

PRICE 15 CENTS.

SEP 23 1895
CITY OF WASHINGTON

SEPTEMBER 21, 1895.

THE
AMERICAN ARCHITECT
AND BUILDING NEWS

VOL. XLIX.

* REGULAR EDITION *

NO. 1030.

ARCHITECTURE

ENGINEERING

DECORATION

211 TREMONT ST.

CONSTRUCTION

BOSTON, MASS.

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VOL. XLIX.

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No. 1030.

Entered at the Post-Office at Boston as second-class matter.

SEPTEMBER 21, 1895.



SUMMARY:—

Suggested Amendments to the By-laws of the American Institute of Architects.—The Piling for the Brooklyn Dry-dock.—The Use of Followers in Pile-driving undesirable.—Examining Sites by Boring.—The School of Drawing and Painting of the Boston Museum of Fine Arts.—Death of William Frye, Inspector of Buildings.—The Sacred Way at Athens.	117
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THE next Convention of the American Institute of Architects will have a special importance, as it will deal with measures of the utmost interest to the profession. It is not often that three amendments to the By-laws are proposed for action at one Convention, and it is still less often that three such radical measures are proposed together as those which the members of the Convention will be called upon to accept or reject. The first of the three amendments proposed introduces, in a moderate way, the principle of representation in the affairs of the Institute, by providing, in brief, that the Nominating Committee shall, at each Convention, consist of one duly-accredited Fellow from each Chapter having a membership of at least six Fellows. We imagine that every member of the Institute will favor this change, which gives the Chapters control over the choice of officers of the Institute. By this means the Chapters will be induced to interest themselves in Institute affairs to a much greater extent than is now the case, without taking so much from the prerogative of the Conventions as to suggest the idea of dispensing with them in favor of a government exclusively representative. To abolish the Conventions, with the opportunity that they give for personal acquaintance, and the exercise of personal influence, would be a great misfortune for the profession, and the proposed amendment seems to us to provide most happily for uniting personal and representative influence in professional affairs.

THE second amendment proposed is simply a correction of an amendment passed last year which provided that all Chapter members must be members of the Institute. The very diverse constitutions of the local professional associations, many of which had become Chapters of the Institute without change in their by-laws, made it very difficult to apply such a rule. In several cases, membership in the local society, which had, subsequent to its organization, become a Chapter of the Institute, was open, under the original by-laws of the society, to persons who were not eligible to membership in the Institute. The passage of the amendment made it necessary for such Chapters to choose between retaining their place in the Institute, by expelling those of their members, who, while in good standing under their own by-laws, were ineligible to the Institute, or resigning their Chapter charters, to take up again their independent career. Either course was undesirable, and the matter has, by the

general consent of all parties, been left for this year's Convention to rectify, as it undoubtedly will. Connected with this proposition is one which provides that two Chapters of the Institute may be chartered in the same territory, if the officers of the Institute see fit to grant applications made in due form for such Chapters. This provision has certainly much in its favor. Especially in the large cities, architects divide naturally into cliques, drawn together by community of tastes or training. There are many reasons why this subdivision is desirable, and why certain cliques, as, for example, the Beaux-Arts architects in New York, or the German architects in Chicago, should have a definite standing and representation in the Institute. They can by such means present their views more distinctly than as members of a single large local Chapter, and the exchange and comparison of well-defined views on professional affairs is just what the Institute is most desirous of obtaining. The third innovation proposed is the substitution of an Executive Committee for the present Board of Directors; the Executive Committee to consist of the President, Secretary and Treasurer, and four other Fellows, to be chosen at each annual Convention. This simplifies the standing control of Institute affairs, both by reducing the number of officers, and making the method of their election less cumbersome; and there seems to be no reason why the experiment should not at least be tried.

A VERY curious technical point is to be decided by the Bureau of Yards and Docks of the Navy Department at Washington, and architects will be interested in the result. It seems, from the newspaper accounts, that the Government is building a dry-dock at the Brooklyn Navy Yard, and a large number of piles are to be driven. The site of the dock is now under water, and the contractors, in order to get the piles down to the requisite depth, place "followers" on top of them, and, by driving the followers, push the submerged piles to the necessary depth. To this arrangement, however, the supervising engineer, Mr. Menocal, objects, and claims that the contractors should sheet-pile the ground, and pump out the water to a depth sufficient to allow the piles to be driven by direct blows to the depth intended. As the contractors do not wish to do this, and Mr. Menocal is not willing to accept piling driven with a follower, it has been agreed to refer the question to the Department officials.

THE common impression among architects is certainly unfavorable to driving piles with a follower. According to the daily papers, Mr. Menocal considers that "the stability of the piling is jeopardized" by driving with a follower. What this means, we will not attempt to say, but we presume that Mr. Menocal's real objection is just that which any architect would make—that in driving piles with a follower, it is not only impossible to give as solid a blow as by direct impact of the hammer, but, owing to the varying rebound of the follower from the head of the pile, it is impossible to tell when piles so driven have reached the firm stratum to which it is commonly intended to drive them. As every one knows, the arrival of the foot of a pile at the bearing stratum is shown partly by the rebound of the hammer from the top of the pile, and partly, as well as more accurately, by the diminished distance to which it sinks under the blow. The sinking at the last blow is usually the most important factor in determining the load that the piles will bear safely, and it is of the utmost importance that it should be accurately measured. Where a follower is used, this essential measurement is rendered misleading. If it is measured, as is usually the case, at the hammer, all that can be shown is the descent of the follower. This may, owing to the crushing of its end, and of the corresponding end of the pile, be much greater than that of the pile itself; or, if the follower is elastic, and its tip well "broomed up," a blow on its top, followed by a lively rebound, may have a very insignificant effect in driving the pile below; so that data drawn from the sinking of the follower are nearly worthless for estimating the resistance of the piles driven with them. Iron plates, with sockets on each side, are sometimes interposed between the pile and the follower, with advantage, and it is to be hoped that the official investigation will serve to elucidate all these points.

ACCORDING to the *New York Sun*, the Assistant District Attorney has been expounding to a reporter the law relating to buildings in a way that is rather startling. Speaking of the disaster at the Ireland building, he is said to have remarked that, "The building-law does not require that any excavations or borings shall be made to determine whether the subsoil is firm or not, but the builders should take these measures, and, if they do not, they are criminally liable for manslaughter, if a death results from their negligence or failure to do so." This would be good law in France, and will, undoubtedly, some time be good law here, but it would be interesting to learn on what American decisions this opinion was based.

THE Nineteenth Annual Report of the School of Drawing and Painting of the Boston Museum of Fine Arts shows a very satisfactory condition of affairs in this noted school. During the past year two hundred and fourteen pupils were enrolled on the school lists, and the Treasurer's accounts show a balance of receipts over expenses. The pupils come, of course, mainly from New England, but some are noted in the catalogue from Wisconsin, Illinois and Michigan, besides one from California and one from Nova Scotia. As before, the instruction includes painting, under Mr. Tarbell, drawing and painting from the nude model, under Mr. Benson, drawing from the cast, under Mr. Philip Hall, and decorative design, under Mrs. William Stone. Besides these, Mr. Platt has a class in modelling, and Mr. Cross one in perspective, and Dr. Emerson resumes this year his lectures on Artistic Anatomy. Next year, attendance upon these lectures will be required of all pupils drawing the figure, either from life or the cast, and the first-year pupils will be called upon to make, during the first half-year, a satisfactory drawing of the skeleton, and to pass an examination on its construction, and the names of the principal bones. This innovation appears to be a part of the plan devised by the Permanent Committee, for carrying out their avowed intention of raising the standard of attainment. As they say, "the Committee is not inclined to tolerate the error so common in this country, of regarding the study of art rather as an interesting pastime than a serious profession"; and they propose to hold regular exhibitions of the work of the students, and, perhaps, examinations, with a view, as they say, of "eliminating the poorer elements among the students," and of ascertaining "what pupils, either through a lack of seriousness, or a misapprehension of their talents, should be engaged in other pursuits than those taught at the Museum School." These are rather plain words, but the Committee could do the community no greater service than to carry out the plan thoroughly. There is plenty of good material in this country for making artists, but the material needs tolerably rough handling before it can be brought to the necessary degree of plasticity, and the school which applies most thoroughly the requisite discipline will soon find its reward in the results that it will obtain.

MANY Boston architects will regret to hear of the death of William Frye, the senior Inspector of the Department of Buildings of Boston. Mr. Frye was a native of Salem, but was educated mainly in Boston, and, after serving his apprenticeship, established himself there as a builder. For some time he was associated with Nathaniel Adams, a noted builder of the last generation; but, in 1873, soon after the establishment of the Department of Buildings, he was appointed inspector, and placed in charge of the mercantile district, by far the most important within the jurisdiction of the Department. In his official capacity, he was brought very much into contact with the architects of the city, and won their highest respect and regard for his unvarying courtesy, joined, as it was, with a modest firmness which admitted of no retreat from a position which he had once deliberately taken. At the same time, his decisions were based on a knowledge and experience which gave them great authority, even among architects. He was always much interested in matters relating to the art of building, and nothing pleased him better than a discussion of some theoretical point with an architect, who generally learned quite as much from Mr. Frye as the Inspector did from him. Within the past year or two, Mr. Frye's duties had become so arduous that he was obliged to share them with an assistant, but until within a few months he was regularly at his desk during the hours of office duty.

THE Builder, which is always interesting and instructive when it takes up the subject of Athenian archaeology, gives an account of Dr. Dörpfeld's recent excavations on the western slope of the Acropolis, undertaken with the object of tracing the line of the ancient Sacred Way, the scene of so much Athenian life, and the route followed by the Panathenaic Procession. Most of the books on the archaeology of Athens represent this Sacred or Panathenaic Way as ascending to the north of the hill of the Areopagus, and passing around its eastern side to reach the Acropolis. Certain texts seem to indicate that this was the route; but Dr. Dörpfeld, who studies archaeology on the ground, as well as from texts, found that the grades around the north and east sides of the Areopagus were so steep as to make it very unlikely that chariots could ever have ascended a road laid out over them. It is certain that chariots passed frequently over the Sacred Way, and Dr. Dörpfeld, beginning a line of induction from this end of the subject, reasoned that, notwithstanding the texts, the chariots must have ascended the Acropolis over the only route by which such ascent is, or ever has been, practicable; that is, by its western slope, between it and the south side of the Areopagus. To this day, the high road from the city to the Acropolis follows this route; and, after a small portion of the old road had been laid bare, in searching for the site of the Agora, Dr. Dörpfeld followed these indications by excavations near the line of the present highway, with the result that a large part of the Sacred Way was found in a state of preservation, which left no doubt of its identity.

THE street through which, on the days of the festival of Athena, the girls of pure Athenian blood, attended by the foreign women of the city, who were obliged to hold umbrellas over the heads of the daughters of Athens, walked in procession to the temple of the goddess, under guard of the young men and boys of equal rank with themselves, is a narrow and rather winding thoroughfare, walled-in on each side with polygonal masonry, of limestone blocks. Notwithstanding its sacred character, in deference to which no one was allowed, on the days of the festival of Athena, to appear in it in clothing of any color but white, it seems, on ordinary occasions, to have been a commonplace street enough; and it was closely lined, in the historical period, with houses, the foundations of which are still in place. As the ancient street crosses and recrosses the modern highway, which is much travelled, Dr. Dörpfeld found it impracticable to lay bare those portions included within the modern highway limits, and was obliged to content himself with what could be found on each side. In one of the places thus partly covered by the modern street, just east of the hill of the Pnyx, he found, for example, a large number of wells, basins for water, the remains of conduits, and stones with heads, apparently used as fountains. A considerable portion of this collection of water-works is still buried under the modern highway, but Dr. Dörpfeld thinks that the place shows the site of the Enneakrunos, or Nine Fountains, made by Pisistratus and his sons, and fed from the spring Callirhoë, farther up the hill, which they covered over. The foot-path which led from the Sacred Way easterly, up the hill to the spring Callirhoë, and which was used by Athenian maidens for bringing water, was found in the course of the excavations, distinctly marked by turns in the limestone wall. After the construction of the Enneakrunos, the people of the city seem to have used it for their principal water-supply. For religious ceremonies, the use of this water was obligatory; and the demand upon the fountains seems to have been so great that several other springs were called in to increase the supply, pipes being laid from them to the fountains. In particular, water is brought from the upper portion of the river Ilissus, by cylindrical earthenware pipes, glazed inside, and jointed with lead. A large portion of this line of pipes, which dates from the sixth century, B. C., still exists in place, but the pipes themselves are choked with a deposit of lime from the water. A considerable part of the line is laid in a tunnel, cut through the rock. This tunnel is in some places forty feet below the surface. It is large enough for a man to walk through, and is ventilated by shafts to the surface, while the pipes, which lie on the bottom, have hand-holes for cleaning. A very similar tunnel, containing pipes precisely similar, is found in the island of Samos, and is known by inscriptions to have been constructed in the sixth century, B. C., by Eupalinos, of Megara, for Polycrates, the tyrant of Samos.

THEATRES.¹—XX.

THE EMPIRE PALACE, BRISTOL.

