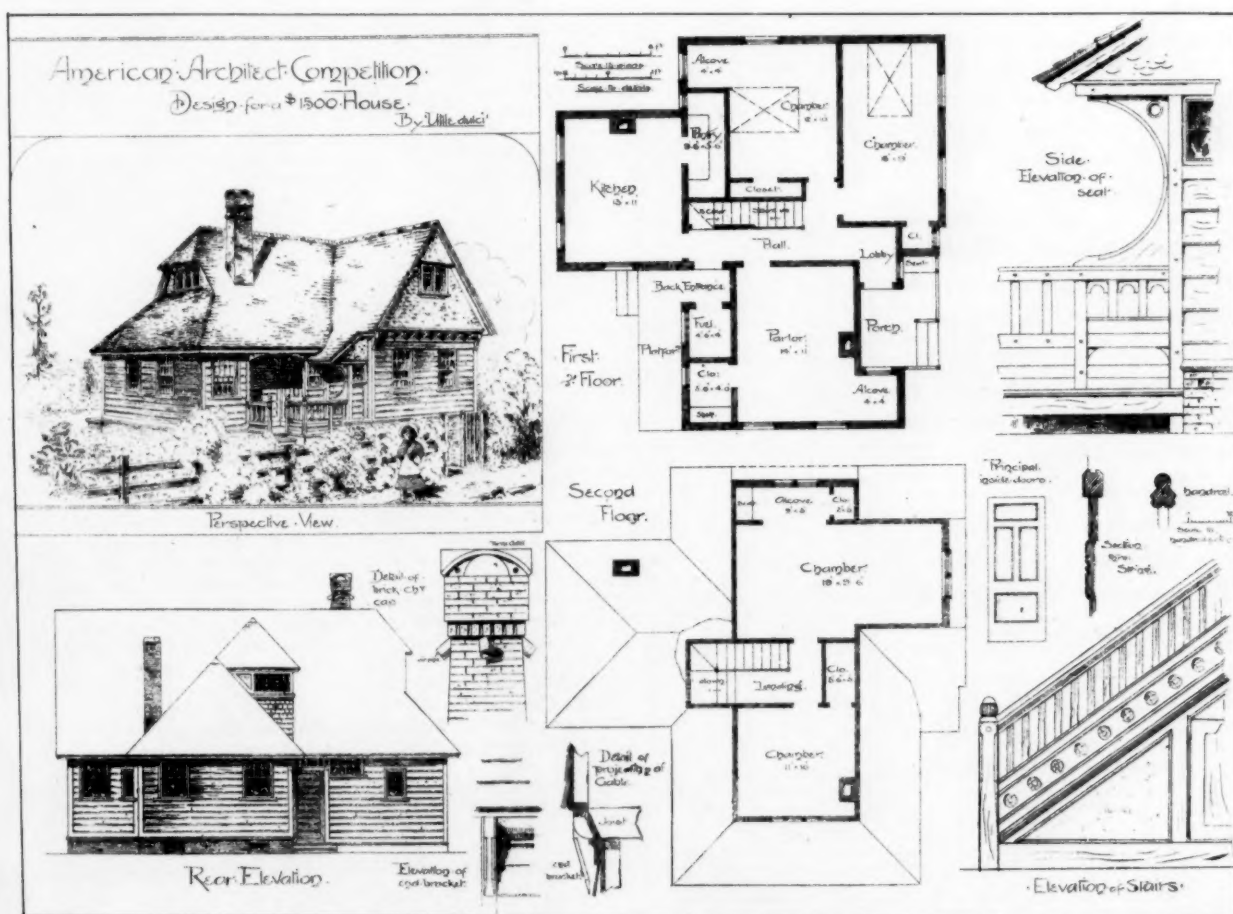
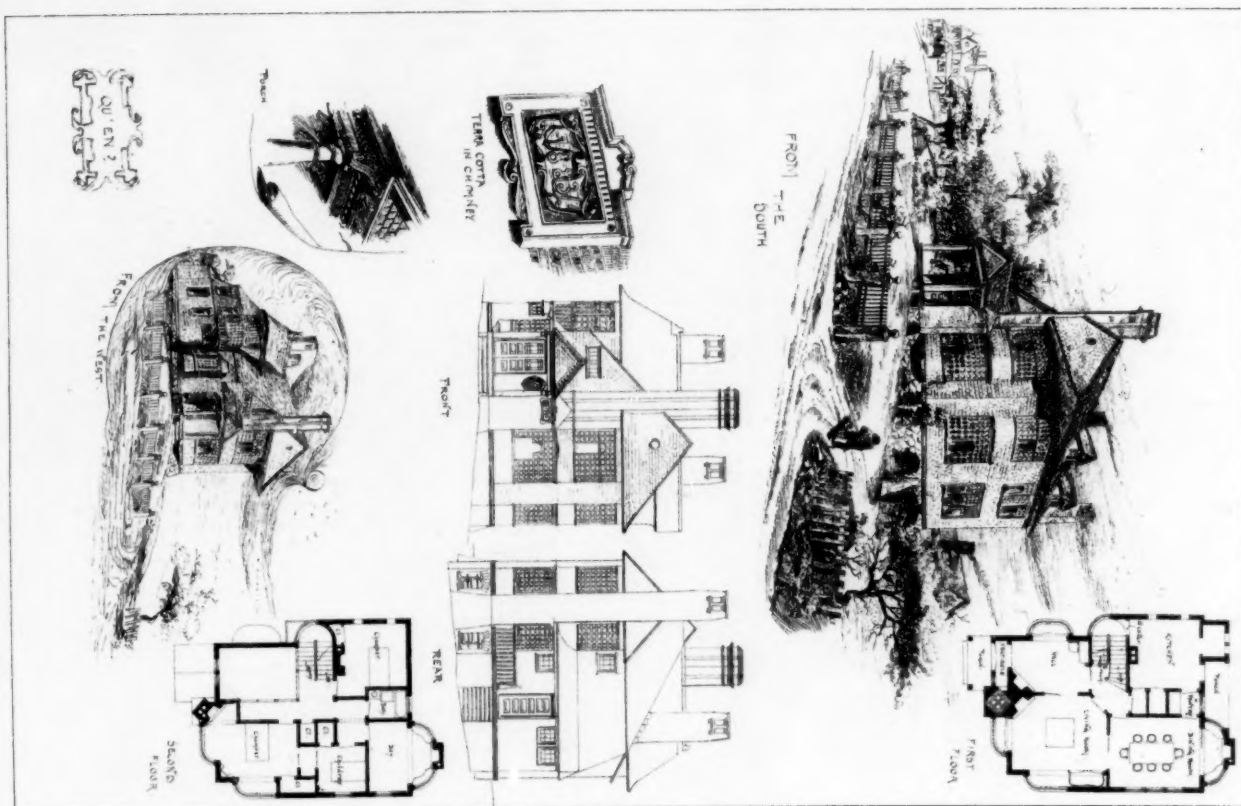
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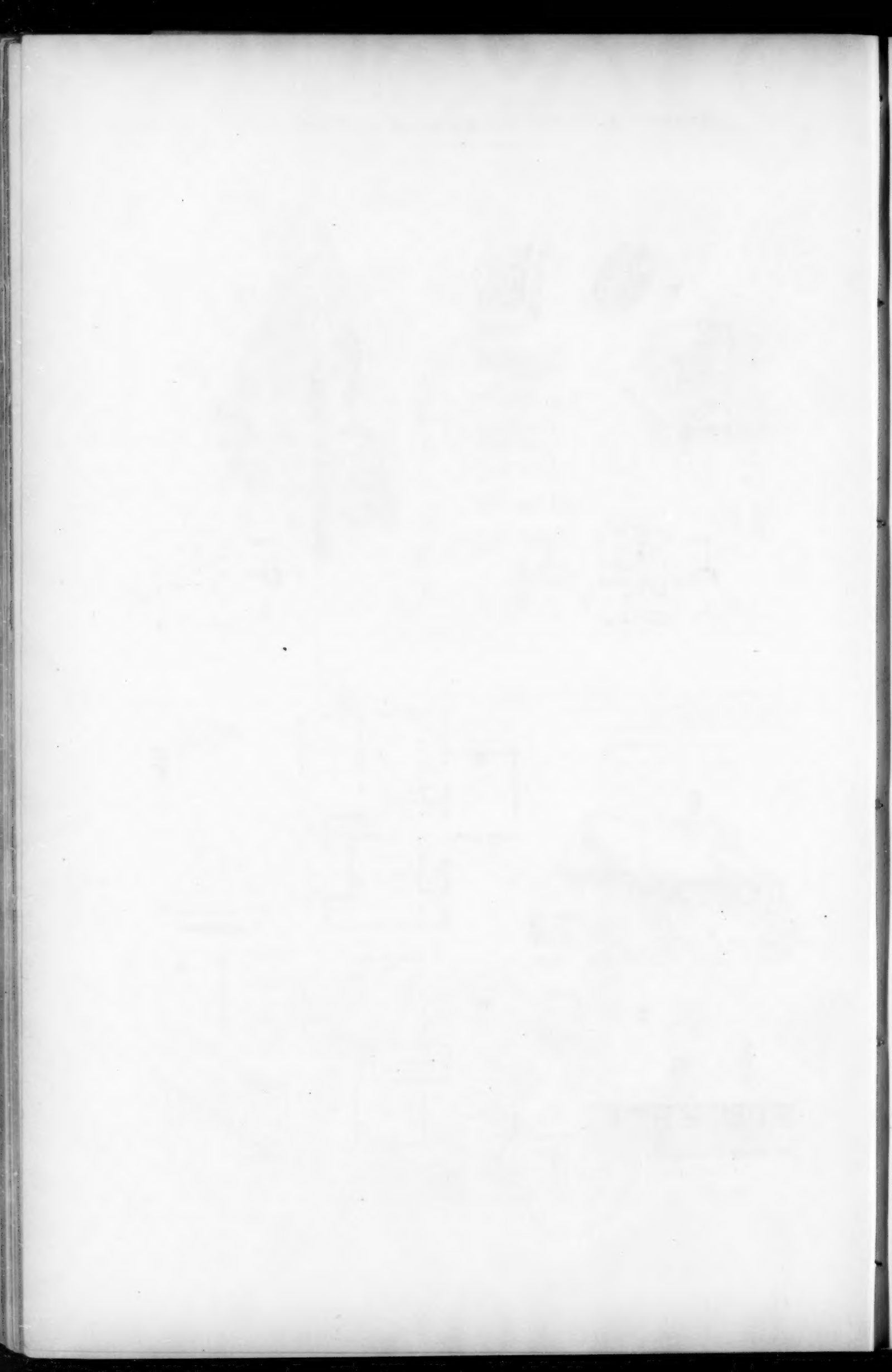


ROBERT WILGIBSON, ARCHT. ALBANY.

