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VOL. XXVIII.

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DECORATION

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XXVIII.

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MR. JOHN T. WOOD, the explorer of Ephesus, died recently in London at the age of seventy. Mr. Wood was trained as an architect, and had won a considerable reputation, when he was engaged as architect to the Smyrna & Aidan Railway, and, in that capacity, took up his residence in Asia Minor. Here he became interested in the antiquities of the country, and, after a year's service with the railway company, resigned his position to devote himself to antiquarian research. His most noted work was the excavation of the Temple of Diana at Ephesus, one of the most splendid and famous structures of antiquity, and, although the incendiary Herostratus and the pillagers who succeeded him had done their work effectually, he found remains enough to determine the arrangement of the building and to restore much of its detail. The manner in which this investigation was carried out gained Mr. Wood a high place among archaeologists, and for many years he has been, perhaps, the principal authority on the architectural work of the Asiatic Greeks.

WE are glad to see that some one has awakened to the importance of providing the principal streets in our great cities with subways, through which gas and water mains, electric wires, and perhaps sewers, can be carried without the intolerable expense and annoyance caused by the continual digging up of the streets, which makes it impossible to use or maintain in this country the smooth, clean pavements which in Paris, London, Berlin, Frankfurt or Milan are matters of course. All architects know that if a deep trench is dug, and the excavated material put back into it, years must elapse before the newly-filled tract will become as hard as the surrounding soil. A rule very commonly accepted is that the filled ground is comparatively soft, and subject to settlement, for twenty years, even though kept constantly wet during that time. It is evident, therefore, that when a ditch is cut through the middle of a street, a pipe laid in it, and the earth immediately shovelled back, compacted, not by ramming, which is at best a feebly efficient process, but by the miserable farce of squirting a little stream of water on it from a hose; and the paving-stones then reset, this portion of the street is sure to remain for years soft, uneven and muddy, to the loss and annoyance of all who use it. Even the authors of the mischief suffer from this careless and stupid method of working, for the pipes so

laid are liable to be broken, and, buried in the foul, acid city soil, they rapidly corrode. Every one who has paid any attention to the subject sees that the proper remedy is to provide subways in the main thoroughfares through which all pipes and wires must be carried, and the paved surface left untouched. In the end, these subways would save a large sum of money, both to citizens and to the companies which used them, every year; and, as we believe, they might be constructed by private companies, if the legal right to do so could be obtained, and rented to telegraph, gas, water and electric-lighting companies, with great profit and advantage to all concerned; but it seems to be difficult to arrange for the surrender of rights in the public streets to private companies, and few cities in this country are prepared to incur the expense of building such subways for themselves. In New York, the State Legislature seems disposed to make a beginning toward providing the metropolis with something of the kind, but we will suggest, for the benefit of cities less prosperous than New York, that the problem might be gradually solved by having a proper scheme of subways laid out by a competent engineer, and requiring every telegraph, telephone, electric-light, power, heating and gas company that might wish to carry wires or pipes about the city, not only to use whatever subways might be already in existence, but to build a certain length of subway in addition, according to the official plans, and to the satisfaction of the city engineer. By this scheme, if a new electric-power company, for example, could have the privilege of using a subway already built, instead of having to go to the enormous expense of digging up, restoring and repaving the streets, whenever it wished to lay a new wire, or inspect an old one, it could probably afford to construct one foot of new subway for every ten feet of existing subway that it had the privilege of using; and, although the extension of the system would be slow at first, it would increase in geometrical ratio. A little calculation will show that on this basis, supposing the city to begin with a hundred feet of subway, in some street where it could be used to advantage for water-pipes, and supposing, which is not unreasonable, that ten applications a year were made for the privilege of laying wires or pipes, the total length of subway at the end of the first year would be two hundred feet. At the end of five years it would be thirty-two hundred feet; in ten years it would be nearly twenty miles; and at the end of the fifteenth year there would be six hundred and seventeen miles of subway, all, except the first hundred feet, constructed without expense to the municipality, and by means of a tax on the pipe and wire companies so light that there would probably never be an instance in which it would not be cheaper for them, considering deterioration and surveillance of their property, to build their proportion of subway than to dig up the streets in the manner which now prevails.

THE Executive Committee of the Grant Monument Association has, it is said, decided that the memorial to the great American general shall have the form of a hall, of monumental character, but large enough, not only to contain the tombs of General Grant and his wife, but other objects appropriate to a memorial hall. This resolution seems to have been taken with the praiseworthy object of giving architects, in the new competition, which will probably be invited, something more definite to work upon than the misty instructions of the last; but we hope the zeal of the Committee for improving upon the previous competition will not carry it too far. A memorial hall is all very well; and we should like nothing better than to see at Riverside Park a sort of Valhalla, where those Americans who deserved it might have their names commemorated by the side of our hero; but to specify, for instance, the form or dimensions of the memorial hall, especially if the dimensions were made too large, would be likely to result in the construction of something between a pagoda and a hotel, which would not satisfy anybody. Whatever moralists may say, architects know well enough that a thing cannot be conspicuously beautiful and conspicuously useful at the same time. If the memorial-hall destination of the structure is made too prominent in the conditions, the genius of Ictinus and Phidias might be lavished upon it without suggesting to the minds of the passengers on the river boats the idea that anything more than a new lunatic asylum was being erected. To be "phonetic," as Fergusson would say, and not only to

attract sharply the attention of beholders, but to convey to them the impression that some unusual and solemn feeling is commemorated by the structure before them, the expression of utility must be kept very much in the background, or the commonplace suggestions of front-door, back-door, stairs, windows and elevator, which are inevitably associated in our minds with anything like a public building, will destroy what is most to be desired, the power of the monument to produce an effect at a distance. Of monuments purely phonetic, the colossal statues, such as that of Liberty at New York, the Germania statue on the Rhine, the San Carlo Borromeo at Arona, the Pilgrim Monument, and others, are the best examples, and these are certainly far more effective than any utilitarian house would be in their places. The effect of the Germania is, however, unquestionably improved by the architectural setting, and a still more purely architectural object, well placed, like the monument on the hill near New Haven, may be very noble; but it requires the highest talent and skill to find the happy mean, and care should be taken not to prevent the successful solving of the problem by fixing upon a certain kind of solution beforehand.

THE most remarkable bridge in New England, with by far the widest draw-span, if we are not mistaken, in the world, is said to be already showing signs of settlement, although it was only completed last October. This is the bridge over the Thames River at New London, on the Shore Line Railroad between Boston and New York. At the time of its construction, the bridge attracted great attention among engineers, and was illustrated and described in several foreign technical journals. The trouble appears to have begun in the western pier on the New London side of the river, which is said by the New York *Herald* to have sunk seven inches, cracking also the ice-breaker of stonework which extends northward from the pier. What the foundation of the pier is we are not informed, but the whole region is rocky, and there can be no great difficulty in securing a proper foundation, and underpinning or rebuilding the pier.

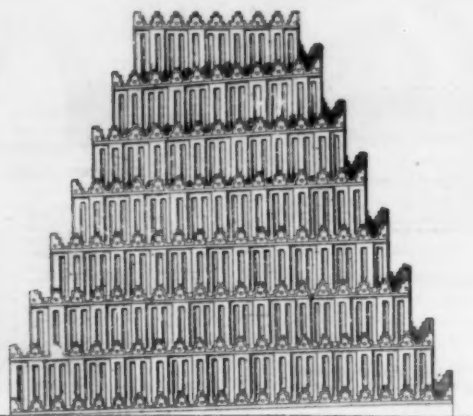
THE *Builder* has some sensible remarks about the compulsory examination for architects, which it is proposed to try again to establish in England. It will be remembered that a bill was introduced into Parliament last year, by which all persons desiring in future to practice architecture were to be required to prove their proficiency by an examination. The bill was not supported by any architects of prominence, and was rejected. This year, another attempt is to be made to get it passed, and the Royal Institute of British Architects, which had taken no notice of the scheme last year, was drawn in by compulsion, in a certain way, by getting twelve members to propose for discussion, in the manner provided by the by-laws, a resolution urging the establishment of compulsory examinations. When the time came for the appointed discussion, a counter-resolution was adopted, by a vote of about three to one, to the effect that "while not opposed to the principle of compulsory examination, as applied to those about to practise architecture, the Institute is of opinion that the difficulty of restricting by statutory powers the practise of architecture to those who have passed an examination is at present so insuperable that it is undesirable to make an immediate application for such powers." Some of the advocates of the examination made rather intemperate remarks on the subject, one of them, in particular, disparaging the Institute, and saying that in the city where he lived, and where there are many architects, only a very few, and those not the most eminent, were members of the Institute. This gives the *Builder* an opportunity for an effective retort. As it says, what the architectural profession needs now to raise its standing in the world is not examinations, but friendly coöperation. In the Institution of Civil Engineers, it informs us, there is not, and never has been, any test examination for admission; yet all young engineers apply for admission as soon as they can, and membership is generally recognized as an indication of professional ability. Among architects, however, membership in the Institute is regarded with indifference, and a large part of the profession seems to think that unity and loyalty to a common cause, that of the advancement and defence of good architecture, is a matter of no importance. The consequence is, as the *Builder* says, that, although the Institution of Engineers has no examination, the profession which it represents, acting through it with the force

which numbers and unanimity of opinion give, "holds its position uncompromisingly before the public," while that of architecture, divided, disloyal and indifferent, has sunk into a public contempt, the depth of which is only occasionally revealed by some rude shock.

A NEW and very important observation is made in regard to the statues of the Parthenon pediments by Dr. Puchstein, Assistant-keeper of the Berlin Museum, who points out that these statues must have been cut with the aid of what Pausanias calls a "running drill," since the chisels used by the Greeks before the invention of this drill would not do the undercutting which the pediment groups show. In this respect, moreover, the pediment sculptures differ from those of the Parthenon metopes and those of the other principal Athenian buildings of the date of Phidias, as well as from the newly-discovered pediment group of the Parthenon at Olympia, which is with certainty ascribed to Phidias. From these indications, Dr. Puchstein concludes that the pediment groups of the Parthenon must have been cut and placed in position after the completion of the rest of the work, and he thinks they may have been executed by Callimachus, the inventor of the Corinthian capital, and the hero of the pretty story about the acanthus leaves growing up about the basket, with a tile on it, laid upon a grave. It by no means follows that, because Phidias did not do a certain piece of work, Callimachus must have had a hand in it; but Callimachus is said by Pausanias to have been the first to devise and use the "running drill," and the Parthenon groups must have been among the earliest works executed with the new instrument.

