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THE fatal fire in the old *World* building in New York has called out some sharp comments from the press of that city. The owner, Mr. O. B. Potter, with certain mechanics employed by him, having testified that the structure was "well-built," provided with "quite sufficient" means of escape in case of fire, and that it was never on fire before, the *World* rejoins by remarking that notwithstanding the "quite sufficient" fire-escapes, four or five persons were burned to death, because they could not get out; that another witness, a fireman, testified to having been called to three fires in the building before the final one; that instead of being "well built," the partitions in it were made of unplastered pine boards, and the ceilings in the upper and lower stories of the same. Very little care appears to have been taken of the premises, and the building seems to have been one of those which crowd the narrower streets of our large cities, mere shells whose interior has been altered over, patched up, divided and sub-divided in the cheapest manner, until their construction, not less than the character of their occupancy, offers a standing menace to the property in the neighborhood.

THE destruction of the building seems, however, although the owner cannot be said to have shown remarkable diligence in the care of his property, to have been rather the result of his ignorance of precautions which an expert would have thought of immediately, rather than of any intentional or culpable negligence. According to the testimony taken at the inquest, the building when first erected was furnished with a flue for a steam boiler, which was kept in constant operation. Within a few years the construction of the Morse, Vanderbilt, and other lofty buildings in the neighborhood had impaired the draught of this flue, and another larger one had been made by taking out the wall of an adjoining stack, and removing the with between two unused flues, so as to form one of considerable size, then closing the opening with four-inch brickwork. The smoke from the boiler was turned into this new shaft, which gave a perfect draught, but complaints were soon heard of the heat of the wall over it, even as far as the fifth story, and for some days before the fire a smell of burning wood was perceived in the building. The day before the conflagration, this smell having become more distinct, an investigation was made, resulting in the removal of a charred timber from the fifth-story floor. Mr. Potter then, desirous of preventing further danger from the flue, sent for his masons, and had the draught from the boiler shifted back to the old flue, and the opening into the new one closed with bricks and mortar. The walls rapidly cooled, and to all appearance the danger was averted, so that Mr. Potter left the city the next morning for his farm in the country, where he received a telegram in the middle of the day, saying that his building was in flames.

THE circumstances seem to us to indicate that a slow combustion had been kindled in several portions of the wood-work by the proximity of the new flue, which was unquestionably insecurely built and overheated. The charring of the beam in the fifth floor was simply an example of the process in operation in other places, and the removal of the timber only diminished

the danger, but without reaching all the trouble. The shifting of the boiler draught back to the old flue, which had served its purpose safely for over twenty years, was a wise measure, but in this instance was adopted too late. The wood-work, already dried and carbonized by the heat, probably continued to smoulder, although the exciting cause was removed, until some access of air quickened the spark into a flame. Experts know that in such cases the combustible material will sometimes burn almost imperceptibly for weeks, to burst out into violent combustion if opportunity offers, or die out quietly if oxygen is not supplied, but the average proprietor can hardly be expected to understand this fully, and Mr. Potter probably did all that the case seemed to him to require. The structure itself was, it is true, old and inflammable, and rendered more so by the numerous wooden partitions which divided it into rooms, but Mr. Potter found no difficulty in insuring it last year for its full value at the rate of fifty-five hundredths of one per cent, and probably thought that if, as this would indicate, the agents of the underwriters believed that it would not burn down for at least two hundred years, he need feel no very great anxiety as to its security.

A CAREFULLY prepared set of rules for the arrangement of apparatus for electric lighting has been adopted by the Board of United Fire Underwriters in America, and issued to its constituent associations. The regulations are so important, not only to architects, who are often obliged to direct the introduction of electric wires in buildings, but to owners and occupants of structures in which the electric-light is already in operation, that we reproduce them in full in another column, and advise our readers to preserve them for reference. Of the rules laid down, although all are of recognized value, very few are yet in general use, the electric-light companies being too intent upon present profit to take the precautions which every day's experience shows to be necessary to insure safety, and their publication, by calling attention to the difference between good and defective work, will do much to promote a demand for the former, even independently of the coercion which will be exerted by the refusal of the companies to insure risks where their regulations for the introduction of the wires have not been complied with. Considering the great and beneficial influence which the underwriters have had over the practice of electric lighting, by their intelligent investigations and well-considered suggestions, it seems strange that they should not extend the field of their inquiries to other details of building. A regulation, for instance, prohibiting the agents of the associated companies from taking risks on buildings in which wooden cold-air boxes were employed to supply furnaces would save to the insurance interest more money in three winter months than the code of electric-light regulations will in five years, and there would be no more difficulty in enforcing the one than the other. If this should be thought too radical a measure, a beginning might be made with the smallest matters, such as the requirement of sheets of zinc under stoves, the prohibition of projecting bases to chimneys or the like, and the way once opened, stricter provisions could follow, to the advantage of the whole community.

OUR readers will recollect the case which occurred a few months ago, where the New York Inspector of Buildings refused his assent to a certain project for alteration of a building, and after an appeal had been taken from his decision to the Board of Examiners, which voted against him, still refused his consent, on the ground that the statute only gave to these examiners authority to advise him, and not to compel him to accede to their opinion. The parties interested took their case to the Supreme Court, which in General Term last week approved the position of the Inspector, and confirmed his exclusive discretion in such matters. A minority opinion was delivered by one member of the court, Judge Brady, who considered it impossible that the Legislature should have intended to confer upon one person absolute power of determining whether an enlargement or alteration of a building should or should not be made, and that the statute omitting to provide definitely for any other appeal, the Fire Commissioners might fairly be inferred to possess authority to reverse the decisions of the Inspector, their subordinate. Unless some such relief as this were provided, there would be no remedy, he thought, for an

unjust or erroneous ruling of the Inspector. This seems sensible enough, certainly, and the parties aggrieved by Mr. Esterbrook's decision will carry the matter before the Court of Appeals, whose decree will be authoritative and final.

A SUGGESTION is made by the Boston *Herald* which deserves careful consideration, not only by those to whom it is particularly addressed, but to citizens of other places where the circumstances are, or may be, similar. After speaking of the difficulties which lie in the way of establishing what every one acknowledges to be much needed in the United States—a school of practical forestry, the *Herald* calls attention to a proposition which has met with much favor in the eastern part of Massachusetts, for taking and laying out as a public park a large tract of picturesque territory about ten miles from Boston, called the Middlesex Fells, and remarks that these two schemes might be combined in a manner very favorable to both, and without the direct coöperation of the State, by the formation of a corporation, authorized to hold the territory included in the Fells, and carry out experiments in forestry on a large scale, and with a view to profit, keeping the place at the same time open to the public, which could safely be done under certain restrictions. As the district in question constitutes the gathering ground for the lakes which furnish several large towns with water, it seems reasonable to suppose that these towns would find it for their interest to subscribe liberally for the stock of the corporation, in consideration of the advantage which they would derive from the control thus secured over the sources of their water supply, and the private individuals who have signified their willingness to contribute toward the cost of acquiring the land for the benefit of the public might be still more disposed to lend assistance in a project which, while it promised to the public all the advantages of the original scheme, held out the prospect of some return to themselves. The profits of the enterprise would probably be small, but the outlay would be trifling and the risk very slight, while the close vicinity of a certain and increasing market for all forest products affords an assurance that economical cultivation and management would result in some degree of financial success. The subject is well worth discussion, and if statistics could be obtained, showing what results might be reasonably anticipated, it seems quite probable that the project might be carried out.

A COMPANY has been formed in Philadelphia, to construct an underground railway through the heart of that city, beginning at the lower end of Market Street, and extending up this avenue to Broad Street, which crosses it at right angles, dividing at this point, and running north and south through Broad Street, for whatever distance may seem desirable. It is proposed to lay a double track under these streets, and to build lateral branches under other thoroughfares if needed. Although the traffic of Broad or Market Streets is but a fraction of that through Broadway, an efficient system of rapid transit would be a great advantage to Philadelphia, and as Broad and Market Streets are so wide that an excavation through the middle of them need cause no uneasiness to owners of buildings on each side, it is quite possible that the capital of Pennsylvania will have its subterranean road in running order before that of its great rival at the mouth of the Hudson is fairly under way.

ANOTHER elevator accident of an unusual kind serves to illustrate the caution which should be observed in inspecting machinery after the occurrence of a fire or other accident by which it may have been affected. In a large brick building in Newark, N. J., a fire took place a few days ago, doing considerable damage in the upper floors, and charring the wood-work. The elevator shaft, which served as a flue for the fire, suffered most, and the platform was reduced nearly to the state of charcoal. The inspectors of the insurance companies, however, estimated that it was still capable of sustaining a load of a thousand pounds, and it was utilized for removing the injured goods from the upper story. Several men were engaged in this work, and had placed some pieces of machinery upon the platform, when it fell, carrying four of them with it to the bottom. Three of these were fatally injured, and the fourth will be a cripple for life. On examination it was found that the lead, by which the wire rope was secured to the socket in the beam of the elevator had been almost entirely melted out, so that the rope had pulled away from its attachment. The elevator was provided with a safety catch, but this proved entirely useless.

Two decisions of interest to architects and builders have just been delivered by the French Cour d'Appel. The first is simply a reiteration of the principle so often affirmed by the English courts, that when a penal clause has been incorporated in a contract, obliging the contractor to pay a stipulated sum as ascertained damages for every day of delay beyond a fixed time, this clause must be sustained, as being the expression of the free intention of the parties, and the court can do no more than determine the actual number of days' delay chargeable to the contractor. The other decree applied to a case in which a dealer, who had furnished supplies to a sub-contractor for public work, on the bankruptcy of the sub-contractor applied to the principal contractor for his pay, on the ground that the agreement entered into on behalf of the State prohibited all sub-contracts, and provided that in case any such were made the principal contractor, together with his "caution," or forfeit-money, should be held answerable for the work which he had delegated to another. The court held that this clause was intended simply as a guaranty to the State of the responsibility of the principal contractor, whether he made sub-contracts or not, and did not render him accountable to third parties, who had contracted with his sub-contractor, but between whom and himself there existed no legal relation.

AN extraordinary species of horse-car is said to be now on exhibition in Chicago, where a company has been formed to introduce it to public use. The main peculiarity of the vehicle consists in the fact that it carries its own track, and is thus adapted for use on any kind of road. The shape of the car itself is not very different from that of the ordinary kind, and it rests upon a four-wheeled truck, set under the middle of the body. These wheels project slightly beyond the side of the car, and run, not on the ground, but on the inner surface of two large steel rings, each ten feet in diameter, which are held to the car by sets of wheel-clamps, and revolve as the whole is drawn forward, the entire machine resembling in its mode of progression some of the little German toys sold for children. The car is designed to hold fifty people, and the owners of the patent claim that the greater the load, the easier is the movement. Two horses will be employed to draw it, and brakes will be adapted to the wheels in the usual manner. The company proposes to build a thousand cars, and run them through the streets of Chicago.

A RECENT decision of the Commissioner of the Land Office has caused much anxiety among the large class of settlers upon the public domain who have availed themselves of the law granting a quarter-section of land,—one hundred and sixty acres—to any actual resident who will plant ten acres of his tract with forest trees. In several of the States and Territories, trees of any kind grow with difficulty, and the occupants of the fertile lands very naturally set out those varieties which promise to give the least difficulty in cultivation. Among these the catalpa, the ailantus, and the Osage orange, all of which are small, but thrifty and ornamental trees, of rapid growth, have been particularly favored; and the Lombardy poplar, which, though less prized by experts, is a large and imposing variety, has been introduced in some cases at considerable expense. It is not surprising, therefore, that an official declaration that these species are not forest trees within the meaning of the Act has caused dismay to those who have spent time and money in cultivating them. In defence of the colonists it is asserted that no other trees than the species mentioned can be successfully planted west of the Missouri River, and if this is found to be true, it would seem that the settlers have not only not neglected the duty by the performance of which they were to acquire a title to their lands, but have done the best that could be done under the circumstances. It is a remarkable fact that the oaks, maples, walnuts and other deciduous forest trees do not grow spontaneously, even in the most favored tracts, until the ground has been prepared for them by a preceding vegetation of a different kind. Every one who has seen the pine and spruce forests of New Hampshire must have observed that when such land is cleared, by fire or otherwise, the evergreen wood is succeeded, not by a new growth of the same species, but by a light shrubbery of birch, which flourishes for some years, to give place gradually to the stronger and slower-growing oaks and other hard-wood trees, as the soil becomes enriched by the decay of the fallen leaves; and it is very possible that the small, shrublike trees now planted on the open plains of the West may form the only practicable preparation for a heavier growth to succeed them.

ARCHITECTURAL TERRA-COTTA.



architects should fully understand its peculiarities and capacities, and we therefore reproduce at length, from the *Building News*, a very practical paper on this material, written by Mr. Joseph Timms, of Gibbs & Canning's works, at Tamworth, England:—

I propose to divide my subject under the following heads—namely, the origin of terra-cotta, its durability, the material of which it is made, the processes of its manufacture, and the mode of its application; and to say a few words on each of these points as far as a limited space will permit.

In searching for the origin of terra-cotta, we must let our thoughts go back to the most remote periods of which we have any historical record, and in those ancient times we find a material answering in substance to the terra-cotta of to-day being largely used for the purpose of building. It is said "that the children of Seth, the son of Adam, built two pillars: one of brick, and one of stone, and they inscribed upon each of them the discoveries they had made concerning the heavenly bodies, so that their inventions might be preserved to mankind, and not be lost before they became sufficiently known." This is the earliest record we have of any kind of building material: we are told previously of their building cities, but no record is made of the material used. I think from this single record we may reasonably infer that brick was a general building material in those ancient antediluvian days. I am aware that the term brick, as technically applied and understood in our days, is restricted to blocks of burnt clay of a limited size, not exceeding such as may be easily taken up and laid in the building with one hand, whilst the other is left free for the use of the trowel; and that the term "terra-cotta" applies only to blocks of a larger size, into which only the best selected clays are convertible. But in this pillar of brick I think we may discern the employment of both small and large blocks; and that the term "terra-cotta" being then unknown, the whole is spoken of as brick. Whatever small blocks there may have been used, it is only reasonable to suppose that larger ones in the shape of tablets would be required, on which to model or inscribe the representations of the heavenly bodies, illustrative of the manner of their revolutions as then believed in, or ascertained.

Then coming to the days immediately following the Deluge, we read that the families of the sons of Noah, as they journeyed eastward, found a plain in the land of Shinar and dwelt there, and they said one to another, "Go to, let us make bricks, and burn them thoroughly, and they had brick for stone." I think that from the mention of brick in these particular instances, we may reasonably conclude that brick also entered very largely into the other building operations of the time, and that the cities built in those periods, such as Nod and Enoch before, and Babylon, Sidon and Nineveh after, the Flood, were in great part built with that material. We have corroborative evidence in support of this supposition in the masses of brickwork, and many fragments of ceramic ornamentation which have been unearthed and brought to light by the researches that have been made in what are supposed to be the remains of those ancient cities. Of course, it is impossible to determine with any degree of certainty as to what part of these remains, if any, belong to that very early period of which we have been speaking, but they are certainly the most ancient that have yet been discovered. Enough, therefore, I think, has been said to show that the manufacture of terra-cotta is no new invention, but one of the earliest, if not the very earliest, which history has recorded, or antiquarian research has revealed.

Coming down to more modern times, the technical term "terra-cotta" being in itself Italian, at once points to the source from whence its present extensive and extending use as an architectural or building material is derived. It was, no doubt, in the first instance, applied by the Italians more to the purposes of ornamentation than construction, and this, very probably, because from its plasticity they could easily treat it, and bring it into any artistic form they might desire.

Its present use in this country as a constructive material seems to have arisen from a felt want of some good, reliable building material that would retain its color, and successfully resist the decaying influence of the atmospheric gases, especially in large towns and cities; the best and most carefully selected stone having been found to fail in these respects.