Heliotype Printing Co. 211 Tremont St. Boston







be substituted for these sewers. Waring's system, as it has been set forth by M. Poutzen before the Second Sub-Commission, seems to furnish, under excellent conditions, the elements of this substitution.

If the trials, which are to be made in pursuance of the determination taken by the Second Sub-Commission, confirm the principal advantages attributed to this system — if the trials demonstrate:—

(a) That by means of simple arrangements, easily to be adapted to soil-pipes and house-drains, the house can be connected by a bell-mouthed branch (of earthenware), of which the diameter varies from 10 to 15 centimetres, with pipe-sewers established under the public street, having a diameter of from 15 to 20 centimetres for the primary pipes, increasing successively as the needs of the current require;

(b) That in these pipe-sewers, of such size as to run only one-half full with the ordinary flow, with an average velocity of 70 to 80 centimetres per second, the variations of flow from hour to hour are slight, so that deposits will not easily be produced, and that provision is made for the removal of such deposits as may accidentally be formed by means of automatic flushing, more or less frequent, sufficient to clean the walls of the sewer, alternately made wet and left dry by variations of the flow;

(c) That in these pipe-sewers the air above the level of the liquid is never stagnant, and that its circulation, artificially increased by fresh-air inlets established at the successive junctions of the sewers, is assured by the extension of soil-pipes above the tops of the houses; and,

(d) That under these conditions, household wastes and water-closet matters—diluted ordinarily in the proportion of one part solid to eighty or ninety parts liquid—being rapidly carried forward, take on and give out no foul odor, not even requiring the use of traps under closets.

If these fortunate conditions are practically established, it seems to us that Waring's system offers an important means (*ressource précieuse*) of urban sanitation.

The flow, and this is essential, is produced in this system by the simple force of gravitation; there is no complicated mechanism at any point, not even in the automatic flush-tanks; there is no clock-work; there is no trapping of the pipes; there is no indispensable water-seal; all is simple, sure, and inexpensive. Let us add, from another point of view, that unless we wilfully disregard the most elementary rules of hydraulics, we cannot avoid securing, in the ordinary conditions of flow, constant movement at every point at a predetermined velocity.

A single circumstance may suggest some difficulties: the absence of sufficient fall. Although the lack of fall may be supplemented in great measure by an augmentation of force or an increase in the number of the flush-tanks, it is necessary from an economical point of view not to go beyond certain limits in the volume of water to be used. Under the conditions of this system this difficulty is not grave. We may always increase the fall by having recourse to pumping, and were this condition necessary in certain parts of Paris, it would cost but an insignificant outlay. The daily discharge of the sewers of Waring's system will rarely represent, including the flushing water, more than 20 litres for each of the population. That is to say, 45,000 cubic metres for all Paris. Were it necessary to pump a tenth part of the whole flow one horse-power for each metre of lift would be sufficient. There is therefore in this nothing which need disturb us.

THE ILLUSTRATIONS.

THE CATHEDRAL OF ALL SAINTS, ALBANY, N. Y. — THE INTERIOR LOOKING EAST; THE SOUTH AISLE; THE NORTH SIDE OF CHOIR FROM THE SOUTH TRANSEPT; SOUTH CHOIR AISLE, AND AMBULATORY. MR. R. W. GIBSON, ARCHITECT, ALBANY, N. Y.

FOR description see the *American Architect* for July 14.

COMPETITIVE DESIGN FOR A \$3,000-HOUSE SUBMITTED BY "Qu'en."

"NO contrast to the preceding design could be greater than that which 'Qu'en' offers us. Self-conscious and affected, full of clever conceits which are pushed into mannerisms, this competitor's remarkable facility is his stumbling-block. While nothing could be more charming than his design, if considered as the plaything of a wealthy owner, on the other hand it is utterly unsuited for our purpose, while the one or two servants of the modest establishment proposed could never give the constant care necessary to keep clean the numberless little panes indicated, and these themselves and their curving sashes and cornices are costly luxuries. Again, the charming hall, occupying two stories, is far beyond our straightened means; so is the pretty carving which is nonchalantly scattered through the design. In spite of any relief such joyous extravagance may have been to the jury after the plain, economical schemes presented, this design is evidently not a solution of the programme. The plan is clever and full of decorative points, without sacrificing comfort, but it is also ingeniously expensive. The fireplace of the hall crowds upon the door inconveniently. The drawings are brilliantly rendered." — *Extract from Jury's Report.*

COMPETITIVE DESIGN FOR A MECHANIC'S COTTAGE SUBMITTED BY "Utile Dulci."

"'Utile Dulci.' The plan in the first story seems complicated; alcoves four feet wide are not useful. While a lodge on a country

estate might well have rooms in the roof, so that the building might be low and picturesque, a mechanic building his own house would wish as good and clear second-story rooms as possible. This plan also requires two chimneys. The cottage is, however, picturesque and the drawing remarkably good." — *Extract from Jury's Report.*

HOUSE FOR DR. W. FINLEY, DENVER, COLO. MR. F. J. STERNER, ARCHITECT, DENVER, COLO.

THE \$3,000-HOUSE COMPETITION. — XVII.

ABSTRACT OF SPECIFICATIONS SUBMITTED BY "Qu'en."



FROM CHURCH OF ST. ETIENNE, BEAUVAIS, FRANCE.

EXCAVATIONS:—Excavate for cellar and for 8" outside of walls. Space outside to be filled with broken stone and laid to drain.

Walls, Stone:—Build cellar walls, 18" thick, range work, laid in equal parts lime and cement; pointed up and smooth on outside. Bed sill in cement mortar.

Chimneys:—Flues smoothly plastered on inside, and 2-inch air-space between all chimneys and wood-work. Build of hard brick and lime mortar.

Ventilation:—Set cold-air box and hot-air boxes of tin, and line passage of hot-air box near all wood-work with bright l. c. tin.

Cellar Bottom:—Cement cellar bottom; two coats Buffalo cement on bed of grout.

Plastering:—Two-coat plastering; Port Byron white lime, long winter hair, clean sharp sand and clean water; second coat, no hair.

Laths to break joint every six courses.

Lumber:—All lumber of white-pine, sawn die-square; dry, free from sap-wood, shakes, or loose knots.

Scantlings:—Sill, 6" x 6", painted on under side; bridge partitions; plate, 4" x 4"; joists, 2" x 10", bridged and crowned; studs, 2" x 4"; door and window studs to be doubled. Joists, studs and rafters, to be 16" on centres; rafters, 2" x 4"; false girt, 1" x 6"; bridge floors.

Cut-off Partitions:—Cut off all communication between first and second story outside walls, and also between second-story floor joists and attic, with brick.

Sheathing:—Cover outside of building, including roof, with surfaced sheathing.

Paper:—Cover above with "iron-bound" paper, well lapped, and laid double around openings.

Shingles:—Shingle roof and walls down to sill with common XX shingles, 4" to weather on roof, 6" on walls; two nails to a shingle.

Outside Finish:—Second quality stuff for outside finish.

Piazza:—Piazza post solid; floor laid open joint, 3" wide; second flooring laid in white lead.

Floors, Pine:—Under floor in first and second stories of surfaced sheathing; second flooring for attic floor; upper or finished floors of second flooring with hard-wood edge, in hall, living and dining-room. Kitchen floor of soft maple.

Sash:—One and three-quarter-inch sash throughout; bronzed sash-locks; double strength American glass to be used.

Furnace:—Set furnace selected by owner.

Doors:—Front door to have night-latch, bronzed door fittings.

Stairs:—Treads, 11"; risers, 7".

Inside Finish:—All of clear white-pine, painted three coats in lower rooms; two coats above.

Wainscot:—Wainscot five feet high on lower floor, except kitchen, where it is to be three feet; same in bath-room.

China Closet:—Fit hooks, shelves, etc., in china closet.

Bells:—Good bell communications.

Painting:—Paint outside of house three coats zinc white and line-seed oil; putty nail-holes.

Tinning:—Tin eaves-gutters, braces every two feet. Tin step-flashings and down spouts, painted.

Plumbing:—Connections with water-main and sewer. Hot and cold water pipes; soil-pipe of iron, 4", running through roof and open on top. Running trap, vented, between soil-pipe and sewer; S-trap under water-closet, not vented; trap under wash-bowl.

Tin-lined pipes for supply. Lead safes under bath-tubs and wash-bowl; overflow to run to kitchen sink.

Grease-trap, 6" diameter, with opening for cleaning, to be attached to kitchen waste. 12-oz. bath-tub.

Lead and iron pipes connected by brass ferrule. Iron pipe caulked with oakum and run with lead.

Soil-pipe coated inside with hot coal-tar, and painted outside two coats; 35-gallon galvanized-iron (wrought) circulating boiler and a sediment-pipe. AA lead pipe.

Trimmer-Arch:—Build trimmer-arches where shown.

Architraves:—Inside architraves 4" x 5", moulded.

Bases:—Bases, 9" high in principal story; 7" high elsewhere.

Splicing:—No sheathing or architraves to be spliced. Outside doors to have weather strips.

ESTIMATE OF QUANTITIES AND PRICES RULING AT MINNEAPOLIS, MINN.

83 perch stone, @ \$2.00	\$207.50
168 cu. yds. excavation, @ 25 c.	39.50
600 ft. joist and rafters, @ \$20	120.00
3840 ft. studding, @ \$20	76.80
8720 ft. sheathing, @ \$10	87.20
51,000 shingles, @ \$4	204.00
Sheathing-paper	30.00
850 yds. plaster, @ 24 c.	204.00
301 ft. chimney-flues, @ \$1	301.00
2400 ft. upper flooring, @ \$25	60.00
98 ft. wainscot, @ \$1	98.00

7 doors and fittings, @ \$15.....	\$105.00
14 " " " " @ \$10.....	140.00
28 windows, @ \$10.....	280.00
7 openings, @ \$6.....	42.00
280 ft. baseboard, @ 4 c.....	11.20
Painting and finishing.....	325.00
Stairs.....	190.00
3 mantels, @ \$50.....	150.00
3 mantels, @ \$25.....	75.00
Plumbing.....	175.00
Hardware and tinning.....	90.00
Total.....	<u>\$3,011.20</u>
Contractor's commission, 5%.....	150.56
Total.....	<u>\$3,161.76</u>
Architect's commission, 5%.....	158.08
Total cost.....	<u>\$3,319.84</u>

The figures given above were mostly obtained from a prominent builder in this city (Minneapolis). After looking at the drawings, he estimated at a guess that it would cost \$3,300, which came very near the result got by the detailed estimate.