A SCHEME is actually under consideration for the construction of a railway up the Jungfrau, in Bernese Switzerland, one of the loftiest and most difficult of ascent of all the Alpine peaks. As the Jungfrau is remarkable for the force of the avalanches which rush down its sides at short intervals, a railway on the surface would be out of the question, and the new road is to ascend almost entirely in a tunnel. Here and there, the tunnel will be aired and ventilated by means of short galleries extending directly out to the mountain-side, and the trains will stop at these places, partly to allow the passengers to enjoy the view from the opening of the galleries, and partly to prolong the ascent, so that the change in atmospheric density from a pressure of about fifteen pounds to the square inch at the foot, to ten pounds at the summit, may not be too suddenly felt. Even with these stops, the journey will occupy only two hours. Although the view from the Jungfrau comprises nearly all Switzerland and a part of Germany, Italy is cut off from it by the still higher Monte Rosa range, and it seems a pity that the energy needed for tunnelling a railroad to the summit should not be kept for a line to the top of the Mount Blanc, which, though more than two thousand feet higher above the sea, is only about as high above Chamonix as the Jungfrau is above Interlaken, or even Lauterbrunnen, while the view from it is infinitely more interesting, comprising Switzerland and the Tyrol, portions of France, Germany and Austria, the Mediterranean, and Italy as far as the Apennines.

A DISCOVERY of ancient subterranean tombs, arranged something after the fashion of the Roman catacombs, has been made on the Mount of Olives, near Jerusalem. A Greek bishop, Epiphanius, probably fearing the consequences to historical and sacred sentiment of the opening of the railway from the sea-coast to Jerusalem, which is, we believe, already in process of construction, bought about twelve acres of ground, including one of the three peaks of the Mount of Olives, that known as the "Hunters' Garden," and, after surrounding it by a high wall, planted it with trees, and began the construction of a house and a small chapel. In the course of the excavation for the buildings, the workmen came across the remains of a group of tombs. Several shafts and capitals of columns, ornamented with acanthus leaves, in the Roman-Greek manner, were dug up, and the plinths on which they rested were found. Between the plinths was a mosaic pavement, containing a Greek inscription in black on a white ground; and under the mosaic were found stone slabs, which formed the covers of tombs. So far, fifteen of these tombs have been opened. They appear to have been made partly by Jews, and partly by Christians, those attributed to the latter being situated in a group a little apart from the others.

RELIGIOUS ARCHITECTURE.¹—IV.II. RELIGIOUS ARCHITECTURE OF ANTIQUITY. — ASSYRIA,
PHœNICIA AND PERSIA.Fig. 1. Elevation of the Observatory Temple at Khorsabad (8th Century B. C.).
After Place and Thomas.

THE ancients applied the term Mesopotamia to the land lying between the rivers Tigris and Euphrates, and extending from the Persian Gulf northward to the sources of these streams. This vast region comprised, in the south, Chaldea, with Babylon as its capitol, and in the north, Assyria with the seat of government at Nineveh. The population was of Semitic descent. On the west stretched the deserts of Arabia, while to the east the country was occupied by the Elamites, and by the Medes and Persians, two Aryan tribes derived from a common origin.

The history of these peoples presents an almost unparalleled record of incessant warfare; and hence there grew up in the bosom of the Semitic family a vigorous, belligerent and conquering race.

At the dawn of history the country was under the rule of a Median dynasty, which shows that the Medes had previously subjugated Chaldea. The precise date of this conquest, 2295 B. C., is learned from the ulterior inscriptions of Ashurbanipal. About 2047 B. C., a Chaldean dynasty recovered the power and held it down to the moment when the Egyptians of the eighteenth dynasty subdued all Mesopotamia.

Chaldea continued under the domination of Egypt, after the sixteenth century B. C., while the northern division succeeded in reconquering and maintaining its independence. The Assyrians gradually invaded Chaldea, and driving back the Egyptians, at length, in the fourteenth century B. C., became complete masters of the country. Babylon attempted, by numerous revolts, to escape from their yoke; but, notwithstanding many bloody struggles, it remained under Assyrian supremacy down to the seventh century B. C. The conquerors pushed their expeditions in all directions, along the shores of the Caspian Sea, in Armenia, in Cappadocia, in Syria and in Phœnicia. It was during this glorious period, in the eighth century B. C., that Sargon founded the city of Khorsabad, whose ruins have been discovered and of which we shall have something to say farther on; it was at this time also that Sennacherib built the palace of Koyunjik (Nineveh), which Layard was able to unearth and restore.

In 632 B. C., the Scythians invaded the country, entirely ravaging it, with the exception of the fortified cities, and extending their incursions to the very frontiers of Egypt; then they retired to their deserts and were superseded by the Medes, who occupied Assyria as well as Chaldea. Nineveh was destroyed at this time.

Under the Median monarchs, and later under the Persian, the rival city of Babylon reared its walls and grew in importance and splendor; in the sixth century B. C., it was the largest and most beautiful city of Asia. It began to decline after the conquest of the country by the Greeks, and the Parthian invasion completed its ruin.

The remains of Mesopotamian religious architecture are unfortunately in a very bad state of preservation. The edifices were built of unburnt brick, and the action of rain, wind and sun has converted them into rubbish-heaps. The explorer can

only guess at their existence by the discovery of mounds in perfectly level plains, whose presence there cannot be accounted for by the geological character of the soil.

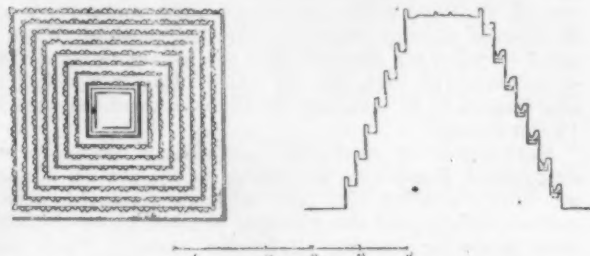
In Chaldea, we may call attention to the ruins of Warka, Abou-Shahreïn and Mougheir, of which we shall speak hereafter, and of Tell-Loh; also to those of Babil, El-Kasr and Tell-Amram on the site of Babylon; in Assyria, we note especially those of Birs-i-Nimrud and of Koyunjik, formerly Nineveh.

But the most important of all these remains, those which archaeologists have been able to turn to account in reconstructing the edifices of Assyria, are the ruins of Khorsabad, near Mosul and ancient Nineveh. Originally discovered by Botta, they were first seriously explored by Place and Thomas who completely unearthed them. They proved to be the remains of the gigantic palace reared by Sargon.

On one side was discovered a terrace-shaped structure, which, from our especial view-point, furnishes a most interesting subject for study.

The purpose of this edifice has not yet been satisfactorily determined. Place and Thomas are of the opinion that it was an observatory; it is, however, generally believed to have been a temple. Yet the one destination did not exclude the other, as is shown by the well-known religious ideas which the Chaldeans connected with the observation of the stars. In any case the discovery of two stone altars in the ruins unquestionably determines, even according to Place, the religious character of the structure.

A staircase, or inclined way, wound around the tower (Figures 1, 2, 3), as indicated by the elevations and sections. The path encircling the first story measured 564½ feet in length; the slope was only about 1½ inches to every 3½ feet. As the ascent was made the distance around the pyramid



Figs. 2 and 3. Plan and Section of the Observatory Temple at Khorsabad.

diminished, and, since the stories were of the same height, the slope became steeper: at the summit, however, it was still only 2½ inches to every 3½ feet. The terrace at the top was 39.37 feet square; it was there that the altars must have been placed and that the priests were stationed during ceremonies.

There are four stories still in existence; the total number was doubtless seven; this would tally with the descriptions of antiquity and would also make the height of the pyramid equal to the side of the base, the usual proportion. The faces of the lowest story were stuccoed with a white coating, while the next story was black, the next red, and the one above that blue. And, in fact, Herodotus writes: "The Medes constructed the mighty and formidable ramparts of the city at present called Ecbatana, where the walls rise behind one another. This disposition was favored by the slope of the ground, which is such that each wall surpasses the one in front by the height of the battlements. The battlements of the first wall are of white stone, those of the second are of black stone, while those of the next are purplish; they are blue in the fourth and vermillion in the fifth; the battlements of the last two walls are painted, the first in silver, the next in gold." This variation in the coloring by stories was then the customary thing in Assyria, and we need not be surprised to find it on the tower of Khorsabad, and in such complete harmony with the tints described by the ancient historian.

The brick steps were intact; the remains of the battlemented parapets which originally bordered the inclined path have been discovered.

Not far from this tower, and in the huge mass of buildings constituting the palace and city of Khorsabad, we find the remains of a temple which seems to have been left unfinished.

Only a few varieties of material were in use; first of all, and for the heavy part of the work, crude clay was employed; this was puddled and mixed with straw which had been

¹From the French of P. Planat, in Planat's "Encyclopédie de l'Architecture et de la Construction." Continued from page 53, No. 748.

trampled fine by men and horses; it was cut and moulded, and then dried in the sun for a long period, sometimes for several years even. And yet stone was not wanting in this region; the Assyrians understood working and using it, for enormous blocks of it are found in a few retaining walls and flags, and especially in decorative sculptures. But, as the Ninevites came originally from Chaldea, they had brought with them southern customs; and in Chaldea clay was the only feasible material; besides it answered perfectly and cheaply all climatic requirements. Even now, thick layers of earth are the most effective protection against the torrid suns which parch all this country. In the Assyrian constructions the walls were of extraordinary thickness.

The manufacture of burnt bricks had likewise been imported from Babylon or Chaldea; all ancient historians moreover agree in attributing the invention of this building material to the Chaldeans. It appears to have been of excellent quality. The dimensions of the bricks were about $15\frac{1}{2}$ in. x $15\frac{1}{2}$ in. x $2\frac{3}{4}$ in., for the upper courses of construction, and $12\frac{1}{2}$ in. x $12\frac{1}{2}$ in. x $4\frac{1}{4}$ in. for the lower courses. For vaultings, bricks moulded in special forms were employed.