I think that the principal value of terra-cotta lies in its durability, and that its continued use as a building material greatly depends upon this. Whether it will fulfil this condition is, as yet, a matter

THE multiplication of terra-cotta manufactories in this country, which enables architects to employ in ever increasing abundance one of the most valuable of building materials, makes it desirable that

of experiment. It is now on its trial, and time alone will disclose it. Its introduction into this country being of so recent a date, it may be thought premature to make any positive assertion; but I think we may safely say, without fear of contradiction, that from the observations we have been able to make during the few years it has been in use, and from the chemical experiments that have been made upon it, there is every reason to believe that it will answer the purpose admirably. In the first place, terra-cotta being impervious to wet, or nearly so, it will not vegetate, as stone is liable to do; and the small particles of dust, soot, etc., which settle down upon it, and which in the case of stone so soon disfigure it, changing it from white to black, are upon every shower of rain that falls washed away, leaving the color just as at first. And secondly, that most destructive influence of all with which stone has to contend—the quick succession of moisture and frost, which so rapidly demolishes a stone building, crumbling away its copings, projections and mouldings;—this decaying influence has little or no power upon terra-cotta.

Of course, it will be understood that the foregoing remarks are intended to apply only to well-burnt terra-cotta, made from a suitable clay. There is bad terra-cotta as well as bad stone, and I think that of the two bad stone is the preferable. Nothing can be more objectionable than terra-cotta made of unsuitable clays, that will not stand the maximum of heat; or made of good clay, but only partly or imperfectly burnt. The object that is aimed at, and which I think has led to the adoption of terra-cotta—its durability—is defeated by this inferior class of goods. The making of it cannot be too severely censured, or its use too roughly discarded. In these days of sharp competition, when we are too apt to look more to the cost than the quality of an article, there is great danger of this rubbish, in the shape of half-burnt clay, getting into the market, much to the detriment and permanent injury of the genuine and reliable material. I think that architects have the remedy of this in a great measure in their own hands, by looking well to the quality of the material they recommend. A perishable material is dear at any price; although it may cost slightly more to obtain a durable one, it is by far the cheapest in the end. Sometimes the durability of terra-cotta is materially affected by the manufacturers endeavoring to meet the expressed wish of the architect that it should be of a certain tint or color which is unnatural to it when treated in a legitimate way. A little lighter or a little darker may seem an easy thing to attain, but many times it means the sacrificing of durability, in order to satisfy a questionable taste or fancy. To obtain the desired color, the material has to be heated artificially; it must be either under or over-burnt, or there must be an admixture of other, and often inferior, clays with the genuine, and thereby the whole substance is deteriorated. If terra-cotta is to stand its ground, and prove itself a durable first-class building material, I think it would be well for the manufacturers themselves to be honest, and to exhibit plainly what their own particular clays will produce of a reliable character, without any injurious admixture or composition, and not be easily induced to deviate from it. To take a good material as a base on which to heap as much of an inferior kind as it is able to bear, or as much as is compatible with its saleability, will in the end prove most suicidal to the manufacturer's interest.

The material, as you are well aware, is clay. It is, then, concerning the composition and manipulation of the clays that I have to speak, and more especially to point out those that I consider the most suitable for the manufacture of terra-cotta. In this I think it very probable that we differ from the most ancient practitioners. We cannot suppose that the ancients would in the first instance delve into the bowels of the earth in order to ascertain if other and better clays could be found for their purpose. They would, in all likelihood, make use of that which came the readiest to their hand. In this case, they would naturally begin with the surface clays of the alluvial plains, which were easily obtained, and because of their native plasticity easily heated and moulded or fashioned into form by the best methods they then could invent.

The clays of which the best terra-cotta of to-day is manufactured, as a rule, with few exceptions, have to be raised from a distance below the surface of the earth. This is generally done by means of sinking shafts and mining for it in the same way as for coal, or if by open work, a large amount of superincumbent earth has to be removed in order to obtain it. A hard, compressed substance of clay is by this means obtained, which, if free from foreign organic matter, and possessing the proper stamina of a genuine clay, is the most serviceable that can be obtained for this work.

However desirable it may be to make use of the surface clays of the country for the manufacture of terra-cotta, because of the ease by which they may be obtained, and of their native plasticity, this is more than counterbalanced by the absence of strength and durability in the material they produce, and by its liability to crack, twist, and go out of shape in the manufacture. Whatever scientific knowledge or experiment has discovered, or may discover, of the nature of its deficiencies, I think it is impossible at a reasonable and remunerative cost to infuse into this surface clay that which will enable it to rank with such raw material as naturally possesses in itself the qualities which we look for; and it is very doubtful whether this can be effected at any cost whatsoever.

The chief substances of which all clays are composed are scientifically called alumina and silica; but these substances very much vary in their proportions, and as they vary, so the strength and durability

of the material they produce is increased or diminished. Alumina is an earth that may also be called a metallic base. It cannot be dissolved in water, but it has a close affinity for it, and when combined with water it yields a tenacious and plastic paste. Silica differs from alumina in not being a base—it is rather of the nature of an acid, for it will combine with the base of the alkalies, forming a class of salt-like substances called silicates. Silica is therefore able to combine with the base alumina, and produces silicate of alumina, which is really the constituent of the clay, rather than alumina alone. The presence of silica in very small proportions, as in the clayey top soils of the fields, seems only to prevent the extreme closeness of the clay; but in large proportions under the action of heat it acts as a cementing or consolidating substance. It is therefore on the proportion of silica which the clay contains that the strength and durability of the material depend, and in the manufacture of terra-cotta it is above all things desirable that the clay should possess its adequate proportion of silica.

The natural clays that are most favorable to the production of the best terra-cotta are those which contain from 60 to 70 per cent of silica, 20 to 30 per cent of alumina, and a small proportion of foreign materials, chiefly ferruginous oxide. These clays are to be found in abundance in many parts of the country, and only require the necessary labor and expense of excavating or mining in order to obtain them. In some few instances the surface plastic clay of the vale comes near to the required standard: in others, certain strata in the deep banks or beds of red marl approach it; but the best and most plentiful supply is in the anhydrous strata of the coal-measures, commonly called fire-clays. These seem to cover the whole area of the coal-measures, varying in thickness up to about five feet. Of course, the whole substance of these clays is not suited to the manufacture of terra-cotta; but with a judicious selection and amalgamation, the best and most reliable material is produced.

I think that I shall not be charged with undue partiality when I say that one of the most suitable beds of this clay available at this time is that which underlies the coal-measures at Glascoffe, in the neighborhood of Tamworth, and which is now at the service and use of Messrs. Gibbs and Canning. The superiority of this clay is manifest in the works they have already produced from it, to particularize which I would name the Natural History Museum, South Kensington. There are many other buildings to which I might confidently refer; but this one alone is enough to convince the most casual as well as the most searching observer, that the clays of which I am now speaking are an invaluable material for the production of terra-cotta.

There is also one metallic oxide—that of iron, which enters more or less into the composition of all genuine clays in some form or other, and pretty largely into some. This has little or no effect upon the strength or durability of the material, but only acts as a coloring agent. Its presence in small or large quantities makes the difference in the color, varying from a slightly tinged buff to a dark red. The action of the heat upon it brightens up or brings out the color, and the greater the heat that can be brought to bear upon it, without damage to the material, the darker the color becomes. Yet it is impossible for any scientific research or analysis to decide with any degree of accuracy what shade of color any clay will produce. They may be able to ascertain the quantity of the oxide it contains, but these are so varying in their results that experiment alone can decide the tint it will burn. Of course, it will be understood that I am now speaking of the colors which are natural to the clays, and not of any artificial ones that may be produced; this properly belongs to the manufacturing process. But I may here say, whilst speaking on the question of color, that the color properties of any clay may be increased or diminished by the addition or extraction of the oxides, and that other colors not natural to the clay may be produced by the aid of chemical ingredients, such as cobalt, for instance, which produces a dark blue gray; but it is doubtful whether the additional cost of all such productions will not exclude them from forming part in any extensive building operations.

Enough may have been said about the material, and I pass on to speak of the manufacture. But before we enter upon the manufacturing proper, there are some preliminaries which claim our attention. The first of these is the setting out of the work in order to ascertain the number, size and shape of the blocks required, so as to be able to give correct information for the making of the moulds out of which the blocks are cast, and the number of the blocks to be cast out of them. This work requires to be very accurately done, so that there may be no waste of material, and that every block may fit its intended place. In any important building this is no mean task: it requires a practical knowledge of drawing and construction, a full acquaintance with the nature and capabilities of the material, a considerable amount of mechanical skill, and an insight and perception sufficiently keen to take in the ideas and requirements of the architect, to see the way through from beginning to end, and, if necessary, to point out any practical difficulties there may be in the way, and to suggest a remedy.

Having ascertained what is required, the next step is to prepare the moulds. These are made of plaster, and are taken from a plaster model made to the exact form of the blocks required, only increased to allow exactly for the shrinking of the clay. For this, unless it is done in the first instance, the architect's drawing has to be carefully enlarged; a reverse profile has then to be made in strong sheet-zinc or other suitable material, and with this a plaster mould-

ing is run, which is cut up, jointed, and squared to the required size and shape. Any particular models requiring notches, sinkings, returns, enrichments, etc., have to be treated in a special manner. Great care is requisite in the preparation of these models, as upon the accuracy of them depends in a great measure the correct fitting together of the blocks, and the trueness of the work when placed in the building. The least twist or imperfection in these will repeat itself in the mould, in the block, and eventually in the building, proving a vexation and a perpetual eyesore.

The model having been perfectly prepared, a piece mould is then taken from it, in such manner as to allow of its being easily withdrawn without injury to the model. These moulds are so interlocked as to be readily put together, and form a substantial receptacle for the pressing of the clay. In making these moulds also, some considerable skill and practical knowledge and experience is required, and more especially for the work that is enriched or undercut—any slovenliness or bungling in this is sure to prove fatal to the work.

It must be confessed that in the performance of these preliminaries the terra-cotta manufacturers in the past have been sadly deficient. They have had a work thrust on them for which they were not prepared, and the importance of which they did not fully realize. The making of a few moulds for chimney-pots, vases, and such like things, that required no exact dimensions, and no particular nicety of fitting, had been about the full extent of their experience, and they thought that by such workmen as were then in their employ, they could succeed in this new and more important branch. In this they have been mistaken, and to this they are now fully alive. They now see the necessity of having men of superior ability, specially and technically trained for the work, and we may confidently expect that the terra-cotta of the future will be more appropriate to the purpose, and more exact in form, than the generality of it has been in the past.

I come now to what I have called the manufacturing proper. In speaking of this, I think we cannot do better than begin with the raw material, and follow it through all the stages of its manufacture. Let us first take up the surface, or naturally plastic, clays. The preparation of these, in order to secure satisfactory results, is even more elaborate than for the hard consolidated ones. It is so, because of the grit and other impurities they contain, which must be thoroughly eradicated before they are in any way fit for the purpose designed. To accomplish this, the clay has first to be thoroughly incorporated with water, and by a process of blunging brought into a state of liquidity, for which purpose several methods are devised. It is then passed through a very fine sieve, by which all the impurities, in the shape of stone, grit, etc., are extracted. From the sieve it passes into the drying-pan, until it is full to the depth of 4 or 5 inches, and there remains until, by the action of the fire underneath, the water is sufficiently evaporated, when it is taken out and passed through the pug-mill, which is a machine composed of blades, revolving in a cylinder. By this process the clay is brought into a high degree of plasticity, and when cooled down is ready for the hands of the presser.

With the hard marls and fire-clays, the process of preparation in some respects differs from the preceding ones. These clays are the better for having been exposed to the influence of the atmosphere for some three or four weeks before being taken in hand. They are then by means of powerful machinery, reduced to the condition of a very fine powder, for which several different kinds of machines have been invented. As the clay comes from the machine it is sifted and incorporated with an adequate supply of water, in which state it is passed through the pug-mill with the same result as before. The working up of these clays is improved by their being left in stacks covered up for some days before being used. If there is any mixture of clays from different strata, in order to secure equality of shrinkage, great exactness in the proportion of each should be preserved, or it will be found that the material made from one mixture will be smaller or larger than from another. In such case, it will be impossible for terra-cotta, made from the two, to come together and make good work. Some manufacturers endeavor to modify the shrinkage of each of these clays by adding "grog," made of the same material, burnt and ground up. In that case the proportions must also be kept, and I am of opinion that such an admixture does not improve the ring and soundness of the material produced.

The clay having been prepared, it is taken in hand by the presser, who, in the first place, forms a block of it of a workable size near at hand upon his bench, from which by means of a wire, he cuts slices of sufficient thickness and lays them down upon the battering slab; these are well battered down in order to drive out the air and compress them, and from them he cuts suitable sizes for the work he has in hand. It is customary to well dust the mould to prevent the clay from adhering to it, then to cover all the several pieces of the mould with the clay and well press it upon them. As the pieces are taken up and put together, great care should be taken that none of the clay gets between the joinings of the mould, so as to throw it out of shape. When all the several pieces are adjusted it is strongly braced to keep it in form, and then by the hand all the several joinings are well puddled and pressed together so that the adhesion may be complete. Afterward if any webbing be required for the strengthening of the block it is cut and placed in position. The pressing is then practically finished, and after remaining some time in order to stiff-

fen, it is turned over upon a straight board, the mould is taken off, and the block left to dry. In this work of pressing no great skill is required, and the commonest laborer may soon be brought into the way of doing it. It only requires care and a determination to do it perfectly. If the clay is not well battered, or if not well pressed upon the mould, or if the joinings are not well made, it is sure to turn out faulty; but if these points are carefully attended to, a sound block will be the result.

Too great haste in drying is very injurious to the work, and especially when first taken from the mould. It should not be placed in way of draughts or exposed to any considerable degree of heat, as by this the outside is formed into a crust before the inside has time to attain the same degree of dryness: this prevents the proper shrinkage of the clay, and produces cracks, warping and twisting. At first it is essential that the drying process should proceed slowly and gradually in order to produce good work.

When it has become sufficiently dry it is taken up by the finisher, who carefully takes off the seams, and, if it is at all drawn out of shape, he restores it, and then cleanly polishes the face. Far greater skill is required for this work, than for the pressing, and only the best workmen should be employed at it; for, with whatever nicety or exactness the moulds may have been prepared, it will be all neutralized unless the finisher does his work properly. The blocks will now be in such a state of solidity that they may be placed in a better position for completing the process of drying.

There are some kinds of terra-cotta which require special treatment at the hands of the finisher, and particularly that made from the red plastic clays. There are few of these clays but what are impregnated with what is called a lime-juice, created by the action of the rain-water with which it is saturated, and which always contains a small quantity of carbonic acid, corroding the particles of stone it contains. During the process of drying, as the water evaporates, this "juice" rises to the surface, forming a kind of scum, which, if not removed before burning, greatly disfigures the material. To wash it over with any coloring matter only adds to the disappointment, as this will soon peel off and disclose the white surface beneath.

Now we come to the process of burning. This is a very critical time in the production of terra-cotta, and at the outset let me say that it is important to have a competent and well-experienced man for this work, as a little carelessness or unsound judgment here will soon frustrate all the preceding endeavors, and render them quite fruitless. He must understand the quality and nature of the material placed in his hands, and be able to perceive beforehand with exactness the effect which the heat he administers will have upon it. He must know the time to apply it, the quantity to give, the degree to attain, and almost the precise moment when to withdraw or discontinue it, attending the process with a watchfulness and anxiety which a due sense of his responsibility alone can inspire.

There are several kinds of kilns used for the burning of terra-cotta, each maker very probably adopting those he considers best suited to the nature of his material. We cannot suppose that they would allow any pecuniary considerations to stand in the way of their erecting those which in their judgment will do the work most perfectly. Some of these kilns are made square, and some round; some with a down-draught and some with an up-draught. But the best for the purpose, in my opinion, whatever the material may be, is a cone muffled kiln, as by this the object desired, viz.: a thoroughness and equality in the burning and a clearness and regularity in the color, is best attained; the heat becomes more equally distributed, while the clay is protected from the damaging effects of the sulphur and flame. The additional cost of erecting these kilns, and the extra amount of fuel required in the heating of them, is more than repaid by the superior substance and purity in colors of the material they produce.