THE COMPETITION FOR A MECHANIC'S HOUSE.—V.

DESIGN SUBMITTED BY "Utile Dulci."



IN order to reduce the cost, the vertical walls of this house have been kept as low as possible. The height, in the clear, of the first floor is 8' 6", and in the attic 8'. All doors, architraves, and bases are of stock patters, except where otherwise shown. The floors are covered with one thickness of boards. The foundation and cellar walls are brick. All outside walls above, except gables, to be covered with pine weather-boarding. The gables to be shingled and plastered where shown.

All framing to be of spruce: the sills to be 4" x 7"; plates, 3" x 4"; outside studs, 2" x 4"; partition studs, 2" x 3"; first and second floor joists, 2" x 8"; rafters and ceiling joists, 2" x 4½".

The roof to be covered with spruce shingles, and to have dripping eaves. The outside framework, gables, porch, etc., to be painted two coats, as directed.

The cellar under the kitchen would be available for heating purposes as well as stores if required, and a bath-room could be introduced in front attic gable, to be entered from stair landing.

ESTIMATE OF PRICES AND QUANTITIES RULING AT SPRINGFIELD, MASS.

These prices, which include builder's profits, all nails, etc., are quoted by Mr. E. W. Shattuck, builder, Springfield, Mass., at local rates.

125 cu. yds. Take if surface, and excavate 2' or deep for foundations, and 6' for cellar, @ 12	\$15.00
350 yds. brick foundations and cellar walls 8" thick, piers and chimneys, 15,573 bricks, laid, @ \$10 per C.	190.78
No. 1 extra work to chimney-cap.	20.00

STUDDING AND FRAMING.

1890 sq. ft. outside walls, @ \$25 per M.....	\$32.50
1250 sq. ft. inside partitions, @ \$25 per M.....	31.25
1000 " " first floor	25.00
360 " " attle floor	9.00
1900 " " ceiling joists and roofs	47.50
3000 " " rough outside boarding to walls and roof, @ \$25 per M.....	75.00
1260 " " weather boarding, @ 30 c. per M.....	36.00
Outside casings.....	15.00
1300 shingles to gables (laid), @ \$10 perM.....	13.00
13.314 " " roofs	106.51
17 ft. run cornice in gable, @ 60 c.....	10.20
10 large windows, including sashes, lines, pulleys, etc., glazing, architraves and blinds, complete.....	100.00
12 small windows, complete.....	96.00
2 cellar windows, complete.....	6.00
2 fixed frames to staircase in small lights, two or three made to open.....	10.00
1116 sq. ft. first floor, @ \$35 per M.....	37.60
885 " " attle	29.00
4 doors, as per detail, including architraves and hardware, complete, @ \$10.....	40.00
11 stock doors, 1 1/2" thick, complete, @ \$9.....	80.00
550 ft. run base 7 1/2" high, @ 8 c.....	44.00
Outer front porch, railing and seat, as per detail.....	60.00
Fittings and shelves to pantries and closets	45.00
Principal stairs, complete, as per detail.....	65.00
Cellar stairs.....	10.00
12 sq. ft. plastering on wire laths outside gable.....	3.00
388 sq. yds. lath and plaster walls.....	97.25
148 " " " ceilings.....	37.00
General plumbing, sink, etc., in kitchen.....	35.00
250 sq. yds. painting, two coats outside, @ 15 c.....	37.50
150 " " " inside, @ 20 c.....	30.00
Total.....	\$1,507.44
Architect's commission, 3%.....	75.00
Total.....	\$1,582.44

A CITY A HUNDRED MILES LONG.—Santa Barbara's Mayor proposes the consolidation of the governments of the city and county of that name, the object being to save \$8,000 a year which the city government costs under the present system. As the consolidation can only be effected by making the municipal limits coterminous with those of the county, Santa Barbara, under this arrangement, would become, territorially, the largest city in the world, say, a hundred miles long by sixty wide, and including a great quantity of farming land and stock ranches, besides several forests containing deer, bears, and other wild animals. It would be a big attraction to summer visitors to know that they could hunt this large game on the back streets. And then just think of being able to boast that some of the householders in the city had front yards containing from 25,000 to 40,000 acres! We would be willing to bet that the Mayor of Los Angeles is mad because he did not think of this idea first.—*San Francisco Alta.*

MODERN ARCHITECTURAL PRACTICE.¹—I.

RAILING and CAST and WROUGHT IRON. PARIS
Bureau Generale de l'Architecture 1432.

IT is now nearly two years since a lecture on architecture was given in this room. Our late professor was taken from us in the meridian of his power, as a teacher and an exemplar of what an architect ought to be. We were at first too much overwhelmed with the loss sustained, per-

sonally, and by our art, to be in a mood to address you on subjects which had lately been so lucidly analyzed by our friend and master, and nothing would have induced me now to undertake the task of addressing you but an anxiety to be loyal to the twice-expressed wish of those who rule us here, and who I feel have a right to the services of the humblest of their members as of the most illustrious, if they choose to demand them. It is from this motive alone, and not from any sense of ability to follow in the steps of such a demonstrator of the anatomy of architecture as was our late professor, that I am here to beg your indulgence and kind attention to-night.

Those of you who were students in our Architectural School two years ago, will I know, agree with me in deploring the loss of Professor Street. His wonderful knowledge, acquired by personal observation, his readiness to impart it, the facility with which he used his pencil to illustrate his point, his contempt for whatever was mean or false, either in the character or the art of men, his outspoken condemnation of it, his love of whatever was pure, honest, and of good report, his astonishing industry (so that during a so-called holiday he would do more than many of us during the rest of the year), and, above all, his faith in his art as a living art, made him to us here the model professor of architecture.

I hardly know whether to admire him most as a man or as an artist—the practical architect or the learned professor. He was great in each aspect. *We* know him best by his successful teaching in the schools, and by his inimitable lectures, in which he carried the enthusiasm of his audience wherever he chose to take them. It mattered not what building he chose to dissect, whether it was Pisa or St. Mark's, Chartres or Salisbury, he seemed equally at home in all; he knew not only their builders, but what their special difficulties had been, and how they had gone to work to overcome them; how their age and country had affected them in general, and how their special circumstances in particular. I should strongly advise you to read his Royal Academy lectures—even those of you who had the advantage of hearing them, especially the last three, on Italian, French, and English mediæval art. They are as interesting as a romance, and eminently useful to every student of art.

It is, indeed, melancholy to reflect that in less than four years the Royal Academy lost three professors of architecture—all of them men of the highest mark, though in a somewhat different way. Since I received the request to address you to-night, I have looked through their lectures again, to see if there were any path which I might venture to tread where they had not been before me. In this I have met with but indifferent success. Professor Scott gave you in his nine lectures an exhaustive exposition on the history, *rationale*, study, and practice of Gothic architecture. Professor Barry took a somewhat wider range. His published lectures (three of which were written for you, but, alas! never delivered) were divided under two heads. In the lectures under the first head he went fully into general principles, while in the thirteen final lectures he traversed the history of our art, beginning with the Roman period, and proceeding through mediæval times, through the various English styles to Sir Christopher Wren, and then treating of Italian architecture, from Giotto to Vignola. Our latest professor's lectures, have not, as you are aware, been published as a collection and illustrated, as I hope they will be; but those of you who were students here two years ago, will have in your memory their catholic spirit; how the lessons he inculcated were drawn from Greek art as well as from that to which he particularly attached himself.

I feel that, instead of rambling over any of the ground so successfully occupied by your late distinguished professors, on this single occasion on which I am likely to address you, it would be better for me to earnestly commend their lectures to your renewed consideration, as being both very interesting in themselves, full of what is all-important to the architect, and well worthy, I venture to think, of the consideration of both painter and sculptor; and, having done so, to ask your indulgence while I make some discursive remarks on matters which were not much enlarged upon by them, but which have occurred to me whilst I have been reading these lectures with the aforesaid object in view.

When one reads the lectures of the two distinguished men whose remains now rest within the walls of the abbey they loved so well, and whose advocacy of the architecture which that noble building typified

¹ A lecture delivered at the Royal Academy, February 8, by Alfred Waterhouse, A. R. A.

for us was so constant, so able, so full of enthusiasm, one feels sad that their labors have not borne more fruit, and, perhaps, that those of us who come after them have not been more earnest in following closely in their footsteps, so as by every architectural effort of our own to have helped forward as directly as possible the cause they had at heart—a nineteenth-century development of thirteenth-century architecture. But I confess that ten years ago the prospect of doing this looked brighter than at present. The public does not seem to be sufficiently with us in this endeavor. The wave of enthusiasm for a thirteenth-century revival has somewhat spent itself. It may, however, be better for true architectural progress that we should not attempt to resuscitate fully a bygone period of art, but content ourselves by earnestly studying it, so as to become entirely imbued with its beauty, its constructive excellences, its direct solution of the varied problems of its day, while we are at the same time earnestly endeavoring to solve the problems of our own day, with its new wants and new materials, in the most directly artistic manner of which we are capable.

If there is no longer any authority as to the style in which we should practice, it is because there are no longer the old convictions. If we once more acted from conviction, there would no longer be shifting about from one style to another. We should no longer be anxious as to what style we should adopt for a particular building. All we should be anxious about would be to justify everything we did when brought to the test of intelligent criticism and sound reason.

Art now-a-days has lost its way. One calls to it, "This is the right way," whilst another points in a different direction. The only wise course in such a difficulty is to fall back on first principles, and to walk cautiously. Everything should have a clear purpose. No feature, no moulding, no member of a moulding, but should be applied with a distinct and definite intention. "Clearness, and a freedom from everything doubtful and untruthful, is the inseparable companion of taste." When we had to draw a curve, it would be the sort of curve best adapted to enable the material so fashioned to fulfil its function. If a wooden brace, it would almost certainly have a slight segmental curve instead of the quadrant of a circle; if the bell of a capital supporting a heavy weight, the curve would also be a slight one. It is instructive to examine the capitals of Doric columns in this respect, and to notice the vigor and refinement they ultimately assumed as they changed under Greek criticism. The lines of the human form will give you the best possible illustration of the beauty and variety of the curves of vigor which may be employed by us; and, therefore, the Academy has encouraged its architectural students of the higher grade to study the figure in its life schools; and I should strongly advise you to avail yourselves of the advantages this opens to you. By familiarizing yourselves with this highest type of beauty, you will learn to loathe the redundancy of meaningless ornament. Your buildings will be marked by style, which is a very different thing, and more precious, than blind adherence to any one of the styles of the past. I hope yet to see the day when they will not be named among us as practising architects. I have, I confess, the greatest possible objection to hear the question asked concerning a modern building, what is its style? What we want to know is, does it perfectly fulfil its functions? Have the refinements of proportion been considered by its designer? Has nothing been left to accident or to chance?