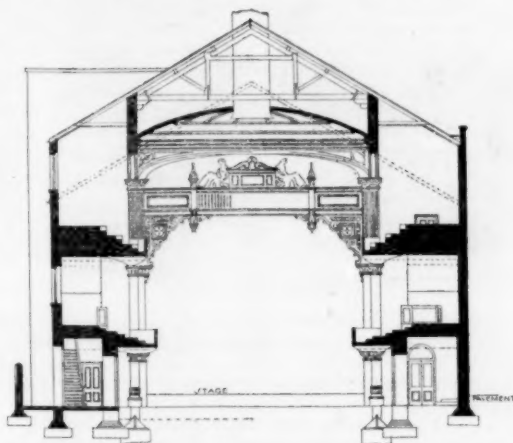
THE subject of the present chapter is one of the new provincial variety theatres which are rapidly springing up all over England. The improvement in recent years of the "music-hall" performance has, by drawing a better class of people to such entertainments, created a demand for larger, better and more elaborate buildings than those which satisfied the public some ten years ago. Messrs. Wylson & Long are the architects of the Empire Palace, Bristol, and have given special permission for the production of their drawings in the *American Architect*.

The theatre consists of a large pit on the ground-floor, 81 feet three inches deep by 52 feet wide, from which there are four exits. Immediately over the pit is the balcony, consisting of six rows of seats, with a wide promenade and raised buffet in the rear, from which a full view of the stage can be obtained. The gallery or second tier has eleven rows of seats and is provided with two separate exit staircases. The principal entrance to the theatre communicates, by swing doors, with an inner lobby leading directly to a large vestibule, from which opens the grand staircase leading up to the balcony and down to the stalls-corridor.

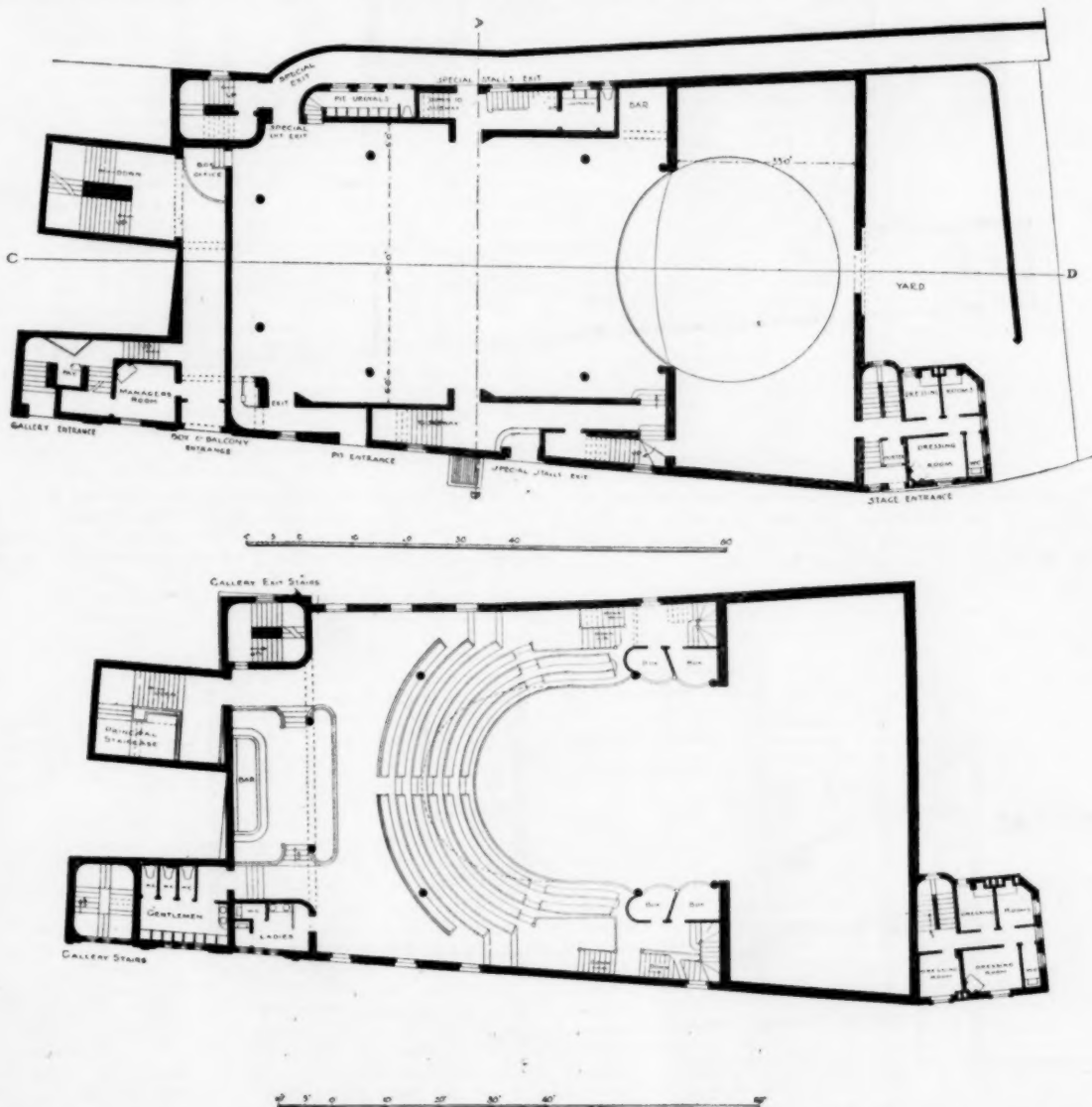
In the designing of the auditorium, particular care has been taken to provide that every part of the house shall command a good view of the performers, and for this reason the theatre has been constructed on the cantilever system, with as few supports as possible. Indeed, there are only four main columns, two of which are incorporated with the construction of the boxes, and these are joined at

minimum; while the ample exits that are provided enable the audience to rest in perfect safety. To add to these precautions, fire-hydrants are provided to command the several portions of the house. The Empire is said to be one of the finest variety theatres in the

Plan of the Empire Palace, Bristol.



Provinces, and is designed in a free Oriental style which readily adapts itself to the internal and external decoration of the building. In the front to Captain Carey's Lane, the elevation of which is here given, red bricks, with dressings of bath-stone introduced in bands



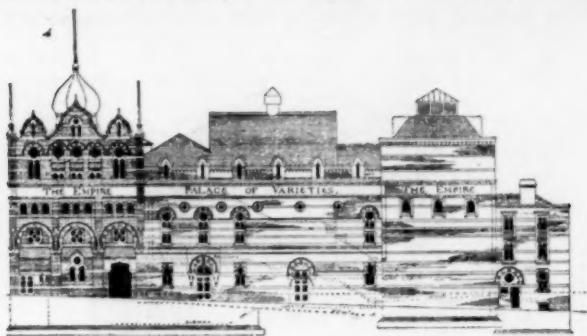
the top by elliptical arches, carrying a dome forty feet in diameter. Iron and concrete enter very largely into the construction of the entire building, thereby reducing the risk, from damage by fire, to a

and mouldings are used, while the frames and sashes of the pointed doors and windows are painted in light and dark tones of peacock-blue, which form a strong but pleasing contrast to the colors of the other materials used.

The color-decoration of the interior is carried out in warm tints

¹ Continued from No. 1027, page 90.

in which blue and red predominate, harmonizing with the upholstery of the seating, which is blue throughout; rich figured-plush cur-



tains drape the boxes and tableau curtains of the same material fill the stage-opening.

The building is lighted throughout by electric-light, and in case of temporary failure, an auxiliary supply of gas is provided, together with a powerful gas sun-burner, which in communication with an extractor acts as an efficient ventilator.

done to make the new Bristol Empire worthy of the city, and a fitting place of amusement for its large population.

The following are the chief dimensions of the building :

Width between the main walls.....	68.0 feet.
Depth between back wall of pit and curtain line.....	83.0 "
" " from front of balcony to curtain line.....	47.0 "
" " " gallery " " ".....	57.0 "
" " back of stage " " ".....	33.6 "
Width of stage.....	72.0 "
Height from pit floor to auditorium ceiling.....	48.0 "
" " stage floor to gridiron.....	48.0 "

The seating-capacity of this house is :

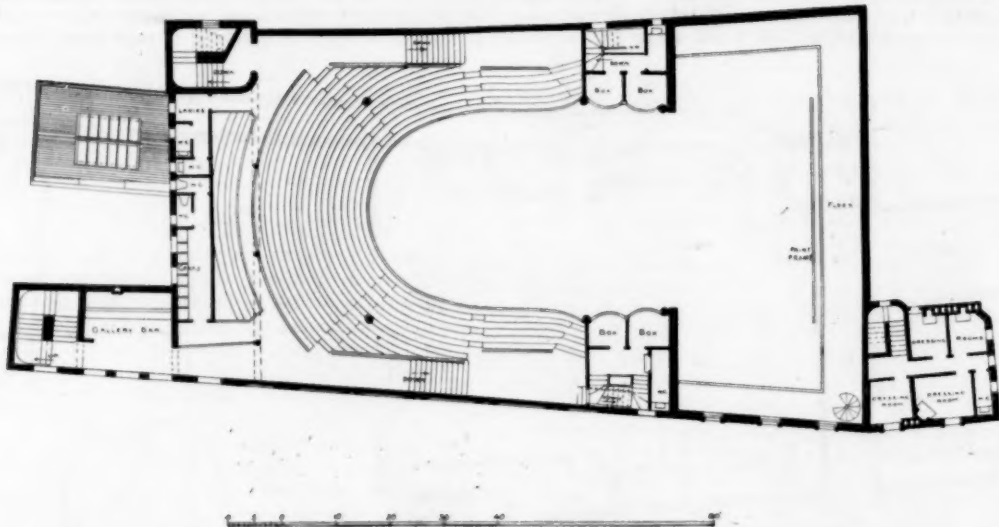
Pit.....	338
Stalls.....	218
Balcony.....	246
Gallery.....	542
Private boxes.....	32
Total.....	1,376

E. A. E. WOODROW.

(To be continued.)

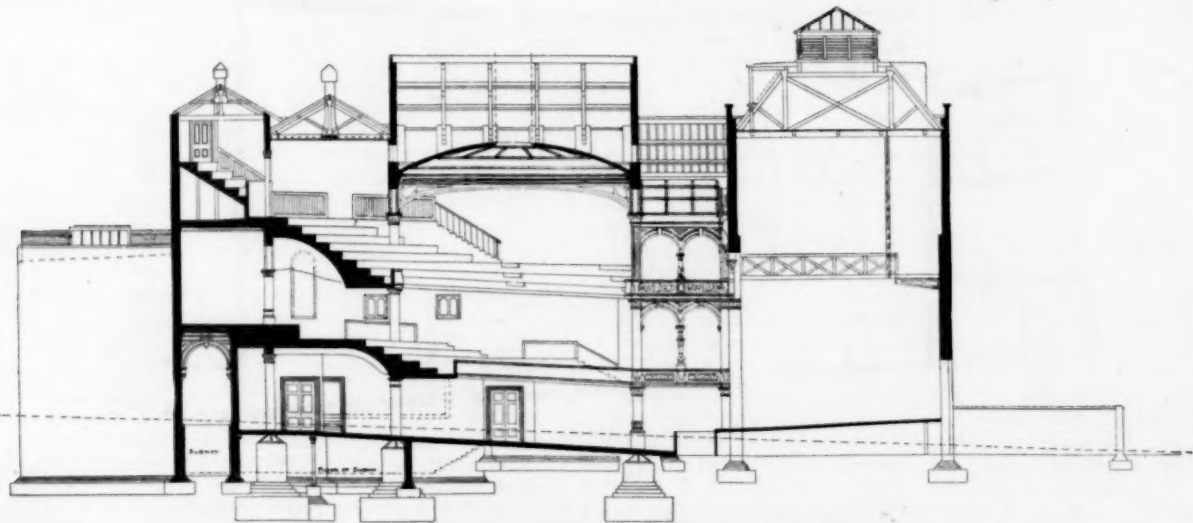
ARCHITECTURE AT THE SEASIDE.

AMONG the manifold impressions of a summer's outing among our American watering-places, none is stronger, upon one who takes notice of that sort of thing, than that made by the extraordinary growth of many of our so-called "summer cities." When one considers the enormous sums of money expended annually in building and lavished on these summer homes, he cannot but regret that more careful study has not been given to this class of architect-



It will be noticed that special attention has been given to the accommodation of the performers, and that a separate building, erected in the rear, contains the dressing-rooms which are thereby cut off from the dangers of fire arising on the stage.

ure. That the seashore demands a unique treatment of architecture is plain. In all periods, throughout all lands and in all styles, a strict relation has been preserved between architectural forms and topographical characteristics. How clearly this æsthetical influence



The stage is very commodious, and is, including the wings, of a width of 72 feet, with a minimum depth of 32 feet, and is thus sufficiently large for the production of any class of performance, including ballets and pantomimes. In short, everything has been

of landscape upon architecture is exhibited in a comparison of the lines of a Venetian palace and a Tyrolese castle!

Usage in this regard, of course, does not conform to any code of hard and fixed rules. Custom is rather the outcome of the influence

of natural conditions upon taste than a result of æsthetic training. Yet how sensibly do we feel a decided offence against fitness in this respect. It is often difficult to explain where the trouble lies; we know that there is something wrong, something distasteful, and that is sufficient.

It would be impossible to find, in the whole world, greater opportunities for the display of taste, more varied natural conditions of scenery and climate than are afforded by our Atlantic sea-board from the rugged coast-line of Maine, along the bluffs and headlands of Massachusetts and Rhode Island, to the level shining sands of Long Island and New Jersey's sandy beach and smooth green meadows. Yet there is no place where one sees the unwritten law more frequently fractured, no place where incongruity and discord have been more firmly combined to do violence to the sensibilities of the unoffending observer than at our seashore resorts.

It is not difficult to find the reason for this. In the search for a suitable style much originality has been shown, and this is highly commendable. Our seashore resorts are new and very different from those of the Old World, and we want a new and original style. But, unfortunately, so great is the originality, that no considerable number of architects have shown the slightest agreement of ideas on the subject: the result is, therefore, far from satisfactory.

