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MR. BENJAMIN S. ROTCH, of Boston, who died very suddenly a year ago, had during his lifetime formed an admirable project for encouraging the study of architecture, an art in which he took a great and intelligent interest, by offering to students and draughtsmen, as an incentive to special exertion, an annual prize, to take the form of a sum of money large enough to pay the cost of a year of travel in Europe. No plan for carrying his intention into effect was, however, formed, and at the time of his death, the matter had assumed no more definite shape than that of a benevolent scheme, to be further developed at leisure. At the settlement of the estate of the deceased gentleman, his children, knowing that this particular fancy had been much in their father's mind, formed the idea of carrying it into effect, in the manner that they thought he would have wished, with a portion of the property which they received from him; and as soon as a satisfactory plan could be arranged, and the necessary legal formalities complied with, they joined in executing an instrument of gift surpassing, if possible, in thoughtful generosity the kind intention to which they were endeavoring to give effect.

THE deed, as finally executed, assigns in trust forever to three persons, as trustees, property sufficient to yield an income of two thousand dollars a year, and from the income of this fund not one, but two, young men are to be constantly maintained as travelling students of architecture in Europe, the award of the studentship being made annually, and each successful candidate holding it for two years. By a provision which, considering all the circumstances, must be called a wise one, the privilege of competing for this studentship—the most brilliant prize, with the exception of the Prix de Rome, offered to young architects in any country—is restricted to students or draughtsmen in offices in the State of Massachusetts, and no one can be a candidate who has not spent at least two years in the office of a practising architect, this amount of experience of actual professional work being justly regarded as essential to the most intelligent appreciation of the architecture of other ages and countries. The details of the examination which candidates must pass, and of the work to be required from the beneficiaries of the fund, are not yet settled, but the Boston Society of Architects will coöperate with the Trustees in regard to these points, and the first examination and award will take place during the coming winter or spring.

IT is impossible to over-estimate the future influence for good in the profession of this most noble and thoughtful gift. To say nothing of the opportunity for artistic improvement which it will open to poor young men of talent, the very fact that the prize is a public one, to be secured by any one, well grounded in first principles, who has the industry and perseverance necessary to win the highest place, will make it the object of an emulation which, although success may fall only to few, will in itself bring nothing but good to those who may be stimulated by it to energetic efforts at improvement in their chosen profession; while even the older architects will share in the in-

terest of their pupils or assistants, and will find themselves renewing their youthful enthusiasm in the discussion of the merits and prospects of candidates or the *envois* of the year. As compared with the great French prize, moreover, we cannot help thinking that the American possesses a certain advantage, as being the offering of private, rather than public liberality. Undoubtedly, the Prix de Rome carries with it that fame which the French know so well how to confer upon those who win success, but the young Massachusetts architect who goes forth from home as the winner of the Rotch prize will find, we imagine, his ardor for gaining further distinction for himself and his country rather increased than diminished by the personal interest which his career will have for the family and friends of the founders, and there are few, we think, capable of gaining such a prize, who would not feel it to be for them, in a certain sense, enhanced in value, as having been the offering of filial affection.

THE origin of the disastrous conflagration which destroyed in a few minutes the other day the buildings of the Pittsburgh Exposition, with all their contents, has been explained by a theory which is, to say the least, very plausible. It seems that Mr. Warner, the aeronaut, having an ascension to make, spent the day before the fire in repairing his balloon, and in revarnishing the canvas of which it was made with boiled linseed oil. As the most convenient place for his work, he chose the boiler-room, and after the varnishing was complete, the balloon was rolled up and put by to dry. A more reckless operation than this it would be difficult to conceive, the warmth of the room, the rolling together of the canvas, and the boiling of the oil, all conspiring to make the spontaneous combustion of the inflammable mass almost inevitable, and the opinion of the Pittsburgh Fire Marshal will be concurred in by every builder, architect, insurance agent and painter's apprentice, that the result was simply what ought to have been expected under the circumstances. The only thing that could have made the canvas more certain to take fire than simple saturation with linseed oil would have been to sprinkle it with water before rolling it up, but this is by no means essential to the effect. It is, however, a very common factor in the cases of spontaneous combustion which occur every week or so. Some uninstructed person, having been engaged in painting, or polishing wood-work, undertakes to save the cotton rag which he has been using by washing out the oil or paint, but after one or two trials, finding this a rather difficult operation, abandons the attempt, and rolls up the rag in a knot, and throws it into some corner, where the oil and water speedily react upon each other to set the whole in a blaze.

A DISPUTE, if not a small quarrel, has arisen in Boston in regard to one of the statues in the remarkably pretty collection of sculpture which forms a part of the Foreign Exhibition in that city. Among the statues is one, numbered 218, and catalogued as a figure of Victory, by Professor Tommaso Lazzerini, and dedicated to the American nation. It is not very evident why a statue of Victory should be dedicated to the American nation, but most people would suppose that some sort of compliment was intended, and accept it as gracefully as might be. Mr. J. R. Koehler, however, a connoisseur of the city, not being, apparently, as easily soothed by inexpensive flattery as most people, after inspecting the statue wrote a note to the *Daily Advertiser* asserting that the Victory was a barefaced copy of one of Rauch's Victories in the Walhalla at Munich, and expressing the opinion that the dedication of a fraud to the American nation should be considered an insult rather than a courtesy. This note called forth an answer from Mr. James Jackson Jarves, to whose exertions the managers of the Foreign Exhibition owe the collection of a large and attractive part of the objects which they show, merely saying that the sculptor of the Victory, Professor Lazzerini, held a high position among Italian artists, and that the statue in question was modelled many years ago. Further than this he did not pretend to enter into the merits of the case, but had sent the newspaper article to the sculptor, for his own comments. The rejoinder of Mr. Koehler to this letter reiterated his assertion that the statue was a reduction of a figure well-known throughout the artistic world, and referred to pictures of it in books easily accessible, so that any person might judge for himself of the

imitation. Whether any one except Mr. Koehler has yet done so we do not know, but it is not unlikely that the incident may serve to bring up some details of sculptors' ethics in a way which will prove very useful.

THE Philadelphia *Bulletin* makes a comparison of the returns of building operations in the various cities of the country, which furnishes some surprising results. Few people, for instance, we imagine, will be prepared to hear that, as to the number of buildings erected, St. Paul, Minnesota, was last year the most active city in the United States, and, we are inclined to think, in the world, four thousand new structures having been registered there during the past twelve months, while Philadelphia, the next in order on this side of the ocean, shows only three thousand three hundred and thirty-four. In New York, where, it is true, the size and cost of buildings is greater than in any other of our towns, the number last year was nineteen hundred and five, or less than half that of St. Paul. Boston, although presenting a steady rate of building, is, in respect to actual number of structures, very low on the list, having been during the last three years considerably surpassed by the new town of Topeka, Kansas, and for the past year by the still newer village of San Antonio, Texas. Even Salt Lake City, which to the ordinary mind presents itself as an encampment of fanatics on the border of a desolate pool, constructed last year four hundred buildings, or a third more than New Haven, and nearly as many as the busy town of Newark, New Jersey. In 1881 and 1882 the number of buildings in New York very nearly reached that recorded in Philadelphia, a fact which sufficiently illustrates the great relative prosperity of trade there during that time.

THE *Sanitary Engineer* mentions an interesting example of sewage utilization, as practised at Buntzlau, in Silesia. Buntzlau, although a place of only about seven thousand inhabitants, enjoys the distinction of having been the first town in Germany, and perhaps in Europe, to introduce a public water-supply, and with it a system of sewerage and sewage disposal by irrigation. The first houses were built late in the twelfth century, and their number increasing rapidly, advantage was taken of the circumstance that some fine springs existed on a neighboring hillside to draw from them a supply of water, which was carried in wooden pipes to the town, and distributed to many of the houses. The introduction of an abundant supply of pure water in the mediæval village soon brought with it, as it does everywhere else, the need for an efficient system for disposing of the waste liquids, which of course equalled in amount the original water-supply, and as the open ditches first dug for carrying away the drainage soon became offensive, underground sewers were substituted for them within the city limits. Beyond these limits the ditches were retained, and extended to a final outfall into the river Bober, a mile or so away. Between the city and the river, however, were cultivated meadows, and the farmers soon took the liberty of diverting the sewage from the ditches to increase the fertility of their land. The period when this practice was first begun is not definitely known, but the advantage possessed by the Buntzlau farmers in being able to irrigate their fields and gardens with the sewage is mentioned in a chronicle dating back to the year 1538, and to this day the same meadows are still irrigated in the same manner. In 1559 the irregular and unauthorized appropriation of the sewage was terminated by the adoption of a comprehensive scheme for irrigating the meadows below the town on a large scale. All the street-wash and roof-water of the town was turned into the sewers, but even with the aid of the rain-water the supply of the fertilizing liquid ultimately became inadequate to the demand, and in 1748 a town meeting was called to adopt a weekly schedule, by which each farmer was allotted the use of the sewage during certain hours of every week, the weekly period of irrigation for each customer varying from two to twelve hours. Within the present century the system of distribution has been improved, and iron pipes have been substituted for the old wooden ones, but the principle of disposal is unchanged. The irrigated area, so far as can be judged from the small map accompanying the description, now amounts to about one hundred acres, of which forty-two acres are devoted to market gardening, while the rest consists of meadow, in which, however, many fruit trees are planted. The subsoil is gravelly, and although there is no attempt at under-

drainage, the ground, after nearly three hundred and fifty years of constant irrigation, has never shown any sign of saturation. The sewage is distributed in open carriers, through the winter as well as the summer, and its efficacy as a fertilizer, diluted as it is, may be judged by the fact that four or five crops of grass are cut every year. The interest which attaches to this experiment, which may certainly be considered to have attained a substantial success, is increased by the fact that the latitude of Buntzlau is substantially the same as that of the southern part of Hudson's Bay, and its irrigation fields, although not perhaps exposed to so rigorous a climate as those of Dantzic, are perhaps at least as unfavorably situated in this respect as would be those of any town in the United States.

THE great earthquake on the island of Ischia has been the occasion of much scientific discussion, and some theories in regard to such occurrences have been brought forward which will probably be new to most of our readers. The particular catastrophe at Ischia is generally considered to have had a mixed character, the sinking of the ground, with the consequent destruction of life and property, appearing to have been due to the collapse of the earth over vast subterranean cavities, which had probably been in process of excavation for ages by the solvent action of the hot mineral springs of the region, but remained concealed under the crust of the surface soil until a comparatively slight volcanic shock disturbed the cohesion of this, and threw the whole in ruins into the abyss beneath. Many circumstances support this view. Among others, the sharpness of the boundary which circumscribed the scene of the catastrophe has attracted the notice of all observers, and suggests at once the sinking of the crust over a concealed cavity. One house is said to have been torn into two parts, one of which remains intact, while the other is in ruins; and in the dormitory of the paupers' lodging-house a row of trestles which supported the heads of the cot-beds was found still in place, while the corresponding trestles which sustained the feet were mingled with the heap of debris below. The suddenness of the crash, which is shown by the attitudes of the bodies taken from the ruins, also indicates a collapse, rather than a shaking of the ground. Most earthquakes are preceded by warning movements and noises, and the bodies of those who fail to escape are found afterward in positions indicating flight, but at Casamicciola the corpse of a woman was found with the yarn of her knitting work still looped around her finger, and a shoemaker with the waxed thread which he was drawing through the leather still grasped in his hand.

VERY little evidence of mental agitation or fright was discovered, and death seems to have come to the victims as an instantaneous shock, few of them showing even the signs of suffocation or of bruises from falling objects. One of the most noted physicists of France, M. Flammarion, takes occasion in speaking of this earthquake to remark that many, if not all, very fatal catastrophes of the kind have probably occurred in a similar way. The old theory of the internal fires of the earth is, as he says, now generally discredited. It is true that the temperature of the earth rises for a certain distance below the surface, but the rate diminishes with the depth, and the maximum temperature is probably reached at a mile and a half or so from the surface. Below this, as the form of the earth, the precession of the equinoxes, and many other phenomena indicate, the mass of the globe is solid, or at most slightly plastic by reason of the enormous pressure at every part. If there is no subterranean fire beneath our feet, there is certainly no need of breathing-holes to give vent to the terrestrial flames, and the ancient theory which regarded volcanoes as safety-valves for the Titanic furnaces is as devoid of foundation as that which attributed the throes of *Ætna* to the struggles of the imprisoned *Enceladus*. Volcanoes, however, exist, and need to be accounted for in some way, so M. Flammarion explains the phenomena which they present by the theory that they indicate chemical action in the substance of the earth below them, caused generally by the infiltration of water, which, coming in contact with oxidizable substances, produces at great depths, and under immense pressure, the phenomena characteristic of violent oxidation. In support of this view it is observed that all volcanoes now active are situated directly upon the sea-coast, and all known extinct volcanoes are either near the sea, or on the borders of what were once large bodies of water.

SPANISH ARCHITECTURE.¹—I.

ist, can find in Spain that which is lacking in every other country of Europe; namely, freshness. If he leaves the well-known Andalusia, and travels north and west he can find things and people of which and whom he has not read in books until they are familiar; architecture of which he cannot get photographs, unless he takes them himself, and, a little off the usual routes of travel, people who have not seen a foreigner since the Duke of Wellington's campaigns there.

There is very much to see in Spain. The land of some of the richest history and legend of Europe, it is full of the records of its past. The field in ages long gone by of race struggles of Aryan and Semitic man, later the turning point of the great advancing tide of Mohammedanism, when Christian and Paynim met and fought, not for sentiment and religion only, as in the Crusades, but for the soil and its fruits; later yet, Spain, the already world-renowned for learning and refinement and wealth, for a time nearly monopolized the exploring and despoiling of the wondrous wealth of the New World; and still nearer our own day this land was the stage whereon the terrible Inquisition performed its tragedies in the name of religion.

And all these happenings have left their marks. The cities and the people, their language and habits, have incorporated in them such inheritances of all that eventful past that were no writings extant, the student could almost construct a history from the things as they now are. But the change has begun. Spain is rapidly being modernized, and railways and the telegraph and travel and literature are quickly bearing fruit and effacing that presence, as it were, of the past, which is so charming although it is the evidence of stagnation or decadence. While it remains let those who can go and see it, in the most fascinating land for travel that progress-jaded men could wish for. There is the quaintest mixture of the luxurious civilization which France claims to typify, and the semi-barbaric Oriental indifference, to be found purer in Morocco, which is not far off, almost as near as France. Madrid is almost like a French city, while Toledo, hard by, might be in Africa for strangeness.

Travelling is now perfectly safe in Spain. The evils of misgovernment and civil war and brigandage, which till lately made travelling for pleasure out of the question, are fading away. Hotels, as we understand the word, are few indeed; but necessities can always be had, and often with primitive Old World circumstances very interesting to the traveller of good digestion and contented mind. Men of this kind, only a few as yet, and only the hardiest of the fair sex, are exploring the country with delight even in their discomforts, and soon enough will be known and written to rob travelling of the charm of exploration. Soon Leon and the Asturias and Galicia will be as much frequented and as little surprising, as now are Andalusia and Granada. There are very great differences between the various provinces—the old kingdoms—of Spain and nearly all our ordinary ideas of what is Spanish are obtained from Andalusia. The route by Cadiz and Seville to Granada is well trodden and well recorded, but this no more constitutes Spain than Georgia does the United States. In the interior are the things to be seen. Painters will continue to make studies and pictures of all the old well-worn subjects in Venice and Rome and elsewhere, and beholders will welcome in them the slightest freshness in treatment, atmosphere, color, any new way of telling the old story, but he who will go to Spain will have a new story to tell, many indeed, and so rich that though his telling be faulty, he may hope to get some attention.

In this belief the writer ventures to unfold his tale and his portfolio to brothers of his profession, without vanity and without apology. There is little yet done toward recording the interesting architectural treasures of Spain. The works of Don Juan A. Cean Bermudez (1829), of Don F. J. Parcerisa (1844), of Don G. P. de Villa Amil (1842), are good; indeed, Parcerisa's is excellent if we take into consideration its date and aims, but now, and for our own desires, they are all wanting in most essential things. A commission created by the Spanish Government is preparing and publishing a most ambitious, but, so far, unsystematic and unavailable work, "The Architectural Monuments of Spain." It is far from complete yet, or even from being usefully advanced. In the English language the book by Richard Ford, F. S. A., best known as "Murray's Handbook for Spain," has much information not to be despised, and the "Gothic Architecture in Spain," by George Edmund Street, A. R. A., is a valuable work, which, so far, stands above all for its excellence, although there are some others of value. It was as a respectful pupil and admirer of this master in architecture, so admirable both in his

THROUGH Spain is as interesting a journey as can be taken in Europe. The traveller, be he architect, artist, historian, or ethnologist, or simply an appreciative and observant tour-

own work and in his devotion to his office of Professor in the Royal Academy, that the writer, when he found the fitting opportunity in obtaining the Travelling Studentship of the Academy, resolved first of all to visit Spain, and add some little contribution to the work which Mr. Street had practically commenced. The drawings for this purpose have been usually made from subjects not illustrated by Mr. Street, or when it seemed desirable to follow closely in his footsteps, (and sometimes it was unavoidable by reason of the beauty of the subject,) then at least a different point of view was chosen so as to add to, rather than compete with, what was done before.

