



GEORGE B. POST.

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THE WORKS OF GEORGE B. POST.

GEORGE BROWNE POST was born on the 15th of December, 1837. He was educated as an engineer in the scientific course of the University of the City of New York, and graduated in 1858. It was in that year that the late Richard Morris Hunt first opened his atelier for students, and Post entered this school at the same time with the late Charles D. Gambrill, who was first his partner, and afterwards the partner of Henry Richardson. The firm of Gambrill & Post found its business seriously interfered with by the war, for the junior partner was absent during service with the army; and it was soon dissolved. It was not until the year 1874 that large and important buildings were undertaken by George Post, but during the years that have elapsed since that time his business has been, perhaps, the largest, and certainly one of the two or three largest which have existed in the United States.

This business is, moreover, distinguished by the importance, from a social and commercial point of view, and by the high cost of many of the buildings, as well as their extremely thorough and workmanlike construction. Many of our cities have, among their most important public and mercantile buildings the structures erected from Post's designs, and several of the most sumptuous and splendid residences in America are also of his work. These buildings are appropriate and enduring, useful and worthy, but they are often found to be without especial charm. The beauty which may exist in some American buildings of no great originality, and no essential or lasting merit, and which beauty is partly in unconscious association with buildings loved in Europe, and partly in some inherent grace of proportion, is not always to be found in these buildings which we have under consideration. The student who has learned to love architecture in older lands, rich in the monuments of an artistic past, is not always delighted by the general aspect of the buildings we are considering. That charm of conventional proportion which, in our modern practice, can only be got by the deliberate sacrifice of convenience and logic to the massing of lines of a façade, is not especially a characteristic of these

compositions. On the other hand, these buildings are admitted by all to be among the best built, best planned, most useful and most truly economical of our modern structures. It is, moreover, generally admitted that this architect, more than most men in very large practice, designs his own work. Of course, the mysteries of a working office are impenetrable. Of course, no one really knows which member of a firm, or which subordinate of the many in an office of seventy or eighty employees, is really responsible for the merit or demerit of a design. We call a building the design of Smith or Brown, because Smith or Brown is the responsible man; it is he who has received the commission and who draws the percentage; but who deserves the credit or discredit of the plan, the general design, or the details, is absolutely unknown to the outside world. And yet it is not to be doubted that the architect whose work we are now considering does far more of his own original planning and designing—arranges his own studies far more thoroughly and in person—than is at all the rule. It is not many months since Mr. Post said, himself, in the course of discussion at the Architectural League, that the limit of business in his office was that of his own capacity to originate the designs—to make primary studies—and it is probable that no one of those present was inclined to dispute this saying, rash as it seems, and almost incredible, if measured by the well-known practice of many architects in a large way of business.

We have, then, before us an interesting inquiry into buildings personally designed, thoughtfully organized and carried out in the most thorough and workmanlike manner, but which buildings are very often other than agreeable to the cultivated eye. Could these buildings be any better in proportion, any more graceful, any more attractive, without being made less useful or less economical? Is there room for the genius for refined proportions with which we credit Palladio and Inigo Jones to show itself in our modern mercantile and domestic buildings? Or, if the genius for refined proportions is lacking, or is prevented by untoward circumstances from working, is there anything that can take its place? It is notorious that we cannot generally have any decorative sculpture in our modern structures, and we shall see, by and by, that, perhaps, the first attempt to introduce fully realized sculpture, and that of high artistic character, was made by George Post himself. It is notorious, too, that our whole modern habit of building has grown without the aid of, and without inspiring any, appropriate system of architectural design. It is notorious that the pseudo-classic, or the would-be Romanesque, or the sham-Gothic forms which we insist upon and perpetuate, having no others, are mere borrowings, generally misunderstood, from noble buildings of the past to which they were es-

sential. A very great and exceptional native power of design may, indeed, enable the modern architect to weave some of these forms together into a not displeasing fabric. Once and again he may do this, but it has no result; no one else is strengthened by his example; the art of design in architecture makes no progress in this way. It is probable that no progress will be made until we agree to reject for a length of time all the traditional systems of ornamental designs in architecture. If we could have fifty years of absolutely plain and undecorative building, that often mentioned and evasive thing, a new style, might indeed, evolve itself naturally; but, in the absence of that unattainable condition of things, an agreement, such as seems to be reached by many of the classic revivalists of the last three years, that is, an agreement to build as many square boxes with square holes in them as possible, may be the next best thing. At all events, the inquiry which we have now to make into the architectural qualities of a number of large, very costly and very important buildings will suggest many problems which it is much easier to state than to solve.

Let the reader go into any great business building and look out of its back windows, looking at the walls upon its own court-yard or its neighbor's rear or court. Aldrich Court, the building No. 45 Broadway, will serve his turn as well as any. Or let him look from the street up at the court-yard walls of one of the very lofty buildings which now rise above the five-story structures of twenty years ago; the as yet unfinished business building of the Standard Oil Company, on the east side of Bowling Green, is an excellent example. Those walls are not without a certain architectural treatment; the material is chosen carefully, both as to quality and as to color, and even the forms are, at some expense, brought into harmony with recognized styles of building. Now, the arrangement of openings and solids in these walls, the disposition of the windows in horizontal lines and in vertical sequence, are the obvious and natural arrangement and disposition. No genuine system of architecture will come out of these business buildings, unless that obvious and necessary arrangement is recognized as a very condition of their design. In Greek and in Greco-Roman temples, a windowless box, with a single door, was fronted by a columnar porch, or faced on every side by a peristyle; that was the accepted condition out of which style was to grow, if it was to grow at all. In the Roman basilica with vaulted roof, or in the great hall of a public bath, the dignity of the structure arose from the very nature of its structural organization. The Pantheon is exactly what it was required to be, and gets its magnificence from the fulfilling of those requirements. In either of these Roman instances the little accessory surface ornamentation of pseudo-Greek form helps it as hanging pictures on the wall of a private drawing room helps that; the essence of its architectural

value lies in other things. In later Romanesque and Gothic churches, the effect, both inside and out, was obtained almost exclusively from the division and sub-division of the plan, and the growth upward from this of the vaulted roof, supported on isolated piers. The church forms of the Classic Revival were as constructional as those of the thirteenth century. San Lorenzo, San Fantino, Saint Roch, Saint Paul are all names which call up at once the images of buildings whose interiors, at least, are, in an architectural sense, the inevitable outgrowth of the plan and the system of building. The residences, large and small, of the mediæval and later periods follow and not lead the architectural style. Each is a congeries of rooms, passages and court-yards, in which the heights of stories and the number and disposition of window openings were not, of necessity, greater or less, more or less ample. The architect of the Veronese palace might range the windows along the front of his one principal story, and might group the small openings of his massive basement almost exactly as he chose; his employer would hardly have complained if the little valued daylight was somewhat skimped to allow for a stately façade. In brief, all the great original styles of architecture have taken their system of decorative building direct from necessary plan and natural superstructure; and all the great derived and secondary styles have deviated from this only in so far as they might consider their "orders," and the supposed necessities of their somewhat artificial design, without very great forcing of the situation.

Now, however, all is different. Churches no longer set the example, nor tend to the development of new styles. Public buildings, in the sense of buildings erected with public funds for public purposes, are the most contemptible of all our structures—nor can the student point to a public building which is essentially other than a private structure enlarged. The "Office Building" and the private house are to us what the church was to mediæval Europe, the typical buildings from which our modern architecture must shape itself, if, indeed, it is capable of taking any shape. With the modern private house something has been done, something is doing. In previous papers of this series, dealing with the work of Messrs. McKim, Mead & White, Messrs. Peabody & Stearns, and Messrs. Shepley, Rutan & Coolidge, an attempt has been made to show how far the architecture of our private houses has succeeded and promises to succeed. The "Office Building" remains. It must be many stories in height, and the stories must be of the same height. Every story must have a vast number of windows, and those windows must be equally spaced, or nearly so, nor are there any rational means of distributing the windows of one story on a scheme differing widely from the others. A high-pitched roof is an absurdity; a broken sky-line is false economy; the abandonment of a square foot of rentable space for the

purpose of breaking up the exterior is out of the question; deep shadow is unattainable, because all the openings must be fitted with glazed sash; architectural effect, born of the structure, has not even been attempted, with, perhaps, the single exception of what has been done in the Guaranty Building in Buffalo. As the business building is, so is the Club House, the great Hotel, the National or State building for public office. To approach the task of designing such a building with your old basketful of classical or sixteenth century orders and rules of proportion, is to fight your weight in wildcats with one hand tied behind you. It is, perhaps, because Mr. Post keeps both his hands free that his treatment of the almost hopeless question is of peculiar interest, in spite of the comparative rarity in his buildings of marked excellence in the way of proportion. The very absence of these exceptional graces may be an essential part of his manful and individual struggle with the terrible difficulties of the situation.

The question of very lofty buildings comes up immediately when Mr. Post's name is mentioned. He, indeed, is one of the two or three for whom is claimed something of the inception of the steel frame construction which has made these very lofty buildings practicable. For a number of years previous to 1889 the large business buildings of our cities had been, only in appearance and in the exterior structure of stone, or brick and stone, or granite. The interior of these buildings had been mainly a skeleton of uprights and horizontals of cast iron and wrought iron, bolted together and carrying floors of masonry. The partitions dividing the different rooms were carried directly upon the large girders or, in the case of minor partitions, by the floors themselves indifferently. Buildings of seven or eight stories had become not exactly common, but still familiar to the dwellers in our great cities, and these were called "elevator buildings," or, jocosely, buildings in the elevator style, because it was obvious that they could hardly be made to pay in a business sense if their upper floors were accessible by stairs alone. The general use of elevators in our large buildings began about 1871, but many buildings remained for some years after that date without them, and, in such buildings, whether before or after the introduction of elevators as a business investment, the third story was hard to rent and the fourth story almost unrentable. An elevator building, then, after the public had had six months' experience of the novelty, could rent its sixth story as well as its second story, or, perhaps, to even better advantage. It was, then, a natural thought that buildings might be wholly of iron in their essential construction, the exterior as well as the interior frame work depending upon this material and this system of building, and that, moreover, the buildings so planned had no limit to their available height or, at least, no such limit as had hitherto

been set to lofty towerlike structures. The towers of the Middle Ages, fortresses and the like, had been carried to a great height, but this was with twenty-foot walls at the basement and a construction so massive that windows were almost ignored and the available interior was as nothing compared with the mass of material used. Now, however, it appeared that a tower could be built of light wrought iron or steel framing with its exterior walls wholly eliminated and replaced by screens which, indeed, might look like walls, but were not walls in their ordinary weight-carrying sense. The first building of this kind was built in Chicago; there is no doubt as to that. But there is question as to the origination of the idea and as to the first elaborately composed plan.

In all such buildings the exterior wall is carried, and must of necessity be carried, by the steel frame itself. This may be done either by the placing of the outermost row of steel uprights in the line of the exterior wall—that is to say, in a city building, close up to the exterior lines of the lot to be occupied—or the outermost row of posts may be three or four feet within these exterior lines, and the walls themselves, or the screens which replace them, may be carried in that case on cantilevers or brackets, which project from the frame and carry the wall exactly as a statuette or a vase is carried on a bracket in a parlor. It has been said that these screen-walls were necessarily supported by the metal frame. This is because the old-fashioned masonry wall must needs be so thick at the basement of the twenty-story building as to preclude the economical use of such lofty buildings. This fact used to be stated freely and as a commonplace, in the years immediately preceding the introduction of the steel frame building. It used to be said freely that buildings had reached, and had even overpassed, the limits of reasonable and useful altitude, because one had to sacrifice so much precious ground floor and the equally precious floor at the head of the first short flight of stairs, for the sake of the less valuable space above. Imagine a building divided by partitions into offices twenty feet wide, sixteen feet wide and the like, and standing at the corner of ordinary city streets; is it not clear that the outer and inner walls of such a building would have to be of such excessive thickness on the ground floor that the very object of the commercial building would be frustrated? The fact that these walls would have to be pierced with innumerable windows and doors only increases the complication, because a wall for which a thickness of four feet might have sufficed, if unbroken by openings, must be perhaps six feet thick if it is reduced to a little more than a row of piers; and the very partitions within would have to be perhaps four feet thick if broken by many and large doorways. If any one will lay out on a piece of paper a rough sketch of the ordinary conditions of a business building he will see that such walls as these make the lower

stories of little avail to the investor in real estate—to him who builds for the sake of rent. But if the steel frame is to carry the external screen walls and the partition walls as well, then the thickness of these walls on the ground floor need be no greater than their thickness above. The conditions change altogether. The strength of vertical support has to be got and resistance to force of wind has to be met by the steel frame itself, which is constructed of posts and girders, pinned together. Stone and brick architecture and the principles which have governed it for sixty centuries are replaced by modern engineering, and with a new set of principles all the conditions of a building are new. The exterior wall need no longer present the deep reveals, the broad archivolt, the heavy lintels, the careful superposing of openings and solids; it need no longer have that weight or that appearance of weight which has always been thought so essential to architectural grandeur; it can dispense with all those conditions of stability and security which have made up two-thirds of the architecture which we love in the past—two-thirds, because certainly that proportion of architectural splendor is in the construction of a building itself, and it is a large allowance to say that ornamentation is for the other one-third.

Now, it is true that our lofty buildings have not as yet met these artistic requirements. No new system of design has arisen connected with this wholly new system of building, and there is another of the many evidences of our feebleness as a race of artistic builders. One building, by a Chicago architect, the often cited Monadnock business building in Chicago, makes no pretensions at being anything but a steel cage with the spaces between the bars filled in with light material. It cannot be called an elaborate design in the architectural sense; it is too entirely utilitarian in its scheme of openings and solids and the resulting proportions to be called a design; but it is a perfectly reasonable, proper and respectable attempt to show how the design of such a building must be undertaken. If we do not make a system of architecture of such cages filled in with light, thin panels we shall make no system of architecture out of the high buildings at all, and must content ourselves with the wretched simulacrum of architecture which they now present. There is nothing more certain to destroy all architectural feeling than the deliberate retention of a system of design out of which all reason and intelligent purpose have gone. When a twenty-story building pretends to a solidity of effect produced by arches with broad archivolt and deep reveals, an appearance of massiveness which would be adequate and wholly respectable in the case of a five-story building—when such a design as this is submitted to the public, the public has a right to say that this is a sham. While the builder is perfectly excusable for not yet having had time to find his way out of this confusion of old forms

with new requirements, he is still to be praised only with such reserve as must be granted in the case, and the building itself is not admirable but only tolerable. The building is to be tolerated because it is a good deal to ask of an architect that he should have seen his way to meet these requirements; it is not to be admired because the architect has not yet so seen his way.

Many such experiments as that seen in the Monadnock, as that seen in the Guaranty, are yet to be made, and each in its way will be interesting to every free-minded student of architecture, but which of these experiments is to be the successful one will not readily be known to its contemporaries. The experiment which is to be the forerunner of many other experiments, the whole forming together a natural evolution resulting in a good modern style of architecture, will not be readily recognized when it appears. A few designers will see in it suggestions for their own innovating attempts which will become less hazardous in the light afforded by their forerunner. The world in general will see nothing of this. It will take a century, more or less, of such development before the world recognizes it and knows that now at last something has been achieved.

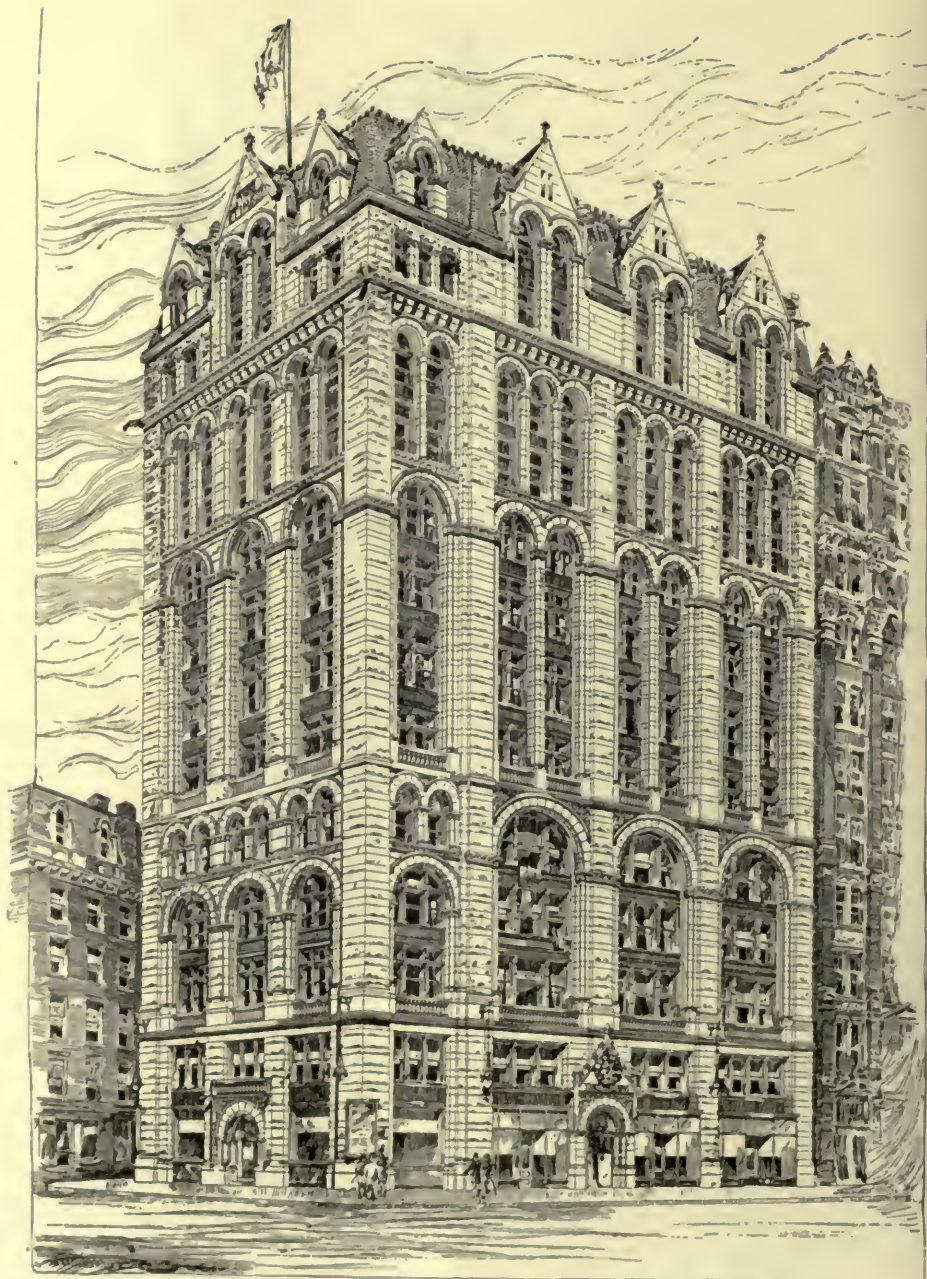
There is, however, this serious difficulty in the way of doing anything for our tall business buildings and hotels. They rise high above the neighboring structures and must continue to rise high above them unless our cities are to become what it is almost impossible to conceive—groups of houses with streets cut through them only one-fifth as wide as the height of the structures on either side. The lofty walls which show a hundred and fifty or two hundred feet of clear height above the roofs of their neighbors, that is to say, those walls which do not constitute the street front, are destined to be blank flat walls of brick with square holes in them for windows, and without projection or relief of any kind. The one serious attempt which has been made to overcome this difficulty and treat the wall faces rising above neighboring roofs in a way to correspond with the wall faces which front the street, namely, in the Surety Building, in New York, has resulted in difficulties with the adjoining properties which make it certain that the attempt will not be renewed. The office building of the more common form, forty or fifty feet wide, at the most, and perhaps two hundred or two hundred and fifty feet high, and with a depth nearly equal to its height, resembles nothing so much as a book on the shelf, and it must be a book in half binding, too, for that which corresponds to the back of the book, namely, the street facade, will be of different material from the sides and the opposite thin edge, and will receive an adornment which they do not share. All this is as awkward in effect as possible, or seems so until the building on an irregular lot, or the large building on a corner with the inner faces so combined as to include a court, has to be



THE PULITZER BUILDING.
Park Row, New York City.

compared with it. Then it is found that the narrow structure which we have compared to a book is seemly in comparison, and that the hopeless lack of significance in the grouping of the wall surfaces which inclose the larger and more diversified structure, produces a result absolutely unarchitectural and without possibility of architectural treatment—so long, at least, as mercantile requirements are listened to.