The blocks being sufficiently dry, they are placed in the kiln. The clays differ as to this condition—some kinds requiring to be more perfectly dry than others. It is then for some days subjected to a very low heat, in order to drive out the remaining moisture, and to evaporate the salts; the heat is afterwards gradually increased until it is brought to the required height. There is also great difference with regard to this: some terra-cotta will only bear a good red heat, whilst others require a white heat, enough to melt iron, or even steel. To aid the burner in deciding when the heat has been sufficiently applied, trial pieces put in for the purpose are continuously extracted, and when this climax is attained, the firing is discontinued and the kiln left to cool.

The manufacturing processes are now completed, and I turn to the last point on which I have proposed to speak.

I confess that I approach this part of my subject with some degree of diffidence, it being truly, if not absolutely, the prerogative of the architect, whose province I have no desire to invade. But from my long and intimate acquaintance and experience with this work, I think that I may be permitted to make a few suggestions for the guidance of those who are not as yet initiated into its use. So far, therefore, I venture to say, that designing for terra-cotta work does not very materially differ from that for stone, the difference lying principally in the jointing of the work so as to meet the nature and requirements of the material; and this should be done on the best methods of construction. All attempts at imitating masonry should be carefully avoided, giving to terra-cotta a standing and an individuality peculiar to itself, so that at first sight of a building, by the

very manner of its construction, the material may be recognized, and the word "artificial stone" which is sometimes given to it, may cease to be applied. I am of opinion that if this is done with sound judgment and architectural skill, the beauty and symmetry of the building will be enhanced, so that, instead of terra-cotta being called "artificial stone," it will have an attraction peculiar to itself.

To illustrate the above: It is impracticable to span an opening of any considerable width in one block; the work must be jointed up according to the ideas of the architect, but so as to allow of as many pieces in the sill, and as many voussoirs in the arch or head as is consistent with the appearance of strength and beauty. The jamb blocks, also, must be restricted in height not to exceed one foot or thereabouts. The mullions, transoms, and tracery should be made in as small pieces as the design will admit. And, if there are several orders in the depth of the mouldings, these should be as much as possible divided, care being taken that each alternate case bonds well upon the other. The strings and cornices should be reduced to as short lengths as convenient, and if the several orders in the mouldings of a cornice may be separated without prejudice to the constructional lines and strength of the work, it should be done; and the facing blocks should be made in as small sizes as the style of the building will permit.

I think that the foregoing suggestions are enough to serve as a guide to any who may not have had any extensive experience in working out drawings for terra-cotta construction, and I may safely leave it in their hands to carry the principles here indicated throughout every detail of the building.

In concluding, let me answer very briefly some of the objections that have been urged against the use of terra-cotta. The first of these is, its liability to twist and go out of shape, and so cause the lines in a building which should be rigidly straight to become distorted. I think that I have already said enough to show that such a defect does not necessarily belong to the material, but is produced by a want of skill or by carelessness and inattention. Undoubtedly, there are many instances to be produced, which, taken by themselves, would give force to this objection; but such illustrations have been taken from the infancy of the material struggling into life, and must not be brought up as full-grown specimens of its power and capabilities. As the demand for it has increased, it has gathered strength, knowledge, and skill. There are some good specimens of terra-cotta building at length to be seen, and there is no reason why every specimen in the future should not be equal to them, if not superior. The method to adopt, in order to obtain a good terra-cotta, is to pay a good price for it, and not have it unless it is good. If this plan were more generally adopted, all the inferior and inefficient makers would be shut out of the market, or be spurred up to make greater exertions for improvement, and the wretched specimens we sometimes see, and which make one blush, would soon become a thing of the past, never to be recalled.

Another objection that has been, and is still urged against the use of terra-cotta, is the time it takes to produce it, and the consequent slow progress of the structure where it is used. It cannot be denied that there has been some good ground of complaint in this respect, and I can readily conceive the irritation and disappointment which must sometimes have been caused by the delay in the delivery of this material. It would, no doubt, be instructive if we could sift out the cause of these delays, and I imagine that if we could do this, in nine cases out of every ten, the fault would not be chargeable to the material, but to some cause which, by foresight and precaution, might have been avoided. The maker has, perhaps, not been up to the mark; his appliances may have been insufficient, or his workmen inexperienced; his hands may have been too full, or he may have been too slack, and the price too low to stimulate or quicken him. Or, it is possible that the drawings may not have been delivered to him in time. It must have been observed, from what I have previously said, that there are certain stages in the manufacture, where hurry, or push, would be most injurious to the welfare of the work; and sometimes great delay is caused by having to press it unduly at these most critical times, in order, if possible, to supply it within a given time: the consequence is, that the material turns out faulty, and the whole process has to be gone over again.

The processes in the manufacture of terra-cotta cannot well be abbreviated, and the only satisfactory way of solving the difficulty is to anticipate as much as possible the progress of the building. This may be done in the first instance by making a special contract for this work with the manufacturer himself, setting him at it some time before the commencement of the structure. Or, if this does not meet with the approval of the architect and his employers, it may be done by giving the manufacturer all possible time after the signing of the general contract. Some six weeks are required for the production of terra-cotta of the ordinary kind; this, at least, should be allowed at the commencement of the work, and, if the whole of the detail drawings for the building are placed in his hands with all possible speed, instead of waiting, as is often the case, until one part is executed before others are furnished, then there can be no reasonable or justifiable excuse for any serious delays in the delivery of the goods.

To facilitate the speedy execution of the work, it is important that the whole of the drawings (as far as possible) should be placed at once in the maker's hands, so that he may have the whole thing before him, and be able to take each part up in succession without delay, and not have details doled out to him some month or six weeks

before the work will be required. In my experience there have been many such cases where the hands have been comparatively standing still for some time, waiting for the next batch of drawings, and then, when the goods have not been forthcoming at the required time, the terra-cotta has had to bear the blame; whereas, if the whole of the drawings had been furnished at the first, the thing might have been accomplished with ease. It may be that at the precise moment of the reception of the drawings there is other work in hand requiring attention, and the manufacturer is unable to turn to this as quickly as he could wish; or, there may be some failure in the manufacture, which cannot always be foreseen or avoided, and which has to be replaced. Hence the necessity of anticipating the progress of the structure, and of giving the maker all possible help as to time.

Let me now add a few words on the question of comparative cost. It would be unfair to strike any comparison between the cost of terra-cotta and Bath-stone, which is proverbial for its softness and undurability when exposed to the atmospheric gases of large towns. Yet there are instances where the two estimates have been simultaneously obtained for the purpose of economy, and of testing the cost, and that for terra-cotta has been found to be the lowest, and has been accepted. But, speaking more generally, the advantage of terra-cotta in respect of cost depends principally or solely upon the number of blocks required of the same kind, or made out of the same mould. If there is only one, then the advantage is decidedly on the side of stone; if only a few, the cost may be equal; but, as the numbers begin to increase, the balance in favor of terra-cotta preponderates. So that, taking a building of any considerable size, where the same details are carried through sets of windows, etc., and with a continuous run of strings, cornices, etc., terra-cotta will compare very favorably with any stone which can be obtained. In all buildings there are many features of which there is no great repetition. These must be set against those that are largely repeated, and the cost of mould-making distributed over the entire surface. It sometimes happens that the cost of a single doorway or other special feature of the design, taken by itself, is very great, because of the number of moulds it requires to make it; hence, in estimating the cost, it is well to take the building as a whole.

The advantage on the side of terra-cotta is greatly increased if there is a large proportion of moulded work, and especially if there is any great repetition of enrichments in the mouldings. And another and not unimportant one is, that in all enrichments the exact simile of the artist's own handiwork is produced, instead of being left in the hands of masons or inferior artists to reproduce it, as it is in the case of stone. Of course, there are certain things which tell upon the comparative cost of terra-cotta and stone, such as distance and locality, but the probabilities are very decidedly in favor of terra-cotta being the cheapest.

After the above remarks, it seems almost superfluous to say that in designing for terra-cotta work, if cheapness is to be obtained or is a consideration, it is desirable for the architect to keep the idea of repetition before him, and aim at that without impoverishing the design; this may be counterbalanced by an increased richness of the mouldings, and a larger amount of artistic ornamentation.

A TREATISE ON WOOD-ENGRAVING.¹



THE announcement of this new issue of what still remains the standard English work on wood engraving may have given rise to hopes that were but to be disappointed; for it is in no sense a new edition. It is merely an exact reprint of the edition of 1861, the first having been issued in 1838. Since 1861 a great change has come over the practice of the art and a far greater degree of interest, moreover, has sprung up in the public mind concerning it. These facts might well have warranted a really new edition of this work carried up to date. Or if this would have made too bulky a volume, at least the existing chapters might have been edited and annotated throughout. This last would have been the better plan perhaps. Jackson and Chatto's book would have been rendered more useful to the reader of to-day, and the way would have been made plain for a supplementary work to deal with the more recent developments of wood engraving. That such a book cannot long remain unwritten seems quite certain. The literature of wood engraving in general is singularly scanty. And with reference to contemporary work there is nothing at all to be had save in the way of scattered magazine articles, if one excepts Mr. Linton's "History of Wood Engraving in America," published in the *American Art Review*, and announced for speedy appearance in book form. And this, though clever and interesting, is limited in scope and, of course, somewhat controversial.

If we turn, however, from what might and perhaps should have been to what the publisher really gives us, we acknowledge readily the standard worth of this volume. It is old-fashioned in some ways, even in its treatment of the periods to which it is necessarily limited. The author strays very often from the artistic or purely historical aspects of his subject into the antiquarian or controversial. But he is so clear, so enthusiastic, yet so full of good sense, that we

¹ A Treatise on Wood Engraving, Historical and Practical, by William Andrew Chatto. With upwards of four hundred illustrations engraved on wood by John Jackson. A new edition with an Additional Chapter, by Henry Bohn. New York: J. W. Bouton.

are not loath to follow him. Certain errors of detail may, of course, be noted; but these are lost in the general good impression that is left upon the reader's mind. His treatment of Bewick and the revival of the art is peculiarly attractive. The concluding chapter about later developments in England — prior to 1838, that is, — is naturally much less satisfactory to the reader of to-day. Corresponding Continental schools are not referred to, and Mr. Bohn's supplementary chapter is little more than an illustrated catalogue of names.

The portion which seems most behind our present needs is the chapter on the practice of the art. Exceedingly clear and well written it is a good explanation of former requirements and methods. But as it was composed before the modern improvements in printing and when photography on the wood and electrotyping were alike in their uncertain and almost untried infancy, it explains little of actual processes for the instruction of the reader.

All the wood-cuts in the book were laboriously copied on the wood by Mr. Jackson. The reduction of very large prints to small dimensions has been extensively practised, especially in the history of the earlier periods of the art. This necessarily destroys their beauty to a great degree and often renders inappropriate the encomiums pronounced in the text. This is, however, perhaps an inevitable defect. And the hurt here is after all not much greater than when we see, for example, Bewick's cuts copied by another hand though on the same scale as the originals. To-day, of course, these examples could have been reproduced, with infinitely less of labor, and with greater though still not complete accuracy, by some mechanical process.

One would, of course, have hailed an amended edition of this book with greater pleasure than a mere reprint. But one is very grateful, all the same, that it has again been made accessible even in an unimproved state, and again been brought prominently to the notice of the public. Not its least virtue, in conclusion, lies in the fact it is so interesting. It will fascinate the most uninstructed reader, give him more information than he could gain from any other existing work, and lead him to further pursue so attractive a study.

