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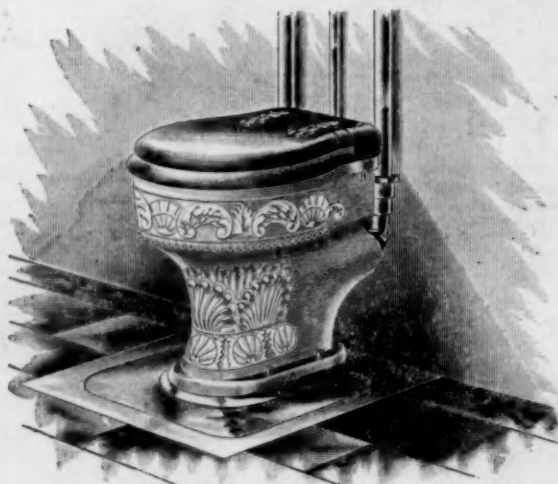
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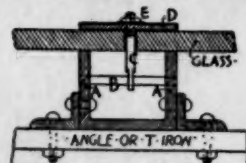
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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLVI

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NOVEMBER 3, 1894.



SUMMARY:—

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SOME feeble effort seems to be making to promote the commercial interests of Boston, by suggesting that the city should take possession of the large part of the water-front, and build new piers, as has already been done by the municipality in New York. One or two hearings in regard to the matter have been given by the city authorities, and it has been made evident that some, at least, of the present generation of Bostonians would like to see the days revived when Boston ships and Boston captains carried the American flag to nearly every seaport in the world.

WHETHER the matter will ever go any further remains to be seen. There is every reason why Boston should become a great commercial city. It is half a day's sail nearer Europe than New York, it has a better harbor, an almost unlimited water-front, a good Custom-house service, and admirable railway connection with all parts of the United States and Canada; and that it should be, as it now is, about on a level, as regards commercial facilities, with a second-rate Chinese port, appears to be due simply to the apathy of the people most concerned, who, after they have made one experiment at importing goods by this route, instead of protesting publicly against the wretched piers, and the miserable tackle with which their unfortunate cases are tumbled slowly about, meekly order their future consignments to be shipped by the way of New York, and wash their hands forever of the "commercial facilities" of Boston. No doubt, one indignant importer could not do much to change this state of things, but a large number could do a good deal; and the combined action of all the people who would like to see the commercial greatness of Boston revived, and of those who do not care much for the greatness, but would like to be able to import their goods by the shortest, and, in many respects, best and most convenient route, might, now that public attention has been directed to the matter, bring about a change. In this change, they would be seconded by the great foreign steamship lines, if not by ship-owners at home. It is well known that every company which has ever been formed in England to run steamships to the United States has laid its plans to send its vessels to Boston, imagining, from the information derived from the railway maps and the Coast Survey charts, that here would be found the best and nearest harbor, and the quickest communication with the interior. A few months' experience of the cold reception accorded to commercial ventures in

Boston has undeceived them, and nearly all of them have soon changed their American port to New York, where could be found the advantages of rapid discharge, and ready return cargoes, which were lacking in Boston. Even now, the bare possibility that Boston may awake again from its commercial lethargy appears to have revived the old hope in the bosoms of foreign ship-owners, for, within a week or so, the announcement has been made that one of the lines which has kept faithfully by Boston is about to double its service, while one of the Montreal lines has decided to transfer its ships to Boston, at least for the present, and there are rumors of the establishment of two new lines, one between Bristol and Boston, and the other from Antwerp to Boston.

IF the Boston people are wise, they will not let this opportunity slip through their fingers. However unpleasant it may be to exert one's self to see that the Antwerp captain is not compelled, on his first trip, to have his crates of Venetian glass and French china rolled over the pavement with hooks toward the cars by which they are to be shipped to Chicago or St. Louis, or that the cases of velvets and laces from the new Bristol steamers are not received and stored in a shed with no particular roof, and still less floor, it should be remembered that the arrival and departure of four new steamships a week means, if proper facilities for business are afforded them, transfer charges, insurance and commissions on some thirty-two thousand tons of merchandise every six days; it means the loading and unloading, reception and dispatch, of thirty-two hundred new freight cars every week; it means dividends for the New England railroads, rents for water-front property, and employment and prosperity for a very large number of Boston people who have nearly forgotten what prosperity is. There is no need of placing the piers in the hands of the municipal government to accomplish all this, and the process of doing so would be so long that the steamship agents would get tired of waiting before the revolution was accomplished. A much better way would be for the Chamber of Commerce, or some similar existing body, to depute at once a good committee to examine the existing commercial facilities of the city, and report upon their deficiencies, and propose means for improving them. In most cases, the private owners would be glad to have such suggestions made by competent persons, and, in their own interest, would probably carry them out; but, rather than lose the increased trade which is now offered, the municipality should be empowered to enter upon the premises and cause the changes to be made, charging the cost, or a part of it, to the owners, under the betterment act, just as is now done in improving facilities for internal communication. If this were objectionable, there is no reason why a dock corporation should not be formed, with powers assimilated to those of a railroad corporation, to extend and improve the means of communication between Boston and other seaports. The owners of wharf property would probably be glad to join the corporation, putting in their wharves, and receiving stock in exchange; and when the corporation had acquired control, either in this way, or, in case of necessity, by eminent domain, over a sufficient water-frontage, it could issue bonds to raise money for improvements. The bonds would be doubly secured, by the value of the original property, as well as of the improvements, and, if the work could be done before Boston commerce had gone beyond the possibility of resuscitation, the enterprise ought to prove extremely profitable to the stockholders. Many a wharf in Boston, on deep water, furnished with good buildings, within a few hundred yards of the Custom-house, and with the tracks of the Union Freight Railway crossing the head of it, can be bought for a song, while in New York, and still more at Liverpool, the great steamship lines are obliged to find piers miles away from the business part of the town, in Jersey City, or Hoboken, or Birkenhead, for want of proper accommodation in a more desirable quarter.

THE profession has experienced a serious loss in the death of Mr. James Keys Wilson, one of the oldest Fellows of the American Institute of Architects, who has been identified with the best architecture in Cincinnati for many years. Mr. Wilson was born in Cincinnati in 1828, his family belonging to the pioneers of the city. He was educated as an

architect, and from 1855 to 1875 designed a very large number of buildings there, among them being the Sinton Building, the Shoenberger Mansion, the Jewish Synagogue on Eighth Street, the Mitchel Building and many other business structures and private houses. He was the first President of the Cincinnati Chapter of the Institute, and, a few years ago, was one of the most prominent candidates for the appointment of Supervising Architect of the Treasury Department.

TO show how cheaply structural steel is now produced and sold in this country, the New York *Evening Post* publishes some comparative figures of prices at Liverpool and at Pittsburgh, including, in both cases, delivery on board ship or cars. For beams and channels, the Liverpool price ranges from \$26.75 to \$33 per ton, the average being about \$29. The Pittsburgh prices for the same goods range from \$28 to \$30.24 per ton. For angles, the Liverpool price averages \$26.81, while the price at Pittsburgh varies from \$25.76 to \$26.88, the average being thus less than for the Liverpool angles. Tees cost in Liverpool \$29.23 to \$31.67, and at Pittsburgh \$30.24. As the American structural steel is quite equal to the English, and probably better, it will be seen that, in this important material, the lowest level of prices has probably been reached. It is true that, within a year, some structural steel is said to have been sold at our mills for prices even lower than these; but this was in a time of great financial distress, and, as the mills are now full of orders, no more panic sales are to be expected. Whether any great advance will come in prices later, no one can say. The combination among the rolling-mills, which for so many years held prices of structural metal at figures which must have paid an enormous profit, seems to have been effectually broken up; and it is to be hoped that the business may settle permanently on a basis of reasonable profits to all concerned. If it does, we may expect to see the consumption of structural steel and iron extend very rapidly, with, of course, advantage to all the allied industries, and still greater advantage to the owners of buildings and to the public.

THE coal-miners' strike of two years ago in England is having its sequel, in a strike of the Scotch coal-miners.

It will be remembered that the English miners won, as they said, their contention, gaining an increase of wages. Their Scotch brethren have demanded a similar increase, which has been refused. As usually happens in such cases, the Scotch miners have applied to their English fellows, whom they, no doubt, consider to be in affluent circumstances since their great victory; and the Englishmen, who would naturally like to see the cost of labor in the competing Scotch mines raised to a level with their own tariff, and who have no fancy for having the dissatisfied Scotchmen come over to seek work in the English mines, have responded to the call, and are forwarding subsidies regularly. The Scotchmen, being thus dependent on the English Miners' Federation for relief from starvation, do not dare to oppose the orders of the Englishmen, and their propositions to the mine-owners have, so far, been dictated by the English Miners' Federation. Neither the mine-owners nor the miners in Scotland take very kindly to this interference with their affairs, and, in some districts, the men have already abandoned their demands, and have gone back to work on the old terms.

IT is evident that the fact of having succeeded in a strike for higher pay makes the members of the successful organization objects of envy by their fellows elsewhere, and they are sure to be called upon for contributions to help out all the other strikers who can concoct a pretext for demanding them. It is very easy to enforce such a demand, by the threat that, if it is refused, the strikers will come in a body, and compete for work against their more fortunate brethren; so that the "successful" strikers have to pay dear to maintain their success, and the low schemers who manage labor organizations are adepts at extortion. Some time, we hope that the inner history of labor agitations may be written, and there is no doubt that the tale will contain some singular chapters.

THE English School of Archæology at Athens, which is entirely dependent for support on money raised for it by its friends, having no subsidy from the Government, is to be helped along next year, it is hoped, by the proceeds of the

performance, in London, of an English translation of the trilogy of Æschylus, the Agamemnon, the Choephoroi and the Eumenides. Professor Villiers Stanford, who has already composed music for the Eumenides, will prepare music for the two other plays of the trilogy, and will conduct the whole. Who is to design the costumes and accessories is not stated, but we hope that Mr. F. D. Millet will not be forgotten in the inquiry for some one to carry out this difficult task, which requires a scholar and an artist, and a good one of each, united in the same person. In order to provide with certainty for the expenses, a guaranty-fund of two thousand pounds is to be subscribed, but it is thought that it will not be necessary to call in the subscriptions, if the plays prove reasonably successful. As the first attempt to interest the general public in Greek drama, the experiment will be closely watched on both sides of the Atlantic. There is so much of human sympathy in the great Hellenic tragedies, and the costumes and accessories, with a little of the real Grecian feeling, might be made so exquisitely beautiful, that one cannot help hoping, for the sake of the public, as well as of the managers and the School, that the effort may be crowned with complete success. The translating should be well done, or it will either miss the delicacy of the original, or be repulsively bold and strange; but, if this point is cared for, although we cannot expect the admirers of "1492," and similar masterpieces of dramatic art, to be attracted, the people who appreciate beauty, dignity and touching tenderness, and who are quite numerous enough in London to fill a theatre several times over, will be likely to take up Æschylus with enthusiasm, and to find themselves the better for it. If, as we hope, some of our readers will be able to find an opportunity to witness this interesting experiment, they can help and encourage the project by sending their names to Viscountess Maidstone, Hurst Monceaux Place, Hailsham, Sussex, England.

BUDAPEST, the capital of Hungary, has long been distinguished for the possession of the best electric railway in Europe, and is now to be endowed with an underground road, which, according to the account given in the *Elektrische Zeitung*, will far surpass, in ingenuity and completeness, anything of the kind in the world. In the construction of the tunnel, the pavement of the streets, which is of wood, is to be removed, together with its concrete foundation, and a trench is cut, wide enough to accommodate, when finished, two tracks, divided by a row of columns. The bottom and sides of the trench are lined with concrete, and iron columns set in the middle, thirteen feet apart. On these columns are placed longitudinal girders, which carry cross-beams; and between the cross-beams are turned concrete arches, on the so-called "Monier system." A stratum of concrete is laid on top of the arches, and covered with a sheet of asphalt; and over this is put more concrete, finishing with the regular wood-block pavement of the street. By these successive coatings it is expected that the infiltration of water from the street will be entirely prevented. The tunnel itself is rather narrow, so that, although the cars pass each other readily, there is only about four inches space between them and the sides of the tunnel; and the current is conveyed to the car-motors by means of lines of angle-irons, fastened to the sides of the tunnel, and forming continuous contact with projections on the sides of the cars; the return-current being carried through the rails. It seems as if there might be some difficulty in reconciling such a mode of conveying current to the cars with a comfortable arrangement of springs in them; but certain advantages are secured by means of it, in the way of automatic operation, which could hardly be obtained with a trolley-wire. So long as the conductor looks out for the regular running of his car, or train, he has nothing else to do. When the train approaches a station, the current is automatically switched off the motors, and the electric brakes are applied. As soon as the train is brought to a stop, alongside the platform of the station, the sliding-doors in the sides of the cars open automatically, and, at the same time, the brakes are released. So long as the doors remain open, the cars cannot start, but the shutting of the doors, which is done by the conductor, switches on the current, and the train moves on. The line is divided into blocks, about one hundred metres in length, and automatic switches are arranged in such a way that if a train arrives at a block on which another train is standing or moving, the current is switched off from the second train, and the electric brakes automatically applied to it.

THE LATE G. B. DE ROSSI, ARCHÆOLOGIST.



Jennie Turner's House, Philadelphia, Pa.