We are now-a-days overwhelmed with a mass of treatises on architecture, books, lectures, drawings, photographs, to say nothing of weekly literature on the subject, so that if one would read all, one has little or no time to think. Now with those who preceded us it was not thus. They had a vernacular architecture in which they could perfectly and naturally express their thoughts and aspirations. They had nothing to do but think and act. We are cumbered by a host of traditions, but half believed in by most people, and a world of new sciences which lead us away from these traditions.

Instead of the temples, amphitheatres, and basilicas of Classic times, and the enormous mediæval cathedrals and castles which formed the chief architectural achievements of the past, we have now to apply our intelligence in the erection of places of worship of more moderate dimensions, concert-rooms, theatres, and other rooms of assembly, in which the difficult problem has often to be solved, how to bring the greatest number under the influence of one voice without fatigue to the speaker or his audience. Then we have to erect buildings applied to very complicated and multifarious uses, as town-halls, courts of justice, and Government offices (where the convenience of the whole depends upon the proper allocation of the different parts), museums, picture-galleries (in which the character and direction of the light is all-important), hospitals, and even ordinary dwellings, in which an attention has to be paid to sanitary science which would have astonished our forefathers, palaces, club-houses, gigantic hotels, colleges, public schools, and other educational buildings, all highly complete in their arrangements, and requiring for their successful designing a mind in sympathy with the wants and aspirations of to-day (rather than longing for the resuscitation of what was perfect yesterday); therefore, when we proceed to catalogue our new wants, it seems reasonable that we should not be too archaeological in our way of meeting them. The new materials presented to our notice as offering advantages over the old, add still more force to this view of the case.

It is undoubtedly the duty of the architect to avail himself of such, when manifestly superior to those hitherto in use. Our prejudices are nevertheless greatly in favor of those which have been hallowed by universal use in the past, often with such glorious results, and so

long as granite, marble, the more durable sorts of stone, slow grown and straight-grained oak, and even good, honest brick, tile, and terra-cotta can be had, it is difficult to conceive what better stuff the world can place at the disposal of the architect for the realization of his dreams; but we must remember that our quarries and forests are rapidly getting exhausted. "Crown Memel fir" (which occurs in every architect's specification) describes an almost obsolete sort of timber. Even in America, men are beginning to calculate the number of years her hitherto boundless forests will last, and to say they can be counted on their fingers. In my own experience, the deterioration of the natural building material in the market is very marked. This, of course, means a worse article, or one at a greatly enhanced cost, even if it can be had for money at all.

What, in the face of this difficulty, seeing that, with very rare exceptions, indeed, we have to count the cost of all we undertake, is the architect of the future to do? He will have, in the majority of cases, to betake himself to new materials. If, in the treatment of these new materials, he contents himself, either from indolence, or, what is far more likely in the present day, from archaeological considerations, with blindly reproducing forms which have hitherto satisfied him and others of cultivated taste, but which have gathered round no longer attainable material, and which do not develop the peculiar properties of the new material with which he has to do in the directest and the most economic way, then he can no longer claim to be a scientific constructor, and he will cease to be an artistic one.

Some people maintain that the Greek temple proclaims its descent in its principal lines from a timber prototype. Be that as it may, I can see nothing in its construction but the most common-sense application of the materials used (marble or else very coarse calcareous stone, covered with a thin layer of stucco to receive color), to meet the special requirements of the case. Every stone seems to have fulfilled its function with special regard to its qualities as stone.

The like may be said of mediæval building, though the result was so curiously different. All the material used, of whatever sort, was applied in the way to which the peculiar property of the material lent itself most naturally. Brick was never made to do duty as stone. A veneer of marble was never treated to look like solid blocks of the same materials.

Of all comparatively new materials the modern architect has to take chief account of iron. Its remarkable qualities, its power of resisting compression, its wonderful tensile strength, render it one of the most useful servants of the building constructor. Its cheapness, too, when these qualities are taken into consideration, is another powerful factor in favor of its use. On the other hand, we know that it has certain inherent defects, such as its oxidation when exposed to the action of the air, and its rapid and total loss of the marvel of its strength when subjected to a very high temperature. This points to its being protected both from the action of a damp atmosphere, and from the effects of fire by some impervious coating of cement or plaster. This application of plaster to the soffit of a wrought-iron beam, or as a casing to a cast or wrought-iron column, is as common-sense and intelligent a use of the material employed as the coating of stucco to a Doric column formed of the coarse calcareous breccia mentioned above. Only let the column from its delicacy proclaim its iron core, and there will be no false construction about it; and as much true art-perception may be shown in the treatment of its plaster covering as we admire in the exquisite lines of the Doric column.

With regard to the safety of iron thus treated, in the case of the severest fires, we have had already some proof. As, however, it is impossible to make any material absolutely air-proof, it is as well always to give excess of thickness to all parts of an iron structure, even to those not subjected to any strain, so as to allow for a reasonable amount of oxidation, as, for instance, to the web of a beam (its neutral axis), being neither subjected to the compression experienced by its upper flange, nor the tension experienced by its lower. When the formula for the construction of wrought-iron beams was first discovered, beams were made of a web of almost gossamer thickness. Such beams, I have heard an engineer remark, should be kept in vacuum at a uniform temperature of 60° Fahrenheit, and then they would doubtless continue to perform their functions for an indefinite time; but such not being the conditions in which they find themselves, they must sooner or later yield to circumstances. It behooves us, therefore, in the employment of iron, to take account of atmospheric deterioration, and also to beware of the too great facilities it gives of superimposing great weights over voids, as of walls many stories in height dividing a number of small apartments above one large one. Such is not desirable construction, though it may have sometimes to be resorted to: and is one of the evils begotten of competitions, when, in order to fulfil the instructions to the letter, many expedients have to be resorted to, which a skilful constructor, if unshackled by such conditions, would know how to avoid. Moreover, however carefully you may case your iron, so as to cause it to retain much of its power during a fire, you can hardly so isolate it from heat as to prevent its serious expansion, and the consequent disturbance of the stability of your walls.

The celebrated architect and archæologist (M. Viollet-le-Duc), in his lectures "On Architecture," is very earnest in directing the student to the importance of iron as the building material of the future, and he gives several illustrations of its application to architecture, which are all of them strikingly novel and ingenious. In every case, however, he exposes his iron to view, and thus appears to omit from his consideration the danger arising from fire, unless, indeed, his

structures are not only absolutely fire-proof in all their parts, but are kept free from inflammable contents, and inflammable neighbors also.

MORE VANDALISM AT VENICE.



MONUMENT TO PARMIGIANINO, PARMA.
(The Builder.)
ITALY. GIOVANNI GUERRELLI, Sculptor.

MANY of our readers will doubtless remember the little island of Sant' Elena that lies just off the public gardens at Venice. It is always a beautiful object, whether it be in spring, when the buds are bursting upon the trees of its garden, or in late autumn when the bare branches stand relieved against the red wall of the old monastery, and the pines and cypresses acquire a greater value of color from the absence of any other green. The island is so picturesquely placed, detached from Venice and yet in a measure belonging to it, like a full-stop at the end of a sentence, that most people must recall it with pleasure. The memory of it lurks unobtrusively in some still corner of the mind. No one has written much about it; no one has insisted that it must be preserved; no clamor of laudation has

drawn the public eye to its quietude. We might therefore have hoped that the island would escape the invasion of the commercial spirit, and be left, as it was clearly intended to be, the finale and close to the splendid sweeping curve of the Riva degli Schiavoni and the public gardens. But publicity and obscurity are equally perilous to beautiful things. A company has bought the island of Sant' Elena, and is engaged in converting it into an iron foundry. A new island of forced earthwork is rising in ugly squareness around the old Sant' Elena, destroying its natural beauty of line; wharves and landing-stages are springing into view; and the place is no longer recognizable by its friends of old.

For the antiquarian and for the lover of the picturesque alike the sacrilege is horrible. The island possesses a beautiful church in the Gothic manner, disused now for some time, and covered with a rich mantle of ivy, but still a very good specimen of fourteenth-century Italian Gothic; while the titular saint, the Sant' Elena from whom the island takes its name, is no less a person than the Empress Helen, mother of Constantine the Great. Her body was said to have been brought here and laid in the vaults of an earlier church, over which the present building was raised. And, coming to more recent and authentic times, this church has been the burying place of many a famous Venetian of the Giustiniani and Loredano houses. During the last few months workmen have been busy breaking up the vaults and many noble ashes must have been scattered by the laborer's pick. The remains of the Empress saint, however, have escaped this indignity, for the urn supposed to contain them was removed some years ago to the Church of San Pietro di Castello. But it is not the outrage to the antiquarian sentiment of reverence that is most to be regretted. No one who loves Venice can fail to feel the deepest sorrow that a lovely and essential part of the city is passing away. After all, it is the outside of Venice, the present every-day aspect of the place, that concerns most of the people who visit it. Buildings that threaten to come down must be restored, and pictures may have to be retouched or left to perish; either is a serious loss to those who know about such things; but they are few out of the many to whom Venice as a whole is the most singular and fascinating city in Europe; and there is no one of these who will not miss the accustomed beauty of Sant' Elena, and will not feel that, by its desecration, the charm of the city has suffered an irreparable injury.

There are places we all of us know to be lovely, and yet, for some reason or other, we keep our knowledge to ourselves. We do not go into raptures over them, nor write of them, nor talk of them; indeed, there is even a sense of injury, an impression that trespass is being committed on our private demesne, when by accident we find that some one else holds the same appreciative views which we believed peculiar to ourselves. No one talks or writes about the Lake of Bourget as they do of Como; yet no traveller by the Cenis will forget how lovely that lake is by day, or still more so when the moon is pouring her light upon the water through a mellow haze just tinged with blue, and the great white chateau of the House of Savoy gleams cold and weird above its headland on the further shore. So all will talk of the Lido or of San Giorgio; but most of those who know Venice will have Sant' Elena in some quiet nook of their hearts. It was so pleasant to go there on a lazy afternoon in spring. One was sure of stillness and abundant sunshine. The old gardener, a char-

acter in his way, whom Scott would have rejoiced to draw, seemed part and parcel of the place, as wrinkled and venerable as the trees he lazily pruned; he would receive the visitor as though the place belonged to himself, but soon left him to wander at will through the garden. It could hardly be called a garden, but rather a wild shrubbery, surrounding a stretch of lawn spread out beneath an avenue of wych elm and sycamore. In the sward the periwinkles and violets and potentillas, with fruit like strawberries, and therefore called by the Italians "*ingannadonna*," ran riot together. At one end a little grove of pine and cypress offered its shade, and at the other a row of pomegranates put out scarlet blossoms in July. The old cloister of the monastery, open at one side to the garden, enclosed rose-beds; and up the slender shafts and round the capitals vine stems were trained. All the stone-work was coated with a fine surface of lichen, and the "*silentium*" above the broken door of the dormitory was half covered with velvety green mosses and fern that had taken root there and in the heavy Renaissance mouldings of the lavatory which stood by the refectory door. The whole garden was in admirable confusion, tangled and wild and left to itself, yet beautiful to wander in. From one corner of the island you saw the Alps rising behind Venice, each familiar peak and ridge sharply defined in serene weather—Antelao, Trofana, Sorapiz, known to the traveller among Dolomites; or else, to the left hand, far away, the Euganean hills threw the reflection of their cones upon the water.