The watering-places of England and France are old; their architecture is the result of long experience, and we may unquestionably benefit by it, for the coast of England and the north coast of France are not unlike portions of our own seaboard. Along a coast more or less uneven, where sea-frontage is not the main feature, as at Bourne-mouth or at Etretat, a somewhat irregular style prevails. The houses have more the character of a typical villa than our own have. People who can afford it have sufficient space about their houses to give them a good setting of lawn and trees, and to have the stables inconspicuously situated at a distance from the house. The house itself is large, simple and picturesque in design. It shows no striving after conspicuousness, but rather after elegance. Even the wealthiest abroad build houses of a modest style, making up for richness and display in simplicity and taste.

The materials employed are largely stone or brick, building with these being much cheaper there than here; but a whole marble palace in the style of Michael Angelo is seldom seen by the sea. It would rather offend a Frenchman's taste. Such a building might be suitable beside the blue of the Mediterranean, under the Italian sky, with a background of dark ilex groves and other classic surroundings, but by the gray-green of the Atlantic, beneath a cold northern sky, and with little verdure not parched and brown, the Classic porch would seem rather far from home.

There are also resorts where the sea-frontage is in great demand, as at Brighton and Torquay, where the straight conventional shore is terraced and graded. Here the houses and hotels are, of necessity, built in a long unbroken line; their architecture conforms to such conditions, and we see elegance and repose in the horizontal lines of the façades, a monotony in the straight sky-lines, in the symmetry of fenestration and colonnade, in perfect consonance with the continuity of the grand horizon.

The houses of those of smaller means are quite as attractive. These are, of necessity, more closely situated, often on narrow lots, as at Cabourg or at Houlgate, near Trouville-sur-Mer. They are situated only a short distance back from the edge of the sloping sea-wall (a universal feature of the French sea-towns), which forms a pleasant promenade above the sandy beach. The materials used are both wood and brick. The houses were designed by some of the ablest architects in France, and though the style of all is similar, there are no two alike. Their colors present various shades of soft grays and browns brightened by the red of the roofs and chimneys. The effect of a group or long row of such cottages with their shady gardens, inclosed in vine-clad walls, at the rear is very picturesque.

Let us now glance at the architecture of one of our seaside resorts and endeavor to find, by the light of comparison, some of its faults. In the first place, we shall discover, in many instances, an overwhelming extravagance. Every man's house is *literally* his castle. Huge mansions of baronial style are crowded upon little lots in rows suitable only for modest cottages. It is the pitiable, insane desire in Americans to make a costly display, lavishing expense upon the house and taking little thought about the land; but the display here is simply a foolish waste, for a manor-house without its park loses all its dignity, and castles in rows are absurd.

The same extravagance is seen in these very forms of architecture. Towering structures, with steep broken roofs, all pinnacles and turrets, with oriel-windows and overhanging balconies, are typical of rugged mountain scenery, where peaks pierce the clouds, and crags stand out in bold relief. But beside the sea, where the level line of the horizon is the characteristic feature, a stretch of sand or a line of bluffs and green fields making up the scenery, a long low structure, sloping roofs and broad verandas, and, above all, plenty of space, seem much more compatible with the surroundings.

A second difficulty must be pointed out in what may be called inharmoniousness — a lack of harmony in form, in style and in coloring among the groups of houses which make up our seaside towns. Were the distance between the houses greater, this objection would lose much of its force, but as it is, the confusion is bewildering. It will not be necessary to explain what is meant here: every day we see extremes placed, side by side, the two forms just described, the pointed and pinnacled and the broad and low, almost touching each

other over the narrow boundaries; reds and yellows, greens and grays wage continual hand-to-hand combat, as if each man had painted his house with a view to killing the effect of his neighbor's, although he thereby commits both murder and suicide.

There is a wide distinction, which some do not seem to grasp, between variety and difference. It is never necessary to sacrifice harmony for the sake of contrast, but very easy to secure both. One of the chief charms of the sea and seashore is the delightful restfulness and monotony, monotony which, in reality, is ever changing with the variation of wind and weather, of light and shade. Why may not nature be imitated in art? Should not each house be a type of the class of seashore residences with as many variations as the owner pleases, but having some relation to its environments? Should not the colors employed by all reproduce the exquisite blending of sombre tones which makes marine views so attractive? It is unquestionably the

"Patchwork of Japan,
And queer bits of Queen Anne,"

the juxtaposition of styles wholly incongruous that detracts most seriously from the beauty of our seaside architecture.

These two difficulties form a third drawback. They deprive the architecture of its meaning. Of course, all architecture has its significance, from a church to a theatre, from castle to porter's lodge; if religious service be held in the theatre, or a play be given in the church, if the lord moves into the lodge and the porter takes up his abode in the castle, the architectural significance of the buildings will be still unchanged. People seek the seashore for rest generally, for health often and for a good time always. Should not the architecture of the seaside suggest some of these things? Should it not be an expression of quiescence, of refinement and of homelikeness?

Castles suggest siege and attack; palaces the tiresome routine of court life, while prismatic warfare suggests anything but the above requirements. On the other hand, broad roofs and verandas suggest rest and protection from the sun, from severe winds and heavy rains; spaciousness is hospitable and inviting, while a little consideration for the color of our neighbor's house would contribute largely to restfulness, good digestion and friendly feeling, besides giving a far more artistic general effect. HOWARD CROSBY BUTLER.



THE City of Toronto has again been visited by disaster, and this time of a character far more general in its probable evil results than were the three great fires of the early part of the year. For the second time in two years the water-supply of the city has been cut off — for the second time the "new" steel conduit across the foul harbor of Toronto Bay has burst and risen in sections to the surface. At Christmas-time, 1893, when the Bay was covered with ice two feet thick, the conduit made its appearance through the ice, and was only completely repaired at a cost of fifty thousand dollars, the repairs extending over a period of nearly twelve months. It was well known that these repairs were only of a temporary character — the nature of the work did not admit of anything better. The question was one of providing good water, while other schemes for a permanent supply were under consideration. It must be remembered that when this steel conduit was laid and completed only in the preceding year, at a cost of some six hundred thousand dollars, it was understood that at last the city had obtained a faultless system, and that the annual outcry against bad water had ceased forever.

The system consists of a four-foot riveted steel pipe, starting at the pumping-station on the main land, and extending across the harbor towards the island (that almost makes the harbor, or bay, into a lake), a distance of 4,660 feet. This is continued by a five-foot steel pipe, in the same direction, for 6,027 feet, through the sand-bank, or island, and to this is added a six-foot wooden pipe running out into the lake 2,357 feet. This is connected with a six-foot steel pipe, 365 feet long, which forms the intake, and, at its southerly end, is sunk into 70 or 80 feet of water. Into the bay, or harbor, all the sewage of the city is conducted. The bay is a mile and a half wide from north to south at the widest part, and about three miles long from east to west, its greatest depth being forty feet. On the morning of September 5, about 150 feet of the five-foot pipe, covered with mud and weeds, with terrific commotion burst up, rising some twelve feet above the surface, and then settled down on the surface. In this part is a movable joint, put in for the purpose of allowing the pipe to accommodate itself to the uneven bottom of the bay. A second break, and the worst of the three which have occurred, is a quarter of a

mile farther south. Here the sections of the pipe were connected by cast-iron flanges, riveted to the steel pipe and bolted together. Now one part of the great tube raises its entire diameter above the surface, while the section to which it was connected lies more than half submerged, and slopes downwards to the bottom a few hundred yards farther on. The third piece of piping shows on the surface, but here there is a "universal" joint that has stood the strain, although, of course, the various joints of the pipe, still below the surface, are probably strained and open. A careful investigation is now in progress to attempt to discover a cause. The city engineer, Mr. Keating, is in no way responsible for this second disaster to the piping laid by former engineers, when the water and engineering departments were separate bureaus. He has described the situation very plainly over and over again, and shown how the water system was "hanging by a thread." The result was that a by-law was submitted to the people for raising a sum to bore a tunnel, by which water was to be supplied to the city, instead of by the conduit, but this appropriation was lumped together with other sums for purposes objectionable to the majority of the ratepayers and it was vetoed.

The probable cause is the unusual lowness of the water, and the engineer stated a few days ago that if the water of the Lake fell two feet more the pipes would not run full.

It will probably be many months before the city will be in the enjoyment of pure water, and a considerable sum will have to be expended. People are warned that all water must be boiled for drinking purposes, for we have nothing but the sewage-laden waters of the bay to draw from.

It would almost seem as if the "water" trouble would never cease. During the period of the winter conflagrations, there was not sufficient power to raise the water, by the firemen's hose, to the top of the burning buildings. The fire appliances have been considerably increased through the summer, and there are now three steam-engines to give the required force, the absence of which was so disastrous before. No sooner have these arrived and been tested and found satisfactory, and the Underwriters began to contemplate reducing the rates of insurance, which they raised after the fires, than the water-supply fails and the engines are almost useless, for the pressure is reduced tremendously. Since the above was written the cause of the disaster has been discovered. There are several man-holes constructed in the channel under which the conduit runs at the island. In one of these was found an eight-foot plank, sixteen inches wide and three inches thick, its foot embedded in sixteen inches of sand and rising diagonally up into the man-hole, thus obstructing the passage of the water, sufficiently to cause the disaster. The plank was thoroughly water worn, suggesting that it must have been a long time in water, and the only theory as to how it got there is that it must have been part of the old cribwork or wooden conduit that was removed to make way for the last lengths of steel piping put in two years ago. Somehow or another, it must at that time, unseen by any one, have been sucked into the new pipe, and it has taken it all this time to travel the 2,000 feet and to become the cause of the accident. It remains a mystery as to how it raised its end up so as to catch and rest against the side of the man-hole, but there it was when the place was examined. Having now been taken out, it should be transferred to the Museum and kept properly labelled, as a warning to all who have to do with similar works. No money will be spared or time lost in making the repairs. A temporary intake will be constructed in what is known as "Blockhouse Bay"—a bay on the city side of the island, which is almost cut off from the bay proper by a sand-bank, and in which the water is purer than that in the bay, and in a few days the engines will be able to pump to their full power again. Precautions have been taken to guard so far as possible against the use of the impure water for drinking purposes. The mayor of the Town of North Toronto has offered to the city a supply of 100,000 gallons a day of water from springs, which now supply that place. The offer has been accepted, and some fifty of the city water-carts are to be used to bring this precious gift to the city. It is intended to supply first all the public schools and other institutions, and if the supply will permit and the scheme can be organized, half a gallon a day is to be left at every house, or else great hogsheads are to be placed at the corners of the principal streets, guarded by an officer of the police (to prevent waste) that the thirsty may go there and drink. While repairs are being promptly undertaken, and all the authorities are acting with commendable energy, it has been resolved by the aldermen to submit again the former by-law for money to construct the tunnel, and this time one might bet with certainty on its passing.

At last the ruins of the winter conflagrations are giving way to the new buildings which are to replace them, and the bedraggled look of the principal streets is vanishing. There appears to be a little spurt in the building-trade generally, but the majority of architects are still complaining that there is nothing doing. Beyond the rebuilding of the places burned down, there is very little going on; prices are ruinously low, and it is getting too late in the season to hope for better things this year. The result of the magnificent harvest will not be seen just yet, but in a country like Canada, which depends so much upon its harvest for its prosperity, it is hoped that there will really now be a turn of the tide and that the long period of depression is at last drawing to a close. The holidays will all be over at the end of this month, and then probably we shall find that several works are contemplated for next spring.

The possible effects of an injurious nature, upon the levels of the

Lakes that may follow the opening of the Chicago Drainage Canal, are (it is reported from Washington, D. C.) exercising the minds of the United States authorities even more than they excite the authorities of the Dominion, but both appear to be fully alive to the idea that harm of a serious nature is likely to occur. The report of the Board of Engineers, appointed by the Secretary of War of the United States Government, is published in the daily press, and may find its way into the columns of this journal. At any rate, it is hardly my province, in the limits of this letter, to refer particularly to it, except as the subject affects Canada. The Lake Carriers' Association is, we are told, making every effort to prevent the completion of the canal, and has obtained the coöperation of the Canadian engineers and shipping interests to oppose any steps that would result in lowering the levels of the Lakes. Captain McElhinney, of the Marine Department, is of opinion that the Lakes are lower now than they have ever been "since they were navigated," and says that the United States have far more to lose than has Canada by the Chicago Canal, so that it is not likely this great work will be allowed to proceed. This, of course, remains to be seen. It is, naturally, a matter that cannot be settled off-hand.

THE DUC D'AUMALE AND THE CHATEAU D'AMBOISE.



It is fortunate for the Republic, says a Paris correspondent of the *New York Tribune* writing under date of August 21, that the Duc d'Aumale does not stand in the position of a pretender to the crown of France. For he would be infinitely more dangerous as such than the Duc d'Orléans, Prince Victor Bonaparte and Don Carlos are for the present, or the Comte de Paris and the Comte de Chambord have been in times past. Alone of them all he appears to understand that one of the principal qualities which the public looks for in royalty is generosity and a readiness to distribute riches in doing good and in relieving distress. None of the other princes above mentioned can be said ever to have fulfilled this popular expectation. Indeed, they seem to have considered it more blessed to receive than to give. Thus the Comte de Chambord's riches have gone to swell the fortunes of foreign kinsmen, even the historic chateau and estate of Chambord, purchased with money raised by public subscription and presented to him as a token of loyalty on the part of the Royalist element in France, having been bequeathed to an alien prince. The Comte de Paris's money was hoarded for the benefit of his family, and not even his followers, let alone the public, can be said to have ever derived any benefit therefrom. The Duc d'Orléans is extravagant only where his own pleasures are concerned, and has already won for himself an unenviable name in connection with the shabbiness of his behavior in money matters to his followers, especially to those French noblemen who have taken upon themselves the duty of serving him as gentlemen-in-waiting without remuneration.