THE science of archæology has just suffered an irreparable loss in the person of the Commendatore G. B. de Rossi, whose reputation was world wide. The illustrious savant has died at the age of seventy-two, after a life absolutely devoted to science and art. There is no one who has studied Roman antiquities who does not know his work, and his book "*La Roma Sotterranea Cristiana*" is the text-book for all who interest themselves in the history of Christianity. Signor de Rossi was a tireless and conscientious worker, and while he pursued those higher studies which earned him a reputation, he also found time to write certain highly appreciated articles for the historical bulletins, and wholly with his own hand the *Bullettino di Archeologia Cristiana* which he had founded. His name is associated with all the important discoveries that have been made during the past fifty years. His works have been translated into all languages, and have been particularly commented on and digested by Spencer and Northcote, and so have made the circuit of the globe. His investigations were not restricted to religious antiquity; they embraced Roman topography and pagan epigraphy, thus enlarging the circle of historical studies. Momsen and Henzen were determined to have him as their collaborator on that monument of universal erudition which bears the title "*Corpus Inscriptionum Latinarum*."

He was attached to the Vatican Library and to the Christian Museum as Prefect, and the savants who came from every part of the world to consult the treasures contained in that vast library—unique in the world—gladly availed themselves of his courtesy and his knowledge. For them he was a guide at the same time learned and good-hearted. Two popes, Pius IX and Leo XIII, honored him with their protection and sympathy. The admiration that was felt for him was indicated in 1882, when his friends and pupils celebrated in the Christian Museum his sixtieth birthday and presented him with a gold medal and an album containing the autographs of the leading men of science in Europe and America, eager to testify to the consideration and gratitude they felt for him.

His vocation for the study of Christian archæology declared itself in a very touching way. His father, a man of great piety, made him read each day the life of that saint to whom the day was assigned in the calendar. When his father took him to walk, he used to beg to be taken to the Roman Forum, the Colosseum, or the ancient basilicas, where the sight of the ruins of these old buildings redoubled his love for things antique, and increased his desire to decipher the mysteries enclosed amid these débris of the past.

There are cited two instances of his lively and early inclination for studies of this kind: In 1835, when he was hardly thirteen years old, he went with his father and some of his friends to visit the Vatican Library, where they met the celebrated Cardinal Mezzofanti who was showing to a family of foreigners the most precious of the codes contained in the collection. Having come upon an inscription which greatly impressed him with its beauty, he drew his note-book from his pocket and began to transcribe it, but a guardian, jealously observant of the rules, rudely snatched the book away from the young epigraphist. A long time after, when Signor de Rossi had become one of the most respected of the library's frequenters, the same guardian, grown old in office, shamefacedly recalled the incident and excused himself by saying that he never imagined that that curious and indiscreet lad was to become so notable a man.

Some years later, he again returned to the Vatican with his father who frequently had to go there in his capacity of *attaché* of the Portuguese embassy, and while he was waiting for his father he began to copy a Greek inscription. Coming to a word he could not translate, he stopped short. Cardinal Mai, who had recently been advanced to the dignity of the purple and who was a Hellenist of the

first rank, chanced to pass just then and stopped beside the youth whose perplexity aroused his curiosity: having learned the cause of his embarrassment, he set himself to translate the inscription for him. But coming to the same word that had puzzled young Rossi, he, too, had to come to a standstill, for the word was a new one even to him. Cardinal Mai, because of this introduction, desired that a young man already so skilled in ancient languages should be attached to his service, and took him as a pupil. Later, he was allowed to descend into the catacombs with Padre Marchi, who was directing the excavations, and in this way he was enabled to penetrate into that world, at that time almost unknown, upon which he was destined to throw so much light.

The subterranean chamber under S. Prassede contained a great number of inscribed marbles stored there, together with the bodies of martyrs. On the twentieth of each July, the *fête* day of the saint, this crypt is illuminated and opened to the faithful. Now, on July 20, 1840, young Rossi repaired thither and began to copy some of these inscriptions in his note-book. All at once some one rapped him on the shoulder: it was Padre Marchi, who had come down to perform his devotions, and who wanted to know what Rossi was doing there, and was astonished at discovering that he had already copied, with great exactitude, several hundred inscriptions. He begged him to take this material to the Museo Kircheriano, of which he was director, for he perceived that these notes might be the starting-point of a collection having capital importance. Rossi accepted the invitation, and at this interview were laid the foundations of that monumental work which contains the Christian inscriptions at Rome. From this moment, Rossi became the coadjutor and disciple of Padre Marchi. Rossi also had the satisfaction of accomplishing an incomparable volume on "*Christian Architecture*," which had a powerful effect in bringing about a revival of the study of religious archæology. But his most important work is that by which he withdrew from the shades in which it had been enveloped up to that time the history of the primitive church, which had been wronged by apocryphal traditions.

His idea was, first, to study the monuments of the early epochs, the vicissitudes of the Church, the statements of the writings of the times, its constitution and its relation with pagan society; then, by the aid of the catacombs and ruins, to reconstitute the topography of ancient Rome, and to discover in this underground labyrinth the tombs of the most illustrious and venerated martyrs. Thanks to his unwearying activity, this dream became a reality.

In 1849, he discovered the inscription of Pope Cornelius which was cited in the recital of Fabiola, and has had so good an effect in stimulating the English to study Christian archæology.

This first discovery, which disclosed the spot where the tomb of St. Calixtus was, was followed up by the great explorations which Pius IX authorized, which in time led to the discovery of the tombs of several popes and of St. Cecilia, as well as of a great many inscriptions and symbolical paintings. It was at this time that the reigning pontiff instructed him to write his "*La Roma Sotterranea Cristiana*," three volumes of which are already published, in which he has condensed all the scientific elements necessary for the historical and topographical reconstitution of the Roman catacombs and the interpretation of the monuments contained in them.

In proportion as he extended the domain of his discoveries in this underground world, so rich in precious documents, he conceived the project of disseminating his discoveries by means of a periodical publication which should keep the little world of savants posted on the discoveries he was making, and it was at this time that he founded the *Bullettino di Archeologia Cristiana*, which has been the journal of his efforts, for in it are given the accounts of all his discoveries from 1863 to the time of his death.

Of the colossal work on the Christian inscriptions, two volumes have appeared and a third is now in press.

The monuments of the early ages had been illustrated in his "*La Roma Sotterranea Cristiana*," but there was need of a work, too, that should deal with the basilicas and churches of the succeeding epochs as well as with the Byzantine period. This lack Signor Rossi has made good with another colossal work on the "*Mosaics in the Churches at Rome*,"¹ illustrated with chromolithographs, and this work fortunately is finished.

Besides these works of capital importance, this great archæologist published a large number of dissertations on those matters which attracted his attention, and on consulting the "*Album G. B. de Rossi*," published, a couple of years ago on the occasion of the seventieth anniversary of his birth, one can discover that these writings having a bearing on history and Christian archæology number not less than three hundred. It was desired to signalize this anniversary occasion in some way, and for the purpose there was selected an oratory near the crypts of the ancient cemetery of St. Calixtus, which Rossi had discovered, and here in the presence of representatives of archæological science from every part of the world was unveiled a marble bust of the archæologist, bearing the date April 30, 1892. In the "*Album*" I have just mentioned can be found the addresses delivered by the representatives of societies and academies in all parts of Europe and America, as well as a description of the ceremonies which formed a real triumph for this savant of noble birth.

As I said in the beginning, the death of Signor de Rossi has

¹ "*Mosaici Cristiani e saggi di pavimenti delle chiese di Roma anteriori al secolo XV.*"

inflicted on the whole world an irreparable loss. His knowledge, his assiduity, his rectitude, have increased the prestige and widened the horizons of archaeological studies, so arid in all seeming, yet so fecund in their teachings, because of the light they shed on the facts and events from which is born a philosophy by which future generations will profit.

H. MEREU.

THE WHOLESALE ARCHITECT AS AN EDUCATOR.

IF Bulfinch were to be suddenly brought back to life and permitted to resume his honored position in the ranks of the profession, there would be one feature of architectural progress, so called, which would probably strike him as being very peculiar; namely, the enormous development of what might be termed the wholesale architect.

The time is quite within the memory of the modern practitioner when architecture was a profession limited to a very few individuals, a time when architectural publications were hardly thought of and the library of the average architect was limited to Tredgold and Vignola. Twenty-five years ago there was practically no art in this country. The Centennial Exhibition, with its vast array of object-lessons from abroad, awoke this country to a new life, and architecture with the other arts began to be popular. It is, however, only within the last fifteen years, indeed one might say only within the last decade, that an active and apparently permanent public interest has been evinced in the work of our profession. Our fathers seldom employed architects to build houses. That was the province of the mason. We hope our children will not even dare to lift a finger except under the architectural guidance of our successors.

Now-a-days, architects are as numerous as the leaves in Vallambrosa, and the literature and current publications upon the subject are so plentiful and copious as to seemingly place imitative architecture within the reach of any one who wishes to think himself an architect. Furthermore, within the last few years there has sprung up in various parts of the country a brood of architects, if the name can properly be applied to such creations, who apparently make it their chief business in life to turn out designs for houses, churches and school-houses by the score and sell them in cheaply-bound volumes by the hundred. It is hardly possible to turn through the advertising papers or any magazine or newspaper of note without finding frequent advertisements of building plans; and to the professionally uneducated mind these advertisements are by no means lacking in suggestions of real value to the man or woman — especially the latter — who is building for the first time. Thus, one architect frankly admits that "some architects plan seventeen-story buildings. I never have; but I do draw little, cheap cottages, and beautiful ones. If you want a house, which because of its beauty will be a joy forever, send for this book. Price, 50 cents." Another advertises in the *Century* to send his beautifully-illustrated book of artistic houses for four cents. Another sells 180 complete plans for two dollars, and a Michigan architect advertises thirty designs for twenty-five cents. The limits of cost are clearly stated, the sample design accompanying each advertisement is usually sufficiently unimpeachable, and the purchaser of the publication risks very little money. The hard-working legitimate architect, so called, who grinds away with a different set of plans for every client and sometimes has trouble in wringing a bare five-per-cent commission from a reluctant property-owner, is very naturally moved to dire wrath when confronted with one of the so-called "art cottages" which his unsophisticated, hoped-for client has culled from some cheap magazine and has presented to him with the statement that such plans are purchased at two dollars a hundred and why, then, should he charge five per cent for a single set of drawings? The architect's first impulse is to consign the whole lot of cheap architects to that locality where all bad architects ought to go, and it sometimes requires a great deal of philosophy to calmly appreciate the value of the services which are rendered to the country by our wholesale brethren. Our artistic spirits may be galled by the intrinsic worthlessness of the vast majority of plans ground out by any such processes, and our feelings for architects who so sell their birthright for a mess of pottage may rise to supreme contempt, but it, nevertheless, must be admitted by every candid thinker, that the function of the cheap architect in this country has been very decided, very positive, and very successful in helping to prepare the way for a better development of architectural growth, for a better appreciation of an architect's functions, and for better opportunities for our profession.

Architecture is so essentially an adjunct of high civilization, at least in its personal relation to the architect, that the profession as a whole is sure to be benefited by anything which tends to the advancement of culture and civilization among the masses. Furthermore, although the individual sometimes fancies that he possesses intrinsic ability, that his art is *sui generis*, or that he is able to think beyond the scope of the ordinary mind, it is, nevertheless, a perfectly well established fact that only a very few times in a century is an intellect evolved or an artistic nature developed of sufficient force to reach beyond its generation. We are the slaves of our surroundings not only in our habits, our customs and our methods of life, but also in our ways of thinking, in our art, and in our sciences. Until the general average is raised, there can be little hope for personal achievements of any decided or far-reaching value in any of the lines of human thought or activity. Consequently, although we,

as architects, may think we know a great deal more than our clients, and can design much better houses than they can possibly imagine, filling them with what to them are unknown refinements and niceties, we very soon find that it is extremely difficult to get very much ahead of the current style, and that our most successful efforts when we look back at them in the future will appear to be but steps in the general progress of the community. We may keep on the top wave, may even lead the advance, but we do not get very far ahead, and, at the most, we are mere advanced pickets of the army of progress.

Now it is safe to say that all of the development tending to the greater employment of architectural service has not come entirely as a result of the excellent achievements of the individual architects. It is also safe to say that the enormous supply of cheap architectural publications, issued for the sole purpose of selling plans by wholesale, has not sprung up simply because a few architects wanted to make money by the wholesale manufacture of plans and undertook to create a market by selling their wares very cheaply, but, rather, owes its existence to the fact that the common people who cannot afford to pay five per cent for an architect, or who do not appreciate the necessity of being told how to build their own houses, feel a desire for just the sort of cheap literature which our wholesale brethren are now so ready to supply. In other words, the demand has created the supply, and the quantity of such wholesale publications is evidence that thousands of people who build are seeking for light, and that the average house-builder in this country has reached a stage in artistic development where he is willing to pay at least something for professional advice, even though it reaches him in such an extremely attenuated condition. It is, therefore, perfectly evident that the wholesale architect acts — doubtless unconsciously, but not the less surely, as an educator of the masses, by giving something which, at least, may create a desire for a better article. The fact that so many seem to be satisfied with professional services so cheaply secured should not be accepted as evidence that the popular taste is stationary or becoming vitiated. If the people, who a generation ago felt no need for plans of any sort, are now buying them by the hundred, a generation hence these same people will appreciate an architect's full services, by a perfectly natural process of development.