Nearly all the illustrations are fac-similes of pen-and-ink drawings done deliberately on the spot; two or three are redrawn from water-color sketches; and whatever they may be otherwise, they are all conscientiously correct architectural drawings.

ANDALUSIA.

It is good to see Andalusia first of the provinces of Spain. This is the land of our Spanish ideals; the European home of Oriental grace and romance and luxury. Here a poetic, ease-loving southern people, retaining yet many habits and sentiments taught them by the Moors, live in a luxuriant country with a glorious climate; live so easily that to exist is almost enough to do. Necessity is not very stern in this corner of the earth and the Andalusian's labors are regulated accordingly. He has abundant time at his disposal to compensate for a minimum of energy, when work is in question. But withal, he can be bright as his native sunshine, and handsome and lithe as he is gay; and if bull-fighting or other sports are afoot, he will prove that his indolence is of the spirit rather than of the body; for Andalusia is the home of the arena and the dance as well as of Moslem indifference and procrastination.

Approaching Spain at Andalusia by Gibraltar we see first those things we have been led to expect. Steaming up from the rolling wastes of the Atlantic into the Straits, with blue distant shores on either hand closing in nearer and nearer, and rising bolder and higher, till they stand opposite each other in forbidding mountain peaks, are the pillars of Hercules. One can sympathize (if circumstances are propitious) with the ancient heroes who feared to pass these ends of the earth; for at times these mountains are wreathed with thunder-clouds and rain-mists; and winds sweep down their sides and across the narrow seas, wildly enough to justify the fears of the superstitious mariners in their diminutive ships. The waters, too, boil and eddy between the great sea and the greater ocean in the strangest way; of small account, perhaps, to modern mariners who understand the meaning of it, yet mysteriously enough to afford food for reflection, even when seen from the deck of an iron steamer.

There on the right is Africa—the "Dark Continent." Its nearest shores, the city within sight upon the bay, and everything there are as different from things European as if a thousand leagues instead of a short mile or two separated them. On the other hand is the Spanish land of promise for which we are bound, and in front, standing independently in the sea, almost a separate island, the steep-peaked Gibraltar bears the flag of another race; and its little town lives a life different again, although not altogether English. There is very much that is interesting in this locality, and greatly varied in its interests, too, so that architecture is apt to be neglected for a time even by the most devoted students, and in truth there is not much architecture to study. But here I left the Peninsular and Oriental steamship "Poonah" and began my wanderings, and the first impression was so pleasant and lasting as to warrant a line or two here. "The engines stopped, the anchor fell, dragging out the rumbling cable, and starting us up from the dinner table, where we had been lingering expectant, and we all hurried on deck. The view agreeably surprised me. The storm had ceased, and there was just enough light to show in silhouette the bold, dark ridge of the rock, black against the sky, hard and distinct, towering up into rugged crags aloft, and looking like some such sleeping sea-monster with spike-studded backbone as the Goths and Japs loved to imagine; much, in fact, like a gigantic whale with the spinal appendages; and the clouds in great broken masses driving across the sky behind, made such a scene that one looked around for the battle or wreck which should be in the foreground to complete the picture consistently; but all along the base and lowest slopes quiet twinkling lights, and dim outlines, and faintly-seen white walls showed where the town lay peacefully, in tiers and terraces, behind its two miles of fortified seawall. I stood and enjoyed the scene till the Gibraltar boats swarmed around, and their crews made that din and confusion which all Mediterranean boatmen love, and then we landed and entered the English fortress by drawbridge and portcullis, real enough to convince us that peace was not always mistress of this lovely spot of earth. Gibraltar is not a barren precipitous rock only. True, the rock is there, with the world-renowned galleries and chambers honeycombing its cliffs, but the exterior of even this part is decorated with wild flowers and grasses, lodged wherever they can find root-room in crevices and on shelves, and all along the western base semi-tropical vegetation beautifies the land; cactus, prickly pear, and palms and geraniums in big shrubs, and many flowers greeted my explorations of the next day."

But Andalusia and not Gibraltar was my object, and is now my subject. After a well-remembered trip to Morocco across the straits, and a pleasant day or two in ancient but modern-looking Cadiz, I at last reached Seville and began work, and pleasant work it proved to be. I wandered out in the genial sunshine (it was early April,

¹ By Robert W. Gibson, Travelling Student of the Royal Academy.

and I had left cold and storm at home), and soon found the cathedral and its beautiful tower, the Giralda. It is square and massive, rising simple and grand, the decoration not disturbing the dignified outline, but encircling the surfaces of the walls with delightful variety of window-arch and wall-tracery up to the first cornice, one hundred and eighty-five feet from the ground. This is the work of the Moors, of their renowned builder, Abu Jusuf Yakub, who, in 1171-1196, raised the great mosque of which this is the principal remaining feature. The belfry above is Renaissance, but it is a very happy completion in general conception, and, indeed, its well-proportioned columns and cornices, relieved with many a terminal and balustrade, harmonize wonderfully with the lines of the more ancient work, although so different in character of decoration. It is more than probable that the Moorish termination of the tower was something like it in outline, not only because the original top was moved away to give place to the present one, but by comparison with some other Moorish towers of similar type which remain as first built. The Giralda tower is about forty-eight feet square externally, and is ascended by means of inclined planes, like those in the Campanile at Venice. Its name is derived from the gyrating figure in bronze which crowns the belfry, said to be fourteen feet high and to weigh twenty-five hundred-weight. The manner of hanging the bells is noticeable; the cross-head is pivoted between the piers of the external wall, the bell hangs in the arch or window as the case may be. It is balanced by a ponderous counter-weight of wood and metal above the cross-head, so that with a few swings the ringer can give the bell impetus enough to turn completely over. This is not a bad plan when one bell is in question; a little push at each revolution applied at the right moment, and with due regard for one's personal safety, will keep the bell going over and over with a rhythmic ding-dong. But the



Spanish bell-ringer too often displays his dexterity by starting up three or four and even five bells at once, running from one to the other to administer a shove to the flagging one. They are usually approximately in tune, but their rates of oscillation and revolution bear no discoverable relation to one another, or to anything else in creation, except, perhaps, the seemingly irregular movements of the ringer, and for this reason the time is—well, "bad" is a weak word for it; generally there is no time at all, but only a clatter-clang-dong as broken as the banging of a kettle in tow of an insulted dog. Some of the bells are so degraded as to have a rope which coils several times around the cross-head, and being hauled in, gives the complaining bell a dizzy speed, strong enough to recoil it as many times the reverse way; a new element of variety in time is introduced thus, for the motion is not only independent of that of the other bells—it quickens and slackens in itself. It was novel, and for a little while interesting, but

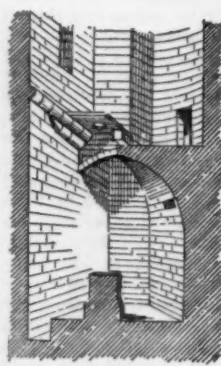
at times it produces more noise than music.

The exterior of the cathedral as seen from the streets is not very impressive. It is of many periods and styles, and therefore has little unity of expression, and misses, too, the charm of picturesque contrast which such mixtures sometimes attain; yet there are some "bits" which are beautiful, taken separately, and much that is worthy of study for expressive details in the later Gothic styles. The interior is grand enough to justify its reputation in that respect, but its grandeur is so well recorded already that further repetition would not be in place here; suffice to say that my impressions were chiefly of its size, of some glorious stained-glass, and, most, of that almost indescribable aroma of an ancient and powerful and self-glorifying religious temple, a strong sentiment impregnating the very stones with its quality, and commanding respectful approach. This, strangely enough, seems to belong to some buildings and be absent from others, independent of architecture or decorative arts, or even of religion pure and simple, and Seville gave me that impression quite apart from my observations architectural. I heard that they are very intolerant of Protestant curiosity there; a lady had been ignominiously expelled for venturing to sketch some admired bit of ornament the day before, so as there was plenty to do elsewhere, and little time at my disposal for Seville in any case, I did not try to commence my pictorial labors inside. I walked round to the north side by the terraced foot-way, and found the old arch leading to the court-yard or "patio," the old court of the great mosque which preceded the cathedral. There is some of the work of the Moors about this part yet. The court is situated much as the cloisters are

in some other places, between the cathedral proper and certain ecclesiastic buildings which stand upon the street. It is a charming retreat for the sketcher. The orange trees from which it takes its name, "Patio de los Naranjos," are luxuriant, and in their shade in the centre is a plashing fountain, with, usually, two or three picturesque children or idlers about its circular basin. On one side stand the transept and walls of the cathedral, rich in deep shadows, and picturesque in sky-line of pinnacles and traceried parapets, and best of all, at the end, far enough away to be comprehensively seen, rises the grand old Giralda tower. To describe its appearance here I made my sketch (see *Illustrations*), which is perhaps better than words, and that done I made another note of the flying-buttresses of the nave, because they seemed to me to be a very good example of the exuberance of detail of a late style properly subordinated to good expressive constructive forms, a somewhat rare quality in advanced Spanish Gothic. The way in which square angles are broken back into diagonally placed pinnacles, and the combinations of gables and crockets upon them are very good, and there is enough plain wall-surface, and enough solid, heavy arch in the buttress itself to satisfy the desire for stability, apparent as well as real.

SANITARY PLUMBING.¹—V.

THE VALVE AND PLUNGER CLOSETS.



A FEW years ago, before systematic ventilation of the sewers and soil-pipes became universal, it often happened that a back-pressure from the sewers occasioned by rising tide, adverse wind or other cause, forced the sewer-gas through the water-seal of the trap in bubbles. A tight-fitting valve or plunger in the trap might, under these circumstances, have served a good purpose in resisting this back-pressure, and as valve-closets were at first built without overflows the valve or plunger performed an actual service in resisting, in a measure, the entrance of sewer-gas.

Now, however, the circumstances are altered. It is found that an overflow is necessary in these closets, and this overflow-passage is rarely provided, like the trap, with a valve or other mechanical closure. Hence, any gases which could pass an ordinary water-seal could pass through these closets by way of the overflow-passage quite regardless of and quite as easily as if the valve or plunger in the trap never existed. Moreover, the ventilation of the sewer and soil-pipes renders back-pressure impossible, so that the only useful office which the valve or plunger could perform in relation to sewer-gas is no longer called for.

The valve and plunger evidently cannot prevent the loss of the water-seal from siphonage, momentum, evaporation, or suction, even where the overflow passage is closed by a ball, as is the case with some of the Jennings² valve and plunger closets; for siphonage, momentum and suction act in the direction in which the overflow-ball or valve is opened, and evaporation is chiefly due to the trap ventilation-pipe. Moreover, the tightness of a valve or plunger against its seat can never be implicitly relied upon. They are always liable to leak, and could never be fitted with such microscopic accuracy as to prevent the passage through the minute openings which exist between the particles forming the valve and its seat, of any micro-organisms—the bacteria or disease germs, or their spores—which might be in the water.

The only object of the valve or plunger, therefore, is to retain a certain quantity of water in the bowl to receive the waste matters, and prevent their striking the dry surface of the closet-bowl to which they would adhere, and if it can be shown that this result can be accomplished equally well without them, and by simpler means, it is obvious that they are utterly superfluous.

The efficiency of the large body of water suddenly emptied from the bowl for flushing the water-closet is destroyed by the obstruction of the valve and plunger themselves, and their machinery. The drains and soil-pipe can be equally well flushed without them.

The receiver or container of the valve and plunger is open to the same objections as that of the pan, differing only in degree, and the overflow-passage, not required in the pan-closet, forms a second filth collector, and increases the complexity and cost of the apparatus. The sudden discharge of the larger body of water in the bowl is very liable to empty the trap below by its momentum and siphon action, leaving a free passage-way for the entrance of sewer-gas into the house, requiring a special provision to be made for its automatic re-filling.

These and other considerations have led sanitarians to express themselves very differently as to the relative merits of the pan, valve and plunger closets, though there is no sufficient reason why, after a thorough examination of the subject, such difference should exist. Were they agreed in their views, their unanimous testimonies either

¹ Continued from page 150, No. 405.

² These, and the "Eclipse" and the Bower plunger closet, are the only closets in the market known to the writer, in which the overflow is provided with anything more than a simple water-seal.

way might be accepted by the public in faith as sufficient. As they are not, the facts should, if possible, be so clearly presented that any reader may easily decide for himself. The great importance of the subject is a sufficient excuse for the space such a careful analysis occupies.

THE VALVE-CLOSET.

Valve-closets are those which have the outlet of the bowl closed by a movable valve or plate, usually held in place by a lever or spring.

Figure 2 represents a valve-closet having the trap below the floor.

Figure 3 represents a valve-closet with trap above the floor.

Figure 4 represents a valve-closet with a ball in the overflow.

These are among the simplest and best of their class, and may be considered as types or standards. All others differ from these merely in slight and comparatively unimportant matters of detail. Some

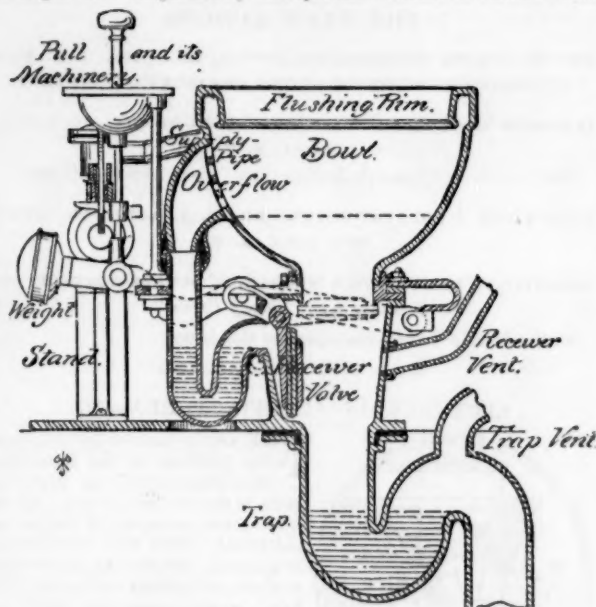


Fig. 2.— Valve-Closet.

valve-closets are made without water-traps below the valve. These are totally unreliable, as no valve has as yet been discovered which is not liable at some time to leak, especially when used in water-closets. Beginning as before, with the flushing:—

(a) We see, by examining the drawings, that the cleansing effect of the stream can never reach those parts of the receiver which lie behind the valve and around its hinge, nor any part of the overflow passage. Hence, these parts are sure, sooner or later, to become foul, and they are exactly the parts in which foulness will impede the proper working of the valve and closet, and occasion leakage of the water from the bowl. The receivers of both the pan and the valve closets can be enamelled and provided with special cleansing jets, and closets having these improvements are now manufactured, but the overflow-passage cannot be so scoured, and I know of no closet in which the attempt to do so has been made. Finely divided waste dissolved in the water and making its way into the overflow-passage, as it very frequently does and must, soon fouls it, and once the foul deposit has begun it can never be arrested, except by taking the closet to pieces. The extent of surface which cannot be reached by special scouring streams is, therefore, greater in the valve than in the best pan closet, and this goes far to offset the advantage it has in the smallness of its receiver.

(b) The flushing stream does not act instantaneously, but only after the supply-pipe has had time to fill from the cistern. In this defect, which may be remedied in the manner hereafter to be described, the valve-closet is similar to the pan-closet.

(c) The valve, like the pan, breaks the force of the flushing stream, and prevents its passing through the receiver and trap in a compact volume, occasioning (d) a total loss of the power which the water-head could give. Here again the valve and pan closets are equally defective.

(e) The same causes for the production of disagreeable noises in flushing exist in both kinds of closets. Most valve-closets now in the market being protected by patents, their workmanship like their price is superior, and some of the causes of noise are partially overcome; but the same care devoted to the construction of the pan-closet would effect the same result, and, so far as principles of construction are concerned, the valve-closet has, in this particular, no superiority over the pan-closet.