The Duc d'Aumale, however, the only one of all these royal personages who has achieved fame as a soldier, and to whom France is in a great measure indebted for her great African dependency in Algeria, is conspicuous for his public spirit. He had scarcely returned from the exile decreed against him through the artifices of General Boulanger, a man deeply in his debt for many favors received, than he presented to the French Nation his superb palace of Chantilly, with all the priceless treasures of art, literature and history that it contains, and the park, gardens and surrounding forests as well, merely reserving to himself the right of enjoying the use thereof for the remainder of his life. It is a gift the financial value of which it is well-nigh impossible to estimate, and enhanced by the fact that the Duke has lavished both time and untold money in perfecting the architectural beauties of the chateau, and in adding unique masterpieces to the various collections that are set up within its walls. And now, as if this were not enough, he has announced his intention of purchasing the grand old chateau, or rather palace and estate, of Amboise, in the Touraine, for the purpose of converting it into a home for soldiers and sailors, especially for those who have sustained wounds and injuries in active service, and who, for one reason or another, can find no place among the veterans at the *Hôtel des Invalides*.

The purchase will be made at the sale, which is about to take place, of the real-estate in this country left by the Comte de Paris. This sale is in accordance with the requirement of the French law, which ordains that whenever any of the children of the dead man happen to be minors and unable therefore to effect any legal agreement with regard to the division of parental property, the latter shall be converted into cash, so that an equal distribution can be made. In such cases the auction is a mere matter of form. The various pieces of real-estate are advertised for sale at the lowest possible prices, and everything is bought in by members of the family. Thus, in the notice of the projected sale, the value of the chateau and estate of Amboise is put at the preposterously small figure of \$12,000, which does not represent the cost of a tithe of the roofing, or of one of the huge sculptured mantlepieces which adorn some of the big halls and apartments. The Comte de Paris alone is known to have spent nearly a million francs in repairs and improvements, while in the reigns of King Louis Philippe and Napoleon III vast sums were devoted to the same purpose, the famous architects, Viollet-le-Duc, Champfleury, and others equally celebrated being employed to direct the work. In spite of all this, much remains to be done, and the Duc d'Aumale proposes to accomplish it out of his own purse.

Incidentally a peep is accorded into the peculiar arrangements which the royal house of Bourbon-Orléans has been compelled to devise in order to meet the exigencies of the situation created by the frequency of the decrees of exile issued against them. When they were exiled in 1848, it may be remembered that all their estates were confiscated, Chantilly alone escaping from this sweeping measure—subsequently confirmed by Napoleon III—by the Duc d'Aumale having taken the precaution to assign the entire domain to Coutts's bank, in London, and in part, too, to Lady Burdett-Coutts. With a view of avoiding any such danger as this, the princes of the house of Orléans have now vested all their real-estate in the hands of a joint stock-company formed *ad hoc*, which owns even the very chapels containing the family tombs. The moment there is the slightest danger of confiscation, the shares of this concern are at once mortgaged or transferred to some bank, native or foreign, which, by becoming temporarily the proprietor thereof, prevents any possibility of forfeiture.

Even far more than Chantilly or Chambord is the Château d'Amboise, so superbly situated on a site overlooking the Loire, redolent with the historic memories of old France. It was there that Mary Stuart spent her honeymoon with her young French husband, François II. Leonardo da Vinci's body lies in the beautiful chapel at the corner of the castle court. Diane de Poitiers sought the shade of the magnificent trees of the matchless park which surrounds the château. It was at Amboise that Louis XI—the Louis of "*Quentin Durward*"—instituted the famous French order of St. Michel. The Emperor Charles V visited François I, of jovial memory, there. It was from its balconies that Queen Catherine de' Medici and her son, the King, watched the frightful massacre of the Huguenots, every spike of the railings along the terraces being adorned with a Protestant head, and the whole place reeking like a shambles. To Amboise, too, was conveyed, as a prisoner, the Surintendant Fouquet, after the marvellous chase and capture by D'Artagnan, whom all the readers of Alexander Dumas's "*Three Musketeers*" will remember; while, in more modern times, Abdel-Kader, the Algerian chief and hero, who so long resisted the conquest of his country, was detained as a State prisoner for several years, until he received his liberty on parole, and was permitted to establish himself at Damascus.

The Château d'Amboise stands high above the town, like another Acropolis above a smaller Athens. It rises upon the only height visible for a considerable distance, and gains more from the river than any of the other famous châteaux of the Loire. The magnificent round tower that springs from the end of the Charles VII façade completely commands the approaches of the bridge, as well as the little island in mid-stream, where King Clovis is said to have met Alaric before he overthrew the power of the Visigoths; and a superb effect of lofty masonry is produced by this building being erected on the summit of a hill, and by the carrying of the stone courses upward from the lower ground. It is a fitting gift from a great and noble prince to a great and glorious nation, especially appropriate when the uses to which it is destined are taken into consideration.

ARCHÆOLOGICAL EXPLORATION AT JERUSALEM.

IT is now more than a quarter of a century since Captain, now Major-General, Sir Charles Warren carried on his explorations at Jerusalem for the Palestine Exploration Fund, and which resulted in such brilliant discoveries, revealing to us what was then known as "Underground Jerusalem." That was the remains of the ancient city, now covered up with the accumulated *débris* of ages, an accumulation that reached, in some places, to a depth of more than seventy feet. Since that time, no systematic explorations have been carried on in the Holy City. Herr Baurath von Schick and other agents of the Palestine Exploration Fund have watched wherever any digging took place—for the foundation of new buildings or any other purposes—and, if anything of importance turned up, it has been faithfully reported in the *Quarterly Statement*, published by the Fund, and which is now the recognized journal of archaeology in Palestine.

For some years back the value of ground at Jerusalem has been increasing, and building, more particularly on the north and west, has been going on outside the walls, and it became advisable to have some excavations made before houses were erected, which would make explorations impossible. The necessary firman from the Sultan was procured, and Dr. F. J. Bliss began operations last year. The first task he undertook was to trace the line of the ancient wall on the southern side of Jerusalem. It was known that the old wall was about eight hundred feet to the south of the present one, and that it skirted the brow of the slope which forms one side of the valley of Hinnom. Why the builders of the new wall left this commanding height undefended is a question that is not easily explained. It is certain that the older engineers did not leave this advantageous position for an enemy to occupy. Traces of the old wall were first come upon when levelling the ground for the English cemetery.

In 1874, Major Conder, writing from Jerusalem, recommended that explorations should be made at this point; and Mr. Henry Maudslay, at that time, did sufficient digging to show the existence of the wall all the way from the Protestant School to the east end of the cemetery. Among other things, he found that the dining-room of the school had its walls standing on the square base of one of the

ancient towers; and that, in places, the rock on which the wall stood was scarped below to a depth of thirty feet. Mr. Bliss took up the work at the point where Mr. Maudslay had left off, and followed the line of wall from the cemetery, where it runs in a southeasterly direction for about two hundred and fifty feet. He also found deep scarps in the rock, which must have given great strength to the defence, and made the battlements to tower with an imposing appearance over the Hinnom Valley. The stones are of no great size, that is, in comparison with some of the masonry at other parts of the walls, such as that of the Jews' Wailing-place, and portions of the Haram Wall. They have the usual draught round their borders, and the lower course is bedded on the solid rock.

Water-supply had not been forgotten, as numerous cisterns have been come upon. The existence of a gateway was discovered at this point, and it is here that one interesting point in the present exploration presents itself. The main street of Jerusalem runs from north to south in almost a straight line—it begins at the Damascus Gate on the north and ends on the south at the Sion Gate, also known as the Bab an Nabi Daud, or Gate of the Prophet David. This is, do doubt, the original line of a thoroughfare that has existed from the earliest times, and it is assumed that there must have been a similar gate at the end of this main street in the older wall. This was one of the points Dr. Bliss was directed to discover. The gate which has been found is not exactly in the position where the expected gate was supposed to exist; it is a little too far to the west to be in a line with the main street. Still it ought to be borne in mind that the present Sion Gate is not quite at the end of that street, but a little to the west of it; this may indicate that some reason existed for the deviation in both cases. Here for the present judgment must be suspended, as the "spade" will in time settle the matter.

The point would have been cleared up by this time, but in tracing the wall eastward difficulties arose with some of the proprietors of fields on the subject of remuneration, and Dr. Bliss, merely as a strategical move in the negotiations, started his operations still farther to the east, where he picked up the line of the wall again near the Pool of Siloam. There he found the wall runs south of the old pool, and turns up in a northerly direction, and as the Hinnom valley here meets the Kedron valley, it is assumed that the wall will continue northward till it joins the portion of the Ophel wall which Warren came upon during his operations; this will then connect it with the old wall of the Temple enclosure at the southeast corner. The Ophel wall is mentioned in 2 Chronicles 27: 3, where it is said Jotham "built the high gate of the house of the Lord, and the wall of Ophel he built much." It is also referred to in Nehemiah 3: 26-27: "Moreover the Nethinims dwelt in Ophel, unto the place over against the water-gate towards the east, and the tower that lieth out. After them the Tekoites repaired another piece, over against the great tower that lieth out, even unto the wall of Ophel."

Close to the corner, where the newly discovered wall turns northward, another gate has been found. As four or five courses of the draughted masonry still exist, the details of this gate can be well made out. Its date may be also determined to within a few years, for Josephus says that at his time Siloam was outside the walls; but Antonius, a martyr, who wrote about 750 A. D., states that "The mountain of Siloam is at the present day within the walls of the city, because the Empress Eudocia herself added these walls to the city." This makes it evident that the portion of the wall with its gate Dr. Bliss has brought to light at Siloam was that built by this Empress, and its erection may be dated as having taken place within a year or two of the middle of the fifth century. The remains of the older wall that existed in the time of Josephus are, no doubt, still under ground, and will require to be sought for in order to make the exploration complete at this locality.—*London Daily News*.

ASPHALTS AND BITUMENS.¹

TO define in sufficiently broad, but exact terms, the proper use of the word asphalt, we must first refer to the meaning of the other term which I have used in choosing a subject for this lecture, viz. *bitumen*. The word bitumen in mineralogy is applied to hydrocarbon mixtures of mineral occurrence, whether solid, liquid or gaseous. With this understanding of the nature of bitumen, we can adopt the very concise classification of Prof. S. F. Peckham, who published, in 1885, the "Special Report on Petroleum" for the tenth census. It divides bitumens into:

Solid: Asphaltum (German, *Asphalt* or *Erdpech*; French, *Asphalte*). *Semi-fluid*: Maltha (French, *Gondron minéral*; Spanish, *Brea*). *Fluid*: Petroleum. *Volatile*: Naptha (German, *Naphta*). *Gaseous*: Natural Gas—of burning springs.

According to this classification asphaltum is simply a solid bitumen. It may be almost pure, as the so-called "Glance-pitch," Gilsonite, or Grahamite, and find its chief application in asphalt varnish-making; or, it may contain earthy matter, varying in amount from two to three per cent to the ninety per cent of the so-called asphalt rocks. . . .

In this country mineral tar or maltha is found in a large number of States, especially in the West. The most important occurrences are those of southern California, in the counties of Kern, Ventura

¹ Extracts from a lecture by Samuel P. Sadler, Ph. D., delivered before the Mineralogical Section of the Brooklyn Institute and published in the *Journal of the Franklin Institute*.

and Santa Barbara. Crude maltha or mineral tar, as found in California, is often mistaken for a heavy petroleum, or rather a petroleum residuum, as its gravity, 12° to 17° Baumé, corresponds with that obtained in such residuums; but, as pointed out by Professor Peckham, it differs in important particulars. The maltha in its crude state contains from twelve to fifteen per cent of water, which will not settle out, but must be removed by heating to from 212° to 300° Fahr. The amount of water retained by crude petroleum, incapable of settling out, on the other hand, is slight, not over one to two per cent. The crude maltha usually contains air, carbon dioxide, or hydrogen sulphide, in varying proportions, mechanically mixed with the viscous mass, so that when the maltha is heated to not more than 100° Fahr., it begins to froth rapidly, and will usually fill both still, condenser and receiver with an overflow of foam before any of the water has been removed.

These malthas, likewise, contain, in the natural state, volatile oils and basic hydrocarbons, both of which have to be removed in the refining process.

Similar to this occurrence of natural malthas, although distinct from them, in respect of the conditions required for its extraction and possibly also in chemical characters, is the so-called "liquid asphalt" obtained at Las Conchas mine, some thirteen miles east of the City of Santa Barbara, in Santa Barbara County, Cal. Here is found a bed of clean sea-sand, holding, like a sponge, the thick maltha, which oozes up from underlying beds of shale.

It is stated that a well sunk 400 feet in this lower stratum continues to ooze maltha at all points. The mine is right on the edge of the ocean, and the sands extend some miles back from the beach. Covering the sand deposit is a surface deposit of light earth and soil, upon which is ordinary vegetation. This soil is "hydraulicked" off by a twelve-inch stream of clear salt-water, and the maltha-containing sand uncovered. The separation of the maltha from the sand is accomplished not by distillation, but by mechanical means, and with the aid of specially designed machinery, by the California Petroleum and Asphalt Company, which sells it under the name of "Alcatraz liquid asphalt."

Crude maltha, under the several names of "liquid asphalt" and "mineral tar," is found also in Utah, Kentucky, Tennessee and Texas, although in most cases, no attempt has been made to utilize these products commercially.