Suppose a clerk with a salary of, say, fifteen hundred dollars a year has accumulated a couple of thousand dollars, and wishes to build a home. His first step may be to join some building-association or cooperative-bank, and with its help to become possessed of a small parcel of land. If he has no architects among his personal friends, very likely his next step will be to invest in three or four of the most conspicuously-advertised house-plan publications, and to supply himself with the miscellaneous array of badness which they present, with the result of probably selecting, in nine cases out of ten, the very worst of the whole lot as the scheme for his new home. If he is an intelligent man, before the foundations of his house are laid, he will begin to understand that house-building means more than the mere selection of plans from Somebody's Monthly. Later on, he will appreciate that there are difficulties in the mere business operations associated with building which may be somewhat harassing to a dry-goods' clerk or butcher's apprentice. And, finally, when the house is all finished, if, as is very likely, he is a man who reads the magazines, gets occasional glimpses of the Art Museum, and perhaps occasionally listens to a lecture on art, he will discover that there are, at least, a few particulars in which his house might be improved in an artistic sense, and that house plans at seventy-five cents per hundred are not always perfect. He may even get so far as to appreciate that his site and his house should have some relation to each other, and that it is not sufficient to merely select a design which on paper looks most pleasing, but that the circumstances, the plan and the external appearance might possibly be studied to advantage together. Being a sensible man, it will not be strange if the next time he wants to build, or the next time his friend wants to build, his advice will be: "Buy some of the cheap architectural publications, pick out the design you want, and then get some cheap architect to fix it over for you so as to fit the lot." Such conclusions are by no means ideal for our profession, but they are certainly an improvement over the first condition, and after a few experiences in architecture, either personally or through others, our fifteen-hundred-dollar clerk will very likely become converted into a pretty firm advocate of the advisability of employing skilled professional advice in building a house. If, however, the clerk, instead of being a thinking man, one who profits by his experience, is of the far too common type who views with extreme complacency every effort in which he sees his own hand, the result will, in the long run, be much the same, with the exception that he will develop ultimately into that very common form of client who knows the business a great deal better than any architect living, who knows just what he wants only he "can't quite draw it," but who, at the same time, feels that architects are not entirely useless members of the community.

An experience of this sort, repeated a thousand times over in different parts of the country, cannot fail to have a distinct educational value upon the mass of people who are obliged from circumstances to build and occupy cheap houses, and the function of the wholesale architect as an educator would be of distinct value if it went no farther, but, fortunately, it acts in both directions. The cheap architectural publications influence not only the deluded being who buys them to build himself a house therewith, but they

very often have a distinct influence upon the conscientious architects who, by business limitations, are confined to the humbler lines of the profession. There are so many bright, clever young men whose services can so easily be secured, for a consideration, to give style to the work of the wholesaler, that the published designs in some cases are far from bad in the abstract. The publishers fully appreciate that the taste of the average house-builder, when once aroused, is keen, if uncultivated; and the standard of design is constantly being raised. The architect who is called in to design an inexpensive house for an individual client finds himself confronted by these cheap publications, and is obliged to show that he is superior to such productions. Unfortunately, the result does not always justify the assumption, for all of the bad designs are not limited to the pages of such architectural publications, and some of the worst examples of the vernacular are perpetrated by architects who ought to know better, but do not. Still the effect of the wholesale architect remains the same, and any one who has designed a number of cheap wooden houses must admit that the presence of the work of our wholesale brethren is a spur to better efforts on our part.

Therefore, although we may with perfect justice deride the result, and feel a legitimate contempt for talent which is so prostituted, let us be, at least, charitable in judging of the work of men who are often perfectly sincere, who intend to give the public full value for what it pays, and in the main succeed in doing so, and to whom, after all, we indirectly owe no inconsiderable share of the public intelligence, the general taste, the wide-spread appreciation which to-day makes architecture so honored as a profession, and which has prepared the way for the opportunities we are permitted to improve.

C. H. BLACKALL.

THE INFLUENCE OF THE HANSEATIC LEAGUE ON THE ARCHITECTURE OF NORTHERN EUROPE.¹—III.



St. Patroclus's and St. Peter's, Soest.

I HAVE already mentioned that the peculiarity of the westward radiating buttresses is only to be found, outside the Baltic provinces, at Westminster Abbey; but I would not in the least suggest that this is due to Northern influence. At the same time, this peculiar feature—the greater width across the chapels than across the choir, also very German, the eccentric and perfectly un-French plan of the chapels (six sides of an irregular decagon)—associated with the fact that at the very time Westminster choir was building, Henry III was permitting the Hansa League to erect its storehouses in London, all taken together form a coincidence at least remarkable.

Although in the Baltic style the arrangement of radiating chapels had been worked out in its own way, and was for long an essential feature in the more important churches, side by side with it was growing up another characteristic form which eventually led to its almost total abandonment—I mean the gable. In French buildings the gable never assumed very great importance, but in German architecture it became a prominent feature; and in the formation of the towers and spires of the early buildings it played a leading part.

¹Read at the general meeting of the Royal Institute of British Architects, Monday, May 28, 1894, by J. Tavorer Perry, [A] and published in the *Journal of the Institute*. Continued from No. 981, page 13.

Of the way in which the spire form became gradually perfected we have the well-known examples of Paderborn and Soest, for the earliest periods, which afterwards became stereotyped in the forms we see at Lübeck and Lüneburg and throughout the Baltic provinces



St. Mary's, Lübeck.

during the best periods of the style. But the gable alone was afterwards preferred to the spire, and the architects adopted the simple double-gabled saddle-back tower through all the last phases of the style. By the omission of the clerestories, and construction of the aisles of equal height, the gables of the churches became of enormous size, and these presented so wide a field for the panelled decoration so dear to the Baltic artists as to lead gradually to the extinction of the *chevet* altogether. One of the finest examples of the transition is the east end of Prenzlau, where the three aisles are terminated with shallow apses grouped together outside and gathered over so as to bring the upper surface of the gable to a level, which is covered with intricate tracery, all in brick, standing free from the surface of the wall, and producing a most rich effect in light and shade. In a later example at Neubrandenburg the gable is as richly covered with tracery, and the apses have been altogether omitted.

Of gables at the west end of the churches, where there were no towers, perhaps the most complete and satisfactory example is that of the Church of St. Katherine at Lübeck, which was rebuilt in 1531.



Prenzlau: the East Gable.

Here there are no sham walls or meaningless tracery spread over the surfaces, and although the two great windows may seem excessively lofty and attenuated, yet they are no larger than required to light the interior, and their peculiarities are but characteristic of the

brick manner of construction. So fond were the Baltic architects of the effect of these lofty mullions that they frequently prolonged them downwards over the blank wall space which concealed the aisle roofs, as at St. Nicholas's, Stralsund, and St. Peter's, Malmoe; but the



difficulty of supporting such thin and lofty erections in brickwork, especially where they carried tracery above, resulted in the frequent substitution of two tiers of windows in the same wall-face, suggesting, from the outside, the gallery of a dissenting chapel, as at the Church of St. John, Stettin, and St. Mary's, Stargard.

So enamored of the gable form did the architects of the style become that it was considered in itself a decoration, and house-fronts, gate-towers and roofs of all sorts were finished with gables. Where this was a natural termination to a roof, or where fair opportunities for gable terminations were created, as at Neubrandenburg or Bruges, the treatment was legitimate and satisfactory; but where, as at St. Katherine's, Brandenburg, or the fronts of the great Town-Halls of Lübeck and Stralsund, the gabled fronts were merely a screen-work, solid or pierced, bearing no relation to the roofs behind, they became not only unmeaning, but ugly.

Whatever the demerits of brick as a building material, from an architectural point-of-view, may be, in one particular it had great advantages over stone. It was too inexpensive to suggest for its saving the use of a cheaper and commoner ingredient. Thus, in the



great and lofty piers which are found throughout the Baltic provinces, we find they are built solid of one homogeneous material, and not, as were so many of our own mediaeval piers, of rubbish faced up with a thin shell of stone. These great brick piers are a very noticeable

feature in the style, and are most marked in those churches where the nave and aisles are of equal height. They are frequently richly moulded, as at St. Nicholas's, Stralsund, and Neubrandenburg, but the more usual form is a simple octagon.

At first the rich decoration of the wall-surfaces by deeply moulded and traceried arches, although in no way arising out of the construction, produced a very ornamental effect; and where assisted by glazed bricks of various colors, as at St. Mary's, Stargard, the Town-hall, Hanover, and other places, it was often beautiful. These arches, in the lightness of their tracery and their slender mullions, may, indeed, in a degree, have suggested such light arcading as the double tracery on the west front of Strasburg Cathedral. The enriched fronts of the barbicans of Neubrandenburg, with their elaborate foliations and crocketed gables, however incongruous such decorations may appear in the works of a fortification, are architecturally most satisfactory; but the reverse is the case in the great church of the same town, where the gables and spire are covered with meaningless attenuated tracery bearing no conformity to the parts of the building to which they are applied. From the cheapness of the materials used, and the facility the builders acquired in dealing with this mode of decoration, it quickly degenerated into a series of panels of arches or circles, sometimes moulded and cusped, but generally plain, often having the background covered with a coat of plaster for painted armorial decorations. This panelling is found throughout the Baltic provinces repeated on towers, churches and houses in a wearisome manner. How far the flintwork arcading of our eastern counties may have been suggested by this, one cannot say, but in many cases it produces an equally monotonous effect.

As the Gothic forms of the Baltic style gradually gave way before the Renaissance, these two principal local features—the gable and the arcading—assumed increased importance; and in the lofty house-fronts of the cities, and the huge castles erected in North Germany before the outbreak of the Thirty Years' War, these features in semi-Classical guise are the most noticeable. On the pages of Fritsch's great work¹ a large number of these are depicted; and the old towns all round the Baltic are still full of beautiful examples of German Renaissance too numerous to mention. It is doubtless due to the attention which has been drawn to them, and to the appreciation of their immensely picturesque qualities, which has led to that revival of Renaissance Art in this country meaninglessly described as "Queen Anne," but which is merely an approximation to that form of the Renaissance practised in the Baltic provinces in the last days of the Hanseatic League.

APPENDIX I.—LISTS OF THE TOWNS COMPRISING THE HANSEATIC LEAGUE AND OF TOWNS IN FOREIGN COUNTRIES ALLIED TO THEM. COMPILED FROM PROFESSOR G. DROYSSEN'S *Historischer Handatlas*.

I. TOWNS OF THE LEAGUE.

Wendland and Pommern.—LUBECK, Head of the League. GRIEFSWALD, HAMBURG, ROSTOCK, STRALSUND, WISMAR. ANKLAM, COLBERG, DEMMIN, GOLNOW, GRIEFENBERG, GRIMMEN, KIEL, RUGENWALD, STETTIN, STOLP, TREPTOW, TRIBSEES.

Saxony.—BREMEN, BRUNSWICK, GOSLAR, MAGDEBURG.

Ascherleben, Buxtehude, Eimbeck, Göttingen, Halle, Halberstadt, Hameln, Hanover, Hildesheim, Lüneburg, Osterode, Quedlinburg, Salzwedel, Stade, Uelzen, Wern.

Markland.—Berlin, Brandenburg, Coeln, Frankfurt a. O., Havelberg, Kyritz, Oardelegen, Osterburg, Perleberg, Pritzwalk, Seehausen, Stendal, Tangermünde, Werben.

Livonia.—DORPAT, REVAL, RIGA.

Fellin, Pernau, Wenden, Wolmar.

Sweden.—WISBY.

Calmar.

Netherlands.—Amsterdam, Arnheim, Bolsward, Deventer, Dollart, Elburg, Groningen, Harderwijk, Hasselt, Hindelopen, Middleburg, Nimwegen, Staveren, Utrecht, Zwolle, Zutphen.

Prussia.—DANTZIG, ELBING, KOENIGSBERG, THORN.

Braunsberg, Culm.

Westphalia.—COLOGNE, DORTMUND, MUNSTER, SOEST.

Bielefeld, Coesfeld, Duisburg, Emmerich, Hamm, Hervord, Höxter, Lemgo, Lippstadt, Minden, Osnabrück, Paderborn, Rormond, Unna, Venlo, Warburg, Wesel.

II. ALLIED TOWNS IN FOREIGN COUNTRIES.

England.—LONDON, Boston, Hull, Ipswich, Lynn, Norwich, Yarmouth, York.

Flanders.—BRUGES, Antwerp, Damme, Dinant, Ghent, Ypres.

Denmark.—Copenhagen, Falsterbo, Flensborg, Helsingborg, Helsingör, Malmoe, Roeskilda, Skanör, Svenborg, Warberg.

Norway.—BERGEN.

Russia.—NOVGOROD, KOWNO, PSKOV.

APPENDIX II.—THE CHRONOLOGY OF THE HANSEATIC LEAGUE.

B. C.

809 Hamburg founded by Charlemagne.

950 Jomsborg, or Jullin, on the Island of Wollin founded by Harald Gormson.

979 London. Privileges granted by Etheldred to German merchants to trade there.

1143 Lübeck founded.

1150 Novgorod established as a free republic.

1158 Lübeck ceded to Saxony.

¹ "Denkmäler Deutscher Renaissance," K. E. O. Fritsch.