The place was perfectly quiet and peaceful, and silence brooded above it, except for the lapping of the water on the foundations of the old brick walls, or the distant and muffled hum, borne from the arsenal across the lagoon. The crabs had it all to themselves on the oozy mud-banks that lay around the island, and fought and raced through the shallow water, leaving a rippling trail on its surface. But now their hunting-ground is covered with basements for sheds; the old monastery walls are fast being overthrown; most of the trees have been felled, and the axe is laid to the roots of the rest; a wide and yawning ditch is dug right down the middle of the lawn; soon the machinery will begin to arrive; the black pennon of smoke will stream from the chimney; the place will resound to the clank of engines. There is no hope of reprieve. Sant' Elena has gone through many changes of fortune. It has been monastery, barracks, and even bakehouse ere now; at the opening of this century there were forty-three ovens and a hundred German bakers at work upon the island. From all these it has suffered little ill, or time has repaired the ravages inflicted. It would be mere folly, however, to hope that Sant' Elena will ever recover from the injury of the iron foundry to which it is doomed. — *Pall Mall Gazette*.

NOTES AND CLIPPINGS.

THE HISTORY OF A SUIT OF ARMOR.—A suit of armor that originally belonged to King Francis I of France has had a strange history in modern times. It was bought, says a correspondent of the *St. James's Gazette*, by the late Sir Anthony Rothschild for £100, and sold by him to the late Lord Ashburnham for £1,000. Some years afterward it was sold by Lord Ashburnham for £4,000 to a dealer in curiosities, who resold it within twenty-four hours to a wealthy customer for no less a sum than £17,000. The subsequent history of the armor is even more remarkable. It was deposited by its purchasers in the Belgrave-square Pantechnicon, and when that unfortunate building was destroyed by fire the armor was buried beneath the ruins. Dug out of the debris, it was sold for a few pounds as old iron. It survived, however, even this degradation; for, after undergoing a process of renovation, it was subsequently sold for £12,000 to Mr. Spitzer, of Paris, where it is said to be now on sale for £20,000.

ROTTERDAM.—Rotterdam, with the exception of the church of St. Lawrence, of the construction of which Washington Irving gave a comic sketch in his "*Knickerbocker*," is in some respects one of the most prosaic cities in the world. Hood hit it off happily enough when he called it a kind of vulgar Venice, though, like Venice, its commerce and commercial arrangements have been indefinitely developed since Hood's days. But, vulgar or not, there is much that is picturesque about it, as any one must admit who has admired the studies of its streets and canals by the most eminent of the Dutch masters on the walls of the picture galleries. It is not everywhere that you can see a fairly-sized East Indian man berthed full in front of the mansion of its owner, so that the skipper leaning over the quarter-rail can deliver a parcel on the doorstep. Then the visitor can study original fashions of existence in the lives of the crews of those cargo boats on the canals, which are in some sort a survival of the comfortable old *trekrschuyt*. The boat is generally occupied by the master and his mate and his wife, with a family more or less numerous. The cooking goes forward in the half-decked caooose, and you can watch all the other details of the domestic arrangements. Nor is due attention to the graces and adornments of life by any means neglected, although the man in command seems the very embodiment of the prosaic, in voluminous undergarments which emerge from the tobacco smoke that invariably envelops his upper person. There is pretty sure to be a hanging garden on the stern, with the gayest flowers that may be blooming in the season; and the skipper of each canal craft is as enthusiastic a horticulturist in his way as any of the tulip-fanciers of Haarlem or Leyden. Moreover, on board as on shore, you are easily struck by the intensity of the cleanliness that has become proverbial in Holland. "Water, water everywhere," you murmur again, should you venture out for a stroll in the early morning. The housewives are splashing pailfuls of water about your legs as they are dashing them against the speckless doors and windows. Each brazen knocker glistens like burnished gold, brought to the extremity of polish by an excess of hand friction; while the very buckles on the harness of the dog-teams in the milk-barrows sparkle to each gleam of the watery sunshine. — *Saturday Review*.

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.]

- 282,033. HAND-VISE. — George Amborn, Jr., and Edwin D. Chaplin, Pawtucket, R. I.
 282,077. BOLT. — Benoni J. Hardin, Springfield, Ky.
 282,079. FIRE-ESCAPE LADDER. — John S. Harrison, Clinton, Iowa.
 282,082. COMPOSITION FOR WATER-PROOFING AND PRESERVING WALLS OF BUILDINGS. — Theodore Hunt, St. Louis, Mo.
 282,109. WEATHER-STRIP FOR DOOR-SILLS. — Joseph G. O'Kelly, Chicago, Ill.
 282,126. PIPE-WRENCH. — Frank A. Simonds, Grand Rapids, Mich.
 282,138. ROOFING-COMPOSITION. — Welcome White, Everett, Mass.
 282,139. ROOFING-FELT. — Welcome White, Everett, Mass.
 282,160. WEATHER-STRIP. — D. Lawton Cady, Holly, Mich.
 282,764. TILE-FASTENING. — Albert Chase, Boston, Mass.
 282,167. CEILING. — William S. Cogswell, Hyde Park, Mass.
 282,186. PNEUMATIC DOOR-BELL. — Robert P. Garsted, Norristown, Pa.
 282,191. METALLIC SKYLIGHT-BAR. — Geo. Hayes, New York, N. Y.
 282,208. WEATHER-STRIP. — Thomas B. McCurdy, Lancaster, Tex.
 282,212. FIRE-ESCAPE. — Charles Murdock, New Rochelle, N. Y.
 282,216. WEATHER-STRIP. — Clinton M. Packer, Cambridgeport, Mass.
 282,219. ARTIFICIAL STONE. — James S. Pierce, Portsmouth, N. H.
 282,236. LIFT AND HOIST. — John S. Stevens, Chas. G. Major, and David P. Edwards, London, Eng.
 282,246. ELECTRIC BELL-PULL. — Frank J. Wall, Lawrence, Mass.
 282,248. T-SQUARE. — Jacob Weidenmann, New York, N. Y.
 282,251. BORING-BRACE. — Azro H. Adams, Santa Rosa, Cal.
 282,256. COMBINED PIPE-TONGS AND WRENCH. — Elbridge F. Barnes, New Haven, Conn.
 282,290. SASH-FASTENER. — Emanuel Ensminger and Henry S. Ensminger, Bloomington, Ill.
 282,298. PIPE OR NUT WRENCH. — Dan P. Foster, Waltham, Mass.
 282,306. HAMMER. — Christopher J. Grellner, St. Louis, Mo.
 282,314. COMBINED STAND-PIPE AND FIRE-ESCAPE. — William and John M. Heffner, Minneapolis, Minn.
 282,334. TRANSMO-LIFTER. — Wm. Leggett, Bradford, County of York, England.
 282,351. FIRE-ESCAPE. — Charles W. Mills, Philadelphia, Pa.
 282,362. FLEXIBLE FIRE-ESCAPE LADDER. — David A. Peters, Hagerstown, Md.
 282,367. SASH-BALANCE. — Calvin O. Power, West Newton, Pa.
 282,372. PIPE-WRENCH. — Eugene H. Robbins, Pittsfield, Mass.
 282,413. FIRE-ESCAPE. — Geo. H. Thompson, Plattsburgh, Neb.
 282,426. ARTIFICIAL STONE. — Jas. S. Watts, Baltimore, and Lunsford G. Watts, Pikesville, Md.
 282,435. PIPE-CUTTER. — Elbridge F. Barnes, New Haven, Conn.
 282,437. DEVICE FOR PREVENTING THE ESCAPE OF EFFLUVIA FROM PRIVY-VULTS AND DRAINS. — Henry C. Buddenberg, Cincinnati, O.
 282,439. DEVICE FOR ATTACHING ROOFING-SLATES. — Josephus C. Chambers, Cincinnati, O.
 282,470. BLIND-HINGE. — Charles G. Shepard and Peter Adams, Jr., Buffalo, N. Y.
 282,478. FIRE-ESCAPE. — Seth D. Woodbury, Lynn, Mass.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report eighteen permits have been granted, the more important of which are the following: —
 Wilhelmus Myers, two-sty brick building, e s Patterson Park Ave., between Aliceanna St. and Canton Ave.
 Ann Morgan, two-sty brick stable, w s Vincent Alley, n of Lanvale St.
 St. Catherine's Normal School, two-sty brick stable, in rear n e cor. Harlem and Arlington Aves.
 Howard K. Scott, 6 three-sty brick buildings, s w cor. Gilmore and Mulberry Sts., fronting on Gilmore St.
 Heck & Petzell, two-sty brick building, s e cor. Saratoga and Eutaw Sts.

Mrs. M. Hart, three-sty brick building, s s Lexington St., between Howard and Eutaw Sts.
 Matthew O'Reilly, two-sty brick stable, in rear 127 Albemarle St., between Fawcett and Trinity Sts.
 John C. Parker, two-sty brick stable, in rear e s Fulton Ave., between Townsend and Lanvale Sts.
 A. E. Heilegeist, 10 two-sty brick buildings, s s Lambert St., between Dolphin and Laurel Sts.

Boston.

MONTHLY STATEMENT. — During July, 31 permits for brick buildings and 102 permits for wooden buildings were granted at the office of Inspector of Buildings.
BUILDING PERMITS. — Brick. — Conant St., near Bumstead Lane, Ward 22, for James McCormick, cooper-shop, 28' x 39' 4", one-sty flat; J. H. Kelley, builder.