M. G. VAN RENSSLAER.

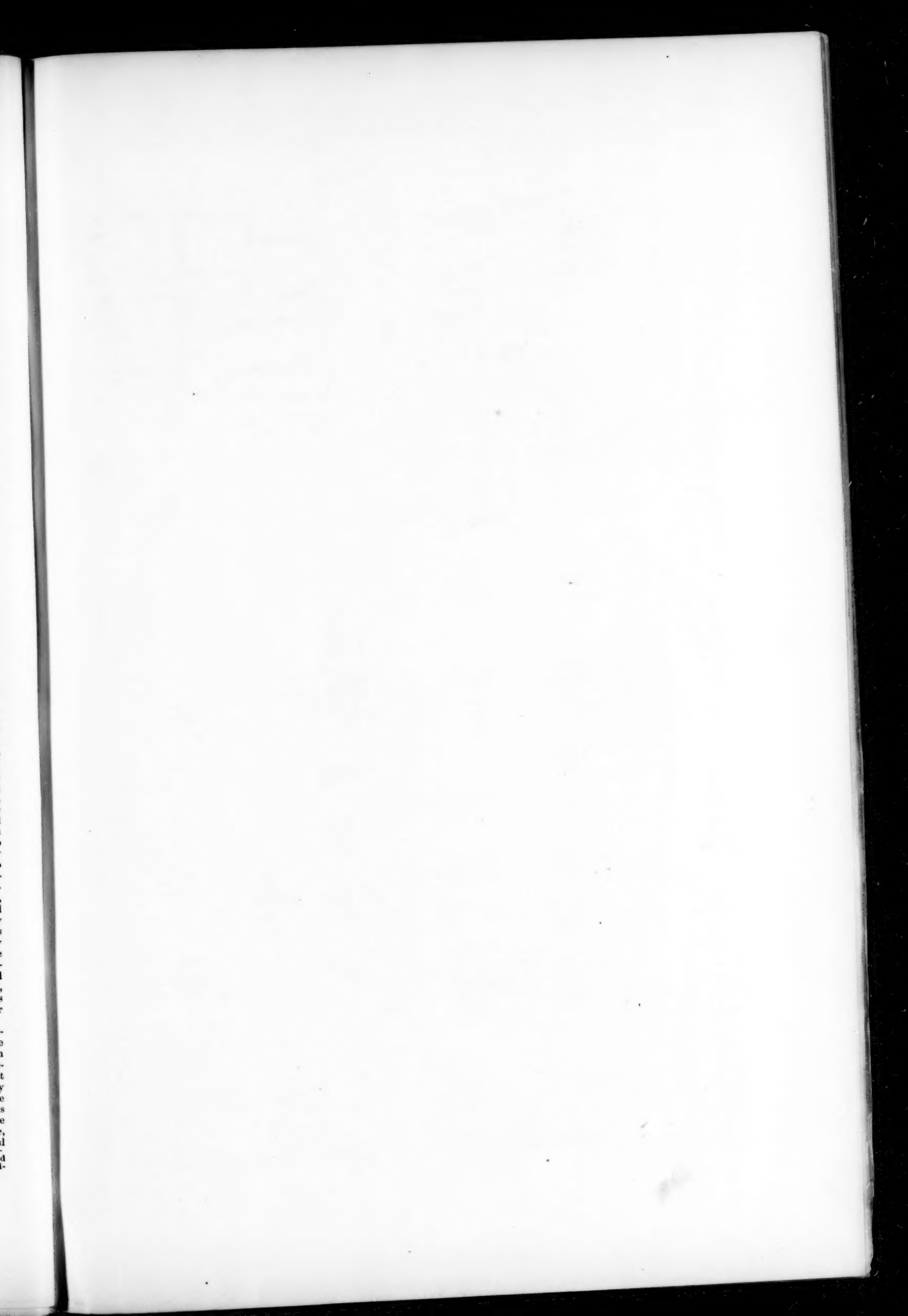
SIR CHRISTOPHER WREN.²



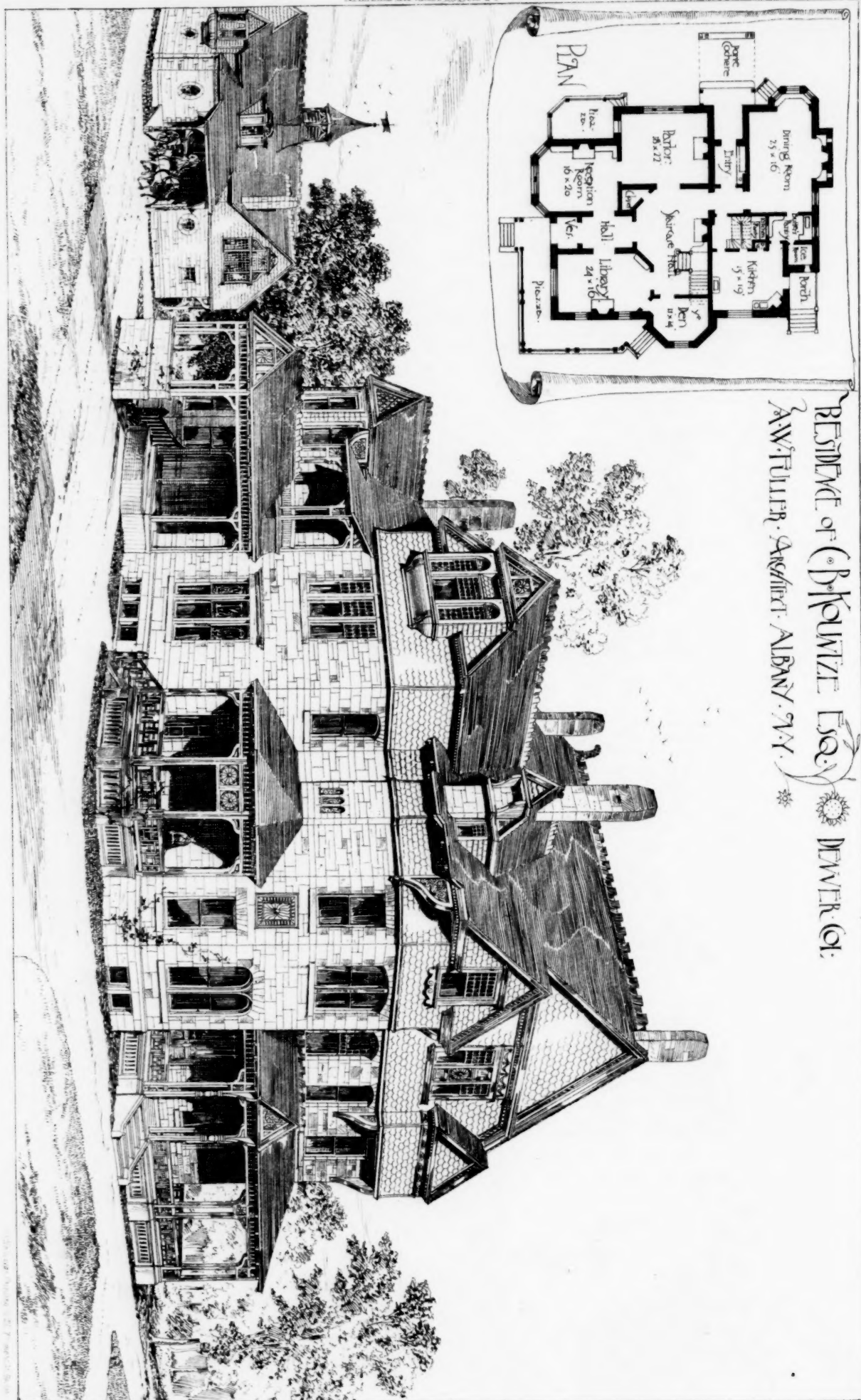
THIS interesting little book is primarily concerned with the life and not with the works of Sir Christopher Wren, and it is well that such should be the case. All needed information about his creations can easily be obtained by every student; but as a man he has been almost unknown to us. With the exception of cyclopedia notices, of two essays by Mr. James Elmes, published in 1823, and of the scarce folio volume called the "Parentalia," there has been little to which the curious might refer. This fact seems all the more strange as Sir Christopher lived in an age of stirring interest, an age which was prolific in historians and memoir writers, an age, moreover, which has been commented upon and discussed more fully than almost any other in English history. The materials for a detailed personal account of the great architect seem, however, to be rather scanty. Perhaps the fact of their scantiness and the fact that the epoch is crowded with figures of equal interest about whom fuller information can easily be gathered, have combined to render his biographers so few. Be that as it may, Miss Phillimore's biography was greatly needed. It is not written on a scientific plan: it does not go into any branch of the subject very deeply; but it is interesting and valuable, gaining an additional charm by reason of a naïve sort of enthusiasm which marks it off very widely from the dry, perfunctory, and would-be judicial sort of biography to which we are so well accustomed. To the student of architecture it will not afford any description of Wren's buildings that can profit him much. Still less does it attempt any critical estimate of his talent, or historical study of the art and the influences about him, but it helps to individualize the man and to show the wide range of his talent. Only just sufficient mention of his various works is made to explain the nature and the vast extent of his activity. An ideal biography would, of course, give both aspects of his life, the personal and the artistic. But Miss Phillimore's sketch is quite charming within the much narrower limits she confessedly sets herself.

Wren lived from before the death of Charles I until after the accession of George I — that is, through portions of six reigns and the Protectorate. The famous Bishop of Ely was his uncle; Evelyn and Sir Isaac Newton were his appreciative friends. After the return of Charles II he was constantly employed, until his death at the age of ninety-one, in public works of many kinds, constantly brought into contact, therefore, with celebrities of every class. He was for years a member of Parliament. He was one of the founders of the Royal Society, and one of its most enthusiastic and valuable promoters in after years. There was scarcely a branch of science, pure or applied, which he did not understand, and in which he did

² Sir Christopher Wren, His Family and His Times, with Original Letters, and a Discourse on Architecture hitherto unpublished. 1583-1723. By Lucy Phillimore. New York: Harper & Brothers; Franklin Square Library.



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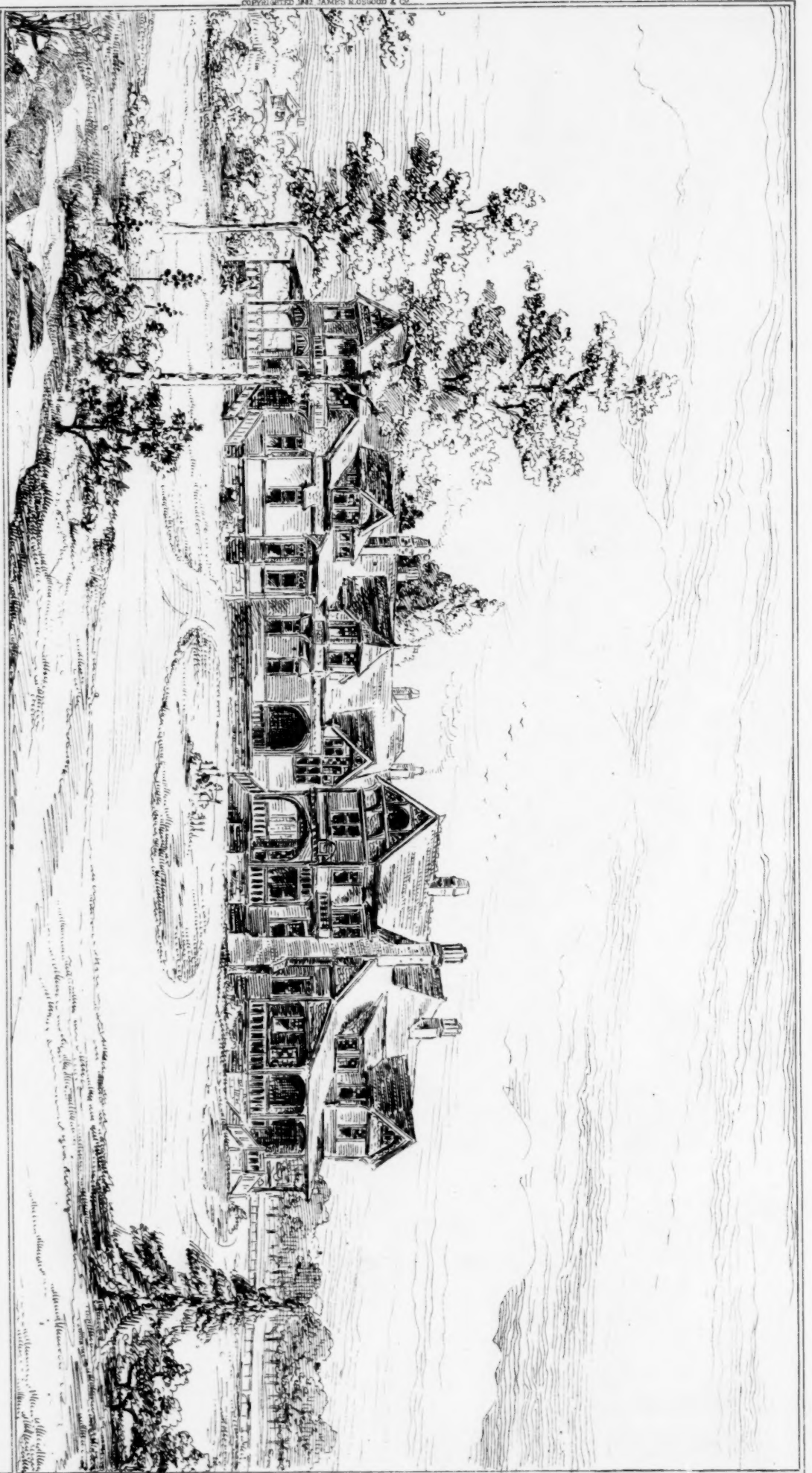


RESIDENCE OF C. KOWITZ ESQ.
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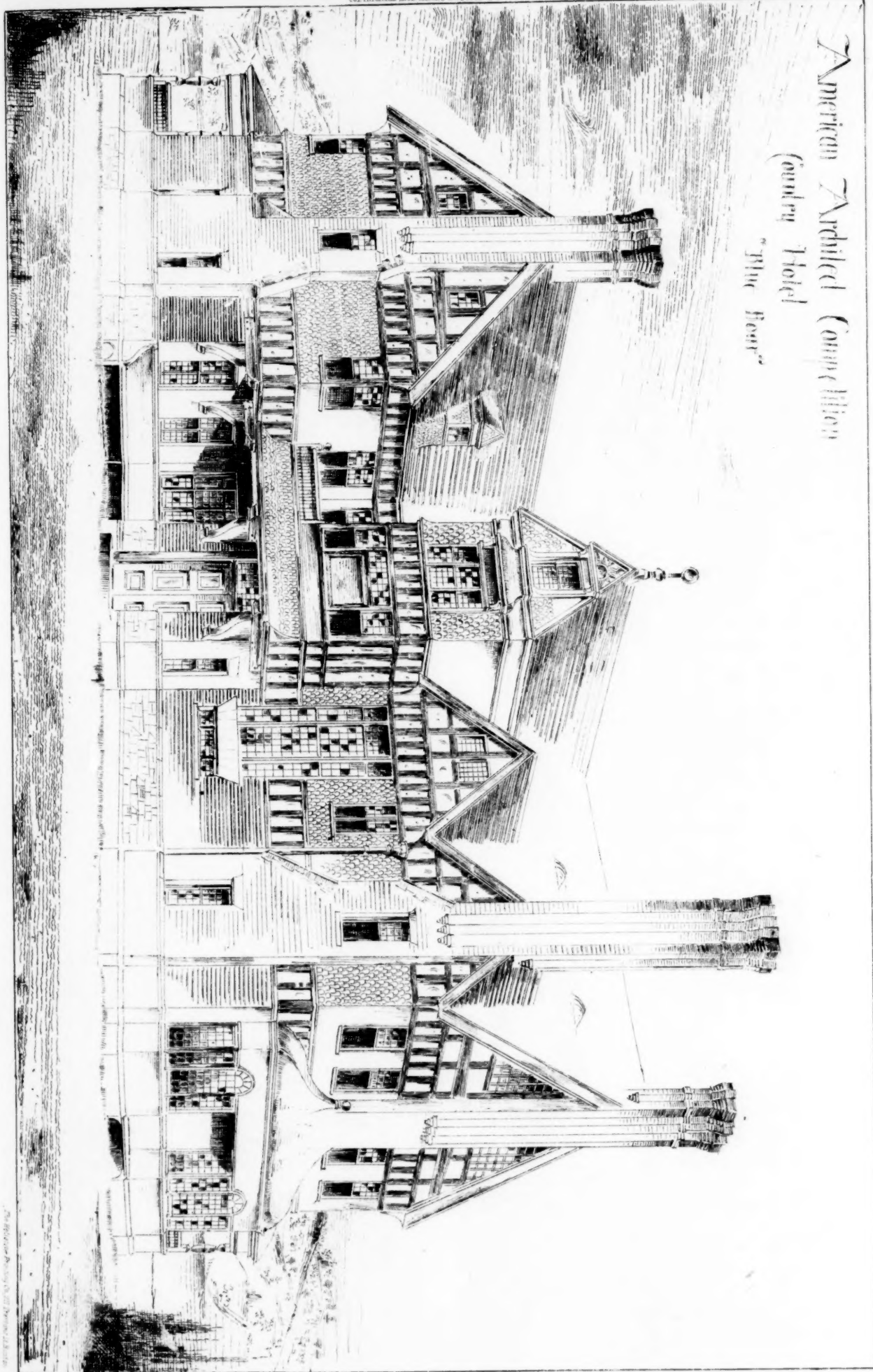
OF THE 25 CHAMBERS ALL
BUT 4 HAVE HORIZONTAL CEILINGS.

SOUTH-WESTERLY VIEW
OF "THE CANTERBURY"
'82.

