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THE demolition of the "old" Chicago Post-office, a structure, by the way, which was finished only twenty-one years ago, and is torn down because it had begun to fall to pieces of its own accord, has furnished lessons of immense value in regard to the durability of iron and steel, as employed in connection with masonry in modern buildings. This structure had walls of granite, interior columns of cast-iron, and floor-beams and girders of wrought-iron, the floors being made with arched sheets of corrugated iron, sprung-in between the beams, and levelled up with concrete. The lathing on which the plastering was laid consisted of corrugated sheet-iron, of a different pattern. The roof was of iron framework covered with slate. The beams and columns, as the *Metal Worker* informs us, on being exposed, were all found in excellent condition, with less rust on them than would collect during a short exposure in a builder's yard; and, we may observe, it is by no means certain that what rust appeared may not have been on them when they were set in place. The corrugated-iron floor-arches, although of poor quality, showed no injury from rust, and it is remarkable that not only did the metal show bright where the concrete was scraped off, but portions of the sheets which had not come in contact with the concrete, on account of vacancies left in filling-in the latter, had not sensibly rusted, nor had the underside, which was covered with paint, suffered any deterioration. The sheet-iron lathing from the partitions was slightly rusted where it had come in contact with the mortar, but was bright on the side toward the studding, and what corrosion was found seemed to have ceased after the mortar was dry. Whether lime mortar, or some acid substance, containing sulphate of lime, was used for plastering, we are not informed. With lime mortar, it is rather surprising that the lath should have rusted at all; while, if plaster-of-Paris, or some acid cement, was employed, it is still more surprising that corrosion should have entirely ceased when it dried. In any case, the results shown should give great encouragement to the owners and architects of modern buildings of steel and masonry. That iron buried in lime mortar is little subject to rust is shown by the fact that the ties found in the walls of mediæval cathedrals by the architects who have charge of restorations are generally free from rust; but cement concrete is, chemically, a very different substance from lime mortar, and, although the indications derived from observing the behavior of iron in cement-lined pipes, and construction of artificial stone, have been favorable, no one has been able to say what might happen to it under the conditions which obtain in building, where complete contact of the cement and iron is not practicable, and where irregular dampness, alternations of heat and cold, and many other circumstances, affect the question materially.

A GOOD deal of annoyance has been given unnecessarily to architects and owners in Boston on account of the cornices of buildings in the business district of the city. There is no doubt that cornices at the top of high buildings do a good deal to darken narrow streets bordering the buildings. It is easy to see that, at the top of a building one hundred and twenty-five feet high, which is the extreme limit for office-buildings in Boston, a cornice of five feet projection will cut off as much light, at the curb level, from the opposite side of a street forty feet wide, as would be cut off by an addition of eighteen feet to the vertical height of the building without the cornice. A wide cornice may, therefore, do much to defeat the object of the law restricting the height of buildings, and, as there are several cornices in Boston of more than five feet projection, and many streets less than forty feet wide, it is natural that owners of property which would be unnecessarily darkened by large cornices on new structures struggle vigorously, and often successfully, to have them reduced in size. At the same time, architects and owners, who have studied the proportions of their cornices carefully, and have paid for making them, feel themselves aggrieved when, after their designs have been approved by the Department of Buildings, and the work has been carried nearly to completion, they are unexpectedly stopped by an injunction, and, after suffering weeks of delay, and the expense and annoyance of a suit, are compelled to pay for a new cornice, probably much less suitable to the design of the building. Of course, the proper time for neighboring proprietors to object to the projection of a cornice is when the designs for it are under consideration in the Inspector's office, and the change can be made without causing the owner delay and expense; but people cannot be on the lookout all the time to see whether some one has filed plans for objectionable cornices in their neighborhood, and no provision has been made for giving notice of a cornice, such as the law requires in the case of stables. Now, however, the matter has been set right by a statute, limiting the projection of cornices in all cases to three feet; and it is to be hoped that architects and owners, knowing this limitation, will be able to design and build their cornices in peace.

THE discussion of the forestry question in our Western States has received a valuable contribution, in the shape of a report made by a committee of the National Academy of Sciences, at the request of the Secretary of the Interior. This report, which has been sent to the Senate, gives an account of the experience of European countries in regard to the desolation of agricultural regions, resulting from cutting away the forests from the highlands furnishing their water-supply, and their gradual restoration through the processes of "reafforestation"; and will, undoubtedly, be of great value to some of the Senators, and to their short-sighted constituents, who are willing to see the agricultural prosperity of their State destroyed, and, most probably, themselves ruined in a few years, rather than submit to restrictions preventing them from pasturing their sheep on the public timber-lands. The Committee makes the important statement that forest fires, and the gnawing of sheep, are far more destructive to the Government forest reservations than the taking of timber from them, although the latter practice is very prevalent among the settlers, as well as other people, and it recommends that actual settlers in and near the forests should be allowed to take such timber as they need for their own use, and that mature trees should be systematically cut and sold; while it advises that prospectors for minerals should be allowed to enter the forests for that purpose. This last privilege ought certainly to be extended with discretion, for nobody has less interest in the welfare of the forest-dwelling community than the average mining-speculator, who hunts through the woods for ore. This man's first proceeding, in making his search, is always, not only to destroy every vestige of vegetation over the district submitted to him, but to remove all the soil, leaving nothing but the bare rock; and if this proves not to contain metal, the place is abandoned to hopeless, and, practically, eternal desolation.

IT is rather flattering to American pride to read, in the list of candidates admitted at the March examinations to the Paris School of Fine-Arts, six American names among the first nine on the list. Although the Americans who enter the School are generally graduates either of colleges or of technical institutions, and have thus a higher training than the French candidates, who, as a rule, come from what would be called here high schools, and depend for their special preparation on a year or two's study in some architect's *atelier*, this would not account entirely for the superiority of the Americans in the entrance examinations, or for the distinction which they very frequently gain by their work in the School, and we may fairly take their success in Paris as an evidence of the natural aptitude of the American character for artistic pursuits, and particularly for that most subtile form of art which uses building-materials for its expression.

THERE is to be an International Congress of Architects in connection with the Universal Exhibition, to be held this year at Brussels, and all architects of the world are invited to participate. The Congress is to be in charge of the Société Centrale d'Architecture of Belgium, which is already renowned for its activity in professional matters, and is likely to be very interesting and useful. The meetings of the Congress will be held every day, from August 28 to September 2, and discussions will be assigned on the questions: whether instruction in architecture should be eclectic, or limited to the principles of a school; whether an architectural diploma is necessary; whether, in the restoration of ancient monuments, the mistakes and errors of construction of the original builders should be respected or corrected, and whether portions not belonging in style to the original structure should be suppressed, for the sake of harmony; what steps should be taken to insure to architects their artistic proprietorship in their works; in what way the institution of a fund for the defence of the common interests of architects can be generalized, and such other questions of interest as may be proposed by members. Besides the discussions, there will be visits to the Exhibition, to Tervueren, to the ruins of the Abbey of Villers, and to Antwerp, and an inspection of the buildings of interest in Brussels; and the members are invited to a ball at the Town-hall, offered by the Municipality of Brussels, a reception at the rooms of the Société Centrale, and a "confraternal banquet." As is the practice in most of these International Congresses, each member must subscribe a small sum. In the present case, the subscription may be either twenty or thirty francs, payable by postal money-order. A thirty-franc subscription entitles the subscriber to reduced fares on the railways, to free transportation on the excursions from Brussels to Antwerp and the ruins at Villers, free admission to the Exhibition, a reserved seat for a representation at La Monnaie, the Brussels Opera-house; free entrance to the public buildings of Antwerp and Brussels, the Plantin Museum and the Antwerp Zoölogical Gardens, a place at the confraternal banquet, admission to the Society's reception and the Municipal ball, and reduced rates at the principal hotels in Brussels. A twenty-franc subscription entitles the holder to admission to all the excursions and entertainments above mentioned, but does not include the confraternal banquet or the opera ticket. Members who take their wives with them may obtain for them admission to the excursions, and an opera seat, for twenty francs additional; and a member's ticket will admit ladies accompanying them to the Municipal ball and the Society's reception. At the time of the Congress, that is, on the 29th of August, will be opened an architectural exhibition, which will remain open until September 30, and will include drawings, sketches, photographs or engravings of any architectural works projected or executed during the second half of the nineteenth century. Works for this exhibition must be mounted on strong cardboard, and delivered in Brussels, carriage paid; and a committee will receive and place them, and return them at the close of the exhibition. The works of deceased architects will also be shown, and, in this case, the expense of transportation to Brussels will be reimbursed to the heirs or others sending them, and they will be returned, carriage paid; and the heirs or executors will be given free entrance to the exhibition. Works for exhibition must be sent, signed, with a card describing them, before July 1, 1897, to M. Valère Dumortier, Avenue Ducpétiaux 104, Brussels, Belgium; and subscriptions for membership in the Congress must be sent to the same address, accompanied by two good photographs of the applicant, for subsequent identification, also before July 1 next. Applications for lady's cards will be received from members up to August 20, but it will be convenient for the management to have the application made at the same time with the member's subscription. The time is rather short for American architects to arrange for exhibiting works, but it is to be hoped that some of them will be able to contribute, as American architecture is an object of great interest on the Continent just now, and any American member of the profession who may be in Europe in August and September will find the Congress a source of much pleasure, and, undoubtedly, of profit. Brussels is one of the pleasantest cities in Europe; the hotels, as in most royal-residence towns, are very good, and laces and other things dear to ladies' hearts are beautiful and cheap; and the advantage of visiting a Continental city under the hospitable care of a society of its most intelligent and cultivated inhabitants is not one that can be enjoyed every day.

MANY people have read with interest the accounts of the trials of the experimental steamboat "*Turbinia*," driven by a steam turbine, of what is known as the Parsons type. So much fraudulent nonsense is published now in the newspapers regarding steam-turbines that it may be well to recollect that steam-engines of this sort have been known and used for at least twenty years. In theory, the idea of allowing steam to enter near the centre of a wheel of the turbine sort, revolving freely, and expand toward the circumference, is a most attractive one. The engine is, so to speak, infinitely compounded, the expansion of the steam being utilized to the utmost, while its simplicity and compactness commend it at once. In practice, however, very few steam-turbines have been brought into successful use. As the turbine must, in general, revolve in a tight case, it is important to make a close joint between the casing and the turbine, without checking the free movement of the latter, and such a joint, while easily imaginable, is not so easily realized; and any friction at the circumference of the turbine acts as a powerful brake. To compensate in some degree for the leakage of steam through this joint, it has been found necessary to run most of the successful turbines at a very high speed. The Altham engine, one of the most promising of the American experimental machines, runs at ten thousand revolutions per minute. The Parsons turbine, which was invented twelve or fifteen years ago, and has made its way into tolerably extended use in England, is said to have been run continuously at four thousand revolutions a minute for three years. Quite recently, the manufacturers of this machine, the only steam-turbine, so far as we know, which has ever reached commercial success, acquired rights in another turbine with meritorious features, and having thus a certain control of the field, resolved to try the application of the turbine principle to marine engines, and the building of the "*Turbinia*" was the result. As the current of steam not only turns the turbine, but pushes it in the direction of the length of the shaft, the stationary Parsons engines have two opposite turbines on the same shaft, so that the push of one neutralizes that of the other; but in the marine type, as used in the "*Turbinia*," there is only one turbine, the push of which tends to thrust the propelling screw out into the water, thus neutralizing, in part, the inward thrust of the screw, which in ordinary marine engines is resisted by an enormous cushion-block. A good deal of friction is saved by this arrangement, and the trial trips of the "*Turbinia*," which began last December and have been carried on at intervals until now, have given remarkable results. In the earlier trips, the vessel, with the engine running at twenty-five hundred and fifty revolutions a minute, made, on an average, 29.6 knots per hour. The screw was then changed, and one with greater pitch substituted, with the result that an average speed of 31.01 knots, and a maximum of 32.75 knots, or about thirty-eight miles an hour have been obtained, with an average of about twenty-one hundred revolutions a minute.

OUR readers have found in the daily papers of late such plethora of information about the latest addition made to public works of art in Boston, that they may be grateful to us for simply noting as a matter of record that on May 31 there was unveiled the life-size *alto-rilievo* bronze memorial by St. Gaudens, erected to the glory of Colonel Robert G. Shaw and the negro troops of the 54th Regiment of the Massachusetts Volunteer Militia. When we find opportunity to publish adequate illustrations of the monument we will refer to it in detail.

THE SPANISH MISSIONS OF THE PACIFIC COAST.

View of Entrance on Centre Street: City Prison, New York.

THE California Building at the Columbian Exposition, in 1893, afforded an opportunity to examine a style of architecture that might be regarded as the Pacific Coast analogue of the old Colonial buildings of the Atlantic States. The same style was made a dominant architectural feature also of the California Midwinter Fair, which opened after the Columbian Exposition had closed, where however, it was observed by fewer eastern visitors than at Chicago, though appearing to better advantage, because more at home with its surroundings. Thus has been awakened an interest in what are known as the Spanish Missions of the Pacific Coast, as presenting a peculiar phase of American architecture capable of furnishing a distinct style of design; already adapted to the climate and environment of the Pacific Coast; embodying certain historic ideas worthy of perpetuation, and suggestive of development to meet modern requirements. Through the enthusiastic study and patient labors of the late A. Page Brown, F. A. I. A., of San Francisco, this style was sufficiently developed in that direction to gain a recognition and a name. And so many points of interest are noticeable in regard to the history of the mission buildings, and the mission system is so closely connected with the colonization and settlement of California, that a few words on this phase of western Colonial life may not be amiss in an architectural magazine.