(f) To operate the machinery of a valve-closet requires even more strength than is the case with the pan. It is indispensable that the valve press very firmly against its seat in order to retain and sustain the large body of water in the bowl above it, while no such pressure is required with the pan, whose holding capacity is dependent upon its form and not upon the principle of closeness of contact. To overcome this greater pressure a greater effort is required, so that in this respect the valve-closet stands inferior to the pan.

(g) In the matter of complication of arrangement for the simultaneous opening of the closet and cistern valves through levers, cranks, and wires, the valve and pan closets are evidently equally defective.

(h) When the water-closet is used as a slop-hopper, and a large body of water is suddenly emptied into the bowl, the obstruction occasioned by the valve to the outflow of the water is likely to cause spattering, while the pan, on the contrary, though it forms an obstruction, allows the water to escape in a measure as it is poured in; and the danger of spattering and overflowing is somewhat diminished.

When, as often happens, the valve is suddenly closed at the moment the waste matters are passing out, and catches these matters, it presses them against the valve-seat, whence they can never be removed by flushing, but remain to decompose until they are scraped off with great difficulty by hand. The same objection holds with the pan-closet, but such an obstruction on the valve causes it to leak, and as soon as the water has escaped from the bowl the odor of the adhering matters becomes intolerable.

The Form of the valve-closet is:—

(a) Complicated by the overflow, not required in the pan-closet. In other respects the machinery of the closets is similar.

(b) The receiver is smaller in the valve than in the pan closet, and herein lies its only important point of advantage over the latter. It has less surface to become foul, and it enables the trap to be placed above the floor.

(c) The form of the bowl and principle of the valve admits of a larger surface of water for the reception of the wastes than is possible with the pan-closet. This has its advantages and its disadvantages. Under the former head belong the greater cleanliness it gives, and the stronger flush for the drains. Under the latter, its increased consumption of water and its liability to siphon out the water in the water-closet trap and in the overflow trap.

(f) As in the pan-closet, the trap and receiver are invisible and inaccessible from the outside and are in these respects equally defective.

The Material.—As in the pan-closet the materials of construction are usually not the best for their purposes.

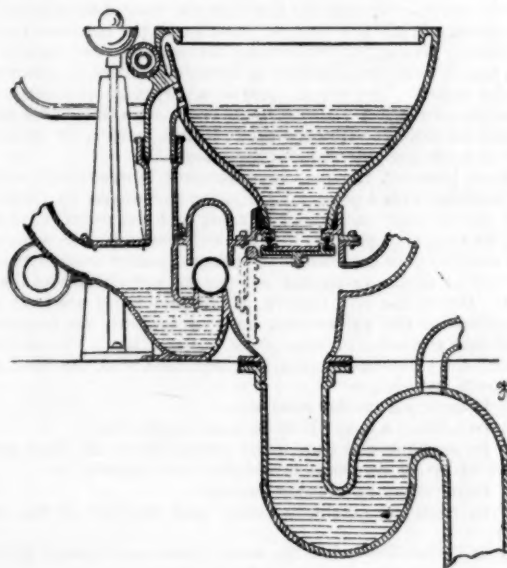


Fig. 4.— Valve-Closet.

The Construction.—(a) The valve, like the pan, the receiver, and all the machinery connected with them are unnecessary, because the wastes can be better removed and all the functions of a perfect closet be better performed without them, and they form no additional security against the entrance of sewer-gas. The money thrown away upon them should be saved for improving, strengthening and protecting the useful and necessary parts. This is the vital defect in the principle of the valve-closet and is the same as in the pan-closet.

(b) As is the case with the pan-closet, there is nothing in the mechanism of the valve-closet to provide against the loss of its water-seal through evaporation, momentum, siphonage, or suction, though such a provision is possible in a good water-closet, as will hereafter be shown.

(c) As is the case with the pan-closet, there is an unnecessary number of joints and parts. The overflow adds others not required in

the pan-closet. To prevent the loss of the overflow water-seal by the siphonic action of the flushing, already referred to, it is necessary to ventilate the receiver. To carry off the odors generated in the receiver of the valve and pan closets, a single vent-pipe is not sufficient. Efficient ventilation implies an air-supply as well as an air-exhaust pipe, which adds enormously to the expense. Were there no receiver these two pipes would be dispensed with.

(d) In practice, the connection between the bowl and receiver is usually better made than in the pan-closet, but in principle they are the same.

(e) Equally defective is the valve-closet in the want of a frame around the bowl to protect it, and receive the weight of the wood-work.

(f) Equally defective is its connection with the soil-pipe.

(g) The valve is more complicated in form and construction than the pan. It requires a very carefully-turned seat, and a rubber packing. This lasts at best but a short time, dependent upon the quality and durability of the perishable material of which it is made. Hence, repairs are necessary quite often, and much oftener than with an equally well-made pan-closet.

The Cost of manufacture is evidently considerably greater than that of the pan-closet on account of the overflow, and of the principle of the valve, which requires both greater strength and delicacy of form and adjustment. It is correspondingly more liable to get out of order, and hence is more expensive to keep in repair.

DEDUCTIONS.

Thus we find in the valve-closet every defect of the pan-closet, and at the same time others which are peculiar to itself.

Of all the defects of both, the greatest is evidently the dependence upon a construction which involves the use of a receiver or inaccessible cesspool, which is never clean, never tight, and is opened wide to discharge its odors into the house every time the closet is used. If the receivers were of the same size, or could be kept equally free of foul deposit, it is evident that the valve-closet would stand very far below the pan; but this is not the case. The ordinary pan is twice the diameter of the ordinary valve, and has four times its superficial area. To give room for a quarter revolution around a point on its circumference requires a space eight times as large, and the wall surrounding this space must have an inner surface four times as extended. A flushing stream large and powerful enough to thoroughly scour the smaller receiver (except the parts behind the valve) would have no effect whatever upon the surface of the larger, unless divided up into small jets and directed advantageously against all parts of it, and even then the scouring effect would be only one-quarter as great as in the smaller receiver, and in both cases the amount of water required would be very great.

Now, with the common pan-closet the special sprinkler for the receiver is not used because the first cost and the consumption of water is too great. With the cheaper pan-closets the receiver is not even enamelled. Hence, the foul deposit accumulates very rapidly on the sides, and the "hidden chamber of horrors" exhales its noisome odors into the house. The closet becomes a perpetual open cesspool, and defeats its own object. Anything is better than this, and a well-constructed valve-closet with enamelled receiver is, in spite of its many faults, a much less objectionable apparatus.

Where, however, the pan-closet receiver is enamelled, ventilated and provided with a powerful sprinkler, and where all parts of the closet are strongly and carefully made and put together, so that, in short, its cost is as great as that of the valve-closet, the greater size of its receiver does not become so serious a matter as the complicated construction of the valve, and the general unreliability of the valve-closet. Hence the best modern patent pan-closets are to be classed as superior to the valve-closet, and, in general, the former stand higher than the latter in principle of construction. The three points in which the valve-closet gains in comparison with the best modern pan-closets, namely:—

- (1) In having a smaller receiver;
- (2) In holding a larger body of water in the bowl;
- (3) In enabling the trap to be placed above the floor, are more than offset by the six points in which it loses, namely:—
 - (1) In requiring an overflow-passage;
 - (2) In requiring greater accuracy and strength in the working parts;
 - (3) In its liability to lose the water in the bowl through an obstruction under the valve;
 - (4) In requiring the use of a perishable material in the valve washer;
 - (5) In requiring more strength to operate it;
 - (6) In its greater tendency to siphon out the water in its own trap and in its overflow trap.

Ninety-nine out of a hundred of the pan-closets set to-day are without the modern improvements referred to.

These have received the unqualified condemnation of sanitarians, and no plumber can be excused for recommending them.

The valve-closet, however, has not yet called forth such general expressions of disapproval from the authorities, partly, perhaps, because their views have not changed as they should to correspond with the changed conditions the last few years have developed in plumbing; partly because the construction of the valve-closet is so far

superior to that of the ordinary pan-closet as to bias the judgment in confusing matters of workmanship with matters of principle; partly because nearly all the valve-closets are protected by patents, which may have prevented some critics from fully expressing their convictions through deference to their owners; and partly, perhaps, because many, knowing of no water-closet to which they could give their unqualified approval as an alternative, have not laid sufficient stress upon the defects of the valve-closet. So long as sanitarians and the public are divided in their opinion as to this closet, the plumber can hardly be blamed for taking a neutral ground in regard to it, and the public will continue to incur the annoyances arising from its use, until they are relieved by a more general enlightenment on the subject.

THE ILLUSTRATIONS.

UNITED STATES COURT-HOUSE, PEORIA, ILL. MR. J. G. HILL,
SUPERVISING ARCHITECT OF THE TREASURY DEPARTMENT.

SKETCHES IN SEVILLE, SPAIN. MR. R. W. GIBSON, ARCHITECT,
ALBANY, N. Y.

SEE article on "Spanish Architecture" elsewhere in this issue.

DESIGN FOR A COUNTRY-HOUSE. MR. W. A. BATES, ARCHITECT,
NEW YORK, N. Y.

COMPETITIVE DESIGN FOR A MECHANICS' DOUBLE-COTTAGE, SUB-
MITTED BY "Family Broils."

FOR a description see elsewhere in this issue.

LECTURES ON ARCHITECTURE.¹—III.



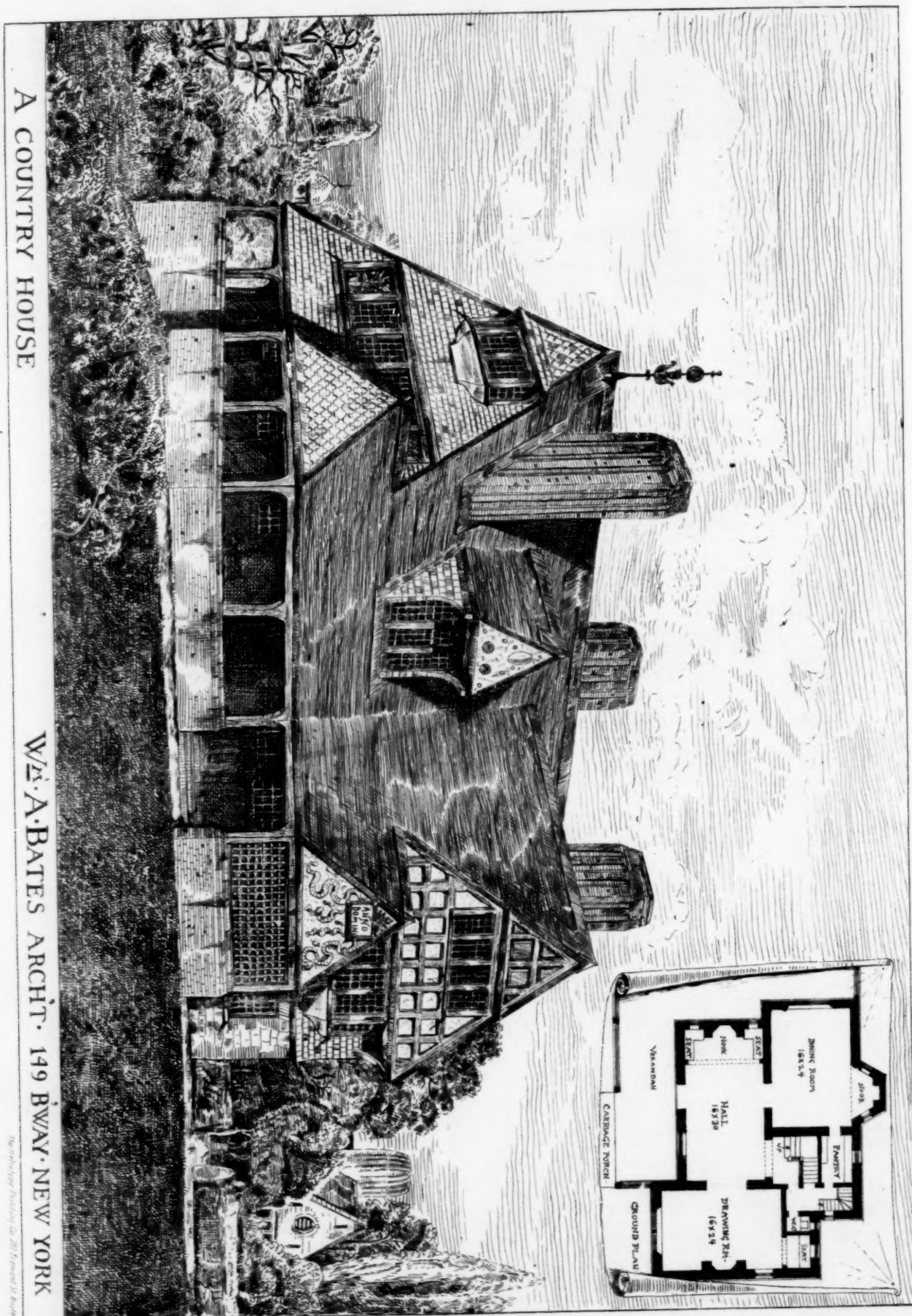
THE architecture of our own country previous to the Revolution was influenced by the prevalent taste in the mother country, and exhibits some examples of Italian architecture, which with very few exceptions far surpass any of our more modern productions in the art. We have several examples which do honor to the talent of their architects, and to the liberal taste of those who employed them. It is, indeed, a sad truth, and none the less so, however much outcry may

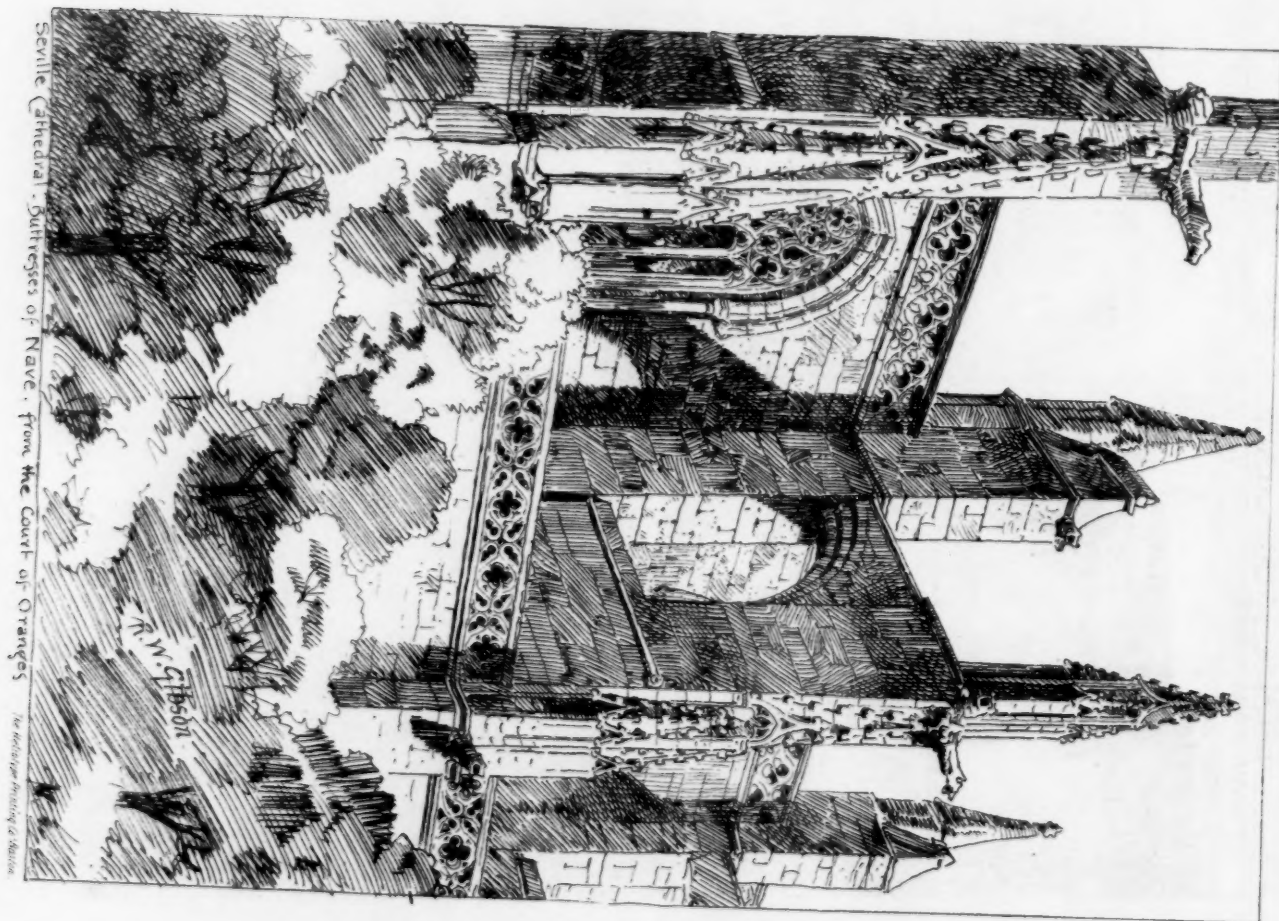
happen to be raised against its enunciation, that if we look about us in Boston for any correct or pleasing building, we do not find it so much in the works of our own time as in those which were executed sixty or eighty years ago. One of these, the old King's Chapel, on Tremont Street, has often been the subject of judicious admiration. If the exterior be bare of ornament, at any rate it makes no pretension to any other character; it is a plain, solid, well-jointed piece of masonry, which is respectable for its sober unity of expression, and venerable, at least in our young country, from the weather-stains which have gathered upon it for nearly a hundred years. In its exterior form and character it is almost exactly like the London churches erected at the same period; such a one as Hawksmoor, Gibbs, or Kent, the English architects of that day, would have been very likely to design. Its plan is that of a simple oblong building, with a semi-elliptical recess for the chancel at the eastern end, and having a heavy square at the opposite front. The tower is surrounded on three sides by a plain portico, which might have been omitted without disadvantage to the design. The order displayed in it is the Roman Ionic, and the details are executed in a correct and pleasing manner. Not so, however, in the recent alterations and repairs, where, by the omission of much of the old work, and the substitution of meagre, shallow, Grecian mouldings in what has been restored, the vile taste of the present race of builders is continually obtruded upon the eye. The windows of this church in the lower row are small and nearly square, covered with a low flat arch, and deeply recessed in the wall. In the next, or gallery story, they are still of the same width, but nearly twice as high, and finished at the top with semicircular arches, the substantial solidity of which would be aped in vain by the bricks and cements and stucco compositions of our gaudy contemporaries. A bold, projecting cornice crowns the whole, relieved with modillions on its lower surface, but appearing perfectly in keeping with the main idea. To the race of "Roman cement men," as Mr. Pugin happily calls them, I can imagine that this exterior would present very little attraction. There is indeed, nothing particularly handsome in it; but it is the sentiment shown by its designer, which is deserving of admiration; an utter absence of clap-trap and pretension; a stern disclaimer of wishing to appear anything more than it really is; a plain rejection of extraneous and ostentatious fictions. No one of true taste could look at it in this light for a moment, and then wish to see it stuck over with dapper shreds and patches of