The enamelled bricks, for polychromatic facings, were of somewhat different sizes. Limestone was used for mural casings and for flags; it was of two qualities, one soft and the other very fine, like hard, firm rock.

Gypseous alabaster, a substance peculiar to Assyria, was employed on surfaces, often of considerable extent, for architectural or sculptural decorations.

Stucco materials, with a base of lime for the white portions and of bitumen for the black, were applied in coatings to all parts that were not covered with chisellings.

The system of foundations was exactly the reverse of ours. Instead of making excavations, the Assyrians began by building an enormous mound of unburnt bricks, which was often carried up 45 or 50 feet in height. The walls, which were likewise of unburnt brick, were erected on this. When we speak of walls, the reader should not picture to himself constructions in the least like our walls. They varied in thickness from 25 to 80 feet, and the thinnest partitions were 9 to 10 feet through.

Mere climatic exigencies are insufficient to account for such exaggerated dimensions; in seeking an explanation of these, we must remember that the materials employed were of mediocre quality, and above all that manifold forms of vaulting were in use for covering all interior spaces. These vaults were necessarily made very thick to keep out the heat. The

thrust would consequently be considerable, and it would be impossible to support it, especially with insecure material, unless the walls were of a thickness that seems to us enormous. Moreover, the Assyrians constantly made use of buttresses to complete the necessary supports, especially in the base-

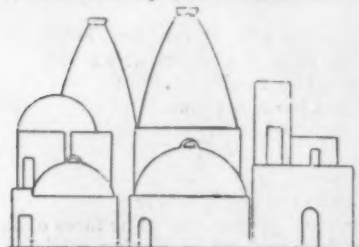


Fig. 4. Dome-covered Edifice; a Bas-relief from Koyunjik. After Layard.

ments, where it was to be feared that the masses of crude clay might slump and become, despite the masonry, veritable rubbish-heaps.

There is no reason for assuming that wood played any important part in the ceiling of halls; on the contrary, entire sections of vaults have been discovered, with the intrados still revetted with stucco or enamelled bricks. In fact, the vault was employed almost everywhere.

The dome was very probably known to the Assyrians, as is shown by several bas-reliefs (Figure 4) figuring dome-covered edifices, both spherical and elliptical. Adequate remains of these have not yet been discovered, although several square rooms at Khorsabad seem to have been covered in this way. It is probable also that some roofings consisted of semicupolas or open niches (Figure 5), reaching above the walls and so oriented as to shade one side while admitting the

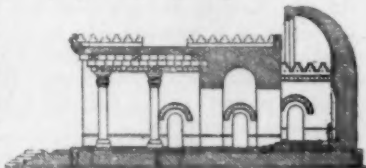


Fig. 5. Assyrian Semi-cupolas. After Place and Thomas.

diffused light on the opposite side for the illumination of the interior.

But the most remarkable constructional peculiarity is to be observed in the divers subterranean conduits or drains which

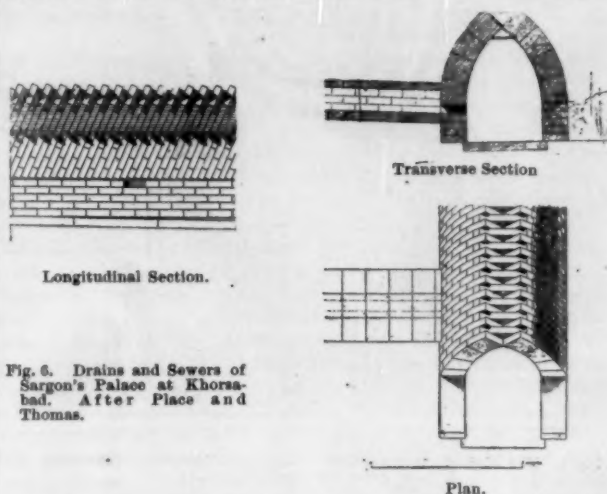


Fig. 6. Drains and Sewers of Sargon's Palace at Khorsabad. After Place and Thomas.

were built to carry off the water. The study of these demonstrates that from remote antiquity the Ninevites put in use the various forms of the vault—flat, rounded, semicircular, surbased, pointed and ellipsoidal—and all built in a very satisfactory manner.

Without entering into minute details, which will be found set forth in the work by Place and Thomas, entitled "*Ninive et l'Assyrie*," we will call attention to several of the peculiarities

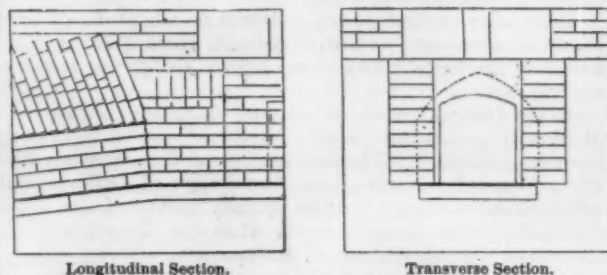


Fig. 7. Depressed Vaults in the Drains at Khorsabad. After Place and Thomas.

of these varied dispositions (Figures 6 to 9). In the principal drain (Figure 6), it is noticeable that the body of the brick is laid—not following the direction of the haunches or flanks of the vault, so that a vertical section shows a vertical section of

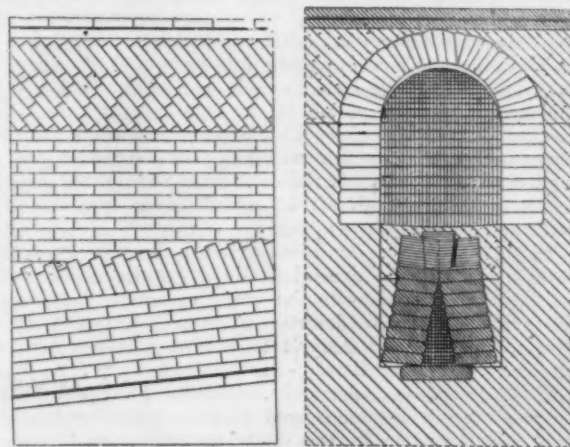


Fig. 8. Semi-circular Vaults in the Drains at Khorsabad.

the brick—but obliquely; the bricks of the same section, instead of touching on their broadest surfaces are in contact on their smaller sides. We shall see this same disposition re-appearing several different times in more advanced ages, in Byzantine architecture, but it was important to fix its high antiquity.

It will be remarked that only every other course of bricks was closed at the crown of the vaults. The filling-in of the

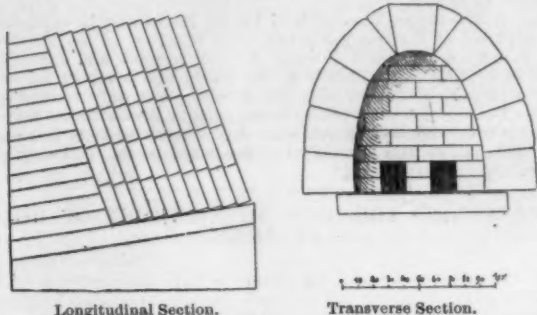


Fig. 9. Elongated Elliptical Vaults in the Drains at Khorsabad. After Place and Thomas.

joints was done after the whole was laid, by means of crude clay. Moreover, in the triangular arched construction a voussoired key is not necessary, as the two halves need only to be buttressed against each other at the summit, that is, contact need only be established, in order that the vault should be maintained in equilibrium. There was, therefore, nothing irrational in the disposition adopted by the Ninevites.

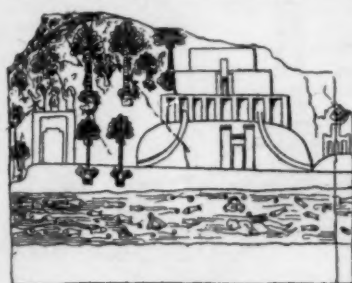


Fig. 10. Assyrian Temple, from a Bas-relief (Layard).

When the vaulting was in the form of an elongated ellipse (Figure 9), it will be remarked that the trapezoidal shape given to the moulding of the voussoirs was not well adapted to the peculiar key-joint. Without taking any farther precaution,

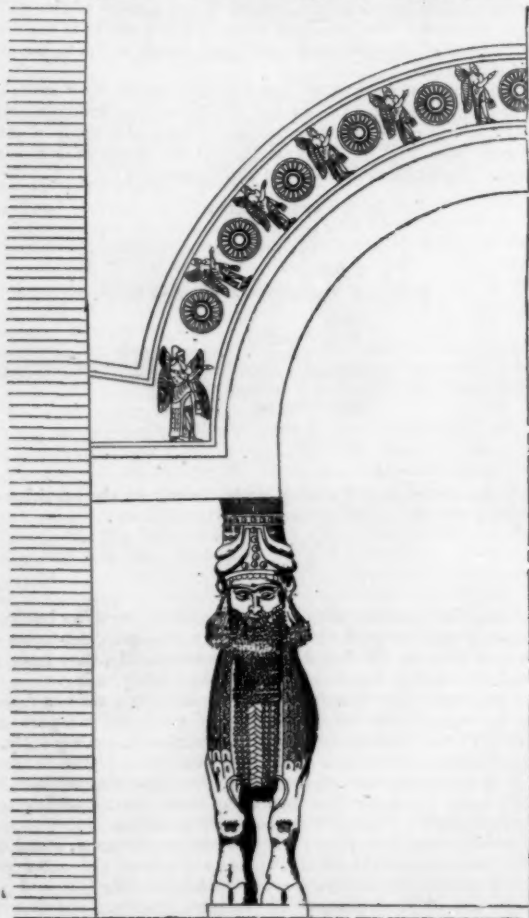


Fig. 11. Door in the Southeast Façade at Khorsabad (8th Century B. C.).

the Assyrian builders contented themselves with merely inserting two clay wedges.

Although the several-storied tower was the orthodox design for religious edifices, variants of this disposition were not unknown. An examination of the remains discovered by Taylor and Loftus at Warka, Abou-Shahreïn, and Mougheir seems to prove that in these structures the tower did not rise in accordance with the vertical axis of the basement, but was set back. Flights of steps and broad terraces were laid out in front; there was a chapel at the summit. Restorations, necessarily hypothetical on account of the insignificance of the fragments that have been preserved, have been attempted by Perrot and Chipiez; these are very likely quite correct.