Colonization and evangelization had generally proceeded hand in hand in New Spain. In the northern provinces, however, the latter had taken the lead and prepared the way for the former. And thus the religious names dotting the map of Northern Mexico and the southwestern portion of our own country are accounted for; and the number of towns in Northern Mexico architecturally dominated by ecclesiastical edifices. So successful had the ecclesiastics been in thus enlarging the borders of the Spanish Dominion in the New World, that the work of reducing the natives of Lower California was formally entrusted to the Jesuits at a time when all efforts at settlement and colonization in what we now know as California had proved unsuccessful. The work assigned to the Jesuits was undertaken under what may be known as the Mission System, as distinct from the Presidial and the Pueblo. The Presidio was a garrison established to guard the frontier. It grew in time into a military settlement. The Pueblo consisted of colonists settled on lands under civil restrictive regulations derived through Spain from ancient Roman customs. The Mission, however, was a purely ecclesiastical system in its inception. Its avowed objects were the conversion and civilization of the Indians. The system was encouraged by the State and furnished with military protection, with the hope of being found useful to the State and ultimately merging into the pueblo. The missionaries, like the soldiers of the Presidio, were liable to dismissal, as soon as their efforts towards the acquisition and development of territory had advanced sufficiently for the State to appropriate the results with profit.

Under the supervision of Padre Salvatierra, the Jesuit Missions flourished in Lower California until the entire peninsula, nearly to the borders of the mainland or Alta California, was brought under the domination of Spain. The system developed and proved a merciful substitute for the iniquitous *encomiendas* and *repartimientos*, which the religious orders had themselves bitterly opposed because of the cruelties practised upon the natives. The mission *padres* gathered the Indians into groups, or villages, and by instructing them in religion and the industrial arts, tried to bring them within the pale of civilization. The process was, however, a forcing one, and though capable of justification to some extent by its results it yet was reprehensible in the abstract.

The Lower California Missions declined after the death of Salvatierra under the supervision of inferior men, partly because of the exhaustion of the physical resources of the country. The decline did not take place, however, before the mission system had been well developed and had proved its value to the Spanish Government as a means of extending its territorial sway. By the expulsion, in 1767, of the Jesuits from all Spanish Dominions, the supervision of the missions in Lower California devolved upon the Franciscans. It was then that the Spanish Government proceeded to prosecute a long cherished plan to extend colonization northward along the Pacific Coast; to provide Spanish vessels with good ports of supply and repair on their return voyages from Manilla; and to occupy the coast of Alta California as a safeguard against Russian and other foreign aggressions, which then began to threaten. Here was a grand field for the exercise of the mission system, and the viceregal government of New Spain was prompt to make use of it. The proclamation of the Viceroy declared the purpose of the expedition he was fitting out to be: "To establish the Catholic religion among the numerous heathen people submerged into the darkness of paganism, to extend the dominion of the King [of Spain] our Lord, and to protect the peninsula from the ambitious designs of foreign nations." The missionaries were scarcely to be blamed if they regarded the first of these expressed objects as of the greatest importance; developed the missions according to their own ideas; and objected and temporized when the government sought to interfere with their work and appropriate the results of their labors.

With the advancement of this project began the career of Spanish discovery and settlement in California. The pioneer in the establishment of the Franciscan missions in California was Padre Junipero Serra, whose name it is scarcely possible to write and resist the temptation to eulogy. But without narrating the dramatic details of the landing of the early colonists at Monterey and San Diego, suffice it that Serra founded the first of the California missions at San Diego (named after the patron saint of Spain) in 1769, and proceeded rapidly to extend the work he had in hand northward, meeting with only one serious disaster. That was the destruction of the San Diego Mission by an assault of the Indians early in its career. That loss was quickly repaired, and in 1770 the Mission of San Carlos was founded at Monterey. San Gabriel, San Fernando and San Antonio (de Padua) were established in 1771, and San Luis Obispo in 1772. In that year a land expedition explored the eastern shore of San Francisco Bay, but it was not until four years later that a mission was established there. The church was dedicated in October, 1776, to San Francisco de Assisi, the founder of the order to which Serra and his coadjutor missionaries belonged. The Mission of San Juan Capistrano was likewise founded in 1776. In 1782, two other missions were established, Santa Clara and San Buenaventura: and at the time of his death, in 1784, Serra had the Mission of Santa Barbara in contemplation, and it was finally established two years later. Thus a line of settlements was formed along the coast, within easy reach of each other and occupying all the fertile valleys of that region. Subsequently, the intervening spaces were more fully occupied by the establishment of the Missions of La Purisima (1787), Santa Cruz and Soledad (1791), San Juan Bautista, San José and San Miguel (1797), San Luis Rey (1798), Santa Inez (1802), San Rafael (1817), and San Francisco Solano (1823). Some of these were established by direction of the Government and with funds provided for the purpose out of the public treasury. And although, by provision of the Government, no civil town could be legally located within five miles of a mission, yet room was found for the establishment of some pueblos occupied by Spanish colonists. The first of these was San Jose, in 1777; the next was Los Angeles, in 1781. By a line of missions and pueblos, thus almost touching one another, the much desired boon of protection from foreign invasion was conferred upon the State, while the industries of the mission furnished the Government of New Spain with valuable supplies.

The process of establishing a mission may be thus described: A few rude huts were constructed to serve the missionaries as temporary homes and as the bases of operations; and efforts were made, at first by the display of banners and bright pictures, to attract the attention of the Indians, and then by gifts of food and personal ornaments, to win their confidence. The most spectacular features of the religion of the friar missionaries were exhibited, and were found to have a powerful influence over the Indian mind. They were thus brought back from day to day to the rude homes of the missionaries and constrained to listen to religious teaching. In times they were induced to engage in work about the missions (as the friars' abodes came to be called), and for this they were remunerated by food, clothing and instruction. Then they consented to occupy huts in or near the mission, and a permanent relationship was established.

Upon consenting to receive baptism, the Indians became neophytes, and were made to feel that they had taken vows which bound them to God in the person of the *padres*, who were God's visible representatives. They became, therefore, part of the mission property, and a patriarchal form of government was established, capable of being made as harsh as that of the *encomiendas* and *repartimientos* in the hands of unscrupulous friars. If a neophyte escaped from the mission and failed to obey the summons to return, he was captured by soldiers, brought back and flogged for his truancy. The discipline of the mission provided for punishment by whipping, stocks, chains and imprisonment. For offences more serious than those over which the mission authorities had jurisdiction, neophytes were handed over to the soldiers, who were sent to protect the missions, and who, acting under the command of the civil governor, punished according to the military code, even to the execution of the death sentence.

The daily routine of the missions included seven hours of labor and two of regularly specified religious services. The day began with mass said at sunrise, and attendance upon this and all other religious services was made obligatory under pain of corporal punishment. The labor imposed upon the neophytes consisted at first of care of the more distant stock-ranches and the nearer gardens, orchards, vineyards and fields. Then came the damming of creeks and rivers, the building of long irrigation-ditches and similar engineering works. In time artisans were sent from Mexico, by whom the neophytes were taught saddle and shoe making, blacksmithing, weaving, and, in short, all the ordinary industrial arts, so that the missions not only became sufficient in themselves for the supply of all their ordinary needs, but capable of developing a commerce in a vast variety of products of the soil and of the shop.

Two seemingly contradictory pictures are presented of the life of the neophytes at the missions. One is of a happy people, lightening their tasks throughout the day with songs, and engaged in childish games in the hours of recreation. The other is the grim picture of a naturally free people, oppressed by an irksome slavery, controlled by chains and the lash. Probably the two pictures represented distinct phases of the same life; or, it may be they represent the variations possible under such a system, in various localities and under different *padres*.

It soon became necessary to replace the primitive homes of the friar missionaries with permanent structures better adapted to the needs of their rapidly developed work; and thus came into being the mission buildings which are more particularly the subject of our present inquiry.

It was a characteristic of the religious orders of those times, that their members were skilled in architecture and engineering. The Franciscan Order, especially, had been recruited from a class of highly cultivated men who had previously been soldiers, lawyers, physicians, artists and engineers. Some of the greatest engineering and architectural works in the City of Mexico have been planned and executed by Jesuit and Franciscan friars. In the edifices now erected for the accommodation of the missions, the Franciscan friars exhibited considerable genius in selecting a style and plan adapted to the climate and to their particular needs. Their buildings were to include, first of all, churches, in the most prominent positions. Upon these the greatest amount of ornamentation was expended. They were further required to include living-rooms for the friars; refectories; separate dormitories for the Indian men, women and children; school-rooms; workshops; storehouses, and even places required by the discipline of the mission. The necessity of separate abodes for the Indian women under strict surveillance to prevent outrage by the men, gave to the women's quarters the name of "monastery" (convent?) and the women neophytes were called "nuns." The children of the Spanish Colonists and those of the Indians mingled in the school-rooms upon equal terms.

Though possessing many features in common, the mission-buildings presented great varieties of details. They were the fruits of Indian labor. Under the supervision of the friars, the neophytes quarried and dressed the stone, made the adobe bricks, and hewed the timber used in the construction, and then labored at the erection of the edifices.

The friar missionary architects had for their models, buildings with which they may have been familiar in their early lives in Spain. Yet there is nothing in Spain exactly corresponding to their buildings, as there is nothing resembling them elsewhere in America. Even the so-called mission-churches of Texas and the Church of San Xavier at Bac, in Arizona, attributable to nearly the same period and to similar conditions, present more points of difference than of similarity. And the designs of the mission-buildings of the Pacific coast are not without a degree of originality, resulting from the effort after convenience and adaptability.

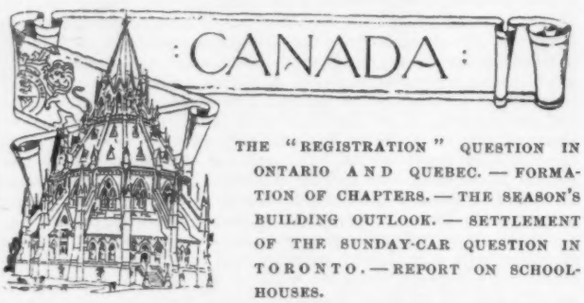
The plain exteriors which reserve all adornment for the interiors; the large open courts, embellished with gardens and fountains; the corridors facing these courts, upon which the rooms open separately; and the square columns supporting the roofs of these corridors — all these were borrowed from the style which the Arab Moors had brought into Spain from the far East. There are occasional slight traces of the horse-shoe arch, or of Moresque cupolas or domes to be found. But for the most part, the arches are Romanesque, as are also the ground plans and the massive walls. The belfry towers, tile roofs and general characteristics of the buildings show distinctly Spanish influences.

The most successful and prosperous of the missions were those established in the eighteenth century, though they reached their highest point during the first third of the present century. It was estimated in the year 1834, that the value of the annual productions of the twenty-one missions was over two million dollars, and that they possessed movable stock to the value of three millions. Those established in the present century only attained to a position of prosperity in time to participate in the decline which was inevitable to all.

Not to prolong the history, though it suggests some interesting points in economics, the decline was occasioned by the attempt to bring about the political purpose for which the missions were, in the mind of the State, originally created. The attempt to secularize the orders and convert the missions into pueblos and the mission churches into parish churches, began in 1813. It was resisted by the friars until 1834. The scheme of secularization included the "emancipation" (as it was usually called) of the neophytes, thus recognizing the system by which their labor was obtained, as a slavery imposed upon them. Great damage to the mission property had already resulted, in the continued struggle between the civil authorities and the missionary friars, when in 1845 and 1846 some of the property was sold or rented under regulations of the Mexican Government. The cession of the territory to the United States ended the struggle. But the property had already begun to decay. Some of the churches were maintained. Some passed out of existence altogether before the relentless march of commercial and domestic architecture in the prosperous towns growing up upon the sites of missions; some of them perpetuating the saintly names bestowed by Terra and his successors. Some were replaced by modern ecclesiastical edifices. Only in one case (Santa Barbara) does the mission survive, still in the charge of Franciscans.

Simultaneously with the effort to perpetuate the style embodied in these buildings, a movement has been made looking to the conservation of such of the fabrics of these buildings as yet remain, as monuments of the early history of California.

The most pretentious effort and the most successful thus far, to copy the style of the mission-buildings, is to be found in the buildings erected for the Leland Stanford Jr. University at Palo Alto, where the style is exhibited not only in all its picturesqueness, but also in its convenience and adaptability to local climate and conditions. It should be remarked, however, in passing, that the perpetuation of the historic idea in the architecture of the buildings at Palo Alto, was the suggestion of an Eastern architect, — none other than the late Mr. H. H. Richardson. It may, perhaps, be taken as one of the manifestations of his superior genius, that he should have been so quick to see the architectural possibilities and fitness in the character of the buildings of the friar missionaries, now rapidly disappearing along the shores of the Pacific. Arthur Howard Noll.



THE "REGISTRATION" QUESTION IN ONTARIO AND QUEBEC. — FORMATION OF CHAPTERS. — THE SEASON'S BUILDING OUTLOOK. — SETTLEMENT OF THE SUNDAY-CAR QUESTION IN TORONTO. — REPORT ON SCHOOL-HOUSES.