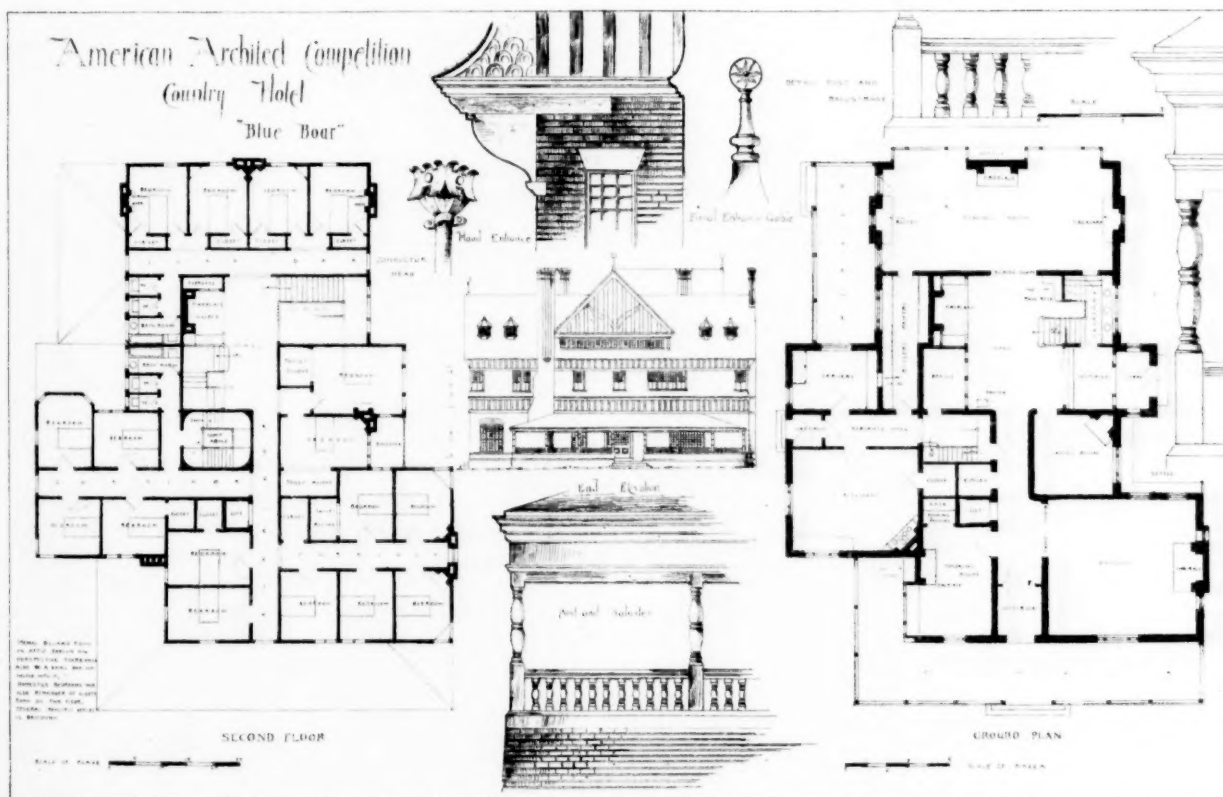
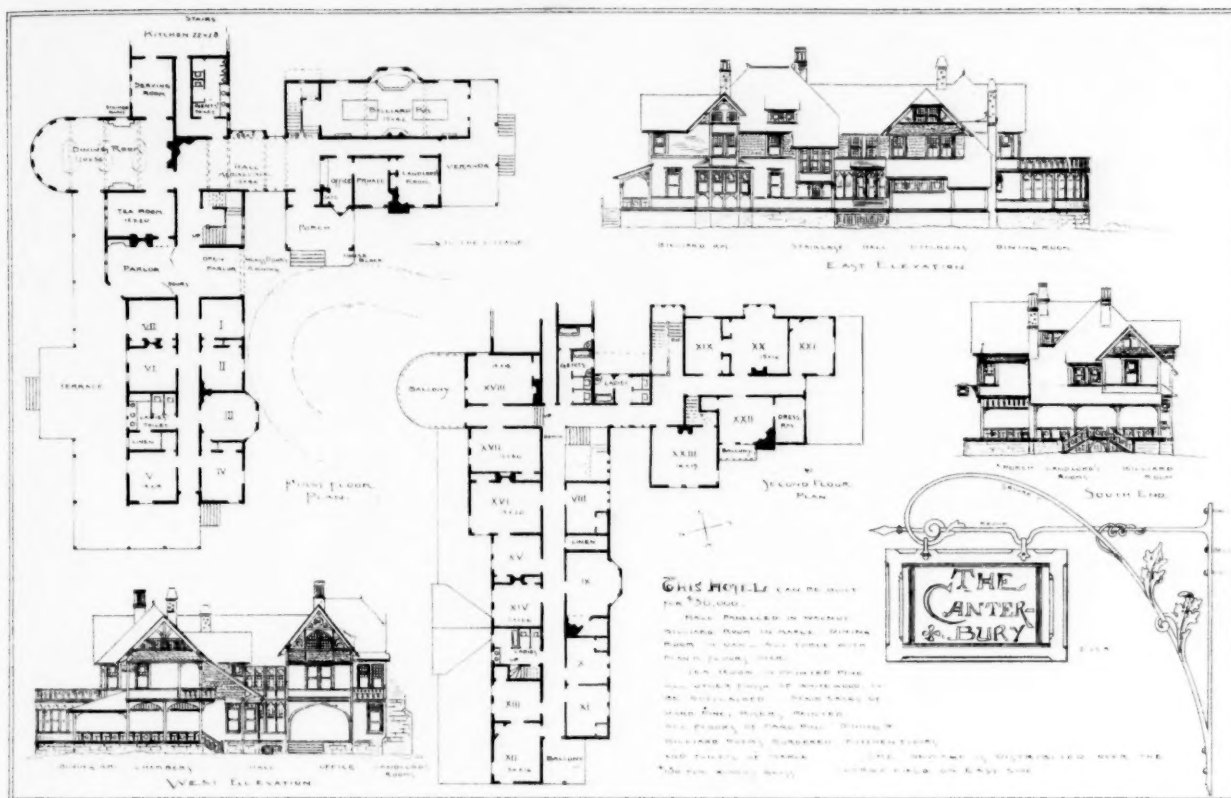


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American Architectural Company
Country Hotel
"The House"







not make earnest and important investigations. Mathematics first engaged his talent and showed the clearness of his intellect. At the age of twenty-four he was made Gresham Professor of Astronomy in London, and later held a similar position at Oxford. Many interesting scientific and mechanical inventions, some of which partly anticipated the discoveries of much later days, are attributed to his early years, and for applied science he showed all through his life a love not second to his love for his art. "But to give all Sir Christopher's experiments," says his biographer, "would be to write over again the already well-told history of the Royal Society." Add to this the fact that Wren was criticised, opposed, and calumniated in a way which seems to have fallen to the lot of all great artists from Phidias down, and the reader may judge whether his life did not afford the subject matter for a long biography of the most interesting kind. From Miss Phillimore's testimony, however, we learn that most of the direct material for its construction has perished. The "Parentalia"—written by the son and grandson of Sir Christopher as a memorial of the family—is the chief source of information; and while it is full of interest, it is scrappy and ill-proportioned. Nevertheless, we may hope some day for a biographer who, encouraged by the charm of this less ambitious volume, will sift still further the voluminous remains of Sir Christopher's time, and will consider side by side in a volume of much greater bulk the two aspects of his life, the personal and the artistic.

I may repeat that it should be counted to the credit and not, as is sometimes the case, to the discredit, of the work under consideration that it inspires us with the desire for a fuller one on the same subject. It is well, if quaintly written, and must not only attract the art student but all who take an interest in the lives of their fellow men. Some of Wren's family letters are so charming that we long for more. And there is nothing more attractive in the book than his curious little "Discourse on Architecture," now for the first time given to the public. Though Miss Phillimore does not enter into the artistic questions of his life, she gives a cursory chronological account of his undertakings, and in an appendix a useful list, as complete as it could be made, of the buildings erected or repaired by him. This list includes—wonderful to relate, especially when we remember how much work of other sorts he accomplished—no less than 58 churches, 4 palaces, 35 guild-halls, 22 other public buildings—hospitals, theatres, etc.,—and 10 private mansions. For all of these he furnished not only the plans but his personal supervision, often into the minutest details. And in addition he has left a great collection of carefully elaborated drawings that were never put to service.

It is natural, perhaps, and not at all to be regretted that the author of this pleasant little work should take an optimistic view of Sir Christopher's art. Refraining from thorough examination of his works no other attitude of mind would have been so desirable. And as she thus refrains her enthusiasm will not be distasteful to the most contrary-minded of readers. A similar fact, and one likewise to be approved from the point of view of artistic fitness, is that she writes her story from the standpoint of a loyal adherent of the Stuarts—an adherent so loyal, unquestioning, and free spoken as to seem almost an anachronism in these later days. Yet one would not wish otherwise the biographer—at least not the narrative and unscientific biographer—of Sir Christopher Wren, founder of the Royal Society, architect first of all to Charles II, nephew of the great Bishop of Ely, and son of that Dean Wren who concealed during the whole Protectorate the registers and manuscripts of the Order of the Garter.

A full index completes Miss Phillimore's book, and there are throughout copious references to authorities which may prove of much value to the student. I can only express regret, in conclusion, that this little work has not been given to the American public in better shape. It is so cheap, of course, that it can be read by all, but it is a book to keep as well as read, and who can keep these detestable three-column pages—"quarto paper,"—or even read them through with the feeling that he is properly enjoying an agreeable and instructive book?

M. G. VAN RENSSLAER.

THE ILLUSTRATIONS.

COMPETITIVE DESIGNS FOR A COUNTRY HOTEL, BY "The Canterbury" and "Blue Boar."

HOUSE FOR C. B. KOUNTZE, ESQ., DENVER, COL. MR. A. W. FULLER, ARCHITECT, ALBANY, N. Y.

THIS house is now in course of erection, and is being built of local stone with Ohio tile for gables. The probable cost is \$25,000.

ST. SOPHIA.—A Turkish superstition has it that when the mosque of St. Sophia falls in ruins, the Ottoman Empire will also be destroyed. A recent examination of the old mosque reveals the fact that it may collapse at any moment. It may not be in verification of the superstition, but the empire is in a most dilapidated state, an insurrection has just broken out in Arabia, and another of considerable proportions prevails on the northwestern frontier, with at least a possibility that the warlike spirit may cross the Turkish line. The fall of the mosque, should it occur, might not be without effect on the fate of the empire.—*Cincinnati Gazette*.

THE LATE M. CHARLES BLANC.



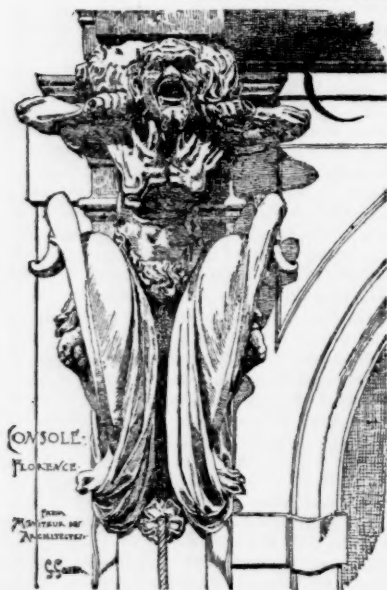
CHARLES BLANC, the art critic, and elder brother of M. Louis Blanc, died on Tuesday from the effects of an operation for tumor. Born at Castres in 1813, he was brought up as an engraver, but soon devoted himself to art critiques, first for his brother's and afterwards for other journals. From 1848 to 1852 he held the post of Director of Fine Arts; in 1868 he was admitted a member of the Academy of Fine Arts; and a few years ago he was nominated to a newly-created Professor of Aesthetics at the Collège de France. He took a leading part in the continuation of Armengaud's "History of Painters," and was an enthusiastic admirer of Rembrandt, whose engravings he reproduced and edited. Only a few weeks ago he followed up his "Grammar of Drawing" by a

"Grammar of Domestic Decoration." M. Charles Blanc never took part in political movements, but was credited with a general sympathy with his brother's views, and accompanied him in his political tour in the South. Physically they were a great contrast, the deceased being a stout-built, white-haired and apparently robust man, while M. Louis Blanc is slim and delicate, but much younger-looking. They had in common, however, a singular purity and charm of style. M. Charles Blanc's later critiques have appeared in the *Temps*. His death creates a vacancy in the Academy, where he succeeded Carne in 1876.

Charles Blanc, says the *Times*, was in the world of art a representative man of great power and originality, though neither architect, sculptor or painter. He had all the artist's nature from a boy, and never lost his tender sensibility and the naïf admiration of the beautiful in Nature and art which give such charm and glow of enthusiasm to his writings, however profound and penetrating in critical insight, in dealing with the most abstruse subjects. His "Grammaire des Arts du Dessin," which is his *magnus opus*, and the fruit of his prime, written first when he was editor of the *Gazette des Beaux-Arts*, in which journal it appeared in 1860 in parts, may be considered as the foundation of the scientific method in art criticism. In this he brought his intellectual qualifications and extensive reading to bear upon a subject till then treated either by philosophical theorists, like Lessing and Victor Cousins, by eloquent essayists like Burke, or by accomplished artists like James Barry and Sir Joshua Reynolds, the friends of the author of "The Sublime and the Beautiful." He came to his task also with the technical knowledge of an artist, for through all his early life his intention was to become a painter, and when he and his brother Louis came from the college at Rodez to Paris, in 1830, youths of twenty and eighteen, with their aged father to support, after he had lost his post at Madrid under Joseph Bonaparte, Charles spent his days in the Louvre, and in wandering about Paris looking into the old print shop windows, "le nez collé aux vitres." He was then learning much that he has since developed in those invaluable works which are esteemed among the classics of their kind—"L'Œuvre complet de Rembrandt" and "L'Histoire des Peintres de toutes les Ecoles." Through his brother Louis having created for himself a position as journalist, Charles was enabled to enter the studio of the great painter Delaröche, which alone must have given him the training of fine taste under the influence and precepts of a master so highly distinguished among the most serious and gifted painters of the modern French school. At the same time with extraordinary industry, he was studying engraving under Calamatta and Mercuri, and at night occupying himself in writing articles upon the pictures in the *Salon* for his brother's paper, the *Revue du Progrès*. His literary acquirements were so far appreciated that they led him away from his artist studies, and in 1840, during the reign of Louis Philippe, he was induced by his brother to undertake the editorship of a small Republican journal at Troyes, in which Louis had published his first part of the "Histoire de Dix Ans." His inclinations, however, were towards the calm atmosphere of art; he was utterly indifferent to politics, and regarded with wonder his little brother, so fiery and so full of action, who in his turn, however, communicated something of his energy to Charles in his peaceful and reflective pursuits, and inspired him with an equal ambition for distinction in art. His "Histoire des Peintres" had created his reputation when the revolution of 1848 came, and by universal assent he was pointed out for the post of Directeur des Beaux-Arts under the Republic. It is curious that he had frequently, some years before, said to his intimate friends that he knew it was to be his destiny to fill this place. He signal-

ized his position by the important innovation of forming a gallery of copies of the great works of the greatest masters in painting; but it is to be regretted that the scheme was barely entered upon when the Napoleonic *coup d'état* deprived Charles Blanc of his office. It was singular, however, that while he was Directeur des Beaux-Arts he for the only time departed from his peaceful pursuits as an art student to fight a duel in defence of his exiled brother Louis, though he had never fired a pistol off in his life. Louis Blanc, during the storms of political parties in 1848, was condemned by the Assemblée Nationale, and had fled to England. He had been abused in very insulting language in the journal called *L'Assemblée Nationale*, and the writer, M. Lacombe, was called to account by Charles Blanc, whose seconds in the affair were M. Méry, the brilliant novelist, and M. Nieuwerkerke who afterwards succeeded Charles Blanc as Directeur. The combatants met on the ground, and at the word "*En place, Messieurs*," after saluting each other, took their position and fired, when it was seen that M. Lacombe was hit. But on the seconds approaching him it was found that the ball had struck the *portmonnaie* in his pocket and glanced off. So Charles Blanc escaped the remorse of having killed an antagonist, and the affair ended with a *plaisanterie* of M. Méry's, who laughed as he said, "*Voilà de l'argent bien placé!*" The other strange event in the career of Charles Blanc is one that has often been alluded to, though not always correctly, as having given the idea of the plot of "*Les Frères Corses*" to M. Dumas (père). The Blancs were a Corsican family, the mother being Mlle. Estelle Pozzo di Borgo, connected with the celebrated diplomatist of that name. In 1839 Charles Blanc went to visit a friend, a physician, M. Bouloumié, 150 leagues from Paris, who is now living at Vittel. There he was chatting and laughing with the party in the garden one evening, when suddenly he started up in agony and cried out that he had been struck, and at the same moment said he was sure something had happened to his brother Louis. The next day a letter came telling him that his brother had been struck down in the street at nightfall by a blow across the forehead. The story was afterwards related by Louis Blanc to Alexandre Dumas, and was, as we know, adopted by him. M. Charles Blanc, among the numerous circle of his friends, enjoyed the special esteem of M. Thiers, who was so distinguished a lover of the fine arts, and consulted him constantly in forming his remarkable collection of pictures and engravings. It was mainly through the recommendation of M. Thiers that Charles Blanc was elected to the Académie Française. M. Blanc was very well known in England, having visited all our great art exhibitions, such as those of the Art Treasures at Manchester, in 1857, upon which he wrote a charming little volume, and the Rembrandt Exhibition at the Burlington Fine Arts Club. The loss of so accomplished and masterly a writer upon art will be universally lamented, and the more so as he had not reached the time when age enfeebles the mind, and brings the strongest rest from their labor.—*The Architect*.