Let us pass now to solid bitumens or asphalts in the proper sense of the word. The purest of the solid bitumens are known sometimes as "glance-pitch" or "gum asphaltum." Prominent among them is the gilsonite of Utah. This is found in the Uintah Indian reservation in Wasatch and Uintah Counties. The purity of the gilsonite (some ninety to ninety-eight per cent soluble in carbon disulphide) is such that it finds large application in the manufacture of varnishes and insulating compounds. The present production is some 2,000 tons annually. Glance-pitch also occurs in Texas, in Cuba and Mexico.

We come, then, to the asphalts which contain inorganic matter in varying amount as a uniform constituent of the mineral as it occurs in nature.

The two most important occurrences of these asphalts are those of the Island of Trinidad, known as the Trinidad Lake asphalt, and of the Province of Bermudez, in Venezuela, on the mainland, nearly opposite the Island of Trinidad, and known as the Bermudez Lake asphalt.

The so-called "Pitch Lake" of Trinidad occurs on the west coast of the island. It is situated about a mile and a half from the sea-coast, at a height of 138 feet above sea-level, and occupies the crater of an old mud volcano. It forms, therefore, a circular mass of asphalt of an area of a little more than 114 acres, and of uncertain depth. Rude borings have been made which indicate a depth of 78 feet in the centre and about 18 feet at the sides. If these figures are correct, the lake should contain about 6,000,000 tons of asphalt. Too much confidence, however, cannot be placed upon these borings, as the asphalt near the centre seems to be softer than that around the edges and seems to rise readily to replace the portions removed. Whether the lake or deposit of asphalt is still fed from underground sources, as has been suggested by some authors, is not definitely known. While the term lake is used, it must not be supposed that the surface resembles that of a liquid, even a viscid liquid. On the contrary, the surface shows a brownish, earthy material, with cracks or fissures here and there of a width and depth of several feet, some filled with rain-water, and some with earth, supporting a scrubby vegetation. Carts and mules, it is stated, can be driven everywhere on the surface. The material is dug with pick and shovel, loaded into carts and hauled to the beach to be loaded on lighters which carry it to the vessels. During the voyage to this country, the material unites into a solid mass, and must be removed from the hold by the use of the pick and shovel.

The crude Trinidad Lake asphalt has the following composition:

Bitumen.....	39.83 per cent.
Earthy matter.....	33.99 "
Vegetable matter.....	9.31 "
Water.....	16.87 "
	100.00 "

After a refining process, in which it is heated in large tanks to a temperature of not much over 300° Fahr., in order to drive off the water and allow portions of the earthy matter to settle and of the vegetable matter to be skimmed off, it has the following composition:

Bitumen (by CS ₂).....	59.96 per cent.
Earthy matter.....	35.82 "
Vegetable matter.....	4.32 "
	100.00 "

Besides this lake asphalt, the Island of Trinidad also yields a "land asphalt," from the neighborhood of the lake.

This asphalt may have come from overflows of the main deposit in past ages, or it may have an independent, although analogous, origin. It seems harder and more earthy than the lake deposit, and its bitumen shows differences in solubility and other physical properties.

The exportations of the Trinidad Lake asphalt have increased rapidly in recent years, and amounted in 1892 to 96,319 tons, and in 1893 to 88,881 tons.

The Bermudez asphalt also comes from a so-called "pitch lake," situated in the State of Bermudez, in the republic of Venezuela. The deposit is some eighteen miles from the mouth of the San Juan River, which empties into the Gulf of Paria, opposite to, and about one hundred miles distant from, the Island of Trinidad. A narrow-gauge railroad runs from the shipping-point, Guanaco, on the San Juan River, to the lake, a distance of six miles. The deposit, or lake, covers an area of over 1,000 acres, and is of unknown depth. While vegetation is found growing in irregular patches over the surfaces, it is only superficial, and a uniform deposit of asphalt is found underneath.

The Bermudez asphalt, as dug from the lake, is a solid bitumen of great purity, containing, according to an analysis recently made, but 2.63 per cent of mineral matter and about 1.3 per cent of organic non-bitumen, with several per cent of water, leaving over 90 per cent of bitumen soluble in carbon disulphide.

The refined asphalt, obtained by a process similar to that spoken of under Trinidad asphalt, is slightly purer, being:

Bitumen (by CS ₂).....	97.22 per cent.
Mineral matter.....	1.50 "
Organic non-bitumen.....	1.28 "
	100.00 "

This asphalt is, of course, notably softer and more plastic than the Trinidad Lake asphalt, which in its refined state carries some 35 per cent of mineral matter (chiefly clay and oxide of iron) as compared with 1.50 per cent of the Bermudez.

The natural asphalts (or solid bitumens) of California are also very important and of a high degree of purity. Thus, the La Patera mine, situated twelve miles west of Santa Barbara, and at a depth of 125 feet, yields a compact solid rock of the composition:

Bitumen soluble in CS ₂	59.15 per cent.
Mineral matter.....	39.75 "
Organic non-bitumen.....	1.10 "
	100.00 "

The deposit covers several hundred acres, and is mined much in the same manner as coal. It is not soft, but is friable, and breaks readily under the pick or wedge. The mineral residue is fine silica, free from clay and organic matter.

Similarly in Kern County, California, are extensive deposits of a solid asphaltum worked by the Standard Asphalt Company. This material in its crude state shows the following composition:

Bitumen soluble in CS ₂	84.79 per cent.
Mineral matter.....	8.70 "
Organic non-bitumen.....	traces.
Moisture.....	6.51 "
	100.00 "

An interesting feature in connection with this asphalt is that the mineral matter consists almost entirely of infusorial earth, or silica of organic origin, possessing a peculiar absorbent character.

Other asphalts of this class, that is, solid mixtures of bitumen and earthy material, are those of Cuba containing some seventy per cent of bitumen, and of Syria containing from seventy-five to ninety per cent of bitumen.

We have now to consider the case of bituminous- or bitumen-saturated rocks. These are included in two classes: Bituminous limestones and bituminous sandstones. The former class includes the best known and most generally used asphalts of Europe. We have among these the mines at Seyssel-Pyrimont in the Department of Ain, France; those of Val de Travers in the Canton of Neuchâtel, Switzerland; those of Ragusa in the Island of Sicily; of Limmer, near Hanover, Germany; and of Vorwohle, in Germany. These asphalts are in general composed of a fine amorphous limestone, saturated with from five to fourteen per cent of bitumen. The subjoined analyses, taken in part from Howard's pamphlet and in part from the "Mineral Resources of the United States for 1893," will show the composition of these asphalts:

	Seyssel, France.	Val de Travers, Switzerland.	Ragusa, Sicily.	Limmer, Germany.	Vorwohle, Germany.
Bitumen.....	8.15	10.15	8.92	14.30	5.37
Calcium carbonate.....	91.30	88.40	88.21	67.00	90.90
Magnesium carbonate.....	.10	.30	.96	—	—
Clay and oxide of iron.....	.15	.25	.91	17.52	.59
Sand.....	—	—	.60	—	2.55
Insoluble.....	.10	.45	—	—	—
Loss.....	.20	.45	.40	1.18	.34
	100.00	100.00	100.00	100.00	100.00

One very characteristic occurrence of bituminous limestone is found in the United States, viz, the so-called litho-carbon in Uvalde County, Texas. The mineral here found, according to "Mineral Resources of the United States for 1893," is a bituminous limestone, the limestone being a shell deposit, in which the original forms are still maintained. The rock contains from fifteen to thirty-three per cent of bitumen, the average being about twenty per cent. The refined product is said to possess peculiar properties, being especially noted for its elasticity, making it, in this respect, somewhat similar in character to elaterite.

In this country the bituminous sandstones occur chiefly in California, Utah and Kentucky. In the State first named, these sandstones are found at various points between San Francisco and Los Angeles, in the counties of Santa Cruz, San Luis Obispo, Santa Barbara and Ventura. They contain from twelve to eighteen per cent of bitumen and are easily pulverized when heated. They are used in most cases without other admixture for street-paving, being rolled or tamped thoroughly while hot. Similar products are obtained from Utah and Kentucky, although that from Utah is often too rich in bitumen to be used for paving purposes without farther dilution with sand.

The production of asphaltum and bituminous rock in the United States for 1893 is given by the United States Geological Survey in "Mineral Resources of the United States for 1893," as 47,779 tons, of which California produced 42,650 tons, Utah 3,200 tons, and Kentucky 1,929 tons. For 1892 the production is given as 87,680 tons.

There remains the practical side of the subject to be noted.

The uses of asphalt may be summarized as follows:

1. As a varnish or paint.
2. As the base of insulating compositions.
3. As a waterproofing material.
4. As a cement in ordinary building construction.
5. As the cement in roofing and paving compositions.

(It is stated that fully ninety-five per cent of the asphalt used is for the last-named purpose.)

For the manufacture of asphalt varnish or paint, the asphalts rich in bitumen (like gilsonite) are used, the bitumen being partly dissolved by admixture with oil of turpentine and linseed oil. In this way a so-called Japan varnish is obtained for the process of japanning metals. The asphalt varnish may also have other resins (like shellac) added in order to give greater flexibility and toughness.

For the manufacture of insulating compounds the asphalt is usually tempered with wax tailings and other petroleum products to give the mixture the proper consistency; the exact composition of the mixtures being, however, carefully kept secret by the manufacturers.

For waterproofing the foundations of buildings, and as a protection against moisture in cellars, etc., a refined maltha or melted asphaltum is often used, being painted on the masonry or timber, or bricks are dipped in it before being set in position. For lining reservoirs, irrigating canals and ditches, an asphalt cement similar to that used for paving is frequently used. In this case, as has been shown in practice, a natural asphalt with a proper proportion of bitumen and mineral matter or a natural asphalt tempered with a maltha or so-called "liquid asphalt," will yield a more homogeneous and water-resisting coating material than an asphalt tempered with either coal-tar or petroleum residuums.

For other forms of construction, especially for paving sidewalks, stable-yards, open areas and flooring in exposed positions, as upon flat enclosed roofs of large buildings, asphalt mastic is used. The basis of this is usually one of the natural asphaltic limestones, such as Seyssel or Neufchatel asphalt.

The rock, having been powdered, is put in round kettles in which about eight per cent of its weight of refined Trinidad asphalt has been previously melted. It is thoroughly mixed with this at about 280° Fahr. for several hours, and is then run into moulds, where it is formed into square, hexagonal or round blocks, of about fifty to sixty pounds weight. When the mastic is to be used, it is again melted with refined Trinidad asphalt, in the proportions of about seven pounds of asphalt to one hundred pounds of the mastic, and sand or fine gravel is added gradually up to sixty pounds, according to the use to which the mixture is to be put. This mixture, known as "gritted mastic," is spread while hot, rubbed smooth and allowed to cool. When cold it is slightly pliable and thoroughly waterproof.

The last-named application of asphalt, viz, for roofing and paving construction, as before stated, is by far the most important of all the others. As applied to roadway or street paving, we have two entirely distinct methods to note. The asphaltic limestones such as are found in Europe, and asphaltic sandstone such as is found in California, require merely to be crushed, heated to from 275° to 300° Fahr., and hauled to the streets and spread uniformly while still hot. It is then tamped and rolled with hot instruments. Asphalt pavements of this kind are in general use in Paris, London, Berlin and other European cities. Roadways made from bituminous limestone are said to become polished by wear and to become slippery in foggy and drizzling weather. In California, where bituminous sandstone is used, they are said to wear well, except that they soften rather too much in warm weather.

The other form of asphalt paving construction, used most largely in this country, is that in which an asphalt cement is first made by taking a hard but relatively pure asphalt and tempering it with

some oily or bituminous liquid. This cement, in the proportion of ten to sixteen parts, is then mixed at a temperature of about 300° Fahr. with from eighty-four to ninety parts of clean sand and powdered limestone, and the mixture applied with no more loss of heat than necessarily follows its transportation to the streets in covered carts.

While this general statement as to the nature of an asphalt paving composition may be taken as covering the subject broadly, many points of the greatest importance come in to determine whether a given composition will be a satisfactory one or otherwise. The asphalt should be one with a high percentage of so-called petroleum as compared with asphaltene; the oily or bituminous liquid above referred to should be one that will make a satisfactory and durable blending with the asphalt, and the proportions of tempering liquid and asphalt which go to make up the cement should be chosen with reference to climate and the character of the traffic that is likely to pass over the street.

The analyses quoted in this lecture will show how asphalts may differ in the first respect. With regard to the nature of the tempering liquid, I may say that coal tar was at one time used, but has been almost universally rejected, as not making a satisfactory or durable blending material, the mixture having been found to disintegrate under atmospheric influences. Petroleum residuums are now almost universally used in the Eastern States, while malthas, or natural "liquid asphalts," so-called, are used on the Pacific Coast and in Western States. I am satisfied, on both theoretical and experimental grounds, that the last-named tempering materials are to be preferred.



AMERICAN INSTITUTE OF ARCHITECTS: AMENDMENTS TO THE BY-LAWS.

THE following Amendments to the By-Laws will come before the Annual Convention, to be holden in St. Louis, October 15-17, 1895, for discussion and action thereon, and are hereby published in accordance with the provisions of Article XI, for the information of the Fellows of the Institute.

It is proposed by the Committee appointed at the last annual Convention on Proportionate Representation of Chapters in the Board of Directors:

That Article III of the By-Laws be changed by inserting in the first line the words "Section 1," and that the following paragraphs may be inserted at the end of the Section 1, i. e., after the word "qualify":

Sec. 2. There shall be a Nominating Committee, consisting of one duly accredited Fellow as representative from each Chapter having a membership of at least six Fellows.

Sec. 3. The place and hour of meeting of the Nominating Committee shall be announced by the Chair at the first session of the Convention; such announcement shall give at least twenty-four hours' notice of the meeting.