- 1163 The Oldenburg bishopric transferred to Lübeck by Duke Henry of Saxony.
 1164 The Dom of Lübeck consecrated.
 1177 Jomsborg destroyed.
 1190 The Teutonic Order founded by three knights of Bremen and two of Lübeck.
 1209 Stralsund founded.
 1225 Wisby. First treaty made between the German merchants resident here and the German traders from mainland.
 1226 Lübeck declared a free imperial city by the Emperor Frederick II.
 1227 Lübeck attacks the Danes in the battle of Bornholm.
 1234 Lübeck destroys Danish naval supremacy in engagement at the mouth of the Trave.
 1241 Hamburg and Lübeck enter into treaty to protect the roads from Travemünde to the Elbe. (This is regarded as the date of the complete establishment of the Hansa League.)
 1250 London. The Hansa storehouses erected.
 1250 Bergen. Treaty made with Hakon of Norway for establishment of League in Bergen.
 1252 Bruges. Storehouses erected, and the League as "Merchants of the Roman Empire" established in Flanders.
 1253 Damme. Roger of Lübeck and Jourdain of Hamburg obtain special privileges for the League in Damme.
 1259 London. Henry III confirms the privileges of the League.
 1272 Novgorod. Storehouses erected.
 1276 Novgorod. Joins the League.
 1278 Mons. Storehouses erected.
 1281 London. Troubles between the German merchants and the citizens as to the cost of repairs to Bishopsgate.
 1348 The League attacks Denmark.
 1361 Wisby destroyed by the Danes. Consolidation of the League by the Danish War. (From this time the assemblies of the League become regular.)
 1367 The League meets at Stralsund.
 1370 Peace of Stralsund by treaty between the League and Waldemar of Denmark, which "induced close relations between the League and the Teutonic Order." (At this time the League was at the height of its power and embraced sixty-four confederate and forty-four allied cities.)
 1395 Treaty with Denmark when Albert surrendered to the League.
 1426 War between the League and Denmark.
 1448 War between the League and England.
 1455 Bergen. The German merchants attack the king's governor and burn him and his men in a church, by which the influence of the League in Norway is much increased.
 1474 The privileges of the League in England restored.
 1477 Novgorod captured by the Russians, and the League ejected.
 1479 London. Bishopsgate rebuilt by the German merchants.
 1537 Lübeck. Fall of the Bürgermeister Jorgen Wollenwever. (From this time the power of Lübeck rapidly decays.)
 1550 The Kontor of Boston suppressed.
 1551 London. The German merchants collect materials for the repair of Bishopsgate.
 1552 London. Privileges of the League revoked.
 1578 The League abolished in England by Elizabeth.
 1619 Outbreak of the Thirty Years' War and gradual decay of the supremacy of the League.

THE EFFECT OF FROST ON GREEN MASONRY.

DURING the construction of the new theatre in Zurich, Switzerland, it became necessary to carry on part of the masonry during the winter. The contractors obtained advice from several sources as to the manner in which the work should be done, but as the recommendations were very diverse the Austrian Society of Engineers and Architects, which has made a special study of cements, limes and mortars, was asked to recommend a course of procedure. The matter was turned over to the Cement Committee, and this body instituted a series of experiments, which are described in the following free translation made by the *Illustrated Carpenter and Builder* from the report in the Society's journal.

The experiments were made in two ways, the first with brick masonry and the second with rubble masonry, using stone of two kinds. This appeared desirable in order to determine if there were any difference in materials which were unlike hygroscopically. The materials used were dry and free from snow and ice, and the mortar was mixed as stiff as possible. The limes and cements were all tested in the municipal experimental-station according to the system of the society.

The separate pieces of brick wall tested were about 3.28 feet long, 6.56 feet high, and 12 inches thick, and were made with lime, Roman cement, Portland cement, mixed lime and Portland cement, and slag cement. The test walls made with these five mortars were laid with unwarmed water from the city mains and with water warmed to a temperature of 77° Fahrenheit. A series of tests were also made with Roman and Portland cements and cold water to which seven per cent of its weight of cooking-salt had been added. All mortars were made with one part of the cementing material and two parts of sand. In the mixed mortars twice as much lime as Portland cement was used. The lower half of the walls was partly protected by timbers, but the upper portion was entirely exposed. A few tests were also made with brick masonry laid with Hausleitner's frostproof Roman and Portland cements.

The test blocks of rubble masonry were 3.28 feet long, 6.56 feet high and 16 inches thick. The stone used was partly limestone and partly sandstone. These blocks were laid with lime-mortar, Roman-

cement mortar and Portland-cement mortar, mixed with cold and hot water and cold brine as before.

The brick walls were started the last part of December, when the temperature was 26° Fahrenheit, and the fourteen pieces were finished in about three weeks. The temperature of the air was taken three times daily until the middle of April, the lowest temperature being on January 2, when three degrees above zero Fahrenheit was registered. The walls were pulled down June 6. It was at once apparent that those pieces of masonry laid with mortar containing lime had suffered more from the frost in the exposed upper part than in the portions protected by timbering, since in the former the mortar had plainly been frozen. The following remarks give an idea of the condition of the walls, as revealed by an examination of the joints with a sharp iron:

1. Lime-mortar mixed with cold water. The mortar in the joints had hardened but feebly, and the bricks could be pulled apart by hand without exercising any noticeable amount of strength.
 2. Lime-mortar mixed with warm water. The mortar in the joints had hardened feebly, and there was no adhesion between the bricks and mortar.
 3. Roman-cement mortar mixed with cold water. The mortar in the outer and inner joints had hardened moderately, and there was considerable adhesion between the bricks and the mortar.
 4. Roman-cement mortar mixed with warm water. The joints were quite brittle, and the inner portion of the mortar not particularly well hardened; the adhesion between the bricks and mortar was quite good. The part of the walls protected by timbers was in better condition, and excelled any of the preceding walls.
 5. Portland-cement mortar with cold water. The joints were hard and the mortar clung well to the bricks. The protected part was better than the other, in this case.
 6. Portland-cement mortar with warm water. The joints were hard, the mortar adhered well, and the entire piece of wall was a little better than any of the preceding.
 7. Lime and Portland-cement mortar mixed with cold water. The mortar was badly mixed, brittle and crumbling, but adhesive.
 8. Lime and Portland-cement mortar mixed with warm water. The mixture was uniform in this case, but the mortar was brittle and not well hardened in the interior, although adhesive.
 9. "Frostproof" Roman-cement mortar mixed with cold water. The mortar was well hardened, and there was a good adhesion between it and the bricks. A plaster of the same material put on a part of the wall at the request of Herr Hausleitner was thoroughly hard and without sign of injury.
 10. "Frostproof" Roman-cement mortar mixed with cold water. This mortar was well hardened and adhered very well to the bricks. A plaster of the same material was thoroughly hard and without defects.
 11. Wittkowitz slag-cement mortar with cold water. The joints were brittle, and the mortar fell into little particles when scratched out with the iron. The inner parts which had hardened somewhat were crumbling, and showed but a slight adhesion to the bricks.
 12. Wittkowitz slag-cement mortar with warm water. The condition of this wall was but slightly better than of the last noted.
 13. Roman-cement mortar mixed with cold water to which seven per cent of salt had been added. The mortar was brittle and crumbling, adhering but slightly to the bricks.
 14. Portland-cement mortar mixed with cold water to which seven per cent of its weight of salt had been added. The mortar was well hardened throughout, and adhered well to the bricks.
- The masses of rubble masonry were built on a succeeding year, being started on December 28 and completed about two weeks later, the temperature ranging from 7° to 25° Fahrenheit. The blocks were examined on April 7, and were found to be in the following condition:

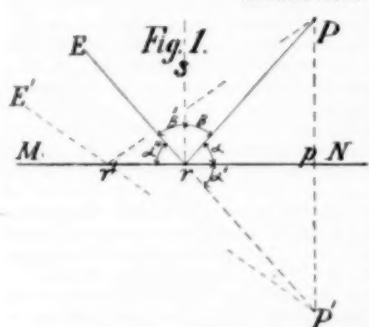
LIMESTONE RUBBLE.

1. Lime-mortar mixed with cold water. The mortar was completely frozen and brittle, without any adhesion to the stones. The block had fallen completely.
2. Lime-mortar with warm water. The mortar was entirely frozen, brittle and without adhesion.
3. Roman-cement mortar with cold water. The mortar had hardened pretty well, but had not the slightest adhesion to the stones, which could be removed from their beds without injuring the latter.
4. Roman-cement mortar with warm water. The mortar was quite well hardened, but did not adhere in the slightest degree to the stones.
5. Roman-cement mortar mixed with cold water and salt. In this block there was a partial adhesion between the stone and cement, and the latter had hardened somewhat better.
6. Portland-cement mortar with cold water. The mortar had hardened very well, and the adhesion between stones and mortar was quite good.
7. Portland-cement mortar with warm water. The conditions were the same as with the last block, although the adhesion may have been a trifle greater.
8. Portland-cement mortar mixed with cold water and salt. The mortar was very hard, and adhered to the stones very well. The tearing down of the wall required considerable strength and necessitated the use of bars and other tools.

SANDSTONE RUBBLE.

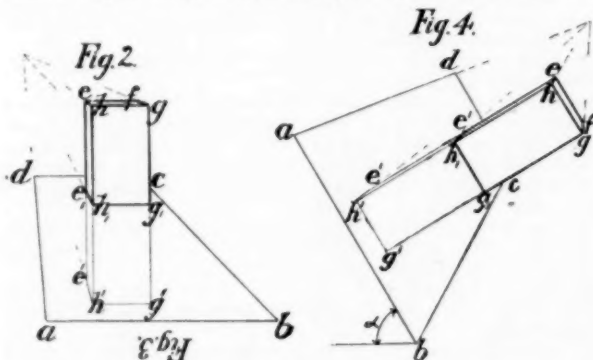
1. Lime-mortar with cold water. The mortar was entirely frozen, brittle, easily broken and without a trace of adhesion to the stones.
2. Lime-mortar with warm water. The condition of this block was the same as that of the first.
3. Roman-cement mortar with cold water. The joints were badly frozen, the mortar crumbling and slightly hardened. There was no regular adhesion between it and the stones.
4. Roman-cement mortar mixed with warm water. This block was in the same condition as the last.
5. Roman-cement mortar mixed with cold water, to which salt had been added. The mortar was well hardened and adhered fairly to the stones.
6. Portland-cement mortar with cold water. The mortar was well hardened, but its adhesion to the stones was only partly good.
7. Portland-cement mortar with warm water. The conditions were much the same as in the last block.
8. Portland-cement mortar mixed with cold water to which salt had been added. The mortar had hardened very well, and adhered firmly to the stones. The block could not be broken apart without tools.

The conclusions of the committee from these experiments are that in brick masonry laid in frosty weather, mortars into which any part of lime enters should not be used. Roman-cement mortars behave fairly well under such conditions, and Portland-cement mortars give good results. The use of warm water gave somewhat better results, and salt materially increased the resistance to frost. With rubble masonry, using either sandstone or limestone, lime-mortar was entirely out of place, and Roman-cement mortar gave poor results unless mixed with salt. Portland-cement mortar behaved well, especially with the addition of salt. The final recommendation of the committee is that in laying brick or rubble masonry in winter, only Portland-cement mortar should be used, mixed with salt if possible.

SOME CONSTRUCTIONS IN LINEAR PERSPECTIVE.—II.
REFLECTIONS.

required. From P draw PpP' perpendicular to MN making $pP = pP'$. Draw EP' intersecting MN at r . Join Pr ; and draw rs perpendicular to MN . Since $pP = pP'$ the right angled triangles Ppr and $P'pr$ are equal; therefore $x = x'$. But x' is equal to the opposite vertical angle x'' ; therefore $x = x''$; therefore $B = B'$.

A ray of light passing through P and reflected to the eye at E must, according to the law, pass through the point r , which is situated in the straight line ErP' . The perspective of r is the same point as the perspective of P' . If, then, we wish to represent the reflection of any point P , the problem is resolved into the very simple one of representing a point P' which is supposed to be situated on the other side of the mirror, pP' being equal to pP . This statement is true whatever may be the position of the eye of the observer. For if E

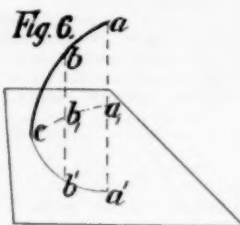
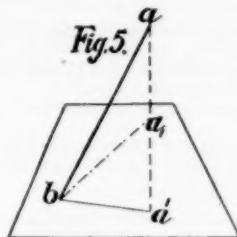


be moved to any other position E' , while r will move to r' , the position of P' will not change.

Let $abcd$ (Fig. 2) be the perspective of a horizontal mirror, and $efgh, h, e$, the perspective of a prism standing upon it. The reflection

¹ Continued from No. 925, page 174.

tions of the points e, h and g are respectively e', h' and g' in the prolongations of the vertical edges of the prism, making $e, e' = e, e'$, $h, h' = h, h'$ and $g, g' = g, g'$. The reflection e, e', h', g', h, e is the perspective of an inverted prism which is supposed to be situated on



the other side of the mirror, two sides of the bases of the real and imaginary prisms being represented by the common lines e, h , and h, g .

If the mirror and the prism are inverted (Fig. 3), we make a similar construction. It will be seen that Figure 3 is obtained by revolving the drawing (Fig. 2) through an angle of 180° . In

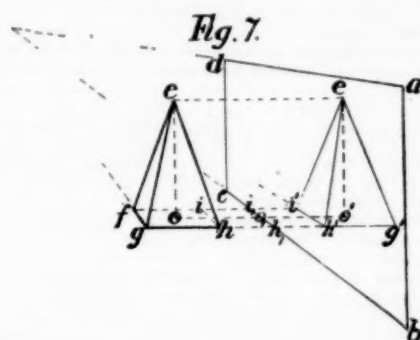


Figure 2, the prism and mirror are below the eye of the observer, while in Figure 3, they are above. In each case the heavy lines represent the prism, x , the fine lines, its reflection.

If the mirror ab cd (Fig. 4), is inclined at any angle x to the horizontal plane, its plane being perpendicular to the picture-plane, the construction is

similar to that of Figure 2. In each of these illustrations the mirror is rectangular in outline, two sides ad and bc being perpendicular to the picture-plane, and two sides ab and dc parallel to the picture-plane. The angle x is shown in perspective in its true value. The long edges of the prism ee, hh , and gg , are perpendicular to ab or dc , and the reflection e, e', h', g', h, e is the perspective of the prism ee, h, g, g', f inverted.