¹Extracts from a lecture by the late Mr. Arthur Gilman, delivered before the Lowell Institute, Boston, in the winter of 1844-45. Continued from page 114, No. 402.

A COUNTRY HOUSE

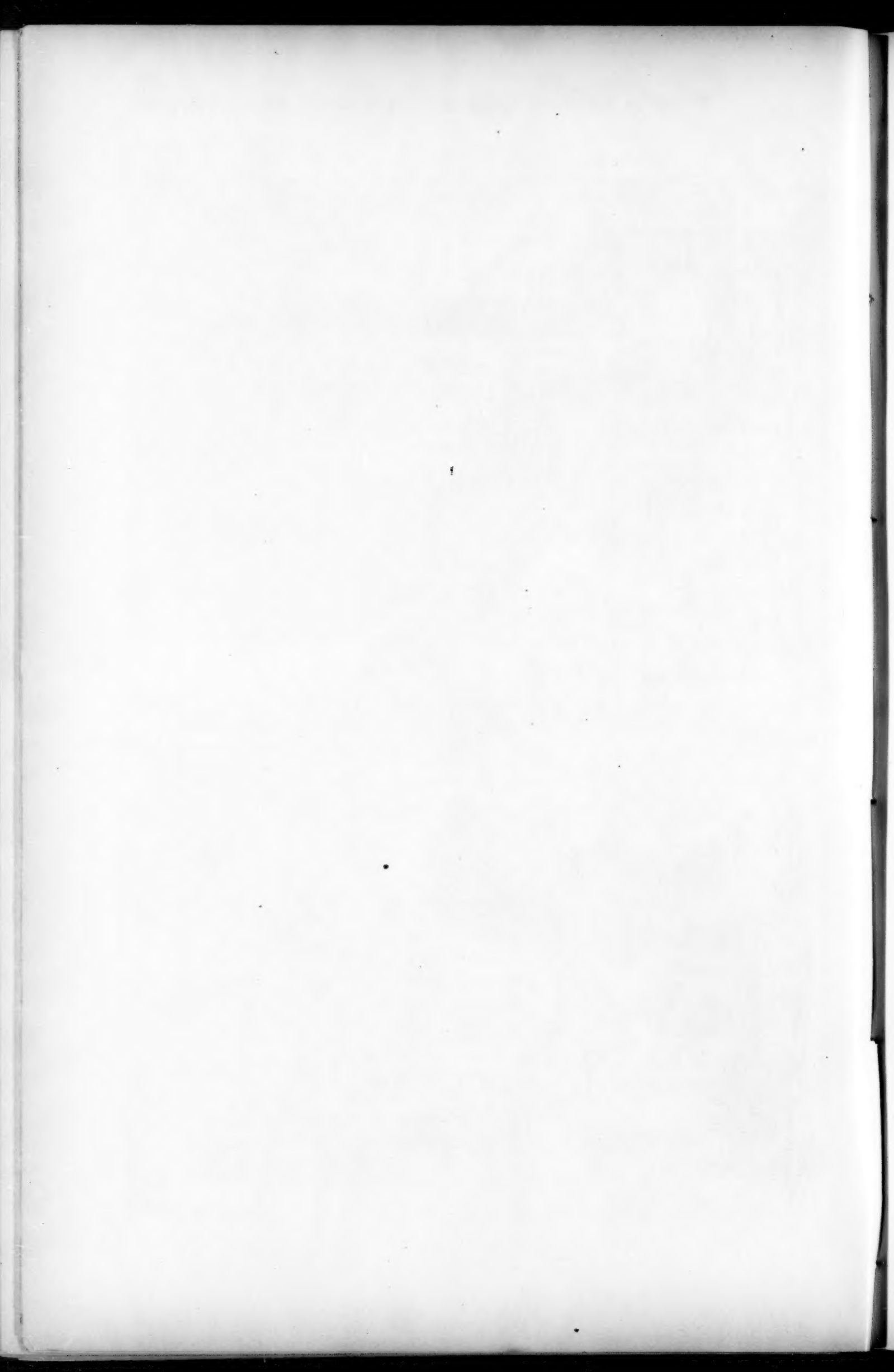
Wm. A. BATES ARCHT. 149 B'WAY NEW YORK

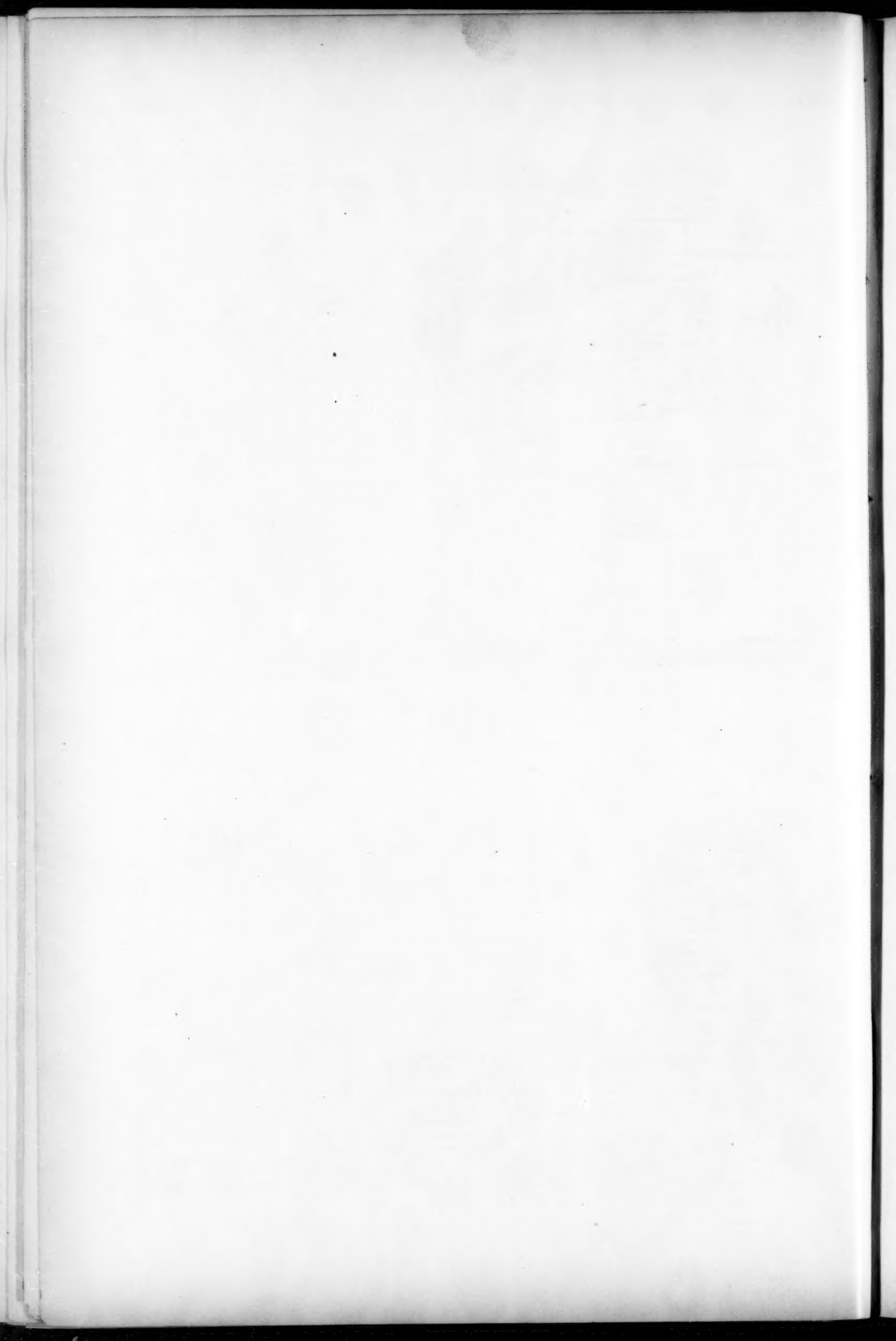




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Grecian ornament. It is perfectly consistent with itself, and tells its own story unweakened by any after-thought, and undisfigured by any deformities.

But though the exterior of King's Chapel is so designedly unpretending, the architect has bestowed a much higher, yet equally consistent degree of finish upon the interior. The nave, or body of the church is separated from the aisles by very elegant Corinthian columns, standing in couples, and raised upon appropriate bases; just as they stand in the exquisite façade of the Louvre, and in many of the most characteristic examples of the Venetian school. Perhaps the manner in which the entablature of these columns is broken to receive the arches of the ceiling is open to criticism; but it should be recollected that architecture, when rightly considered, means much more than a childish measuring of this moulding and that moulding, at the expense of a failure to appreciate the principles of fitness, and expression in their most obvious manifestations. The whole effect of this interior is so solemn and imposing, and so fully answers what is required in our ideas of a church, that we ought willingly to forget this slight license. The King's Chapel was not composed by an architect of the mechanical copying school; he had a proposed effect, present and visible to his mind, before he drew a line on the paper; and he has produced it full and complete in his building. There is no other church in Boston where the "dim, religious light" so conducive to a devotional frame of mind is admitted with such judicious and sparing economy; the decent pulpit desk and clerk's desk, standing apart from the chancel; the antique altar-piece with the Prayer, the Belief, and the "good commandments ten;" the marble monuments to occupy the centre of the wide piers, and the deep, quiet organ-loft at the western end at once bespeak the character of a church, and make us sensible that we cannot desecrate it even in thought. It has the air neither of a disguised ball-room, nor a travestied theatre; it neither resembles the church in Chauncey Place, nor the Tremont Temple, its unfortunate neighbor. . . .

In 1762 appeared the first volume of Stuart's "Antiquities of Athens," a work upon which it is scarcely too much to say that praise might be exhausted, without surpassing a just appreciation of its merits. A second visit to Greece by Nicholas Revett, the coadjutor of Stuart, at the cost of the Society of Dilettanti, produced the "Ionian Antiquities" in the year 1769. The glories of ancient Greece are depicted in these admirable works with a clearness and fidelity only to be equalled by Mr. Pugin's subsequent elucidation of Gothic architecture. What an opportunity was now presented for the taste of the profession to be elevated and purified by the study of these monuments of the best days of classical antiquity. But a different method was pursued; the books fell into the hands of the cement-and-copying school, and wherever we look about us we see the result. . . .

The school of Athenian copyists now began to rise into favor; and the art in consequence declined. I do not know of a single structure out of the hundreds produced by this class of artists which is deserving of mention as an example of taste; and it is some consolation to find them entirely omitted by Mr. Gwilt in his "Encyclopædia," and denounced by Mr. Leeds, the accomplished editor of that accurate and beautiful work "The Public Edifices of London;" but perhaps the name of James Wyatt claims a station in this consideration of architecture in England, for the part he took in the revival of Gothic architecture, which, before the close of the eighteenth century, had begun to dispute for ascendancy in the conflict of styles, over the fallen Palladian. Wyatt took up the Gothic style with a view to reproduce it; he speedily acquired a considerable knowledge of its forms and details, and showed that these were to be gained like those of any other style, by the study and measurement of original examples; by research and comparison; and by no other means. But its spirit he had not yet acquired, nor did he ever understand the broad principles even of those various modifications of the style as applied to civil, military, and ecclesiastic purposes, however well he may have been acquainted with its general features. This was, indeed, too much to expect from the labors of a single individual; but Wyatt seems to have felt no distrust of his own knowledge, and it is certain that his employers had none, from the unexampled and barbarous manner in which he was allowed to mutilate the exquisite cathedral of Salisbury, under pretence of repairs. The rash architect, in spite of remonstrances, was allowed to demolish at his own pleasure, and to proceed according to his own notions of architectural effect. To correspond with what he called the innate beauty of unity, he swept out the inside of that venerable pile, reducing the whole edifice as far as possible to an empty room; thereby stultifying the architects of the middle ages, who showed their skill in no point more strikingly than in the gradual and distinct development of those numerous members which constitute the complicated fabric of a Gothic cathedral. There perished by this act of vandalism, eleven chapels, the two porches, the bell-tower, and the illuminations on the roof and walls. Thus what the Reformers and the Puritans had spared, this restorer seemed likely to destroy; but happily, the general feeling on the subject was so strong as to prevent, it is to be hoped forever, similar acts of devastation elsewhere.

As the church in Cambridge, Mass., was erected in the year 1760, it belongs strictly to the period which has now been reviewed. Probably no building of its size made its appearance in the mother country during the same time, which exceeds it in the extreme beauty of its design. It is — or rather it was, for the interior went through the or-

deal of church wardenizing not long ago — a model of beauty and propriety in all its parts; its design belongs purely to the Venetian school, and presents us with some of its most admired characteristics. No one can fail to observe the happy effect of its exterior proportions, and the dignity it acquires from the deep cornice of the Italian Doric with which it is finished. On each side of the church are five long circular-headed windows, crowned with a bold moulding, which ends in a return, and imparts a great degree of relief to the apertures which it decorates. The tower is singularly modest and charming, with not one-half the show, but infinitely more than the merit of its neighbor, which stands on the opposite side of the churchyard, and which has well been termed "a hideous bandbox cathedral." The effect of the interior, though somewhat injured by alterations, is yet very pleasing. There is no doubt that the architect intended to have made the entablature which is over the columns that separate the nave and aisles continuous, instead of carrying it up in a square mass over every single column; but a want of the necessary funds at the time is said to have prevented its completion. The organ gallery and the three doors under it are designed in fine taste, the order employed throughout the whole interior being the bold, graceful Roman Ionic, with its angular volutes and delicately finished modillions. The aspect of the church is now much impaired by the situation of what should be the altar-piece, which was brought from the old Trinity Church in Boston, when that building was taken down, and was stuck up in its present situation at the wrong end of the church, so as to block up the front window inside, as well as the corresponding window on the other side. The arrangement of the pulpit, desk, and pews was formerly much more in keeping than at present; the pulpit standing forward into the nave, as at the King's Chapel, but it is now very improperly moved back, so as only to be reached by an inconvenient circuit inside the altar-railing.