NOW that the battle waged by the Ontario Association of Architects with the Provincial Government is over for this year, at least, the architects being again defeated in their laudable efforts, it may be well to compare the methods of the two sister associations — "Ontario" and the "Province of Quebec" — to bring about the same result. The Ontario Association is the older and the leader, and the Province of Quebec Association has waited and watched the progress of its sister society, profiting by its failures and putting into practice the lesson of patience that it has seen to be a wiser course than that followed in Ontario. Ontario, having secured the passage of a bill recognizing it as a properly constituted association, could not rest content, and naturally so, with the principal clause of its bill eliminated. Repeated efforts have been made to get the Act amended, so that no one should call himself, *in future*, an "architect," who was not registered as such, the necessary qualification being that he must have passed the examinations provided by the Association and recognized by the Minister of Education. The clause did not affect present architects — and architects self-styled — and although at first it was thought that the bill was in effect, the making of a close corporation for personal benefits to the promoters, it has, through the courage of the Association in continually pressing the point, been learned that it must be many years before the actual benefits of such an Act could be realized by the public and that, therefore, the present promoters were not pressing for personal aggrandisement or selfish ends. Ontario met with a great deal of opposition even from the men at present practising in some parts of the Province, who succeeded in throwing dust in the eyes of the legislators

and blinding them to the real objects of the Association; but time has shown that the desired bill is an educational measure, pure and simple. Still the opposition of the pockets of some who feared they might be injured by its passage has blocked it from year to year, until the patience of the Association is well nigh worn out. Point after point in the programme has had to be dropped or changed. The proposed tariff, upon which considerable time and labor was expended and promises given by the members that they would use, fell into abeyance, because it was found that many members in the scramble for business were not keeping their promises. No doubt, it was too early to press for anything of the kind. Considerable opposition was raised by at least one judge, who, whenever a case came before him between architect and client, steadily refused to recognize the society in any way or even listen to evidence of professional custom, slighting the architects of long-standing and well-known ability in a most unjustifiable manner. So that it is to be wondered that the patience of the Ontario Association did not give out long ago. It has been misunderstood and abused and ridiculed, but still has pressed its objects and sought to benefit the public who has shown itself unwilling to be benefited.

The Province of Quebec Association, seeing the opposition excited in Ontario, has proceeded in a less pushing way. Its plan has been to make itself, through perhaps a long course of years, recognized by the public as a public-spirited body, having at heart the interests of art, and taking an active part in all movements for the furthering of art in the two chief cities of the Province, Montreal and Quebec. The Association has held its annual meetings and annual examinations, it has established monthly meetings of the members near at hand, has taken its part in art exhibitions, and in many ways appeared before the public, in a manner that could not excite criticism or arouse opposition. One of its latest moves has been to secure the Governor General of the Dominion as a patron. When, therefore, this Province of Quebec Association of Architects does think it advisable to bring out a measure for prohibiting the use of the name "architect" by any one not properly qualified to bear it, it will have the support of all the better-educated and the leading men of the Province and will, no doubt, see its efforts crowned with success. The prestige of the Ontario Association is much injured by the repeated snubs received from the Government. It has been put to very great expense in organization, and by its efforts to obtain legislation. Its annual examinations have been conscientiously held, but its efforts are nullified and rendered nugatory by the half-hearted support given by the Minister of Education. He has always extended a cordial hand to the Association, encouraged it to proceed and been glad to recognize the examining body, but his aid at critical periods was not to be relied on, and as a friend at court, as he might have proved, he failed entirely.

At its last annual meeting the Ontario Association instituted Chapters or local gatherings of architects, and a few days afterwards the Toronto Chapter met and held an interesting and successful meeting. Chapters may very well be formed in the principal towns, but these will not have the effect of holding country members together and it is a great question whether the Association, as such, has not received its death-blow by its last defeat.

The building prospects for the year in Canada are very poor, and the new tariff is not likely to improve them if it goes into force. It is to be hoped that the large number of delegations waiting upon the Government may have the effect of causing changes to be made in the tariff, but if not, a great number of manufacturers will close their works, and the general distress will be greatly aggravated, and in the meantime, no one seems to care to venture on building operations. Interviews with the leading architects reveal a pitiful state of things; the busiest (and none can be called busy) can point to no works of any importance as likely to be carried out this year. Old established firms are almost idle and it looks as if it would be a long time before the building-trade would show any signs of improvement.

There is in Toronto a strong element of "goody" people, who for years have blocked one source of progress, and simple as it may seem, have been keeping a great deal of business out of the city. We have never been able to have a street-car service on Sunday. Commercial travellers, holiday people, of whom we have an immense influx in summer, all avoid Toronto, because it is impossible to get about anywhere on Sunday. For years it has been projected to build a great hotel like the "Windsor" of Montreal, but, like many other schemes, it has been held in abeyance because so large a number of visitors steer clear of this city, or cut short their stay here for the same reason — the absence of easy travelling accommodation on Sunday. A great fight was made for the cars a week or two ago, in which a larger vote was polled than on any previous similar occasion, — larger than for any other subject that has ever been voted on. However, the result was satisfactory: in a poll of 32,500 votes, the small majority of 321 carried the car question and Sunday cars will be run. It is possible that this question being settled, a general improvement may take place. Estate agents of outlying properties expect to be able to sell better and are in hopes of opening up other neighborhoods. Suburban property will certainly be more marketable.

The question of the health of public school children has been exercising the minds of the Provincial Board of Health, incited thereto by the action by a similar Board in the State of Massachusetts, where regulations are in force for the construction of school and other buildings where large numbers congregate, with a view to rendering them healthy at all seasons. Through the courtesy of Dr. Cassidy, Chairman of the Committee on Ventilation for the Ontario Provincial Board of Health, *The Canadian Architect and Builder* has been able to publish the report and result of experiments carried on by them in Toronto schools, and to those interested in such subjects it will be satisfactory to note that the experiments, minutely described in the report, will serve as further authoritative information on this very important subject. The Committee came to the somewhat alarming conclusion that out of six school-buildings examined, only one could be "considered as satisfactory in the matter of ventilation." Although the defects in the others were not of a very serious nature, still they did not come up to the standard of perfection. The absolute necessity for perfection in the ventilation arrangements of public schools especially, must be apparent to all, and when so much public money is spent on school-buildings for free education, the first consideration should be proper sanitation and ventilation. On the whole, the school system of Ontario works well; the rooms are of good size and the children are not crowded, but overheating in winter and too much draught in summer are defects which too commonly exist and often with serious results. The system employed may be perfect so far as it goes, provided no interference is permitted, but the opening of doors or windows by unauthorized teachers is apt to throw the system out. The appointment of inspectors for the supervision of the schools when in use would be an admirable move, if the proper men should be appointed.

PURIFICATION OF WATER BY METALLIC IRON.

In the United States, comparatively few efforts have been made to secure proper water-supplies. Thus far, not more than one-third of the towns and cities have made any effort to insure wholesome drinking-water; the remainder either confess indifference or ignorance of the subject. In other words, more than one-half of the people in the United States are living in total disregard as to whether they are drinking pure or contaminated water. Spasmodic efforts are made now and then to open the way to the desideratum by asking Congress or State legislatures to provide legal protection against the fouling of public waterways — a scheme which, in our vast country, where rivers traverse several States, would seem to be impracticable. What law, for example, can Congress enact to remove the sources of deleterious impurities which find their way into the Potomac River without interdicting industries or agricultural operations on or near the banks of the river and its numerous tributaries — wastes from factories, washings from farmyards, drainage from villages, towns and cultivated fields laden with the microbes of various fertilizers? It is well enough to inculcate the doctrine of "rainfall to the river and sewage to the soil," but in order to reach the river, the rainfall must pass over or through the soil, and in doing so, it necessarily carries with it an appreciable quantity of filth which contaminates and renders unfit for domestic uses the waters of the streams.

What, then, can be done to make these waters of disease and death living waters of health? London (where 4 out of every 1,000 people in the world live), not many years ago, had a fearful experience from the consumption of water furnished by the Thames and fouled by filth which found its way into the river above the sources of supply. The operation of the "pollution of river acts" did not alone succeed in correcting the evil; but sand filtration of the entire water-supply, before it entered the city, proved an efficient safeguard against disease-bearing germs, and has given the city not only absolute immunity from cholera, but has greatly reduced typhoid, and London is to-day the healthiest city in the world. This process, then, may be said to answer well for Thames water, protected as it is by the strictest sanitary surveillance; but where microscopic organisms of a dangerous character exist in the water in large quantities, it has been found quite impossible to bring such water to a pure or potable condition simply by sand filtration, which is now supplemented in many Continental cities by first agitating the water to be purified with bits of metallic iron, and then passing it through sand filters.

This process was suggested about ten years ago by Sir Frederick Abel, and was first practically applied at Antwerp, where foul water, drawn from a source a little better than a sewer, has been converted into a drinking water — bright, clear and wholesome; and this explains why Antwerp has been so free from epidemics of cholera and other diseases since these works have been in operation. This method of purifying water can no longer be considered as in the experimental stage; it has been installed in some of the important cities of Holland, France, Turkey and India, and has been recommended for improving the water-supply of Florence, Italy, by Sir Douglas, Galton, the eminent English engineer and sanitarian. While it can not be said that the process gives a perfect water, it certainly gives one which is wholesome, as has been shown in many Continental towns.

When the process was first introduced at Antwerp, its original birthplace, by Dr. Anderson, who designed the mechanical appliances for agitating the water with scraps of iron, it was considered that the iron had a more or less pronounced chemical action upon the dissolved organic impurities of the water, but it now seems that the real action is one of coagulation, the formation of a precipitate

in the water tending to throw out of solution the dissolved organic substances, and this view of the process applies equally well to its action upon microbes, which become entangled in the gelatinous precipitate, and either subside with it to the bottom of the settling tank, or remain behind on the surface of the sand filter through which the water is passed.

After being agitated with the metallic iron, Dr. Dupré examined water where there was only sand filtration and found the microbes were from 1,300 to 3,000 per cubic centimetre, but directly the iron process was applied, the number sank to 100; they very rarely exceeded that, and, sometimes, went down as low as 5. The effect of filtration of water by this process is not so much to remove chemical substances as to remove microbes. It is true that water may be foul and objectionable irrespective of microbes, but the main advantage of the iron process is that it removes the microbes so completely. Dr. Dupré says:

> This can only be done by very perfect sand filtration at the rate of 4 inches per hour, but if the rate is varied by half an inch per hour, or an inch, the whole process breaks down, and you jump at once into hundreds of microbes. With the iron process, you may vary the rate from 4 inches to 20 inches without apparently affecting the numbers at all. The film of iron which is formed is such a perfect medium that even continued disturbances in the rate does not seem to affect the result.

The apparatus for purifying the water is a hollow cylinder, either of cast-iron or built up of plates like a boiler, supported horizontally upon hollow trunnions, through one of which the water to be purified enters; after traversing the cylinder, it leaves by the other trunnion. The cylinder is caused to rotate about its axis by means of a gearing, which is driven in any convenient way. Fixed inside the shell of the cylinder, and running longitudinally, are six shelves, five of which are curved in the direction of the motion of the cylinder. The sixth shelf is not curved, but is formed of a number of square flat plates arranged *en échelon* to insure a more continuous and regular action of the apparatus.

The cylinder is charged with a certain quantity of metallic iron, according to size — a purifier capable of treating 1,000,000 gallons of water in twenty-four hours requiring a charge of 2 tons or more. The iron may be in any convenient form, but that most commonly employed in practice is burrs or punchings from plates. Cast-iron borings are very efficient, and, weight for weight, much cheaper. The charge of iron, in whatever form, is spread evenly along the bottom of the cylinder before commencing the work.

The water, on first entering the cylinder, strikes against a circular baffle plate, which directs the stream toward the shell and prevents it passing through axially. As the cylinder rotates, the curved shelves scoop up the charge of iron and shower it down through the water as they reach the top, thus causing a constant falling of the iron across the current of the water. Practically, it is a process by which the iron is filtered through the water. The outlet pipe terminates inside the cylinder in an inverted bell or hood, coming as low down as the shelves will permit. The object of this contrivance is to prevent any iron from being carried out of the cylinder by the current. The revolving purifiers are made in fourteen sizes, distinguished by the diameter of their inlet pipes, from 1 to 14 inches. In large installations, batteries of purifiers are employed, placed side by side, very frequently all discharging into a common outlet tank.

Mr. Anderson, who has presented a considerable mass of evidence showing the value of the process for the purification of water-supplies, states that the effect of the agitation with iron upon the water is simply to cause a small quantity of iron — from one-tenth to one-fifth of a grain per gallon — to be dissolved, or, rather, held in solution, in the form of ferrous hydrate, which quickly changes under the influence of the air to ferric hydrate, which is precipitated in particles more or less coarse, according to the nature of the water to be treated. At Antwerp and other places, where the earliest applications of the process were made, a tank or reservoir existed before the purifiers were applied, and was consequently utilized. In more recent plants, where the works have been designed especially for the process, the expensive settling-tank has been replaced by a trough or flume, along which the water runs on its way to the filters.

From the settling arrangement, the water passes on to the filters, which are sand-beds of ordinary construction and call for no particular remark, except that the sand need be neither especially fine nor of great depth. Through the filters, the water passes at the rate of 80 to 100 gallons per square foot per twenty-four hours, and emerges pure and free from any trace of iron.

A very important feature of the iron process consists in the rapidity with which perfect results are secured. A few years ago the Massachusetts State Board of Health, after an elaborate series of experiments, showed that an ordinary sand-filter would not remove any considerable number of microbes in water until its surface had become sufficiently blocked by a layer of matter (or filth-destroying bacteria), separated from the water being filtered. To obtain this result, it was necessary to work the filters for several days, delivering all the while imperfectly filtered water, until this layer had time to form. With the iron process no such thing occurs. The filter yields, from the first, water containing the minimum number of germs. We know that any accidental disturbance of the surface of the sand of an ordinary filter seriously impairs its microbiological efficiency, but by the iron process the filters are wonderfully tolerant of such disturbances. After working one of these filters a fortnight, the film was purposely broken up by dragging a chain over the surface of the sand. One hour after this operation, a sample of the water was taken and found to yield only 40 microbes per cubic centimetre, and subsequently, hourly samples yielded from 31 to 67 microbes per cubic centimetre. The original water, before filtration, contained from 20,000 to 100,000 microbes per cubic centimetre.