If we take Mr. Post's thirteen-story and fourteen-story buildings together, and direct our attention to the Pulitzer Building, in which the New York World is housed, the New York Times Building, only a few hundred feet farther south, and the Havemeyer Office Building, in Cortlandt street, it becomes evident that the only chance for an agreeable general aspect of one of these huge masses lies in



THE NEW YORK TIMES BUILDING.
Park Row, New York City.



THE HAVEMEYER BUILDING.
Church, Cortlandt and Dey Streets, New York City.



UPPER STORIES OF THE HAVEMEYER BUILDING.
Church, Cortlandt and Dey Streets, New York City.

what may be called accident. The requirements of the structure will seldom allow of a good general mass to any one of them. The Pulitzer Building, for instance, has been unfortunate in every way. The dome does not bear upon the middle structure, but is put to one side in a way which is awkward in a building as tower-like as this. The common verdict of architects is that the dome is too small for the building, but this is not exactly the case. St. Peter's, or any other domical church, has its dome not, indeed, in the middle of its mass, but where that dome naturally springs out of the internal construction, which internal construction is accepted as a well-known feature of the building by every beholder; but when a tower has its highest and crowning turret well at one side, the presence of it there should be accounted for, architecturally, in some way, which is not possible in the Pulitzer Building. From the east, northeast or southeast, where the gable walls and the courtyard walls of this building are seen, it is neither more nor less awkward in its general disposition than it is from the southwest, where both the street fronts are shown. From the north alone—that is to say, from the approach to the Brooklyn Bridge, or from the park beyond—does the dome seem

rightly placed. The unsuccessful skyline and general massing of this building are purely matters of accident which the architect had no obvious means of controlling.

With the New York Times Building and the Havemeyer Building, the case is somewhat different. Here is to be seen by means of a comparison with these two structures, and in the strongest possible way, the peremptory demand for a simple outline and a square level cornice which these high buildings make upon their designers. It is generally true that the best of them have been those whose walls rise sheer from the sidewalk to a cornice of but slight projection, and whose skyline is the simple perspective of the sides of a parallelogram. The attempt to give a more varied skyline to the Times Building by means of a mansard roof rising from a low attic in which the lofty dormers are inserted, has not been successful, and this merely because no such attempt can be successful. The proportions of the roof are reduced to nothing by the great height of the walls; and, whereas, the roof, if visible, should always seem large in proportion to the walls and constitute almost a dominant mass in the design, as befits it in its capacity as the one most important part of the structure, such a roof as this has the look of an afterthought and addition not at first contemplated and forming no part of the design. The chateau of the sixteenth century would have a roof at least two-fifths of the whole structure in height, or else it would have no visible roof at all. Now it is easy to say that we are not to condemn a New York business building for not being a country chateau, and that the requirements of the one building are not those of the other; but the answer is as easy. It is, that, architecturally speaking, the requirements are, in a sense, the same—that a roof which, as in the Times Building, is reduced to one-seventh, or one-eighth, of the whole structure in height, is a feeble thing which had far better be omitted. In other words, this is not the place for a steep roof with large dormer windows forming any important part of the design. Roof and dormers together are reduced to nothingness by the great height of the walls below, and the roof is felt to be a sham—a mere modification of the walls in view of the fact that its steep slope ends not in a ridge but in a flat deck, of which every beholder is conscious and which is in fact the roof of the building. The two lofty edifices, the Pulitzer Building and the Times Building, can be seen from the park, or from Broadway, across the park, in such a light as admits of good comparison; and from this point, the Pulitzer Building is superior as having its walls much more fortunate in their architectural subdivision, as having a flat roof with a parapet, though with a pediment to mark the principal front on the park, and as having the culminating feature, the dome, very large and lofty, in itself as big as a five-story apartment house and rising directly from the invisible

flat of the roof. This, of course, is the architectural design as it grew into being on the architect's drawing boards. The building is not fortunate in color, its sculptured detail, although somewhat elaborate, is not so applied as to add a charm to it, and the orders of coupled columns are lost in the hugeness of the mass, which they seem, in a way hard to explain, rather to contradict than to assist; but the tower-like mass is well proportioned and good, if seen from any such point as allows the dome to rise out of the middle of it and dominate the whole of it instead of a wing or a projection. What, however, is the use of trying to make anything of a building which has to show its rear and side walls of blank brick-work with the windows cut almost at haphazard, which walls, moreover, are grouped with each other in so unfortunate a way, and which contradict in every way the architecturally treated walls which front the streets? What is the use of trying to make a design of a building which half the city is seeing in its most unfortunate and hopeless confusion of masses while the other half only, or less than the other half, sees as an architectural composition?

The New York Times Building has the immense advantage of presenting three architectural fronts to three important streets, and of having a very lofty adjoining structure to conceal entirely its remaining wall. In other words, the Times Building is built as if part of a city of buildings of its own height. It is, therefore, to be judged more nearly as a building of less height and of old-fashioned proportions usually is judged, than as its neighbors, the lofty modern business buildings, generally can be. In general effect it is not fortunate, and this is probably due more to the absence of strong horizontal lines than to any other single cause. It is curious to see how vastly superior in effect the Pulitzer Building is because of its strongly marked horizontal string courses, classical entablatures though they be, and how the constant superimposition of story upon story, supposed so difficult a task for the modern architect, has ended in a marked superiority for the building which recognizes it over the one which tries to ignore it. It is curious, moreover, to see the defeat, in the Times Building, of that effort to get harmony by throwing four stories into one by means of piers carrying arches as if of enormously high windows which are subdivided into the actual windows of the different stories. This experiment is tried by every architect in turn and fails in the hands of all, in nearly every instance. When the designer first undertakes the confessedly difficult task of putting a dozen stories, or more, of equal size and importance, one upon another, he has a natural longing for the reduction of these many stories to a few, at least in appearance; and this unhappy device of what are meant to look like tall windows is tried by every designer, and is not abandoned by all of them as quickly as might be wished. We

shall see it more skilfully used in the Union Trust Building and in the Western National Bank, but nowhere is it commendable. Meanwhile, in the Times Building, it is so carried out as to allow of the one valuable feature of the design, when considered in detail, namely, the great piers which rise from sidewalk to cornice almost unbroken, and which lack only a more fortunate combination with the cornice and its superincumbent attic to give in themselves great character to the building. Even here, however, the ill luck which seems to have attended all parts of this design has followed the piers too, and one of the principal piers has been cut through at its base by an important entrance door with porch and gable. Actually this is done, on the face toward the Park. A doorway, six feet wide, with its accompanying arches and piers and gable with a clock in it, a very agreeable detail in itself, actually penetrates the great central pier at its base; and although that pier is widened at the bottom to make this possible—for, indeed, everything that Mr. Post's office turns out is constructional and safe—the architectural solecism is not the less crying on that account.

If in every such instance the critic were to stop to explain that he is quite aware of the mercantile requirements which make such architectural sins almost inevitable, he would never have done. Let it be understood, once for all, that the tall business building can hardly ever be successful; that almost never do its conditions allow of noble architecture; that everything which is even enduring is to be got by the architect in spite of and not in accordance with the necessary conditions of the business building, and that we expect nothing. Let it be clearly understood that business requirements are in themselves the very defeat, the very ruin, of architectural effect; and that the public and the lovers of architecture are prepared to feel grateful for the slightly less discordant results which now and then a fortunate or patient architect may produce from these untoward conditions. The necessity of building for the maximum rental, and with the minimum loss of rental by delays during erection of the building, would alone suffice to explain the impossibility of fine work. All this is understood, and must continue to be understood if we are to consider mercantile buildings at all. It must be taken as read into every line of critical remark.

The Union Trust Company's Building has two fronts, one on Broadway and one on New street, exactly alike in masses and in details, but carried out, the one in limestone, the other in yellow brick and terra cotta. These fronts are elaborate, and they contrast sharply with the blank side walls which rise high above the nearest roofs; and yet, in this structure, the contrast is less harsh than usual, probably because the gable walls are almost unbroken masses and seem to afford that solid wall surface which the lantern-like, window-pierced



THE UNION TRUST BUILDING.
Broadway, south of Wall Street, New York City.



NEW STREET FRONT, UNION TRUST BUILDING.

street fronts require. The design of the fronts is a very interesting composition, the great piers being carried up through nine stories and ending in the abutments of three large round arches, which, as in other such fronts, seem to span vast cathedral windows, one hundred feet high, or more. These window-spaces, however, are subdivided into the actual windows of the different stories with more variety than is common. The lower part, three stories high, has three arches, carried from pier to pier, and above this is a row of windows on a smaller scale, two to each space between the great piers. All this is fortunate in an architectural composition and, although one cannot but feel the practical absurdity of the immense spandrels in the lower and the upper row of large arches, which spandrels shut out the precious daylight from the offices within, this is yet so common a solecism that it has to be condoned. The uppermost story of the wall proper has three more of the great arches, which now finish the window-spaces and end the great piers, and finally a roof with three dormers of moderate size shows even from the street below—the street being, fortunately, of reasonable width—for from New street it can hardly be expected to show. This is one of the best fronts that has yet been achieved. A view of the lower part of the New street façade shows clearly the manner in which a remarkable effect of solidity has been obtained while nearly the whole front is glass. Nowhere is there a better proportion between roof and walls, and let it be said plainly here that the dictum given above for high roofs on these high buildings is contradicted so far as the example of one such structure can do it, for on this building the roof is an element of the general comeliness of its design. As affecting the general truth of the proposition, it is to be noted that the Union Trust Building is only ten stories high below its cornice. The details are of unusual merit. The whole design is, of course, in a modification of the Romanesque architecture, and the column-like mouldings of the deep jambs, the sculptured string courses which break around great piers and form their imposts, the other sculptured string courses which go through the building from side to side, unbroken, at three different levels, one of which string courses is treated with a row of corbels and forms the cornice of the building—all this is unusually good of its kind. It is most gratifying to see how the faults of the Times Building have been avoided and its merits retained, how the style which was, perhaps, not fully understood when the walls of the Times Building rose had been thought out before the Union Trust Building was undertaken. Indeed, we have no business building in New York which is more comely in design than the Union Trust; but then it is not very high and is not a modern steel frame structure.

All the difficulties which have been found inseparable from the problem of high buildings which rise above their neighbors are pre-



THE ST. PAUL BUILDING.
Broadway, corner Ann Street, New York City.

sented in an aggravated form in the St. Paul Building, a sky-scraper of twenty-two stories and the highest building in New York, measured from the sidewalk to its cornice; that is to say, in clear vertical height, without including cupolas, finials and bits of pointed roof. Everybody is throwing scorn upon this building now, in the spring of '97, as its full ugliness is seen from the south and the southwest, and, in fact, from nearly every point of view except the one to which its tower front, as of a lofty octagonal castle-keep, is presented. Curiously enough there is no building anywhere about in which the details have been more carefully studied; but of this hereafter. The really surprising awkwardness of the structure, as it rises above the city, is one more result of the business requirements of such a lofty building. The walls on the court and those which divide this building from the adjoining property have neither projection which would encroach on that property, nor recessing and diversity within the lot-line which would use up rentable space. One down-town experiment of giving architectural treatment to the walls rising above neighbors' property has been thought sufficient. The "packing box" with square holes sawed out of it has been thought the right thing for the gable walls in this case—but, also, has been thought the right thing for the walls on the courtyard. All this has the oddest effect of contrast with the carefully designed and costly fronts on Broadway and Ann street. Thus, and not otherwise, must a twenty-two story building be erected so as to furnish the utmost amount of valuable space, and so as not to abandon the sacred tradition of making the street walls architectural or the other walls blank and bare. Whether anything better could have been done with it, artistically speaking, it is impossible to say here. Perhaps the way to treat such a case is to let all the walls rise blank and sheer and appear like a natural cliff which has never received its weathering and has gained no beauty from the forces of nature at work upon it. It is, perhaps, better to make all the sides equally plain and let the thing rise like the Queen Anne's Mansions in London, as that building stood ten years ago, in naked ugliness. Moreover, if in the St. Paul Building, the Broadway side and the Ann street side as well as the sides turned away from the great thoroughfares, were flat brick walls alike, some mode of decorating those flat brick walls might have occurred to the designer. This, however, was not what was ordained. On the contrary, great minuteness of detail has been lavished upon the design, which, as in the Pulitzer Building, consists of a number of superimposed stories with no attempt to group large numbers of them together into one seeming story. It is, however, to be remarked that one architectural story includes two stories of offices throughout; as if, to quote what has been said above, the building consisted of eleven stories, twenty-four feet high, instead of twenty-two stories

twelve feet high. If this is regarded by anyone as a mistake, an answer, and perhaps a sufficient one, may be found in the suggestion that no possessor of a rentable building is indifferent to the advantages of wide, unbroken windows, and that if windows are to be five feet wide in the clear, they will necessarily be of most ungainly proportions in a twelve-foot story. Therefore, the reasoning is, let two such five-foot windows, one above the other, be combined into an opening, such as a twenty-four-foot story would allow, namely, eighteen feet high, more or less, and let these apparent windows, five-feet by eighteen, be divided in the middle by an almost unseen panel, which hardly counts upon the exterior design, and you will have the proportions of each story and of story to story far more fortunate. Perhaps this is a sufficient answer. At all events, this being admitted as a sufficient answer, the arrangements of the architectural fronts of the St. Paul Building with their square piers adorned with pilasters and properly fitted with bases and capitals, and with their string courses between them, may be taken as a model of this sort of composition. In fact, a careful examination of the building from the street or from the windows of any neighboring structure, such as the Astor House, will show the student that the architectural fronts taken by themselves are full of thought and purpose and are successful to a certain extent, while the general mass of the building, its main proportions, its sky-line, are unfortunate and ungainly. This is as much as to say that that which came within the necessary scope of the designer's work, that which was inevitably committed to him, has been intelligently, if not brilliantly, designed; while all that was of the untried, or, at least, unsolved, new difficulty, as of a building of wholly untried proportions and out of all scale with its neighbors, has been left to chance or to the decision of merely practical requirements. In this, the building follows the fashion. It is but seldom that there has been any attempt to make very lofty buildings acceptable to the eye. It has generally been thought sufficient to design their fronts as if they were to stand among other buildings of their own height. That the difficulties here were peculiarly disagreeable, and that the resulting effect is peculiarly unpleasing, may have made it the more desirable that the architect should have struggled with the problem, but it has made that problem no more easy to solve.

It is impossible, however, to leave the building without remarking on the two solecisms which appear to mar the otherwise interesting design of its architectural façades. The finishing of the tower by an architectural story much higher than those below, forming an attic with a lofty composite order, has not been at all successful. The covering of this story with delicate sculpture is an instance of almost complete waste of good workmanship; for this sculpture counts for nothing from any ordinary point of view. Finally, the Broadway

entrance to the elevators has prominence given to it by an order of crouching figures carrying an entablature, and the way in which this feature is applied can hardly be admired. It is not a well-managed principal entrance.

To look carefully at the Havemeyer Building, on Church street, New York, and occupying the front between Cortlandt and Dey streets, is to wish that the system of the story beneath the main cornice, with its piers, around which the lower members of the cornice break, could have been carried farther. One does not care for the telamones; they are too far above the street to be properly seen, and the foreshortened view of them is not pleasing; but the system of separate piers, detached from one another to the very top and then bound together by the main cornice itself, is one which the logical student longs to see tried on these business buildings. The great piers of the main structure end in abutments to large arches with spandrels, and with archivolt of such immense breadth that it is clear how much valuable light is thrown away. In this, again, the old arrangement of lofty windows cut up into little ones obtains; but at least, in the story above, the scheme is tried of ending the piers squarely in a way which the steel frame construction naturally suggests. This building is a curious instance of very careful detail nearly wasted because of the vast space of blank wall which it tries in vain to adorn. It is hard to judge of the sculpture of the capitals and main arches, except by means of a good photograph taken from the top of a neighboring building; then, indeed, it is found that this detail is of great beauty. Mr. Post's willingness to put figure sculpture and delicate architectural ornament at the very top of lofty buildings is almost inexplicable. The error, for it is not harsh to call it an error, occurs again and again, and one longs to see the good money and the not unworthy art put where they will be more useful.

The Park Building, at Pittsburg, and several very recent business buildings in New York, are instances of a curious experiment in designing, the origination of which is hard to identify. Whence came the idea that a building not at all columnar in its architecture could be adorned by a classical order very near its top? There are a dozen buildings in New York in which this experiment has been tried. There seems to be something wholly incongruous in the idea of making one story, or one architectural story of two tiers of offices, into an order of columns with its entablature and all complete, while the rest of the building contains no such use of classical forms. In the buildings under consideration, the experiment is neither more nor less successful than it has been elsewhere, unless it may be thought that in the building at Broadway, corner of 12th street, the independent and untraditional use of the deeply splayed jamb in the lower part, which feature is repeated in the very story it-



THE PARK BUILDING.

Pittsburg, Pa.

self where the order is used, contradicts more decidedly the use of the columnar order than anything in the other buildings of this general character. If tradition counts for anything, the order in a civic building of more stories than one should either be of the whole height of the wall, as frequently in the seventeenth and eighteenth centuries, or should be set upon a high and somewhat solid basement which may contain one or more subordinate stories, while the order forms the front of the principal story, the state apartments, etc. This is, of course, putting out of the question for the moment those buildings where several orders are superimposed. Now, in the buildings under consideration, not only the three by Mr. Post but several designed by other architects, the ten or a dozen stories which come be-

low the order, and act, in a sense, as a basement to it, form a whole so utterly out of proportion to the order itself that it seems like a misnomer to even speak of them as being the basement which carries it. In the building at the corner of 12th street and Broadway there are, probably, one hundred and thirty feet of sheer height below the bases of the columns which form the order, and that order itself cannot be more than twenty-eight feet high. It is to debase that noble, stately thing, the classic or pseudo-classic system of columns and pilasters with their entablature and other concomitants, thus to reduce it to a mere device for breaking up an otherwise monotonous front by putting a little band of the columnar architecture near its top.