It is a pity that any circumstances should intervene to impair the pleasing expression which the architecture of this beautiful little church is calculated to convey; but pleasing as it is, it is quite evident that the example set forth in its design has been almost without any effect upon the public taste. It appears to have been imitated only in a single instance — a church in the same town which stands a little to the left as we enter by the high-road from Boston. But the alterations made in the copy cannot be viewed as improvements upon the original. The elegant simplicity of the one becomes only baldness in the other, which, however, is certainly a much handsomer edifice than many which might be mentioned in its vicinity. It is strange, perhaps, that the purity and harmony of character observable in the older church should generally have been so feebly appreciated, and in this case so poorly copied; but we must account for it on the broad and general principle that the nineteenth century, whenever it condescends to take a lesson from real merit, will not rest satisfied until the example has been improved out of all its real beauties. . . .

We have arrived, I think, at a tolerably clear and connected idea of the groundwork of Grecian architecture. A cell, surrounded by a colonnade, is the form which can be traced in almost every temple in ancient Greece, the memory or the remains of which have reached the present day. It does not appear that they ever entertained a thought on any other department of architecture than that which respected the projection of their favorite arrangements; but it may still be inferred that if the prosperity of Greece had continued for a sufficient length of time to have enabled them to discover the deficiencies in an art which they had begun to cultivate in only one of its branches, they would have pushed their researches and carried their inventions to a much greater extent. If the private wealth of individuals among them had so much augmented as to introduce a taste for domestic pomp, or if the nature of their climate and other circumstances had concurred to make public buildings of great extent necessary for the accommodation of the people, in which men could be protected from the inclemencies of the weather without being deprived of light, it cannot be doubted that the lively and inventive genius of the Greeks would have supplied those deficiencies under which their system of architecture, as applied to our wants and uses, most evidently labors; but we cannot expect to find convenience for our purposes in buildings whose originals were only designed for external grandeur and elegance, while internal decoration of every sort was comparatively disregarded. The area contained within the walls of these temples was so small as not to admit of any ornaments or accommodations on an extended scale, and they were in general buried in such deep obscurity as not to allow of their being used with any comfort for purposes of congregation. Under these circumstances, their architecture, as applied to ourselves, must, of necessity, be found to be extremely imperfect. It is defective in almost all those particulars which will always be deemed indispensably necessary for the accommodation and convenience of a wealthy and luxurious people — those, especially, who inhabit high latitudes, and who, by being under the necessity of living much within doors must find internal convenience and elegance, in public buildings as well as private houses, of more necessity to them than those external accommodations which were so much and so justly admired among the Greeks. Circumstances certainly alter cases, and where the former, as in the present instance, are diametrically opposed to each other it is impossible that the latter should not be widely different.

It must then, I think, become evident that the introduction of Grecian architecture among us to the extent to which it has hitherto been carried has been a great and almost inconceivable mistake. We

have seen that its edifices are suited to another climate, that they are the legitimate offspring of a remote age, an antagonistic religion, an obsolete form of government, and a widely different state of society from our own. Though perfect in their own way, yet with us they have no concern. We might as well expect the cold, stately, statue-like tragedies of the Grecian drama to supplant, on our modern stage, the glowing pictures of Shakespeare and Otway. Beautiful as may be the forms which this pure style of architecture assumed when used by its original authors, chaste and elegant as are the columns that lie scattered in the ruins on the Acropolis, majestic as appears the frowning temple of Jupiter, or the elegant Parthenon, the shrine of the guardian goddess of Athens, standing in their sublime solitude on the hills of ancient Attica, we must still conclude that the forms and uses to which it was then applied are far too few to satisfy the numerous and complex demands of modern art. The Grecian style has indeed been studied with devoted diligence, and defended by its advocates with an almost Quixotic zeal. It has been declared to possess every excellence, and to combine every beauty. If we were a people at all resembling the Greeks in our habits, manners and customs perhaps this eulogy might, to a great extent, be perfectly true; but we are, on the contrary, quite as different as could well be conceived, and therefore a style of building exactly suited to them must be unfitted for our purposes in almost every particular. Whatever may be thought or said of it in the abstract it has, so far, failed to produce among us a single edifice that does not contradict and stultify itself repeatedly upon the most cursory reference even, to the principles of its ancient prototypes. It must certainly be admitted to be deficient in variety. Originally exhibited only under one form, it is unfair to expect that it can be pressed arbitrarily into the service of all. It cannot be moulded to every purpose, nor can we engraft upon it with impunity whatever features our own occasions may happen to call for, whether they are provided for or not in the limited theory of their originals. It is, therefore, an impossible task, in reducing the system of the Greeks to modern practice to avoid even the most offensive and glaring inconsistencies; to do so will yet require a degree of inventive genius that can harmonize contradictions and reconcile impossibilities, that can go beyond the exact calculations of the ancients in accomplishing a certain proposed effect, and recast every part with reference to a new and different whole. It will be recollected, from what was said of the unity of system in Grecian architecture, in the first lecture of this course, that the rigid severity of the style does not submit to any serious alterations. If, therefore, we adopt a perfect Greek temple for any modern purpose our interior will be confined and ill-suited for its intended use, while on the other hand, if we strip the Greek temple of its external colonnade we take away the life and soul of the whole; we entirely destroy the leading and most beautiful feature of the architecture, and our building becomes only a miserable departure from the style it proposes to imitate. The folly of copying only the Parthenon as the one universal model for every public building which we may have occasion to erect is becoming every day more glaring, and it were to be wished that the perception of the error gave, in this case, any reasonable hope of its being amended; but for the last twenty years our architects no less than the public, their patrons, have been joined to their Athenian idols with a blind enthusiasm, and, in consequence, there is more Grecian architecture (such as it is) in New England than was ever dreamed of in Attica.

Let us trust, however, that the *Americano-Greek* lath-and-plaster temple will shortly cease to exist. No style which is so absurdly applied can long outlive the novelty of its first introduction. "If after so long a trial of it," says the eminent critic, Mr. Leeds, "it will be found utterly incapable of giving us anything much better or more consistent than has hitherto been produced, and that we have already exhausted its powers of design and the combinations it admits of, we have no very great reason to be surprised if it should now be laid aside for a style which not only readily adapts itself to our mode of building, but derives much of its character and effect from features for which ancient architecture makes no provision, or, rather, obstinately rejects." These views are certainly founded upon sound reasons, and commend themselves to the unbiased judgment of every cultivated mind. . . .

It is impossible that the Egyptian style should ever be revived at the present day with any great degree of propriety or pleasing effect. The only example of it of any consequence in this vicinity is in the gateway at Mount Auburn, and several tombs in the grounds over which the gateway appears to have diffused its own peculiar character.

If the whole history of architecture had been ransacked to find an inappropriate style for such a structure, the designer might certainly have gone farther, even to the end of the chapter, without faring worse, or without making a greater and more glaring mistake. I have endeavored to show that this style bears the impress of its origin upon the face of it, and that it embodies those peculiar characteristics which would be expected to result from the causes which called it into being. The religion of which it is the offspring has been declared, on high authority, to be the most degraded and revolting form of paganism that ever existed. Egyptian architecture is the architecture of a creed that worshipped embalmed cats, sacred cows, and deified crocodiles; solid and stupendous, it must be allowed, but indelibly associated in our minds with all that is absurd and disgusting in heathen superstition. Its distinct emblems, as well as others so much in vogue at present, have certainly no possible connection with the ideas of Christianity. In Mount Auburn we are presented with winged globes; urns, which commemorate the custom of burning, not

burying the dead; inverted torches, signifying life extinguished forever in the darkness and ignorance of heathen despair; and snakes biting their own tails, with an ingenuity of self-destruction that may mean whatever you please to attach to it. The accomplished author of *Alciphron* speaks of such symbolical sculptures as these, as

"Fit emblems of the faith that sees
In dogs, cats, apes—divinities,"

and it must be confessed difficult to behold the idolatrous Egyptian gateway at Mount Auburn, used as an entrance to a place of Christian sepulture, without thinking it more fit for an entrance to the chamber of the royal beetles, or the consecrated stable of the holy cow of Isis.

The Puritans, the founders of our commonwealth, in their anxiety to escape from every recollection of what they had left behind them in the old world, rejected all forms and varieties of symbolical expression, refusing in any way to recognize the outward form as suggestive of the inward meaning. The cross, for ages almost the only badge of the Christian faith, was avoided with a studious repugnance. The kneeling forms of cherubs and angels, the monumental effigies of the faithful dead, composed into the stately rest of the grave, with the hands crossed upon the breast in an attitude of devout resignation; the dove and the palm tree of early Christianity were alike rejected and forgotten; but so long as man retains his double nature it will be in vain to attempt such a divorce between the outward and the inward existence. Feeling the want, the absolute necessity of some symbolism or other, the descendants of the stern Puritans are reviving it in daily practice; but what is the kind which they have adopted? Not the Christian symbolism of the Middle Ages, which grew with the growth of Christianity and which contains the natural outward sign of its doctrines, but the symbolism of a revived paganism; objects which if intended as ornaments are truly hideous, anterior to any of the graces of civilization, and possessing in themselves no beauty of form or outline, and if intended as emblems, are emblems of nothing but heathenish blindness, ignorance, and despair. "A public monument is a book opened for the perusal of the multitude, and unless it declares its own meaning fully, plainly, and sensibly on the face of it, the main use is lost, and it becomes worse than nothing. As long as it continues to be a part of our common stock of visible objects, it perverts the taste of the artist, and bewilders the imagination of the crowd. But the pedantry of imitation unfortunately retains an inveterate hold in architecture; and the more irrational and grotesque the original, the more numerous will be the crowd of its hereditary deformities."

"Certainly there is no place," observes Mr. Cleaveland, whose admirable essay on American architecture would stamp him as a writer of vigorous judgment and elegant taste, even if other proofs of this were wanting, "certainly there is no place, not even the church itself, where it is more desirable that our religion should be present to the mind, than in the cemetery; it is a place which must be regarded, either as the end of all things—the last, melancholy, hopeless resort of perishing humanity; the sad and fearful portion of man, which is to involve body and soul alike in endless night; or, on the other hand, as the gateway to a glorious immortality,—the passage to a brighter world, whose splendors beam even upon the dark chambers of the tomb. It is from the very brink of the grave, where rest in eternal sleep those whom we have best loved, that Christianity speaks to us in its most triumphant, soul-exalting words, of victory over death and of a life which is to come. Surely, then, all that man places over the tomb should in a measure speak the same language."

"Far be it from us," he continues, "to encourage extravagance in these structures, yet it seems to us that if a few dollars more will purchase the change from the architecture of paganism to that of Christianity they would be well expended. As yet, the gateway at Mount Auburn must be considered as unfinished, the present structure being only a model in wood of what is hereafter to be perpetuated in granite. We would, therefore, suggest the question for the consideration of those who are interested in the matter, whether the plan might not be changed, and a Gothic structure erected instead of the one we now have, at little or no additional expense. A fine effect would be produced by a wall pierced by three pointed arches, the middle one very lofty and broad for the admission of carriages. Such a structure, we think, might be erected at no greater expense than the present one, and would serve as the model for a more suitable style of monuments than that which prevails in the cemetery."

These observations of Mr. Cleaveland's were printed in the *North American Review* in the year 1837. From such a simple, earnest, sensible and truthful appeal it would have been natural to expect a favorable result. In the year 1842, however, the trustees of Mount Auburn deemed it proper to expend \$9,550, as I am informed, for an Egyptian gateway, erected in granite on the precise model of the former one, and bearing a winged globe by way of an emblem of something or other on its exterior face. I mention this fact because it is certainly right to give honor to whom honor is due.

Persons who have the common sense to laugh at these absurdities are sometimes denominated by the perpetrators of them as fanatics in the cause of pointed architecture, and as blind bigots, who are insensible to any beauty but that of the Middle Ages; but so far from this it may be questioned whether they are not, in fact, much better acquainted with the principles on which the various styles of pagan antiquity were founded than many of their warmest advocates. Hear the testimony of Mr. Pugin, the great reviver of Gothic architecture in England: "I believe the edifices of classical antiquity," says he, "to be

the perfect expressions of imperfect systems; the summit of human skill expended on human inventions, but I claim for *Christian* art a merit and perfection which it was impossible to attain even in the Mosaic dispensation, much less in the errors of polytheism. The former was but a type of the great blessings we enjoy, the latter the very antipodes to truth, and the worship of demons.

"I can readily understand how the pyramid, the obelisk, the temple and the pagoda have arisen, and whence the arrangement of their plan, and the symbols which decorate them have been generated. I am prepared to join in admiration at the skill which piled such gigantic masses on each other, which fashioned so exquisitely each limb and countenance, but I cannot acknowledge them to be appropriate types for the architecture of a Christian country.

"If we worshipped Jupiter, or were votaries of Juggernaut we should raise a temple, or erect a pagoda; if we believed Mahomet we should mount the crescent and raise a mosque; if we burned our dead we ought to place cinerary urns on their tombs, as symbolical of such a custom; if we disbelieved the immortality of the soul we should carve inverted torches, signifying the extinction of that 'vital spark of heavenly flame,' with complete propriety on our monumental architecture. If we attached no sanctity to the repose of the grave, beyond the preservation of the physical frame, it would be highly expressive to place the winged globe, the emblem of Anubis, the deity with the head of a jackal, and the supposed watcher of the mummy, on the entrance to our Christian cemeteries, and if we denied the divine mission of our Lord we should at once reject the symbol of His cross; for all these would be natural consequences, and possess an obvious connection and propriety. But in the name of simple common sense, while we profess the *creed* of Christians let us have an architecture, the arrangement and details of which will remind us of our faith, an architecture which we may claim as our own, and whose symbols have originated in our religion and customs. If symbols have no signification and no effect why do we use them? But if we do use them why not use those which are significant and appropriate?"

THE COMPETITION FOR A MECHANICS' DOUBLE-COTTAGE.—II.

DESIGN SUBMITTED BY "Family Broils."



EXCAVATION AND MASONRY:—The cellar to be excavated 6' below the grade line. Foundation wall to be of good local stone laid on natural beds neatly pointed. Brick to be good hard-burned brick laid with flush solid joints, rubbed, stained and pointed. Fire-places of pressed brick. Fill in between studing in second story with soft brick. 8'-brick dwarf walls under all partitions.

Carpenter Work:—Second story balloon-frame, clapboarded and shingled. White-pine for all joinery and finish. Hardware, good mortice-locks, "Hemacite" knobs, roses and escutcheons for interior doors. All outside doors trimmed with Berlin bronze.

Tinning:—Valleys and all flashings of best I. C. tin.
Plumbing:—20' x 36" iron sink and drain-pipe to cesspool.
Painting:—Three coats inside and out, except the shingles.
Plastering:—Brickwork two coats, lathing three coats.

ESTIMATE OF QUANTITIES AND PRICES RULING AT DENVER, COL.

MASON-WORK.

60 yds. excavating and grading, @ 25 c.	\$ 15.00
65 perches stone, @ \$2.26	143.00
Cut stone for sills and chimney	40.00
160 ft. drain-tile, laid, @ 30 c. per ft.	48.00

BRICKWORK.

5540 brick, @ \$8.50 per M., laid	\$ 470.90
Setting two mantels	14.00

CARPENTER-WORK.

18,000 ft. rough lumber, @ \$20 per M.	\$360.00
3,000 ft. spruce flooring, @ \$35 per M.	105.00
5,600 ft. white-pine boards, @ \$40 per M.	224.00
1,200 ft. clapboards, @ \$30 per M.	36.00
19,500 shingles, @ \$5 per M.	97.50
24 window openings, all complete, @ \$7.50 per window	180.00
28 doors, openings all complete, @ \$9 per door	252.00
Stairs, with rails, \$65. Box stairs, \$40.00. Cellar stairs, \$20.	125.00
300 ft. moulding, @ 6 c. per ft.	18.00
435 ft. moulding, @ 4 c. per ft.	17.40
6,000 plain shingles for sides, @ \$5 per M.	30.00
Carving	20.00
Nails and hardware	65.00
180 ft. valleys and flashings, @ 3 c. per ft.	7.20
Painting	160.00
2 mantels	55.00
720 yds. plastering, @ 25 c. per yd.	180.00
Sink, with all necessary plumbing	15.00

Total	\$2,668.00
Labor and extras	400.00
Builders profit, 5%, on \$2,668	133.40
Architect's commission	153.40

Total.....\$3,354.80

DENVER, COLO., May 8, 1883.

Bid for double-tenement according to drawings marked "Family Broils," for the sum of \$3,092.

D. B. FOTHERINGHAM.

RECOVERY OF A RAPHAEL.—In the little country house of Blankenheim, in Rhenish Prussia, an oil painting has, according to the *Deutsche Tageblatt*, been found rolled together behind the wainscot, which turns out to be the Raphael which belonged to the Düsseldorf Gallery about one hundred years ago, and was lost on its way to Munich about the year 1805.

WATER-CLOSETS.¹—XX.