The following is a history of the reception of the iron process in France: about five years ago the process attracted the attention of the largest and most influential water-company in France — the Compagnie Générale des Eaux, of Paris. After having investigated the process at the places where it had already been adopted, the Compagnie des Eaux wished to have further proofs, and the Revolving Purifier Company, which was formed in 1889 to work the process, undertook to demonstrate its efficiency in dealing with the water of the Seine, taken below Paris, at the pumping-station of the waterworks of Boulogne-sur-Seine, close to the Pont de Sèvres, not far from the outfall of the sewers. Accordingly, a complete plant was erected, capable of dealing with 100,000 gallons of water in twenty-four hours, consisting of a 6-inch purifier, delivering into a long settling-trough and filters to correspond. This plant ran for some months, and amply proved the correctness of all that had been claimed for the process to the complete satisfaction of the Compagnie des Eaux, who closely followed the trials and made all requisite analyses. The next step was the application of the process to the whole of the water pumped from these works. The trial plant was removed, and two 10-inch purifiers erected, capable of treating rather more than 1,000,000 gallons daily. The results have been most gratifying. The Seine water at the point of intake, though not very heavily loaded with organic matters, is very rich in microbes, the average result of some analyses indicating the presence of nearly 400,000 per cubic centimetre. Dr. Miquel, the eminent head of the bacteriological department of the Observatoire de Montsouris, was commissioned to investigate the working of the process here, and during the period from February to July, 1893, took twenty-two sets of samples for analysis. The purified water was, on each occasion, compared with the spring water of the Vanne, which is considered to be the model of what a drinking water should be. The result of his analysis is surprising. Of the twenty-two samples of purified water examined, no less than eleven were either equal or superior to the water of the Vanne on the same date, as regards bacterial purity, while the average of the whole set of samples of purified water gave a figure which does not greatly exceed the average of the Vanne water. The average number of microbes removed was 99.57 per cent of those existing in the original water. The Boulogne works being the first really designed throughout to work the Anderson process, it was of great interest to see how the working expenses came out. It is satisfactory to find that the cost of purification is very low. The following detailed figures give the working expenses for one year:

Description.	Working Expenses.	
	Francs.	
Iron (at 7 francs per 100 kilograms)	350	$67.55
Cleaning decanting reservoirs	180	34.74
Cleaning filters	780	150.54
New sand	300	57.90
Coal, oil, waste, etc.	1,400	270.20
Total	3,010	$580.93

Installations have also been made at Libourne, Nice, Monaco, Mentone and Villefranche-sur-Mer. The total output of the Nice works ranges from 6,000 to 8,000 cubic metres a day, or from 1,300,000 gallons to 1,700,000 gallons. The installation works well and the purity of the water is all that can be desired.

Early in 1894 a contract was signed between the prefect of the Seine, acting on behalf of the department, and the Compagnie Générale des Eaux. The Compagnie des Eaux in this contract undertook to construct works on the Seine and the Marne, above Paris, capable together of purifying 70,000 cubic metres daily, or nearly 15,000,000 gallons, and to remove 99.6 per cent of the microbes in the original water. These works were to be in full operation by January 1, 1896. The total cost was estimated to be 12,000,000 francs ($2,310,000).

C. W. Chancellor, *U. S. Consul at Havre.*

SOCIETIES

NEW YORK CHAPTER, AMERICAN INSTITUTE OF ARCHITECTS.

A REGULAR meeting was held at the Chapter Rooms, 156 Fifth Avenue, on Wednesday, May 12, 1897, at 4.30 P. M., President Carrère in the chair.

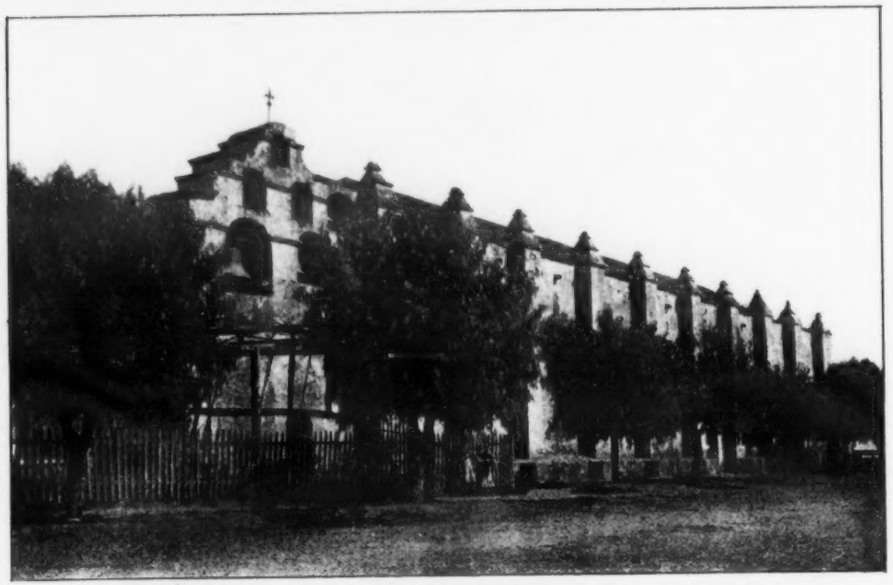
The minutes of the last meeting were read and proved.

The following gentlemen were elected members: Messrs. Russell Sturgis, J. Cleveland Cady, E. P. Casey, A. L. Brockway and T. F. Turner.

Communications, among others, were presented from the Fine-Arts Federation, in relation to several matters, and from the Bureau

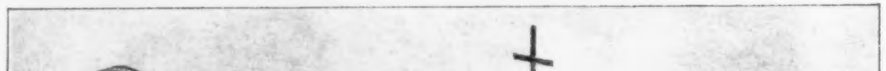
San Buenaventura.

San Diego Mission. Founded 1769.

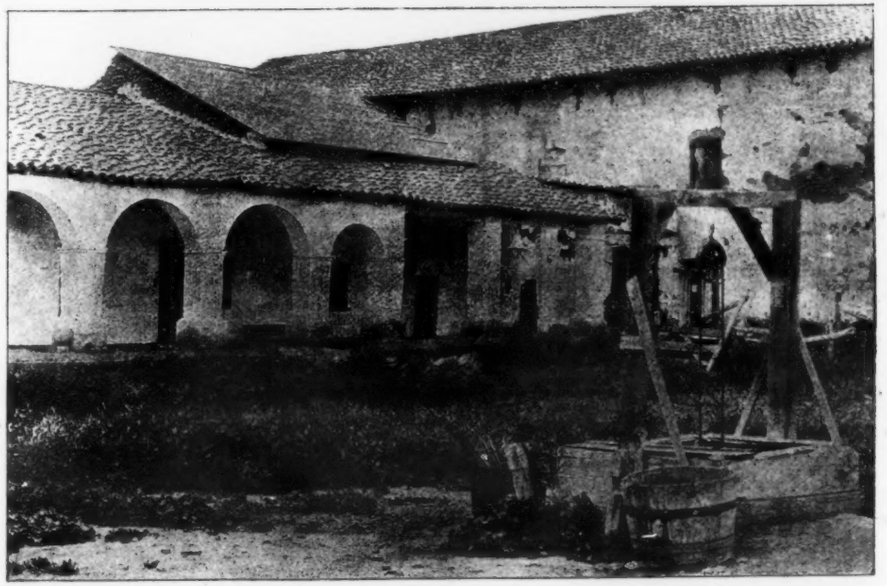


San Gabriel Mission, 1885. Founded 1770.

San Juan Bautista.

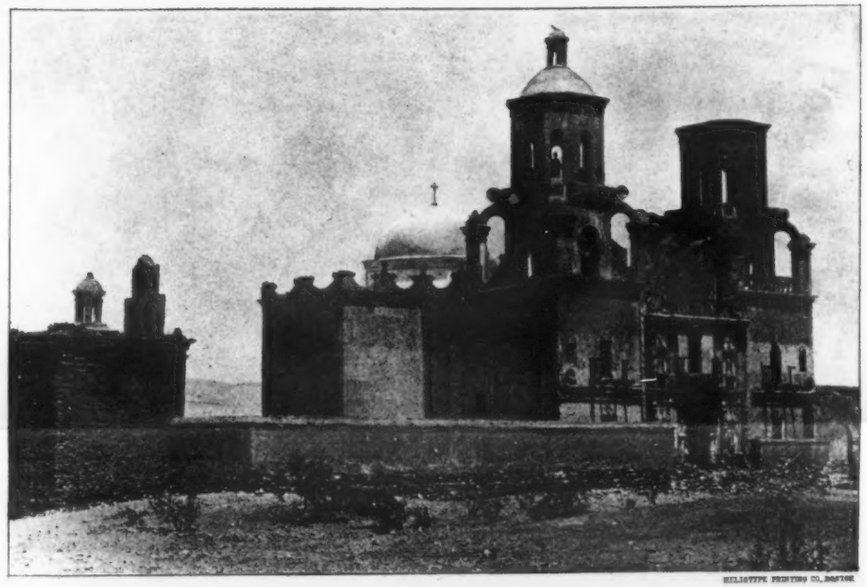


San Antonio of Padua.



San Miguel.

San Carlos Mission, Monterey. In use since 1794.



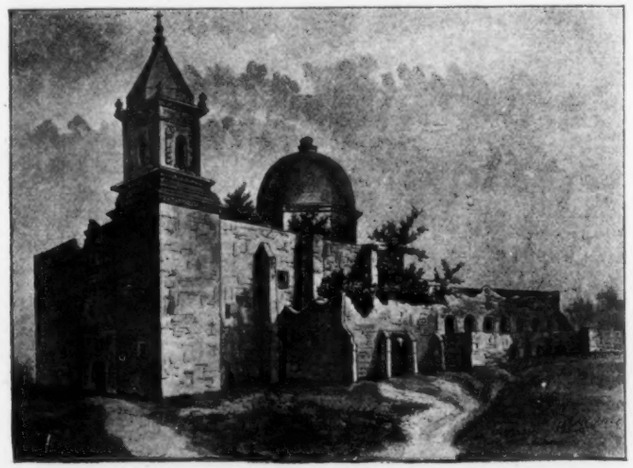
St. Xavier Church, Bac, Arizona.

SPANISH MISSION BUILDINGS.

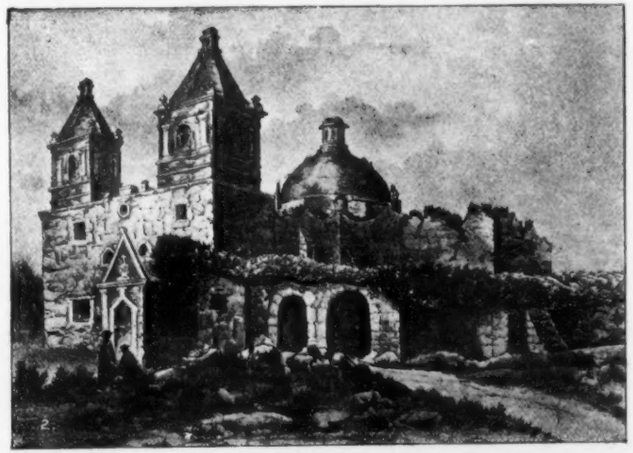
SPANISH MISSION BUILDINGS

San Luis Rey Mission, 1882. Founded 1798.

Carmel

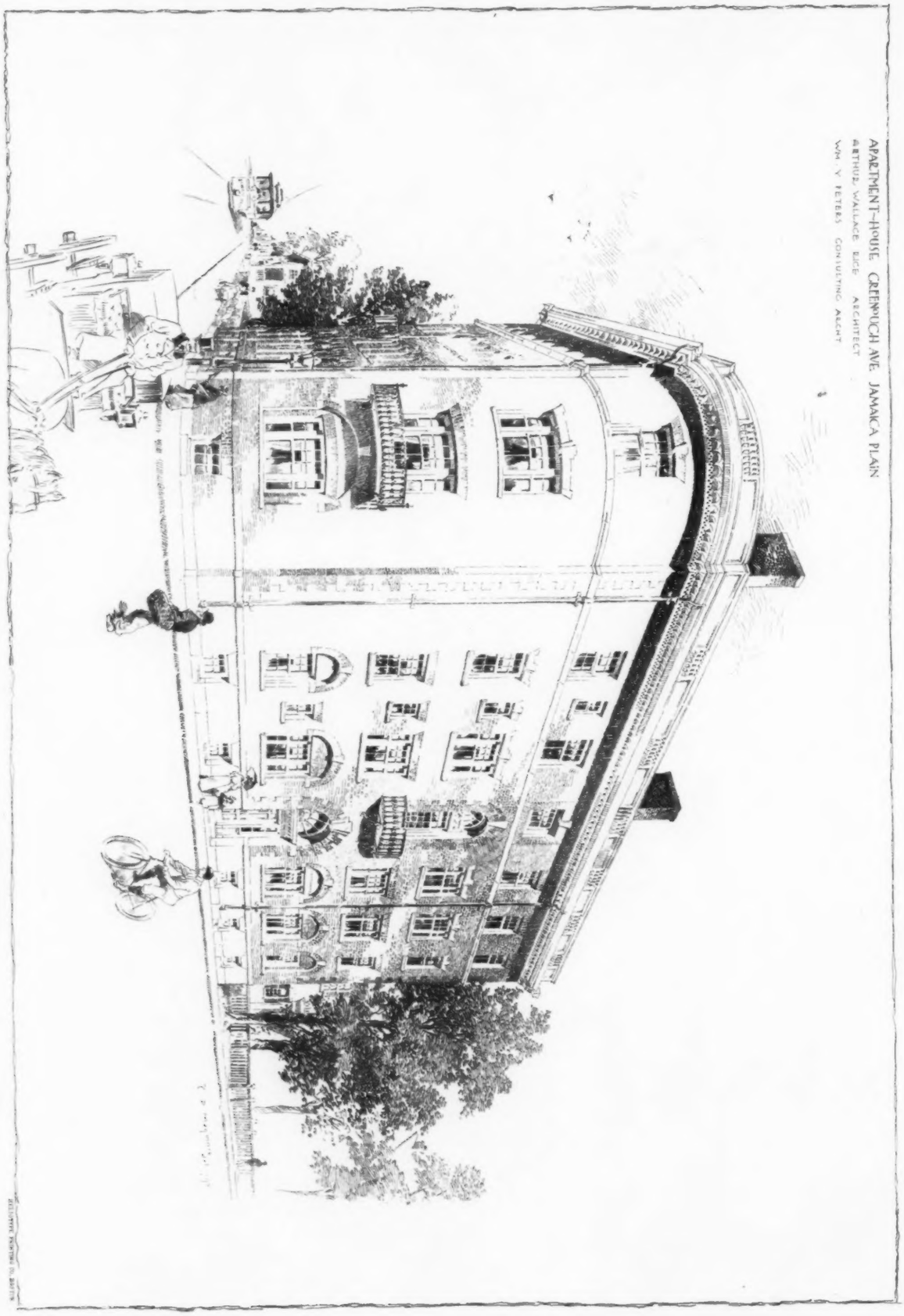


Mission of San Jose.