We must also call attention to a disposition exhibited on a bas-relief found at Koyunjik (Figure 10), in which the basement seems to have taken the form of cross-vaults. Two paths traced along the flanks of the substructure apparently lead to the base of the terrace-tower.

And, lastly, it is believed that vestiges of temples constructed on a wholly different model have been found at Khorsabad and at Nimrud. In design, they apparently approach more nearly the universal type of a temple; there is an anterior room, a *pronaos*, perhaps, communicating with a *naos* or *cella*; a few adjoining chambers, the uses of which are unknown, extend along the side.

How were these temples decorated, if, in fact, they are temples? This cannot be determined, as the condition of the ruins allows of only a reconstruction of the plan. We may, perhaps, assume that their general form is indicated in the familiar bas-relief of Khorsabad. In that case, the façade must have consisted of a triangular pediment supported on pillars and columns. But it is not certainly known whether the edifice represented is Armenian or Assyrian, nor whether it is indeed an example of a temple. For the present, therefore, it is best to maintain a discreet reserve on all that concerns this particular form of Assyrian religious structures.

As for the system of decoration employed, the details properly belong to a special article on Assyrian architecture. We will merely call attention here to the southeastern door at Khorsabad (Figure 11), where the greater part of the motives will be found.

[To be continued.]

PROPOSED LAW FOR LICENSING ARCHITECTS.



"All the Modern Improvements."—No. 7.

THERE is given below the text of a bill introduced in the New York Legislature providing for a State Board to license architects:

SECTION 1. Within 60 days after the passage of this act, the Western New York State Association of Architects and the New York Chapter of the American Institute of Architects, may each, at a duly called meeting thereof, nominate four of its members for appointment as members of the State Board of Architects, and may transmit such nominations, duly certified by its President and Secretary, to the Governor of this State. The Governor shall thereupon appoint seven persons to constitute the State Board of Architects, as follows: Two shall be appointed from the members so nominated by the Western New York State Association of Architects, one of whom shall be designated to hold office for one year; two shall be appointed from the persons so nominated by the New York Chapter of the American Institute of Architects, one of whom shall be designated to hold office for one year; one shall be so appointed from the persons constituting the Faculty of Architecture of Columbia

College; and one shall be so appointed from the persons constituting the Faculty of Architecture of the Cornell University; one of the persons so appointed from one of the said faculties shall be designated to hold office for one year; one of the persons so appointed shall be a lawyer of at least five years' standing. Each person so appointed shall hold office for two years, unless so designated to hold office for one year. Annually thereafter the Western New York State Association of Architects and the New York Chapter of the American Institute of Architects shall each nominate for appointment by the Governor in like manner two of its members, from whom, in each case, the Governor shall appoint one member of the State Board of Architects for the term of two years. Upon the expiration of the term of office of the member appointed from either of said Faculties of Architecture, the Governor shall appoint from said Faculty one person as successor to such outgoing member, to hold office for two years. Upon the expiration of the term of office of the person appointed from the legal profession as a member of said Board, the Governor shall appoint a person qualified in like manner as his successor for a term of two years. Each member shall hold over after the expiration of his term until his successor shall have been duly appointed and qualified. Any vacancy occurring in the membership of the Board shall be filled for the balance of the unexpired in like manner. The members of the Board shall serve without compensation or reimbursement for their services and expenses from the State.

SEC. 2. The members of the State Board of Architects shall, before entering upon the discharge of their duties, take and file with the Secretary of the State the constitutional oath of office. They shall annually elect from their number a President and a Secretary, who shall also be Treasurer, to hold office for one year. The Board may adopt rules and regulations to govern their proceedings, not inconsistent with this act. The Board may adopt a seal, and the Secretary shall have the care and custody thereof, and shall keep a record of all the proceedings of the Board, which shall be open to public examination. Five members of the Board shall constitute a quorum; but the Board may delegate the examination of applicants to a committee of less number to report the examination to the Board. Special meetings of the Board shall be called by the Secretary upon the request of any two members, by giving at least five days' written notice of the meeting to each member. The Board may adopt rules and regulations for the examination and licensing of applicants for licenses to practice architecture in accordance with the provisions of this act, and may amend, modify and repeal such rules and regulations from time to time. The Board shall, immediately upon the election of each officer thereof, and upon the adoption, repeal or modification of the rules and regulations for the licensing of applicants, file with the Secretary of the State, and publish in at least two architectural journals, the name and post-office address of each officer and a copy of such rules and regulations, or the amendment, repeal or modification thereof.

SEC. 3. Provision shall be made by the State Board of Architects for holding examinations of applicants for license to practice architecture at least once in each year, if there shall be any application therefor, in each of the judicial departments of the State, except the second judicial department, and any person over 21 years of age, upon the payment of a fee of \$5 to the Board, shall be entitled to enter any examination appointed for determining the qualifications of applicants for such license. If the examination of any applicant for a license shall be satisfactory to a majority of the Board, a license shall be issued to the applicant, authorizing him to practice the profession of architecture, upon the payment of an additional fee of \$15. A person who shall at the time of the passage of this act be engaged in the practice of architecture in this State shall be entitled to such a license without fee or examination on presenting to the State Board of Architects an affidavit to that effect. Each person so licensed shall cause the same to be recorded in the clerk's office of the county of his residence, or, if a non-resident of the State, in the county in this State in which he shall have an office, and the clerk shall record the same upon payment to him of his fees at the same rate as for recording a deed. Upon every change of such residence or office from such county to another county in this State, the holder of such a license shall cause the same to be recorded in like manner in the clerk's office of the county to which such residence or office shall be changed. The Board shall keep on file in the office of the Secretary of State a correct list of all licensed architects.

SEC. 4. Any license so granted may be revoked by the State Board of Architects for gross negligence, recklessness or dishonest practices of the holder thereof; but before any license shall be revoked, such holder shall be entitled to at least 20 days' notice of the charge against him, and of the time and place within the county of his residence of the meeting of the Board for hearing and determining of such charge. For such purpose the Board shall have the powers of a court of record sitting in the county in which their meeting shall be held, and issue subpoenas and to compel the attendance and testimony of witnesses. Witnesses shall be entitled to the same fees as witnesses in a court of record to be paid in like manner. The accused shall be entitled to the subpoena of the Board for his witnesses and a reasonable opportunity to produce his witnesses before them and to be heard in person or by counsel in open public trial; and no license shall be revoked except by the unanimous vote of all the members of the Board.

SEC. 5. If a person shall pursue the practice of architecture in this State, or shall engage in this State in the business of preparing plans, specifications and preliminary data for the erection or alteration of buildings, or shall advertise or put out any sign or card designating himself as an architect having an office or doing business within this State, without a license therefor in accordance with the provisions of this act, he shall be guilty of a misdemeanor, and upon conviction, shall be fined not less than \$50, nor more than \$5,000. But nothing herein contained shall be construed to prohibit any person in this State from acting as architect of his own building, or as architect for any person employing him with full knowledge on the part of such employer that the person so employed is not a licensed architect in accordance with this act; nor to prohibit architects residing in other States and not having an office or carrying on a general business in

this State, from competing for a special building, or from visiting the State for such purpose in person; nor to prohibit students or employees of licensed architects from acting for or upon the authority of such licensed architects.

SEC. 6. The license fees received by the Board may be expended for the payment of the travelling and other expenses of the members of the Board. An itemized account of such receipts and expenditures shall be kept by the Secretary of the Board and a report thereof for each year ending with the 13th day of September, duly verified by the affidavit of the Secretary of the Board shall be filed with the Secretary of State within 60 days thereafter. Any surplus of such fees exceeding \$500 shall be paid annually by the Board to the Treasurer of the State.

SUGGESTIONS FOR THE IMPROVEMENT OF HOUSE-FRAMING.



IN our wooden frame houses, cracks in the plaster of the walls are very common. The principal cause of these cracks is the unequal settlement of the walls and partitions, which is due to the shrinkage of the frame.

In the ordinary method of framing, the second-story studs of the outer walls have between them and the unyielding underpinning (?), fourteen inches of shrinkable timber, whereas the studs of interior partitions have 29½" or 4", according to the mode of construction adopted. This timber is disposed as follows:

OUTER WALLS.	
Girt,	8"
Sill,	6"
Total,	14"
INTERIOR PARTITIONS.—COMMON MODE.	
Sole,	2"
Floor-boards,	3"
" joist,	10"
Partition cap,	2"
" sole,	2"
Floor-boards,	3"
" joist,	10"
Sole (?),	2"
	29 6-8"

Or, if the better way of setting studs directly on the partition-caps is adopted, the shrinkable timber will be as follows:

Cap,	2"
Sole,	2"
	4"

The studs of partitions with no corresponding partition below, and the furring studs around chimneys, are customarily set upon a 2" sole, which rests on the floor-boards. Consequently, they have 29½" of shrinkable timber between them and the underpinning.

The accompanying drawings (See Illustrations) show a frame in which (provided the timber shrinks as much in one part as in another (?)) the settlement will be uniform, and, consequently, the principal cause of cracked plastering removed. This is accomplished by arranging that all the studs (furring-studs, partition-studs and all) upon the same floor have the same amount of horizontal timber between them and the unyielding foundation.

The studs of the first story, and also the corner-posts, stand upon a sill of the same thickness throughout: 6 x 8 on the outer walls, and 6 x 6 on the interior brick partition-walls. The girt and partition caps are of hard pine, which shrinks less than spruce. The partition-caps are of the ordinary size, 2 x 4, while the girt is 3 x 4, and the studs are framed into it half-an-inch on each side, so that there is left but two inches of timber between their ends.

Over door and window openings the girt and partition caps must t

be reinforced with angle-iron, or else the openings must be trussed in the ordinary way. (See isometric drawing.)

The furring-studs about chimneys rest upon a 6 x 4 sill at the first floor, and have a 2 x 4 cap, the same as the partitions. The sill supporting them rests upon an engaged pier built out from the corner of the chimney-breast. (See drawing.)

All partitions which have no corresponding partition below to rest upon are trussed so as to be self-supporting; or, if the openings will not allow of this, they may be supported on iron or steel I-beams; or, if there is nothing but their own weight to be supported, they may rest upon an iron strap screwed into the under-side of the floor-joists.