To find the reflection of any straight line, ab (Fig. 5), one end of which, b , rests upon the mirror which is horizontal.

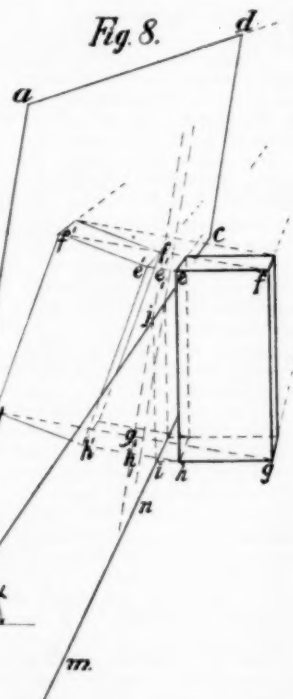
Drop a perpendicular from a , the other extremity of the line, and find the point a' in which it pierces the mirror. Produce aa' to a' making $aa' = a'a$; ba' is the reflection of the line ab .

To find the reflection of any curved line abc (Fig. 6), one end of which, viz c , rests upon the mirror.

Drop perpendiculars from points a, b , etc., and find the points a', b' , etc., where they pierce the mirror. Produce aa', bb' , etc., making $aa' = a'a, bb' = b'b$, etc.; $a'b'c'$ drawn through these points is the reflection of abc .

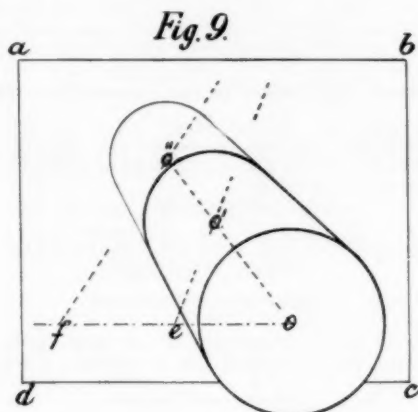
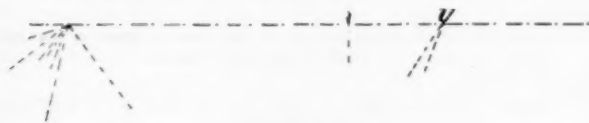
To find the reflection of a pyramid $efgh$ (Fig. 7), the mirror $abcd$ being perpendicular both to the horizontal and picture planes.

From o , the centre of the base, draw oo', o' parallel to the horizon, making $oo' = oo$. Draw the perpendicular $o'e' = oe$; produce fi and gh respectively to i' and g' , making $ii' = i, i'$, $h, g' = h, g$ and $h, h' = h, h$; $e'i'h'g'$ is the reflection of the pyramid.



To draw the reflection of a prism $efgh$ (Fig. 8), the mirror $abcd$ being perpendicular to the picture-plane, and inclined at any angle x to the horizontal plane.

A vertical plane through bc , the lower horizontal edge of the mirror, intersects the plane of the base of the prism—at the line



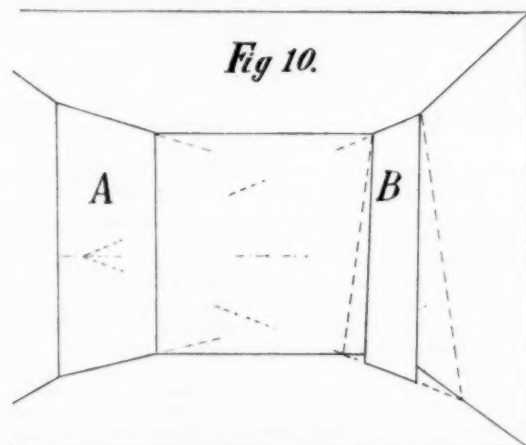
mn . Produce gh to i ; erect the perpendicular ij intersecting bc at j . Through j draw $f'h$ parallel to ab or cd . From feg and h draw perpendiculars to $f'h$, intersecting the mirror in this line at f, e, g , and h ; make $f_i f' = f_i f$, $e_i e' = e_i e$, $g_i g' = g_i g$ and $h_i h' = h_i h$. The rectangles $fegh$ and $f'e'h'g'$ are symmetrical with respect to the axis $f'h$. In a similar manner the parallel face of the prism is treated and the reflection completed.

To draw the reflection of a right circular cylinder whose axis is perpendicular to the picture-plane (Fig. 9), the mirror $abcd$ being parallel to the picture-plane.

In this figure the base of the cylinder, the perspective of whose centre is o' coincides with the mirror. Produce the axis $o'o'$ to o'' , making $o'o''$ the perspective of a line which is equal to $o'o'$. To do this, through o draw of parallel to the horizon. Lay off $oe = ef$ any convenient measurement. Draw eo' and produce it until it intersects the horizon at v . Draw fv intersecting $o'o'$ produced at o'' , the centre of the circle which limits the reflection. The radius of this circle is found by dropping a perpendicular from o'' to either of the tangents which represent the extreme elements of the cylinder, and which vanish in the point of sight.

In each of the illustrations from Figure 2 to Figure 8 inclusive—equal measurements on a line perpendicular to the mirror are equal in perspective, and this is true whenever the mirror is perpendicular to the picture-plane, since it is made on a line parallel to the picture-plane.

In Figure 9, since the mirror is parallel to the picture-plane and the axis of the cylinder perpendicular to it, while that part of the



axis produced represented by $o'o''$ is in space supposed to be equal to the part represented by $o'o'$, the perspective $o'o''$ is not equal to $o'o'$.

The cases which we have not considered are first (Fig. 10), when the mirror is vertical, and neither perpendicular nor parallel to the picture-plane; and second, the most general case that can be con-

sidered, viz, when the mirror is not perpendicular to the horizontal or picture planes.

These cases involve constructions which are not as simple as those which appear in this paper, and will be studied to better advantage after certain other constructions have been explained.

F. R. H.

THE WATER-WORKS OF NAPLES.

H. M. CONSUL at Naples says that the supply of pure water conveyed to the city by the Naples Water-works Company has been of such immense benefit to the sanitation of the city, that the manner in which this supply is obtained may be interesting to record. Since the opening of the works not only the needs of Naples have been regularly and abundantly provided, but the supply has been copious enough to furnish many of the adjoining communes and islands in the Gulf of Naples with good water, when such communes and islands were afflicted with epidemic diseases, arising from an insufficient and generally impure supply of drinking-water. The supply comes from the springs of Urcinoli, in the valley of Serino, about thirty miles nearly due east of Naples, and 1,080 feet above the level of the sea. It was originally proposed to utilize also the springs of Acquaro, situated in the same valley about 140 feet higher up, but on the first-mentioned springs being enclosed, it was found that in the driest season they furnished the amount stipulated for in the contract with the municipality, viz, a minimum of 37,000,000 gallons a day. The passage of water through the aqueduct is accordingly limited to 440 gallons a second. The consumption of Naples is calculated at 44 gallons a day per head (in comparison, it may be noted that the average consumption per head in London was given by the Royal Commission at 31 gallons per head), which, with a population of 50,000, only amounts to 22,000,000 gallons; consequently, at present, 16,000,000 gallons of water run to waste. In case, however, of still more water being required, the springs of Acquaro and Pelosi still remain untouched, and could be brought into requisition. The geological formation of the ground at the springs consists of an impermeable stratum at a depth of 40 feet; aqueous stratum 10 to 12 feet thick, composed of sand, shingle, and calcareous rock, covered and protected by a constant crust of black volcanic sandstone; and above this, vegetable earth and gravel. The subterranean waters are derived from distant parts of the mountainous region, by which the valley is surrounded. Two mountain torrents, which traverse the tract of land above described, have been floored and walled with concrete to prevent their currents from mingling with the springs. An area of 35,000 square yards to 40,000 square yards of the aqueous sand has been drained by means of three collecting channels, about 6 feet high and 5 feet wide, which have a total length of 563 yards. They are generally placed either in the tufa or at the top of the aqueous stratum. The bottoms of the conduits are made porous, and a considerable space outside the walls of each channel is packed with broken limestone. Over the whole are two layers of beaten clay, with a layer of cement between, so that the surface-water cannot penetrate the system. Above this, earth is filled-in to the general level of the area. The water that flows into and through these channels is very pure, and of the average temperature of 12° Centigrade. The conveyance of this large quantity of water to Naples is effected as follows: A covered masonry canal lined throughout with Grenoble cement, laid generally at a depth of three feet below the surface of the ground, but sometimes through tunnels under the hills, doubly placed along aqueducts raised 66 feet over valleys, and once changing into four parallel iron tubes, 2½ feet wide, which descend into the valley of Cronti, and rise on the opposite side, having, at the lowest point, to resist a pressure of seven atmospheres, conveys the water for a distance of 37 miles into two covered reservoirs on the hill of Cancellò, about 12½ miles distant from Naples. The reservoirs are at the respective elevations of 68 and 444 feet. The power of the fall of water from Cancellò into the plain is calculated at 2,900 horse-power, and might be easily utilized for the production of electricity. From these reservoirs three iron syphons proceed down into the plain, and up into the hill of Capodimonte, which dominates Naples. The longest of the three syphons measures more than 14 miles from end to end; it debouches into the high-service reservoirs 600 feet above the sea-level. These reservoirs may be reckoned among the grandest works of modern times; they are entirely hewn out of the rock. The low-service one holds 240,000 cubic feet of water in five large tunnels, which are filled to a depth of 27 feet. This reservoir lies 150 feet below the surface of the ground, so that the water is always cool. From the Capodimonte reservoirs the main service-pipes branch all over the city, forming a network, with close meshes; the supply is continuous, and there are no domestic cisterns. From this description it will be seen that the water is collected underground, in pure mountainous strata, at a high elevation. All the reservoirs are subterranean, and the water, therefore, is never exposed to the open air until it issues from the taps or fountains in Naples. Reservoirs and aqueducts are alike thickly lined with Grenoble cement, rendering pollution impossible. The length of the whole system of pipes that feed the city from the reservoirs of Capodimonte was, at the opening of the work, 62 miles. Numerous public fountains stand in all the twelve quarters of the city, and flow constantly.



THE ARCHITECTURAL LEAGUE OF NEW YORK.

THE regular monthly meeting and dinner of the League will be held in the Club-rooms, on Wednesday, November 7, at 6.30 P. M.

The Committee on Current Work announces that Mr. C. Howard Walker, of Boston, will address the League on "The Advisability of Registration of Architects."

The Committee on Monthly Exhibitions announces that, through the courtesy of Mr. Richard M. Hunt, there will be an exhibition of $\frac{1}{4}$ " scale, $\frac{3}{4}$ " scale, and full-size drawings of the Fogg Art Museum at Cambridge, Mass., also $\frac{3}{4}$ " scale drawings of other buildings; these drawings will remain on exhibition for one week from the date of the meeting.

The following gentlemen have been elected members of the League since the September announcement:

Resident. — Mr. Edward Palmer York, Mr. Burt Leslie Fenner, Mr. Everts Tracy, Mr. Augustus D. Shepard, Jr., Mr. Isaac A. Josephi, Mr. Raleigh C. Gildersleeve.

Non-Resident. — Mr. John T. Windrim, Mr. Louis C. Hickman, Mr. Frank A. Hays, Mr. John H. Coxhead, Mr. Samuel Huckel, Jr.

The following gentlemen are proposed for membership: Mr. William H. McCabe, Mr. Alex. S. Locke, Mr. Caryll Coleman, Mr. Herman Behlen, Mr. Teunis J. Vander Bent, Mr. Julius F. Munckwitz, Mr. Arthur A. Hodges.

Any member having any communication to make, relative to candidates for membership, is respectfully requested to forward it to the Executive Committee prior to the second Thursday of the month. All communications are privileged and confidential.

SPECIAL PRIZE COMPETITION.

The members of the Architectural League are especially invited to take part in the following programme scheme for the decoration of the Architectural League Rooms.

Prizes awarded from the Decorating and Furnishing Fund: First Prize, \$100; Second Prize, \$50.

The Competition is open only to members of the League.

CONDITIONS.

The screen and bookcases now in the rooms are not of necessity to be retained. Provision must be made for the library in bookcases to contain about 1,000 volumes.

The designs should be presented in elevation, rendered in color to a scale of three fourths inch to the foot, and should include the decoration of walls and ceiling and the arrangement of the bookcases. The floor-plan to be to a scale of one-fourth inch to the foot. The drawings may be on one or several sheets. No perspective drawings will be admitted.

The awards of First and Second Prizes, as above, will be made by vote of the League. As it is especially desirable to have the opinion of the League whether any of the designs submitted shall be carried out, a separate vote on this point will be taken. The object is to obtain a scheme of decoration consistent with the uses of the room, in the hope that it may ultimately be executed.

All drawings must be marked with a motto or cipher only, and a sealed envelope similarly marked, containing the names of the authors, should be sent with the drawings, which are to be sent to the undersigned Committee on or before the second of December, 1894.

They will be placed on exhibition at the regular December meeting of the League, and remain on exhibition until the regular January meeting, at which time they will be voted on by the members present.

Blue-print plan and elevations of the room may be obtained from the Curator, Mr. U. J. Pratt, at the League rooms on payment of twenty-five cents.

The Committee on Competitions and Awards: Thomas Hastings, Will H. Low; G. L. Heins, *Chairman*.

Deliver drawings addressed to The Committee on Competitions and Awards, Architectural League of New York, 215 West 57th Street. CHARLES I. BERG, *Secretary*.



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

CHRIST CHURCH, PORTSMOUTH, N. H. MR. H. M. CONGDON, ARCHITECT, NEW YORK, N. Y.