WORKS OF RESTORATION IN FRANCE.—II. CHARTRES CATHEDRAL.



the whole length of the shafts. The great rose-window externally is entirely new, but it seems that the old stone-work was in a most ruinous state, and only kept together by its iron bars. They seem to have taken the opportunity of the removal of this window to clean its old stained glass, for it has a more brilliant and transparent effect than I remember noticing on former visits. I do not, however, think the south clerestory or south aisle glass has been touched, as the stone-work was in so good a state that it was not necessary to disturb the glass. The east side of this transept, the southeast tower, and the south choir aisle, are now hidden behind

the works of restoration have been long in hand here, and up to the present time the exterior only has been dealt with, and that chiefly on the south side. The nave, with its aisles and buttresses, has been carefully repaired, and though there is a good deal of new stone, it seems to be introduced not more than was, perhaps, necessary. The south transept has been completed on its west and southwest fronts quite recently, and the scaffolding removed. Here much pains seem taken to replace only decayed work. This is especially to be noticed in the shafted buttresses, where a few stones here and there are put in, instead of renewing

a mass of scaffolding; the windows are boarded up, and the works are just started. The south porch is left alone; though structurally like the northern porch, it really is in need of repair; but yet one would be sorry to see anything done, even though the great wooden props must still stand there. Some new finials are, however, being put on its pinnacles, but this seems the extent of what is to be done.

The interior greatly needs fittings worthy of the building, and the cleaning off of the thick coats of yellow wash and imitation porphyry (!) with which it is encrusted, and, above all, the removal of the horrible classic casing of the choir arches and their piers. These abominations were executed in 1772 by the architect of the Duc d'Orléans, and at the same time the authorities barbarously destroyed the magnificent *jube*, which is said to have been the original one, dating about the year 1050, and which, of course, must have been reconstructed in the new choir. It had seven arches, carried on monolith columns, and was ornamented with bas-reliefs, and had two staircases on each side, with "watch-lofts" for the guardians of the church. The present altar, erected 1773, involved the destruction of the ancient one of 1520, which is thus described:—"Environnée de chaque côté de colonnes en cuivre surmontées d'anges de la même matière et couronnée d'une figure de la Sainte Vierge, en argent, monument dont, comme de tant d'autres objets sacrifiés à la manie et le mode du jour, nous ne cesserons de déplorer la perte si importante à l'histoire de l'art dans le moyen âge." When one reads how magnificent an effect the interior formerly presented, its present neglected and squalid state is the more to be regretted.

Most visitors to Chartres will remember the beautiful Early Gothic house on the south side of the Place of the cathedral, with its beautiful two-light windows in the first floor. This house has been restored (?) in the most grievous fashion, and its interest and beauty are gone for ever.

LAON, VALENCE, AVIGNON.

At Laon Cathedral the works are nearly completed, though the western end and the porch are still partially covered with scaffolding. It strikes one here that the work is almost entirely new, but whether that was necessary is doubtful. It is true the church was built very rapidly, and that there were partial failures in consequence, but the material used for the building generally is in such singularly good condition, that it is puzzling to account for the complete disappearance of the ancient west porch, and the parts adjoining it.

Valence Cathedral has been partially restored, and has a very beautiful modern Romanesque west tower, possibly to a great extent a reproduction of ancient work; the lower story, forming an open porch, is remarkably fine in its proportions and details. A portion of the west end of the nave and aisles has been rebuilt, and here a fatal mistake is made. The architect did not seem to appreciate how much the effect of the design depended on the manner of its construction, and he has used courses of ashlar and dressings of great height, instead of following the old thin courses and small dressings of the ancient work; the result is deplorable. There is at Valence, as in so many French restorations, too much use made of black mortar in re-pointing the interior stone-work: the result produced is one never intended by the designer, and there being no need to draw attention to the irregular sizes to which the stones are worked. For instance, at Valence the slender apsidal pillars are some of them carried up in numerous stones, only 10 inches or 1 foot in height; others are in two or three stones only in the total height, but the architect never meant this to be pointed out in the emphatic manner in which the black pointing does it.

At Avignon, little or nothing is done to the cathedral in the way of restorations, but some unimportant works are going on at the Papal Palace, which will some day or other be disused as a barrack, and become a museum. At present much remains to be done. The magnificent Salle de Garde is so divided by floors and partitions that one has to go into very many rooms to get an idea of its magnificent dimensions. The interesting painted chapels open off barrack dormitories, but fortunately are kept locked; the frescoes are, however, terribly mutilated, and many of the heads of the figures have been cut out and removed to be framed and sold!

However, on the north side of the palace is a magnificent hall of early fourteenth-century date, under restoration; its great pointed barrel-vault is being for the most part reconstructed; the walls are supported by very massive buttresses, between which are thrown great pointed arches, leaving a space vertically next the wall for the purposes of defence; these arches are being rebuilt, and the old Roman system of carrying the centering is adopted by supporting it on a projecting course of stone of the arch itself, just above the horizontal courses which form its springing. At the Pont du Gard these projecting courses in the arches are left, but at Avignon they will be cut to the form of the arch when the centres are taken down.

The ancient city walls and towers, which still exist all round, are now almost entirely cleared of the houses built outside and against them, and are being restored, and their battlements and corbelling renewed where they had been destroyed. A boulevard is formed around the city, at the foot of these ancient walls, with most admirable effect.

NIMES.

The Cathedral of St. Castor is being almost entirely rebuilt excepting its very interesting Romanesque west front; the whole building was of that date, but had sustained such injury during the religious wars of the sixteenth and seventeenth centuries, and had been so modernized that it had become an utter wreck. The church is so

entirely built round, with houses against its walls, that nothing but the west end is visible, and there are no open windows on its ground floor. In the fifteenth century, pointed groining was erected on the earlier walls of the nave, of fair detail and proportions; this groining has been very cleverly supported and retained in its place during the rebuilding of the walls under. The church has been reconstructed in its ancient Romanesque style, with a bold arcade and triforium, consisting of four or five small semicircular arched openings, with a round headed clerestory window over. The same design runs through the choir, which is not yet built to its full height. Most of the old aisle walls are retained, as they support the houses adjoining them; the eastern ambulatory walls are, however, new. There is in the choir a curious example of modern construction: the marble pillars of the triforium are very small in diameter, and the architect has feared to bring the weight of the clerestory upon them; he has, therefore, introduced a double cast-iron girder over them from pier to pier, to carry the superincumbent weight. The clerestory is built; but the triforium arceding, which apparently carries it, has yet to be filled in under the girders (see rough sketch). The groining of the choir will be on the old Romanesque lines. It is not yet constructed, but I examined the drawing (set out on the wall) showing its design. This rebuilding is a most important work, and seems to be carried out with the greatest activity, and promises to be very successful. It used, indeed, to be a reproach to Nîmes that its cathedral was so ill cared for, when it had three great modern churches on a still larger scale. As regards these churches, two are very pretentious and costly, and utterly uninteresting; but another, dedicated to St. Paul, built in 1850 by M. Questal, in the Romanesque style, is worthy of the highest praise for its refined architecture and for its magnificent paintings by Flandrin.

LYONS.—ST. MARTIN D'AINAY.

The Church of St. Martin d'Ainay was the most remarkable church in Lyons by reason not only of its great antiquity, but also for its beautiful proportions. The earliest portions date from the ninth century, and there are used in its construction granite columns of great size taken from some Pagan building. The style is the Early Romanesque of the district, and of beautiful detail; the western tower is Carolingian of admirable design. Its plan consists of nave and shallow transepts, and choir, with an octagonal domed lantern over the crossing; the aisles are narrow, and end in apsidal chapels east of the transept. The restoration and enlargement of this church is much to be deplored; the architect has entirely ruined its proportions externally and internally; he has added great aisles on each side (see plan), cutting through the ancient aisle walls. This extra width, of course, would have darkened the church (the nave having a barrel-vault without a clerestory), so he raised the old aisle walls and added a clerestory to them, and continued up the wall pilasters considerably above the level where the cross arches sprang. These heightened aisles were then continued on to the west front, with new doorways, the effect being to dwarf and ruin the proportions of the old tower. The eastern chapels, fortunately, are not raised, and here the charming relative proportions of choir, lantern, and aisles can be seen and enjoyed. The modern aisles have semicircular-headed windows, etc., imitating the tower, and they are carried out in a costly and most substantial manner; but such a church should never have been enlarged, and no architect should have attempted it: success was not possible, as the old building was quite perfect in its proportions.

LIMOGES AND CLERMONT-FERRAND CATHEDRALS.

The new works at the cathedrals of Limoges and Clermont-Ferrand are of peculiar interest and importance, for both are now being completed after the suspension of building operations for four centuries. Both cathedrals are on the site of Romanesque buildings, and both were commenced to be rebuilt in the Northern Gothic style in the thirteenth century, and (as Viollet-le-Duc points out) on the same general plan, and most probably under the same architect's directions. In each case the choir (and at Clermont three bays of the nave (were completed in the Middle Pointed style. At Limoges the transept and two bays of the nave were proceeded with and completed, and the lower portions of two more were commenced, in the fifteenth century; while, at the same time at Clermont, a portion of another bay of the south aisle was erected. The works then were stayed at each church, leaving standing portions at the west end and the towers of the Romanesque churches.

The works now in hand follow more or less the ancient lines. Viollet-le-Duc gives plans of each, showing exactly what was originally carried out, and he indicates further the supposed original intention of the architect. I was much interested in examining the new works and comparing them with these plans, and I find some important variations from them; while, however, on the whole they represent fairly well the new work done.

At Limoges the three western bays are in course of erection, including the aisles and chapels, and these seem to be faithful reproductions of the ancient work; but on reference to page 374 of the "Dictionnaire," it will be noticed that Viollet-le-Duc shows on his plan one bay of the nave and aisles of the Romanesque church as existing; and in a foot-note he explains it thus: "*On a laissé subsister un débris de l'ancienne nef romaine et les soubassements de la tour de XIe siècle, renforcés et surélevés au XIIIe et au XIVe siècle.*" But this bay of the nave, unfortunately, has been entirely pulled down, and a porch has been designed by the architect (as indicated

in my plan) between the nave and the tower. He has arranged this with a view to get over the difference of the centre lines of the tower and the nave, and when viewed internally the result is fairly successful and picturesque. The porch is vaulted at the same height as the aisles, but is not yet sufficiently advanced to enable one to see how the upper part will be treated, and whether or not it will be made an organ-gallery by continuing the triforium and clerestory up to the tower, and so give the same number of bays as at Clermont, which the original architect probably intended to do. The external effect of this porch is, however, most inharmonious, and has singularly ugly doorways, with square lintel-heads, carrying the upper part of a four-light window, giving the effect of the window having been cut down to form the doorway, and its tracery supported by a girder! These doorways are a most serious blot on the work; but, in other cases, the ancient details, and even the heights of the courses, are scrupulously adhered to.

The progress of the works has been rather slow since the commencement. The first and second bays (on each side) next to the old work are built as high as the sill of the clerestory, and the next bay and the west wall as high as the string under the triforium. The aisles are vaulted, and the windows formed, but are yet without tracery or mullions. A light-colored granite is used, like the ancient material, which has now weathered to a dark brown tint. Very little scaffolding is being used, much of the work being fixed by men standing on the walls themselves. While there is so much to praise in the new works, one regrets the destruction of the Romanesque fragment, and the substitution for it of the not particularly successful porch.

There is a point in Viollet-le-Duc's plan to which I will just draw attention. He does not show on it the singular thickening and strengthening of the walls of the Romanesque belfry referred to in his foot-note, so I have indicated this in my plan. The original porch and bell-tower was on the usual Romanesque Auvergne type, and had thin walls, with openings, and four central columns, resembling the belfries at Le Puy-en-Velay and at S. Benoit-sur-Loire. It was, however, incapable of supporting the great tower which was erected over it in the fourteenth century. The architect of that day, therefore, built up the centre, and thickened the external walls, so as to get a solid mass on which to start his tower safely: the result is singularly heavy and ugly, and hopelessly ruins the western view, and gives but a narrow and tortuous entrance to the church.

And now as regards the works at Clermont. They are very much more advanced; the new portion of the nave, aisles, and chapels are completed, and are opened into the ancient church. Here the old details have also been carefully followed in all respects, and the result is most satisfactory, giving its due effect and proportions to the very beautiful original design. The apse, and its surrounding chapels, of this cathedral, with the magnificent stained glass, combined with the dark tone of the lava of which the whole is built, are to my mind almost unequalled in beauty, except, perhaps, by the glorious apse of Barcelona Cathedral.

But with regard to the west end, there seem variations from M. Viollet-le-Duc's plan (they are executed as shown in my plan), but the western towers are puzzling. He speaks of the ancient Romanesque west end and towers thus: "*On voit encore les restes de la façade du XIe siècle,*" and he goes on to say in a foot-note: "*Deux tours qui subsistaient encore sur cette façade, mais qui avaient été démantelées depuis longtemps, ont dû être démolies parce qu'elles menaçaient de s'écrouler.*" This front was pulled down in 1855 and a new front and towers erected in the thirteenth-century style, designed by M. Mallay, as shown on the plan given by Viollet-le-Duc. The spires are now being commenced, and the effect on the whole promises to be very good; but unfortunately the lower story of the towers, both inside and outside, are exceedingly poor in detail and effect. The space is cut up into passages and steps, and is very different in effect to the lower stories of the Cologne towers, the plan of which is here imitated on a small scale. One much regrets that the ancient Romanesque towers were not strengthened and restored.

The new works are all carried out in lava, but of a somewhat lighter tone than used in the old work. It is a material of great strength, and wears remarkably well. The ancient work is therefore in an almost perfect state. Its whole construction is exceedingly slight, yet the wonderful skill and knowledge of proportion shown in its design is most remarkable.

THE ROMAN ANTIQUITIES OF ORANGE, ARLES, AND NÎMES.

The restoration of Roman remains is questionable from an historical and artistic point of view, and really only to be defended when it is adopted as a measure of precaution for the purpose of preserving these buildings for posterity to study, and I was, therefore, glad to find that (excepting, perhaps, some rather superfluous new work in the amphitheatre at Nîmes) the works of restoration have been, and are now, carried out in a most judicious and careful manner. At Orange the very beautiful triumphal arch was taken in hand some years ago. It had been built into a palace of the Princes of Orange, but this building has now entirely disappeared, and the arch stands in a clear open space across the main north road to Valence. The southern face and its engaged columns, including portions of the pier of the small side archway, have been rebuilt, and blocks of stone inserted where the old stone had been cut away. The mouldings are wisely carried on in the new work so as not to needlessly break the ancient lines and profiles, but no carving or en-

richments of mouldings are executed, so the new work preserves the old from further decay, and in no way professes to imitate it, while at the same time it gives additional value to the ancient work by enabling its proportions and design to be fully appreciated.

The top of the great wall, which forms the "scena" of the Theatre of Orange, is now being repaired. The whole had much bulged in its length, and had lost most of its coping, and portions of the upper courses, especially on the slopes of the wing walls; these are being rebuilt and a new coping put on, copied from the old, portions of which are suffered to remain *in situ*, so that the accuracy of the restoration is guaranteed. Nothing else is to be done, and the great wall, with its interesting doorways, recesses, and niches, is left untouched.

At Arles the amphitheatre has not had much done to it beyond repairs to the ancient steps, and the replacing of some of the outer piers and arches, — this last, possibly, from necessity; for I saw an old print showing the interior filled with houses, which were also built up and into the recesses of the arches. The three great towers raised on the upper series of arches, when the whole was one vast fortification in the eighth or ninth century, are carefully preserved and repaired. Of course they are incongruous, as was the old Venetian tower on the Acropolis at Athens, lately pulled down; but they are part of its history, and are, as such, valuable; the details of their windows, etc., are, moreover, very good.

The theatre of Arles is being gradually brought to view by pulling down the houses which formerly covered nearly all its area. Most of it is now exposed, and on the foundations and remains of the piers there is in course of construction the outer semicircle of open arches, copied from some old ones which exist; these will form a bounding line to the ruins, and in no way interfere with its great archaeological and architectural interest.