UPPLY-PIPE Connections.—The common manner a few years ago of joining the supply-pipe to the water-closet was by enlarging the mouth of the lead supply-pipe so it would fit against, or making it small enough to enter, the nozzle of the bowl; when the two were fitted, a piece of putty was put around it, and the whole covered with a piece of cloth held in place by a string. The joint is sometimes covered with a piece of sheet-rubber, the rubber being wrapped with wire instead of cord. Joints of this kind are rarely tight for any length of time, and they cause a great deal of trouble by their leakage. Years ago efforts were

made to perfect the joint between the supply-pipe and the bowl; but the plumbers as a class do not appear to have taken advantage of the best methods.

As early as 1829, Tyler, of London, invented a nozzle which was to be bolted to the side of the bowl by means of a plate with in one piece with the nozzle, and shaped the same as a portion of the surface of the bowl. This plate had ridges, and the bowl corresponding grooves. When the plate was bolted to the bowl, and the space between the two was filled with red lead, or a cement of red and white lead, it made a good joint. The metal nozzle, being made of brass, either had threads to which a pipe could be screwed, or a lead pipe could be connected with it by means of a wiped solder-joint. Before making a solder-joint, the surface of the metal had to be made clean.

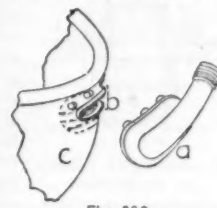


Fig. 208.

Tyler's Joint.

a, Brass nozzle and plate.
b, Opening into bowl with raised rim.
c, Bowl.

In 1848, Armstrong invented a mode of connecting the supply-pipe with the closet-bowl. A metal ferule, with screw-threads on the outside edge, is imbedded in the nozzle of the bowl. Working on the thread is a clamp nut. A second brass ferule, with a flange around the larger end, is firmly screwed up against a rubber washer that rests on the first ferule. The lead supply-pipe can be connected by the usual wiped solder-joint to the brass nozzle.

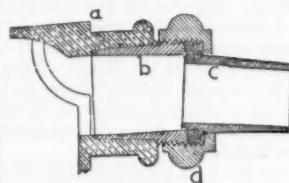


Fig. 209.

Armstrong's Connection.

a, Nozzle of bowl.
b, First ferule.
c, Second ferule.
d, Clamp nut.
e, Rubber washer.

cast so as to form a right-angle, with one end made smaller than the earthenware opening into which it is intended to fit. This metal tube has a flange or shoulder that fits against the outer edge of the earthenware nozzle, there being a rubber washer between the brass flange and the earthenware. Where the brass pipe bends, a hole is left through which a hook passes. This hook is made to fit around the earthenware where the orifice enters the bowl. Where the hook passes through the bend of the pipe there is a nut, by which the pipe can be screwed up tight against the earthenware nozzle. A lead pipe may be joined to this connecting pipe by a wiped solder-joint if it is brass, or it may be connected with iron or brass pipes by a screw-joint.

I find patented in this country a manner of connecting the supply-pipe by putting it directly into the nozzle which projects from the bowl, when a piece of vulcanized-rubber tubing, which fits tightly around the pipe, is stretched

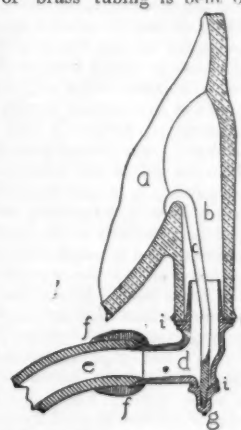


Fig. 210.—Carr's Connection.

a, Bowl.
b, Earthenware nozzle.
c, Hook.
d, Brass connecting-pipe.
e, Lead pipe.
f, Solder-joint.
g, Nut.
h, Rubber washer.

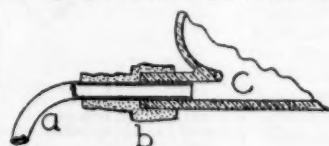


Fig. 211.

a, Lead pipe.
b, Rubber tubing.
c, Bowl.

over the earthenware nozzle. This manner of connecting the supply-pipe might be employed as a temporary expedient.

J. L. Mott has patented an ingenious mode of connecting the supply-pipe with the closet-bowl. A small metal plate is used, which is zinc-coated or brass, and has a conical hole in the centre of it. The inlet formed on the bowl has a conical projection of earthenware that corresponds to the hole in the metal plate. A piece of lead pipe is fitted over the conical projection, when the plate is put over the pipe and

¹ Continued from page 139, No. 404.

screwed fast by means of clamp-screws introduced through slots which are made in the earthenware for the purpose.

Soil-Pipe Connections.—With the most approved forms of water-closets where the trap is above the floor and forms a part of the closet instead of a part of the soil-pipe system, it becomes very important to have the joint between the water-closet and the branch from the soil-pipe made gas-tight; otherwise the trap and vent-pipes would be useless.

The common method of bringing the mouth of a trap, or a bell on the branch from the soil-pipe, and beating a part of the sheet-lead safe into it, then putting a little putty or cement on the floor, and screwing the closet down, is



Fig. 213.

Common mode of connecting the Soil-Pipe.

a, Outlet. b, Sheet lead. c, Putty. d, Soil-pipe.

very defective. Where the sheet-lead is beaten into the bell it is a very imperfect joint, even when the space is filled with putty. The sheet-lead has no power to resist the packing of even putty into the bell of the pipe. A joint of this kind might be opened, even when gas-tight in the first instance, by jarring on the floor, by any movement of the closet itself, or by the jarring of the soil-pipe.

Hellyer in his work describes a method of connecting a lead soil-pipe to the "Vortex" closet. A soft india-rubber ring is sent out with these closets, for fixing between the flange of the outgo and the "tafted" (bent over and beaten down) edge of the soil-pipe or lead safe.

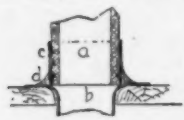


Fig. 214.

Hellyer's Connection.

a, Outgo of closet. b, Soil-pipe. c, Cement. i, India-rubber ring.

This india-rubber ring can be made to perfectly seal the jointing, and it will allow for considerable movement in the closet or the floor. The space between the flange of the closet which is screwed to the floor and the "tafted" edge of the soil-pipe or safe can be caulked with spun yarn and a cement composed of red and white lead.

Buchan in his work on plumbing illustrates his method of connecting the "Carmichael" closet to the soil-pipe. A lead branch is brought through a hole left in the floor for the purpose, and beaten out flat upon the floor by a dresser. The outlet of the closet, instead of having a flange, in the usual manner, has three grooves formed in the earthenware. A piece of lead is placed around the bottom of the closet outgo, and being forced into the grooves, and the depressions filled with solder, it would probably form a tight joint. The lead on the outlet of the closet and the tafted edge of the pipe are joined by solder.

What is generally considered the best American practice is a modification of Hellyer's and the common methods. A Y-branch is brought from the soil-pipe to within a limited distance of the floor. Into the hub of the Y-branch a short section of brass pipe is caulked, by putting in a gaskin, then pouring in molten lead and driving it firmly in with a caulking tool. A short section of lead pipe is put in, just long enough to be carried through the hole made for the purpose in the floor, and beaten over so as to form a flange about two inches wide on the top of the floor, and at the same time reaching the brass pipe. When the lead pipe has been properly soiled, and the brass tube filed bright, they can be joined together by a wiped solder-joint. Where the pipe is turned over the floor, it is usually joined to the safe by a solder joint. There is a soft rubber ring stretched around the outgo of the closet just beneath the flange which is screwed to the floor. The space between the flange and the tafted edge of the lead pipe or the safe can be filled by a cement composed of white and red lead. This method of joining the closet to the soil-pipe is recommended by the most prominent sanitarians, but I think it objectionable in having the short lead pipe where it is exposed to the action of gases generated in the soil-pipe. There is every reason to believe that this acts on lead injuriously; in fact, reasons which are urged against lead soil-pipe may with equal force be urged against this short piece of lead; the whole inside sewerage system being only as efficient or as perfect as is its weakest point. I also object to having the closet depend for its stability on the floor, which is constantly undergoing expansion and contraction, according to the moisture and dryness of the air, and is subjected to vibrations from movements that may occur upon it. The above methods are all im-

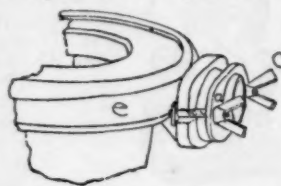


Fig. 212.

Mott's Supply-Pipe Connection.

a, Metal plate. c, Bowl. e, Clamp-screws.



Fig. 215.

Buchan's Connection.

a, Outlet of closet. b, Soil-pipe branch. c, Lead around outlet. d, Solder-joint.

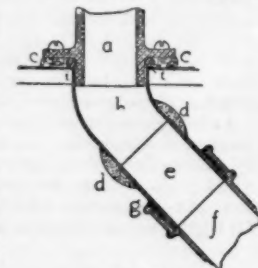


Fig. 216.

Improved Connection.

a, Outlet of closet. b, Lead pipe. c, Putty. d, Solder joint. e, Brass pipe. f, Iron pipe. g, Outlet-joint. i, India-rubber ring.

perfect in their mode of connection. I think the methods described below are the best that have been introduced.

The Durham Drainage Company, of New York, have connected with the branch from the soil-pipe an iron fitting with a large plate or flange formed on it to receive the closet. When the outgo of the closet has a soft rubber ring put just beneath its flange, and it is screwed down tightly, a permanent gas-tight joint would be formed, the space between the two flanges which

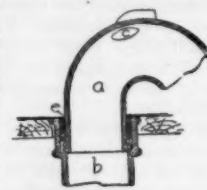


Fig. 217.

a, Trap. b, Branch from soil-pipe. c, Vent. e, Caulked joint.

was not filled by the rubber ring being filled with cement. In section its appearance would be the same as Figure 213, except an unyielding plate, which forms a part of the soil-pipe, would take the place of the yielding floor, and an iron pipe the place of the lead one. This method may be used where the trap, flange, and outlet are made in porcelain or earthenware.

The other method, which can only be used where the trap is of iron, has been recently introduced by J. L. Mott in connection with his side-outlet short-hopper closet. A branch from the soil-pipe has its hub brought to a level with the floor. The end of the trap is formed, as it is usual, with the spigot end of the soil-pipe with a small projecting ring around it. The trap is formed so it can run below the floor, the depth of the hub, into which it is caulked in the usual manner. In either of the cases mentioned, the trap of the closet and the closet itself forms a part of the soil-pipe system, the joints being as perfectly formed as any other joints in the system.

Safes.—It is customary and usually necessary to have sheet-lead safes under closets, to catch leakage or splashing that may occur from water or slops thrown into the bowl. These safes are simple shallow pans, formed by the turning of a piece of sheet-lead up about an inch-and-a-quarter high. These pans are placed beneath the closet, and their size varies, according to circumstances, from a safe which covers the whole of the bath-room floor to one that will only cover a space about two feet square. Safes, to be useful in case of an emergency, must have a waste-pipe. A few years ago (and the same manner of connection may be found in a large number of houses at the present day) it was the custom to connect this waste-pipe with the soil-pipe. In some cases there was not even a siphon-tap between the soil-pipe and the room. In the better class of work it was usual to connect the supply-valve with the trap of this waste by a small quarter-inch pipe, called a "weeping" pipe. This weeping-pipe was intended to carry the water that remained in the short section between the valve and the bowl when the water is cut off, into the trap of the safe-waste. It is positively wrong to connect the safe directly with soil-pipe. The weeping-pipe may be stopped without the knowledge of any one, leaving the water in the trap to evaporate. The trap of the waste would be siphoned by each discharge from the closet. The best practice is to carry a "tell-tale" pipe from the safe into the kitchen or cellar, and leaving it open over a sink that is in constant use, where if anything were wrong, it might be noticed and stopped. In England the custom is to carry this waste-pipe through the wall, where it is allowed to form a drip or overflow. In some instances the outlet is closed by a flap-valve, to be opened by the pressure of water, if the hinge has not in the meantime become rusty. North of the Potomac, in this country, our cold winters would prevent a waste-pipe of this kind from being effective, as a small leakage trickling through would be sure to freeze and stop up the waste-pipe.

Where the floors of bath-rooms are made of impervious materials, such as glazed tile or slate laid in cement, they should be made to drain to a convenient point, and have a waste-pipe similar to the lead safe.

A safe is illustrated in connection with Jennings's closet (Vol. IV, No. 142, *American Architect*).

CONDITION OF THE AIR IN THEATRES.—Some interesting experiments have recently been made in Germany relative to the temperature and condition of the air in theatres when lighted by electricity and gas respectively. The investigations at the Residenz Theatre at Munich showed that the increase of temperature was ten times as great in the upper gallery when gas was used than when illuminated by electricity. In the former case the temperature rose about 16.5° Fahr., and in the latter only 1.6°. In the lower portion of the house there was naturally a less marked difference. With a full house the temperatures with gas and electricity were 84° and 73° respectively. The temperature was not as high in the third balcony with the electric light as in the first with the gas-lights. The amount of carbonic acid was also determined, and it appears that with an empty house, where all the carbonic acid came from the lamps, there was the same difference as in temperature. At the beginning there were about four parts in ten thousand in the auditorium. With gas-lights this increased to five parts in the pit in about half an hour, to eleven parts in the first balcony and twenty in the third. With electricity it was four parts at the beginning, and in half an hour five in the pit, five in the first balcony and six in the third balcony. With five hundred or six hundred people in the house the maximum amount of carbonic acid was twenty-three parts in ten thousand with gas-lights, and eighteen in ten thousand with electric lights. A number of reasons, however, may be given as tending to produce inaccurate results, and consequently these figures cannot be looked upon as absolutely correct. So far as the temperatures are concerned, the results obtained may undoubtedly be accepted as fairly representing the condition of things when using the two different lights, and point strongly in favor of the use of electric illumination. — *Iron Age*.

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.]

285,795. SHUTTER-BOWER. — William Butterfield, Boston, Mass.
 285,801. CISTERN-COVER. — Thomas Cubbins, Memphis, Tenn.
 285,806. FIRE-ESCAPE. — Timothy H. Foster, Danbury, Conn.
 285,808. FIRE-ESCAPE. — David Galivan and John C. Manning, Buffalo, N. Y.
 285,811. TRANSON-LIFTER. — Henry J. Hardenbergh, New York, N. Y., and Gustav A. Weirich, Philadelphia, Pa.
 285,829. WATER-CLOSET. — Franz J. Merz, Newark, N. J.
 285,832. FIRE-ESCAPE. — William L. Murphy, Oxford, O.
 285,834. PNEUMATIC APPARATUS FOR EXCAVATING FOUNDATIONS. — Michael J. O'Connor, Henderson, Ky.
 285,865. VENTILATING-APPARATUS. — Levi J. Wing, Brooklyn, N. Y.
 285,866. FRICTION-CLUTCH FOR ELEVATORS. — Wm. Winkless, Newport, Ky.
 285,875. FLUSHING WATER-CLOSETS. — James E. Boyle, Brooklyn, N. Y.
 285,891. FLOORING-JACK. — Jacob Himelberger, Holt, Mich.
 285,907. PROTRACTOR. — Patrick Kennelly, Bridgeport, Conn.
 285,909. WELL-PUMP TUBING. — Joseph Marsden, Far Rockaway, N. Y.
 285,911. LIMEKILN. — Patrick McLoon, Glencoe, Mo.
 285,919. SASH-FASTENER. — John Outhwaite, Oecola, Ohio.
 285,924-928. WATER-CLOSET AND SIMILAR RECEPTACLES. — John Pickering Putnam, Boston, Mass.
 285,953. COMPRESSION-COCK. — James S. Barr, Wheeling, W. Va.
 285,961. BELL-PULL. — John B. Boyle, Baltimore, Md.
 286,000. HOD-ELEVATOR. — Albert T. Hull, New York, N. Y.
 286,012. ILLUMINATING VAULT-COVER OR GRATING-TILE, ETC. — Thaddeus Hyatt, New York, N. Y.
 286,018. KERFING-GAUGE FOR SAWS. — William C. Jones, Philadelphia, Pa.
 286,024. CLAMP FOR HAND-POWER DUMB-WAITERS AND OTHER PURPOSES. — Edward Lange, Poughkeepsie, N. Y.
 286,064. SAFETY APPLIANCE FOR ELEVATORS. — William Pintard, Red Bank, N. J.
 286,085. DOOR-HANGER. — Luke A. Smith, Ludington, Mich.
 286,119. HOD-ELEVATOR. — Samuel Dale, Boonesborough, Iowa.
 286,124. TAIL-HANDLE. — Crawford M. Fairbanks, Pawtucket, R. I.
 286,128. SASH-HOLDER. — John Felt, Clayton, N. Y.
 286,134. APPARATUS FOR HEATING THE AIR IN HEAT-FLUES OF BUILDINGS. — Albion P. Howard, Brooklyn, N. Y.
 286,136. SELF-CLOSING HATCHWAY. — David Humphreys, Norfolk, Va.
 286,137. VAULT-LIGHT ROOF AND SIDEWALK FOR CONSTRUCTING BASEMENTS, ETC., TO BUILDINGS. — Thaddeus Hyatt, New York, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS. — Lawrence Turnbull is to have built 7 three-story brick buildings on Lanvale St., commencing cor. Greenmount Ave., each 14' x 50'; cost, \$10,000, from designs by J. A. & W. T. Wilson, architects; Wm. Reed, builder.
 Three double houses, brick and stone, each 40' x 60', are to be built on Eutaw Place, by George Zimmerman, builder; cost, \$15,000 each.
 EXHIBITION BUILDING. — There is a movement on foot, backed by Hon. F. C. Latrobe, Robert Garrett, James A. Gary, and others, for the erection of a permanent exhibition building, on the block bounded by Eutaw, Franklin, Howard and Mulberry Sts. Two plans for the construction of the building have been submitted. The first floor will be occupied by storerooms. It will be built of brick, marble and iron, and cost about \$300,000.
 ALTERATIONS. — The chapel of the Associated Reformed Church, on Columbia Ave., is undergoing alterations, to cost \$6,000, from designs by W. H. Marriott, architect; W. S. Smith & Bro., contractors.
 The same parties have the contract for remodeling Emmanuel Episcopal Church, from designs by J. Crawford Neilson, architect; cost, \$6,000.
 BUILDING PERMITS. — Since our last report nineteen permits have been granted, the more important of which are the following: —
 Fritz Frederick, two-story brick stable, s s Chew St., between Castle and Chester Sts.
 John Sengle, two-story brick building, w s Madeira Alley, between Gough and Bank Sts.
 Aug. Dagenhart, 2 three-story brick buildings, n s Biddle St., e of Valley St.