The cost of a five-inch I-beam, 16' long, weighing 30 pounds per yard, which would be amply strong enough to support a partition over a 16-foot span, would be, with iron at present prices (3 cents a pound), only \$4.80.

The drawings also show a departure from common practice in the method of framing the studs into the sill and girt. The studs are ordinarily cut with tenons on both ends, and the bearing comes on the shoulders alone. Thus the full strength of the timber is not utilized. The drawing shows the studs cut with flat ends, so that they bear over the whole surface. They are notched into the sill half-an-inch or so, and secured by nailing to the floor-joists.

The writer claims no originality for the methods above described. He has, however, never seen a text-book on construction which described any of them.

WILLIAM ATKINSON.



WE are now at Munich, but if the reader will permit we will retrace our steps and briefly consider one of the grandest specimens of German architecture, the cathedral at Mayence.

The effect of the Mayence Cathedral is much marred by its unfortunate location; surrounded as it is on three sides by houses, stalls and sheds, and planted in the midst of the busy throng on the market-place, it is only with some difficulty that the main entrance, which as usual in double apsidal churches is placed in the middle of one of the sides, can be found. It is naturally quite unimposing, a characteristic of the Romanesque style in Germany if not elsewhere. A marked contrast lies between the simple grandeur of the German Romanesque and their Gothic, a style which the Germans never seem to have fully understood, importation as it was. For it is now a pretty well established fact that in Germany the Gothic style was not a development of the Romanesque as exhibited in the three great cathedrals, Mayence, Worms, and Speyer, but was brought from France. The cathedral at Mayence is, in point of size, the most noteworthy of the three, also in point of beauty, I should say. Its history is most varied and interesting. From the outset it seems to have been the unfortunate prey of the flames, for from the ravages of fire it has ever suffered much.

Thus we learn that in the year 978 the corner-stone was laid by Archbishop Willgis. Thirty years later, on the eve of the day of its dedication, the ceremonies of which were carried on with all the pomp and splendor of the time, it was destroyed by fire. It is known that at this time the structure was a basilica with the usual flat ceiling of wood. In the year 1024 it must again have been completed, for it was at that time and here that the Emperor Konrad II was crowned. But in 1081 it was almost completely destroyed—from this period nothing remains but the two corner towers on the north and south side of the east choir—and also, in 1137 when, with a whole district of the city, it was at the mercy of the ravaging element. It was only two years before that the chapel St. Godard was commenced, which fortunately remained unimpaired.

In 1159 the cathedral was used as a place of refuge by the clergy who were threatened by the oppressed citizens, enraged by the continued demands for money. Resistance after a short time was of no avail and the cathedral was given up to the mob, who plundered the vaults, which contained no mean treasure, carried off and destroyed what they could and then entered the house of the bishop where they completed their destructive work. They, however, were compelled to pay dearly for thus venting their spite when the Emperor Frederick Barbarossa heard of it, for he soon made them repair the damages. In another riot a year later, the bishop was assassinated. This time the punishment was more severe. The Emperor ordered the wall and gates of the city to be levelled to the ground.

The most disastrous fire, however, was yet to come, for in the year 1190, a part of the Cathedral and three other churches in the neighborhood were entirely destroyed.

The people looked upon this calamity as a visitation of the wrath of heaven and a punishment for the murder of the bishop. Rebuilding was soon commenced but some years later the roof of the central tower was blown off during a gale. This was on the day of a great feast, the emperor, the clergy, and all the great people of the country were in the city. An immense wooden structure had been built, the cathedral not having yet been in a condition fit for the ceremonies, which was torn to pieces by the tempest. And it is reported that the immense wall timbers were sent flying over the Rhine and there deposited. Awe-stricken eye-witnesses also avow that on one of these beams his Satanic Majesty had perched himself, and that this aeronaut after having circled around the city several times disappeared over the Rhine.

In 1757 the Cathedral was again partly destroyed by fire. It was rebuilt, but during the bombardment by the French in the year 1793 it met with a similar fate. After the French had gained possession of the city they decided to entirely destroy it but this act of vandalism fortunately was never accomplished. The reason they gave for their destructive intention was, to quote the words with which the prefect answered all questions regarding his intentions: "C'est trop Gothique." In 1828 an iron dome was put on the central tower but which does not now remain.

Turning again to Munich I should like to treat briefly of several public buildings which to me seem quite noteworthy; in the first place, of the Glyptothek.

The Glyptothek, the Gallery of Sculpture, erected at the beginning of this century and containing the collection formed by King Louis I, not only heads the long list of buildings with which this sovereign beautified the city of Munich, but also marks the opening of the career of one of his most celebrated architects, Leo v. Klenze. Klenze, who practised entirely in the Classic style and who, in fact, thought there was no art but Greek art, held the position of architect to the King until the latter rather wearied of that style and compelled him to share the honors of the position with Fred. v. Gaertner. Gaertner practised mostly in Florentine Renaissance and we shall have occasion to look at one of his buildings presently.

King Louis, to whose exertions Munich owes its present prosperity, not only as a city but as an art centre, held his architects in high esteem. Not only do their bronze statues mark one of the public squares of the city but their busts have also found a place in the Bavarian Hall of Fame (*Ruhmeshalle*).

The location of Munich offers none of the advantages which are usually the requisites of the site of a great city. That its architecture must suffer under such existing circumstances is but evident. The materials with which to build must be brought from a distance, no quarries being found in the neighborhood and on the plateau upon which it is situated; the difficulties of transportation are also vastly increased by the fact that the river Isar, upon whose banks the city is built, is unnavigable. From these facts alone it can readily be understood that as far as monuments of the past are concerned Munich has but little to boast of, and stands far behind the venerable cities of Augsburg and Nuremberg which still bear the unequivocal marks of the wealth and taste of their old patrician families. But with the reign of King Louis commenced an era of art and architecture which even to-day makes itself felt. Himself a poet as well as an artist, a practical architect as well as a connoisseur, he did more to encourage the fine arts than probably any other European monarch ever has done, at least, one with such limited means at his command.

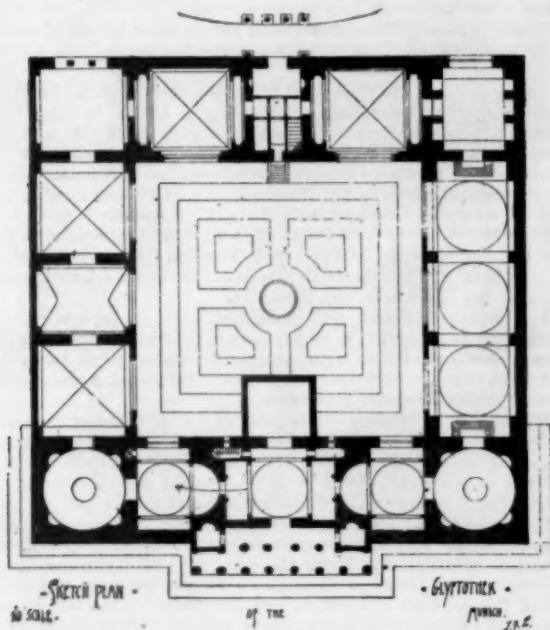
The Glyptothek in its exterior treatment is of a Greek character. However, no servile adherence to Greek precedence is noticeable, as the niches on the front and sides will show. The plan is essentially Roman, also the treatment of the various rooms, which are vaulted, barring the *motifs* of the decoration which have a flavor of the style of the exterior. I do not express an individual opinion when I say that the proportions of the exterior are most beautiful and pure, while the plan is most admirably adapted to its purpose and pleasing in the extreme.

To the left, one passes through the various chambers and halls in a circuit to arrive again at the starting-point, the entrance-hall, from which opens the Assyrian room, whose walls are covered with reliefs taken from the Palace of Nineveh. The entrance to this chamber is guarded by two huge, conventional Assyrian lions, much like those at the Louvre, almost startling, painted as they are in gayest and most sunny of Assyrian colors. The plan is so simple that an explanation is superfluous. Be it said, however, that each chamber is devoted to a certain nation or group. So, the first chamber is the Egyptian one, over the doors of which is placed a tablet illustrating the scene where Isis discovers the body of Osiris. The walls are of stucco-marble, as indeed are those throughout the building, in tints ranging from the lightest to the darkest, all of which are so selected as to form a good background for the sculpture. The floors are of marble, while the ceiling is decorated with plastic stucco-ornaments mostly in white and gold. Not to be forgotten are the three chambers, barren entirely of plastic work, which are given up to the frescos of Cornelius, illustrating scenes from mythology and the Iliad. On one side, it will be seen, three rooms have been thrown together to afford space for the collection of Roman sculpture. To satisfy the eye, the great length of the room demands a corresponding increase in the height of the ceiling. This is brought about by lowering the floor, necessitating the steps at each end which always look so well. The entrance, carriage-porch and reception-room in the rear are reserved for

royalty and people of note. Plain bronze doors on the front separate the outer world from the treasures within. The exterior is faced with white marble. In the niches — which take the place of window-openings, light being obtained from the court — on the front are



statues of Vulcan, Phidias, Pericles, Hadrian, Prometheus and Daedalus. One side is devoted to the best sculptors of the fifteenth and sixteenth centuries, Donatello, Ghiberti, Vischer, Michael Angelo, Cellini and Giovanni da Bologna. On the other side are the more



modern ones, Canova, Thorwaldsen, Rauch, Tenerani, John Gibson and L. v. Schwanthaler. The rear, I presume, will be given up to the sculptors of the present day. The tympanum also presents a group in which Minerva occupies the central position.

SILESIA COUNTRY SEATS.—I.

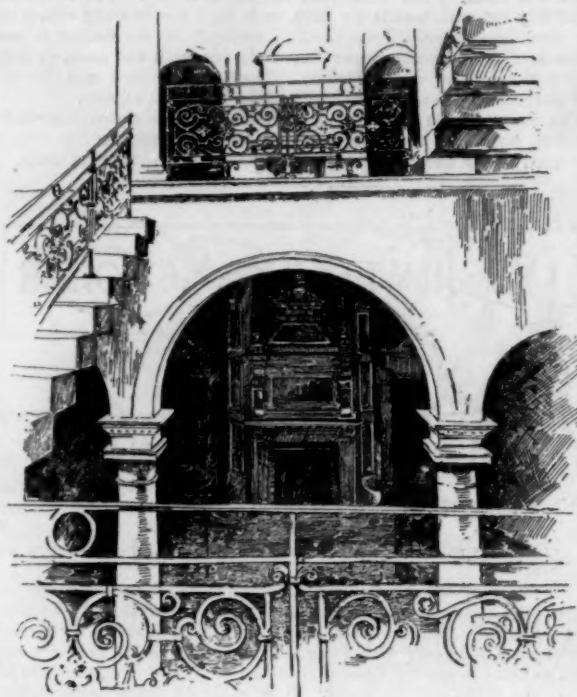


A Modern Silesian Country House.