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

TRINITY CHURCH, SAN FRANCISCO, CAL. MR. A. PAGE BROWN, ARCHITECT, SAN FRANCISCO, CAL.

TRINITY CHURCH, just completed, stands on the northeast corner of Bush and Gough Streets, San Francisco, Cal. The edifice is built

of gray Colusa sandstone in rubble work. The cost of the church including the pews, gas-fixtures, etc. was \$126,500. The church is built in the early English Gothic style.

CHURCH OF SS. PETER AND PAUL, JAMESTOWN, N. Y. MR. F. JOSEPH UNTERSEE, ARCHITECT, BOSTON, MASS.

ST. ANTHONY'S CHURCH, ALLSTON, MASS. MR. F. JOSEPH UNTERSEE, ARCHITECT, BOSTON, MASS.

TWO DESIGNS FOR CHURCHES PREPARED BY MR. W. L. WELTON, LYNN, MASS.

[Additional Illustrations in the International Edition.]

KENESETH ISRAEL SYNAGOGUE, BROAD ST., PHILADELPHIA, PA. MESSRS. L. C. HICKMAN & O. FROTSCHER, ARCHITECTS, PHILADELPHIA, PA.

[Gelatin Print.]

A PRIVATE HÔTEL, RUE HAMELIN, PARIS, FRANCE. M. L. GUINOT, ARCHITECT.

[Copper-plate Photogravure.]

INTERIOR OF PORTE COCHÈRE OF A PRIVATE HÔTEL, RUE HAMELIN, PARIS, FRANCE. M. L. GUINOT, ARCHITECT.

[Copper-plate Etching.]

NO. 180 QUEEN'S GATE, KENSINGTON, LONDON, ENG. MR. R. NORMAN SHAW, ARCHITECT.

NO. 179 QUEEN'S GATE, KENSINGTON, LONDON, ENG. MR. W. EMERSON, ARCHITECT.



[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.]

THE ESSENTIAL CONDITIONS OF SAFETY IN THEATRES.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In my recent articles on "Theatres," contributed to your columns, I stated that I had not been able to find on record a single case of a theatre being set on fire by lightning. I am greatly obliged to Ernest A. E. Woodrow, Esq., A. R. I. B. A., for calling my attention to the recent complete destruction of an English theatre by fire, caused by lightning. The *Reading Observer*, of September 1, 1894, relates that lightning struck the top of the Royal County Theatre in Reading, England, near the ventilator over the gallery, and almost immediately the building stood in flames. The theatre was a complete wreck. Date of this fire: Saturday, August 25. Time of day when fire broke out: in the morning.

Respectfully yours, WM. PAUL GERHARD.

THE INTER-CLUB COMPETITION.

PHILADELPHIA, PA., October 13, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In your issue of October 6, under the heading of "The Beaux-Arts Society's First Competition," you state that this competition is open to all students among the members of the Beaux-Arts Society, Columbia College, University of Pennsylvania, Harvard University, The Boston Institute of Technology, Cornell University, and to all members of the Sketch Club of New York, the Boston Architectural Sketch Club and the Philadelphia T-Square Club.

This, I believe, is correct, and the Beaux-Arts Society have organized the competition as it now is; however, I should like to add that the T-Square Club of Philadelphia has for the past year been endeavoring to get up an Annual Inter-Club Competition, and appointed a committee to correspond with all the leading architectural clubs on this subject.

This committee, after months of correspondence, found that it would be impossible to organize an annual, or even a special competition of each club's regular work, owing to the diversified problems given out by the different clubs.

Finally, fearing that the whole scheme would fall through, the

Executive Committee of the T-Square Club decided that it would accept any agreement for a general club competition, which should be mutually satisfactory to the Sketch Club of New York, and the Boston Architectural Sketch Club, allowing them to pursue any mode of bringing about a national competition, regardless of any of our previous suggestions.

In pursuance of this resolve, I visited the presidents of the above-named organizations and informed them that the T-Square Club stood ready to adopt any programme they would prepare.

The very interesting and scholarly problem prepared by the Beaux-Arts Society meets with our full approval, and is an encouraging step towards the advancement of grammatical designing.

We trust that it will elicit much latent talent among all the members of the competing organizations, and that it will prove the means of a closer relationship between all the architectural institutions of the country.

Very truly yours,

ALBERT KELSEY.

THE REPORT OF THE COMMITTEE ON EDUCATION OF THE AMERICAN INSTITUTE OF ARCHITECTS.

SCRANTON, PA., October 27, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Having read the above report with the greatest satisfaction and being now permanently enlisted in the work of architectural education, I beg to submit a few remarks on the subject. The tendency of this report is admirable, its recommendations are absolutely sound, nor is there anything impractical or utopian about them. They strike at the very root of the defects in architectural education, the superficiality with which the philosophical foundation of the art is being taught. The minds of students are filled with a picturesque array of facts and data, which fail to have been properly explained or properly understood. The whole tendency of the education is not to make the students understand what architecture is and should be, as the art of building beautifully, resting on a basis of progressive historical development and technical evolution, but tends, on the contrary, simply to teach, outwardly, the accomplished results and the means of doing what has been done before. To start, the education is not deep and serious, not analytical, but only practically useful in the every-day sense of the term. The schools turn out good draughtsmen who can handle the existing material of architectural art with fair success, but very few inventive designers whose work shows a knowledge of the æsthetic and technical principles, on which alone the art can be advanced. We miss, as the Committee points out, a steady intelligent tendency with a well-defined direction; we miss, so to say, a communion of effort and aim. This is proved by the spectacle of current work; styles are taken up, in a very few years run to the ground, and dropped for some other fashion, without having left any true gain in their tracks. Commercial reasons cannot entirely account for this wavering and unrest; they exert their influence only because a steadfast and conscious purpose of artistic aim is absent. This can only be supplied by a more analytical and philosophical method of study. It is a totally mistaken notion that young men cannot understand the philosophy of art; I venture to assert that young men of artistic talents (and only such can be considered) can not only understand such teaching, but crave for just such instruction. And if out of one hundred students only five shall attain the aims and possibilities of such training, the other ninety-five will be able to follow them with intelligence; good work commenced by one or a few would be taken up by all and carried to a destination of solid achievement. Architecture, in its merits and defects, is generally said to be the mirror of the times and people to which it belongs, and, therefore, beyond the possibility of conscious direction; but I believe with the Committee, that we occupy in this respect a favored position and that we should resolutely lay the foundation of a great architectural style for this country by planning the instruction in our schools on the soundest possible basis that can be evolved out of past disappointments and a free discussion of the subject.

JOSEPH A. STARK, *Instructor in Architecture,*
Carr School of Mechanics and Industrial Sciences.

THE BATTLE WITH FIRE: A CORRECTION.

CINCINNATI, OHIO, October 20, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—You were kind enough to refer in your issue of August 25, to my recent address on the "Battle with Fire" before the American Association for the Advancement of Science at its Brooklyn meeting.

The criticisms which you make upon certain positions taken by me in the address, according to what you supposed to be a correct report, are so thoroughly in harmony with my own opinions, that it may be desirable to call your attention to the exact text.

1. The address emphasizes the importance of following "the good old system that the Romans taught" and calls attention to the methods devised by chemists for resisting conflagration, as a help to mitigating the evils of the terrible wasteful bondage to which Americans are subject, as long as the extended use of wood as a structural material continues.

2. The use of aluminium is recommended, only for replacing in-

ternal and external wooden decoration, not for replacing iron and steel as structural metals.

3. The use of carbon dioxide and a system of piping, by means of which the liquid oxid is capable of being distributed either automatically or under the control of a watchman, is recommended especially for warehouses and the storehouses of factories where life would not be endangered, but loss by water on the breaking out of a fire could be avoided.

I regret that you did not have the correct text before you, while criticizing the paper, as we are evidently in perfect unison on the above questions. Faithfully yours,

T. H. NORTON.

[We regret, equally with Professor Norton, that we could not have had the correct text of his address before us; but, of course, we are obliged to depend on the daily journals for early notices of such papers, and cannot always correct their reports. As Professor Norton says, we should certainly have agreed cordially with his real suggestions, and we hope that he will be able to devote more attention to this extremely important subject.—EDS. AMERICAN ARCHITECT.]

THE DRY-CLOSET SYSTEMS.

BOSTON, MASS., October 18, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—This is not intended for publication; not but I am willing, but the subject is of such importance that I would like an opinion from the ablest experts on sanitation in New England or Massachusetts.

The Smead system of closets in school-houses is a menace to the health of children and teachers. The system is to drop the dung and urine in vaults in the basement of school-houses where it is supposed to dry and become powdered so it may burn or be taken out. When there is a great heat in the stack-heater, the air may circulate as designed, but in vacations or shortage of fuel the air comes back into the building and is a source of danger, disease and death. I wish the State of Massachusetts would have the systems examined by experts in sanitation.

Some information may be obtained of the inspectors of buildings at Worcester, Lowell and Providence. Yours respectfully,

X. Y.

[We have several times expressed the opinion that the practice of allowing the air-ducts in school-houses to open directly into the vaults, depending upon the rapidity of the outward flow of air to prevent the diffusion of foul vapors into the school-rooms, was objectionable. As our correspondent says, in vacation time or in warm, moist weather, when air-currents move slowly, while diffusion is extremely rapid, it seems to us that there is too much danger of the return and lodgment of infectious particles in the school-rooms. It is, however, only fair to say that this arrangement of the school closets is by no means essential to the Smead system of heating and ventilation, of which, apart from this feature, we have a high opinion. In fact, a good modern school-house, with proper water-closets, and with its rooms heated and ventilated, entirely independent of the water-closets, by either the Smead or the Fuller-Warren system, is a very good place for children to stay in, and the country owes much to these engineers, who have studied school-house ventilation so persistently and successfully.—EDS. AMERICAN ARCHITECT.]



BOSTON, MASS.—*Exhibition of the Works of Adolf Menzel; also, Drawings by John Trumbull; at the Museum of Fine Arts, in October and November.*

CHICAGO, ILL.—*Seventh Annual Exhibition of American Oil-paintings and Sculpture; at the Art Institute, October 29 to December 17.*

NEW YORK, N. Y.—*Loan Exhibition of Portraits of Women; at the National Academy of Design, November 1 to 24.*

Second Annual Summer Exhibition of American Paintings; at the Fifth Avenue Art Galleries.

Twenty-sixth Annual Spring Exhibition; at the Metropolitan Museum of Art, opened May 8.

Group Exhibition by American Painters—William M. Chase, J. Alden Weir, Childs Hassam and others; at the Galleries of the American Fine Arts Society, 215 West 57th Street.

PHILADELPHIA, PA.—*Sixth Annual Exhibition of the Art Club of Philadelphia; opens November 19, closes December 6.*

PROVIDENCE, R. I.—*Paintings by Providence Artists; at the Art Club, closes November 10.*



EFFECT OF REVOLUTION ON FRENCH REAL ESTATE.—One of the most enticing features of life in France is the vast number of châteaux dotted over the country. The soil of France is divided among eight millions of proprietors, and whenever a Frenchman has made a little money he proceeds to buy a small estate with a pretty country-house on it, which he styles a "castle." If he be a man of artistic tastes he has a château specially built for him with the latest architectural improvements, and expends much money on the furnishing. There is not a retired tradesman, painter, journalist, or actor of any standing in

France, but owns his château, where he resides only during the summer months; and at his death this mansion almost invariably goes to the hammer. Owing to the French laws of succession, which oblige a man to divide his property equally amongst his children, it is very seldom that a family lives throughout two generations in the same château; so that pleasant country-houses are continually in the market, and an Englishman with a little capital can make astonishing bargains if he selects the right time for buying or signing a lease. The seasons propitious for such operations come but too frequently, thanks to the political instability of the country. The effect of every revolution in France is to cast hundreds and hundreds of châteaux upon the market, and most of them can be had for a song, furniture included. There is absolutely no ratio between the price of French house-property in times of peace and at periods of turmoil. When a revolution breaks out, owners of châteaux are smitten with a deadly panic; they imagine that the end of all things has come; that Socialism and Communism are going to confiscate the soil and part it among the rabble; their only thought then is how to realize cash that they may bolt to some less accursed land. During the troubles of 1848, an Englishman came to France and heard of a château at Neuilly which was for sale. It was a lovely house, beautifully furnished, and stood in a park of eighteen acres. The owner, a Peer of France, appalled by seeing Louis Philippe's palace at Neuilly pillaged and destroyed by the mob, accepted 5,000*fr.* for the château, furniture, park and all, and thought himself lucky to get that money. Four years later, in 1852, when the Second Empire was established by the *coup d'état*, and property became secure again, the Englishman let his mansion and grounds on a three years' lease for 480*fr.* a year; the lease was renewed in 1855 for six years at a rental of 720*fr.* a year; and in 1862, when the lease had expired, the Englishman sold his property for 1,200,000 francs (48,000*l.*). Eight years then elapsed; the war with Germany broke out: the Empire was overthrown, Paris was besieged, the Commune supervened; the three-per-cent *rentes* (now quoted at 81) had sunk to 45; and the château at Neuilly coming once more into the market, was rebought by its late English owner for 12,000*fr.* ready money. This fortunate speculator bided his time, and in 1878, the Exhibition year, resold the estate for 36,000*fr.* These ups and downs have proved boons to many English people besides the gentleman just mentioned. Revolutions are sure to be followed by a return to order, for the fickle character of the French sickens of riot as it does of everything else; so that a man who has money to invest cannot do better than look about him while the disturbance lasts, and buy valuables of any sort in the full certainty that he will resell them at a great profit within a few years. Not only country-houses, but the leases of houses in Paris, furniture, works of art, and family jewels may be had at extraordinarily cheap rates while the *canaille* are enjoying themselves at the game of governing; and by such means living in France can be made not only a cheap thing, but a very lucrative business. — *Cornhill*.