In the 12th street building, the largest part of the whole exterior is resolved into lofty piers which are splayed on the sides towards the windows so very decidedly that the corner piers are made polygonal, and the piers between the windows triangular in plan; and this should be found a practical device of great benefit to the occupants and a valuable suggestion for the design of the whole exterior. The building under consideration contradicts itself, in a sense, by not having the splayed piers in the lower stories where the light is especially needed. The lower stories, indeed, that is to say, the basement, the two stories of offices and the mezzanine or entre-sol with two stories more, are treated with flat, banded or rusticated pilasters, with Renaissance cap-



TELAMON.
Park Building, Pittsburg, Pa.

itals; and these stories are satisfactory enough, but that they look very thin and slight, with inadequate reveals; the most common of faults in our street architecture. The same system might have been carried to the top and the design might have been made of that; or if the splayed piers were found to be in order, and were found to be desirable as admitting light very freely, a capital thing might have been made of that system if it had been started at the sidewalk. Such, at least, are the ideas which an inspection of this building suggests. As it stands, the upper part seems more massive than the lower and seems



S. W. cor. Broadway and 12th St., New York City.

also free and dashing in design: whereas the lower part is more conventional as well as lighter than the superincumbent mass. The building at the corner of Prince street and Broadway seems, always excepting its order of Ionic columns near the top, to be treated as a steel frame building should be treated, that is to say, without pretense at massiveness or ponderous dignity. The nine stories below the columnar band, which has been spoken of above, are very consistent and very appropriate in design, rusticated in two different patterns, one for the stone-faced wall and one for the wall of brick and terra cotta; and, throughout, the vertical piers which cover and conceal the actual metal supporting parts are treated with that lightness and that absence of deep reveals which these mercantile buildings suggest, and, in a sense, demand. If the eyes are not raised above the ninth story, a very comely and respectable business building is seen,

which would lack nothing but

some breaking-up of the skyline with small details, as with a pierced parapet like that of the 12th street building, to make a very gratifying result. The Park Building, at Pittsburg, is, up to the base of the colonnade, very like the Havemeyer Building, described above, with the great additional advantage of broad corner piers. Here, again, is seen that curious relegation of the only important sculpture to the fifteenth story, at least one hundred and seventy feet from the sidewalk. The building, No. 636 Broadway, is, on the other hand, designed on very different lines: its large piers being shaped like engaged columns of non-classical proportion. The building on Broadway, at the northeast corner of 4th street, is a return to the Romanesque type of which the Union Trust Company's



THE SCHERMERHORN BUILDING.
Broadway and 4th Street, New York City.

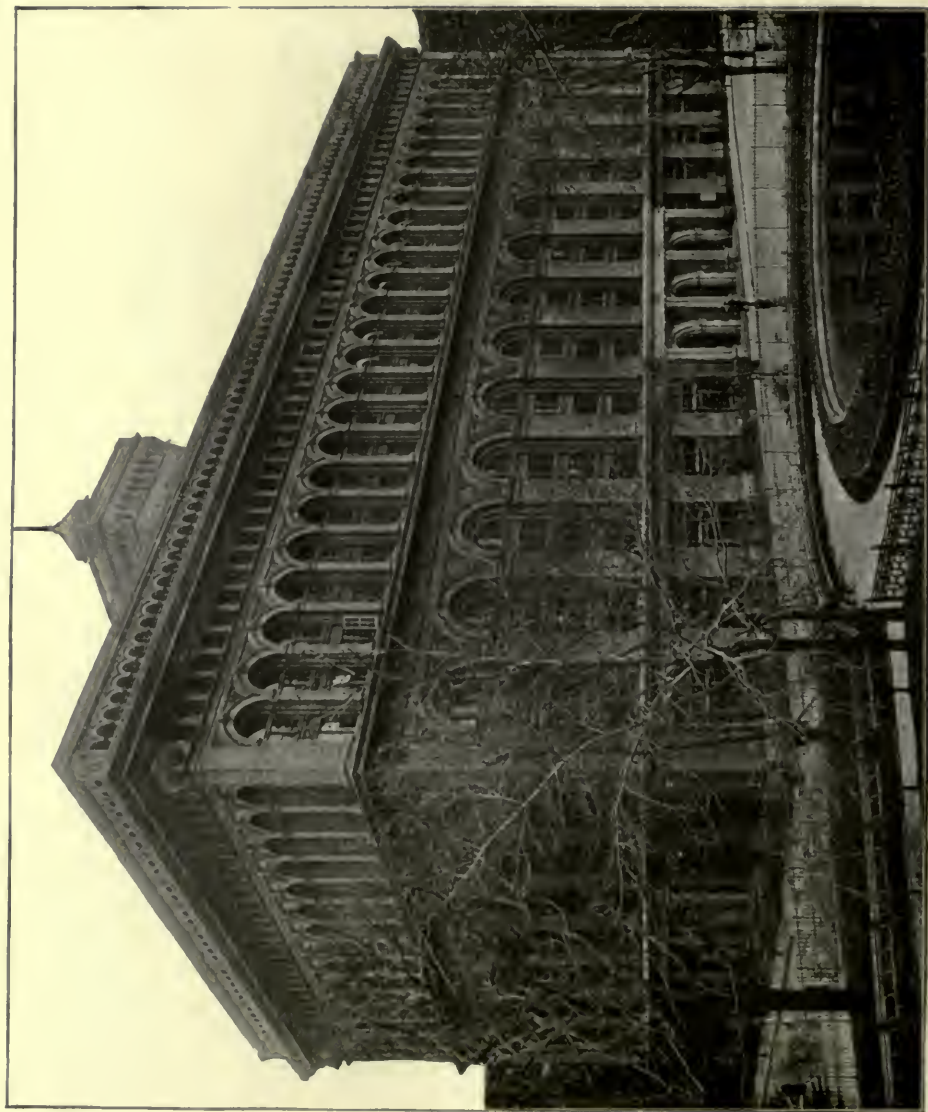
building is the best exemplar. These Broadway stores are subject to even greater hindrances caused by the requirements of investment than the office buildings below the Park, and no architect would will-



THE HAVEMEYER BUILDING.
Northwest corner Broadway and Prince Street, New York City.

ingly submit the exteriors of either class of structure to a critical jury. It is true that unusual power of design, combined with very unusual sense of proportion, may, in rare cases, give to the public exteriors slightly better than others, but no real architectural advance appears possible in this direction.

The Produce Exchange, built in 1881, is a gigantic structure of red brick and terra cotta. The uniform deep red tone of the exterior above the base course is broken only by porticos, with Roman Doric columns; which porticos, although seeming inadequate when the



PRODUCE EXCHANGE BUILDING.

Bowling Green, New York City.

building is viewed from the point of view taken by most photographers—that is to say, twenty feet above the sidewalk, or thereabouts as a neighboring window may permit—do not look too slender or too light as one views them and the structure they adorn from the usual point of vision five feet above the sidewalk. This building is arranged



INTERIOR COURT OF THE PRODUCE EXCHANGE.

to contain one very large interior hall, lighted from the roof; a courtyard above this hall, the walls of which courtyard rest upon the piers shown in our photograph of this interior; and finally, all round this courtyard, fronting upon it and also upon the street, an indefinite number of business offices. There is a flat terrace-roof, and the feeling that something more pronounced than an attic of uniform height and of unbroken horizontal lines was needed to save the structure from monotony has taken shape in the huge square tower which lifts itself high above the mass of the building, as a bell-tower does above the roofs of a church; and proclaims itself a purely ornamental structure by the absence of any windows except the very large ones below the clock-dials. Many different views are necessary to give anyone a sense of this enormous structure, which fronts upon three narrow



THE EXCHANGE ROOM—PRODUCE EXCHANGE.

streets and a curiously secluded little square in the extreme southern end of New York City. A study of these different views or of the building itself will show any student that here is a very forcible and manly design for a building of three very large and lofty stories, with two low stories above them; one of the two being underneath the great wall-cornice as if forming a frieze, and the other above it in the way of an attic. Whether the design lends itself perfectly to a building of nine stories, which this is in part, is another question. It cannot be strenuously urged that the designer was wrong in giving the building the character it has, in view of the fact that, as has been said above, the very large meeting room of the Produce Exchange is an essential part of its structure, and that this is represented by the larger story of great windows with round arches. The building is without special charm of proportion or of detail. It is a big, burly, manly, solid, impressive structure which no one can love very heartily but which everyone must respect. The same words may be used almost in the same sense for the great meeting room. Here, also, the sense of great space and of good construction pervades the whole, and no one can disregard the dignified look of the huge room, although, again, it is not especially attractive or fascinating.

The most extraordinary result in actual construction of the mania for high buildings, so far, is seen in two or three buildings of about



A FIVE-HUNDRED-FOOT OFFICE BUILDING.

twenty-two stories and about three hundred feet in height; but one possible result, still more startling, was on the cards not many years ago, when Mr. Post designed for a New York institution a five hundred foot tower, of which a cut is given in these pages. It seems to have been thought unwise to cast all the business part of New York into shadow by such a mass as this, rising from its very heart; but it is not easy to see why the travelling shadow of such a gnomon as this should be much worse than the shadow of a building of half its height. Good cause there is to limit the height of buildings which line the streets; good cause there is to see to it that our down-town streets are not made into canons too deep in proportion to their width; but an isolated tower like this may be indifferently three hundred or six hundred feet high; even as houses would cluster round the five-hundred-and-fifty-foot obelisk at Washington, if there were building-lots to be had there, without consideration of the precise height of the structure which would tower above them. This tower is good in proportion, moreover, and nothing but its comparatively unutilized roof can be considered as other than conducive to its value as a business building.

The best of Mr. Post's office buildings, at least in New York City, and one of the best to be seen anywhere, is that one which faces on Exchange place, Beaver street and Hanover street, and called, from the family name of the owners, the Post Building. This is a straightforward and simple design in brick and terra cotta, in a kind of Romanesque style, though with semi-classical pilasters and with the lower stories boldly opened up into those store fronts and vast windows for banks which may be supposed essential, all with their frames of visible ironwork. This building dates from sixteen years ago, and long before the beginning of the steel frame construction, or the thought in anybody's mind of the recent office building. On the Beaver street front, the upper part of the building is divided by a very deep courtyard, for light, which courtyard cuts the building into two pavilions of such proportion, one to the other, that the eastern pavilion has five windows in its width, besides a rounded corner, while the western has only three windows in its width. The court between them, then, is wider than either pavilion, and is so deep that eight windows front upon it on either side. On the ground floor and on the principal story, which is raised above this, the court is closed in so that a very large banking room is obtained on the principal story, and the main entrance is arranged beneath this again. Every window in the building is a single window, and takes care of itself. There is no pretense at making five stories into one, or at dividing the building horizontally by means of different materials or different styles of architecture—but then the building is only nine stories high. Where there is flat wall and the windows come in sequence, three,



THE POST BUILDING.
Exchange Place, Beaver and Hanover Streets, New York City.

five, or six together, they are grouped into arcades with square pilaster-like piers, with caps and bases carrying their round arches; and, in the story below the cornice, the same sequence of windows is divided by coupled pilasters with their tops treated corbel-wise, so as to give a semblance of support to a cornice—an arrangement not without its merit when considered, as it may easily be, as forming in itself a part of the crowning member. The great pilasters, four stories high, are used very cleverly; sometimes to mask a sharp angle, in which case they form what might be called antae, and sometimes to divide the flat from the curving wall. All these details are, indeed, above the principal story, which, as has been said above, is opened up into enormous windows with iron frames, for the greater part of its extent. These iron frames are treated like simple window-frames, and with no attempt to make them look like part of the wall above. At the same time, their nature and design make them evidently sufficient to carry that wall, and this is, perhaps, as good an instance as we have of the use of these new materials in fronts that are composed for the greater part of the old materials. The building is peculiarly well-fitted to the narrow streets upon which it faces. It is more effective in reality as one looks up at its walls from the narrow streets—and especially from Beaver street—than the photographs declare it to be. Within, the Post Building has also some features worthy of remark, especially the chimney-breasts and mantelpieces in many of the offices, which are handled in the most obvious and simple way and with excellent effect. Thus, a chimney-breast being faced with red brick from floor to ceiling has a mantelpiece of red terra cotta of a shade which combines well with the red of the bricks; the chimney-breast and the mantel forming, as it were, one composition altogether, and seeming, far more than most indoor fittings of the-kind, really part of the building and not a visible excrescence brought in afterwards by a separate set of mechanics. The Post Building is altogether one of the best business buildings we have, and, although this does not sound like very high praise, it is yet the expression of very sincere respect for one building of the few which, in perhaps two miles of business streets, will give the student a moment of real gratification.

The building of the New York Cotton Exchange, fronting on William street, Beaver street and Hanover square, offers the same bold sacrifice of rentable space to make the space which remains more useful and more agreeable to the inhabitants, by leaving large external courts upon which windows may open directly. It is a tradition that the committee rejected an alternative design of the architect in which this feature was less marked, and more space with less good light was provided. The round tower, by which the irregular angle is occupied, is an obvious resource in



COTTON EXCHANGE BUILDING.
William Street, New York City.

such a case, and Paris is full of such round towers used at the acute angles of meeting streets and avenues, but the New York business world has generally been too sharp-set for office rents to allow of such decorative treatment of its sites. The unusually favorable conditions have been well used in this case, and the building is one of the most spirited structures in the business quarter of New York.

Another simple and manly design for a business edifice is that of the Mortimer Building, at the corner of Wall and New streets, New York City. The reason for the widening towards the east of the doorpiece at the principal entrance is, perhaps, not clear; it may be that the requirements of the office, which is lighted by the great square window opposite the spandrel of the arch, were such that the largest possible light-opening was to be given to it; and this reason one would like to admit, and for the same reason would have gladly seen square openings carried along this story on both fronts. Architecturally, the doorpiece would, perhaps, have been as well without that addition; but this is a matter of opinion and of experiment. The building is a useful and businesslike one for its purpose and is as decorative as such a building has any right to be, nor is there any harshness of line or unseemly lack of proportion about it. The details, designed in a curious sort of Romanesque which includes orders of Ionic pilasters, carrying archivolts, and which include, also, a system of semi-classic entablatures used as string courses, are appropriate to such a building. They might easily have greater charm, but they do their work and fill their place.

The well-known Mills Building, at the corner of Broad street and Exchange place, is one of those structures about which the traditional critic and the realistic critic can never agree. Many persons who care for architecture are inclined to abuse this building heartily, and this, probably because of a certain cluttered look of its reds and whites and a certain lack of firm lines and dominant members. These, if present, might overcome the chequered and spotted appearance brought about by the enormous windows and the fluttering of two hundred awnings, and the diminution of the solid parts to the minimum. But, then, the greater number of lovers of architecture are under the sway—never so absolute as now—of the pseudo-Roman tradition. A building is condemned because its parts do not agree with those of the Theatre of Marcellus, or, at any rate, because it has not the proportion of solids to openings which the sixteenth century Italian palaces possess, and are, of course, the better for possessing. The attempts to turn these Italian designs to modern business purposes have been lamentable failures, and the attempts to build modern business structures by architects and firms to whom the Italian palace is the *ne plus ultra* of design have been more lamentable still. The Mills Building



THE MILLS BUILDING.
Broad Street and Exchange Place, New York City.



STAIRWAY OF THE MILLS BUILDING.

may be criticised from the realistic or logical point of view as lacking only a more severe uniformity of color to be one of the most successful attempts yet made at the true business structure. Red brick used with a large proportion of light colored stone has never been successful in our modern practice; that may be taken, probably, as a safe statement to start from. The uniformity of color seen in the Produce Exchange would have been, one thinks, very good for the Mills Building, which, indeed, is one of the sensible and logical business buildings in the city, and needs only a very slight re-handling to be a relative success architecturally. The proportions of the great pilasters in the third architectural story and in the culminating story of the Mills Building are very satisfactory, indeed. Had the shaft of the pilaster been of the same material as of the cap and base, the world would have recognized this merit. Rarely has it been found that the use of two colors in nearly equal parts in exterior work has been in any way grateful to the eye. Even in the photograph, the chequer of light and dark destroys what would otherwise be a really fine system of lines, marred, indeed, by the excessive use of rustication in the basement and first architectural story, a rustication which breaks up the lines of the piers



THE PRUDENTIAL LIFE INSURANCE BUILDING.
Newark, N. J.



THE ERIE COUNTY SAVINGS BANK.

Buffalo, N. Y.

and destroys the very appearance of solidity which it is intended to give, but, still, a manly and simple linear composition. There is no building in town which seems to serve its purpose better, and which makes less pretense of being something else than what it really is—a pile of nine superincumbent stories of precisely similar offices. A good bit of architectural detail is at the head of the great staircase, within, leading to the first story. In our elevator buildings a staircase is but a negligible quantity, architecturally speaking, but the lowermost flight is of some use, and may rightly be made a feature by itself, and where it has been thought best to give this indoor *perron* a special architectural treatment, that treatment should be of the best, and the one before us is certainly agreeable—both dignified and graceful.

The building of the Prudential Life Insurance Co., at Newark, and that of the Erie County Savings Bank, at Buffalo, are interesting studies in Romanesque. Such round towers would have been used for staircases, in the middle ages, when such towers first appeared on earth. That they are not so used now; that spiral staircases are not in vogue, and that but little staircase accommodation is needed in an



LONG ISLAND HISTORICAL SOCIETY BUILDING.
Brooklyn, N. Y.

elevator building, is not to condemn the round towers altogether. There is much good designing in each of these buildings. Their independent and novel character, with more breaking up of the exterior wall-surface than New York City allows, suggests less expensive lots and a consequent freedom of that one form of restraint.

In considering those buildings which are of more old-fashioned dimensions, the Long Island Historical Society's Building, in Brook-



ENTRANCE LONG ISLAND HISTORICAL SOCIETY BUILDING.

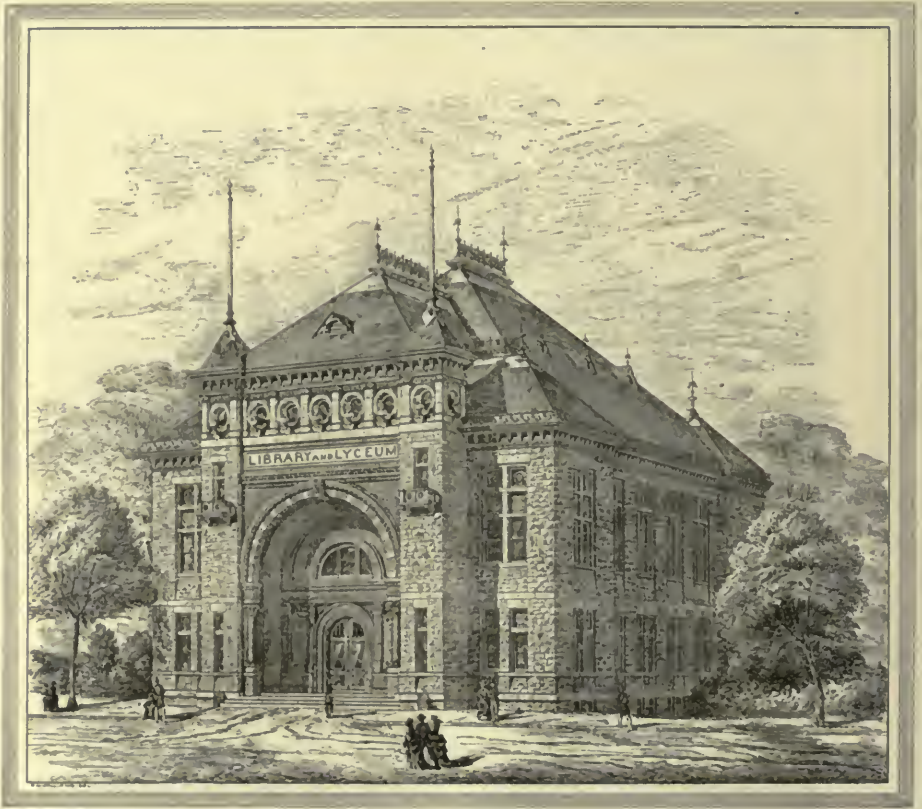
lyn, deserves especial mention, because here the entrance porch was adorned by, perhaps, the initial attempt to put the work of first-rate sculptors to use for architectural enrichment. It is stated, also, that this is the first building in which was used terra cotta made in the United States. The sculptures of the porch and of the roundels filled with portrait busts, were the work of the late Olin Warner and of the elder Bartlett. This building was built in 1878-79. Chickering Hall, corner of Fifth avenue and 18th street, New York; the Williamsburgh Savings Bank; the Troy Savings Bank; the Morristown Library and Lyceum; the New York Hospital, in West 15th street, and the building at 251 Fifth avenue, were all built before that time—that is to say, during the years between 1874 and 1878. Of these the well-known Chickering Hall is the most graceful. The coupled col-



CHICKERING HALL.