N St., near East Fifth St., Ward 14, for Henry B. Stratton, 3 dwells., 21' x 33', three-sty flat; Henry B. Stratton, builder.
 Eliot St., No. 136, rear, Ward 12, for Walter H. Cowing, workshop, 24' x 60', one-sty mansard; Eliot Stoddard, builder.

Albany St., near Oak St., Ward 12, for B. & A. R. R. Corporation, freight-house, 53' x 240', one-sty pitch.

Chestnut St., No. 140, Ward 9, N. F. Goldsmith and W. H. Kiehl, stable, 64' x 70', four-sty flat.
 O St., cor. East Fifth St., Ward 14, for City of Boston, school-house, 65' 4" and 74' 8" x 76' 8", two-sty pitch; Donohue Bros., builders.

South St., Nos. 174-182, Ward 12, for Wm. S. Hill, store, 26' x 40', one-sty flat; Lyman D. Willcutt, builder.

Stanford St., No. 8, Ward 7, for Geo. O. Shattuck, store, 20' x 34', one-sty flat; N. E. Chase, builder.

Fillage St., Nos. 54 and 56, Ward 16, for G. W. Tuxbury, Trustee, 2 tenements, 40' 6" x 55', four-sty flat; Stephen Moxon, builder.

Wood. — Terrace Ave., Ward 1, for Eben Brown, manufactory, 18' x 24', one-sty pitch; Thomas Toemans, builder.

Vernon St., near Everett St., Ward 25, for Anthony C. Ludgate, storage, 18' x 26', one-sty pitch; Charles Hampton, builder.

Walnut St., near Wood St. Court, Ward 24, for Henry P. Oakman, dwell., 30' x 35' and 44', two-sty mansard; H. P. Oakman, builder.

Terrace Ave., near Alleghany St., Ward 22, for Delice M. Nolan, dwell., 15' and 18' x 28', two-sty flat; J. S. Coullahan, builder.

Walnut St., near Wood St. Court, Ward 24, for H. P. Oakman, two-sty mansard building, 30' x 44'; H. P. Oakman, builder.

Bill St., n s, near Hancock St., Ward 24, for Samuel B. Pierce, dwell., 27' x 32' 6", two-sty pitch; Wm. J. Jobling, builder.

Foundry St., near Dorchester Ave., Ward 13, for O. C. K. Corporation, storage, 18' x 24', one-sty pitch; N. K. Randall, builder.

Granite Ave., Ward 24, for Abner C. Childs, stable, 23' x 32', one-sty pitch; Granville Spear, builder.

South St., near Bussey St., Ward 23, for City of Boston, wagon-shed, 18' x 69', one-sty pitch; T. B. McLaughlin, builder.

Bellevue St., near Trull St., Ward 24, for T. H. Warner, dwell., 33' x 35' and 13' x 23', two-sty pitch; Wm. J. Jobling, builder.

L St., near East Second St., Ward 14, for Mary E. Whitney, stable, 38' x 42', two-sty flat.

Brookside Ave., between Green and Boylston Sts., Ward 3, for Cable Rubber Company, dry-house, 40' x 40', one-sty flat; John Fish, builder.

Erie Ave., opposite Merrill St., Ward 24, for Wm. H. Wallace, dwell. and stores, 21' x 41' and 50' 3", two-sty mansard; John H. Gigie, builder.

Erie Ave., near Merrill St., Ward 24, for Catherine E. Gigie, 2 dwells., 19' x 34', two-sty mansard; J. H. Gigie, builder.

Waukebec St., near Warren St., Ward 21, for Neil McNeil, dwell., 26' x 40', two-sty; McNeil Bros., builders.

Erie Ave., opposite Merrill St., Ward 24, for Wm. H. Wallace, dwell., 14' x 35' and 37', two-sty mansard; John H. Gigie, builder.

East Fourth St., No. 766, Ward 14, for Otis Rumrey, dwell., 21' x 32' and 15' x 18', two-sty pitch; Henry T. Hutchinson, builder.

M St., near Second St., Ward 14, for John Murphy, dwell., 23' 6" x 30' and 15' x 18', two-sty pitch; Henry T. Hutchinson, builder.

Harvard St., Ward 24, for Frank M. Silva, dwell., 21' and 25' 6" x 32', two-sty mansard; Frank M. Silva, builder.

Maverick St., near Jeffries St., Ward 2, for Isaac Boudrow, owner and builder, mercantile, 10' x 15', one-sty pitch.

Forrest St., rear, near Adams St., Ward 24, for Jason Gordon, owner and builder, 2 greenhouses, 11' x 52' each, one-sty pitch.

Frederica St., Ward 24, for F. L. Pierce, dwell., 15' and 22' x 28' 6", two-sty pitch; F. L. Pierce, builder.

Brooklyn.

BUILDING PERMITS. — Columbia St., n w cor. Cranberry St., three-sty brick dwell.; cost, \$20,000; owner, R. G. Packard, 361 Fulton St.; architect, B. O'Rourke; builders, P. J. Carlin and Long & Barnes.
 Herkimer St., n s, 100' w Buffalo Ave., 12 two-sty frame dwells., gravel roofs; cost, each, \$2,500; owner, Jno. J. Studwell; builder, G. K. Waldron.

Bartlett St., No. 30, s s, 225' e Harrison Ave., three-sty frame double tenement, tin roof; cost, \$4,000; owner, Adam Schaaf, Whipple St., cor. Flushing Ave.; architect, T. Englehardt; builders, W. Rauth and H. Eich & Bro.

Herkimer St., s s, 20' e Kane Pl., three-sty frame double tenement, tin roof; cost, \$3,900; owner, Henry Bricks, Kane Pl., near Herkimer St.; builder, J. Pirrung.

South Second St., n e cor. Seventh St., three-sty and basement brick flat, tin roof; cost, \$8,000; owner, John Schroeder; architect, J. D. Reynolds; builder, S. Hough.

Atlantic Ave., s e cor. Saratoga Ave., three-sty frame dwell., gravel roof; cost, \$3,200; owner, F. Sammermeier, 420 East Seventy-sixth St., New York

City; architect, C. Peters; builders, E. Sutterlein and W. Nitz.

Haley St., Nos. 152, 154 and 156, s s, 3 three-sty, brick, stone front dwells., tin roofs; cost, each, \$6,500; owner, architect and builder, John S. Frost, 574 Franklin Ave.

Freeman St., No. 214, 75' w Oakland St., three-sty frame double tenement, gravel roof; cost, \$3,000; owner, Jno. H. Murphy, 328 Oakland Ave.

Fourteenth St., n s, 322' 10' e Third Ave., 7 two-sty frame tenements, tin or gravel roofing; cost, each, \$1,500; owner and builder, S. B. Oulton, 108 Boerum Pl.; architect, W. Wirth; mason, O. O'Keefe.

Third Ave., w s, 25' s Forty-second St., three-sty frame double tenement, tin roof; cost, \$4,500; owner and builder, Jno. H. O'Rourke, 116 Thirty-eighth St.

Macon St., e s, 100' w Throop Ave., 5 two-sty brick or stone front dwells., tin roofs; cost, each, \$4,500; owners, Granger & Brown, 123 McDonough St.; architect and builder, H. J. Brown.

North Eleventh St., s s, 199' w Third St., four-sty brick office-building, gravel roof; cost, \$4,000; owners, Poulsen & Egar, North Eleventh St.; architect, F. Winslow; builders, W. T. Lamb, Jr.

Third St., n w cor. North Tenth St., one-sty brick foundry, gravel roof; cost, \$3,000; owner, etc., same as last.

Grand St., No. 564, s s, 125' w Humboldt St., four-sty brick store and tenement, tin roof, iron cornice; cost, \$8,500; owner, Philip Licht, Forrest Ave.; architect, T. Engelhardt; builders, Jauer and M. Metzner.

Jefferson St., No. 62, s s, 250' e Bremen St., two-sty frame tenement, peaked roof; cost, \$3,000; owner, Charles Bethon, 60 Jefferson St.; architect, T. Engelhardt.

Howard Ave., n w cor. Marion Ave., three-sty brick store and tenement, tin roof; cost, about \$5,000; owner, Henry Cordes, Cooper Ave., Ridgewood, L. I.; architect, F. Holmberg; builder, C. Bauer.

Howard Ave., w s, 25' n Marion St., 4 two-sty brick tenements, tin roofs; cost, \$16,000; owner, etc., same as last.

Greenpoint Ave., s w cor. West St., two-sty brick office, gravel roof; cost, \$3,000; owner, John Englis, Green Point; architect, F. Weber; builders, J. B. Woodruff and — Bartlett.

Front St., No. 114, three-sty brick machine-shop, tin roof; cost, \$4,250; owner, James Cornelias, on premises; architect, A. Hill; builder, P. Sullivan.

Chicago.

FACTORY. — Mr. Isaac Tomlinson is building a four-sty brick factory, 50' x 125', to cost \$13,000; Messrs. Treat & Foltz are architects.

HOSPITAL. — Treat & Foltz are architects for St. Luke's Hospital, to be five-sty, 154' x 161', of brick, and cost \$125,000.

HOUSES. — Messrs. Treat & Foltz, architects, have completed plans for Mr. P. B. Moulton's three-sty brownstone house, 55' x 90', and cost \$100,000.

Same architects have plans ready for a three-sty brick dwell., for Mr. J. H. Swan, 43' x 74', to cost \$30,000.

Plans by same architects are complete for three-sty brick dwell., for Mr. E. F. Hulbard, 50' x 75', to cost \$15,000.

W. G. Hibbard will build a three-sty brick house, 30' x 80'; planned by same architects, to cost \$13,000.

Mr. H. B. Mason's house, planned by same architects, will be three-sty brick, 27' x 65', and cost \$11,000.

Treat & Foltz, architects, have planned for Mr. C. L. May a four-sty brick house, 25' x 72', and cost \$13,000.

The same architects have plans for Mr. Herrick Johnson's house, to be three-sty, 20' x 52', of greenstone, and cost, \$9,000.

House for E. J. Lehman by the same architects at Lake View, 25' x 80', two-sty, and cost \$8,000.

Also a house by same architects for Mr. E. J. Lehman, four-sty, 20' x 73', to cost \$7,000.

SCHOOL-HOUSES. — J. J. Egan is architect for the school-house to be built on Wabash Ave., by Rev. P. Rierdon, to cost \$18,000.

Bauer & Hill are architects for the three-sty and basement school-house to be built on Rumsey St., for Rev. Thomas Burke, to cost \$25,000.

STORE. — Treat & Foltz, architects, have planned the store-building being erected for Mr. J. Q. Adams, six-sty and basement, brick, 80' x 172', to cost \$130,000.

BUILDING PERMITS. — A. Jahnel, two-sty flats, 98 Eugene St.; cost, \$4,000.