Mission Concepcion, near San Antonio, Texas.

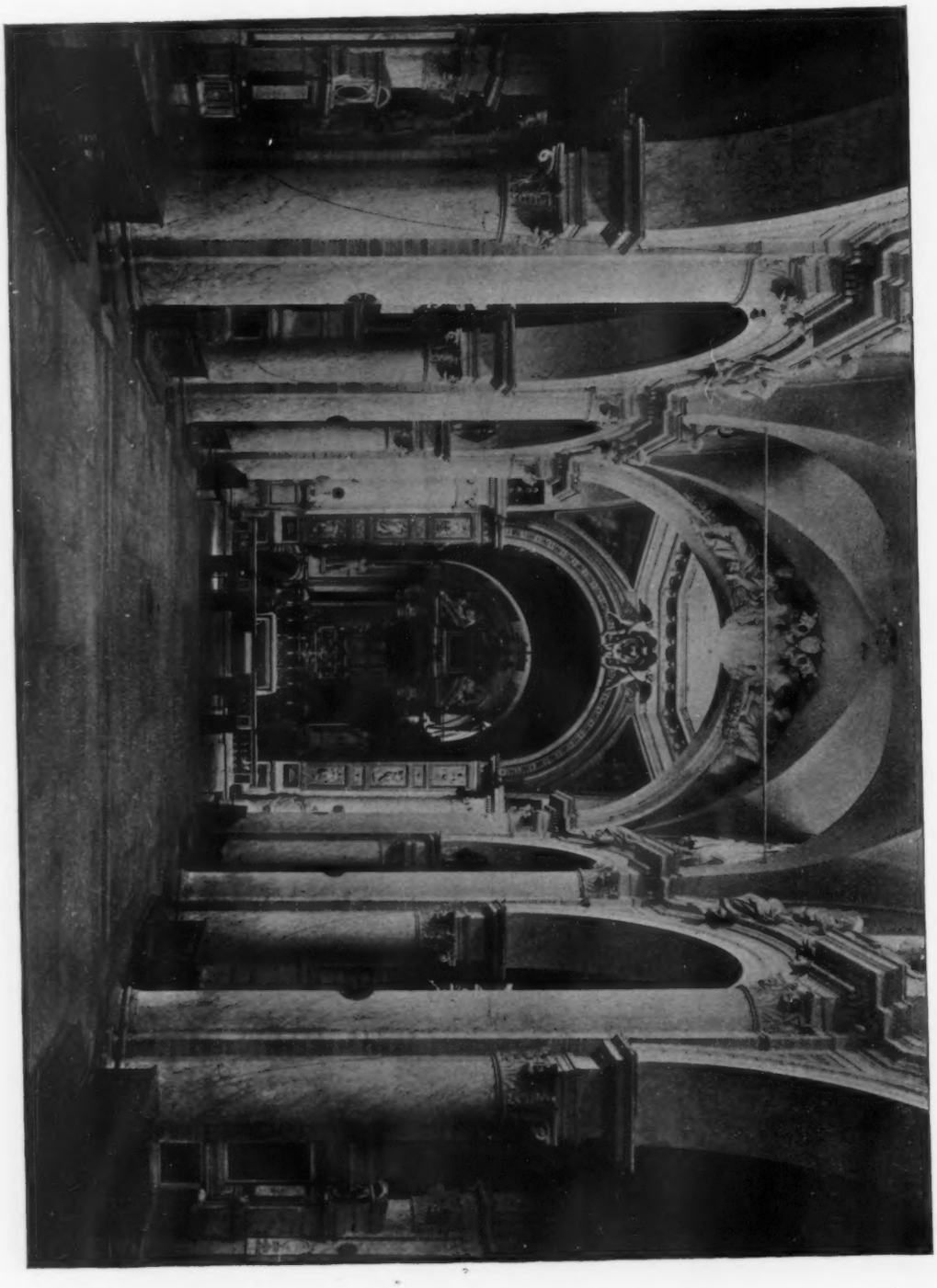
SPANISH MISSION BUILDINGS.



APARTMENT-HOUSE, GREENOUGH AVE., JAMAICA PLAIN.

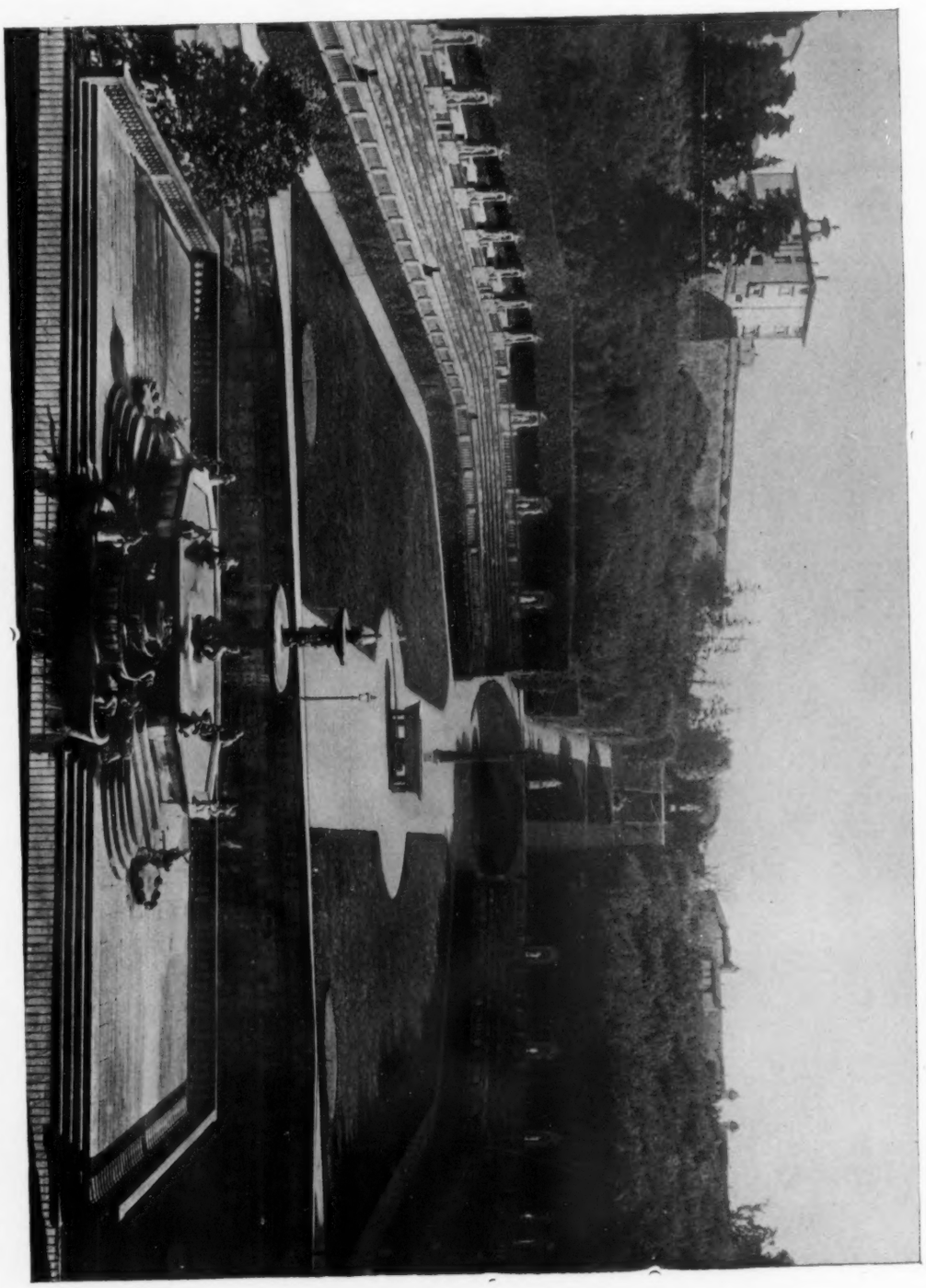
ARTHUR WALLACE RICE, ARCHITECT.

WM. Y. PETERS, CONSULTING ARCHT.



Apsidal Treatment, No. 23:—Sta. Maria del Popolo, Rome, Italy.

Baccio Pintelli, architect.



Accessories of Landscape Architecture, No. LVIII:—The Amphitheatre in the Boboli Garden, Florence, Italy.

of the American Republics, in relation to the proposed new building to be known as the Palace of Federal and Legislative Power of the Republic of Mexico.

The thanks of the Chapter were voted to Mr. Julius Baier, C. E., of St. Louis, for two pamphlets of his authorship, one on "Wind-pressures in the St. Louis Tornado," and the other giving photographic views of the same.

With Mr. Gibson in the chair, the President read several communications on executive business; and, under the new By-laws, made (several resignations having first been offered and accepted) the following appointments for the remainder of the current calendar year: *Vice-President*, R. H. Hunt; *Recording Secretary*, A. J. Bloor; *Corresponding Secretary*, Charles I. Berg; *Treasurer*, J. B. Baker; *Executive Committee*, Walter Cook, R. W. Gibson, H. J. Hardenbergh; *Committee on Education and Publication*, Russell Sturgis, H. R. Marshall and W. A. Boring; *Committee on Examinations*, Geo. B. Post; *Auditing Committee*, Thos. Tryon, W. W. Kent; *Nominating Committee*, H. R. Marshall, N. LeBrun, A. Brunner; *Committee on Professional Practice and Competitions*, H. R. Marshall, Thos. Hastings and A. L. Brockway; *Committee on Fine-Arts Federation*, John M. Carrère, with C. F. McKim as alternate.

The meeting adjourned to the call of the Secretary.

A. J. BLOOR, *Secretary.*

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

SOUTHWEST GALLERY, FIRST STORY: LIBRARY OF CONGRESS, WASHINGTON, D. C. ARCHITECTS, MESSRS. SMITHMEYER & PELZ; P. J. PELZ; E. P. CASEY.

[Gelatine Print, issued with the International and Imperial Editions only.]

THE decorative paintings in the tympana of this gallery are by Mr. Kenyon Cox. The one, here imperfectly shown, at the north end of the room represents the "Arts," while the subject of the one facing it is the "Sciences."

SPANISH MISSION BUILDINGS ON THE PACIFIC COAST.

SEE article elsewhere in this issue.

APARTMENT-HOUSE, GREENOUGH AVE., JAMAICA PLAIN, MASS. MR. A. W. RICE, ARCHITECT, BOSTON, MASS.

APSIDAL TREATMENT, NO. 23: STA. MARIA DEL POPOLO, ROME, ITALY.

THIS early thirteenth-century Gothic church was rebuilt about 1471, by Baccio Pintelli. The choir is very long, with a ceiling painted by Pinturicchio, and includes on its walls the well-known tomb of Ascanio Sforza by Andrea Sansovino.

ACCESSORIES OF LANDSCAPE ARCHITECTURE, NO. LVIII: THE AMPHITHEATRE IN THE BOBOLI GARDEN, FLORENCE, ITALY.

As the Boboli Gardens were laid out by Tribolo and added to by Buontalenti, it is fair to assume that one or the other of these artists devised the amphitheatre here shown, which lies immediately at the rear of the Pitti Palace. In the background on the left is the fortress of the Belvedere, built by Buontalenti in 1590.

[The following named illustrations may be found by reference to our advertising pages.]

RESIDENCE FOR F. A. NEUBAUER, ESQ., CLIFTON, O. MR. HARRY HAKE, ARCHITECT, CINCINNATI, O.

ACCESSORIES OF LANDSCAPE ARCHITECTURE, NO. LIX: THE AMPHITHEATRE OF THE BOBOLI GARDEN, FLORENCE, ITALY. DESIGNED BY TRIBOLO AND BUONTALENTI.

A GROUP OF KNOCKERS.

A GROUP OF SCULPTURE AT WASHINGTON, D. C.

[Additional Illustrations in the International Edition.]

OUTER SIDE OF THE KÖNIGSTHOR, STETTIN, PRUSSIA. GERHARD C. DE WALRAWE, ARCHITECT.

[Gelatine Print.]