THE country seats of Silesia are among the most interesting in Germany to a person in quest of the characteristic German style of house. The province lies away from the coast and great river trade of the world and has, therefore, been less filled with foreign productions than the Rhineland and sea-board; at the same

time, being rich in mines and fertile districts of land, the means of its inhabitants have been considerable enough to excuse a tendency to luxury. There is no such thing as a Silesian style of architecture; but one finds more old pieces of architecture of a middle aristocratic grade there, dating from the sixteenth to the commencement of the nineteenth century, than exists in other provinces. It is an exclusive and at the same time a rich country.

Pomerania and Brandenburg, in opposition to Silesia, present a quality of sandy soil so poor as to make an immense quantity of land necessary for the support of a manor, and, as a result, houses stand at distances of a dozen miles apart. There are fewer of them, and intercourse between the proprietors is more limited, so that the incitements to the cultivation of the arts are feeble. They offer, on the whole, the poorest architectural finds to the seeker of the typical in German building and decoration. Mecklenburg, on the other hand, possesses too many mansions. The rich merchants of Hamburg and Bremen cherish the ambition of becoming landed



From the First Landing.

proprietors, and buy the estates of ancient families that have become impoverished, and divide the land into smaller parcels, while filling the old seats with manufactured wares, and altering the old exteriors. What one sees in Mecklenburg is costly, but it is seldom peculiarly native, excepting of course, here as everywhere, the few feudal seats that are still held tenaciously by descendants of a conservative race.

The right mediums for the ample quietude which constitutes the fundamental idea of a country seat, are thus found in Silesia to an extent that hardly obtains in other Prussian provinces. For, while some estates are sixty miles square, the average *gut* takes commonly only from an hour to an hour and a quarter or two hours to cross, and measures from five to ten square miles in extent.

More than this measurement amounts, in my experience, to isolation now, and must have been an isolation very seldom broken, indeed, in old times when the roads were bad and infected with every sort of freebooter. Enough cases exist to show the effect on houses where such conditions prevail; the first being, they are infrequently left or visited. A generation will go by without the necessity of improvement being felt. All that is done on the manor-house or contingent buildings is done by the home mason or carpenter. Then, suddenly, a son will come back from town or his regiment, as heir to the property and with his head full of statelier-looking buildings. Very often the latter are town palaces or even productions of a foreign people. Yet he adopts the incongruous plan of altering the old place after these models. He lives in a raw climate where winter cold lasts from October till July; yet ten to one, if he does not tear down a floor to make his *saal*, or drawing-room, as lofty as that in a seat in southern France or Italy. If he is, or thinks himself to be, a *grand seigneur*, he is certain to call in a master-builder or architect from one of these countries or the other; and, almost as invariably, his means give out. Building activity ceases suddenly and permanently. The visitors for the next generation find a ceiling of Italian oil paintings set in elaborate gold frames in one room, while the ceilings of all the others are whitewashed and devoid of decorations; a parquet floor, walls of mirrors and furniture of buhl-like delicacy, where the rest of the house is planked with oak timber and scantily set with cumbrous cupboards, and with sofas as high and massive as beds.

The other extreme that comes to light in Germany, where estates are so small as to lead to unbroken social propinquity, is total modernizing of houses. Instances of this sort, too, are offered by Silesia, and are likely to increase in number.

Exactly why the Italian Renaissance is resorted to, in these latter cases where renovation is thorough, may be explained, perhaps, by the new stress laid everywhere in Germany of late years, on light staircases. The first cut shows a typical house after re-building, and the second, a view from the first landing of the stairway in it. The light in the latter illustration comes through the round-headed Venetian windows of the front (they must be called Venetian despite their upper frieze, inasmuch as they present the large central window with closely pressed smaller ones right and left), and the door must be thought of as directly beneath. The third cut shows the same view from a point on the ground-floor looking up towards the landing. I can hardly convey in words an adequate idea of the cheerful and spacious air of this hall. It is not in pure style as the first glance will show; the supporting pillars are copies of the two in the court-hall of the Palazzo Balbi at Genoa, with the pedestals simplified, and the position of the entrance-door half-way down to the basement level, reminds one instantly of the first application of the idea by



From the Floor.

Lurago, that was hailed as so ingenious by his contemporaries of the sixteenth century. But the general plan, as well as such details as the balustrade, vary from its Italian predecessors. Nevertheless, it suits its purpose admirably. The drawing-rooms of the house are on this floor, and the space won by omitting a duplicate flight of steps at the right hand, is used as a passage to a hat and cloak room. The floor is composed of slabs of a colored and polished surface and the rich bronze of the balustrade forms a connecting link from it to the deep rich tone of the stained windows at the first landing, and to the sumptuous "hall of weapons" into which the second and main landing opens. The pillars and the treads of the staircase are of whitish gray limestone while the walls are covered with a hard plaster of the same neutral tone. If the balustrade were of a like color, and of stone or a similar material, the effect would have been too cold for a country home. Carpets and mats would have looked like hard stripes and spots in an expanse of lightness; whereas, they fall in now with this detail—the bronze railing—and the bronze of the chimney piece and drawing-room doors.

The German social season is mainly confined to the winter months, and the guest arrives at a country house to dinners and balls after a chilling drive. He needs space for throwing off his fur cloak and for having his overshoes pulled off; for storing his fur foot-bag, and the foot-bags and mantles of his family. Often, on about departing, he must wait for his carriage or sleigh and so must his neighbors. It would seem to the company a hazardous thing if this waiting were done in a space heated warmly. Transpiration would take place instantly, wrapped as the last man among them is to the eyes in mufflers and furs. A tempered atmosphere in consequence is all that one finds tolerated, and a vestibule, in accordance, is furnished with only slight means for heating. It cannot be made an essential part of the living-room of the house, nor do I know of a single case among old seats where an attempt has been made to make it so. This trait of a comfortable hall must be left to the architectural and decorative peculiarities of English houses. Germany does not offer it (save, of course, in imitations of English houses). And the reason why stress here should not be laid upon the uses of the hall in summer, in place of its use in winter, besides the fact of the longer duration of the cold season, includes also the very influential fact of national habits. For the German sits entirely out of doors when he seeks fresh air at all. If the air is agreeable, it is dry. He knows

nothing from experience in his climate, of a shower falling through an atmosphere so soft and delicious that dampness adds the culminating degree to the suave sense of the enjoyer of it. Nor does he know of fresh draughts, like those through a Kentish or Kentucky hall, at once invigorating and harmless. The rain that falls from the low sky over the great plain of North Germany, falls through an atmosphere, mostly, which has been long soaking in moisture, and every door is shut, and must be shut, against it. What, however, is a hall in this dark climate with shut doors? No place to abide in.

The given example becomes as near perfection as a hallway, for all these reasons, as I can recall. The chimney is comparatively small, and the architectural details of its shelf and cornice are kept in proportion with the frames and cappings of the doors at the left and right, being in accordance with its central position between these door-frames, somewhat higher than the last. As the house is modernized it is actually heated with steam, but the æsthetic feeling, together with tradition, demands a *visible* embodiment for heating; a grating in a side wall is too unsatisfactory for it—at least, it is as yet; and this fireplace conveys the right sense to the native German. A fire in it would take off the biting chill of dampness in the airy hall and leave the temperature not too warm, nor cause a stream of draughty heat to sweep up the open space of the wide and lofty stairs.

Then, while I am in this house, I must call attention to the upper-floor, for its arrangement is another characteristic innovation upon the old seats whose type I shall mostly describe. It follows the plan of the ground-floor, and the vestibule has the same form and measurements as the lower one. But whereas the rooms below are necessarily spacious, being meant for large companies and social occasions, space can be taken above for corridors. Bedrooms and dressing-rooms need separate entries, and need not be large, since they are inhabited by single persons.

In this example the chambers are unnecessarily deep and the corridors narrow; but in other cases of which this seat is a type in the main, but not in this particular, the corridors that run right and left from the vestibule are well lighted by large end windows, and of ample width.

I have mentioned that the arched portals of the upper vestibule, seen in the second cut, lead into a "hall of weapons." Billiard-tables stand in it, and, in the event of balls, it is used as a smoking-room.

The house has hardly any constructive features besides this plan of the vestibules and stairway, which differ from those of the typical old manor. The one great difference between it and the common manor-house relates to decoration, and is found in the fact of it being filled everywhere with furniture.

Your manor of old date is three-fourths empty. It was built at great cost by masons and carpenters brought from a distant town. Its walls are constructed in the traditional manner, very thick, from two to three feet or more, of stones split from neighboring rocks or gathered from the fields (the alluvial of North Germany is full to-day of glacial boulders), embedded in mortar and ornamented, outside and in, with a facing of plaster. It was a long time before these walls were raised. Add to this time, the space taken to complete the interior divisions and their frames and doors, and the date is got at when the purse of the builder gave out. In several of the archives, too, which I have looked over, the kindling of feuds or the continuation of old ones seem to have been direct causes for the cessation of building. And the instances are few, as it is evident, where any second or third undertaking at building ever reached the compass of the first great attempt. Most of the existing manors date from after the Thirty Years' War, and the country was comparatively poor and kept on, as all nations did after the decay of the Renaissance, without feeling any especial ambition for architectural refinements and beauty.

The strange masons and carpenters being gone, no one was left but the village artisan, who worked for his lordship, and finished every year a table or a cupboard or two. One can fancy the process, for the thing goes on still upon many an old domain. Often the proprietor or châtelaine gave the man a sketch or "an idea" of the piece to be made, but the rule was in old days for the latter to collect a store of models in his mind by a wandering apprenticeship abroad, and, on coming home, to give his lordship insights into the marvels of his art. I have in mind a cupboard in the *saal* of a castle which my husband inherited, that was large enough for storing the bedding of sixty-eight guest-chambers, and was eleven years in the workshop of the local carpenter and cabinet-maker. Cabinet-maker and carpenter are one and the same in these villages, and, as they do all repairing for the manor and in the village, a piece of furniture is long in hand. The quantity that can be delivered in a generation is small; but smaller still is the quantity that has been set up. Or, have I left the gifts too much out of account, that must have gone during the centuries to brides and related heirs?