Spencer Prindle, three-sty flats, 394 Oak St.; cost, \$7,000; architect, Gregg Vigent; builder, L. Weick.

E. Burnham, 2 two-sty dwells., Prospect Pl.; cost, \$6,000; architects, Briggs & Warren; builder, L. Weick.

W. A. Briggs, 2 two-sty dwells., 3606-08 Ellis Pk.; cost, \$7,000; architects, Briggs & Warren; builder, L. Weick.

Thomas Pond, 2 two-sty dwells., 462-64 Warren Ave.; cost, \$6,000; architect, Thos. Pond; builder, L. Weick.

Gabriel Frauchire, three-sty and basement store and flats, 188 Blue Island Ave.; cost, \$5,000; architect, J. Chartand; builder, J. McCarthy.

John McCarthy, three-sty stores and flats, 190 Blue Island Ave.; cost, \$5,000; architect, O. C. Hanson; builder, Jno. McCarthy.

C. Y. Edwards, two-sty dwell., 1035 Adams St.; cost, \$3,000.

Peter Fitzgerald, three-sty flats, 168 West Eighteenth St.; cost, \$8,000; architect, Wm. Thomas; builders, Myer & Provost.

Fritz Fritscher, two-sty store and dwell., 1038 Lake St.; cost, \$3,200.

C. L. Benson, three-sty and basement store and flats, 389 Chicago Ave.; cost, \$6,000; architect, H. Kley; builder, S. J. Bock.

M. F. Donoghue, four-sty and basement store and flats, 99 West Adams St.; cost, \$12,000; architect, G. A. Wierzbienier; builders, McMillan Bros.

Chas. Mühlmann, two-st'y flats, 442 Webster Ave.; cost, \$3,000.

James Thompson, two-st'y dwells, 571-3 West Huron St.; cost, \$3,000.

P. Gern, two-st'y dwell., 75 Hastings St.; cost, \$3,500.

Chas. Kennitz, two-st'y dwells, 178-180 Lewis St.; cost, \$5,000.

Wilber Wait, two-st'y dwell., 3201 South Park Ave.; cost, \$9,000; architects, Dixon & Townsend; builders, Martensen & Otersen.

N. C. C. Railway Co., two-st'y car-house, Ashland and Clybourne Aves.; cost, \$40,000; builder, N. Gerten.

E. F. Welch, three-st'y dwells, 2974-76 Dearborn St.; cost, \$6,000.

J. W. Polly, three-st'y dwells, 718-720 North Adams St.; cost, \$3,500; architect, Alford Smith, builder, L. J. Daegling.

John McQuaide, two-st'y and basement dwell., 805 Blue Island Ave.; cost, \$4,800; builder, C. Buhmann.

L. D. Lauther, five two-st'y cellar dwells, 109-117 California Ave.; cost, \$2,000; architect, W. Strippleman; builders, Wilke & Holman.

M. Harris, three-st'y store and dwell., 354 West Twelfth St.; cost, \$6,000; architect, Peter Ruehl, builder, W. Snelldorf.

J. R. Busch, two-st'y and basement dwell., 2635 Prairie Ave.; cost, \$20,000; architects, Burnham & Root; builder, D. Lane.

E. Woods, two-st'y and cellar dwell., 768 Hinmon St.; cost, \$2,800; architect, W. Case; builder, B. Stinebrooks.

M. Brennon, three-st'y store and flats, 3339 State St.; cost, \$6,000.

L. W. Felt, four-st'y dwell., 215 East Chicago Ave.; cost, \$6,000; architect, R. M. Hanson; builder, E. Menschind.

K. C. Larned, 3 cottages, 3519-23 Lundy St.; cost, \$3,000.

John Uber, four-st'y and basement store and flats, 442 Milwaukee Ave.; cost, \$12,000; architects, Rogers & Cook.

F. F. Spencer, two four-st'y flats, 403-405 North Clark St.; cost, \$20,000.

F. F. Spencer, two two-st'y flats, rear 403-405 North Clark St.; cost, \$3,000.

F. Kollman, three-st'y flats, 173 Dearborn Ave.; cost, \$12,000; architect, H. Renwoldt; builder, C. Luchring.

John Serra, two-st'y dwell., 983 Twenty-first St.; cost, \$2,000.

H. Doubek, two-st'y store and dwell., 2358 Dashiell St.; cost, \$4,000.

Jos. Vlasok, two-st'y dwell., 604 West Eighteenth St.; cost, \$4,000.

T. H. Gault, two two-st'y dwells, 725-27 Congress St.; cost, \$8,000; architects, Dixon & Townsend; builder, T. A. Gault.

Chas. Teatz, two-st'y dwell., 22 Thirty-first St.; cost, \$3,500.

Geo. Baird, two-st'y dwell., 2923 Butterfield St.; cost, \$3,000.

L. Steguiller, three-st'y store and dwell., 2427 Wentworth Ave.; cost, \$5,000; builder, J. N. Press.

Wm. F. Thomas, 6 cottages, 844-854 Elkgrove St.; cost, \$4,800.

Chas. Euman, two-st'y dwell., 14 Hammond St.; cost, \$3,500; architect, P. A. Steinwig; builder, C. Winkler.

J. O. Donohue, two-st'y flats, 358 North Ave.; cost, \$3,000.

E. V. Carlson, two-st'y dwell., 126 Sedgwick St.; cost, \$3,300.

L. Thoen, two-st'y flats, 215 West Erie St.; cost, \$4,600; builder, J. Olsson.

F. J. Ebner, dwell., 518 Larrabee St.; cost, \$3,200.

Douglas, Stuart & Forrest, to repair elevator; estimated cost, \$7,000.

Henry Vette, three-st'y store and dwell., 1144 Milwaukee Ave.; cost, \$12,000; architect, Fred. Wolff; builder, W. Meneghe.

C. G. Smith, three-st'y stores and dwells, 516-518 West Madison St.; cost \$20,000.

Louis Hammerstrom, three-st'y store and flats, 760 North Halsted St.; cost, \$11,000; builder, F. Gottschalk.

R. J. Crane, 9 two-st'y dwells, 239-271 North May St.; cost, \$11,000; architect, R. T. Carroll; builder, A. B. Cook.

R. T. Crane, 8 two-st'y dwells, 282-288 Curtis St.; cost, \$8,000.

W. D. Jackson, 3 two-st'y dwells, 71-75 Thirtieth St.; cost, \$18,000; architect, O. J. Pierce; builder, D. H. Hayes.

Louis Otendorf, 2 four-st'y stores and dwells, 439-441 West Chicago Ave.; cost, \$17,000; architect, H. K.; builder, H. L.

James Calvert, three-st'y dwell., 455 West Harrison St.; cost, \$4,000.

E. B. Sheldon, 4 two-st'y dwells, 51-57 St. Clair St.; cost, \$20,000.

F. Koepfen, two-st'y dwell., 56 West Nineteenth St.; cost, \$4,000.

Wm. Short, 4 two-st'y flats, 806-812 Fulton St.; cost, \$10,000; architect, Chas. Palmer; builder, H. Hibbard.

Wm. Frank, two-st'y store and dwell., 997 Ogden Ave.; cost, \$4,500; architect, F. Wolff; builder, Jno. Kroedel.

M. Bland, 2 three-st'y dwells, 266-268 East Erie St.; cost, \$15,000; architect, Theo. Karls.

E. B. Sheldon, 2 two-st'y dwells, 51-57 St. Clair St.; cost, \$20,000; architects, Burling & Whitehouse; builder, E. Earnshaw.

H. Copeland, three-st'y store and flats, 712-714 Van Buren St.; cost, \$12,000; architect and builder, H. Copeland.

Wm. Fitzgerald, 3 three-st'y stores and flats, 743 Indiana St.; cost, \$21,000; architect, Wm. Strippleman; builder, D. H. Scafe.

D. W. Potter, four-st'y stores and hotel, 129-133 East Chicago Ave.; cost, \$40,000; architect, W. A. Furber; builder, A. R. Clark.

Cincinnati.

HOUSES.—Geo. W. Rapp has prepared plans for block

of 6 brick dwells, two-and-one-half-st'y, slate roof, on Ohio Ave. and Calhoun St., 71' x 125'; cost, \$40,000.

Also for Henry Koch, frame dwell. on Woodburn Ave., Walnut Hills, two-and-one-half-st'y, 38' x 45'; cost, \$7,000.

Also brick stable for Julius Balke, two-st'y, 39' x 50', on Lewis St., Walnut Hills; cost, \$6,700.

BUILDING PERMITS.—M. Welke, three-st'y brick dwell., Poplar St., near Central Ave.; cost, \$12,000.

James Walsh, repair house on Gest St., near Evans St.; cost, \$3,500.

Henry Ray, two-st'y frame dwell., Westwood Ave.; cost, \$3,000.

Ross Fenton, addition to three-st'y brick, 530 Elm St.; cost, \$5,000.

L. Dalmer, three-st'y brick dwell., Bank St., near Freeman Ave.; cost, \$6,000.

James Fleming, two-st'y frame dwell., Beech St.; cost, \$3,000.

Benj. H. Cox, two-st'y frame dwell., Bellevue St., near Shillito St.; cost, \$3,600.

Samuel M. Weiss, two-st'y brick dwell., Queen City Ave.; cost, \$2,800.

Three permits for repairs; cost, \$2,200.

Total permits to date, 547.

Total cost to date, \$2,015,350.

Detroit.

BUILDING PERMITS.—H. Englebert, zoological garden, Michigan Ave.; cost, \$6,000.

Wm. Scott & Co., brick fire engine-house, Gratiot Ave.; cost, \$11,800.

A. Chapoton, 2 brick stores, Jefferson Ave.; cost, \$25,000.

A. M. Gray, 3 brick dwells, Park St.; cost, \$10,000.

Joseph Lyonton, brick cracker factory, West Congress St.; cost, \$15,000.

Archenbron & Meire, addition to church, Joy St.; cost, \$13,000.

Alfred Griffith, brick house, Lincoln Ave.; cost, \$4,000.

New York.

APARTMENT-HOUSES.—For Mr. Herman Hoefel, an apartment-house, to cost about \$250,000, is to be built on the n e cor. of Broadway and Fifty-fifth St., brick and stone front; Messrs. Thom & Wilson, architects.

On the n e cor. of Seventh Ave., a five-st'y brick and brownstone apartment-house, 29' 6" x 80', is to be built, at a cost of about \$30,000, from designs of Mr. R. W. Anderson.

FACTORY.—For Mr. Leo. Schlesinger, a seven-st'y and basement factory is to be built of brick, on the n e cor. of Crosby and Jersey Sts., at a cost of about \$75,000, from designs of Messrs. H. J. Schwarzmann & Co.