THE Königsthor, formerly called "Anklamer Thor," was erected in 1726, in the newly-won capital of Pomerania, by order of King Frederick William I, to commemorate the conquest of the province, until then a Swedish possession. The name of its designer cannot be stated with certainty, but there is good reason for ascribing its authorship to Gerhard Cornelius de Walrawe, a Dutch engineer-officer in the King's service. The sculptures are known to be the work of the court sculptor, M. Damast, of Berlin, the same who furnished also the sculptures for the Berlin Gate (see *American Architect* for Mar. 27, 1897). The architecture of the Königsthor, although in its general lines of greater simplicity than that of the Berlin Gate, is on the whole more harmonious, and in its details more refined than the more gorgeous structure which preceded it by a few years. Immediately over the archway, on the outside, the Royal Prussian Eagle is seen. Over the heavy cornice, the seated figures of "Mars" and "Hercules" indicate the King's resolution to defend his new possession against any foe. This side, it must be remembered, faces that part of Pomerania which, at that time, still remained in Swedish hands. The inner face of the gate shows, over the archway, an escutcheon bearing the crest of the King, flanked by two winged cherubs, the one to the left pointing significantly to the King's initials, as if to remind those of the Stettiners who still clung to their Swedish masters: "This now is your Lord and Master!" The panels between the pilasters on each side of the arch contain two figures of children in relief, the remaining space being filled with antique armor in great profusion. The centre of the attic is surmounted by a pedestal carrying the royal crown of Prussia and flanked by cornucopiæ emblematic of the rich blessings which the new reign promised to shed over the province, a promise which has been abundantly fulfilled. All sculptured work was formerly richly gilded. The walls of the fortification, which used to flank the gate on each side, were levelled in 1874, leaving the latter standing as an interesting monument of local history. The wrought-iron gates are of modern origin.

INNER SIDE OF THE SAME GATEWAY.

[Gelatine Print.]

EMPIRE PALACE OF VARIETIES, MIDDLESBOROUGH, ENG. MR. ERNEST RÜNTZ, ARCHITECT.

THE ROYAL MUSIC HALL, HOLBORN, LONDON, ENG. MR. ERNEST RÜNTZ, ARCHITECT.

NEW BOARD ROOM: BRITISH EMPIRE MUTUAL LIFE ASSURANCE CO., LONDON, ENG. MR. ERNEST RÜNTZ, ARCHITECT.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

CONCRETE FLOORS AT THE PITTSBURGH FIRE.

NEW YORK, N. Y., May 29, 1897.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Your issue of like date just to hand, and we note with interest your articles anent the late Pittsburgh fire, though your editorial on page 65 and the extract from *Engineering News*, page 70, somewhat conflict.

We would specially refer to your remarks on the Hamburg fire, where concrete, though assisted by many subdivisions of brick walls and small openings, proved an utter failure, as we contend it always will.

In the same issue appears a note from Mr. John T. Simpson, Engineer, who appeals to "facts" to carry out his claim that in the late Pittsburgh fire concrete fireproofing was the most successful.

Now "facts" are the most stubborn of things, and the enclosed report of that fire, for which we challenge contradiction, will show that the less concrete construction vaunts itself, the better it will be for concrete. Respectfully yours, HENRY MAURER & SON.

NEW YORK, May 20, 1897.

In our pamphlet, issued some time since, we made a broad assertion, that concrete should not be considered an added element of strength, but was simply to be calculated as so much added weight for the system, whatever it may be, to carry. It is the usual custom, in designing a fireproof system, to assume that the concrete bears its share of the loads upon the girder, and in a great many cases the girder is designed on that assumption. When subjected to a severe fire, however, the concrete loses its cohesive properties, both on account of the loss of its water hydration and the great internal strains caused by the expansion of one side under heat, and consequently becomes unable to resist any stress anywhere near what it was originally able to bear, and, in most cases, would *not even be self supporting*. Exhaustive tests have shown that a fire of ordinary intensity is sufficient to completely ruin a very large covering of concrete.

We find full confirmation of the above when examining the results of the Pittsburgh fire, May 3d.

Modern fireproofing systems have never before been subjected to so severe a test; the rapid progress and the intensity of the fire being especially evident.

The situation of the buildings on which we report was as follows:

The Jenkins Grocery Store, fronting north on Penn Avenue, south on Liberty Street and an alley, and easterly on Cecil Alley.

The Durbin Horne Office-Building, to which we shall refer as "the office," situated directly opposite the "Jenkins," on Penn Avenue, easterly on Cecil Alley.

The Joseph Horne & Co.'s Dry Goods Store, referred to hereafter as "the store," facing south on Penn Avenue and westerly on Fifth Street, also opposite the "Jenkins." Between the office and store was a private dwelling, of which not a vestige remains.

The Methodist Book Co.'s Office-Building, fronting north on Penn Avenue, westerly on Cecil Alley, and the Phipps structure, facing south on Penn Avenue, opposite the Methodist Book Co.'s office and westerly on Cecil Alley.

Wind about southeast.

The fire started in the "Jenkins," a warehouse of the so-called "slow-burning" type, filled with highly combustible material, such as oil, lard, hams, sugar, wooden-ware, etc. The walls were of brick and the floors of wood — flooring and stringers; on the alley and Cecil Alley sides the windows were protected by iron shutters.

This building and its contents were totally destroyed; only a few fragments of the outer walls remain standing.

The Methodist Book Co.'s Building, on the opposite side of Cecil Alley, about sixty feet from the "Jenkins," was constructed of 9 inch concrete arches of the old "Iron Economy" system, *i. e.*, suspended wire with pipe iron filled in with cement and slag. This building was protected by the direction of the wind, namely, towards the northwest, and by the iron shutters on the windows of the "Jenkins" facing it on Cecil Alley, and by a small hollow-tile fireproof one-story building, used as a storehouse for cars, situated between it and Cecil Alley. This car-house is totally uninjured.

The fire entered through the windows of the offices on Cecil Alley side; the top floor, occupied as an office by Architect Bickel, was burned out completely, and the floor below that, almost so. The 9-inch concrete arches deflected several inches, and are now being held up solely by the wire-cloth and pipe-iron, and are condemned. The metal-lath partitions between the different offices on the sixth, seventh, and eighth floors were burned through, and offered no protection whatever.

The Phipps Building of Porous Terra-Cotta End Construction, opposite the Book Co.'s office on Penn Avenue, was also protected by the direction in which the wind blew, and, beyond a severe scorching, is little damaged.

The Horne offices, directly opposite the "Jenkins," on Penn Avenue, was constructed of 15-inch I-beams, with 8-inch raised end-construction porous terra-cotta arches, having a covering of 3-inch concrete (less concrete and deeper arches would have been far better, as the concrete is now one mass of rubbish, having lost all its adhesiveness to the tile). The interior was partitioned off by 4-inch terra-cotta, built, however, on wooden strips 4 inches by 2 inches, a very reprehensible method, and one, we regret to say, still in vogue, and was the cause of the partitions falling down when the strips burned down under them. The entire front, however, had no further protection than that furnished by large plate-glass windows, no safeguard whatever against flames from across the street. It was tenanted as follows: on first floor by a drug, a carpet, a millinery, and a china store, and the entrance-way; on second, third and fourth floors by doctors' offices, dress-making and millinery establishments, and a photographic gallery.

This structure stands to-day in good condition, not an arch being sagged, and but few of the soffit tiles down; will require but little repair. The walls and steel-work are in good shape.

The Horne Store was of similiar construction to the office-building, with this exception: the 9-inch arches were of hard burned terra-cotta side-construction, (instead of porous end-construction). The floors were not partitioned off, so that each floor opening to the other through a large light shaft and several smaller vertical openings, when filled with combustible material, formed an immense furnace. The front of this building was one mass of plate-glass, unprotected by iron shutters, and gave early entrance to the flames from across Penn Avenue, almost simultaneously on all six floors. On the roof there had been constructed a large iron tank resting on wooden beams; of course, when these burned through, the tank went crashing through the floors, tearing a large hole through the ceiling and dislodging many of the adjacent tiles; had this not occurred, each floor of the iron would have been intact. It was also apparent here that the concrete filling on top of the arches was pretty well disintegrated. Without going into general details as to the condition of the columns, the general results show the necessity of a thorough protection, through terra-cotta, for them. This building actually was subjected to the severest trial of all, having not only to stand the intense heat generated by its own combustion of inflammable material, but also the additional flames of the adjoining private brick dwelling and the office-building which caught first, but also the heat and flames from the "Jenkins."

At first sight this structure looks like a total wreck, but we understand that nearly two complete walls will be saved, also parts of the other two. The steel had been thoroughly protected by the fireproofing and probably 75 per cent of it will be saved. All that will be necessary is to remove the fireproofing, repaint the steel and replace the arches, except as to those damaged by the iron tank in its course through the building.

The experiences gained from this, the severest test that modern fireproof construction ever went through, suggest: the use of porous terra-cotta end-construction arches, with beam-protecting skews of not less than 2 inch thickness, part and parcel of the skew-back; deafening hollow tiles of porous terra-cotta for filling in on top of arches, instead of concrete; that column-protection tiles be of adequate thickness, well bonded, besides being set in cement as customary, and solidly interlocked by means of iron clamps driven into the tiles; that window-openings be as small as practicable. The demand for large floor space must remain a source of danger until some method other than partitioning off is available.

We are more than ever of the opinion that buildings can be erected, even with our present facilities, which shall be absolutely fireproof, but to obtain such complete results, a more liberal policy must be adopted by the designers; as the manufacturers of fireproofing can, of course, only furnish material as specified; and we therefore welcome any discussion having for its purpose the advancement of practical knowledge as to what is possible in fireproofing.

Henry Maurer & Son,
420 East 23d Street, New York.

Notes & Clippings

Viollet-le-Duc as Professor. — Viollet-le-Duc had a great admiration for Napoleon III and still greater admiration for the Empress Eugènie. Admitted to Compiègne through the influence of Prosper Mérimée, he concentrated all his cares on a little theatre which was set up in a corner of the château. The address he showed in designing costumes and scenery was appreciated. The courtiers used to say that Viollet-le-Duc was the only architect who was endowed with imagination, and if it were not for the jealousy of the Institut he would have been long before a professor. They considered there was no man so qualified for a chair in the Ecole des Beaux-Arts as an architect who comprised Vitruvius and Bramante in himself. During the interval which had to elapse before Viollet-le-Duc was recognized as the new grand master of French architecture, it was decided to open a credit of some millions of francs in his favor, and the old château of Pierrefonds was handed over to him for restoration. In this kind of work Viollet-le-Duc excelled. He was an expeditious designer and possessed wonderful science; his knowledge of the Gothic period possessed a certainty that was impeccable. His restoration of the Sainte-Chapelle and of Notre Dame is excellent, but he does not appear to have penetrated into the spirit of antiquity, and his ideas concerning modern construction seemed mediocre. It was, therefore, a surprise to many when he was nominated professor at the Ecole des Beaux-Arts. Mérimée had used his great influence with the emperor, but this time with an unhappy result. The pupils of the Ecole des Beaux-Arts were discontented and protested. No attention was paid to their objections, and Viollet-le-Duc was solemnly installed in his office by the Superintendent, the Comte de Nieuwerkerke. The professor, being unable to utter a word, owing to the clamor, left the theatre, escorted by the Superintendent and some friends, among whom was Théophile Gautier. The students impeded their progress in the Rue Bonaparte, on the Quai Malaquais and the Pont des Arts. The crowd followed, singing. Some collected in the court. Gautier wished to harangue the mob, and compel them to listen to reason. The law, however, is always the strongest. The police stopped him, and then locked him up. After dispersing the people, the police saw their blunder, and released the unlucky Gautier, who had already related the story of "The Courier of Lyons" to them. The end of the affair was that Viollet-le-Duc did not attempt to teach students who refused to hear him. He was most eager to have an audience, for at a later time, after the fall of the Empire, we find him seeking election to the Municipal Council of Paris. — *The Architect.*

Colorado's Big Tunnel. — Two gangs of workmen have just begun digging in Colorado the longest tunnel which man ever attempted to construct. The main bore will be twenty miles long, and connecting with this are subsidiary tunnels, with a total length of thirty miles. So, in reality, the task that has been put under way is that of digging fifty miles of tunnels, and every foot of this vast system will be under Pike's Peak and the mountains that tower on each side. The starting-point of the main tunnel is at the foot of the mountain leading up to Pike's Peak near the old town of Colorado City. This point is but a short distance from the railroads which span the country between Colorado Springs and Manitou. From here it runs almost due southwest. The further edge of the tunnel is at the edge of the mountains at Four Mile Creek, over in Fremont County, Col., six miles south of Cripple Creek and near the little town of Sunol. Two gangs of men, as stated, are working on the tunnel, one at each end. Just at present they are making progress at the rate of thirty feet a day. It is believed that the mammoth task they have undertaken will be completed in seven years from the first of the present month. The main tunnel will pass directly under the cone of Pike's Peak at a depth of nearly 7,000 feet and 2,700 feet beneath the town of Victor. Its average depth from the surface will be 2,800 feet, and it is designed to test the mineral deposits of the territory at these great depths. Thirty miles of laterals are contemplated, and these will pass underneath all the Cripple Creek district at an average depth of 2,800 feet. Cripple Creek, Victor, Gillette, the various small towns and a thousand mines are to be made tributary to this vast system. Under present circumstances the distance — the shortest way — from Colorado Springs to Cripple Creek is fifty-four miles. By way of the tunnel the two cities will only be sixteen miles apart. It is estimated by the contractors that the average cost per foot of excavation will be $80. This makes the total probable expense of digging the tunnel and its subsidiary branches $20,520,000. — *Cripple Creek Times.*

A Giant Seesaw. — A giant seesaw is one of the amusement features of the Tennessee Centennial Exposition. A somewhat similar device was proposed for the Chicago Exposition, but it was rejected for the Ferris wheel. — *Engineering News.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

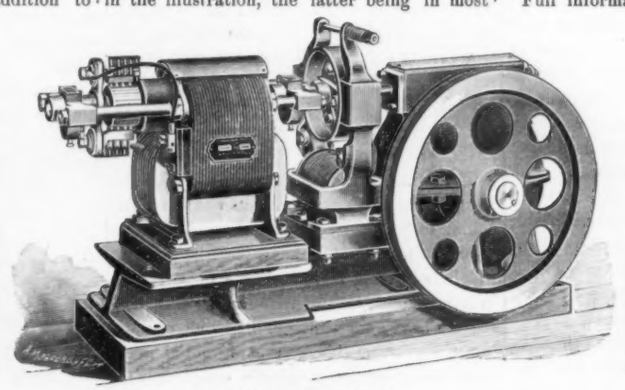
No. 180. SATURDAY, JUNE 5, 1897. Volume LVI. No. 1119.