Sec. 4. A member of the Committee unable to attend the meeting may be represented by proxy, providing the proxy is a member of the same Chapter. Any Chapter not properly represented at a meeting will lose its vote in the Nominating Committee.

Sec. 5. Five members will constitute a quorum of the Committee at the meeting. If such number be not present, then the Nominating Committee shall lose the right to nominate and the matter of nominations shall go over to the Convention at large.

Sec. 6. It shall be the duty of the Nominating Committee to make nominations for all of the officers and Directors to be elected at the Convention; and, if possible, to furnish printed ballots containing such names to each member attending the Convention.

The ballots furnished by this Committee shall be announced as the regular ballots.

It is also proposed by the President that:

In Article I, Section 2, second line; in the form of application under the same section; in the ninth, fifteenth and twenty-second lines on the sixth page; in section 3, eighth and ninth lines; in section 4, second line; in section 5, second line; in Article II, fifth and seventh lines; in Article IV, section 1, tenth line; in Article V, section 2, third, fifth and sixth lines; in Article VI, section 1, fourth and seventh lines; in section 2, last line; in section 3, second line; in Article VII, section 5, fourth line; in Article X, section 1, sixth and seventh lines, respectively, — or wherever else they may occur, the words "Board of Directors" shall be stricken out and the words "Executive Committee" shall be substituted therefor.

In Article I, Section 2, on page 6, strike out in the fifteenth line the words "at its first session," and in the sixteenth line strike out the words "and publish," so that this portion of the By-Laws shall read:

The Executive Committee shall, under these By-Laws, formulate rules for the conduct of a letter-ballot, etc.

In Article I, Section 5, seventh line, the word "Board" shall be stricken out and the words "Executive Committee" shall be substituted therefor.

In Article VIII. — Strike out the title and the whole of Section 1, and substitute therefor the title "Executive Committee," and the

¹Paving and Municipal Engineering, September, 1894, p. 118.

whole of Section 1, Article IX, with the addition after the word "three" in the fourth line, of the words, "and the other four shall be elected at each annual convention to serve for one year or until their successors are elected and qualify," so that it shall read as follows:

ARTICLE VIII.

EXECUTIVE COMMITTEE.

Section 1. The Executive Committee shall consist of seven Fellows, of whom the President, Secretary and Treasurer of the Institute shall be three; and the other four shall be elected at each annual convention, to serve for one year or until their successors are elected and qualify.

In Article VIII, Section 2, strike out the whole of the first line, the words, "shall be as follows" in the second line, and the word "Directors" in the third line, and substitute therefor the words "Executive Committee"; so that the first two lines shall read as follows:

SEC. 2. In the interim between the conventions of the Institute, the Executive Committee shall be the custodians, etc.

In Article VIII, Section 2, strike out the whole of the first line on the thirteenth page and substitute therefor the words: "The Executive Committee shall hold at least four"; strike out the last three words of the fifth line and the whole of the sixth, seventh and eighth lines and the first three words of the ninth line, making the paragraph read as follows:

The Executive Committee shall hold at least four meetings in each year, one within ten days after the beginning of its term of office, and another within thirty days before the regular annual convention of the Institute, and at the last mentioned meeting it shall receive and act upon the reports of officers, of Chapters, and of standing and of special committees, and shall prepare its annual report to the convention.

In Section 3, first line, strike out "Board of Directors," and substitute "Executive Committee," and also strike out all after the word "responsibilities," to the end of the section, and add thereto the words: "and shall have power to delegate especial work to the committees of the Institute or to the committees appointed by itself for the purpose," making the Section read:

The Executive Committee shall also, from time to time, formulate and publish for the information of the Institute such rules and regulations as it may deem expedient and necessary to establish for the furtherance of the discharge of its duties and responsibilities, and shall have power to delegate especial work to committees of the Institute or to committees appointed by itself for the purpose.

In Article IX, the words "Executive Committee and" shall be stricken out of the title, and Section 1 shall be transferred, as heretofore proposed, to Section 8, and the words "Sec. 2" shall be stricken out.

In Article X, Section 2, strike out the last two words of the first line and the entire second and third lines, also the last two words of the seventh line and the entire eighth and ninth lines, so that it shall read as follows:

Sec. 2. A practising architect may apply, in the manner heretofore prescribed, and become a Fellow of the Institute without first becoming a member of any Chapter and being approved by the officers of the same.

Section 3 shall be stricken out.
Section 4 shall be stricken out.
Section 5 shall be stricken out.

In Section 6 and at the end of the same the following words shall be added "but nothing herein contained shall prevent the Executive Committee from granting charters to two Chapters occupying the same territory in whole or in part."

In Section 7, strike out all after the words "new Chapter," in the sixth and seventh lines, through "provided further" in the tenth line, and substituting therefor the words "provided however," making the section read as follows:

Sec. 7. New Chapters. Any six practising architects eligible to membership in the Institute may apply to the Institute for membership and for a charter to organize a new Chapter, stating its proposed limits, and the Institute may elect such new members and charter such new Chapter, provided however that if the new Chapter proposes to take part of the territory of any existing Chapter, such existing Chapter shall be consulted by the Institute before such charter shall be granted.

In Section 10, next to the last line, strike out the words "as such."
[Attest] ALFRED STONE, Secretary A. I. A.



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

LEONARD & CARTER FURNITURE CO.'S BUILDING, DETROIT, MICH.
MESSRS. ROGERS & MACFARLANE, ARCHITECTS, DETROIT, MICH.

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

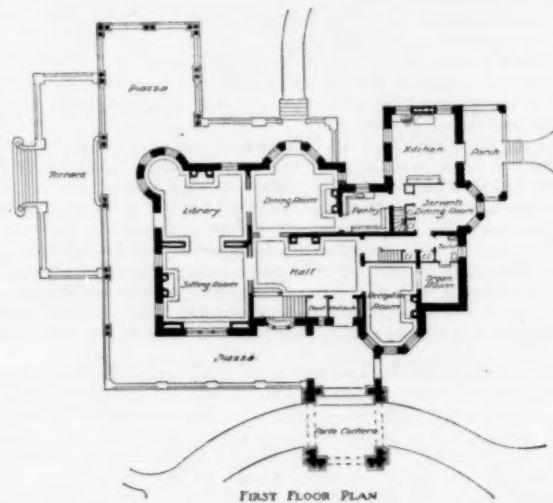
NEW "CENTRAL" SCHOOL-BUILDING, YORK, PA. MR. B. F. WILLIS, ARCHITECT, YORK, PA.

THIS eight-room school building is now in course of erection in the central part of the city. The site is such that the shaded rear portion cannot be seen from the street, hence the more economical design and materials for this part of the building. The

basement story is 6 feet, 6 inches above pavement-line, and is made, together with all other cut-stone details, of cream-buff Indiana limestone starting from Woodstock granite sill-course; outside steps and door-sills are also Woodstock granite. All cornices, pediments, etc., terra-cotta, to match in shade the cut limestone parts. Roof-metal-work and conductors, cold-rolled copper. All roofs are covered with Peachbottom slate. All interior partitions, brick. The stairs are open "mill-construction," 2-inch plank treads, 1½-inch plank risers, all housed into 3-inch plank strings. All floors are double, upper floors maple, 2-inch face, special machine worked; all other interior wood-finish red-oak, common sawed; polished American plate-glass in all windows of 3-story portion. Each school-room washstand is fitted with a drinking-fountain attachment that dispenses with the use of cup or drinking-vessel of any kind. The heating and ventilation plant consists of five vertical-pot, warm-air furnaces. The water-closets for the pupils are in the basement connected with street sewer by flushing-trough fitted with automatic flush; all basement floors are concreted. The entire cost of the building, including architect's services, ready for use, is, exclusive of school desk-furniture and lighting-fixtures, \$27,431.66. Contractor's time-limit for completing the building is eight months.

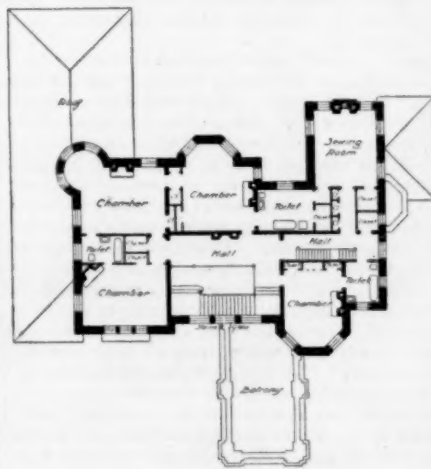
HOUSE OF CYRUS H. K. CURTIS, ESQ., WYNCOTE, PA. MESSRS. BAILY & TRUSCOTT, ARCHITECTS, PHILADELPHIA, PA.

The building is entirely fireproof, including an iron roof. The floors are iron beams and terra-cotta arches, the outside walls being furred with hollow porous brick, the four-inch partitions in the



FIRST FLOOR PLAN

building being "Mackite." The exterior walls are built of brick, faced with four-inch Indiana limestone on all sides of the building, the porte-cochère and columns of the porch being of the same material. The terrace is supported on iron beams and cemented. The roof



SECOND FLOOR PLAN

will be of red slate with copper finials and flashings. The slate is fastened to two-and-one-half-inch porous rough blocks. The interior plastering throughout is to be hard Eureka. All the mill-work, exterior and interior of first and second floor will be cherry and mahogany in the main rooms of the latter. The floors will be oak; the first story parquetry. The plumbing goods all come from the J. L. Mott Iron Works, New York. The heating is "Indirect

Hot Water," the Mercer boiler being used; no hot-water pipes except the one from pressure-tanks run above the first floor. The cold-air ducts all run under the cellar floor, so that the full height of the cellar is retained. The building is also supplied with electricity and burglar alarms. The cost of the building will be about \$75,000.

Green-houses and a stable will also be erected.

THE "GARFIELD" SCHOOL-HOUSE, YORK, PA. MR. B. F. WILLIS, ARCHITECT, YORK, PA.

THIS twelve class-room building is now being built on the outskirts of the city, and in the centre of a plot of ground, 200' x 220', bounded by streets on three sides. The basement story is native dark-blue limestone, rock-face finish, pointed with Alsen cement, natural color; from this point up, all walls including principal cornices are constructed of selected red common native brick, laid with brown-mortar joint. Cornice at second story, principal entrance projection, brown terra-cotta. Pennsylvania brownstone for all cut-stone work in brick walls. Roof metal-work, including conductors, cold-rolled copper. American polished plate-glass throughout. Building is warmed and ventilated by six horizontal furnaces of large radiating capacity. All roofs are covered with Peachbottom slate. All interior partitions, brick. The first story is isolated from story above by self-closing doors which open into stair-halls; this feature was adopted in a ten class-room building built in this city from the author's designs, four years ago, and, aside from lessened fire-risk, has proved very satisfactory in added quietness during time schools are in session. It will be apparent to all that the isolated stories are obtained at the expense of staircase effects on the first floor, but the ends gained seem to the author to justify the means in a school building of this character and moderate cost. All floors are double, upper floors, maple, 2-inch face; all other interior woodwork, selected common-sawed red-oak; the stairs are open "mill-construction," 2-inch plank treads, 1½-inch plank risers, all housed into 3-inch plank strings. Each school-room washstand is provided with a drinking-fountain attachment which does away with the use of cup or drinking vessel of any kind. The contractor's time-limit for completing the building is 11 months. The entire cost of the structure, less school-desks and lighting-fixtures, is as follows: Basement excavation and rough-stone walls, \$1,993.60; superstructure contract, \$25,336; heating and ventilation, \$3,100; architect's services, \$1,521.48; making a total of \$31,951.08.

DOORWAYS AT FAIRHAVEN AND AT ACUSHNET, MASS.

STUDIES IN SKETCHING.

[Additional Illustrations in the International Edition.]

SALON IN THE HOTEL OF THE COMTESSE DE J —, AVENUE D'ENA, PARIS, FRANCE. M. GUSTAVE RIVES, ARCHITECT.

[Copper-plate Photogravure.]

VESTIBULE OF THE SAME HOTEL.

[Copper-plate Photogravure.]

THOMAS STREET, GROSVENOR SQUARE, W., LONDON, ENG. MR. W. D. CARÖE, ARCHITECT.

LADY CHARLES SPENCER, AFTER A PAINTING BY SIR JOSHUA REYNOLDS.

THE publication of an illustration from one of Sir Joshua Reynolds's most characteristic portraits affords us an opportunity to consider the life of a man who must always be reckoned among the worthies of England. Reynolds can never be so well known to posterity as his friend Samuel Johnson, for he was not fortunate in finding a Boswell to whom it would be delightful to record every one of his observations in the painting-room about art and artists, and to whom the commonest occurrences in the house in Leicester Square would be more important than any State business in Europe. Still, Reynolds has fared better than the majority of his contemporaries, or than English artists in general. He is as much of a reality to us as any of Fielding's or Goldsmith's characters. We can trace his career from the time when, as a child, he produced drawings "out of pure idleness" in the Plympton parsonage, until the summer day when his eyesight suddenly failed, and, as if he heard the command of destiny, meekly abjured the magic which had wrought so many wonders. . . . Reynolds, as every one knows, was born in 1723 at Plympton. Devonshire offered unlimited scenes for the inspiration of landscapists, and there were enough of men, women and children to serve as models for embryo figure painters and sculptors. But by one of the inexplicable perversities of human nature young artists seldom or never begin with attempts to represent created forms. . . . Joshua Reynolds was allowed to follow his own system of self-education until he was eighteen. It was no easy matter to determine what was to be done with a youth who was out of place in Devonshire, and was supposed to be as ill-adapted for any other part of England. That an admirer of the great Italian was sent as a pupil to Hudson in London was evidence that his advisers knew little about art. He was, however, a son-in-law of Richardson, who wrote the "Treatise on Painting." The master was puzzled what to do with a youth who gave pre-eminence to Raphael, and he set him to copy drawings or prints after Guercino.