It is at the great amphitheatre of Nîmes that the most important restorations and additions have been carried out. It underwent the same vicissitudes as that at Arles, and like the Colosseum at Rome it was converted into a fortress by the Visigoths, and was, in 1109, held by Knights called "*Miles castri arenarum*," who constructed their houses within it; but at the end of the fourteenth century, the knights having left, the people took possession of it, and its area gradually got completely filled up with mean houses. In the early years of this century the restoration was begun by clearing out the area and pulling down all the houses built up to the exterior, and up to the last few years the works have been continued. As at Arles, the towers and alterations of the Visigoths are not disturbed, and the arena has been lowered to its ancient level, showing the marble-faced podium. The lower division of four rows of seats was found nearly perfect, and also six rows out of the ten of the second division; but the twenty rows of the third and fourth divisions were almost totally destroyed, with the arched passages and "*vomitoria*" under them. Small portions of these have been reconstructed (without interfering with the general effect), with a view to explain the original design of the building. Some persons may say that this is going too far, but I can say that it adds vastly to one's interest when endeavoring to understand this magnificent building. Portions of the exterior have been restored and re-faced, and here there is, I think, more work done than was necessary for strict "conservation;" moreover, the detail is very poor, and the new white stone brings it out in rather painful prominence.

A most interesting and learned history and description of the building has been written by the late M. Auguste Pelet, of Nîmes (and published in 1866). He so thoroughly enters into the question of what a "restoration" should and should not mean, that I will venture to quote some remarks of his on the subject: "*Malheureusement on s'est un peu trop éloigné du but qu'on s'était d'abord proposé dans les réparations projetées; on voulait seulement conserver et l'on a créé. On aurait dû traiter ce colosse avec tous les égards dus à son antique origine; il fallait guérir ses blessures et respecter ses cicatrices, dont chacune était une page de notre histoire. Nous n'aurions pas, il est vrai, une galerie toute neuve, des pilastres à visages arêtes, des moulures ciselées avec soin des chapas éblouissantes de blancheur pour garantir des constructions modernes, des murs qui détraquent le monument; mais en revanche, les tours des Visigoths existaient encore, l'on verrait des arceaux croulant en apparence, mais solides, des arêtes écornées par le temps ou les Vandales, des fragments de voûtes noircis ou couverts de mousse, et cette belle ruine n'aurait rien perdu de son caractère, de son éloquence, et de sa poésie.*"—R. Herbert Carpenter in the Builder.

EXTRACTS FROM MINUTES OF THE BOARD OF TRUSTEES, A. I. A.

QUARTERLY MEETING, October 25, 1881.

THE Secretary presented the applications, duly endorsed by Fellows, of a number of candidates, and reported that in the case of the candidate for Fellowship, no objection had been received in answer to the usual circular. After the customary formalities, the following gentlemen were declared elected:

Mr. Augustus Bauer, Chicago, Fellow.

Mr. Samuel Huckel, jr., Philadelphia, Associate.
" Edward Hazlehurst, "
" W. L. B. Jenney, Chicago, "



Mr. R. P. Southard, Charleston, S. C., Associate.

" N. W. Wall, Trinidad, Colorado, "
" H. G. Knapp, New York City, "
" C. F. Driscoll, Omaha, Nebraska, "
" Wm. C. Smith, Nashville, Tenn., "
" F. E. Davis, Baltimore, "

The Secretary presented a communication from Mr. George Keller, A. I. A. Apropos of his recent transactions with a monument committee, giving various reasons why, in the interest of the maximum of the artistic rendering of such work, the architect should sometimes combine the functions of designer and contractor for its execution. Also a letter, asking if the Trustees had considered said communication. The correspondence was laid on the table.

The Secretary read a letter from the Society "Architectura et Amicitia," of Amsterdam, Holland, enclosing a series of questions to elicit information as to the American Institute of Architects and its components. The Secretary read his answers to the questions, which were approved, and he was requested to forward the paper to Mr. Clark, Secretary for Foreign Correspondence, for general answer and transmission to its destination.

The Secretary said that Mr. Robert Briggs, Corresponding Member, had forwarded copies of his pamphlet on "The Properties of Air relating to Ventilation and Heating," and moved a vote of thanks therefor. Carried.

REGULAR MONTHLY MEETING, November 28, 1881.

Mr. H. Edwards Ficken, New York City, was elected Fellow, and Mr. C. A. Dilden, of Washington, D. C., Associate.

The Secretary read a correspondence on the subject of throwing open the proposed Congressional Library building to competition, and of a tablet in the national Capitol to the memory of its architects. The following preamble and resolution were adopted:

Whereas, The names of the architects who have successively been employed on the National Capitol at Washington nowhere appear on the edifice, and whereas the precedents are numerous in this country, and still more in Europe, for honoring the creators of important and conspicuous works of art by such permanent record, therefore,

Resolved, That it is the sense of the Board of Trustees, A. I. A., that such omission should be supplied, and it desires the Secretary to communicate with a member of Congress with the view of placing a tablet with the rotunda, inscribed with the names of the successive architects, with the dates relating to their period of service.

REGULAR MONTHLY MEETING, December 28, 1881.

After balloting for election the following candidates were declared members:

Mr. T. M. Clark, Boston, Mass.,	Fellow.
" Seth Babson, San Francisco, Cal.,	"
" Jas. E. Wolfe, "	"
" G. W. Sanders, "	"
" J. Wright, "	"
" Wm. Curlett, "	"
" Thos. J. Welsh, "	"
" Chas. Crapsey, Cincinnati, O.,	"
" Augustus Eichhorn, Orange, N. J.,	Associate.
" Fred Morris Bell, Fulton, Mo.,	"
" D. T. Atwood, New York City,	"

A. J. BLOOR, Secretary.

ELECTRIC LIGHTING.

A SPECIAL committee appointed by the Advisory Committee of the United Fire Underwriters in America with power to formulate rules for the use of electric-light wires, lamps, etc., have reported the following revised standard for the same, adopted on January 12, by the New York Board of Fire Underwriters. The members of the committee endorse the conclusions arrived at by Mr. William A. Anderson, of the New York Committee, which are now promulgated to companies and to local boards, in accordance with the authority given by the Advisory Committee, under the resolution adopted at the annual meeting of the Association.

FOR ARC LIGHTS. — The conductor must have a weight per running foot at least equal to that of the wire (or parallel group of wires), constituting the main circuit of magnetic regulator of the electric lamps, or of the armature of the machine employed, whichever of these is the largest.

FOR INCANDESCENT LIGHTS. — Wherever a connection is made between a larger and a smaller conductor at the entrance to or within a building, some approved automatic device must be introduced in the circuit of the smaller conductor, whereby it shall be interrupted whenever the current passing through it is in excess of its safe carrying capacity.

The safe carrying capacity of a wire is that current which it will convey without becoming painfully warm when grasped in the closed hand.

INSULATION. — All wires, machines and lamps to be so mounted and secured as to insure complete and continuous insulation, with the exception of those parts (such as portions of the lamps or machines) where the insulation is impossible, and in this case accidental contact with exterior objects must be prevented by appropriate screens or the like.

In no case must "ground circuits" be employed, or any portion of the system be allowed to come into conducting connection with the earth through water or gas pipes or otherwise.

Exposed wires must be covered with at least two coatings: one of insulating material next the wire, of a thickness and material approved by the Board, and another outside of this, of a material calculated to protect the former from abrasion or other mechanical injury.

Where there is a possible exposure to water, the first or second coating must be impervious to that fluid.

Wherever electricity is carried into a building by conductors from an exterior source, a "cut out" must be provided at a point as near as possible to the entrance to such building.

The outgoing and returning wires for arc lights should enter and leave each building at points at least one foot from each other.

The wires passing through the exterior walls of a building should be firmly incased in substantial tubes of non-conducting material, not liable to absorb moisture, and placed in such a manner as to prevent rain-water from entering the building along the wire.

In running along walls and the like, wires should be rigidly attached to the same by non-conducting fastenings (the wires themselves being well insulated), and should not be hung from projecting insulators in loose loops.

All wires should be placed at a distance of eight inches for arc lights and two and one-half inches for incandescent lights from each other, and wherever they approach any other wire or conducting body capable of furnishing another circuit or ground connection, they must be rigidly secured and separated from the same by some continuous solid non-conductor, such as dry wood, of at least one-half inch in thickness.

Wherever wires are carried through walls, floors or partitions in buildings, they must be surrounded by a special insulating tube of substantial material.

All joints in wires must be made in such a manner as to secure a perfect and durable contact. Continuous wires (without joints) to be used as far as possible.

GLOBES.—Arc lights must be protected by glass globes, enclosed at the bottom to prevent the fall of ignited particles, and where inflammable materials are present below the lamps, a wire netting must be added to keep the parts of the globe in place in case of its fracture during use.

All broken and cracked globes to be at once replaced by perfect globes.

In show windows and other places where inflammable materials are near the lights, spark arresters shall be placed at the top of the globes.

AUTOMATIC SHUNT.—Wherever a current of such high electro-motive force is employed, that if concentrated on one lamp of the series, it would produce an arc capable of destroying or fusing parts of such lamp, an automatic switch must be introduced in each lamp, by which it will be thrown out of circuit before the arc approaches any such dangerous extent.

Companies furnishing electricity from central stations must enter into an agreement with the Board of Fire Underwriters, binding themselves to test their lines for ground connections at least once every day (and preferable three times per day), and to report the result of such tests to the Board weekly.

It is earnestly recommended that local boards having jurisdiction in places where this new hazard has been, or is likely to be, introduced, adopt the above standard, using the following form of endorsement for the privilege wherever granted:

Privileged to use electric-lights in the above-mentioned premises when the entire equipment is in full compliance with the Standard of the New York Board of Fire Underwriters, adopted January 12, 1882, and a certificate is obtained from Board of Fire Underwriters to that effect.

It being understood that no alteration shall be made in the equipment after certificate is issued, without written consent from said Board of Fire Underwriters.

THE REGULATIONS OF THE ENGLISH CHURCH ERECTION SOCIETY.

ST. LOUIS, February 7, 1882.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

I BEG leave to suggest that it would probably be a service to many of its readers if the *American Architect* would print in full that portion of the building regulations of the English Church Erection Society, referred to on page 38 of the last number. Many of the readers of the *American Architect* are non-professionals, or are situated where they cannot have access to the foreign periodicals. They must therefore look to its columns chiefly for information of this character. It would also be of service to others who may have encountered these regulations in their reading, but who cannot recollect precisely where, and who cannot well spare the time to hunt them up; among whom the writer must include himself.

Very respectfully,

C. E. ILLSLEY.

[We shall be very happy to comply with Mr. Illsley's request, and will publish the regulations shortly.—EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

FIRE-ESCAPES IN BOSTON.—A notice has been issued by the Fire Commissioners of Boston ordering rope fire-escapes to be placed upon all work-shops and manufacturing establishments, not already provided therewith, where five or more operatives are employed above second story.

HOUSES BUILT OF COTTON.—Of all substances apparently the least likely to be used in the construction of a fire-proof building, cotton would perhaps take the first rank and paper the second; and yet both these materials are actually being employed for the purpose indicated, and their use will probably extend. Compressed paper pulp is successfully used in the manufacture of doors, wall panellings, and for other similar purposes, with the result that all risk of warping and cracking is obviated, while increased lightness is attained and the fear of dry-rot is forever banished. Papier-mâché, after having served a useful purpose in an unobtrusive manner for years as a material for small trays, paper-knives, and other such light articles, has now suddenly assumed a still more important position in the industrial world. A still more sudden and striking advance has been made in the employment of cotton as a building material. A preparation called celluloid, in which cotton is a leading ingredient, has been used lately as a substitute for ivory in the manufacture of such articles as billiard balls and paper-cutters, and now a Canadian manufacturer has invented a process by which compressed cotton may be used not merely for doors and window-frames, but for the whole façade of large buildings. The enormous and increasing demand for paper for its normal uses as a printing and writing material prevents the extended use of papier-mâché as a building material, for which it is so well suited in so many ways; but the production of cotton is practically unlimited, and there seems to be a large field available for its use in its new capacity as a substitute for bricks—or at least plaster—and wood. Treated with certain chemicals and compressed, it can be made perfectly fire-proof and as hard as stone, absolutely air and damp proof; and a material is thus produced admirably adapted for the lining—internal or external—of buildings of which the shell may or may not be constructed of other material, while it easily lends itself to decorative purposes.—*Colonies and India.*

PROPOSED PNEUMATIC RAILWAY IN LONDON.—The project of building a pneumatic railway under London has been revived, and the present Parliament will soon be asked to grant the necessary privileges for its construction. Its course will lie midway between the existing underground roads, and its length on the main line will be six and a quarter miles, its direction being from the far West End eastward through Oxford Street, Holborn, and Cheapside. A process of tunnelling will be adopted, the line being far enough down to escape all sub-cellars and sewers, entering, in fact, into the London clay, which would require a depth of about fifty feet beneath roadways and about thirty beneath the bed of the Serpentine in Hyde Park. By this means, it is believed that every obstacle can be avoided, while no disturbance of the surface would take place except where stations are to be built. Rarely would it be necessary to encroach on land belonging to private persons, the aim being to follow a line directly below the streets. This great depth passengers could easily reach by an elevator arrangement run by hydraulic power, which, in the completed work, would be abundant, since the engines are to be worked by it. It is proposed that the tube shall be 10' 6" x 12' 6" in size, and that every section shall be finished and fitted to every other above ground, and then taken below and put in its place as the excavation proceeds. The plans contemplate the employment of both compressed and exhausted air, they being used alternately, in order to secure a constant supply of fresh air and thorough ventilation through such a system of blowing and sucking. No difficulty is anticipated in thus propelling or drawing trains weighing sixty tons at the rate of twenty miles an hour. But the greatest boon the line would confer on men would be its excellent ventilation and the absence of smoke, qualities for want of which the present underground roads have become intolerable nuisances which it is a standing cause for wonder that the English people have so long endured.—*New York Times.*

AN OLD WRITER ON DUTCH HOUSES.—The *Antiquary* publishes an entertaining letter from an Englishman of the time of James I who was making a visit to Holland. It was still the fashion to denounce the Dutch, from whom the English had not wrested the command of the high seas, and who were accordingly envied and hated with vigor. "When you enter one of their howses," writes this old traveller, "the first thing you shall encounter is a Looking Glass, the next are the Vessels martialized about the howse like Watchmen, all is neat as if they were in a Ladies Cabinett; for (unless it bee themselves) there are none of God's Creatures loose anything of their native beautie. Their howses (especially in their cities) are the best Eye-beauties in their Countrie, for cost and sight they farr exceed our English, but want their State and Magnificence. Their lynyng is yet more rich than their Outside, not in hangings but in Pictures, wch the poorest there are plentifully furnished with. Not a Sowtor (cobbler) but has his toys for Ornament. Were the knacks of their houses sett together, there were not such another Bartholomew Faire in Europe. Their Artists for these are as rare as thought. And if you want their Language, you may learne a great deale of it on their signe Posts, for what they are they ever write under them. In that onely they deale plainly, and by this device hang up more honesty than they keepe. Their howses they keepe cleaner than their bodies, and their bodies cleaner than their Soules. Goe to one place, you shall finde the Andyrans shutt up in Nett-worke; at a second, the Warning-pan muffled up in Italian cutt-worke; at a third the Scummer cladd in Cambricke; for the woman Shee is ever ye head of the Man, and so takes the howse to her own charge."