ELEKTRON ELECTRIC ELEVATORS.

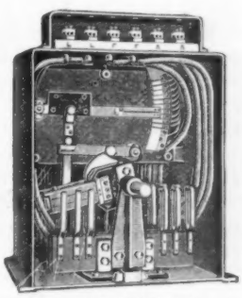
CLASS X Y.

ATTENTION is called to this addition to the Elektron Manufacturing Company's line of elevator machinery. We are making machines of this class in several sizes designed particularly for light service, such as residence and invalid elevators, dumb-waiters, book-lifts, package and sidewalk elevators, hoists, etc. We believe they fully meet the demand for moderate priced apparatus, having the same good qualities as our heavier machines. They have been thoroughly tried and proved to be satisfactory in operation. Owing to the simplicity of the design, they may be installed and handled by comparatively inexperienced persons.

Controller (Exterior View).



Class XY Elevator Machine.



Controller (Interior View).

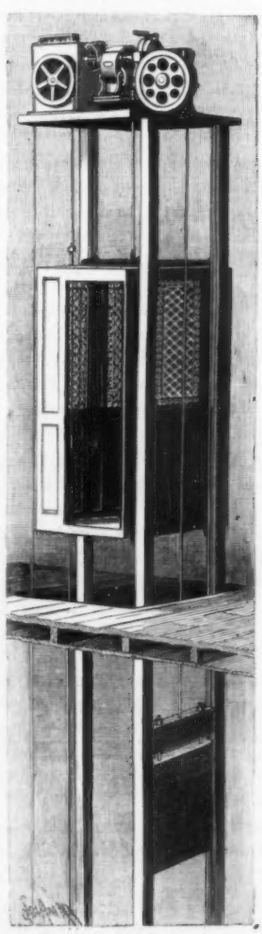
With the controller illustrated above, the motor is started, stopped and reversed by turning the wheel on the outside of the case, and this wheel is operated by an endless rope passing through the car or through the hoistway. We also make a controller operated by push-buttons, which are located at the landings and in the car. This is in some cases preferable to the hand-rope control, but is somewhat more expensive.

The worm and the worm-wheel are accurately cut; the thrust bearings are substantial, and have "take up" for wear; and all these parts run in a bath of oil in a tight cast-iron case or housing.

The electric brake applies direct to the brake-wheel on worm-shaft the instant the controller switch opens and holds the load securely until the motor starts again in one direction or the other.

The illustration shows one method of using these machines on residence elevators with hand-rope control from the car. The controller may be located where it is most convenient to carry the hand-rope, the only connection between controller and machine being by electric-wires.

The machine may be set in basement or on either floor, or at head of hoistway, as shown in the illustration, the latter being in most cases the easiest to erect and running with the least friction.



Electric Residence Elevator.

The car stops and brake applies automatically at terminal landings.

Full information as to the requirements, space available for machinery, etc., is necessary before quotations can be given. A blank form for this information will be furnished on application.

Within a reasonable distance of any of our offices, it is best that we should give quotations for the elevator erected complete, but if desired, we will sell machine and controllers, either with or without car, counterweight, etc., delivered f. o. b. cars Springfield, and will furnish drawings by which any good millwright may successfully set the apparatus up.

We would be pleased to quote prices on Electric Elevators for all classes of service. We make an unusually complete line. Also Electric Motors and Generators, Electric Pumps, Electric Ventilating Fans, etc.

Branch offices: 126 Liberty Street, New York; 143 Federal Street, Boston; German Ins. Building, Rochester, N. Y.

THE ELEKTRON MFG. CO.,
SPRINGFIELD, MASS.

BICYCLE CHAIN LUBRICATION.

THE ideal lubricant should not only lubricate the chain and sprockets, but the pivots or pins holding the links of the chain also. Lubricants made from Pure Flake Graphite are superior to any other, when properly made. An article combining a perfect lubricant and rust preventive, put up in convenient form, is something desired by every bicyclist. To all such, Dixon's *Graphitoleo* will be not only welcome, but indispensable.

Dixon's *Graphitoleo* is a preparation of a very choice graphite finely pulverized, and a pure petrolatum warranted not to gum or become rancid. It is put up in collapsible tubes and is manufactured only by

JOSEPH DIXON CRUCIBLE CO.,
JERSEY CITY, N. J.

CONSTRUCTION OF WESTINGHOUSE ENGINES.

The excellent quality of all materials entering into the construction of Westinghouse engines is assured by actual tests. No iron or steel is used that fails to meet standard specifications, and the babbitt and bronze, made after our own formulas, are of uniform grade and unquestionable superiority.

In so far as modern tool equipment and a high grade of skilled labor can contribute to the result, the workmanship on Westinghouse engines is beyond criticism. The inspection of finished work is thorough and systematic, reaching to every detail and insuring a degree of excellence that probably has no equal in machine work of this class.

Inasmuch as the Compound engine is more particularly the exponent of high economy, we put each individual engine of this class through a complete economy test before it leaves the shops. All "Standards" and "Juniors" are subjected to a regular running test, and two engines, taken at random from each shop order, are tested for economy. Our records, which include the data of each test, are open at all times to the inspection of those interested. Any purchaser, so desiring, may have his engine tested by his own expert, at our shops before shipment, and may accept or reject the engine on that test before incurring the expense of installation. The importance of knowing that an economy guaranty can be fulfilled needs no emphasis; all users of steam-power fully comprehend it.

The Westinghouse engine has always been noted for good regulation. Its worst enemy never complained that it had a poor governor. With so many claims made for superior regulation by various engine-builders, and the prominence given these claims in circulars and printed matter, the prospective purchaser should be careful to avoid getting the impression that the principal point about an engine is its regulation. It should be borne in mind:

1. That no builder of any prominence makes a particularly bad governor.

2. That any automatic governor should be able to regulate within two per cent, or one per cent, or even to over-regulate, so that it runs faster loaded than light, and that without any complication of dash spots, supplemental springs, etc.

3. That unaided by instruments, if the governor be free and steady, no one can tell by the character of its work whether or not an engine is regulating within one, two or even three per cent.

4. That so long as the regulation is within the limits of personal observation, say two per cent at the outside, it has no effect whatever on the economy or durability of the engine.

Economy is a subject on which most engine circulars are discreetly silent. The majority of builders of high-speed engines either do not know, or are unwilling to frankly state, the economic performance of their engines; while the slow-speed builders rest their laurels on the reputation of the past, with little regard to the requirements of modern practice.

In point of economy our "Standard" and "Junior" engines on steady load have equalled the best accorded performance of any simple single-valve automatic engine made. Under varying loads, and this is the kind of service essential in many modern plants, our "Standard" and "Junior" engines give a uniform economy, throughout their entire range of power, that is not equalled by any other single-valve engine on the market, and which approaches very closely, if indeed it does not equal, the performance of the best simple non-condensing four-valve engines under the same severe conditions.

Our 18″ x 16″ "Standard" engine, with 100 pounds steam-pressure, has shown the following duty on the different loads noted:

Indicated Horse-power.	Water per Indicated Horse-power per Hour.
208.73	26.63
167.11	28.05
125.44	28.24
77.70	31.40
32.87	40.50

This means that with 100 pounds steam-pressure, an engine of this size will run at any capacity from half-load up, with a duty inside of 28½ pounds of water per indicated horse-power per hour. With 80 pounds steam-pressure, the steam consumption is from 1½ to 2 pounds per horse-power per hour greater.

Engines of from 45 to 75 horse-power will consume from 29 to 34 pounds of steam per indicated horse-power per hour, depending on steam-pressure and load and size of engine. On the smaller sizes the steam consumption is naturally somewhat higher, but even to the smallest economic performance, is a leading feature. Size for size, the performance of the "Junior" engine is practically the same as the "Standard."

These are not bald statements without foundation, but substantial facts which we are willing to demonstrate at any time.

In the matter of leakage past the pistons, which is often a serious source of loss, the Westinghouse "Standard" and "Junior" engines have an advantage, inasmuch as they use steam on one side of the piston only, the other being open through the crank case to the engine-room. Should the pistons ever become leaky, the steam escapes into the engine-room, where it is instantly detected, and steps can be taken to correct the trouble. In the double-acting engine, if the piston leak, the steam goes out the exhaust-pipe unsuspected.

For our Compound engine, condensing, we have never made any extraordinary claims on the score of economy. In this respect it is as good as the best. The designing of a Compound condensing engine is not a particularly difficult problem.

For our Compound engine, non-condensing, we have always claimed that in point of economy it is unequalled by any other non-condensing engine made. As fully ninety per cent of the high-speed engines sold are to run non-condensing, the Non-condensing Compound Engine cuts a very important figure.

Shorn of all the technical details, which can be easily obtained by any one who cares particularly for them, we give herewith the net results of three tests of Westinghouse Compound Engines running non-condensing:

1. Test made by Mr. Geo. H. Barrus, Boston, for the Bridgeport Copper Company, Bridgeport, Conn., of three 11″ and 19″ x 11″ Compound engines direct connected to electrical generators for depositing copper:

Average Steam-pressure	135.4 lbs.
Average I. H. P. each Engine	106.7
Feed-water consumed per I. H. P. per hr.	23.8 lbs.

2. Test made on 12″ and 20″ x 12″ Compound engine at the Baldwin Locomotive Works, Philadelphia, by Mr. S. M. Vauclain, Supt.:

Average Steam-pressure	125 lbs.
Average I. H. P.	151.45
Feed-water consumed per I. H. P. per hr.	21.52 lbs.

3. Two tests made by the mechanical engineering department of the Chicago, Burlington & Quincy Railroad Co., on a 14″ and 24″ x 14″ Compound engine in the company's shops at Galesburg, Ill.:

	Test 1, lbs.	Test 2, lbs.
Average Steam-pressure	99	100
Average I. H. P.	90	76.8
Feed-water consumed per I. H. P. per hr.	25.2	25.3

These tests are remarkable for the fact that with the given steam-pressure, the normal load for this engine is 150 indicated horse-power. On Test 1, it will be observed, the engine was run at only 60 per cent of its full load, and on Test 2 it was run at practically half load. This economical performance under light loads is one of the strongest features of the Westinghouse Compound Engine.

So far as we know, no other manufacturer of non-condensing Compound engines makes any statement in his printed matter as to the actual performance of such engines; nor have we ever seen in any of the public prints any reports of tests made on Compound Non-condensing Engines other than the Westinghouse.

Inasmuch as we put every Compound engine we build through a thorough duty test, we can guarantee economic performance with confidence and precision.

WESTINGHOUSE MACHINE CO.,
Pittsburgh, Pa.

ARCHITECTS' SPECIFICATIONS FOR APPLYING H. W. JOHNS' ASBESTOS ROOFING.

Roof to be covered with H. W. Johns' Mfg. Co.'s Asbestos Roofing, which shall be laid perfectly smooth in courses parallel with the roof boards and securely nailed ⅜ inch from edge. Nails to be not more than 1¼ inches apart, and all edges to be cemented with Asbestos Roof Coating, both before and after nailing. All laps to be not less than 2 inches. The whole roof to be given two coats of Asbestos Roof Coating; the first coat to be dry enough to walk upon before second coat is applied. Both coats to be evenly and thoroughly brushed out; the second coat to be scattered with the dry asbestic finish, as fast as the coating is brushed on. The asbestic shall be carefully and evenly applied, so that the finished roof shall present a uniform color.

Should the roofing get wet during progress of the work, it shall be allowed to dry out before any coating is applied. Flashings to be made of the same material as the roof-covering and finished in the same manner. Wooden gutters to be lined with same material and finished in the same manner.

Over-flashings to be of such metal as architects may specify.

H. W. JOHNS MFG. CO.,
New York, N. Y.

INTERESTING SUIT FOR DAMAGES FOR FAILURE TO DELIVER COPPER.

An interesting case in the Supreme Court of New York was disposed of recently by the discontinuance of the suit of the Okonite Company against Holmes, Booth & Haydens.

The complaint showed that in June, 1895, Holmes, Booth & Haydens sold to the Okonite Company 300,000 lbs. copper at 12¼ cents, and after delivering 50,509 lbs., stopped further delivery.

The Okonite Co. then, in September, 1895, purchased elsewhere the balance of the copper at 14 cents, and then sued Holmes, Booth & Haydens for about $4,500, the difference. Holmes, Booth & Haydens denied the contract. An order discontinuing the suit was entered in the Clerk's office on the 21st, and on inquiry it is understood that Holmes, Booth & Haydens paid the Okonite Company about $2,800 for a settlement.

NOTE.

THE Ludlow-Saylor Wire Co., St. Louis, are having a large trade in wrought-iron fences which is keeping them very busy in this department. They have just closed a contract for elevator enclosures and cabs for the new Holland Building, St. Louis, an eleven-story building; also elevator enclosures for the Samuel C. Davis Building, St. Louis. They have just completed a pair of fine brass doors and a brass grille for a vault in Bellefontaine Cemetery, St. Louis, and are now busily engaged on a large contract for pipe rail work for the Tennessee Centennial Exposition. They are running their wire-cloth department double turn, and report a very heavy demand for mining screens, of which they carry in stock a full and complete line, and are in position to fill orders promptly for any size mesh required.

BUILDING INTELLIGENCE.

(*Houses Continued.*)

Park Pl., s s, 542′ w Vanderbilt Ave., four-st'y bk. dwell., 21′ x 66′, tin roof; $7,000; o. & a., Geo. W. Kenny, 259 Ninth St.