GENERATING ARTIFICIAL NATURAL GAS.—What is known as the Heckert-Rowland plan for generating natural gas in the bowels of the earth is about to be given a practical demonstration in Findlay, O. The necessary pumps and engines are now being erected on the site of the old Wetherald rolling-mills, in the northeastern part of the city. This is in the vicinity of several abandoned gas-wells which will be utilized for conducting the experiments. The theory, which was evolved by William Heckert, a well-known mechanical engineer, at present a member of the Findlay City Council, will work a revolution in the natural-gas region if it proves practical. Heckert proposes, by means of powerful pumps, to force air down into the gas-bearing rocks, which it will permeate, and thereby become infused with the active properties of the gas itself. It is contended that, as now burned for fuel, the natural gas requires an admixture of nine parts of air to one part of gas, and that this mixing can as well be done in the earth as in the stove or in the furnace where it is burned. The great trouble in the gas region is not so much the decrease in the volume of gas as the decrease in the pressure. This has fallen off in a large portion of the Ohio field, from four hundred pounds, at which it started, to forty to eighty pounds, and this is found to be insufficient to convey the gas from the wells through the system of pipes to the point of consumption. The friction takes up all the initial pressure. By Heckert's process this lost pressure will be re-established. His air-pumps, constantly at work, will force enough air down one hole to create a pressure sufficient to force the remaining gas, mixed with the air, out of several other holes, and give it a strong initial pressure in the pipes. The gas thus formed or charged with air will be ready for burning with little additional mixture of air at the point of combustion. It is also claimed by Heckert that air thus pumped down into the rock and passing over and through the pools of oil which are now almost universal in the Trenton rock in this section will take up the volatile gas of the oil and force it up the convenient wells ready for use. Inside of a month or two, the preparations for the trial of this important theory will be made. — *American Engineer and R. R. Journal*.

SMALLER SIZES FOR YELLOW PINE.—O. S. Whitmore, in *Dixie*, advocates the use of smaller scantling. He suggests 2" x 3" instead of 2" x 4". That suggestion might be made applicable to yellow pine, which is tougher and stronger than white or Norway pine, not only in respect to 2" x 4", but to larger sizes as well. The *Lumberman* has suggested that all yellow pine could be cut to smaller sizes than soft pine, because thus cut it would perform an equal service with larger-sized soft pine. This would be especially beneficial to producers who ship long distances northward, because the lighter weight thus secured on a given nominal amount of lumber would save freight charges, but it likewise would be a basis for cutting prices. Thin or narrow lumber is not worth as much as thick, for the reason that there are not as many superficial feet in the small-sized stuff as in the larger. But this suggests another thing: There could be two sets of sizes at different prices, which would add an element of trade in suiting the customer. But as a general proposition, small-sized framing dimension makes a light, cheap-looking structure.

Trim cannot be applied to light studding without producing this shanty-like appearance. From an architectural and aesthetic point-of-view, studding and joists would better be larger sized than smaller. A 2" x 8" or a 2" x 8", as outside studding, makes a solidier and more substantial-looking building than 2" x 4". Interior studding, of course, need not be so wide, because the saving of space is requisite. Yet a 2" x 6" for partitions would render even an interior more substantial in appearance, and would show off casings and trim to much better advantage than 2" x 4". In this climate of hurricanes, tornadoes, cloud-bursts and winter blizzards, we need to give increased strength and solidity to buildings. It would afford a greater sense of security, whether that result were thereby, in fact, reached, or not, by the use of heavier material. — *Northwestern Lumberman*.

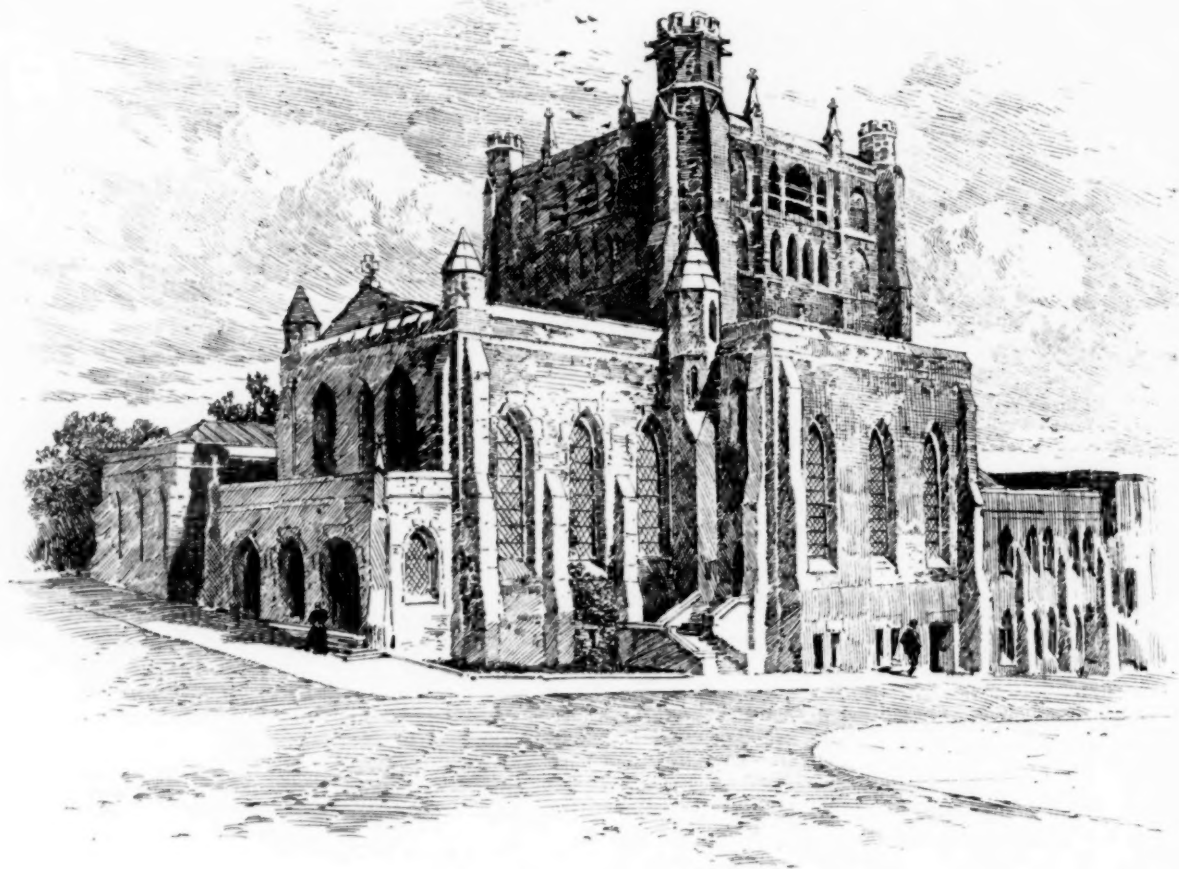
THE BURNS CAUSED BY INTENSE COLD.—M. Pictet of Lausanne, in his experiments on liquefying gases, has suffered from cold-burns, and recently gave an account of these to the Société Helvétique des Sciences Naturelles at Lausanne. In one kind of burn, the skin is reddened and turns blue next day, the area of the spot increasing, and the cure not completing for five or six weeks. A painful itching attends this class of burn. In a more serious kind of burn, due to greater cold or longer contact with the cold body, the skin is detached, and the parts reached by the cold behave like foreign substances. Suppuration sets in, the sore is malignant, and a scar is produced. M. Pictet accidentally scorched his hand with fire at the same time that he burned it with liquid air, and while the ordinary burn healed in ten or twelve days, the other was bad for six months. To try the effect of losing heat by simple radiation in cold air, M. Pictet plunged his bare arm into refrigerated air at a temperature of 105° Centigrade below zero, without touching the wall of the vessel. All over his skin he felt a disagreeable and indescribable sensation growing more and more painful, and having its seat in the central bone or the periosteum. After three or four minutes the skin was blue, and the pain became more intense and deeper-seated. On withdrawing his arm at the end of ten minutes, a strong reaction was experienced, accompanied by superficial inflammation of the skin. This reaction is an intensified form of that experienced after handling snow for some time. — *The London Globe*.

TEMPLE NEWSAM.—Temple Newsam, one of the famous historical mansions of England, stands in an extensive park adorned with stately and ancient timber, at a distance of about five miles from Leeds. The house is a large, brick structure, composed of a centre and two wings, and is a fine specimen of Jacobean architecture, and is curious from its roof being surrounded with a battlement composed of capital letters in stonework, forming the following inscription: "All glory and praise to God, the Father, the Son, and Holy Ghost on high; peace on earth, good will toward men; honor and true allegiance to our gracious king, loving affections among his subjects, health and plenty within the house." The paintings at Temple Newsam are numerous and very fine, occupying a gallery one hundred and nineteen feet long. The collection of family portraits is especially interesting, ranging as it does from Sir Arthur Ingram to the present time, and forming a good study of costume for over two hundred years. Sir Arthur Ingram, who built this magnificent structure on the estate that had belonged to the Lacies in the middle of the twelfth century, was the son of a wealthy citizen of London and founder of the Irvine peerage, and he purchased the place from the Duke of Richmond. Its history and fortunes have been preserved to this day intact, and the present possessor is Hon. Mrs. Meynell-Ingram, whose husband directly inherited it. — *Boston Herald*.

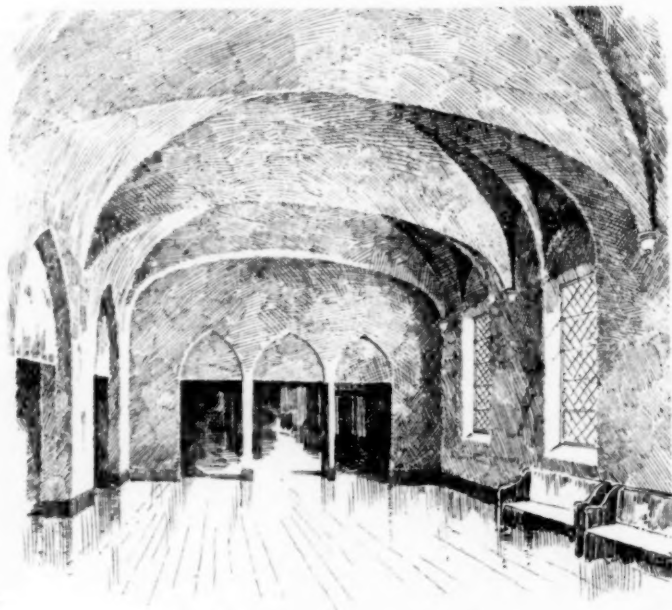
A PRIORY FOR BOTH SEXES.—Watton Priory, on the edge of Holderness, in Yorkshire, is now being excavated to solve a curious problem in church architecture. The priory was the largest establishment of the Gilbertine order, the only religious order founded by an Englishman, St. Gilbert. It never spread to the Continent, and in 1148 was allowed by the pope to keep together Cistercian nuns and Augustinian canons. At the Reformation, only three monasteries containing men and women existed, without doubt, of which Watton was one. The problem is how the two sexes were kept apart. The position of the church, 208 feet long by 51 feet wide, has been found, with the longitudinal partition-wall dividing the sexes. Though the remains are not high enough to show the arching, enough fragments have been found to give an idea of what it must have been. To the north of the church a large cloister, 100 feet square, has been found, undoubtedly belonging to the nuns, who were double in number to the men, with a large chapter-house on its east side, north of which was a dormitory 111 feet long. On the south side of the cloister was the refectory. The canons' house has not yet been found, but is being sought for to the west of the church. — *Boston Transcript*.

ST. PAUL'S FORMERLY A FASHIONABLE PROMENADE.—The visitor to our English cathedrals and churches is accustomed to the facile generalization which attributes every act of irreverent and destructive vandalism to persons vaguely, by papers and others, designated Puritans, with preference to those of the Commonwealth. This is largely a case of "give a dog a bad name and hang him," for it is well known that on the Puritans' shoulders are laid many sins besides their own. It is evident from Dr. Sparrow Simpson's account of the state of St. Paul's Cathedral during the reign of Mary and her consort Philip that even when there was the very contrary to Protestant dominance, exceedingly scanty respect was paid to sacred edifices. The nave of St. Paul's was used as the fashionable promenade and gossiping place of the citizens, and in the reign named it was a matter of common practice not only to turn the church into a sort of passage or street, through which barrels of beer, baskets of provisions or bales of cloth were carried, but even horses, mules, and beasts were led through it. With such habits under a Catholic queen, it is scarcely surprising that Cromwell's troopers may, under the stress of urgent necessity, have on occasions, more or less mythical, stabled their horses in a parish church. — *Illustrated Carpenter and Builder*.