But Reynolds was not to be cheated. He tried his hand at portraits, and he was declared to be so successful with one of a servant of Hudson's that the master rose up against the rebellious pupil, and sent him adrift. Reynolds returned to Devonshire, and with the experience he gained during his two years in London he painted portraits, and it is believed that the most important were reminiscent of the Hudsonian manner. . . . He was twenty-six when the appointment of Commodore Keppel, who was one of his early patrons, to the Mediterranean station enabled Reynolds to obtain a free passage to the Italian coast, from whence he could visit Rome. There he was able to make the masterpieces yield secrets to him which were unknown in Devonshire as in London; but more important still, he was disillusionized by them. . . . When he reappeared in London and set up a studio at the end of 1752, it was not to be expected that he was to be welcomed by the painters. His style was novel, and therefore was likely to attract commissions. Hudson declared that Reynolds did not paint so well as formerly; Ellis found his works to be altogether unlike Kneller's. Reynolds for a time was successful, and then he had to make way for Liotard, the Swiss, who was not superior to Hudson or Ellis. But fortune is whimsical, and in a short time Reynolds was again in favor. He did not exactly imitate John Gay's painter, and employ casts of a god and goddess as the normal types for his sitters. But, as Northcote said, every woman who wished to descend to posterity as an angel, and every man who wished to be accepted as a hero or a philosopher found their way to Reynolds's studio. Three years after his return to London he had increased his price for a head from five to twelve and then to twenty guineas. It was not long before he could say his time was worth five guineas an hour, or one-tenth of the value of an hour to a loquacious Parliamentary counsel in our time. As time went on, Reynolds charged more for the portraits, but if quality be considered, his works were always cheap.

THE ANGLICAN COLLEGE, JERUSALEM.

THE drawing from which this illustration was produced was exhibited this year at the Royal Academy. The architect, Mr. George Jeffery, belongs to the Public Works Department, Cairo.

CHICHESTER CATHEDRAL, ENG.

It would be interesting to discover why Chichester Cathedral is so little prized, but in public estimation there is hardly another which stands lower. The obnoxious fee system may be one of the causes, and the peculiar perfunctoriness of the services a second. Yet the building is not without interest, for besides the architecture the sculptor's art from Saxon times to Flaxman's is represented in the monuments. There are wall-paintings of a sham mediæval sort, which give pain to all who see them. It is a pity some of the white-wash which was used elsewhere was not applied to them. Mr. Hanson has selected the most favorable point-of-view for his representation, for it enabled him to introduce the campanile commonly known as Ryman's Tower. An etching of the cathedral by Mr. Hanson will shortly be published.



[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.]

A CHANCE TO VISIT THE ATLANTA EXHIBITION.

PROVIDENCE, R. I., September 12, 1895.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — It having been suggested that the Eastern members of the American Institute of Architects would like to make their return trip from the St. Louis Convention by way of Atlanta, "so as to enjoy the Cotton States and International Exhibition, which will then be in full force, and that a day spent among the exhibits, particularly from South America and Mexico, will afford more information than could be obtained by a good many months of travel South," I have endeavored to ascertain whether satisfactory arrangements could be made with the railroad companies and tickets could be obtained to cover a return trip through Atlanta.

If a party of fifty can be secured, it is probable that reduced fares covering the entire trip can be obtained, but it will be useless to undertake to get reduced rates unless that number can be guaranteed.

Will you, through the columns of your journal, ask the members of the Institute who intend to go to St. Louis and would like to return through Atlanta to communicate with me as soon as possible, in order that I may know how many there are who would like to avail themselves of the opportunity to attend the Convention and the Southern Exposition?

Yours truly,

ALFRED STONE, Secretary A. I. A.

A SEEMINGLY SIMPLE CASE.

CAMBRIDGE, MASS., September 12, 1895.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you be so kind as to advise me what to do in the following, rather unusual, case:

A and B are brothers, joint owners of large real-estate interests, in this and other cities. C is a local real-estate agent, who handles the local business of A and B. D is a man employed by A and B as a salesman or clerk in a wholesale house in Boston.

Early last spring A and C came to my office to consult with me regarding plans for a large one-story structure for stores and other purposes, which they proposed to erect on a lot of land at the corner of two streets near by. They had a general idea of what they wanted and asked me to make a sketch-plan, which was satisfactory, and I was ordered to make plans, etc. After we had been at work a few days on the plans C came in and wanted me to add a second story over a part of the building, making a large hall, 50' x 70', with ante-rooms, also quarters for a cycle club. This necessitated a change in the plans, which was made, and I sent the revised plans to A and B by C, their agent. He came back the following day with the plans and the word that they were all right, and that I was to go ahead and get out the plans and specifications as quickly as possible and as the building was only a temporary structure, to make it as inexpensive as possible. C also said that A and B told him to ask me what my charges would be for the work. I said that as it was so near the office (only 150 feet) and as I was a tenant of A and B I would charge only 4 per cent on the total cost, except that, if they should want to give the contract to a certain mason who had done some work, that I had charge of, for them before, I should charge the regular rate of 5 per cent as the man in question was very incompetent and required much more care and attention than regular contractors. C told A and B what I had said, and the following day A came to my office and said he did not think it fair that I should charge more if one person did the work than another, and that he did not want the objectionable man to have the contract if he were not the lowest bidder. I then told him that in that case I should make the same charges i. e., 4 per cent, which he said was all right, and requested me to make all possible speed with the plans and have them ready for estimates by a certain date, as the prospective tenants wanted the building as early as possible.

I at once put on all force and had the plans nearly done, when C and D came into the office one day and told me that A and B had gone South for an indefinite period, and that they had given D full power to act for them in their absence. D showed me a letter to that effect from A and B. D wanted the plans and specifications as early as possible and I had them done on time and ready for estimates.

While the estimates were being made, D wrote me that he wanted me to make the framing-plans, as he wanted to let the contracts as soon as possible after the bids were in.

My usual method is to ask for sealed bids to be delivered at the office at a certain date, to be opened by myself, or in the presence of the owner. In this case I did not get the estimates at all, as D wanted me to send him the sealed estimates as fast as I got them, a thing which I flatly refused to do, but told him that he could get the estimates if that was the way he wanted to do. So I sent him plans and specifications, although several contractors did estimate in the office, but sent their bids to D.

About two weeks after the bids were in, D came in my office and said that the bids were higher than he expected, and that in the absence of A and B he would not go on with the work. I told him that I thought the lowest bids were all right, (\$18,000—area of building, 12,000 square feet) and that it would be impossible to build a structure that size for less, as I had estimated the cost from \$18,000 to \$20,000. He said that he would wait for the return of A and B, in a short time.

The last of May, A and B returned, and D came to see me and said that they had decided not to build and wanted me to name a lump sum for my services. I told him what my agreement with A, B and C was, and that for what I had done I should get 3 per cent. He said that this would not be considered as it was too high; he had brought \$100 with which to pay me, and said that they would not pay me any more. I told him that I would not take less than 3 per cent on the estimate, when he said that he had an estimate of \$10,500, which I told him was no good, and that \$17,500 or \$18,000 was a very low estimate. I had the figures of several reputable builders who had estimated, none lower than \$17,500. On the next day D called and offered me \$150 to settle, which I told him was impossible for me to consider, and that I should have 3 per cent.

Shortly after C called and advised me to compromise as it would be better all around, so I sent a bill to A and B for \$300, which brought no reply. I waited a week or two and one day when in Boston called at A's office; he said that he had left the matter for D to settle, and for me to see him. I told him that I did not recognize D in the matter at all as my agreement was with him and his brother. He then said that \$300 was too much, and that he could have had several architects do the work for \$100. I still insisted on \$300; he told me to think it over a few days and see if I could not take something off of my bill.

Some few days after this I was surprised by the objectionable con-

tractor above mentioned coming in and asking for a foundation-plan of the proposed building as he wanted to give it to the engineer to set the batters. I gave him one and shortly after saw the engineer at work; I went out and gave him some heights, etc.

The following day the excavation was begun, but no word was given to me by A, B or D that they were going to proceed with the building. A few days after I wrote to A and B, withdrawing the bill rendered as it had not been accepted by them, and was rendered with the understanding that they were not to erect the building. I also stated that it was my intention to carry out my agreement with them to look after the construction of said building and collect 4 per cent on the cost of the same. I received a reply from A, denying any agreement that I was to do more than make the plans, etc.; in the meantime, they went on with the work and put in the foundation.

After having made considerable progress with the foundation, they applied to the city for a permit to build, which should have been done in the beginning. In the haste in making the plans slight errors had occurred which could have been rectified in fifteen minutes, which prevented them from getting a permit. On account of the disagreement in regard to the price they did not come to me in regard to this, but went at once to another architect, who has prepared new and somewhat different plans. My plans are yet in their possession.

I have been utterly ignored in the matter. I think it all comes from the malice of D, who wanted to get even with me for objecting to his man, the mason before mentioned. The whole thing has been very unpleasant, and through no fault of mine, as I always endeavor to do my work well and with honor.

Therefore, my dear sirs, if you will tell me how to proceed in order to get my rights, I shall be greatly indebted to you.

Yours very truly, "VERITAS."

[On this statement, we should say that the best course would be to commence suit at once. It would be a strange jury which, under such circumstances, would not immediately award "Veritas" the full amount of his bill, with interest and costs.—Eds. AMERICAN ARCHITECT.]



BOSTON, MASS.—Summer Loan Exhibition; Gobelin Tapestries; Japanese Paintings; Line Engravings, Mezzotints, and Etchings by Rembrandt: at the Museum of Fine Arts.

NEW YORK, N. Y.—Twenty-eighth Semi-annual Exhibition: at the Metropolitan Museum of Art.

Summer Charities Loan Exhibition: at the American Art Association Galleries.



AN UNDERGROUND CITY IN TURKESTAN.—Jules Verne thought he was writing of an altogether new and unique thing when he told his famous story of "The Underground City," but again truth proves to be stranger than fiction, as the Russians have discovered a big underground city in Turkestan, near the Bokhara town of Karki. Explorations of some big caves revealed the fact that they led to a city in the dark built thousands of years ago. According to effigies, inscriptions and designs upon the gold and silver money unearthed from among the ruins, the existence of the town dates back some two centuries before the birth of Christ. The underground Bokharan city is about two versts long, and is composed of an enormous labyrinth of corridors, streets and squares, surrounded by houses and other buildings two and three stories high. The edifices contain all kinds of domestic utensils, pots, urns, vases, etc. In some of the streets falls of earth and rock have obstructed the passage, but generally the visitor can walk about freely without so much as lowering his head. The high degree of civilization attained by the inhabitants of the city is shown by the fact that they built in several stories, by the symmetry of the streets and squares, and by the beauty of the baked clay and metal utensils, and of the ornaments and coins which have been found. It is supposed that long centuries ago this city, so carefully concealed in the bowels of the earth, provided an entire population with a refuge from the incursions of the nomadic savages and robbers. To this traveller's tale the *Buffalo Enquirer* might have added a description of the electric-lighting plant that may have been used by these ancients.

ST. GILES, CRIPPLEGATE.—There is no church in London so grimly affecting, or more gruesomely picturesque than St. Giles, Cripplegate. Its lantern is strangely gaunt and blackened, its towers stark and solemn. The approaches are all straggling and curious; we fancy ourselves in a bit of some old foreign city. The curious skulls and hour-glass over the entrance to the churchyard are vigorously done. It escaped the great fire, and is an interesting church altogether—and picturesque. Here we find Milton's tomb, Foxe's, (of the "Book of Martyrs") and that of a daughter of Shakespeare's "Lucy." And, as if this were not sufficient to reward one's curiosity, they will show us the registry of the marriage of Oliver Cromwell to Elizabeth Boucher. In the churchyard a large fragment of the old city wall is to be seen.—*The Gentleman's Magazine*.