And, then, besides these old conditions which drag on still alongside of the new facilities, offered by roads and railroads, for bringing manufactured furniture to isolated seats, a very considerable stress must be laid again upon native habits, for explaining the half-furnished state of Silesian homes. And, among the first of these, the reliance of country families on the military for guests must be brought up. England hardly offers the like, for the garrisons in the island are fewer and denser. In Silesia their multitude has produced a new phenomenon in country society and houses. For, whereas the squire and his family had no pressing business or engagements to call them back when once arrived at a neighbor's, the

officer has; and where, in consequence, chambers were kept ready for the first, no such need occurs in the case of the latter. He must be at his post in the morning, even if he rides half the night to reach it. A ball-room in which half of the men and three-quarters of the dancing-men are military, and the rest the landed proprietors of the *kreis* or circuit, is a common sight. And these fill the house, without any necessity having been felt by the host, to invite "all the country." Hardly a family is present which will not be in its carriage on the long, black, winding road, at the close of the ball; whereas, in the old times when the manor was built, there used to be after such a festival, hardly one which was not ensconced in warm, white beds under the roof where they had danced.

The great unions of kin occur only at weddings or funerals, and it is hardly worth while to keep the great guest-chambers in order, or scarcely to furnish them, for such rare events as these. They, therefore, stand denuded of all furniture but their monumental beds and wardrobes, and the cases are extremely rare where even a few of them have received such ornamental architectural details as corniced ceilings and the like. More often the old stucco work that existed has been blurred and its delicacy spoiled by defacing modern washes of lime.

Thus, from the start, one must release a quarter of the whole of an old seat from all investigation. It is mere empty space. What is left to repay one's interest, are the façades of the manor, the living-rooms of it and the typical bed-chamber.

I can make no mistake, I think, in giving Kreisau, the seat of the renowned Count Moltke, as an example of a regular Silesian Schloss. It is old, and retains the original features of the earliest German architecture, together with the additional decorative alterations which had their vogue in the seventeenth century and the beginning of this. If you search Silesia, you will find manors without these latter alterations, or with one of them without the other; but, unless the seat is wholly modernized or a princely castle, no type will come to light which Kreisau does not essentially contain. It is *par excellence* the Silesian country-home of the middle aristocracy.

By chance I discovered in a little town two buildings near together which are monuments of the two epochs in architecture out of which Kreisau grew, and I had them photographed. That at the right, now sunk three German feet into the soil, and used



Schloss Kreisau.



Two Old Silesian Mansions.

as an inn at present, dates from the fifteenth century, and was the seat of one of the courtiers of Duchess Hedwig, called the Saintly. The dilapidated castle of the Duchess, at no great distance, built in the same century, lies surrounded by a boggy garden that was once a moat. Its style is the same as that of the inferior seat here given: a quadrangular frame, two stories in height, with massive thickness of walls, surmounted by a steep roof slanting from the four sides towards a common ramp intersected with eyelid windows, and covered with potters' tiles of a brick-red color.

The house at the left was built in the beginning of this century for a Prince of Württemberg by a native master-mason. The Prince was detailed to the command of a garrison stationed in the town, and was but just married; later, the house became the birthplace of the present King of Württemberg, and served for the reception of relatives and for various ceremonies of presentation. It will hardly be believed that the bedrooms of the upper floor inside the roof are built out of the garret-room, and that the raw rafters are still to-day picturesque memorials of those early times! But strange things appear as one leaves the palaces of state of German princes, which were erected by architects who had studied at Versailles, and seek their native humbler nests.

The interior, for the rest, is still imposing. An immense dancing-room occupies a fourth of the whole of the ground-floor, and the ceilings and walls, although repeatedly whitewashed, reveal stucco-work of such elaborateness and fineness that I first got the idea here, which since then has often raised a question as to whether the

technics of this art, like that of some others, did not live on in the provinces long after being out of date and knowledge in the larger towns.

But my aim was to call attention to the façade of the Württemberg house, and particularly to the breaking-through the roof by the crowning front above the middle door, for this feature is the last of the old innovations. Between it and the earliest type of façade—which was properly no façade at all, inasmuch as all the four walls of a building presented one and the same aspect—come, first, the doubling of the roof, and, secondly, the broadening of the "eyelids" into dormers, or windows with a gable of separate structure, and the enclosing of windows and doors with frames. The earliest roof for narrow buildings was a so-called saddle-roof, or a two-sided, steep incline towards a common ridge, and German works on architecture term it often "the German style" of roof. But existing buildings of the dignity of manor-houses almost invariably display a four-fold incline, the two-sided roof with a gable at each of its narrow ends being restricted to inferior buildings and city houses. The idea of making the roof two-storied came into Germany from France. A few specimens offer such arbitrary variations as a convex upper roof and a concave lower portion; or an inclined lower frame with a concave upper slant. But, out of a hundred seats, ninety show, as a rule, the simple construction in their roofs of Schloss Kreisau.

Houses with two-storied roofs and framed doors and windows are said to be, by the Silesians, in the *zopf* or "wig" style of architecture. The oldest specimens of native buildings have frameless windows. I have seen rich seats even without so much as a wash of lime-water about the windows to relieve them from the yellowish-gray of the old walls. In Kreisau the frames are architectural reliefs, but in many cases the reliefs are flat, being carried out in stucco, or are no reliefs at all, but *intaglios*, or mere scrolls scraped into the wet plaster of the walls.

The designs of the frames of the front doors, as well as that of these window decorations, are almost invariably conceived in the spirit of the baroque or rococo styles. Kreisau is not a pure example in this respect. A modern renovating hand has been laid on the cornices of the windows, and, in contradiction to the genuine old rococo of the front door, has stretched a line of decorative relief, or a frieze across the façade, so as to mark the division between the second and third stories. The lower portion of the house, which is old and typical, has no such line, but offers its windows to the sight as detached inlets to the air and light.

The architectural development of two fronts is another feature of Silesian manors, and a thing that marks an old seat from new mansions is the fact of the finer façade being turned to the park in old manors, whereas the new turns its best side to the public, or, should I say, to the entrance, seeing that in the country the public is hardly worth speaking of, being composed of only the villagers and the rare passengers that drive along the nearest highway. In the new, too, the court is often laid out at one side. Old seats, however, have all their barns and cottages directly before the manor, and you pass under an arched doorway or between two buildings to get into the court, this latter being a wide space, bordered on three sides by the low stables and *gesinde häuser* of the manor, and on the fourth by the lofty front of the manor-house itself.

There are seats with lodges and lodge-gates, but these form the exception. Most of them still retain a traditional and patriarchal preference for parading a proud line of stables filled with fat cattle of solid worth, rather than a barren expanse of lawn with a more artistic value. Indeed, I could recount a dozen score of manors where you still drive past a manure-close and a dark pond on your way to the front door.

COUNTRESS V. KROCKOW.

[To be continued.]

FACTORY FLOORS.



Restored by Harry Hems.

to many other buildings are agreeably surprising.

Having occasion to use the "factory" floor and roof in some audience rooms, and finding nothing in the books to throw light on the

OF the devices that have contributed to the great success of the modern slow-burning "factory" system of building, it is evident that the solid floors and roofs form the central feature and main reliance. These floors, supported by large planed timbers at wide intervals, spanned by solid planking, the whole without concealed spaces, furnish the best known means of resisting the upward progress of flame, if we except a well-protected iron framework with spaces filled with masonry.

To architects who have tried the capabilities of this feature in other than factory or warehouse buildings, its comparative cheapness and ready adaptability

question of deflection of planking, tongued and grooved together, and of more than one span, some experiments became desirable to give the data from which to work intelligently and economically, when plastering is to be used against the planking.

In our market it is not easy to obtain lumber of greater thickness than 2", suitable for this planking, without sending a special order to the saw-mills. This thickness is sufficient in the cases mentioned to meet all considerations of fire resistance.

In the case of both floors and roofs, these planks are to support laths and plastering—the former to be nailed to thin furring strips ($\frac{3}{4}$ " or less), the laths being placed so open that the plaster will "clinch" everywhere against the planking.

Audience rooms contain little that is combustible, if we compare with the stocks of goods in factories and warehouses; and several considerations argue for somewhat smaller timbers in the former class of buildings, placed at smaller intervals, the use of which permits spanning with 2" plank, planed and matched.

In the following experiments to show the deflection of floors, the joists were placed with clear spans of 5' 8", and a platform was built on them of 2" x 6" pieces, surfaced to $1\frac{3}{4}$ " thick and tongued and grooved together. The platform was 4' 0" wide and covered three spans. Measurements were taken on the central span only—one at the middle (M) and one at the edge (E) but both at the centre of the span. The work was done by Mr. W. H. Burtis under my direction and I have entire confidence in the accuracy of the measurements to the hundredth part of an inch, except in the case of one marked with an (?) in which case there must have been some mistake. The platform was built on a very strong warehouse floor and was so placed as to affect the floor as little as possible, but if any correction is to be made it is on the safe side. All tests were made with evenly distributed loads. The spans were afterward lengthened, as will appear by the table, to give data for roofs little subject to moving loads.

FIRST ARRANGEMENT.

The central of the three spans was loaded with 100 pounds per square foot showing a deflection in inches at M of 0.27, at E of 0.27.

The central span remaining loaded the two side spans were loaded with 100 pounds per square foot, after which the deflection at M was 0.13", at E the same. The load was then allowed to remain on the three spans for 70 hours, and before removing the deflection at M was 0.15", at E, 0.16".

After removing the load the permanent set of the platform was 0.03" at M, 0.05" at E.

SECOND ARRANGEMENT.

The spans and platform remaining as before, the furring strips of $\frac{3}{4}$ " stuff were nailed across it at about 2' 0" centres, and on these a floor of $\frac{3}{4}$ " planed and matched boards was nailed in the usual manner covering the platform thus. See sketch.



This arrangement was made to give a somewhat nearer approach to conditions of practice. All lumber used was dry white pine and the planking had "joints broken" as in practice.