Fifth Avenue, corner 18th Street, New York City.

umns which Mr. Post seems to approve and which he has certainly shown to be in place as the adornment of the pier somewhat broad in proportion to its height, are used here with some success, although they seem crushed by the great archivolt which rests upon their entablature. The attic story, forming a kind of frieze below the *cornicione*, is well managed, and the corner piers, treated as great antae, though not of classical proportion or of classical detail, are in place and are of great assistance to the structure. As a festal building—a pavilion of musical entertainment—this design cannot but be thought appropriate. The New York Hospital is certainly a building of design appropriate to its function; a structure suggesting utility and in-



THE LIBRARY AND LYCEUM.
Morristown, N. J.

telligent planning; in like manner, the building at Fifth Avenue and 28th street differs from its neighbors, the old Fifth avenue fronts, in being rational and purposeful; but to neither of these buildings is it given to charm the beholder by any special grace of its own. The Morristown Building may be classed with the above-named city edifices as having in its merits and its shortcomings alike, the same characteristics of satisfactory but not attractive treatment. No one would go there to see it as a work of art, but it is appropriate to its purpose and suggests its purpose—and that is much.

The Bank of Pittsburgh, of the exterior of which only a façade can be given here, consists, externally, of little more than a Roman portico, but the interior is of great interest as a manly piece of designing in the neo-Roman taste with a uniform order of large pilasters of veined marble. The arrangement of the interior with its enormous lunettes separated by the pendentives of the dome allows the light to be received in the most favorable way, not from a sky-light, but from windows high



THE NEW YORK HOSPITAL.
East 15th Street, New York City.

in the wall; and the lunette opposite the entrance which could not be filled with glass has received an admirable painting by Edwin Howland Blashfield, which it is worth a visit to Pittsburg to see and study. The details of this interior give a slight indication of the real excellence which Mr. Post's work reaches in this matter of ornamental treatment of marble, iron, bronze and the like, when the chance is given him. We shall see him at work under much more favorable circumstances in some private houses which have to be considered, but the adaptation of means to end in the adornment of this bank is certainly excellent.

Two new structures, so new that they were unfinished at the close of 1896, afford excellent instances of common sense building with pleasant architectural results. One of these is the civic building in Crotona Park, New York City; an edifice arranged for the administration of the annexed district, and, perhaps, for the convenience of the Board of Public Parks as well. It is a matter of regret that we cannot present here a plan of this very interesting public building, which is certainly far more reasonable and judicious in its arrangement and its architectural scheme than such buildings usually are. Extrava-

gance, whether of money or of space, seems to have been ruled out, and the building to have been built as carefully as a private house with a private man of moderate means looking after it. The other building is the Western National Bank, at the corner of Pine and Nassau streets, where a somewhat new arrangement has been made by means of which the business of a large city bank is to be conducted on two stories instead of on a single floor, as has been usually thought essential. The most modern appliances in the way of electric elevators, lifts and run-ways for books, papers and men are all brought into use, and it is believed that a needed ledger can be laid on the cashier's desk as quickly as if it had been in the room adjoining his



CROTONA PARK BUILDING.
Crotona Park, New York City.

office. Of all this, however, there is no means of giving an idea in this place. We can only point to the very interesting exterior, which is certainly arranged to yield as much light as is at all practicable to the offices in each of the stories. Perhaps a chance has been missed to give to the *entre-sol* that treatment which would show that it was in a peculiar sense a continuation of the ground floor and used immediately in connection with it as part of the banking room. If this could have been done without destroying the character of the two lower stories taken together as a kind of basement to the order of pilasters above, it would have been well. The pilasters in themselves, forming the whole width and height of the piers with the string course which rests upon them, and which is, in a sense, an entablature and wall cornice, are, indeed, a recent invention of the Parisians.



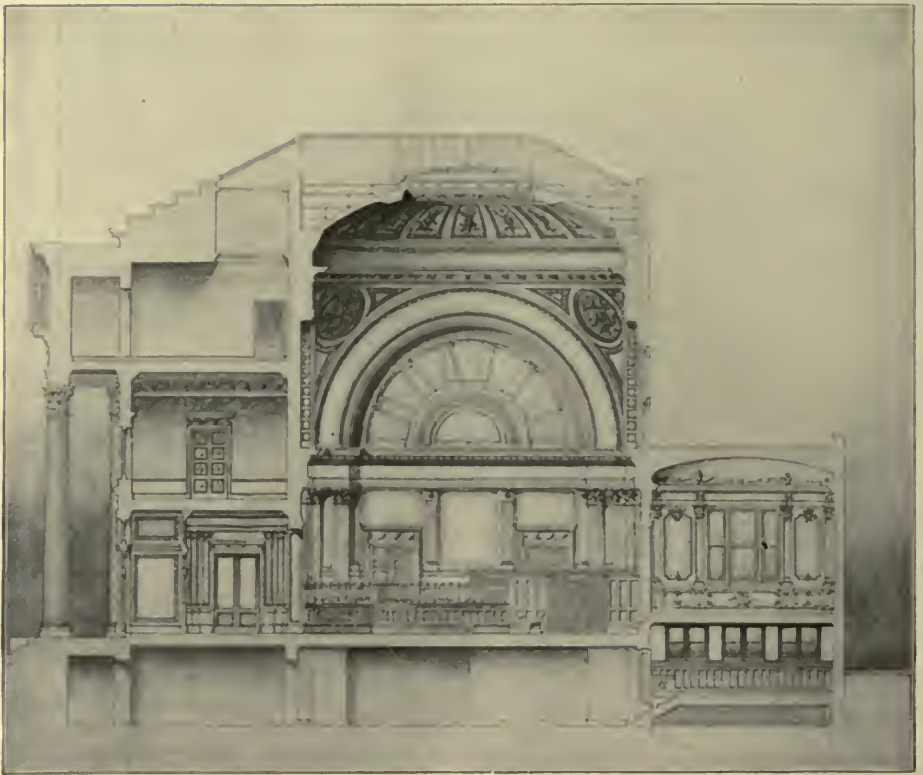
BANK OF PITTSBURGH.
Pittsburg, Pa.



INTERIOR OF THE BANK OF PITTSBURG.



VIEWS IN THE BANK OF PITTSBURG.



SECTION OF THE BANK OF PITTSBURG.

Their management here is excellent, and the building has as sensible an exterior as any business structure in the city.

The gigantic building which formed the chief place of exhibition at the Chicago World's Fair is to be mentioned here very briefly. The building has gone with all of its companions, and the curious attempt at simulating permanent architecture by means of architectural forms worked in plaster has become a memory of the past. Thus far, those façades have been an injury to American architecture; they have encouraged the belief that everything that is fine and stately in architecture can be got out of books and is a matter of academic design only, without reference to requirements and without reference to plan. On this account it is hard to sympathize with them; but it was a stately vision while it lasted, that which one saw as he looked up the so-called Court of Honor; and of this vision an important part, namely, the whole northern front of the great court, was made up of one small end only, of this, the largest of the buildings, with the really well-designed triumphal arch which formed its chief entrance. It was a great and stately composition, although, perhaps, not equal

in delicate proportion or in grace to one or two of the other designs, its rivals. It appears, however, that two changes, made in haste or by change of intention on the part of the authorities, did all that could be done to destroy this design. The long arcades were to have been open, and were to form a portico; but the widening of the gallery destroyed that important part of the design. The entablature, furlongs in length, was to have had due separation by shadow and projection from the surface of the spandrils; but this a hasty blunder defeated.

It is with great pleasure that one leaves the business buildings, for the construction of which this architect's services have been so much in demand, to speak of the private houses, in which a much more serious result has been possible in the way of fine art. There must be, of course, great reserve in the treatment of this theme, for it is the interior rather than the exterior of these vast city palaces which are of interest. The exteriors have much of that hard angularity which



COLUMBIAN EXPOSITION, 1893.
Manufactures and Liberal Arts Building.

seems to be inseparable from Mr. Post's designs and something, also, of that not wholly successful use of colored material which was noted in connection with the Mills Building. Thus, the house No. 4 West 58th street, with all its merit as an elaborate piece of linear design, and as showing in the exterior a great deal of careful thought for comfort and elegance of the arrangements within, is yet open to unfavorable criticism in this matter of contrast of color; and this by itself goes far to injure it as a piece of good proportion. The excellent disposition of the vestibule as it is seen from without, with a large archway for the entrance door looking northward, and a similar archway looking eastward and serving as a window, while above this a small room of the nature of a bay-window is arranged with a terrace-roof, is an instance of what is meant here by the indication on the outside of successful arrangements within. The re-entrant angle which is filled by this vestibule and the superincumbent mass might have been insisted



NO. 4 WEST FIFTY-EIGHTH STREET.
New York City.



THE WESTERN NATIONAL BANK.
Cor. Nassau and Pine Streets, New York City.

on more, one thinks. The two reaches of wall which include that angle and which form the sides of two separate pavilions of the house, might certainly have been made longer in appearance, and the re-entrant angle in this way emphasized and made much of, had the roof been built with gables instead of with hips. It is true that gables are not much used in the style chosen, but the very large dormer windows constantly replace them, and, indeed, on the northernmost and narrower pavilion the projection of the bay-window with its pediment carried on columns above afforded an opportunity to make that particular projecting mass vastly more emphatic than it is. Emphasis is, perhaps, what the exterior of the house lacks. The only thing about it which seems to be fearlessly carried out is the design of the

great chimneys. Refinement of proportion is a great and rare thing, nor can the best of designers always succeed in combining that precious charm with modern requirements, especially in dwelling houses; but boldness of design is not quite so hard to achieve, nor is this, it would seem, a case in which such boldness would have been far to seek.

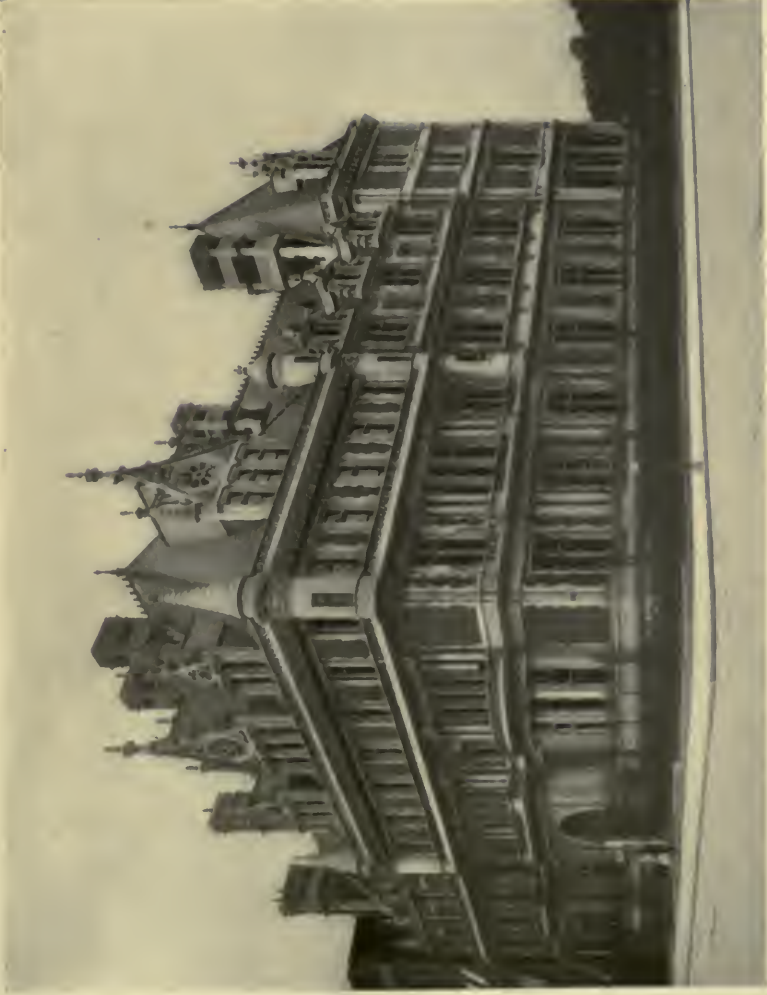
Somewhat the same criticism is to be passed upon the immense palace which nearly adjoins this house and which forms the front of 5th avenue, between West 57th and West 58th street. Here also there is a lack of decided effect. Opportunities seem to have gone unimproved. There is not the boldness of relief, the free disengagement of pavilion or tower from the general mass, the frank use of projection in plan or of a broken sky-line which the immense facilities at the architect's command might, perhaps, warrant us in asking. The tower which forms the northeastern angle of the main structure is certainly admirable in its proportions, taken by itself, but it is hardly distinguishable from the mass of the building, and is immeasurably less effective than it would have been with a little more detachment from that mass. The carriage porch which projects on the northern side, and of which we give a separate view, is, perhaps, the most vigorous piece of the building. This, however, is marred by the manner in which the order of columns is brought within the same horizontal lines as the order of pilasters adjoining. The scheme was a good one in itself, but in this case it carried with it the perching of these groups of columns on the excessively high pedestals which carry them, and which certainly tend to mar this carriage porch as a piece of architectural composition. In a singular way this arrangement tends to make the columns themselves too easily detachable; too little a homogeneous part of the structure they adorn. These pedestals have served, however, one excellent turn. They have afforded place and scope for the proper display of the very admirable bas-reliefs by Mr. Karl Bitter, which show in our photograph of the porch, and of which we give two on a large scale.

The original house, of which the present vast mansion is an enlargement, was a concentrated, energetic expression of an idea, and was as good a piece of French Renaissance modified to meet New York requirements as we are likely to see. Recollection confirmed by photographs gives the idea that nothing was wanting but a more harmonious chord of color to make that a very worthy design. The details were excellent, as are those of the larger structure; but the larger house lacks that unity of design which the original possessed in so high a degree. It is in considering the interior of this enlarged structure that the most complete satisfaction is to be felt. The photographs which we are able to offer our readers are, of course, only fragmentary. No arrangement of such pictures would enable the

reader to form any adequate idea of the house even if, as is, of course, impossible in such a case, a plan were used for minute comparison. It may be proper, however, to follow up the photographs which are given here with such description as will enable the reader to understand the true character of the work in question. Thus, the picture which shows a vestibule with stairs descending and a vaulted roof in what is called the "basket-handled" form is that of the entrance vestibule of 57th street, the view being taken, of course, looking southward, or away from the house. Walls and roof are all worked in Caen stone, and the sculptures are all of them studied directly from the royal Chateau of Blois. The next photograph, then, shows the hall of entrance as it would look to one who, having just taken the view last shown, should turn upon his heel and look northward and westward into the house. The whole of this entrance hall is faced with the same creamy white stone, and all the details are taken from the famous chateau above mentioned, the staircase itself being, one might almost say, a reduced copy of the noted staircase of Francis I. on the court-yard at Blois. The doorway which is in full view, is filled with a great tapestry, and another tapestry of great beauty hangs above this on the wall; but except for this all the details seen are carved in close imitation, as to character and spirit, of the Renaissance sculptures familiar to us in the well-known building already named. The sculptural arabesques of the early sixteenth century in France are peculiar in their style, and especially in the manner in which the relief is managed, the leafage and stems rising from the background with a singularly crisp and well-expressed freedom while yet the relief is low. The French arabesques are more sharp and vigorous than the Italian, as the softer stone suggests, and a comparison of these scrolls and this leafage with the marble work of the Lombard and Venetian cities of the corresponding epoch—that is to say, of the time eighty years before—is, in this way, very instructive. It is right, therefore, to insist here on the fact that the spirit and character of those exquisite French sculptures have been reproduced with unusual skill. The next photograph shows the same hall at a point somewhat further to the eastward. The fragment of tapestry which shows in the upper left hand corner is a part of the same tapestry which is shown complete in the picture described above. Below (p. 66) is a view of the eastern side of the hall with two doors, which open, respectively, into the morning-room at the corner of 5th avenue and 57th street, and the small drawing-room. In this picture the light falls more fortunately, and the shadows tell the story of the relief and of the character of the sculptured ornaments better than in the previous views. The two pictures succeeding show the uprights which support the stair, and the soffit and hand-rail of the curving stair itself as it rises above the floor. All this is, of course, worked in the same

French stone. Two pictures more give views taken upon the stair itself, and these show, with some completeness, the character of the sculpture and the disposition of the ornamental parts. It will be seen how closely the general character is that of the stair at Blois, although the parts are so much smaller, and, indeed, fewer, as well.

The pictures described are all taken from the extreme southern end of the house—that is to say, from the neighborhood of the entrance on 57th street. The entrance from Fifth avenue is different in character; this is through the carriage porch shown in the photograph, and which is especially reserved for occasions of formal entertainment. Persons entering the house at this point may enter the dressing rooms on the basement floor, one of which, with its very rich mantelpiece, with two old English tables and a Japanese cabinet, we give (p. 66). Visitors ascend from the basement to the principal floor by means of a staircase with a groined vault over the landing and small windows pierced in the walls beneath that same vault. This picture with a high bronze lamp-stand in the corner and with the elaborate cartouche and supporters over the window, shows the landing half way up the stairs. It is a curious and pleasant piece of management which has made the roof of this staircase to steadily increase in height. The visitor ascending by this stairway from the basement has over his head a vault which is a little higher at each landing and at each ramp than it was below, and on reaching the level of the principal floor he enters through the doorway, which is filled by the elaborate wrought steel gates shown in that one of our illustrations which has the chariot of the Dawn painted in the lunette above. This picture is a part of the beautiful group of mural paintings by John La Farge, which, having once adorned a hall of the earlier and smaller house, has been removed to another location and now decorates the chief entrance for occasions of high festivity, connecting as it does directly with the staircase leading from the 58th street entrance. The next illustration gives the whole of this entrance hall seen from the southern end, that is to say, looking toward the entrance. The piers are of veined marble and the wall surfaces are of the same material, but the vault is everywhere either of wood or of plaster and painted as above described. The central and highest part—the nave as it might be called—retains the paintings of La Farge and his assistants, one of them, it is reported, almost wholly by the hand of Mr. Will H. Low; but the side passages, the aisles, are recent because these have been made wider than they were formerly, and the roof has been renewed. The lunettes along the walls, however, are of the original decorative composition. The change has been made without injury or deterioration of the charming decorations, and the judgment shown in fitting these and their surroundings to the new site is all that could be wished. The next illustration shows a large detail of these com-



RESIDENCE OF CORNELIUS VANDERBILT, ESQ.
FIFTH AVENUE, NORTHWEST CORNER OF FIFTY-SEVENTH STREET.
(View of Fifth Avenue Front.)



RESIDENCE, FIFTH AVENUE, NORTHWEST CORNER OF FIFTY-SEVENTH STREET.
(View of Fifty-eighth Street and Fifth Avenue Fronts.)



ENTRANCE TO RESIDENCE.
Fifth Avenue, 57th and 68th Streets, New York City.



HOUSE, NORTHWEST CORNER OF FIFTH AVE. AND FIFTY-SEVENTH ST.
Bas-relief of Carriage Porch.



HOUSE, NORTHWEST CORNER OF FIFTH AVE. AND FIFTY-SEVENTH ST.
Bas-relief of Carriage Porch.

bined decorations, and the one following is a view taken from the northeast looking southwesterly towards a door which leads to the great ball-room.