ALTERATION.—No. 47 Broadway is to be altered into an office-building, at an expense of about \$35,000, from designs of Messrs. D. & J. Jardine.

CO-OPERATIVE APARTMENT-HOUSE.—Another large building is projected to be built for the West Side Co-operative Association, on the n w cor. of Eighth Ave. and Sixty-second St., to be eight stories high of brick and stone; to cost about \$25,000; Mr. Carl Pfeiffer is the architect.

BUILDING PERMITS.—West Forty-eighth St., Nos. 609 and 611, three-st'y brick factory, tin roof; cost, \$4,500; owner, Honora Taylor, 255 West Fifty-fourth St.; architect, P. J. Taylor; builder, Patrick Walsh.

Twelfth Ave., s e cor. Thirty-sixth St., two st'y brick freight warehouse, gravel roof; cost, \$48,000; lessees, N. Y. O. & W. and N. Y. W. S. & B. Railway Companies, 35 Wall St. and 15 Broad St.; architect, John D. Fouquet; builders, Ross & Sandford.

West Forty-ninth St., No. 426, five-st'y brownstone front flat, tin roof; cost, \$16,500; owner, Elizabeth Seitz, 18 Beekman Pl.; architect, John Brandt.

Third Ave., n w cor. One Hundred and Thirty-sixth St., 3 five-st'y brick tenements and stores, tin roofs; cost, \$14,000; owner, Mrs. Margaret Schmitt, 428 East One Hundred and Twenty-second St.; architect, Geo. W. Walgrove; builder, Frank Schmitt.

Seventy-fifth St., s s, 100' w Third Ave., two st'y brick stable, tin roof; cost, \$12,000; lessee, Maurice Sullivan, 348 East Fourth St.; architect, F. T. Camp.

Third Ave., s e cor. One Hundred and Third St., 5 four-st'y brownstone front tenements and stores, tin roofs; cost, \$13,000; owner, Francis McEntee, 210 East One Hundred and Fifth St.; architect, F. T. Camp; builder, George H. McEntee.

Elizabeth St., No. 14, six-st'y brick store; cost, \$23,000; owner, Charles Gilden, 48 Elizabeth St.; architect, E. Sniffen; builders, Van Dolson & Arnott and Jones & Taylor.

One Hundred and Ninth St., n s, 80' w Fourth Ave., 3 five-st'y brick tenements, tin roofs; cost, \$16,000; owner, Mrs. Margaret Griffin, 408 East One Hundred and Thirteenth St.; architect, J. H. Valentine.

One Hundred and Thirty-third St., s s, 150' e Eighth Ave., 3 three-st'y brownstone front dwells, tin roofs; cost, \$16,000; owner, Robert Lindsey, 2325 First Ave.; architect, J. H. Valentine; builder, John Hutchins.

Lewis St., No. 144, five-st'y brick tenement, tin roof; cost, \$ 6,500; owner, Edward Donnelly, 346 East Third St.; architect, Bernard McGuirk.

Columbia St., s w cor. Rivington St., five-st'y brick tenement and store, tin roof; cost, \$16,000; owner, Frank M. Weiler, 283 West One Hundred and Twenty-third St.; architect, Julius Boekel.

East Seventeenth St., No. 245, four-st'y brick dwell.; cost, \$35,000; owner, Sidney W. F. Webster, 243 East Eighteenth St.; architect, Richard M. Hunt.

Tinton Ave., n e cor. Clifton St., two-st'y frame dwell., tin roof; cost, \$3,000; owner, Agnes Decker, 841 Forest Ave.; architect, W. W. Gardiner; builder, P. P. Decker.

ALTERATIONS.—East Twenty-fifth St., No. 113, three-st'y brick extension; cost, \$8,000; owner, Margaret A. Goodridge, 127 East Twenty-fifth St.; architect, A. E. Fountain; builders, J. L. Martha and A. E. Fountain.

State St., No. 6, one-st'y brick extension and in-

ternal alterations; cost, \$5,000; owner, Jos. F. Chattekin, 116 East Sixteenth St.; architect, A. B. Ogden.

West Thirty-sixth St., No. 43, raise attic story and internal alterations; cost, \$12,000; owner, S. B. Smith, 2 Nassau St.; architect, B. Silliman, Jr.; builders, Richard Deever and Smith & Bell.

East One Hundred and Twenty-fifth St., No. 165, two-st'y brick extension on front and a one-st'y brick extension on rear, also interior alterations; cost, \$9,500; owner, Henry Schille, on premises; architects, Kentz & Wirtz; builder, not selected.

Philadelphia.

HOUSES.—Messrs. Longcope & Snyder are about to erect at cor. Fifteenth and Diamond Sts., (Carlisle Park), 21 brick houses; from plans by Hazlehurst & Huckel.

Spruce St., No. 1823, H. C. Groome, Esq., will erect a four-st'y brick residence; from plans by Hazlehurst & Huckel, architects.

BUILDING PERMITS.—Kensington Ave., n of Cambria St., two-st'y dwell., 16' x 35'; Alexander Adair, owner.

Broad St., n e cor. Tioga St., one-st'y addition to chapel, 32' x 36'; Benj. Walker, contractor.

Haines St., w of Stenton Ave., two-st'y dwell., 16' x 42'; W. Garvin, contractor.

North Sixth St., Nos. 2116 and 2118, 2 two-st'y stores, 14' x 40'; H. M. Martin, contractor.

Ogden St., Nos. 1328 and 1330, three-st'y stable, 42' x 78'; Jos. Arthur, owner.

Sixteenth St., s of Page St., 4 three-st'y dwells, 3, 15' x 54'; 1, 29' x 30'; W. C. Lea, owner.

Watkins St., No. 311, one-st'y stable, 36' x 57'; W. W. Bozorth, contractor.

Canal Bank, Manayunk, one-st'y addition to factory, 18' x 80'; J. Steelwagon's Sons.

Wilson St., No. 2119, two-st'y dwell., 16' x 20'; Jas. B. Simpson, owner.

Locust St., No. 3531, three-st'y dwell., 17' x 55'; W. E. Culm, contractor.

Nineteenth St., s of Wharton St., two-st'y dwell., 16' x 40'; Lewis Simpson, owner.

Wyoming St., n e cor. Haverford St., fire truck-house, 40' x 80'; F. H. Vodge, contractor.

Hunter St., Nos. 1023 and 1025, five-st'y smith shop, 36' x 78'; A. A. Catanach, contractor.

Fine St., n s, e of Sixty-fifth St., two-st'y dwell.; 15' x 42'; Fulton & Irwin, contractors.

Fortieth St., e s, s of Lancaster Ave., two-st'y dwell., 14' x 40'; Fulton & Irwin, contractors.

North Seventh St., No. 864, third-st'y addition to club-house, 20' x 40'; J. McCarthy, contractor.

McKean St., cor. Gerhard St., 2 two-st'y dwells, 16' x 42'; Chas. H. Clark, owner.

Poplar St., n s, w from Twenty-seventh St., 12 three-st'y dwells, 1, with store, 15' x 37'.

Third St., w s, n of Cumberland St., one-st'y box factory, 32' x 70'; David H. Davidson, owner.

St. Louis.

BUILDING PERMITS.—Ninety-three permits have been issued since our last report, of which 21 are for unimportant frame houses. Of the rest, those worth \$2,500 and over are as follows:—

Wm. Kennedy, 3 adjacent two-st'y brick dwells.; cost, \$8,000; J. D. Fitzgibbons, contractor.

Otto Moser, 2 adjacent two-st'y brick dwells.; cost, \$7,300; Jungeneid, architect; Charles Wehking, contractor.

H. Belz, 2 adjacent two-st'y brick dwells.; cost, \$7,700; Dette, architect; Geo. M. Roeder, contractor.

R. H. Newberry, two-st'y brick dwell.; cost, \$2,500; R. H. Newberry, architect and contractor.

August Held, two-st'y brick dwell.; cost, \$3,000; Jungeneid, architect.

Bowman & Son, 2 adjacent two-st'y brick dwells.; cost, \$8,000; G. W. Pike, architect; sub-let.

Peter Dietz, two-st'y brick dwell.; cost, \$3,200; N. Risse, contractor.

A. Demuth, 3 adjacent two-st'y brick dwells.; cost, \$9,000; Helm Bros., contractors.

Delaney (owner), Carpenter (agent), two-st'y brick dwells.; cost, \$9,100; Beinke, architect, M. Kirkwood, contractor.

J. F. Hackstaff, two-st'y brick dwell.; cost, \$2,780; J. E. Truitt, contractor.

J. E. Truitt, two-st'y brick dwell.; cost, \$2,800; J. E. Truitt, contractor.

Geo. Streit, two-st'y brick dwell.; cost, \$2,500; Geo. Streit, contractor.

Geo. P. Whitelaw, four-st'y brick store; cost, \$13,000; A. Grable, architect; B. F. Stottemeyer, contractor.

Fred. Geisler, two-st'y brick dwell.; cost, \$6,000; J. B. Legg, architect; M. Kirkwood, contractor.

Mrs. M. Carlisle, two-st'y brick dwell.; cost, \$6,500; J. B. Legg, architect; J. Mahon, contractor.

Mrs. H. Herbeck, two-st'y brick dwell.; cost, \$4,500; Stricher, contractor.

J. Cannon, two-st'y brick dwell.; cost, \$6,000; Cairns, architect; A. Redmon, contractor.

St. Louis Mutual House Building Co., No. 3, two-st'y brick dwell.; cost, \$3,100; Mortimer, architect; P. Mulcahey, contractor.

General Notes.

AMHERST, MASS.—Bartlett Bros. of Whately have the contract for building Prof. Henshaw's new house on Orchard St.

CHIFFEWA FALLS, MINN.—The contract for the new city buildings has been let to a home contractor for \$15,000.

DES MOINES, IO.—Burnham & Root have plans ready for a new depot-building for the Chicago, Burlington & Quincy Railroad Co., 50' x 100', to be built here.

DECATUR, TEX.—The town has sold at par \$15,000 worth of bonds issued by the municipality for the construction of a city-hall and high school building.

HOLYOKE, MASS.—Chase Bros. are to build a brick block to contain 4 tenements of 8 rooms each, on the lot north of Dr. N. B. Chase, on Mapleton St. The plans are being drawn by T. W. Mann.

LOSDALE, R. I.—The cornerstone of the new Christ Church was laid last week.

MACON, GA.—Statement of buildings now in progress, or about to commence under the charge of Alexander Blair, architect, Macon, Ga.:—