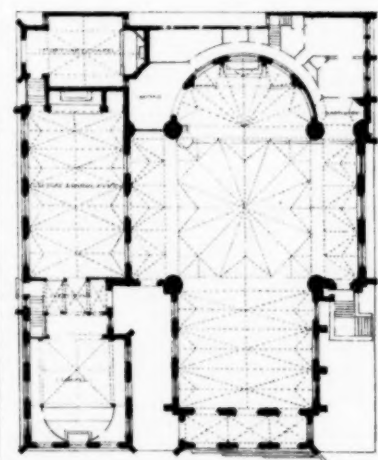




GENERAL VIEW OF TRINITY CHURCH



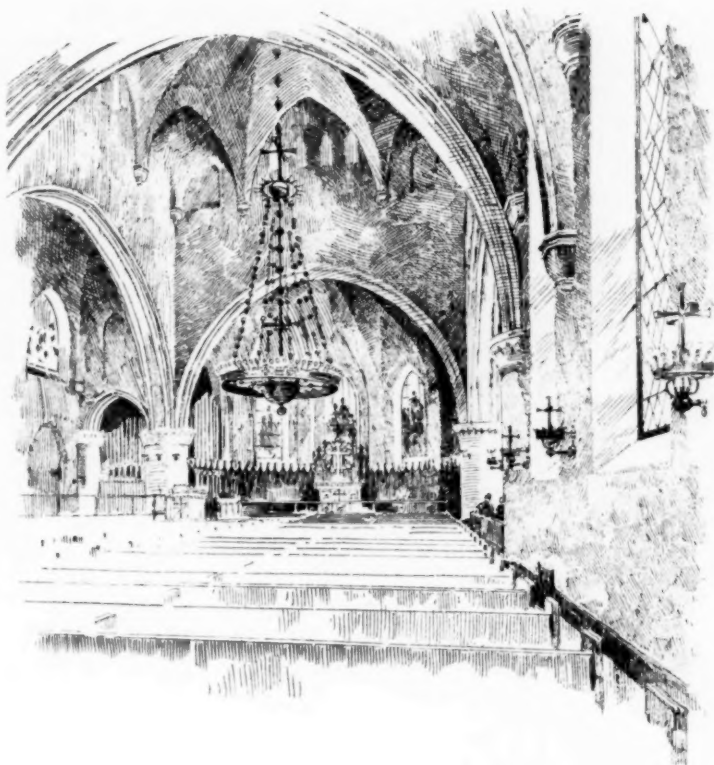
INTERIOR OF CHAPEL AND SUNDAY SCHOOL ROOM



PLAN OF GROINED FLOOR



VIEW FROM THE SOUTH EAST

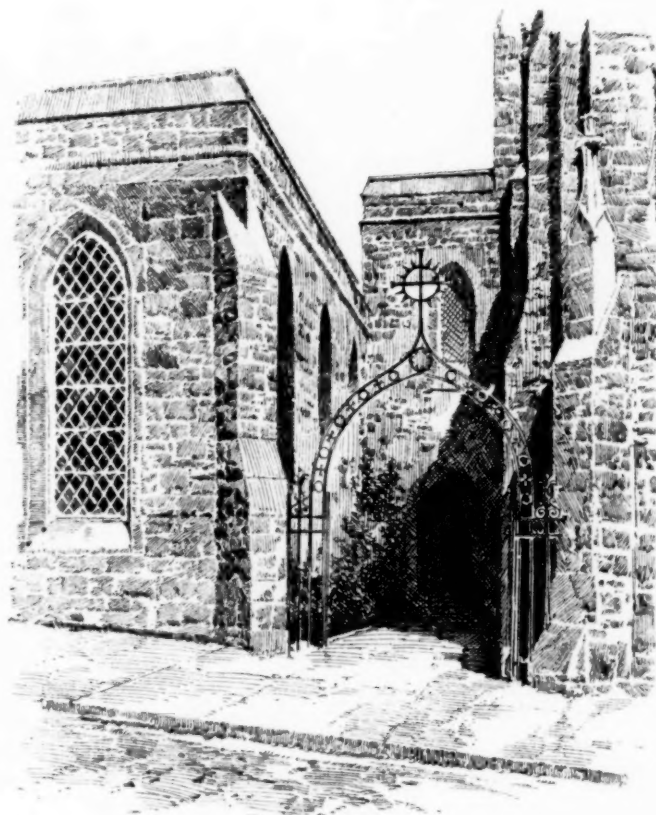


INTERIOR OF TRINITY CHURCH



THE MORTUARY CHAPEL TRINITY CHURCH

*Trinity Church.
San Francisco California
A. L. H. Brown architect.*

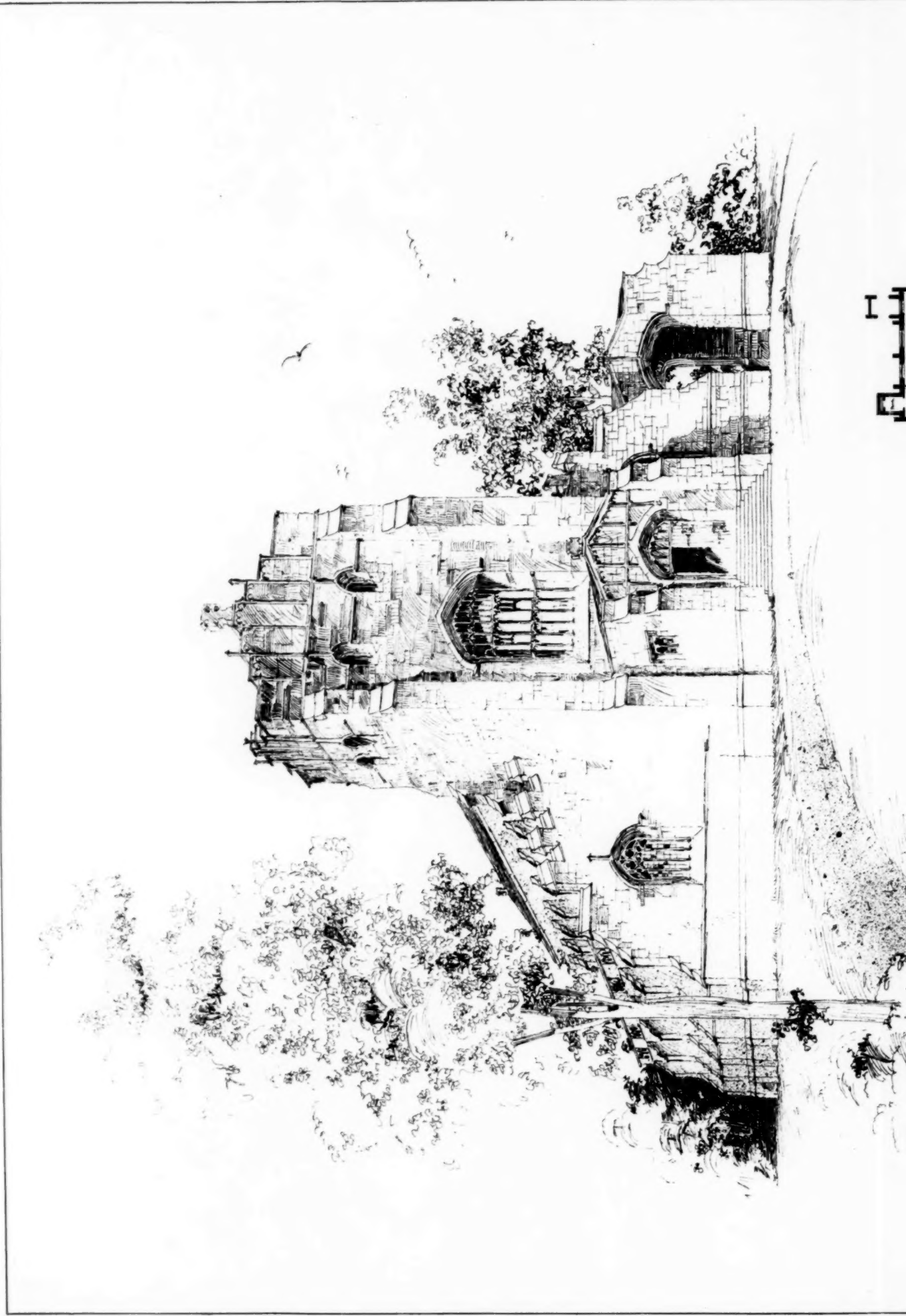


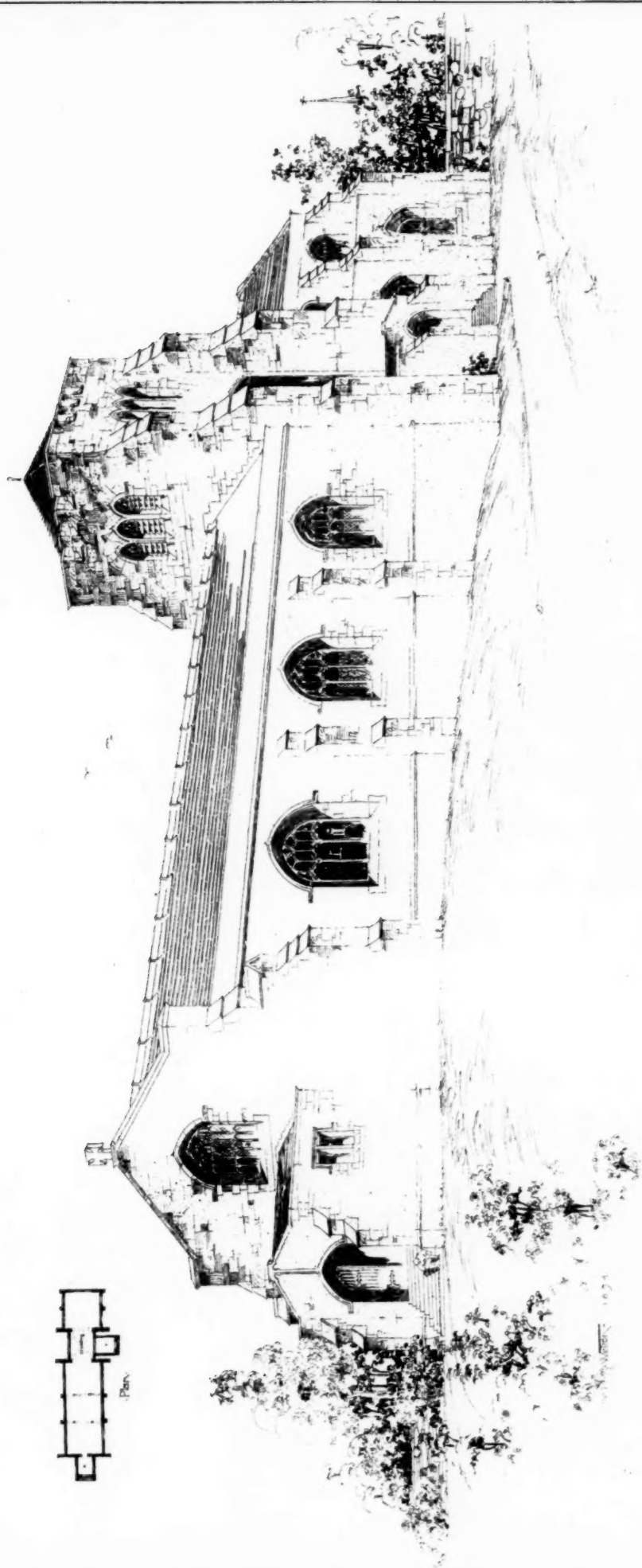
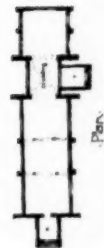
PASSAGEWAY BETWEEN CHURCH AND CHAPEL

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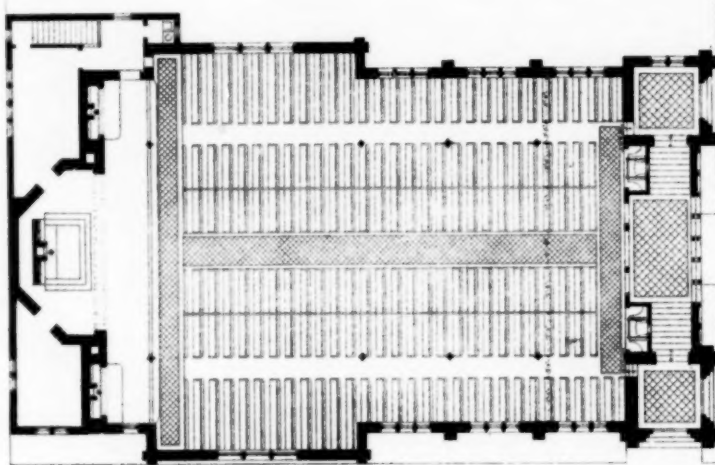
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TWO DESIGNS FOR CHURCHES BY WM. L. WELTON, LYNN, MASS.

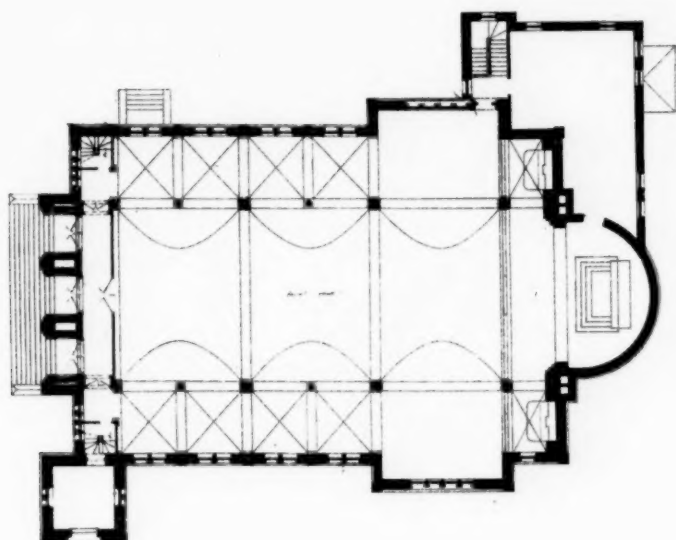


CHURCH STREET

34th STREET



Saints Peter and Pauls Church Jamestown New York
 J. Joseph Winterne Architect Boston



ST. ANTHONY'S CHURCH ALLSTON MASS.
F. JOSEPH UNTERSEE ARCHITECT BOSTON MASS.