The rooms to which these halls of entrance lead are, some of them, decorated without more work of the architect than mere business supervision. The great ball-room in the florid Louis XIV. style, the larger drawing-room in the style of Louis XV. and the smaller one of the style of Louis XVI. are wholly French in origin as well as in



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Northern (Fifty-seventh St.) Vestibule.

design. The great dining-room, however, which serves also for the display of paintings, although it is not considered a picture gallery, is of American conception altogether. The general management of the room is Mr. Post's own, with the adornments of the mantelpiece and its superstructure from the designs of John La Farge. This mantelpiece also has been moved from its original position, but it adapts itself perfectly to its new surroundings. In fact, the very delicate pearl inlay and the extreme refinement of the design make it a work of art, which may stand among the important paintings in this room as al-



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Stairway.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Stairway.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Stairway.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST
One of the Dressing-Rooms in Basement Story.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Stairway from North (Fifty-eighth Street) Entrance.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Doorway between Northern Entrance and Reception Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Reception Hall.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Reception Hall, looking southwest.

most their compeer. One of our illustrations shows this very rich mantelpiece with the picture by Munkacsy hanging over it; the splendid water color, Bamboro Castle, by J. M. W. Turner, on the right, and beyond it the magnificent painting by the same master, that Ostend Harbor, which, by the owner's kindness, has twice been exhibited in New York at the Museum and at a Charity Fair. Leading out of this room to the north is a smoking room, decorated in the Moorish style, the seeming tile work of the high dado being made of decorative glass in a metal frame. It is a curious result of certain conditions of our modern American industry that the very inexpensive material, glazed tiles, should be replaced by that work of very high cost which is done with glass cut into small tesserae separately mounted in metal, and that yet this should be a method so economical in time and thought that the money cost is less to be regarded. The painted decoration above the dado is all done on embossed plaster, much in the way of the work on the Alhambra itself. The scheme of color has been very carefully thought out and much experiment was necessary before the proper effect as of the Moorish palace was attained. Such decoration as that of the Moors in Spain cannot but seem meaningless beside the intelligent and living work in the La Farge glass panel which fills one window, that, namely, to the left of the chimney-piece in our illustration.

There is more work of sculptors and painters in the billiard-room at the top of the house. Three illustrations deal with this, one of them showing the view nearly as seen from the entrance door, including the two important figures by Augustus St. Gaudens, which form the caryatids at the fireplace; one showing the entrance doorway itself as seen from within with the two columns which also were carved by St. Gaudens; and the third showing a detail of the ceiling. This ceiling has been put together from parts of a flat ceiling of the original and smaller house. The original ceiling was entirely by La Farge and the carvings in relief were not in any one material alone, but in material of many colors and of even precious sorts. Different woods, different marbles, ivory, pearl, silver, gold and two or three of those strange alloys which the Japanese have given us, were all used in this design: chromatic effect and not pure form alone, being the artist's aim. One of the large figures is fairly well shown in the detail of the ceiling, but of this it can only be said that three different woods are combined with ivory in the figure. In the original ceiling these panels were set horizontally; but now they are placed at an angle with wall and with ceiling, and very effectively. It is very seldom that a masterly design can be taken to pieces and remade without notable injury, even if rehandled and reset with great skill, but almost complete success has attended the changes made necessary here by the greater size of the room, and its different con-



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of State Dining-Room.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Smoking-Room, or Moorish Room.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Billiard-Room.



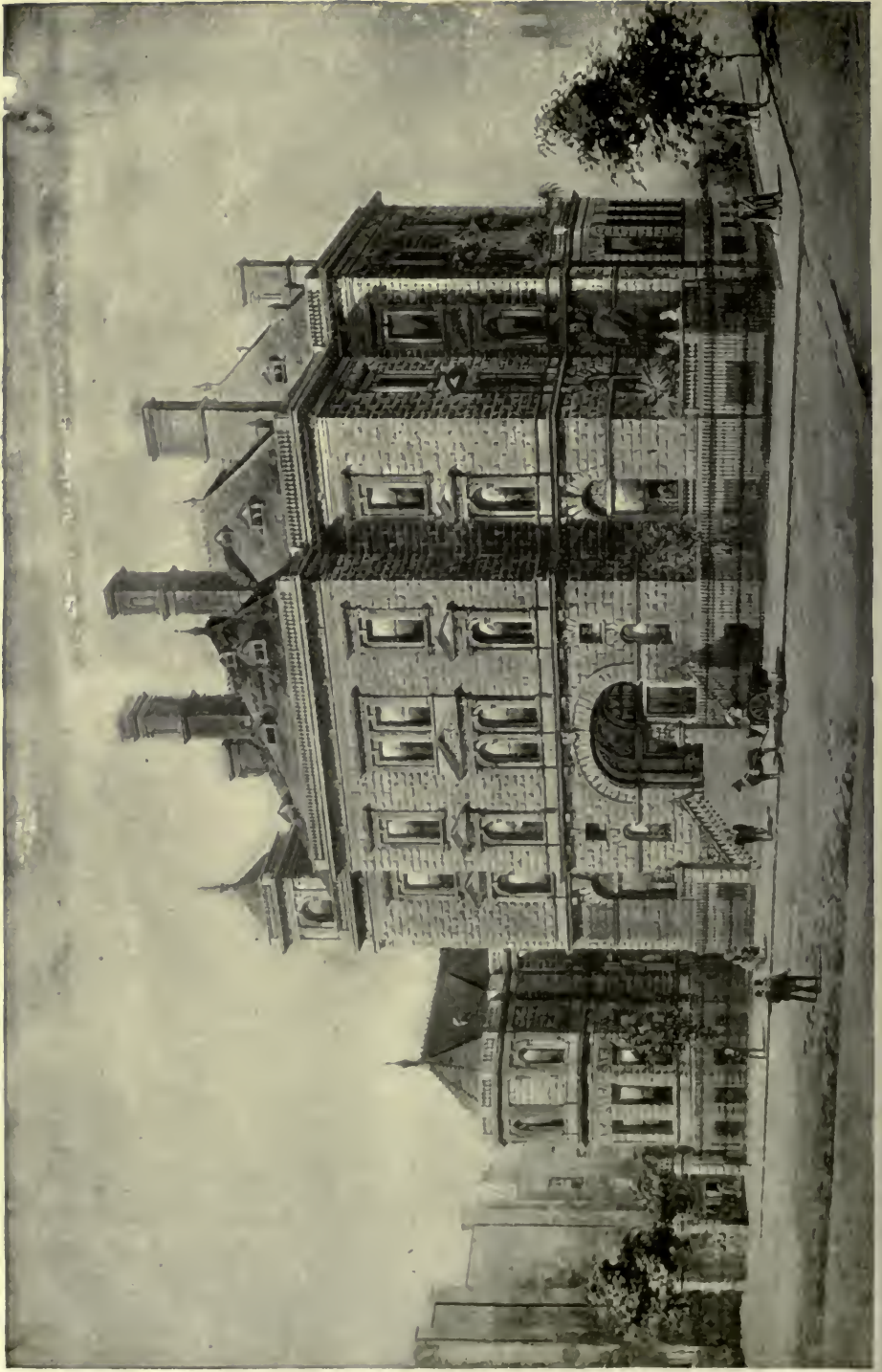
HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Billiard-Room.



HOUSE, NORTHWEST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Billiard-Room.

ditions of lighting. It may also be remarked that, as these panels surrounded, in the original ceiling, a sky-light through which the only daylight entered the room, they were less well seen, except by artificial light, than now, when full daylight invests all the corners of the room alike. It is evident that there is no opportunity for detailed comment upon the splendid combined decoration which some of the rooms of this great house present. The brief remarks made above are all that can be allowed for work which deserves and should receive minute analysis.

The house which stands diagonally opposite the last named, and which occupies the southeast corner of Fifth avenue and 57th street, is hardly attractive in its exterior aspect, in spite of a certain sombre dignity which it undoubtedly possesses. Within, however, it presents a larger amount of very successful decoration than any interior in America, always excepting the new Congressional Library, with which it will take time to establish comparisons. No interior of modern times seems more harmonious—more appropriate and rational as well as sumptuous in its ornamentation, than the one we are now considering. The rooms are not turned into "palace halls," but are simply the living rooms of a man rich enough to adorn them richly. Boldness and delicacy of design are combined in their adornment, and the work of the first-rate masters who have been called in to paint the ceilings and the lunettes has been worthily sustained and aided by the decorative treatment which they have received from the architect. A foretaste of what is thus announced may be seen in the entrance hall of this house, in which what is certainly an anomaly in planning, namely, the entering a corridor at one of its long sides, and crossing it to get from the entrance to the chief apartments, is almost redeemed by the convenience of the arrangements and the easy communication between room and room. The spectator looking into this corridor as in the illustration, sees the dining-room in the distance. On the left is the entrance door from East 57th street, not visible here; on his right is the door directly opposite the entrance door, which leads into the great square hall shown in the next picture. This next picture gives the upper part of the hall in question. The heads of the doors seen at the bottom of the cut are, on the right, the same door of which the other side has just been seen in the view of the corridor, and, on the left, the door leading to the library, which room occupies the greater part of the front on Fifth avenue. The whole of the wall of this lower story is of red Lake Champlain marble treated with dull or matt polish and affording an admirable background for pictures. Above this, the frieze of white marble, very richly carved by Mr. Karl Bitter, would seem to interpose rather boldly between the red marble walls below and the open corridor



RESIDENCE OF C. P. HUNTINGTON, ESQ.



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Entrance Corridor.

above with its play of light and shade, but that the sculpture itself is of so much strength of contrast in light and shade as to sufficiently play its part and to take from the marble its character of extreme whiteness. The coupled columns are of colored marble with bases, pedestals and capitals of white marble, and the lunettes dimly seen in the vault above the entablature are painted by Mr. Siddons Mowbray. One illustration shows the roof of this hall, seen from below; and by comparison of these two pictures some idea may be gained of that



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Corridor at foot of Main Stairway.

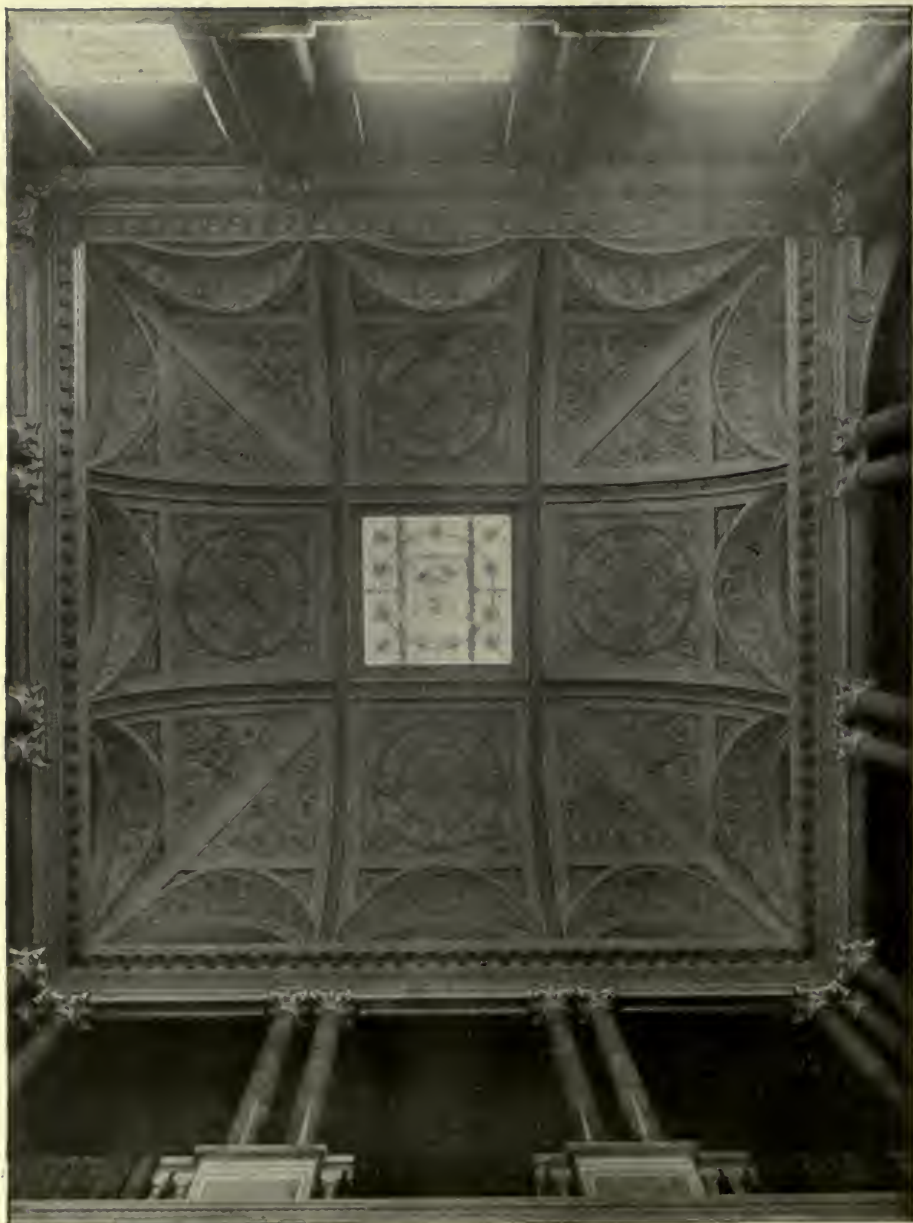
which is notoriously hard to render in photography, the effect of a lofty room or hall. Only comparison and careful piecing out of one picture by another can produce on the student anything of the actual effect of a room of such comparative dimensions.

The picture of the curved staircase shows the principal landing of the main stairway of this house. The stairway itself is entirely of marble, and those who were fortunate enough to see the separate blocks in the works of Messrs. Ellin & Kitson had some warning of



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Central Hall.

the interesting piece of architectural workmanship which they embody. Every separate step is in one block of marble, its eight or nine feet of length representing the width of the stairway, and each block fits neatly and accurately to its neighbor, so that the caissoned soffit comes together perfectly with scarcely visible joints. The illustration showing the Doric pilasters, (p. 83) is of a hall in the basement story at the foot of the great semi-circular staircase. The order here is of the most refined sort, and the architectural details most delicately worked, so that this simple composition is one of the most attractive things about the sumptuous house. A complete contrast to the simplicity of this is the richness of the drawing-room shown in our next illustration. It is understood that all of this work was done in New York, but, of course, the design is simply French of the earliest years of Louis XVI. In such work originality is hardly asked for, much less required, but good taste in the apportioning of part with part is always in demand and not so commonly available. The ceiling and the over-door panels were painted by Edwin Howland Blashfield, and his exquisite handiwork needs the most delicate and carefully chosen surroundings. With the single possible exception made that, perhaps, the ivory-white and gold dec-



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Roof of Central Hall.



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Main Stairway.

oration is a little too strenuous a contrast to serve best the lovely paintings of the ceiling, the adornment of this room is all that even Mr. Blashfield could ask.

Perhaps, however, the gem of the whole is the dining-room, in which Elihu Vedder's highly wrought decorative paintings are admirably combined with the ceiling in moulded and gilded plaster, and the mantel in carved and inlaid marble. The walls are covered with tapestries, and the large figures of these seem, in the photograph, to control too much the decoration of the room. This, however, is not the case in the room itself. The perfectly organized painting carries it easily over the less concentrated color-design of the tapestry. Those familiar with Mr. Vedder's mural painting, and who can remember his fondness for backgrounds of sombre blue, and cool grayish yellow, will understand how his work here, relieved upon embossed gold most carefully handled by Mr. Francis Lathrop, who designed the ceiling under Mr. Post's direction, is of a concentrated strength which no textile or similar fabric can efface. The full effect of this room can never be given by photography, even if the question of color be ignored, for the paintings of the ceiling tell upon the decoration of the whole room, and these form the centre of the decorative system which the lunette over the mantle-piece and the rondels in the smaller lunettes of the ceiling, important as they are severally, merely echo and assist. But the photograph shows fairly well the unusual character of the chimney-piece, which is carried out wholly in Siena marble, the figures and arabesques being carved in relief and the surfaces of them left unpolished while the background is entirely of polished Siena marble of a slightly darker color; all these polished surfaces having been inlaid after the carving was done. This expenditure of time and money is not in itself admirable, but the result is very beautiful indeed, and the plea that the difference in shade of the marble was sufficiently desirable to justify the complicated system of work is unanswerable.

In all these rich interiors the work of the able and highly trained artists who were called in to paint and to carve assumes necessarily a great comparative importance, and no one but the practised designer of such things knows how much of skill and patient thought goes to the proper setting of the work of specialists and the general harmonizing of the whole. Photographs cannot show this; or, at least, only a prolonged study of very many photographs can show it, even in a slight degree. The strong desire on the part of the architect to obtain splendid and tasteful interiors; his patient handling of the problem and skilled apportioning of space and means; his designing of the architectural forms which are to surround and, in a sense, hold up the paintings and sculptures themselves—all this is worthy of more sympathetic study, and will prove to be worthy of



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Detail of Drawing-Room.



HOUSE, SOUTHEAST CORNER FIFTH AVE. AND FIFTY-SEVENTH ST.
Dining-Room.

more hearty commendation than can well be explained in words written about those works of art which cannot be adequately displayed to the reader.

The interiors of the new rooms of the Lawyers' Club, some illustrations of which are given at the closing of this article, are of the very latest work done by Mr. Post, they having been still unfinished in April, 1897. The corridor is a noteworthy piece of sumptuous adornment, the walls being wholly of richly veined marble, very skillfully treated as a pseudo-architectural lining, making, of course, little pretense at being really a part of the structure. Indeed, the visitor is informed that the marble columns have been bored out, as pump-logs are bored, until a comparatively thin shell of the marble remains, and the columns are lightened by half their mass. Not in our time will the conditions be changed. Not in our time will decoration be really a part of the building to which it is applied. This, which is, after all, the classical Roman system of ornamenting a building after its frame and organization are complete, must be accepted frankly; and this, once accepted, there is no reason why columns should not stand over vacancy, carried upon iron beams, and every reason why such masses of marble should be lightened of their unneeded mass. The only requirement should be that a certain magnificence and delicacy of effect be the result. To go through this performance and have nothing but a white plaster simulacrum of massive construction for your adornment, as if the architectural forms and features were in themselves, apart from their meaning, beautiful and admirable things, is the unforgivable sin. But, to take these same architectural forms and carry them out in rich and truly artistic fashion, with splendor of color and beauty of sculptured detail, is another matter; and it would be a shrewd critic, indeed, who would seriously condemn such adornments as these.

In the corridor in question, the roof is vault-shaped, and its whole surface is gilded, except where the scroll-ornaments and the labels are in slight relief. The large room, with free Corinthian columns near the walls, panels of tapestry, with hunting scenes, is the new dining room; and the outside of this may be seen rising like a great tent from the roof of the Western National Bank Building, which adjoins the Equitable Life. In all this work on the rooms of the Lawyers' Club, Mr. Maitland Armstrong has been employed, and, as has been said above, it is extremely difficult in all such cases to distinguish the work of the painter decorator from that of the architect decorator. Any one at all familiar with the subject will know about where the general control of the architect in charge must cease, and where the work of the superintendent of decoration must begin.

The large dining room, with decoration in low relief, and all in white, and where a screen on the spectators' left shows pierced panels



LAWYERS' CLUB, NEW YORK CITY.
Old or "White" Dining-Room.



LAWYERS' CLUB, NEW YORK CITY.
Chimney-piece of Old or "White" Dining-Room, with Blashfield's Painting.



LAWYERS' CLUB, NEW YORK CITY.

New Dining-Room in the Pavillon on top of Western National Bank.



LAWYERS' CLUB, NEW YORK CITY.

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New Corridor, with Marble Linings and Gilded Vault.

above, between columns and carried by square pillars, was built about ten years ago. The over-chimney panel of this room is given in a separate illustration; it is a very noble painting by Edwin Howland Blashfield.

The tail-piece of this article is a view of the Produce Exchange building, from one of the new and still higher buildings on Broadway.