A LARGE PILE-DRIVER.—The pile-driver used for the building of the Morgans' Texas Railroad bridge may be considered the largest in the world, as it has a hammer which weighs 10,000 pounds. The leaders are ninety feet high, and constructed on hinges which admit of the leaders and hammer being inclined so as to drive a pile at any angle. The barge on which the pile-driver rests is forty feet wide, eighty feet long and five feet deep. There are two engines, with 11 1/4" x 24" cylinders. The hammer was made of extra weight, because it would drive the piles farther with less exertion of force and less injury to the top of the pile.—*New Orleans Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

- 253,172. AUTOMATIC ELEVATOR-GUARD. — Jeremiah F. Abbott, Revere, Mass.
 253,173. DOOR-SPRING. — William F. H. Amwake, Lancaster, Pa.
 253,174. ROOFING-TILE. — Thomas B. Atterbury, Pittsburgh, Pa.
 253,278. HAMMER. — Christopher J. Grellner, St. Louis, Mo.
 253,304. LOCK-HINGE. — Felix Ménard, Montreal, Quebec, Can.
 253,315. FIRE-PLACE HEATER. — George D. Sanford, Peekskill, N. Y.
 253,323. AUTOMATIC ELEVATOR-HATCH. — Harriet R. Tracy, New York, N. Y.
 253,345. SELF-CLOSING ELEVATOR-DOOR. — Theodore M. Clark, Boston, Mass.
 253,361. APPARATUS FOR THE TREATMENT OF TIMBER FOR PRESERVING IT. — Henry Flad, St. Louis, Mo.
 253,368. TRACING-DESK. — Edward T. Gibson, Fort Washkie, Wyo.
 253,400. APPARATUS FOR DISINFECTING WATER-CLOSETS, ETC. — Edward J. Mallett, Jr., New York, N. Y.
 253,416. CONNECTING SMOKE, HOT-AIR, AND OTHER FLUES. — Simpson O'Brien, New Cumberland, W. Va.
 253,459. FIRE-ESCAPE. — William Winkless, Newport, Ky.
 253,465. HANGER FOR INSIDE BLINDS. — Chas. M. Young, Lockport, N. Y.
 253,471. DOOR-HANGER. — Wm. B. Cogger, Minneapolis, Minn.
 10,031. (Reissue.) HYDRAULIC AND PNEUMATIC ELEVATOR. — Otis Brothers & Co., Yonkers, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report ten permits have been granted, of which the following are the more important: —
 R. W. Armstrong, 2 three-sty brick buildings, Nos. 22 and 24 Park St., between Fayette and Lexington Sts.
 P. Reddington, three-sty brick building, s w cor. Alsquith and Hoffman Sts.
 Mrs. Sallie E. Luntz, one-sty brick store, 18' x 48', n w cor. Etting and Bloom Sts.
 Dr. E. F. Erick, two-sty brick stable, Plover Alley, between Centre and Monument Sts.

Boston.

ENLARGEMENT. — R. H. White & Co. are to make extensive additions to their store on Washington St., extending it to Harrison Ave. and Bedford St.
WAREHOUSE. — Mr. Fred Ames is to build an immense business structure on 14,000 feet of land just bought on Chauncy Street, Exeter Place, Harrison Avenue extension and Bedford Street.
CHURCH. — The society connected with the French Catholic Church — Notre Dame des Victoires — is at present engaged in the work of raising funds for the construction of a place of worship on the Back Bay. The edifice is to cost about \$200,000.

Brooklyn.

CHURCH. — Work on the R. C. Church of the Most Holy Trinity, foundations and first tier of beams of which were laid last year is to be resumed as soon as possible. The building is on Montrose Ave., near Eleventh St., and will be Belleville stone and brick. The estimated cost is about \$250,000; Mr. Wm. Shickel of New York, architect.
PUBLIC BUILDING. — The bill introduced in the House by Representative J. Hyatt Smith providing for a public building in this city has been reported from the Committee on Public Buildings and Grounds to the House, with a favorable recommendation. It appropriates \$800,000 for the purchase of a site and the commencement of the work of construction.
BUILDING PERMITS. — Hooper St., s s 167' 4" w Marcy Ave., 3 three-sty brownstone dwellings; cost, each, \$11,000; owner, architect and builder, J. F. Ryan, 181 Hewes St.
 Stuyvesant Ave., e s 25' s Van Buren St.; 5 two-sty brick dwellings; cost, each, \$2,500; owner, architect and builder, Wm. Godfrey, 614 Fulton St.
 Palmetto St., s s 500' w Central Ave., two-sty frame dwell.; cost, \$2,000; owner and builder, A. Walker, 47 Monitor St.
 Troutman St., n s 150' from Evergreen Ave., two-sty frame dwell.; cost, \$2,500; owner, John Clemens, 17 Melrose St.; builders, A. Sachs and J. Rueger.
 Ninth St., e s 55' n Ainslie St.; one-sty brick iron foundry; cost, \$5,000; owners, Heuvelman & Co., 106 Ninth St., E. D.; builders, Benj. Mills and Jos. Miller.
 Eagle St., No. 173, three-sty frame tenement; cost, \$3,000; owner, Philip Monahan, on premises; builders, Port & Gamble.
 Division Ave., n e cor. Ninth St., three-sty brick

flat; cost, \$7,100; owner, Frantz Herrschaft; architect and builder, C. L. Johnson.
ALTERATIONS. — Ninth St., n s, between Eighth and Ninth Aves., brick foundation; cost, \$2,000; owner, S. F. Engle, Ninth St., near Third Ave.; builder, E. Dennington.

Chicago.

APARTMENT-HOUSES. — It is proposed to build an apartment-house of 20 flats, brick and terra-cotta fronts. Messrs. Kimball & Wisedell, of New York, are drawing plans.
ELEVATOR. — The Chicago & Rock Island Railroad Company will build an elevator, 80' x 300', five-sty, on Twelfth St., near the river; at a cost of \$100,000.
HOUSE. — Mr. Leander J. McCormick is to build a summer residence upon his estate in Lake Forest. The plans are now being perfected by Messrs. Cobb & Frost.
STABLE, ETC. — Messrs. Cobb & Frost are also preparing plans for a porter's lodge, gardener's cottage, stable, and stock-house. The cost of the whole will not be less than \$80,000.

Minneapolis, Minn.

STORES. — Mr. H. A. Loverin has decided to build a four-story building with a brick front, which will contain two stores and offices on the upper floors, next the Gluck block.
 H. G. Sidle is talking of building two stores on Sixth Street, in the rear of the Grand Opera House. The work on both the Haron & Knowles and Merchant buildings is under way.
 J. W. Lyon of Guelph, Ont., is to build six stores on the corner of University Avenue and Sixth Avenue south in the East Division. The building will have a front of 201 feet, and be of brick, the houses have three floors and the stores a depth of 80 feet and frontage of 22 feet. The building will cost not less than \$35,000.
HOUSES. — H. A. Anderson has begun to build a double house, 50' x 60', on Franklin Avenue, between Thirteenth and Fourteenth Streets, which is to cost about \$6,000.
 Mr. P. D. McMillan is to build a \$4,000 house on University Avenue between Sixth and Seventh Avenues, south.

New York.

APARTMENT-HOUSES. — On Forty-third St., between Seventh and Eighth Aves., two apartment-houses to cover a lot 75' x 86', are to be erected of brick with terra-cotta and stone finish, at a cost of about \$175,000; Messrs. Thom & Wilson are the architects. One building is for Mr. Roberts, of the Hudson River Railroad, the other for Mr. Hermann Hoeffler.
CHURCH. — A church for the Rev. Dr. Johns of the Protestant Methodist Church is to be built of brick and terra-cotta, at No. 317 East One Hundred and Eighty St. It covers a lot 77' x 100' 5", with a wing 24' x 25'. In connection with the church are rooms for social and educational purposes; Messrs. Starkweather & Gibbs, 822 Broadway, are the architects.
THEOLOGICAL SEMINARY. — Mr. William A. Potter has now perfected the designs for the Union Theological Seminary, to be built on Fourth Ave., and running from Sixty-ninth to Seventy-ninth Sts., with a depth of 125'. The central building on Fourth Ave. is the chapel building. On the southeast cor. is the library; on the northeast cor. are the recitation halls. At the back of the three buildings mentioned is the dormitory building, 200' long. There will be an interior flagged court, 40' x 125'. The material used will be Collabough brick, with Long Meadow stone trimmings. The cost of the building will be about \$300,000. Mr. Robert L. Darragh has the contract for the foundation work.
RESIDENCES. — On Madison Ave., near Fifty-eighth St., two first-class residences are to be built, one for Mr. R. L. H. Townsend, and one for Mr. J. M. Valentine. They will have brownstone fronts, and average a cost of \$30,000.
SCHOOL. — On Fifty-first St., between Fourth and Madison Ave., the Columbia Grammar School, 50' x 76', and extension, 10' x 11', is to be built of brick with brownstone finish; at a cost of about \$40,000. The building will be three stories and basement; Messrs. Bacon & Campbell are the Principals, Messrs. Robert and Ogden Golet the owners of the building, and Mr. Jos. M. Dunn the architect.
BUILDING PERMITS. — East Thirty-fifth St., No. 312, five-sty brick tenement; cost, \$15,000; owners, Robert and Joseph Gordon, 725 Second Ave.; architect, A. Wagner.
 One Hundred and Thirtieth St., s s 183' 4" w Sixth Ave., three-sty brownstone dwell.; cost, \$11,000; owners and builders, J. W. Hogenkamp & Son; architects, D. & J. Jardine.
 Cornelia St., No. 30, five-sty brick and stone tenement; cost, \$16,000; owner, J. Varian, 22 Leroy St.; architect, C. E. Hadden.
 West Nineteenth St., Nos. 143 to 149, seven-sty brick factory; cost, about \$55,000; owner, F. A. Kirsch, 192 South Fifth Ave.; architect, H. Mook.
 Greenwich St., No. 42, three-sty brick store and tenement; cost, \$8,000; agent, John H. Muller, 33 Pine St.; architects, Babcock & McAvoy; builders, B. Sheridan and T. Ovington.
 Third Ave., s w cor. Thirty-sixth St., five-sty brick store and flat; cost, \$60,000; owners, Edward H. Coster et al., 145 West Fourteenth St.; architects, D. & J. Jardine.
 Twenty-third St., n w cor. Lexington Ave., brick and terra-cotta church; cost, \$25,000; owner, Stanton-Street Baptist Church; architects, N. Le Brun & Son.
 Greenwich St., n e cor. King St., five-sty brick warehouse; cost, \$60,000; owner, Trinity Church, 5 Church St.; architect, C. C. Haight; builders, R. Desros and L. H. Williams.
 One Hundred and Fifty-fifth St., s s 100' w Eighth Ave., one-sty frame music-hall and summer garden, tin roof, wooden cornice; cost, \$20,000; owner, John Gerken, 153 West Fifteenth St.; architects, Babcock & McAvoy; builders, Wm. Cowen & Son and Jno. Knox.

One Hundred and Forty-third St., n s 225' e Willis Ave., 5 two-sty brick dwellings; cost, each, \$3,000; owner, Chas. Van Riper, One Hundred and Forty-fifth St., near Third Ave.; architect, H. S. Baker.
 Seventeenth St., s s 212' e Third Ave., 4 four-sty brownstone apartment-houses; cost, each, \$18,000; owners and builders, Frame & McGirr, 206 East Seventeenth St.; architect, J. C. Burne.
 Eighty-fifth St., s s 120' w First Ave., 3 four-sty brownstone French flats, 25' 8" and 26' 8" x 62', tin roof, iron cornice; cost, each, \$16,000; owner, William Henderson, 413 East Eighty-fifth St.; architect, J. C. Burne.

One Hundred and Eighth St., n s 100' w Second Ave., 2 four-sty brownstone tenements, 25' x 65', tin roofs, iron cornices; cost, each, \$14,000; owner, Geo. Kuhn; architect, same as last.
 One Hundred and Nineteenth St., n s 75' e Second Ave., 8 four-sty French flats; cost, each, \$13,000; owner, Henry Hawkes, 411 East Eighty-eighth St.; architect, same as last.

One Hundred and Forty-third St., s s 200' w Eighth Ave., two-sty frame and brick dwell.; cost, \$3,500; owner, Wm. Neagle, 2392 Fourth Ave.; architect, same as last.
 Sixty-ninth St., n s 225' w Ninth Ave., 3 three-sty Connecticut brownstone dwells.; cost, each, \$14,000; owner, Michael Brennan, 425 West Fifty-seventh St.; architects, Thom & Wilson.

Chatham St., Nos. 137 and 139, and Nos. 3, 5 and 7 Roosevelt St., five-sty brick store and tenement; cost, \$39,000; owners, William S. Foulke and Ann S. Dudley, Richmond, Ind.; architects, D. & J. Jardine.
 First Ave., No. 1069, five-sty brick tenement; cost, \$9,000; owner, Thomas O'Reilly; architect, A. B. Ogden.

ALTERATIONS. — Eighth St. or St. Mark's Pl., No. 59, four-sty brick extension, alteration for tenement; cost, \$2,500; owner, William Millig, 159 Eldridge St.; architect, F. W. Kient; builder, Ferdinand Sieghart.
 Broadway, No. 595, front alteration and lower basement and store floors; cost, \$2,000; owner, Beadel Estate, 450 Broadway; architects and builders, Haight & Monnia.

Broad St., No. 86, interior alterations for offices; cost, \$3,000; lessee, Chas. Hollwedel; architects, D. & J. Jardine.
 Second Ave., No. 1060, alteration to store and dwell., and front and interior alterations; cost, \$3,000; owner, Chas. Brennan, on premises; architect, W. Graul.

East Twenty-first St., No. 501, raised; also three-sty brick extension; cost, \$5,000; owner, New York Gas-Light Co., 157 and 159 Hester St.; architect, T. T. Lees; builders, C. Copper and A. T. Smith.
 First Ave., s e cor. Eighty-fourth St., one-sty brick extension; cost, \$3,500; owner, George Hoppe, Sixth Ave., n e cor. Thirty-seventh St.; architect, Jno. Brandt.

Hester St., n e cor. Ludlow St., interior alterations, front alteration, etc.; cost, \$2,000; owner, R. Aronson, 73 Bayard St.; architect, J. Brandt.
 East Eighty-fourth St., No. 159, one-sty brick extension, interior alteration; cost, \$3,000; owner, Isabella Baker, 209 West Fifteenth St.; architect and carpenter, T. Falvey; mason, R. Huson.
 St. Mark's Pl., No. 104, raised one-sty, also five-sty brick extension, alteration for tenement; cost, \$5,000; owner, Sophia Berle, 120 Seventh St.; architect, E. W. Grier.

Second Ave., No. 192, alteration for store and dwell.; cost, \$2,500; owner, Jas. Robertson, Peckskill, N. Y.; architect and builder, P. Canfield.

St. Louis.

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

OWNER'S NAME.	USE.	Stories.	Rooms.	Cost.
Theo. Salorgue, Jr.,	Carriage Factory	3	3	\$ 4,000
Wm. H. Thompson	Store	6	6	30,000
T. J. Conway	Dwell.	2	12	4,100
J. J. Rosewell	Dwell.	2	40	12,000
B. B. Krawinkle	Dwell.	2	12	3,700
E. M. Birdsall Co.	Warehouse	2	2	4,500
Mrs. E. M. McKee	Dwells.	2	28	12,400
N. L. Johnson	Store and Office	4	8	11,000
Charles Wehking	Dwell.	2	12	2,700
C. Danzer	Dwell.	2	21	10,000
A. J. Bramwell	Dwell.	2	6	4,000
John C. Vogel	Dwell.	2	17	15,000
G. A. Rubelman	Store	4	4	10,000
William Piel	Dwell.	2	24	6,000
C. Engle	Dwell.	2	8	5,000
A. Schmedmann	Dwell.	2	6	2,500
H. Heinlen	Dwell.	2	14	5,000
R. Verlig	Dwell.	2	6	2,500
Mrs. J. Howse	Dwell.	2	9	8,000

Philadelphia.

ARMORY. — Broad and Callowhill Sts., three-sty brick armory, 140' x 220'; J. H. Windrim, architect.
CHURCH. — Belgrade St. and Allegheny Ave., church, 50' x 150'; Redemptorist Fathers, owners.
STORES. — North Eighth St., No. 50, three-sty store, 37' x 100'; Elliott & Dannenbaum, owners.
MACHINE SHOPS. — Bridesburg, Phila., Yorkes & Plumb intend erecting the following buildings: Forge shop, 80' x 200'; grinding house, 30' x 175'; engine room, 30' x 50'; tempering shop, 30' x 60'.

WORK OF THE PAST YEAR. — The very extensive increase in building operations of 1881 as compared with 1880, is shown by the following figures: Permits issued for new structures during 1880, 1,756; for the year 1881, 2,761; being an increase of 1,005. Addition and alteration in 1880, 1,432; addition and alteration in 1881, 1,489.

HOUSE. — Walnut St., e of Twenty-first St., J. P. Scott, (Continued on next page.)