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Langor's Cottage



On Unusquam Alley



The Cove



On Squam River



College

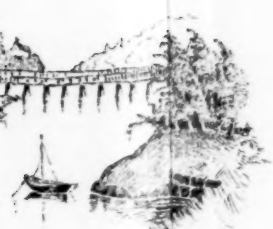


Sketch in the Evening



A bit of Curve St

James Jos. Maginnis

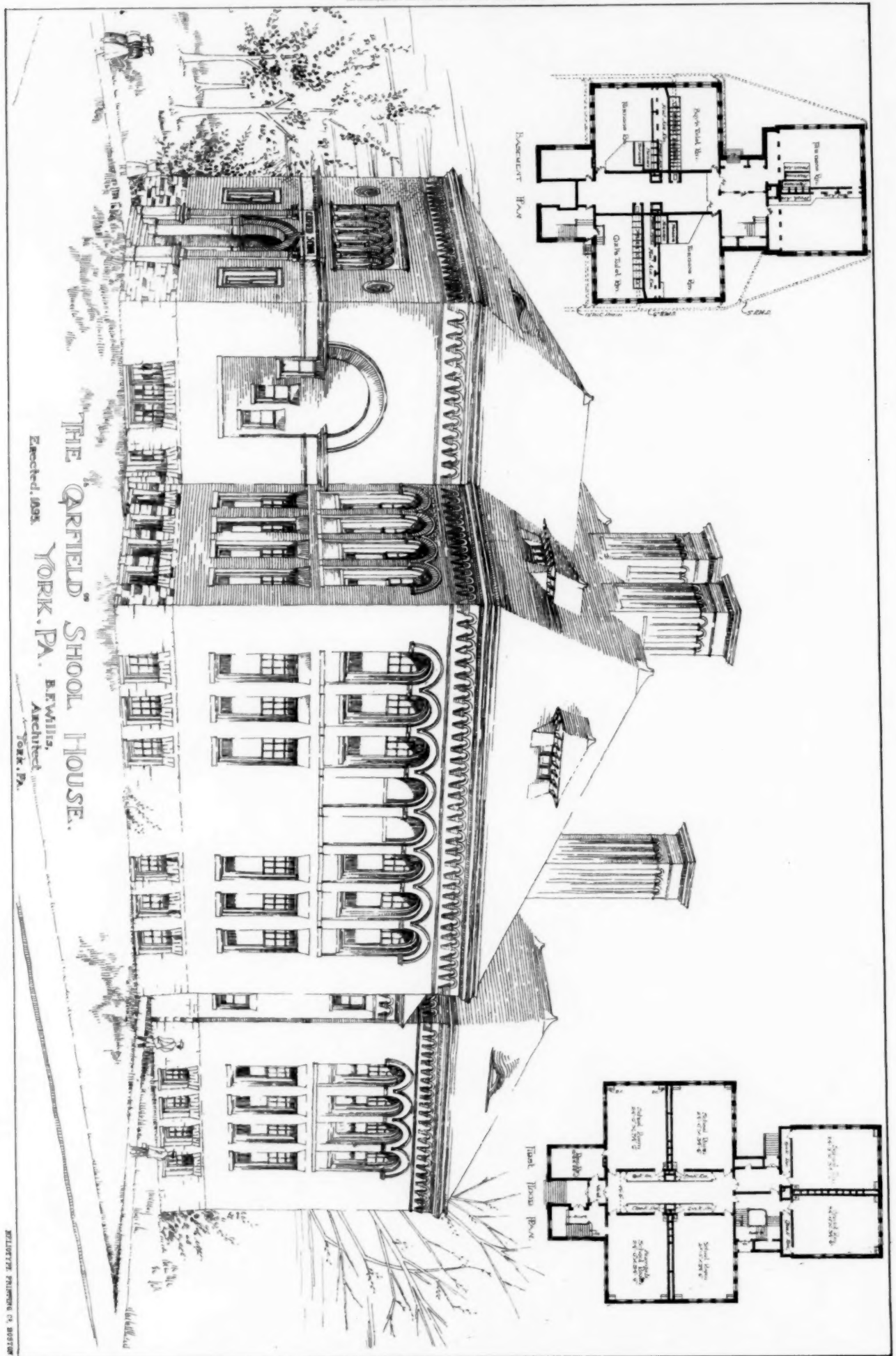


Squam River

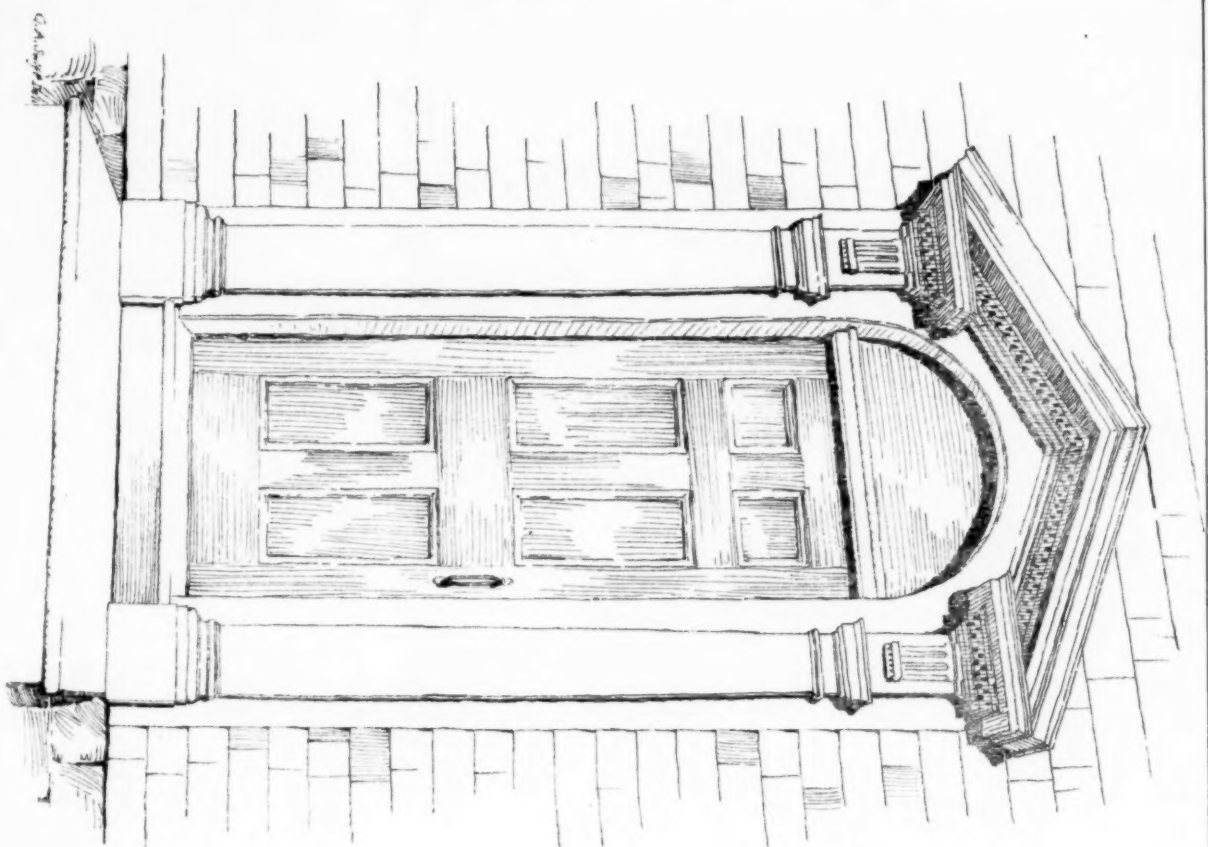


Arlington Street

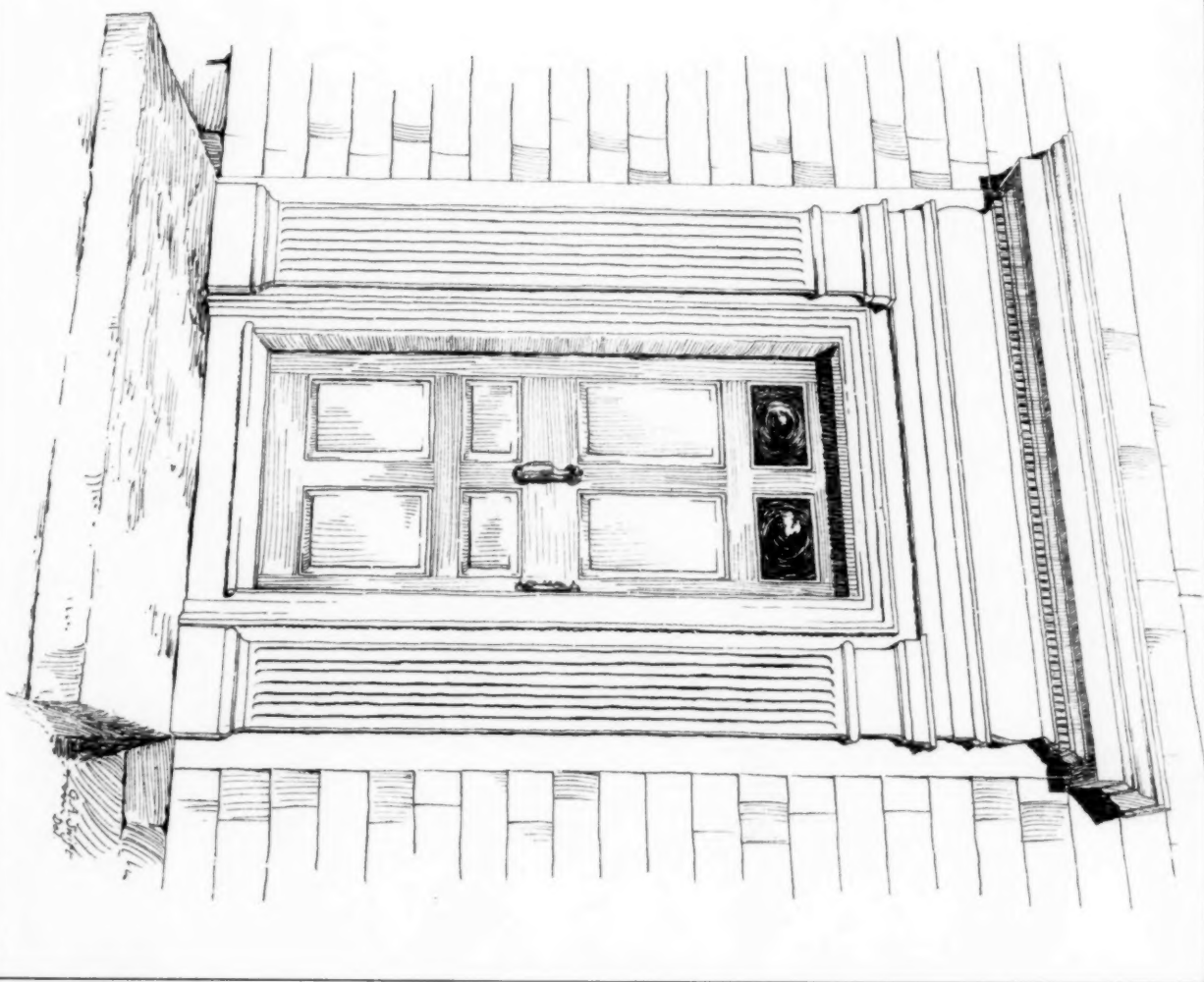
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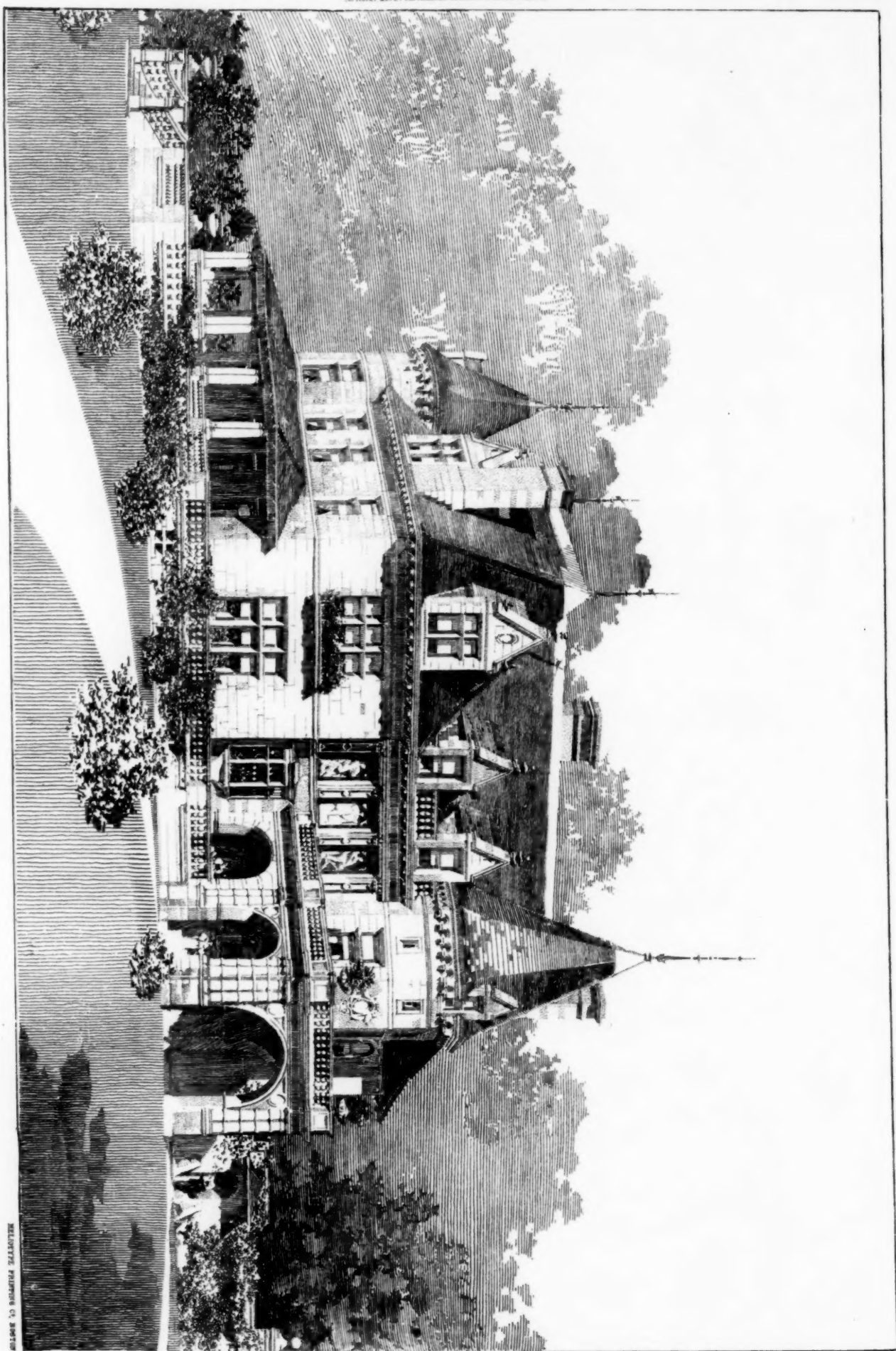
DOORWAY, FAIRHAVEN, MASS.



DOORWAY, ACUSHNET, MASS.

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