Park Pl., s s, 321′ 6″ w Franklin Ave., four-st'y bk. dwell., 27′ 6″ x 60′, tin roof; $8 000; o. & b., A. Dalton, 769 Douglas St.; a., F. G. Wilson, 342 Second St.

Macon St., s s, 100′ w Stuyvesant Ave., two-st'y & base. bk. dwell., 20′ x 45′, tin roof; $24,000; o. & a., W. F. Clayton, 75 Bainbridge St.

Bleecker St., s s, 100′ w Hamburg Ave., 8 three-s 'y bk. dwells., 25′ x 62′, tin roofs; $40,000; o., Hahn Bros., 68 Stanhope St.; a., T. J. Lessing, 140 St. Nicholas Ave.

Eleventh St., s s, 250′ e 8th Ave., 6 two-st'y & base. bk. dwells., 18′ 7″ x 45′, gravel roofs; $30 000; o., a. & b., Thos. T. Martin, 301 Third St.

Ocean Ave., w s 176′ 5½″ s Avenue C, two-st'y and attic fr. dwell., 28′ x 47′, shingle roof; $5,500; o. & a., M. F. Greene, 277 E. 18th St.; b., T. J. Sinnote, 279 E. 18th St.

Eckford St., w s, 150′ n Nassau Ave., 2 three-st'y fr. dwells., 25′ x 53′, gravel roofs; $9,000; o. & b., W. H. Post, Norman Ave. & Russell St.

Willoughby Ave., n w cor. Nostrand Ave., two-st'y & attic bk. dwell., 42′ x 44′, tin & slate roof; $18,000; o., J. Dangler, Myrtle Ave. & Walworth St.; a., Th. Englehardt, 905 Broadway; b., H. Bruckhauser, 137 Ellery St.

Classon Ave., w s, 31′ n Degraw St., 4 four-st'y bk. dwells., 25′ x 57′, gravel roofs; $26,000; o., S. S. Van Wyck, *Times* Building, New York City; a., F. L. Hine, 570 Lafayette Ave.; b., M. D. Walsh, 324 Lexington Ave.

Chelsea, Mass. — *Washington Ave.*, 2½-st'y fr. dwell., 26′ x 60′, pitch roof, hot water; $6,000; o., George B. Swett; a., George H. Wood, Everett.

Colwyn, Pa. — *Main St.*, 2 eleven-room dwells.; o., Geo. Kyle; o., Joseph D. Bartram, Paschall.

Cynwyd, Pa. — Three-st'y & base. bk. & st. dwell., tile roof; o., Mrs. A. L. Oliver; c., A. L. Fretz; a., Clarence Gardner.

Dedham, Mass. — *High St.*, 2½-st'y fr. dwell., 30′ x 60′, gambrel roof, comb. heat; $8,000; o., Olin B. Roberts; a., Henry B. Alden, East St.; not let.

Eddington, Pa. — Three-st'y & base. st. & pebble-dashed dwell., 46′ x 60′, shingle roof; cost about $6,000; o., Mr. De Victor; a., George I. Lovett, Philadelphia.

Everett, Mass. — *Ferry and Chestnut Sts.*, three-st'y bk. & fr. dwell. & stores, 47′ x 112′, flat roof, steam; $10,000; o., Freeman & Paine; b., Saml. Paine, 39 School St.

Fall River, Mass. — *June St.*, four-st'y fr. dwell., 42′ x 48′, pitch roof, furnace; $12,000; o., A. M. Lincoln, 29 Bedford St.; a., J. Merrill Brown, Boston; day-work.

Fitchburg, Mass. — *North St.*, three-st'y fr. dwell., 52′ x 58′, comp. roof, furnace; $6,500; o. & b., Henry T. Allen.

Frankford, Pa. — Three-st'y & base. fr. & bk. dwell., slate roof; cost about $5,000; a., Stearns & Castor, Philadelphia Bourse.

Haverhill, Mass. — *New St.*, 2½-st'y fr. dwell., 35′ x 70′, shingle roof, steam; $10,000; o., Hazen B. Goodrich, 72 Washington St.; not let.

New St., 2½-st'y fr. dwell., 35′ x 60′, shingle roof; steam; $15,000; o., Wilbur H. Gould, 60 Washington St.; a., J. Williams Beal, 55 Kilby St., Boston; not let.

New St., 2½-st'y fr. dwell., 90′ x 35′, pitch roof; $20,000; o., Arthur Veasey; a., J. Williams Beal, 55 Kilby St., Boston.

Lawrence, Mass. — *Essex St.*, 2½-st'y fr. dwell., 40′ x 60′, pitch roof, furnace; $7,000; o., Richard Barlow; a., John Ashton; day-work.

BUILDING INTELLIGENCE.

(*Houses Continued.*)

Leominster, Mass. — *Merriam and Orchard Sts.*, 2½-st'y fr. dwell., 32′ x 50′, pitch roof, furnace; $5,000; o., F. A. Whitney; a., G. W. Howe.

Lynn, Mass. — *Sagamore St.*, 2½-st'y fr. dwell., 29′ x 50′, pitch roof, furnace; $5,000; o., B. E. Grover, 47 Arch St.; a., H. W. Rogers.

Malden, Mass. — *Main and Clarendon Sts.*, 2½-st'y bk. & fr. dwell., 45′ x 39′, pitch roof; $8,000; o., Lucius Turner; a., George E. Abbott, 53 Tremont St., Boston.

Media, Pa. — Three-st'y & base. st. dwell., 30′ x 45′, shingle roof; cost about $6,000; o., J. Fronfield, Philadelphia; c., Joseph C. Seal; a., Yarnall & Goforth, Philadelphia.

New Britain, Conn. — *Pearl St.*, 2½-st'y fr. dwell., 36′ x 50′; $7,000; o., M. S. Foster; a., Davis & Moon.

Lexington St., 2½-st'y fr. dwell., 36′ x 50′, shingle roof, steam; $8,000; o., Frank Porter; a., Clark & James, Boston; not let.

Lexington St., 2½-st'y fr. dwell., 40′ x 60′, shingle roof, steam; $10,000; o., E. N. Stanley; a., Davis & Moon.

Newton, Mass. — *Highland Ave.*, two-st'y fr. dwell., 40′ x 41′, hip roof, furnace; $6,000; o., W. F. Holmes; b., Wm. Kellar; a., Clark & James.

Adams St., two-st'y dwell. & store, 37′ x 42′, pitch roof, furnace; $6,000; o., Mrs. J. Boyle; b., F. Joyal; Crafts St.

Sumner St., 13 three-st'y fr. dwells. in block, 247′ x 63′, flat roof, steam; $65,000; o., Powell Brown; a., C. Cutter, 12 Pearl St., Boston.

Hammond St., nr. Lawrence Road, three-st'y fr. dwell., 40′ x 48′, gambrel roof, hot water; $15,000; o., E. S. Webster; b., A. Hathaway & Sons, Boston; a., Wales & Holt, Boston.

Newton Square, Pa. — Dwell.; $5,000; o., George P. Henderson; a., E. V. Seeler, Philadelphia.

Pawtucket, R. I. — *Fountain St.*, two-st'y fr. dwell., 29′ x 51′, pitch roof, steam; $6,000; o., Mrs. John H. Crawford; a. & b., Geo. A. Simmons, Central Falls.

Kossuth St., two-st'y fr. dwell., 36′ x 50′, pitch roof, steam; $7,500; o., Mrs. Carrie L. Fifield; a. & b., Geo. A. Simmons.

Philadelphia, Pa. — *Germantown Ave.*, w s, n Venango St., 5 two-st'y bk. dwells., 15′ x 46′; o., James B. Carey, 3806 N. Broad St.

Redfield St., e s, s Haverford St., 16 two-st'y bk. dwells., 16′ x 45′; c., J. M. Stitler, 4804 Baltimore Ave.

Haverford Ave., n e, w Wilton St. to 53d St., 7 three-st'y bk. & st. dwells., 16′ x 50′; o. & b., Edw. Roney.

Haverford Ave., n e s Wilton St. to 52d St., 7 three-st'y bk. & st. dwells., 16′ x 50′; o. & b., Edw. Roney.

Fifty-second St., w s, s Seneca St., 17 three-st'y bk. dwells., 16′ x 50′; o. & b., Edward Roney.

Fifty-third St., e s, s Seneca St., 11 two-st'y bk. dwells., 16′ x 50′; o. & b., Edward Roney.

Pittsburgh, Pa. — *Stratford Ave.*, bk. dwell.; $6,500; o., J. E. Farrell.

Portland, Me. — *Spring St.*, 2½-st'y fr. dwell., 47′ x 50′, furnace; $7,000; o., Capt. J. Bain; b., E. C. Johnson; a., J. Calvin Stevens.

Providence, R. I. — *Vineyard St.*, 2½-st'y fr. dwell., 32′ x 50′, shingle roof, furnace; $5,000; o., Thomas E. Colton, 38 Calder St.; b., N. Rivard.

Royal St., 2½-st'y fr. dwell., 32′ x 48′, shingle roof, furnace; $5,000; o., Mrs. Ann Boyle, 46 Royal St.; b., George R. Flynn.

Cypress St., 2½-st'y fr. dwell., 35′ x 50′, pitch roof, furnace; $5,500; o., Patrick J. Burke, 46 Shawmut St.; b., Kelliher Bros.

Somerville, Mass. — *Prospect Hill and Boston St.*, two-st'y fr. dwell., 32′ x 55′, pitch roof, furnace; $6,000; o., C. R. King; b., G. W. Gunter.

Dartmouth St., two-st'y fr. dwell., 29′ x 52′, gambrel roof, steam; $5,000; o., T. S. Wentworth, 350 Broadway; b., L. H. Lovering; a., Geo. P. Fernald, Boston.

St. Louis, Mo. — 2½-st'y dwell., s s Portland Pl., bet. La'te & Union Sts.; $30,000; o., G. N. Brown.

Two two-st'y bk. dwells.; $5,000; o., Mrs. Dora Kaechele.

Four two-st'y bk. & slate dwells., cor. Pine & Boyle Sts ; $18,000; o., Carter & Bowman.

2½-st'y dwell., s s Victor St., bet. Grand & Louisiana Sts.; $5,000; o., F. R. Roseman.

Two-st'y bk. dwell., n s Maple St., bet. Union & Belt Sts.; $7,000; o., P. Nolan.

Two two-st'y bk. dwells., n s Washing St., bet. Whittier & Boyle Sts.; $14,000; o., M. Nicolson.

Two-st'y bk. dwell , w s Grand St., bet. Chippewa & Duncan Sts.; $6,000; o., J. H. Belz.

Two-st'y dwell., e s Grand St., bet. Winnebago & Chippewa St.; $10,000, o., John Weisert.

St. Paul, Minn. — *Marshall Ave. and Ames St.*, two-st'y fr. dwell., 32′ x 50′; $5,000; o., Geo. C. Waller; a., Louis Lockwood; b., Lovene & Anderson.

Wellesley Hills, Mass. — Two-st'y fr. dwell., 30′ x 50′, pitch roof, furnace; $6,000; o., Dr. J. A. Oldham; b., C. O. Harris, Natick; a., W. A. Rodman, Boston.

Winthrop, Mass. — *Lincoln and Herman Sts.*, two-st'y fr. dwell., 38′ x 54′, shingle roof, steam; $6,000; o., O. G. Fish, Lowell; a., J. S. Roach; day-work.

Worcester, Mass. — *Pleasant St.*, 2½-st'y fr. dwell.; $5,000; o., Laban Fiske; a., A. J. Harrington; c., J. A. Courtmanche.

MERCANTILE BUILDINGS.

Allegheny, Pa. — *South Ave.*, office & business building, 296′ x 296′; o., Damascus Bronze Co.; a., Riddle & Kiern.

STABLES.

Brookline, Mass. — *Babcock St., rear No.* 219, 1½-st'y fr. stable, 40′ x 24′, pitch roof; $3,000; o., H. G. Brown, 226 Devonshire St., Boston; b., W. E. Morrison.

Fitchburg, Mass. — Two-st'y fr. stable, 40′ x 70′, comp. roof; $5,000; o. & b., Dana L. Fuller, 369 Main St.

STORES.

Brooklyn, N. Y. — *Kingston Ave.*, w s, 20′ s Dean St., 4 three-st'y bk. stores & dwells., 18′ 6″ x 46′, tin roofs; $22,000; o., F. C. Swimm, 434 Putnam Ave.; a., J. L Young, 1221 Fulton St.

Kingston Ave., s w cor. Dean St., three-st'y bk. store & dwell., 20′ x 50′, tin roof; $8,500; o., F. C. Swimm, 434 Putnam Ave.; a., J. L. Young, 1221 Fulton St.

TENEMENT-HOUSES.

Boston, Mass. — *Allen St., No.* 47, Ward 8, bk. tenement, 25′ x 27′ x 90′, flat roof, stoves; $12,000; o. & b., Louis Segal, 89 Prince St.

Spring St., cor. Poplar St., Ward 8, bk. tenement, 32′ x 75′, flat roof, stoves; $14,000; o. & b., Louis Segal.

Blossom St., No. 20, Ward 8, bk. tenement, 25′ x 60′, flat roof, stoves; $10,000; o. & b., Simon Mazur, 33 Poplar St.; a., C. A. Halstrom.

WAREHOUSES.

Baltimore, Md. — Five-st'y bk., st. & iron storage warehouse, 57′ x 61′ 5″; o., Eigenbrot Brewing Co., 28-40 Wilkens Ave.

MISCELLANEOUS.

Brookline, Mass. — *Sewall St.*, one-st'y fr. & bk. car storage-house, 92′ x 271′, flat roof, steam; $32,000; o., West End St. R. R.; b., B. W. Shippee.