Savings Bank of Baltimore, three-story brick back building to s e cor. Eutaw and King Sts.
 C. C. Kumpf, two-story brick building, 20' x 32', n s Portland St., between Greene and Emory Sts.
 Lewis Beveringer, 3 two-story brick buildings, n s McElderry St., w of Madeira Alley.
 Stephen McGowan, 2 two-story brick buildings, s s Ramsey St., between Scott and Sterrett Sts.
 Philip Welsh & Sons, three-story brick carpenter-shop, s e cor. Maryland Ave. and Federal St.
 John Thomas, two-story brick stable, in rear of No. 60 w s Division St., between Lanvale and Dolphin Sts.

Brooklyn.

BUILDING PERMITS. — Fulton St., No. 92, three-story brick store and warehouse, tin roof; cost, \$4,000 or \$5,000; owner, Sarah J. Semonite, 147 Lafayette Ave.; architect, G. L. Morse.
 Cook St., s s, 250' e Bushwick Ave., four-story brick factory, gravel roof; owner, Iron-Clad Manufacturing Co., Cook St., near Bushwick Ave.; architect, A. Herbert; builder, S. Borrows.
 Sumpter St., s s, 100' e Howard St., 6 three-story frame tenements, tin roofs; cost, each, \$1,500; owner and builder, Jno. Mulqueen, 67 Myrtle Ave.; architect, R. Given; mason, E. Mullin.
 Pleasant Pl., w s, 80' s Herkimer St. and Rockaway Ave., e s, 80' s Herkimer St., 10 two-story frame dwellings, gravel roofs; cost, each, \$2,000; owner, G. H. Bishop, Boston, Mass.; architect, G. H. Chamberlain.
 Braxton St., s s, about 198' e Seventh Ave., 11 two-story frame dwellings; cost, each, about \$2,200; owner, Jane O. Carpenter, 481 Clason Ave.; architect and builder, J. H. Darrow.
 Sixth St., e s, 100' s South Ninth St., three-story and basement brownstone front dwell., tin roof; cost, \$5,000; owner, E. McLoughlin, South Eleventh St., near Third St.; architect, I. D. Reynolds; builder, D. Concannon.
 South Ninth St., s e cor. Sixth St., 3 three-story and basement brownstone front dwell., tin roofs; cost, each, \$5,000; owners, etc., same as last.
 Manhattan Ave., No. 111, n w cor. Fourth St., four-story brick stores and double tenements, tin roofs; cost, \$6,000; owner and architect, J. J. Randall, 68 Nassau Ave.; builders, Van Riper and Randall & Miller.
 Middleton St., s s, 120' w Harrison Ave., three-story frame factory, gravel roof; cost, \$10,000; owners, Cooper & McKee, South Fifth St., near Second St.; architect, E. F. Gaylor; builders, Thomas Gibbons and Jenkins & Gillies.
 Jefferson St., n s, 80' e Tompkins Ave., 6 three-story brownstone front dwellings; cost, each, \$7,500; owner, Wm. Johnston, 96 Taylor St.; architects, Parfitt Bros.; builder, G. B. Stoutenberg.
 Ninth St., n s, 150' e Gowanus Canal, three-story brick factory, felt and gravel roofs; cost, \$35,000; owner, New York Tartar Co., 106 Wall St., New York City; builders, W. & T. Lamb, Jr., and B. Gallagher.
 Conselyea St., s s, 100' w Humboldt St., 3 three-story frame dwellings and tenements, tin roofs; cost, each, \$2,700; owner and builder, Jacob Rauth, Jackson St., cor. Humboldt St.; architect, A. Herbert.
 Bushwick Ave., w s, 54' s Wall St., three-story frame store and double tenement, tin roof; cost, \$4,200; owner, John Mayer, 134 Harrison Ave.; architect, T. Engelhardt.
 Adams St., Nos. 94, 96 and 98, s s, 97' 5" w Evergreen Ave., 3 three-story frame tenements; cost, each, \$3,500; owner and builder, Geo. Loeffler, 78 Jefferson St.; architect, T. Engelhardt.
 Calver St., n s, 50' w Leonard St., 2 three-story frame tenements, gravel roofs; cost, \$6,000; owner, H. A. G. Henshel, Greenpoint Ave.; architect, F. Weber; builders, J. Reed and Port & Walker.
 Newell St., w s, 120' w Norman Ave., 2 four-story frame double tenements, felt, cement and gravel roofs; cost, each, \$5,000; owner and builder, David Atkins, 551 Lorimer St.; architect, E. F. Gaylor; mason, J. T. Gately.
 Tompkins Ave., w s, 25' s Park Ave., 3 three-story brick stores and double tenements, tin roof; cost, \$6,000; owner, Christian F. Teves, Jr., 169 Fifth St.; architect, T. Engelhardt; builders, G. Lebrin & Sons and F. J. Berlenbach.
 Tompkins Ave., s w cor. Park Ave., three-story brick store and double tenement, tin roof; cost, \$7,000; owner, Anthony Wetterer, 22 Stagg St.; architect, T. Engelhardt; builders, G. Lebrin & Sons and F. J. Berlenbach.
 Broadway, s e cor. Suydam St., three-story brick store and flat, tin roof; cost, \$8,000; owner and builder, Frederick Herr, 778 Broadway; architect, T. Engelhardt.

Chicago.

FLATS. — C. M. Palmer is architect of the six-story flat to be built on Michigan Ave., for Leroy Payne; cost, \$35,000.
 Furst & Rudolph, architects, planned the three-story flats to be built on West Congress St., for Henry Furst; cost, \$15,000.
 W. A. Furber is architect of three-story flats with stores on first floor, to be built for Leonard Hodges on Twenty-second St., to cost \$11,000.
 Houses. — Furst & Rudolph, architects, planned the two-story dwell. to be built on Pauline St., for Mary E. Sands; cost, \$9,000.
 The same architects made plans for Mrs. Ober's two-story dwell. on Fulton St.; cost, \$10,000.
 H. Weissner is architect for three-story dwell. and stores on Division St., for Theodore Schultz; cost, \$7,000.
 James S. Lyons is erecting three-story dwell., with store below, on Eighteenth St.; cost, \$8,500.
 The two-story dwell. to be built on Honore St., for John Oliver, was planned by L. G. Quackenboss, architect; cost, \$7,000.
 W. F. Mysiek will build 2 three-story dwellings on Groveland Park Ave.; cost, \$10,000; Cobb & Frost are the architects.
 W. Meyne is architect and builder of four-story dwell. and store to be erected on Milwaukee Ave.; cost, \$10,000.
 J. Baxter will build 2 three-story dwellings on West Monroe St., to cost \$8,000.

MACHINE-SHOP. — Robert Tarrant is building a four-story machine-shop on Illinois St.; cost, \$20,000; Theo. Karls is the architect.

BUILDING PERMITS. — John Oliver, two-story dwell., 24 and 26 Honore St.; cost, \$7,000; architect, L. G. Quackenboss; builder, Geo. Hinchliff.
 Frank Lawlor, two-story dwell., 422 Taylor St.; cost, \$4,000; architect and builder, J. McGinness.
 John Regon, three-story dwell., 163 Lewis St.; cost, \$3,900; architect, Beaumont; builder, Jno. Pedgaft.
 J. Baxter, 2 three-story stores and dwellings, 200 and 202 West Monroe St.; cost, \$8,000.
 U. P. Smith, two-story carriage-shop, 3148 Cottage Grove Ave.; cost, \$4,000.
 Fred. B. Kloske, 6 cottages, 26 to 38 Kendall St.; cost, \$7,500.
 J. Clark, two-story store, 2111 Wabash Ave.; cost, \$4,500; architect, J. Clark.
 E. Goutke, two-story store and dwell., 937 Blue Island Ave.; cost, \$5,000.
 J. R. Cook, three-story dwell., 236 Dearborn Ave.; cost, \$5,000; architect, F. Baumann; builder, Geo. Lehman.
 M. Yourell, two-story dwell., 2521 Fifth Ave.; cost, \$3,000.
 P. Edgeworth, two-story and basement dwell., 321 and 323 Polk St.; cost, \$5,000.
 Mary E. Sands, two-story dwell., 292-296 Paulina St.; cost, \$9,000; architects, Furst & Rudolph.
 Wm. Hafner, two-story dwell., 23 Pratt Pl.; cost, \$3,000.
 Mrs. Ober, two-story dwell., 879-881 Fulton St.; cost, \$10,000; architects, Furst & Rudolph; builder, C. Wagner.
 Theo. Schultz, three-story store and dwell., 152 Division St.; cost, \$7,000; architect, H. Weissner; builder, C. Wagner.
 F. H. Hemisath, three-story dwell., 24 Granger St.; cost, \$4,000.
 Leonard Hodges, three-story store and flats, 84 Twenty-second St.; cost, \$11,000; architect, W. A. Furber; builder, J. Griffiths.
 James S. Lyons, three-story store and dwell., 151 Eighteenth St.; cost, \$8,500.
 H. Staats, three-story store and dwell., 1143 Milwaukee Ave.; cost, \$6,000.
 Daniel O. Reagan, store, 3600 Dashiell St.; cost, \$2,000.
 Fred. Knehl, two-story store and dwell., 842 Clybourne Ave.; cost, \$6,000; architect, C. H. Goettig; builders, Hagenow & Co.
 A. Ammons, two-story dwell., 143 Hurlburt St.; cost, \$3,500; architect, Edward Stende.
 J. R. Van Slyke, two-story dwell., 335 West Washington St.; cost, \$4,000.
 A. Larson, two-story dwell., 193 Canalport Ave.; cost, \$3,000; architect, August Lonka.
 M. Harrigan, two-story dwell., Nineteenth Pl.; cost, \$3,500; architect, August Lonka.
 Carter Bros., warehouse, 323 and 225 West Sixteenth St.; cost, \$4,000; architect, McCormick.
 W. F. Mysiek, 2 three-story dwellings, 1 and 3 Groveland Park Ave.; cost, \$10,000; architects, Cobb & Frost; builder, J. Griffith.
 W. Meyne, four-story store and dwell., 942 Milwaukee Ave.; cost, \$10,000; architect and builder, W. Meyne.
 Robert Tarrant, four-story machine-shop, 52 to 56 Illinois St.; cost, \$20,000; architect, Theo. Karls.
 Henry Furst, three-story flats, 448 and 450 Congress St.; cost, \$15,000; architects, Furst & Rudolph.
 Fred Hess, cottage, 3008 Butler St.; cost, \$3,000.
 Horn Bros., four-story factory, 281 and 283 West Superior St.; cost, \$7,000.
 Leroy Payne, six-story flats, 186 and 187 Michigan Ave.; cost, \$35,000; architect, C. M. Palmer.
 J. Gillon, two-story dwell., 474 West Harrison St.; cost, \$4,000.

Cincinnati.

BUILDING PERMITS. — C. Fenner, two-story brick dwell., Baltimore Pike; cost, \$3,000.
 Samuel James, two-story brick dwell., Chapel St., near Park Ave.; cost, \$4,200.
 Mrs. Horton, two-story brick dwell., Ashland St., near McMillan Ave.; cost, \$5,000.
 H. J. Riley, two-story frame dwell., Ellen St., near Kilgour St.; cost, \$4,000.
 W. P. Hurlbert, two-story brick dwell., Western Ave., near Findlay St.; cost, \$6,000.
 Wm. Leemeyer, three-story brick dwell., Poplar St., near Dalton Ave.; cost, \$3,500.
 Phillip Kopp, three-story brick building, Pleasant St., near Liberty St.; cost, \$5,600.
 John Letzler, two-story frame dwell., Calhoun St., near Madison St.; cost, \$3,500.
 J. H. Empson, 5 three-story brick buildings, Barr St., near Mount St.; cost, \$10,000.
 Fourteen permits for repairs; cost, \$12,000.
 Total permits to date, 669.
 Total cost to date, \$2,480,740.

Milwaukee, Wis.

BUILDING PERMITS. — Nic. Neuschwander, frame dwell. for S. A. Harrison, on Thirtieth St., Fourth Ward; cost, \$3,500.
 Hanbolt & Freming, brick dwell. for F. Schmidt, on State St., Second Ward; cost, \$3,000.
 C. F. Ehlers; brick store for Mr. Kietsch, on Third St., Second Ward; cost, \$6,000.
 M. Wettermann, 2 frame dwellings for John Miller, on Sixteenth St., Ninth Ward; cost, \$4,000.
 F. Tenischick, frame dwell. for himself, on Wine St., Tenth Ward; cost, \$4,000.
 C. Bach, brick building for the Cream City Brewing Company, on Thirteenth St., Ninth Ward; cost, \$5,000.

New York.

HOUSES. — For John T. McDonald, 3 four-story brownstone dwellings, 167 8' x 55' each, are to be built on the south side of One Hundred and Nineteenth St., 300' e of Sixth Ave., at a cost of about \$30,000, from designs of Mr. Jos. M. Dunn.
 For Mr. Charles L. Guillaume, 6 first-class four-story dwellings, to cost about \$125,000, from designs of Messrs. Thom & Wilson, are to be built on the south side of Seventy-sixth St., 200' e of Madison Ave.
 On the north side of One Hundred and Third St.,

300' w of Ninth Ave., Mr. Adam Bickelhaupt is to build 7 three-story and basement dwellings, to cost about \$75,000; brownstone fronts.

Mr. Ralph Townsend has drawn plans for a three-story and basement dwelling, 20' x 50', to be built by Mr. Isaac A. Hopper, for his own occupancy, on One Hundred and Sixteenth St., s. s. 300' e of Eighth Ave., which, with a brick stable, will cost about \$20,000.

BUILDING PERMITS.—Twenty-third St., s. s. 175' e Eleventh Ave., six-story brick factory, gravel roof; owner, Fowler Manufacturing Co., limited, 7 Washington Pl.; architect, A. B. Jennings.

Sedgwick Ave., No. 675, s. Morris's Dock Station, 3 three-story frame dwellings; cost, each, \$3,000; owners and builders, McKenzie & McPherson, 52 East Forty-first St.; architect, Jas. B. Lord.

One Hundred and Twenty-second St., s. s. 100' e Madison Ave., 4 five-story brownstone front flats and 2 three-story brownstone front dwellings, tin roofs; cost, flats, each, \$25,000; dwellings, each, \$12,000; owner and architect, Alfred Kehoe, 58 East One Hundred and Twenty-first St.

One Hundred and Sixty-first St., s. s. 100' w Concord Ave., three-story frame dwelling, tin roof; cost, \$4,500; owner, Elizabeth J. Gray, 1 Sylvan Pl.; builder, P. Garvin.