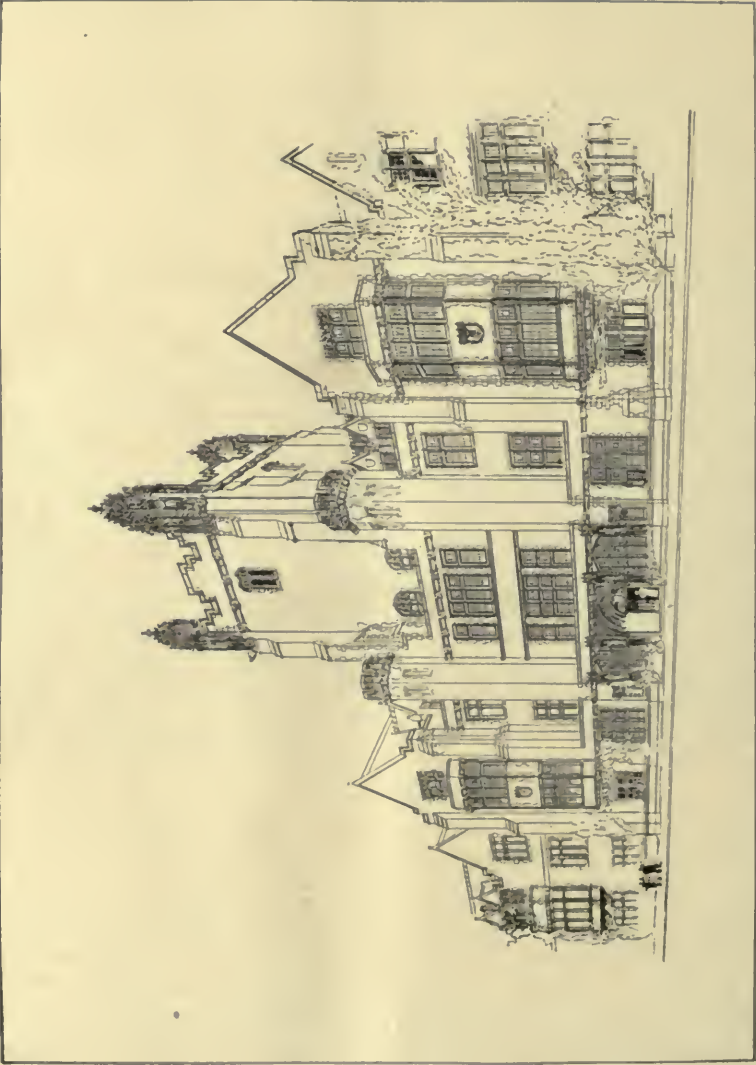
THE PRODUCE EXCHANGE.
Bowling Green, New York City.

POSTSCRIPT.

Since the above monograph was printed several important tasks have been undertaken by Mr. Post's office which demand notice. Unfortunately, they are not so far advanced—for there has been of late a pause and a hesitation about the carrying out of large and costly buildings—they are not so far advanced that they can be treated as existing buildings. Their designs only can be spoken of.

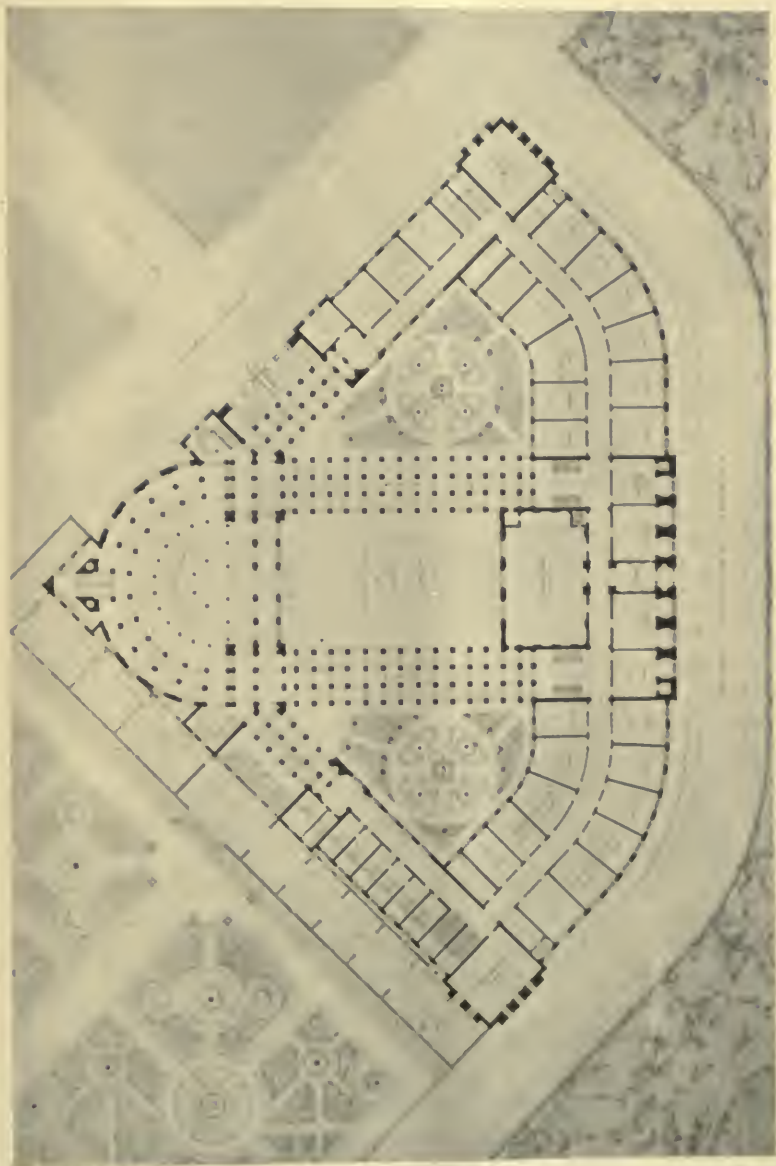
A large business building to be erected for the Astor estate on the west side of Broadway, at the corner of Duane street, requires only such pictorial representation as can be afforded by the elevation drawing. The plans of these business buildings are not possible of consideration in an article like this, because they resemble one another nearly; and, if any novel conditions should appear to be satisfied by them, only a minute comparison of plan with plan would suffice to make this clear. The exterior, as shown by the Broadway front, will be of the type set by the Union Trust Company's building, represented in the illustrations on pages 18 and 19 above. It will probably be a better front than the Union Trust Company's, more graceful in design, better in its proportions and more effective, in spite of the trying conditions caused by its greater height, and by the necessity of a store-front in its basement. This store-front is, by the way, managed with great ingenuity.

The impression made upon the present writer by the familiarity which he has gained in the course of this study with the immense mass of production inaugurated, and, in the main, designed by George B. Post, is that he, considered as a designer, as an artist, as a bringer of good artistic results out of awkward conditions, has a special gift of free and bold handling of the freer styles. The Romanesque designing of the Union Trust Company, of the Times Building as well (page 12), although there less absolutely successful; of the Post Building (page 35), although here the Romanesque feeling is not unmingled; of the rather exaggerated mediæval designs for the Newark Building and the Buffalo Building (pages 41 and 42), and, finally, of the great edifice of the Produce Exchange (pages 30, 31 and 96)—this designing is of an excellent character. In the Union Trust Company it is at once strong and graceful and in the highest degree significant; in the great Produce Exchange Building it is ponderous and dignified; in the Post Building it is somewhat fantastical but admirably well adapted to the conditions and the requirements; in the Times Building it is original and vig-



CENTRAL BUILDING OF THE COLLEGE OF THE CITY OF NEW YORK.

George B. Post, Architect.

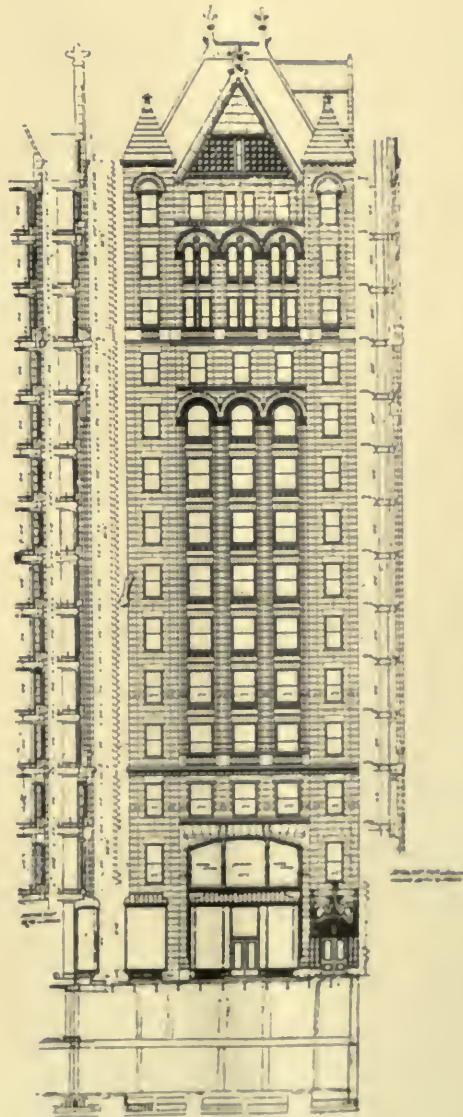


PLAN OF THE COLLEGE OF THE CITY OF NEW YORK.

George B. Post, Architect.

orous, quite beyond the custom of modern designers, although in that case there was found reason to point out that this was only a first study of which the Union Trust Building showed a completer development. In all these buildings the freer style was found to harmonize well with the architect's notion of a business building. Even the two structures with which it is hard to sympathize wholly, even the Prudential Life Insurance, at Newark, and the Erie County Savings Bank, at Buffalo, with their somewhat vexatious affectation of being mediæval castles, point to a not perfectly worked vein of picturesque power in the designer. We shall see in a moment that another free style, the sixteenth century semi-Gothic of England, responds as readily to his touch.

The existing fashion of rather slavish adherence to seventeenth century Italian formality can have but one excuse in the practice of any architect, and that is the existence of very great—very unusual power in the way of abstract proportion. But this, as was said above (page 3), is hardly a special personal gift of the architect whose work we are considering. It is true, as has been pointed out, over and over again, in this and in similar papers, that it is quite impossible to expect much of this charm of proportion, in buildings which are to fit themselves to the commercial spirit; and which are to be built economically, conceived and carried out in headlong haste, and with a single eye to pecuniary profit. Elegance is not practicable in such cases; but elegance is exactly the one virtue of the sixteenth century, hyper-Classical styles which it is now the fashion to consider most excellent. Still, it must seem clear that the burly vigor of the Produce Exchange, the harmonious picturesqueness of the Union Trust Building, in which even the gable walls tell effectively as part of the design, the dashing novelty of the Post Building, with a fearless treatment of each story and almost of each office in the most practical and common-sensible way, and, finally, what may prove to be the still greater excellence of the new Astor front—that these and not any delicate grace of proportion like that admired in the works of Palladio are in the line of our architect's specialty. An excellent critic who read these sheets previous to their publication said to the writer that justice had not been done to Mr. Post's faculty of making a building look massive and grandiose, ponderous and important. It is obviously Mr. Post's special gift that he is able to bestow such qualities upon his buildings. It is because he has not always chosen to take this obvious part and has allowed the design to break away from him and to become slight and even frivolous in the apparent attempt to get "Palladian" harmony of proportion that has caused any seeming lack of recognition of that undeniable gift named by our critic. There are, indeed, several instances of harmonious proportion in classical themes, as especially in the cor-



VINCENT BUILDING.

Southeast corner Broadway and Duane Street.

George B. Post, Architect.

ridor of the great Fifty-seventh Street House (page 87), and, in a different style, in the Reception Hall, shown on pages 74, 75 and 76, but these, it will be noted, are interior effects; and it has already been urged that Mr. Post's work in decorative interiors is almost uniformly admirable. For his big exteriors, the Romanesque style or some modification of it is what suits him the best, and his friends might well wish that he would devote himself to that for the next twenty years of his active practice with a view of achieving possible results greater than those yet attained by him.

The design for the College of the City of New York foreshadows a building of singular effectiveness. It is to be erected on a most admirable site, bounded on the east and north by the curving line of St. Nicholas Terrace from which the hill goes steeply down to Harlem Flats. To the west and south the ground is level, or even rises a little from the College site, and the entrance front, with its triple gateway, will be seen by persons approaching it along what is practically a common city street without much rise or fall. On the other hand, the perspective view with the tower is practically what will be seen by the person approaching the building by climbing the steep hillside which will of necessity always be used as a park, the view which will be seen by anyone a mile away on what used to be called Harlem Flats. If, in other words, one were to stand on top of a house at 150th street and Sixth avenue, the point which we take to be practically coincident with the edge of the Harlem River at that point, he would see the college in this way, or nearly in this way. The Tudor Gothic or "Collegiate Gothic" style of this work will probably be found to suit itself well to Mr. Post's idiosyncrasies as a designer. It appears that the persons charged with the responsibility of selecting a design after what proved to be a very thorough and fair competition, found themselves led to the conviction that this style, associated with memories of Oxford and Cambridge, was what they desired to see used for the new building. A fresher and less "decadent" one would have pleased many of us much better, but it will be interesting to see what the essentially picturesque designer and the determined realist, George Post, makes of this rather conventional style. Criticism of a design is hardly in place when only preliminary drawings are as yet in existence, but it is quite evident to one who understands such matters that the plan is being worked out with closest regard to common-sense and the requirements of the situation, and that the exterior design is developing itself naturally from that well-studied plan.

R. S.

THE HARDWARE OF ORNAMENT.



THE work of Mr. Post, especially in his more important undertakings, includes not only all matters of architectural construction, but also every detail of interior decoration. In common with other architects he recognizes the importance of "Hardware of Ornament" as an essential feature in interior decoration, and in many

of his buildings has given it most careful attention even to the extent of preparing special designs for many of the important rooms. A notable example of this is found in the residence of Mr. Collis P. Huntington, on upper Fifth avenue, New York (which is illustrated on page 84 of this number), in which the metal work, nearly all of it from special designs, is of the most elaborate character, and forms an integral part of the scheme of decoration. A few examples of this work are shown in the accompanying illustrations which thus exemplify one phase of Mr. Post's skill as a designer, the possibilities of effective work in this field, and the ability of The Yale & Towne Mfg. Co. to interpret with fidelity and spirit designs of the highest types.

Beneath each piece will be found its location in the residence of Mr. Huntington and the harmony of the scheme of decoration of the various rooms may be better appreciated by referring to the illustrations of the rooms shown elsewhere in this number.

Until about twenty years ago, no real attempt had been made to give any artistic character to the metal work used in buildings in the United States, and even more recently than this, the Hardware of Ornament for buildings of the



On Entrance Door,
School of French
Renaissance.

better class was largely imported from abroad; the most artistic from France.

It is now conceded, however, that in beauty of outline, correctness of treatment and perfection of manufacture, the Hardware of Ornament made in America exceeds that of any other country. The credit for this is due in a great measure to the efforts of The Yale & Towne Mfg. Co. who, however, could not have succeeded without the cordial and sympathetic support of the architectural profession.

The extensive collection of Ornamentations shown in the Yale & Towne Company's recently issued catalogue No. 16, easily places it in the front rank, not only in the character of the work done, but in the extent of designs. All schools of note are represented and we may mention that in the Colonial, there are seventeen different ornamentations; in Italian Renaissance, eighteen; in Romanesque, twelve, etc., etc.

The book is already in the hands of most architects, and will be sent to any who may apply for it,

It is only by actual inspection of such fine hardware, however, that the beauty of design and finish can be appreciated, and a visit to the exhibit rooms which form a part of the offices of the Company in New York, Chicago, Boston, Philadelphia and elsewhere, is full of interest.



In the Library. School of French Renaissance.



In Dining-Room.



In Parlor.



In Second-story Chambers.

At the General Offices of the Company, at 9-11-13 Murray street, among the beautiful examples of work is a collection of Store Door Handles which numbers approximately one hundred. Architects who attended the Annual Convention at Detroit last Fall will remember this collection as one of the features, it having been loaned by the Company at the request of a number of architects who had seen and admired it. The three examples of Handles shown on the next page form part of this collection.

Admittedly far in the lead of all others in the field of Art Metal Work, the Yale & Towne Company has an even more brilliant record in mechanical achievements.



The name "Yale" in connection with lock-making stands not only for the highest quality of design and for best workmanship, but also recalls the historical fact that the ideas embodied in the original Yale lock by its inventor (Linus Yale, Jr.), before his death in 1868, have since completely revolutionized the art of lock construction. Those inventions by separating the key mechanism from the bolt mechanism, and by combining a sheet-metal key with a corresponding key-way contained in a rotating





Ornamental Store Door Handles, from the Exhibit Rooms in New York, of The Yale & Towne Mfg. Company.

plug, opened the way for the subsequent adaptation of the Yale lock to its present wide range of uses, and for its latest and highest development, the Paracentric Key and Cylinder.

The New Paracentric Key and Key-Way (see illustrations on preceding page) increase vastly the original security of the Yale lock. The peculiar shape of the key-way effectively precludes the introduction or use of picking tools or false keys. The Paracentric key is made by special and patented machinery, developed by years of study and experiment, and its cross-section is such as practically to present its illicit duplication, even if the original key is available as a model. The Yale Paracentric lock and key thus combine to give unapproachable security against picking, duplication or accidental interchange of keys.

The Yale locks are made in more than five hundred styles and sizes, adapting them to almost every conceivable use.

MARBLE AND MOSAICS IN ARCHITECTURE.

THE time seems to be rapidly approaching when buildings will be classed in accordance with the amount and merit of their mosaic decorations. It is at once an art too durable and too thorough in its foundation on decorative principles to ever decline. Having taught the art of color to architecture, it has taken possession also of the means.

If one were asked what feature in architecture gives it its best title to a classification among the fine arts, he would think that his credit for a clear conception of the beautiful demanded that he should say that it is the linear design. This would be measurably true, but, like all the truths that plague us when we attempt to put the elusive sentiments into theories, it is no more than half a truth, and it might give a very imperfect idea of the extent to which linear design covers the fine art side of architecture. There is more in architecture than façades, and there may be more tasteful examples of aesthetic productions in the interiors of buildings than on the exteriors.

As a contributor to the fine art relations of architecture this place of mosaic work is peculiar. It is the keystone of the arch that bridges over the chasm between architecture and painting. Without it architecture is a cold art, comparatively rigid and stiff in even the most beautiful examples, and less susceptible than sculpture to linear graces; but with it the art becomes a sumptuous expression of beauty almost rivaling painting in the agreeableness of its color effects, and surpassing sculpture in its power of appeal to sensuous feeling.

It seems almost a pity, sometimes, that the Renaissance revival of painting killed the art of mosaic design as it was practiced in medieval times. True, the material of broken marble and glass could not lend itself so readily as pigments to the expression of the artist's higher ideas. In addition to the

loss suffered through the greater facility of execution in oil art fresco, mosaic art could never hope to rival the brush in the perfection of gradations or expression, when the motive was found in the representation of figures or faces. But these old picture mosaics were an artistic vehicle of sentiment, even if they failed somewhat in execution, and judging from the examples that have come down to us from antiquity, they were almost as durable as the hills. This latter merit, however, it may be said in passing, might not prove to be a recommendation for all pictures.

But if mosaic work has relinquished something of its medieval claims to high art, it has brought something that is very much akin to high art in its contribution to those resources of architecture without the use of paint. It has brought to architects the power of introducing color into their work and giving to interiors a warmth and glow of which Greek art knew nothing and Roman art rather foreshadowed than realized. Indeed, it is probable that we must credit to the medieval mosaics the one feature of modern architecture which has lifted it beyond comparison above antique architecture and enabled the modern architect to assume that he is something more than a reproducer of old forms with modern adaptations. Once taught the charm of color in architecture by the patient and tasteful masters of mosaic art in the middle ages, the lesson could not be unlearned by the architects of Renaissance, and modern architecture is still endeavoring to better the instruction. Indirectly, we may probably credit to mosaic art the introduction of stained glass, which is doing so much to render our interiors agreeable and restful to the eye.

It cannot be said, therefore, that mosaic art is a declining art. It is finding rather its true place in the field of fine art production and culti-

vating it assiduously and successfully. When one escapes from the rush and thunder of commercial traffic on lower Broadway and enters that temple of modern mosaic art known as the corridor of the Equitable building, he enters a corridor which is a liberal art education within itself. But what is its principal charm? It is perfect, of course, in all the colorless features of cold architecture. The floor space is adequate, the walls are of just the proper elevation, the stairway is grand and the arched ceiling is dome-like, and it spans the enclosure like an architectural sky. But there would be nothing in all this to arrest the eye of a busy man, a commercial traveler, for example, scratching for an opportunity to sell something, were there not an attraction more subtle to appeal to his aesthetic sensibilities. What is it?

It was the work of Batterson & Eisele that executed the corridor of the Equitable building as the great actor creates the part for which he is cast in a new play; and it is to Batterson & Eisele that every one must return thanks when he wishes to express his gratitude for the pleasant avenue of commerce. Possibly he thinks life drowsy and the world a desert, but here, at least, is an oasis of delicately tinted marble brought together in the most agreeable relations, and, if he has a true soul, almost fascinating him with its loneliness. For this contribution to his enjoyment he should be willing to return thanks.

But possibly he is not learned in marbles and he thinks that nature did all this with only a little assistance from the stonecutters and polisher. Let him be told a secret, then. Nature never did anything so well. Nature knows art to perfection, but she is reckless in permitting discords, and here everything is properly attuned and harmonious. "We have nothing so fine on the other side," exclaimed an eminent foreign observer, on studying this corridor, and the truthfulness of the remark will be more readily accepted here because we are almost, if not alto-

gether, forced to admit that we have nothing so fine on this side.

Still, it cannot be denied that we are beginning to have a great deal of very admirable mosaics in this country. The execution of the marble work in the Equitable building could not fail to stimulate the production of other examples. Paint? It is an abomination everywhere except on a canvas or a country cottage. It has no true place in architecture. Time is the only limner that should be permitted to tint the surface of a truly architectural conception, and he alone knows how to do it worthily.

Mr. George B. Post is among the chief architects who look to Messrs. Batterson & Eisele for their marble decorations, and among the business buildings decorated for him by their hand are the Times, World, Union Trust and Mills buildings, and the Prudential Insurance building in Newark. Among the residences are those of Cornelius Vanderbilt and Collis P. Huntington. But these are only examples. The entire art of marble decorations in the United States owes a great deal to the taste and accomplishments of Mr. John Eisele, the junior partner and the chief artist of the firm. He is a man thoroughly competent to either execute or direct. In short, he is a master in mosaics, a term which does not mean precisely what it meant a thousand years ago, but which means a great deal more for architecture than it ever meant in the past.

It should be known, however, that Batterson & Eisele are not exclusively mosaic workers but workers at the finer grades of marble cutting, and some of the best of their composite work of the kind was executed for the late Richard M. Hunt. It is to be seen in such structures as "Marble House," "The Breakers," and "Biltmore," among the finest residences of our well-known millionaires. They have also some fine work in New York City dwellings, noticeably those of Jacob Astor and Ogden Mills.

ENGINEER-BUILDERS.

WHILE New York was still seriously considering the practicability of eighteen and twenty-story buildings, Chicago had ceased to experiment with them, and in the development of the skeleton form of construction its architects and builders had succeeded in obtaining a degree of perfection which their fellows in the East have not as yet excelled. The new lake city, which has risen, Phœnix-like, from the ashes of the old, is a monument to the skill and enterprise of its engineers, architects and builders. The westerners saw the possibilities of the modern high building, and with the untrammelled and unhampered energy peculiar to their section, they set themselves to work to develop them so far as possible.

The first great structures which arose on the shore of Lake Michigan were in a sense a revelation to the world, and showed the results to be attained by the indulgence of a combination of genius and daring, when not fettered by conventional conditions and restrictions. The example of the West was not slow in being followed in the East, but it is to Chicago pre-eminently that we owe to-day the pioneer development of the mammoth structures which are so familiar to us all.

The growth in the use of these tall structures has produced many firms of what might be termed engineer-builders. Dozens of large and well-known firms stand to-day in the front rank by the sheer excellence of their work. But they are, for the most part, only imitators and take a share of the credit which is due, not to those who followed, but to those builders who, by their skill and untiring energy, made the construction of the sky-scraper an actual and practical possibility instead of the bright but theoretical dreams of visionary architects.

No other firm in the world, perhaps, has played so large a part in this revolutionizing of the building trade as the George A. Fuller Co., of Chicago and New York. To this firm primarily is due the credit of having originated many of the actual constructive methods now in general use. For Mr. George B. Post they did the new Coe estate building, on Broadway, near Bleeker street. On this building they had the general contract for iron, mason and carpenter work. From another firm of New York architects, Clinton & Russell, they have the contract for the Chesebrough Building, at State and Pearl streets. The cost of the structure is a half million dollars. In Chicago especially, their work may be seen everywhere in the city. It is safe to say that a major part of the famous buildings in

that town of famous buildings may be credited to the George A. Fuller Co. Among the structures they erected for the well-known firm of Chicago architects, Burnham & Root (now D. H. Burnham & Co.), are the Monadnock and Kearsarge Buildings, two of the greatest office buildings in the world; the Rand-McNally Building, the home of the great publishing firm, and the Masonic Temple. For the same firm they did the Equitable Building, in Atlanta, Ga. For Messrs. Holabird & Roche, they have done the Pontiac Building, the Caxton Building, the Venetian Building, the new Wachusett and Katahdin buildings, the old Colony Building, the Champlain Building, the Marquette Building, the Atwood Building and the D. S. Morgan Building, in Buffalo, in which Messrs. Holabird & Roche were associated with Green & Wicks of that city. The magnificent new house of the Chicago Athletic Club and the residence of Mr. Henry Dibblee deserve to be mentioned among the work done for Henry Ives Cobb. Other buildings include the Fair for Jenney & Mundie, the New York Life Building and the Y. M. C. A. Building for the same firm.

Many of the structures at the World's Fair were built by the George A. Fuller Co., and include the work of well-known New York architects. For Messrs. McKim, Mead & White, of this city, they did the New York State Building, the Puck Building, the White Star Building, and also the residence of Mr. Robert W. Patterson, Jr. The Walter Baker pavilion was done for Carrère & Hastings. For D. H. Burnham, of Chicago, they built the Ashland block, the Marshall Field Building, the residence of Mr. James W. Elsworth and the Reliance Building.

A vast amount of work for other architects has also been done by this firm, among which may be mentioned the Western Bank Note Building, for Chas. S. Frost; the Lees Building, James Gamble Rogers, architect; the Columbus Memorial Building, W. W. Boyington & Co., architects; Steinway Hall, Dwight H. Perkins, architect; the Real Estate Board Building, Julius Huber, architect; the Newbury Building, Mr. Jules F. Wegman, architect; and the Illinois Steel Co.'s Laboratory, Chas. S. Frost, architect. The office of the George A. Fuller Co. is 1027 Marquette Building, Chicago, with a branch at 160 Fifth avenue, New York. The variety of the work done by this firm, as well as the extent of territory which it has covered, reveals a scope and the possession of resources second to none in the country. Although primarily recognized as a Chicago firm owing to the demand upon them they have established themselves at New York, where their success is already assured.

MODERN PLUMBING.

THE epoch of what is commonly called exposed plumbing commenced about 1880. It was in that year that there were slight improvements noticed, which began to follow each other so rapidly that it is easy enough to point out the years 1880 and also 1881 as the beginning of the present era of sanitary and improved plumbing. It is true that for many years previous to this change in the condition of plumbing, contracts were completed in the same even rut. Architects did not specify the use of any innovations because there were none which could truthfully be called improvements, and whatever slight improved devices had been placed on the market did not meet with favor because we were content to remain in a condition amounting to stagnation. This condition of affairs was not by any means, therefore, a suitable one for development in hygienic plumbing. However, building operations which gave promise of healthy growth had been carried on with remarkable activity about these years. Improvements in every branch of the building trade followed the continued activity. The marked improvements in all branches of the building trade during the past two decades can be readily recognized when we compare an up-to-date tenement, apartment house or private dwelling with a similar structure of twenty years ago. This improvement had been particularly marked in the office and business structures; in this class of buildings the change, it is conceded, has been marvellous. In keeping pace with the improvements made in the other departments of building, the plumbers of New York, in co-operation with the manufacturers of plumbers' supplies, have succeeded in establishing a much more radical change for the better in their trade than any of their co-laborers in the building craft. In this they were assisted by the Building Department of New York. The civic authorities recognized that some regulations should be conformed to for an immediate and decided improvement in sanitary plumbing, and it was for this purpose the Examining Board of Plumbers was appointed. To this board, on account of its active work towards a higher standard in plumbing, a great measure of credit is due. But it was the plumbers and the makers of their supplies who rose equal to every demand made upon them, and every year that passed was marked with true and permanent improvements. Year after year New York witnessed the introduction of sanitary devices in the plumbing line that have never been surpassed in any civilized country.

Prior to 1880 the plumbing fixtures were considered so unsightly that architects were accustomed to sacrifice even the occupant's health to hide such unsightliness. As a result the fixtures were boxed or incased. Lead water pipes were altogether used, and the light cast-iron pipe for soil and drainage was common. There were but meagre attempts made for the ventilation of soil pipes or traps up to that date. There was but little porcelain ware used in bathtubs. Kitchen and pantry sinks and waterclosets of copper and cast-iron had been used almost exclusively.

Nowadays wrought-iron pipe with screw-joint fittings has been substituted for iron pipe with lead caulked joints in drainage systems. The use of lead pipe for water supplies has been wholly done away with, and galvanized wrought-iron or brass pipe has taken its place. Instead of running all pipes in inaccessible places such as in partitions or walls hidden from sight by plaster and board, architects now place them in a readily accessible place. Instead of jeopardizing one's health by refusing to have the pipes cleaned on account of the great expense, now it is so arranged that the drainage and other pipes can be readily painted, cleaned and repaired. The advent of the tall building also presented new problems to the plumber as it did to the builder. He was forsooth faced with as serious a question as that which confronted the carpenter and mason. In carrying his pipes to a height of several hundred feet hydrostatic pressure entered the solution of plumbers' problem. He had to arrange his lines of drainage, soil, waste and vent pipes to accommodate not hundreds as had been the case, but thousands of tenants who were to occupy the immense structure. He had to furnish for the water supply, the necessary pipes, tanks, pumps of sufficient capacity to supply a building which in comparison with the old structure was as a city to a town. In piping the building, the plumber had to reckon with a hydrostatic pressure which in some of our office buildings reaches a maximum of 140 pounds to the square inch. In doing so, science and long experience combined with special care and attention to the weight and strength of pipes, fittings, valves, etcetera, were absolutely necessary to the safe handling of water at such heavy pressures. The successful plumber of to-day, however, is ready and equal to carry out any contract, no matter what difficulties he has to surmount. The change has been wonderful, yet it came easily and naturally. The occasion arose and the plumber met it successfully.

Sound plumbing is of vital importance, and the well-known architect who invites tenders on an important work permits none but reliable firms to enter into competition. Furthermore, the investor who builds for investment apartments, flats or private dwellings is fully cognizant of the demands of his future tenants. They have

many years since united with the civic authorities in demanding that the best sanitary precaution in plumbing be made necessary for their health. Hygiene as a result has been studied by the successful manufacturer of plumbers' supplies, and the plumbers themselves, with a view to putting their knowledge to practical use. When a question of practical hygiene presents itself to the well-known plumber, he is perfectly familiar with the conditions and quantities which enter the solution of the difficulty for the reason that he has made the science a subject of research. Before the change for the better, plumbers were to a great extent mechanical in their methods, because there was so much similarity in their work, and, furthermore, hygienic problems of so varied and complicated natures as exist to-day did not present themselves. There were no hydrostatic pressures to reckon with which would necessitate the use of pipes strong enough yet not too heavy so as to entail the strength of the high walls. Science had taught us but little of microbic and bacillic germs of disease, which, by proper sanitary precautions, particularly in our plumbing, could be removed so as not to endanger our health. The up-to-date plumber compared with his predecessor twenty-five years ago has made, therefore, literally extraordinary strides towards perfection in his trade.

One of the leading New York plumbing firms recognized as such by the building trade generally is that of Rossman & Bracken Co., of No. 132 East 42d street. Occupying a prominent position in the plumbing trade, no small share of credit falls to them as a result of their effort towards the betterment of good plumbing in New York. Finished masters of its trade, the firm has completed contracts for some of the best New York architects. The World Building, the residence of Colis P. Huntington, the St. Paul Building, of which Mr. George B. Post is the architect, were completed by this firm. These examples are but a few of the many important plumbing contracts completed during their long and successful connection with metropolitan trade. The company is an incorporated concern, with Mr. J. A. Rossman, president, and W. R. Bracken, the secretary and treasurer.

RECENT IMPROVEMENTS IN TILES.

TILES have come down to us as a legacy from an ancient civilization. Their use dates back thousands of years and there is little doubt but that they shall continue to be used as long as architecture and building coexist. Of late years, with the march of improvements, they have been more largely used as a result of the recognition of their superior value, not only from an artistic standpoint, but also because of their sanitary qualities. With the in-

crease in use came improvements, not only in design, colors and make, but also in the methods of laying the tile. The tall office buildings and mammoth structures of the present day, with the attendant throngs passing in and out the halls, corridors and passageways, demanded improvements particularly in regard to durability. The stupendous height of elevator and air shafts de-



manded a lining which should be light, reflect mirror-like, and economize space. The inventive mind has accomplished during the past quarter century more improvements than have heretofore been accomplished in centuries when mosaic and tile work had attained its golden era.

One of the most successful of the recent improvements is that of the glass tile for side walls and ceilings. Its superior beauty over the glazed tile was recognized many years ago, and a few manufacturers succeeded in placing a good glass tile on the market. Its many advantages were soon recognized. It was much thinner but equally as solid and durable, and besides considerably cheaper, a very favorable attribute. It was also found that the effects in mosaic work produced by the glass tile were in every respect superior to the glazed tile. The great defect in the latter tile, that of crasing or superficial cracking, could not of necessity exist in the glass tile. Possessing these advantages, which were recognized by archi-

teets, students and investigators, its success seemed imminent. But the difficulty in its way was in securing a proper cement or foundation. The old method which has been in existence thousands of years and is still used was found to be impracticable. No concrete was found sufficiently adhesive because of the non-absorbent nature of the glass tile. It was then thought that the glass tile, despite its many superiorities, was doomed.

Among those who had produced a really first-rate glass tile was Mr. Lafayette Crull, who had studied tiles and tiling for many years. It was in 1889 that he secured patents on his process of manufacture. The main ingredient of his opal tiles, as they were named, was a cryolite salt, a mineral found in Greenland, which was fused into a cryolite porcelain manufactured in Belgium. Most handsome effects could be produced, but he recognized that an entirely new adhesive material must be produced before he could successfully introduce the glass tile. The problem to solve was in providing a cushion which the concrete effectually forms against the effects of the expansion and contraction of the wood and iron walls and ceilings, besides other jarring and dislodging agents. After many experiments the cement was produced, and after years of tests it was brought to a complete perfection. The main quality which has virtually brought about its success is its elasticity. It readily adjusts itself to structural variation with a linoleum-like quality.

The accompanying cut is a panel done in gold green, and white mosaic glass tile, the design being the work of Mr. George B. Post. It has yet to be surpassed as an example of glass tile work in mosaic in this or any American city. Panels similar to these adorn the walls of Child's restaurant, at No. 130 Broadway. Other examples of glass tile work can be seen in Dennett's restaurant, Nos. 143 and 145 Nassau street, and in many of the prominent dining halls and restaurants in the city. The cement weighs one and one-half pounds to the square foot. This gives remarkable economy of space, as only three-sixteenths of an inch is required to lay a glass tile on the wall. The tiles are one-eighth of an inch in thickness, but their thinness, as has been shown from a long experience and use, does not detract from their durability. They are not affected by atmospheric changes, nor do they become discolored by age.

The radical change in the process of setting the glass tiles on walls and ceilings proved so successful that the firm of Lafayette Crull & Sons, of No. 124 West 23d street, enlarged its scope of business. It soon found that the same quality of elasticity in the cement made it available to lay floor tiles on any material without the aid of a concrete foundation. Any floor could be covered with the various styles of tiles now manufactured with the aid of the cement so as to produce the same results as if a concrete foundation

has been laid. It was a decided innovation. Architects at first deemed this impossible, and refused to believe that such could be done. Yet the Crull system has for years proved itself efficient in cases where concrete laid tiles would not have stood the severe strain. On boats and parlor cars, where the jarring, dislodging vibrations would of a certainty have loosened the tiles laid in the old manner, have proved ineffectual in the case of tiles laid with the cement on the hard surface. The beautiful private car of Walter S. Webb and many special Wagner and Pullman cars have been tiled during the past few years by Crull & Sons. A passageway in John Jacob Astor's yacht, the main saloon, decks and passageways of the steamer Paris, of the American Line, have also been completed in a rubber tile. Some of the other contracts of marine work include the passageway and saloon deck of the battleship "Texas," the steamer "Detroit," the ferryboat "New Jersey," of the Pennsylvania R. R. Co.; and the Hudson River steamers "Adirondack" and "Dean Richmond." Other important work, which has long since proved the efficacy of this improvement, is to be found in the floors of many of Dennett's restaurants.

Another distinct improvement in tiling which produces a remarkably good effect is the exact reproduction of different kinds of onyx. Still another improvement which is one of the best of recent innovations in the art of tiling is the use of gold glass tiles for effects in dome work. Gilding and similar devices have long proved useless. With the use of gold glazed tiles the cost was very large and in the end the nature of the materials used in the glazed tile, together with the effect of atmospheric changes, soon destroyed the beautiful effect. With the glass tile, however, the gold is protected by the glass, and the mirror-like effect usually desired is readily obtained.

Cork tiles for walls and floors, laid on the hard surface with the Crull system, is also a new feature. It proves a most desirable flooring for bathrooms, and it is the purpose of the United States Navy to introduce it on the walls of officers' apartments and decks.

AN INTERESTING REPORT.

In these days of close competition, the element of economy is unquestionably of prime importance, and the success or failure of business enterprises is often directly traced to the degree of judgment exercised in endeavoring to prevent waste. Having this fact in mind, Mr. Edward Atkinson, the eminent statistician, president of the Mutual Boiler Insurance Co., of Boston, has instigated an investigation as to the relative values of non-conducting coverings for steam-heated surfaces, taking into consideration not only their ability to resist the transmission of heat, but also the actual financial saving accruing from their use, and their entire safety as viewed from the standpoint of critical Fire Insurance Underwriters. The tests above referred to were conducted by Mr. C. L. Norton, of the Massachusetts Institute of Technology, and the following are extracts from his report and Mr. Atkinson's announcement:

"The investigation, of which the report is now submitted, has been made, under the supervision of the undersigned, for the Mutual Boiler Insurance Co., of Boston. Its scope has been extended beyond the hazard of fire, it being the purpose of this company to develop the safest and least costly methods of manufacturing and distributing steam, so far as that can be done in the conduct of a system of insurance of steam boilers."

"The conditions on which these examples of pipe and boiler coverings have been accepted have been the same as in the previous test by Mr. Norton; namely, that the contributors should examine the apparatus, pass upon the method of testing, and approve both apparatus and method, to the end that no exception should be taken on the publication of comparative results. These conditions have been met."