Madison Ave., s. w. cor. Fifth St., (Twenty-fourth Ward), three-story frame dwelling, tin roof; cost, \$6,000; owner, Albert Ayres, 1793 North Third Ave.; architect, W. W. Gardiner.

West Fifteenth St., Nos. 319, 321 and 323, rear, two-story brick stable and one-story brick office; cost for both, \$7,500; owner, Gilman B. Seely, 340 West Fortieth St.; architect, John Sexton.

Ave. B, s. w. cor. Seventh St., five-story brick tenement and store, tin roof; cost, \$12,000; owner, Estate Bernard J. Harrigan, per Ed. H. Harrigan, Plainfield, N. J.; architect, Wm. Graul.

Ave. B, w. s. 28' s Seventh St., five-story brick tenement and store, tin roof; cost, \$11,100; owner and architect, same as last.

College Ave., s. e. cor. One Hundred and Sixty-first St., 2 two-story frame dwellings, tin roofs; cost, each, \$2,500; owner, Edward Deicke, 550 One Hundred and Sixty-first St.

South Fifth Ave., Nos. 124 and 126, six-story brick warehouse, tin roof; cost, \$40,000; owner, Amos K. Eno, 8 Pine St.; architect, Robert Mook; builder, James Rue.

West Sixtieth St., No. 215, five-story brick and brownstone front tenement, tin roof; cost, \$14,000; owner and builder, Thomas Cowman, 429 West Forty-eighth St.; architect, M. Louis Ungrich.

West Forty-third St., No. 333, five-story brick tenement, tin roof; cost, \$18,000; owners, L. & K. Ungrich, 160 West Thirty-third St.; architect, M. Louis Ungrich.

West Thirty-fifth St., Nos. 444, 446 and 448, 3 five-story brick tenements, tin roofs; cost, each, \$17,000; owners, John Schmidt, 602 East Seventeenth St., and Martin Haupt, cor. Sixth St. and Ave. A; architect, Jobst Hoffmann.

Sixty-third St., n. s. 100' e Eastern Boulevard, two-story brick stable, gravel roof; cost, \$6,000; owner, Adam Neidlinger, foot of Sixty-third St.; builders, J. and L. Weber.

East Forty-fourth St., Nos. 220 and 222, two-story brick stable, gravel roof; cost, \$4,000; owner, C. Neuschaffer, 219 East Thirty-first St.; builder, B. Plump.

Seventy-sixth St., s. w. cor. Lexington Ave., 6 three-story brownstone front dwellings and extensions, tin roofs; cost, each, \$18,000; owner, Anthony McQuade, 157 East Eighty-second St.; architects, Thom & Wilson; done by days' work.

East Eighteenth St., No. 134, five-story brownstone front flat, tin roof; cost, \$12,000; owner, Anthony Dugro, 103 East Sixteenth St.; architect, F. W. Klemt.

East Eighteenth St., No. 136, five-story brownstone front flat, tin roof; cost, \$20,000; owner and architect, same as last.

Columbia St., s. e. cor. Hester St., five-story brick tenement and store, tin roof; cost, \$15,000; owner, Geo. H. Benner, 81 Cedar St.; architect, Adam Munch; builder, John Fitzpatrick.

Tenth Ave., s. w. cor. One Hundred and Seventy-third St., two-story frame and brick dwelling, slate roof; cost, \$9,000; owner, Adolph Hinze, 761 Eighth Ave.; architect, H. Kreidler.

ALTERATIONS.—West Forty-ninth St., Nos. 101 and 103, altered for stores and dwellings, one-story and basement brick extension on No. 103 only; cost, \$16,000; owner, John G. Weller, 79 Maiden Lane; architect, J. B. Snook; builder, not selected.

East Broadway, No. 206, change pitch of roof to rear, also one-story brick extension, tin roof; cost, \$4,000; owner, Meyer Isaacs, President Hebrew Free School Assoc., 811 Lexington Ave.; architect, H. Fernbach.

Third Ave., s. w. cor. One Hundred and Twenty-eighth St., two-story brick extension, tin roof; cost, \$4,000; owner, Jacob Ebling, on premises; architect, J. Boekell.

East Forty-first St., No. 51, interior alterations; cost, \$3,000; owner, George Bliss, 387 Fifth Ave.; builders, McKenzie & McPherson.

Fifth Ave., No. 23, n. e. cor. Ninth St., interior alterations, etc., for apartment-house; cost, \$25,000; owner, Daniel E. Sickles, 31 Fifth Ave.; architect, E. Sniffin.

Prince St., No. 198, new store front and internal alterations; cost, \$3,000; owner, Margaret Leibold, 123 Prince St.; architect, A. Crouter.

East Fifty-ninth St., No. 438, raise front building two stories and two-story brick extension; cost, \$3,000; owner, Albert Zoller, 25 Eastern Boulevard; architects, A. Pfund & Son.

Tenth Ave., w. s. 75' n One Hundred and Fifty-fifth St., raise one-story and internal alterations, and three-story frame extension; cost, \$4,500; owner, John F. Cunningham, One Hundred and Fifty-seventh St., cor. Tenth Ave.; architect, Chas. Baxter.

East Forty-second St., Nos. 410 to 416, repair damage by fire; cost, \$3,000; lessee, Robert Ellis, 2 Prospect Pl.; builder, Wm. Archer.

Second Ave., s. e. cor. Fifty-fourth St., raise one

story; cost, \$4,000; owner, Adolph Kerbs, 121 East Fifty-sixth St.; architects, D. & J. Jardine.

Philadelphia.

BUILDING PERMITS.—Fifth St., n. of Huntingdon St., three-story store and dwelling, 18' x 50'; F. Gramlich.

Ingersoll St., w. of Twenty-fifth St., 14 two-story dwellings, 14' x 34'; Phillip E. Coleman, owner.

Fifteenth St., cor. York St., 7 two-story dwellings, 15' x 40'; W. H. Lowes, owner.

Adams St., w. of Edward St., two-story dwelling, 16' x 50'; W. H. Yelland, owner.

Fifth St., n. of Huntingdon St., three-story store and dwelling, 18' x 50'; F. Gramlich.

Church St., Nos. 103 to 111, addition to five stores, 20' x 32'; J. Erickson, contractor.

Susquehanna Ave., w. of Twenty-ninth St., two-story dwelling, 18' x 50'; Henry Mercer, contractor.

Hamilton St., n. of Jefferson St., 4 two-story dwellings, 16' x 28'; Green & Beran, owners.

Jefferson St., near Ridge Ave., 2 three-story dwellings, 16' x 30'; W. Eddleman, contractor.

Jefferson St., near Linden St., three-story dwelling, 18' x 50'; Richard Bighter, owner.

Shur's Lane, between Cresson and Terrace Sts., three-story dwelling, 25' x 65'; F. Davis, owner.

Manayunk Ave., n. w. cor. Penn St., two-story dwelling, 21' x 32'; P. O. Keefe, owner.

Marriott St., above Seventh St., two-story church, 60' x 110'; E. F. Durang, architect.

Forty-second St., cor. Chestnut St., two-story stable, 90' x 310'; Jas. W. Bradin, contractor.

Orthodox St., cor. Cambridge St., two-story dwelling, 20' x 34'; W. E. Carman, contractor.

Twenty-first St., s. of Ontario St., 4 two-story dwellings, 15' x 42'; D. McNeill, owner.

Ridge Ave., Nos. 328 and 3290 (Falls of Schuylkill), 2 three-story dwellings and stores, 22' x 64' and 20' x 52'; Chas. Bartler.

Marshall St., s. of Cumberland St., 8 three-story dwellings, 15' x 40'; P. Heffling, contractor.

Ridge St. (Bridgesburg), three-story dwelling, 24' x 32'; Amos W. Linn, contractor.

Twenty-second St., near Carpenter St., four-story addition to factory, 60' x 74'; W. J. Vankirk, contractor.

Cayuga St., w. of Sixteenth St., 20 two-story dwellings, 14' x 42', and three-story dwelling, 15' x 50'; W. F. Shaw, owner.

Market St., No. 1023, four-story store, 25' x 200'; Jacob Myers, contractor.

Lawrence St., n. of Cumberland St., 4 two-story dwellings, 16' x 39'; Batley & Bowers, owners.

Leithgow St., n. of Cumberland St., 5 two-story dwellings, 13' x 27'; Batley & Bowers, owners.

Victoria St., s. of Bath St., two-story dwelling, 14' x 30'; V. Hazzard, owner.

Cambria St., e. of C St., two-story dwelling, 17' x 40'; Wm. Rawson, owner.

Delaware River Front, opposite Hedley St. (Bridgesburg), one-story steel works, 40' x 150'; G. F. Gibson, superintendent.

Wayne St., between Rittenhouse and Harvey Sts., 12 three-story dwellings, 33' x 34'; Townsend Bros., contractors.

Tasker St., n. w. cor. Dean St., two-story store and dwelling, 12' x 32'; James Buist, contractor.

Front St., n. of Master St., 2 three-story dwellings, 17' x 50'; Shegog & Quigley, contractors.

Garfield St., between Main and Wakefield Sts., two-story dwelling, 17' x 43'; W. Sleath, owner.

Wood St., between Twenty-second and Keifer Sts., 2 three-story dwellings, 15' x 44'; Wendell & Smith.

Pechin St., e. of Penn St., 2 two-story dwellings, 16' x 28'; W. Rainier.

Third St., n. of Huntingdon St., finishing building, 40' x 102', and two-story engine-house, 17' x 65'; Theodore Morgenstern, owner.

Eleventh St., s. of Somerset St., 2 three-story dwellings, 16' x 52'; Jos. Lomax.

Mill St., w. of York Road, Branchtown, three-story dwelling, 22' x 48'; W. Conrad, contractor.

Ashland St., e. of Penn St., 2 two-story dwellings, 16' x 28'; W. Rainier.

Jefferson St., n. of Ridge Ave., 2 three-story dwellings, 16' x 30'; S. B. Richter, contractor.

Fifth St., n. of Butler St., 2 three-story dwellings, 18' x 50'; Chas. L. Lorey, contractor.

Somerset St., cor. Palethorp St., factory, 45' x 145'; Jno. Davenport, owner.

Fairmount Ave., No. 2312, one-story store, 16' x 65'; R. J. Whiteside & Sons, contractors.

Westminster Ave., No. 4633, two-story dwelling, 16' x 50'; D. McGarvey, contractor.

Belgrade St., No. 823, two-story dwelling, 17' x 40'; Jno. Bald & Son.

New Market St., n. of Noble St., one-story storage shed, 75' x 140'; Phila. & R. R. Co., owners.

Main St., s. of Rowan St., three-story store and dwelling, 15' x 52'; W. Keas, contractor.

Toledo.

ASYLUM.—The plans for the lunatic asylum buildings, to be located at this point, are being prepared by Mr. E. O. Fallis, of this city, and Mr. Yost, of Columbus, O. The buildings are to be some forty or forty-five in number, the "cottage system" being adopted. The approximate estimate of cost is \$500,000.

FACTORIES.—Three-story and basement brick factory, cor. Superior and Orange Sts., for Gendron Iron Wheel Co., 80' x 100'; cost, about \$20,000; E. O. Fallis & Co., architects; J. V. Sanflet, builder.

Three-story and basement brick factory, cor. St. Clair and Orange Sts., 80' x 105'; cost, about \$20,000; owner, H. S. Walbridge, architects, T. H. Walbridge & N. B. Bacon; builders, Miles, Cramer & Horn.

HOUSES.—Two-story and basement brick and stone dwelling, cor. Madison and Twelfth Sts., cost, about \$10,000; L. Franco, owner.

Two-story brick block of two dwellings, Walnut St., for Mrs. I. B. Waite, about 40' x 60'; cost, \$7,000; N. B. Bacon, architect; J. V. Sanflet, builder.

Two-story frame dwelling, Lincoln St., for C. L. Smith; cost, \$2,700; N. B. Bacon, architect; John Kerruish, builder.

Two-story frame dwellings, Columbia St., for J. H. Bowman; cost, \$4,500; N. B. Bacon, architect; John Kerruish, builder.

Two-story and basement frame dwelling, Ashland Ave.; cost, \$4,300; N. B. Bacon, architect; J. B. Hasset, builder.

Two-story frame dwelling, Twelfth St., for T. J. Southard; cost, about \$4,000; O. W. Vallette, architect.

MEMORIAL BUILDING.—The foundation and cornerstone of the Soldiers' Memorial Building are in place, and work on the superstructure is to proceed during the coming season. The building will be of brick and stone, three stories high, and contain large drill-room, artillery room, memorial hall, etc. The building is located on Adams St., cor. Ontario St.; cost, about \$50,000; Messrs. Gibbs & Stine, architects.

STORES.—Three-story brick business-building, 13' x 93', Adams St., for Geo. Tait; cost, \$5,000; N. B. Bacon, architect; Dawson & Anderson, builders.

Three-story brick business-building, 20' x 120', Summit St., for John Showel; cost, about \$7,000; N. B. Bacon, architect.

Four-story brick and stone business-building, 60' x 75', cor. Jefferson and Superior Sts., for Estate of E. Walbridge; cost, about \$21,000; N. B. Bacon, architect; E. Malone, builder.

General Notes.

ASHLAND, MINN.—Six new stores (one brick, home-made), a brick printing-office, a four-story furniture factory, a \$10,000 school, and about forty fine residences are in process of erection at the present time.

BRICK CHURCH, N. J.—Mr. James H. Bartholomew has commenced the erection of a frame church on Glenwood Ave., to cost \$10,000, from plans made by S. W. Whittemore, architect.

BRISTOL, R. I.—The cornerstone of the Burnside Memorial Hall in Bristol was laid on Tuesday, September 25.

BROOKINGS, MINN.—Work on the Territorial Agricultural College here is being pushed energetically. The foundation walls are finished.

CARLISLE, PA.—Chas. L. Carson, architect, Baltimore, is preparing plans for a one-story stone scientific building, 57' x 179', for Dickinson College, to cost \$30,000.

CONCORD, N. C.—The Yadkin Falls Manufacturing Company have begun a factory-building. It will be 52' x 100', two-story.

FREMONT, O.—The cornerstone of the new Methodist church was laid August 23.

GERMANTOWN, PA.—Thomas W. Wright has been awarded the contract for the erection of the new hall of the Workmen's Club.

KEY WEST, N. J.—A hotel, with accommodations for two hundred, will be built here this winter, at the junction of the ocean and Shore River.

MANAYUNK, PA.—John Harlan is building a store and dwelling at the cor. of Ripka Ave. and Winchester St.

COMPETITIONS.

STATE CAPITOL.

[At Atlanta, Ga.]

October 6, 1883.
The Board of Capitol Commissioners of Georgia invite plans for a state capital building, to be erected in Atlanta, Ga., under the following conditions:

1. An elevation of each side of the building, and a plan of each floor—drawn in black ink only, and to a uniform scale of one-eighth of an inch to the foot.

2. A perspective view of the building, which may be in colors.

3. Detailed and accurate specifications of material and workmanship, so arranged that the work may be let to one contractor or to several contractors for the various classes of labor and material.

4. Such other drawings as may be necessary to fully elucidate the plan.

5. A detailed estimate of the cost of the building, which must not exceed the sum of \$500,000.

For the accepted design under the above conditions, the Commissioners will pay the sum of \$3,500.00.

Provided, the architect furnishing it will deliver within a reasonable time after the award is made, complete and satisfactory detail and working drawings.

The Commission reserves the right to reject any and all plans. Those declined will be returned to competitors.

The building is to be erected upon a lot 421 feet square, practically level, surrounded by streets sixty feet wide. Copies of the Act providing for the erection of the Capitol, specifying the accommodations to be provided therein, and any other information desired by parties intending to compete, will be furnished upon application to the Chairman of the Commission.

Plans should be addressed to the Board of Capitol Commissioners, Atlanta, Ga., and must be received not later than the 19th day of December, 1883.

HENRY D. McDANIEL,

409 Governor and ex-officio Chairman Commission.

CREMATORY.

[At Wheeling, W. Va.]

Plans and proposals for the erection of a crematory for the purpose of disposing of kitchen garbage and the contents of privy-vaults, will be received by the Committee on Health of the City of Wheeling, W. Va., until November 15, 1883. The plan adopted will be paid for. The committee reserves the right to reject any or all bids.

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COLLEGE BUILDING.

[At Pierre, Dak. T.]

The trustees of the Presbyterian University of Southern Dakota will receive plans for a college building to be erected in Pierre, said building to be of brick with stone trimmings, to cost, when completed, \$20,000, and designed to include chapel, recitation, cabinet, library rooms, etc.

The plans must be submitted to the trustees at Pierre on or before October 25, they reserving the