"We have not reported on pipe or boiler coverings made of what is called mineral wool, which is the slag of the iron furnace blown into filaments, which are, in fact, an impure kind of glass. This material holds entrapped air, being of itself of no value as a heat-retardent. Under vibration it is apt to become more and more massed into a semi-solid, leaving the top of a pipe partially covered, the under side of the covering more and more solid, and therefore less effective. It is a dangerous material to handle and to use. The fine dust getting under the nails creates irritation and sometimes bad sores, or, passing into the bronchial tubes and the lungs, sometimes causes hemorrhage. For this reason we have not again tested any type of mineral wool covering, and do not report upon them."

"The conclusions to which we have been led by the tests on which a report is now made, are as follows:

"There is a sufficient number of safe, suitable and incombustible coverings for steam pipes and boilers to maintain a reasonable and adequate competition, without giving regard to any of the composite pipe coverings which contain combustible material in greater or less quantity, according to the integrity of the makers, and without giving regard to pipe coverings which contain substances like sulphate of lime, which may cause the dangerous corrosion of the metal against which it is placed. We, therefore, name as the pipe and boiler coverings which may have the preference in respect to safety from fire and efficiency in service, the following makes:

Nonpareil Cork Nonpareil Cork Co., Bridgeport, Conn.
 Magnesia Keasby & Mattison, Ambler, Pa.
 Asbestos Air Cell Asbestos Paper Co., Boston.
 Imperial Asbestos H. F. Watson Co., Erie, Pa.

Respectfully submitted,

EDWARD ATKINSON,
 President.

TABLE I.

Specimen.	Name.	Maker.	B. T. U. loss per sq.ft. pipe surface per min.	Per cent. or ratio of loss to loss from bare pipe.	Thickness in inches.	Weight, ounces per ft. of length, 4 ins. diameter.
A	Nonpareil Cork Standard.	Nonpareil Cork Co.	2.20	15.0	1.00	27
B	Nonpareil Cork Octagonal.	Nonpareil Cork Co.	2.38	17.2	.80	16
C	Manville High Pressure.	Manville Co.	2.38	17.2	1.25	54
D	Magnesia	Keasby & Mattison.	2.45	17.7	1.12	35
E	Imperial Asbestos	H. F. Watson.	2.49	18.0	1.12	45
F	"W. B."	H. F. Watson.	2.62	18.9	1.12	59
G	Asbestos Air Cell.	Asbestos Paper Co.	2.77	20.0	1.12	35
H	Manville Infusorial Earth.	Manville Co.	2.80	20.2	1.50	..
I	Manville Low Pressure.	Manville Co.	2.87	20.7	1.25	..
J	Manville Magnesia Asbts.	Manville Co.	2.88	20.8	1.50	65
K	Magnabestos	Keasby & Mattison.	2.91	21.0	1.12	48
L	Moulded Sectional	H. F. Watson.	3.00	21.7	1.12	41
M	Marsden Infusorial Earth.	Marsden Co.	3.11	22.5	1.00	50
N	Marsden Infusorial Earth.	Marsden Co.	3.27	23.7	1.00	43
O	Asbestos Fire Board	Asbestos Paper Co.	3.33	24.1	1.12	35
P	Calcite	Phillip Carey Co.	3.61	26.1	1.12	66
Q	Bare Pipe	13.84	100.0

Nonpareil cork, which, according to the above is proven to be the best, has excited no little interest among scientific and practical men, and particularly those whose duty it is to select for their clients the best materials, of course taking into consideration the question of first cost. Regarding the safety and durability of the four coverings endorsed by Mr. Atkinson, Mr. Norton says: "The question of the ability of a pipe cover to withstand the action of heat for a prolonged period without being destroyed or rendered less efficient is of vital importance. The increasing use of cork as an insulator has led to many questions as to its ability to remain 'fire-proof.' I have exposed it to a temperature corresponding to three hundred and fifty pounds of steam for three months, and to a temperature corresponding to one hundred pounds for two years, and can detect

no change, and I am satisfied, as well as one can be without the actual experience, that any suspicion of its ability to withstand continued heating is groundless. The magnesia covering is, of course, unquestionable on this ground, being almost indestructible by heating. The Imperial Asbestos is also perfectly safe from any fire risks, as is the Air-Cell."

The Board of Underwriters of Philadelphia, Boston, Chicago, New Orleans, and other cities, have endorsed the use of Nonpareil Cork, and the insurance companies in New York insure at the same rates as if other high grade coverings were used, although the New York Board of Fire Underwriters has never given its official approval, which would appear to be excessive conservatism. The testing apparatus devised by Mr. Norton is most satisfactory, the radiation of heat through the coverings tested being measured electrically with entire exactness. It is fully described in his complete report, a copy of which can undoubtedly be obtained either from Mr. Atkinson or any of the manufacturers whose covering was tested.



THE PERFECTED ELEVATOR.

THE unparalleled success met with by the Otis Brothers & Co. elevator corporation, may be ascribed to various causes. But when we consider that a company engaged in the construction of those perilous-looking lifts can say that after a business career of thirty-six years, during which time the company has controlled the elevator trade in all the leading cities of the world, a passenger in an Otis elevator has never been seriously or fatally injured, then one can readily understand that it is not necessary to look further to find the chief secret of their prosperous career.

The corporation cannot help but attribute its success to that security passengers feel when riding in an Otis elevator. Years ago and up to the present time, hotels, stores and offices advertised prominently and continue to do so that their elevators were made by the Otis company. It was universally recognized both in America and Europe that whenever an elevator bore the imprint of the Otis manufacture that elevator was the acme of excellence, and the latest product of scientific research and experiment. Other elevator companies have experimented and based proposed improvements on the Otis elevator, taking it as a model, but it is generally admitted that as yet none have been able to equal or improve upon it.

The Otis Brothers & Co. is an old company, its establishment dating back to 1856. The improvements made in elevators from time to time are but epochs in the history of the company, for its history is the history of the development of the elevator. When one looks back and compares the crude machine that first did service with the well-equipped passenger cars that swiftly carry one up and down the lengthy elevator shaft, one recognizes the immense strides that have been made and the tremendous influence it has had on the building world. We must consider, in connection with the development, the new and important industry born and how enormously it has expanded the field for the investment of capital. The elevator has figuratively turned the atmosphere into gold. It will be remembered but a few years ago that when the Potter Building, in which the offices of the Otis company are located, was being erected, it cost Mr. Potter considerable combative energy to convince the world that he was not soaring to an unreasonable elevation. But with the advent of the perfected Otis elevator, and skeleton construction, investors were enabled to build to a height which a decade ago would be considered in a business building simply monstrous.

The factory of the company, the largest of its kind in the world, is located in Yonkers, N. Y. A large force is kept continuously at work, and in a busy season the forces can be doubled. From this plant elevators are sent to every quarter of the civilized world. The London office controls the European trade; in Paris, Berlin and other centres of population, the important buildings are equipped with Otis elevators. The London office also controls the Asiatic and African trade, but all machines for foreign countries are manufactured in Yonkers, for the company is truly an American one, and while it can compete successfully with foreign manufacturers it has decided to give American labor the benefit. The central home office is in New York, but the selling agencies are located in every city in the Union, and in the chief cities in South America and the West Indies.

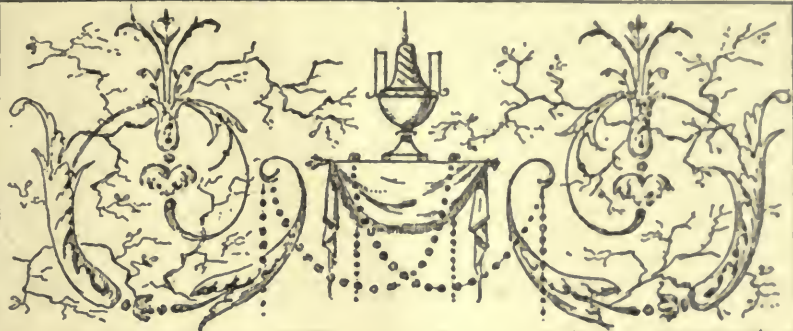
One can readily judge on seeing how the operations of this company cover the wide world, that the managers must have been men of great enterprise, and that they were most excellent financiers. They did not lack the qualities to push forward their operations wherever an opening could be observed; but it is doubtful if this is the secret of their great success. There is no question but that it was and is at the present time due to the unqualified superiority of the elevator, the company made. It will be remembered that when passenger elevators for hotels, apartment houses, office buildings, and the like, first became common, accidents were also common, and that they even became so frequent that a prudent man, before stepping into an elevator, felt like privately asking the janitor, or the conductor, the name of the maker. Then it was that the name Otis began to shine with a peculiar lustre. Accidents in the Otis elevators were practically unknown, and the most timid soon learned to step into one of the cars with a feeling of as much security as he would step into a horse-car. It was no boom that followed; it was the general recognition of the superior quality of the Otis elevator. A builder or architect could hardly afford to recommend anything but an Otis elevator, and hence it happens that the products of the firm are counted away up among the many thousands, and that even a partial list of the buildings in which they are used becomes almost endless, covering about eighty-five closely printed columns in a large book. It is safe to say that three-fourths of the elevators in New York have been manufactured by this company; an observant person can see them in almost every building, whether office, mercantile, municipal or hotel. When one learns that the Otis elevators in New York carry more passengers than does the elevated railroad system, without hitch, delay or accident, then one can appreciate the perfect construction of that elevator.

Probably the greatest triumph which an American company ever

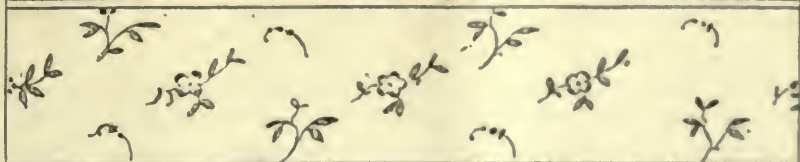
received at home or abroad fell to the lot of Otis Brothers & Co. It was due to the marked superiority of their elevator. When the Glasgow Harbor Tunnel Co. had demonstrated that the engineering feats could be accomplished and that the elevator system of lowering and raising traffic, both pedestrian and equestrian, to the channel way was necessary, the municipal authorities inserted a clause in the franchise to the effect that the Otis elevator, being considered the best the world offered, should then be used. The elevator system in use there now is the greatest in any country. The Weehawken elevators, probably the largest in America, were also manufactured by the Otis Brothers & Co.

What this company gained by inventive talent, care and good judgment in the earlier years of its career, it has never lost. Their safety appliances have not been improved upon, nor is there anything as yet as perfect as the Otis governor safety stop which prevents the falling of the carriage. The company is always ready to experiment upon improvements, but they are never used unless after a rigid test they are shown to be practical. Strength and perfect detail in all matters connected with the hoisting machinery and elevators made by the Otis Brothers & Co. has been always kept in view by the corps of engineers and experts. The company throughout its whole career has been progressive; it was always ready to place before architects, builders and investors an improvement in some part of the machine which was thoroughly tested, and which met with the approval of all concerned. In this way the company maintained the foremost place in the elevator trade throughout the world.





Technical Department





THE MANUFACTURE OF ROSENDALE CEMENT.

IN 1823, while building the Delaware and Hudson Canal, near the village of Rosendale, Ulster County, New York, the fact was discovered that the dark blue limestone rock through which the canal was being excavated, possessed powerful hydraulic properties, and, upon proper calcination, would produce a hydraulic cement. About ten years later, or in 1832, Watson E. Lawrence built a few small kilns, opened a mill, and began the manufacture of the "Lawrence" brand of Rosendale cement at Lawrenceville, on the banks of Rondout Creek, not far from the village of Rosendale. This mill, which has long since been closed, was operated by water-power from the creek, and was capable of producing 20 barrels of cement per day. The growth of the use of Rosendale Cement since the opening of the Lawrenceville mill has been in proportion to the growth of the country. The present mills of the Lawrence Cement Company produce 5,300 barrels of cement per day and about 1,200,000 barrels per year, or about one-third of the Rosendale cement manufactured in Ulster County, and about one-eighth of the total amount manufactured in the United States.

The company's mills are located at Binnewater and Eddyville, grinding the rock from 66 kilns. The respective capacities of the two mills are 2,500 barrels and 2,800 barrels of cement per day.

The source from which the Lawrence Cement Company derives its supply of cement rock is the well-known tentaculate or water limestone, belonging to the great natural cement rock formation extending along the Appalachian Mountains. In Ulster County the deposits are mostly found within the limits of a narrow belt, scarcely a mile wide, skirting the base of the Shawangunk Mountains, along the line of the Delaware & Hudson Canal, in the valley of Rondout Creek.

The rock used in the manufacture of "Hoffman" Rosendale cement is taken from two beds, separated by a sandstone rock, known as the "middle rock." The upper of these beds is known as the "light rock" and the lower as the "dark rock," and the two are mixed together in the proportion found to give the best results for the different quarries. After blasting, the rock is broken into pieces varying from



the size of an orange to that of a football, loaded on tram cars and taken to the kilns for burning. The appearance of a quarry after the excavation of the cement rock is very clearly shown in the first photographic view. Here it will be seen that all of the cement rock in sight, excepting the pillars left to support the roof, has been excavated, and quarrying operations are now being carried on further in to the left of the view.

In describing the process of manufacture of "Hoffman" Rosendale cement, from the blasting of the rock to the labeling of the barrels of cement ready for shipment, the works at Binnewater have been selected for illustration. This may be taken as a typical plant, and a description of the process of manufacture as carried out here will apply equally well, except in minor details, to the company's other mills. At the Binnewater plant the quarries are located in the ridge directly to the rear of the mills. This location is unusually favorable, however, and for the other mills the rock has for the most part to be transported a considerable distance by tramway. In several instances, also, the kilns are located at some distance from the mills, and the burned rock has to be conveyed to the mills in the tram cars. After the excavation and breaking of the rock it is conveyed to the kilns, and, by means of a track passing over their tops, is dumped directly from the cars to convenient points for charging them.

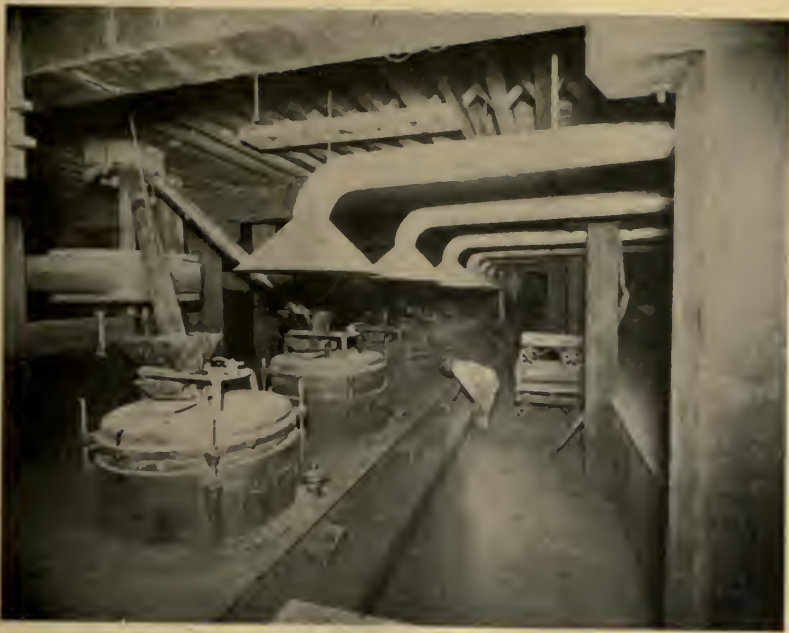
The process of calcination requires constant watchfulness and care, the personal element entering largely into the process, and, as the quality of the cement depends in a great degree upon the care taken in the calcination, it is important that only men of experience and skill should be employed as burners. The kilns are built of stone and lined with brick. In these kilns a fire is built, the calcination being carried on by placing on the wood used for lighting a thin layer of coal, over which a layer of stone from 6 inches to 8 inches thick is



placed, then a thin layer of coal, repeating the process as often as the removal of the calcined rock at the bottom requires it. The coal used is anthracite, usually of pea or buckwheat size, and is placed on the rock in very thin layers, scarcely covering it. Each morning the previous day's burning is removed from the bottom of the kilns, as by this time the rock has become sufficiently cool to be handled.

From the bottom of the kilns the stone, which has been properly calcined, is taken directly to the cracker-room. In the second view, showing the draw pits of the kilns at Binnewater, this cracker-room is just across the tramway tracks, and is partly shown at the right hand. In the cracker-room the rock is crushed to a fineness, varying from dust to lumps of the size of a hickory nut, by what are known as crackers. These are made of cast iron, and consist essentially of a frustum of a solid cone called the core, working concentrically within the inverted frustum of a hollow cone, both being provided on their adjacent surfaces with suitable grooves and flanges for breaking the stone as it passes down between them. The elements of the lower portions of both cones make a smaller angle with the common axis than those pertaining to the upper portions with a view to lessen the strain and the effects of sudden shocks upon the machinery, by securing a more gradual reduction of the stone to the required size. At the Binnewater mill there are eight of these crackers, driven by steam power, which, it may be stated here, is used in all of the company's mills.

After leaving the crackers all the cracked cement or burned stone goes to an elevator boot which is located two stories, or about 22 or 23 feet, below the crackers, from which place it is elevated by the elevator referred to, about 33 feet perpendicularly, and there it is thrown



into a conveyor. This conveyor carries it along for distribution to the different mills or grinders, there being spouts opposite each mill leading from the conveyor to them, and as the cracked stone passes through the different spouts it runs over a sieve or screen made of steel wire cloth. This sieve is fastened into a box or portion of the spout referred to above, and the cracked cement, when the process of grinding is completed, is of an average fineness of 96 per cent., when tested through a sieve of 2,500 meshes to the square inch, allowing the use of more sand when making concrete with "Hoffman" than is possible with most of the other brands of Rosendale.

After being crushed into the crackers all of the cracked cement which fails to pass through the sieve is conveyed by chutes directly to the grinders, which look as nearly as possible like the stones of an ordinary grist mill, as will be seen from the illustration of the grinding room. In fact, the grinding of cement is exactly like the grinding of corn. The Shawangunk conglomerate, or grit, which is found in large quantities in Ulster County, is used for the mill stones. The grinders are placed in a single row, and discharge into boxes containing screw conveyors, which run from each end to the centre. The ground cement is thus conveyed from each grinder to a central reservoir, from which it is taken by a bucket conveyor to the mixers. By means of the mixers, the cement coming from the separate grinders is thoroughly mixed, and uniformity of quality is secured.

From the mixers the cement passes by chutes to the barrels in the packing room. As each barrel is filled, it is removed to the scales, where a man removes or adds sufficient cement to bring the weight exactly to 320 lbs., a feature observed by few makers in preparing their cement for the market.

That Rosendale cement is growing in favor is evidenced by the fact that the largest quantity ever manufactured was in 1896, when the total made was 3,426,692 bbls., or nearly a quarter of a million more than any other previous year.

The production of the two mills of the Lawrence Cement Co. in 1896 was 1,121,729 barrels of cement.

As an indication of the conscientious care displayed by the company in the manufacture of its cement may be mentioned the thorough system of tests carried out. The daily product is subjected to an examination as regards fineness, setting qualities and strength. Not only is this done every half hour of the day, before the cement leaves the mills, but laboratory tests are made of each day's grinding at the New York office in the Washington Building.



A very prominent factor in an industry requiring frequent shipments of cargoes of large bulk and weight is, of course, the proximity of transportation lines in the centre of production. The company has two shipping points, viz., at Binnewater and Eddyville. At Binnewater the works are located on the Wallkill Valley R. R., and all of the cement manufactured here is shipped by railway. The works at Eddyville are located on Rondout Creek, where the cement is shipped to all navigable points.

This company, like many other large companies, has undergone many changes in its organization and personnel. It takes its name from Watson E. Lawrence, and, since 1853, the name of the brand of the cement manufactured has been known as "Hoffmán," more than eleven millions of barrels having been used on important buildings throughout the country.

A bronze medal for "general excellence" was awarded by the World's Columbian Exposition.