The whole of this platform being loaded with 100 pounds per square foot, the deflection at M was 0.10", at E 0.12". A doubt arising as to whether the laying of the upper platform had affected the permanent set of the lower platform, the load was, after 40 hours, removed, the platform measured and reloaded with 100 pounds per foot over the three spans, giving a deflection, at M of 0.09", at E of 0.09".

The load was then removed from all but the central span which then showed a deflection of 0.21" at M, and of 0.21" at E.

No permanent set could be traced after unloading. A load of 60 pounds per square foot being then placed on the central span only, the deflection at M was 0.11", at E 0.14".

The load of 60 pounds per square foot being then placed on the two side spans the deflection at M was 0.04", at E was 0.09 (?).

The loads on side spans were then removed and that of central span increased to 100 pounds per square foot, which caused a deflection at M of 0.21", at E of 0.24".

The two side spans were then loaded with 100 pounds per square foot, leaving at M a deflection of 0.06", at E of 0.07".

THIRD ARRANGEMENT.

The platform was now taken down and rebuilt 3' 6" wide with three spans of $1\frac{3}{4}$ " plank each 8' 8" in the clear. No flooring or furring above.

The central span only being loaded with 50 pounds per square foot, the deflection was 0.69" at M, at E, 0.65".

The three spans being loaded with 50 pounds per square foot, the deflection at M was 0.3", at E was 0.29".

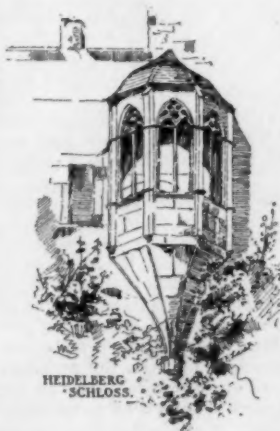
This load was allowed to remain one week when the deflection at M was 0.34", at E 0.33".

The results will appear in the following table.

Other conditions of tests (All loads were evenly distributed).	Load in lbs. sq. ft.	Clear span.	Number spans loaded.	Hours after loading.	Deflection in inches.	Point measured.	Permanent set in inches.
Centre span loaded.....	100	5' 8"	1	0	0.27	M	
					0.27	E	
Side spans also.....	100	5' 8"	3	0	0.13	M	
					0.13	E	
Loads remain.....	100	5' 8"	3	70	0.15	M	
					0.16	E	
Loads removed.....		5' 8"				M	0.03
						E	0.05
Platform furred and floored.....	100	5' 8"	3	0	0.10	M	
					0.12	E	
Unloaded and reloaded to correct....	100	5' 8"	3	0	0.09	M	
					0.09	E	
Two side spans unloaded.....	100	5' 8"	1	0	0.21	M	
					0.21	E	
Further permanent set.....			0			M	0.00
						E	0.00
Central span loaded.....	60	5' 8"	1	0	0.11	M	
					0.14	E	
Loads added to sides.....	60	5' 8"	3	0	0.04	M	
					0.09 (?)	E	
Side spans unloaded.....	100	5' 8"	1	0	0.21	M	
Central spans increased.....					0.24	E	
Three spans loaded.....	100	5' 8"	3	0	0.06	M	
					0.07	E	
Platform relaid, no furring or flooring, spans increased.....	50	8' 8"	1	0	0.69	M	
					0.65	E	
Loads added to side spans.....	50	8' 8"	3	0	0.30	M	
					0.29	E	
Loads remain.....	50	8' 8"	3	168	0.34	M	
					0.33	E	

F. G. CORSER.

DESIGNING AND CONSTRUCTING MILLS.



THE report of the Commissioners appointed by the Government to inquire as to the cause of the collapse of a large building in course of construction for Messrs. Templeton, Glasgow, by which about twenty lives were lost, has been laid on the table of Parliament. It contains some valuable suggestions to architects and engineers, and also to the authorities having supervision over the designs and methods of construction of buildings. The Commissioners were Colonel E. L. Malcolm, C. B., commanding the Royal Engineers in Scotland, and Mr. W. W. Robertson, surveyor in Scotland of her Majesty's offices of work. Many theories were propounded to account for the disaster, and it is remarkable that the cause, according to the Commissioners, was only hinted at by one witness before the public inquiry held on December 21 and 22. Their explanation of the accident is as follows: The first gust of wind caused the whole building to oscillate, an action which is inevitable in a structure of considerable height, and which should not damage a properly designed construction; but this oscillation severely strained the back wall, especially towards the centre of its length, and the oblique pressure which accompanied it fractured one or more of the base-plates of the stanchions supporting the wall. The second gust, acting with increased force on the somewhat weakened structure, caused a greater sway of the building, broke more of the base-plates and probably tilted some of the stanchions, causing a grinding of the wheels observed in the weaving shed. The third and strongest gust was probably that which caused the catastrophe. Under its impulse the already weakened wall, deprived of a portion of its effective support by the fracture of the base-plates, swayed beyond the narrow limits of its stability, and in its fall not only deprived the front wall of the support of the joists, but actually, by their connections assisted to drag it over. The result was the simultaneous collapse of both front and back walls.

The back wall was not exposed directly to the full force of the wind; but it was subjected to a large, though unascertainable, wind pressure, due to window-openings in the front wall and the absence of the roof, as well as to a considerable thrust transmitted from the front wall by the four tiers of joist which crossed the building. Against these forces the back wall had nothing to oppose but its own lateral stability. In matters of thickness and ratio of openings to solids it was inferior to the front wall. The Commissioners, however, were satisfied with the substantial manner of the workmanship and material. At the level of the first-floor windows (the lowest

part which gave way) the horizontal area of the piers in a given length of the front wall exceeded that in the same length of the back wall by 40 per cent, while their aggregate width exceeded that in the same length of the back wall by 20 per cent. The front wall exceeded the dimensions required by the Metropolitan Building Act. The back wall fell, though but slightly, below the requirements of that Act. Leaving out of account the portions which were incorporated and strengthened by the staircase and other buildings at either end, the back wall was 150 feet long, and was entirely supported on iron lintels and stanchions already referred to. There being no cross-walls this back wall was but a sheet of brick-work 150 feet long and 66 feet high, perforated by a relatively large number of windows, resting on iron beams and stanchions and having no connection, except at the two ends, with any other structure which could stiffen or support it. The statement of these facts is sufficient to show that it could oppose but a feeble resistance to lateral pressure. But the stanchions on which the wall rested were not altogether satisfactory; although well enough designed to support the vertical load, the fracture of the bases of five of them has shown conclusively in what respect they were deficient. Even while the pressure came upon them as a vertical and dead load, the centre of pressure, owing to the gradual thinning of the wall upwards, was considerably nearer the last or outer side than the other. They were, no doubt, amply sufficient to bear their load as long as it was stationary; but as soon as an oblique pressure came upon them in consequence of even a slight oscillation of the wall above, they were insufficient. The base-plate projecting 6 inches beyond the solid part of the stanchion without stiffening, or gusset pieces, gave way in one-third of them at the time of the accident, and the Commissioners believe contributed materially to the failure.

The back wall and stanchions on which it rested were, in their opinion, the weakest part of the whole building. The Commissioners did not think the evidence supported the theory that the pressure was greater than a maximum of 17 pounds to the inch, as reported by Professor Grant of the Glasgow Observatory. They did not entertain the theory that the upper part of the front wall falling and carrying away the joists was the cause of the whole building collapsing, because the wall was shown to be sufficiently strong, and the idea was not consistent with the instantaneous collapse of the front wall in one mass.

The matter of supporting the joists at the walls was adverted on, but the Commissioners considered that it left the wall stronger than if they had been carried into the wall, as suggested, care of course being taken to preserve the "tie" between the front and back walls, which received careful attention in this case. Reference was made to a steam crane placed on the top tier of joisting above one of the iron columns, but nothing was said which could lead the Commissioners to the conclusion that this crane in any way contributed to the accident.

While not seeking "to apportion the responsibility," the Commissioners think "that a practical lesson of great importance is indicated, namely, that when an architect and engineer are employed in designing a building — which may in many cases be desirable — they should not follow one another and act without concert as in this case, but they should act together, either as collaborators or as principal and assistant, the responsibility in either case being perfectly clear. There seems to have been no approach to collaboration such as suggested, and communications between the architect and engineer were not direct, but passed almost entirely through the Messrs. Templeton." Indeed there seems to have been a misapprehension in the matter, and it is difficult to see how either can be held responsible. Regarding the Dean of Guild Court, which is intended to protect the public interest in respect of the erection and alteration of buildings, the Commissioners state that its control should be more real and its supervision more effective than at present. More detailed plans should be examined before the court grants authority to erect buildings — the plans did not show the details of the iron stanchions. Some well-considered code of building regulations should be framed, and with these all plans should comply. More complete inspection is also necessary. If these suggestions are given effect to, the public inquiry will have been beneficial. — *Engineering.*



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSES ON SUPERIOR ST., CLEVELAND, OHIO. N. P. CHARLOUTTE, ARCHITECT.

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

THIS block of houses was designed by the late N. P. Charloutte, who died before its completion and the work was carried out by Mr. E. P. Ruprecht. The approximate cost was \$40,000.

DRILL-HALL, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN. MR. L. S. BUFFINGTON, ARCHITECT, MINNEAPOLIS, MINN.

HOUSE OF DR. E. F. HANKS, RIDGEWOOD, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

HIGH-SCHOOL BUILDING AT WINCHESTER, IND. MESSRS. WING & MAHURIN, ARCHITECTS, FORT WAYNE, IND.

HOUSE OF JOHN F. CONANT, ESQ., SEATTLE, WASH. MR. W. P. SKILLINGS, ARCHITECT, SEATTLE, WASH.

DESIGN FOR AN ENTRANCE TO A WORLD'S FAIR. BY MR. MAXWELL H. GRYLLS.

HOUSE-FRAMING.

SEE article elsewhere in this issue.

[Additional Illustrations in the International Edition.]

STRANGERS' GALLERY IN THE CHAMBER OF COMMERCE, CINCINNATI, OHIO. MESSRS. H. H. RICHARDSON AND SHEPLEY, RUTAN & COOLIDGE, Successors, ARCHITECTS, BOSTON, MASS.

[Photogravure.]

PLANS AND SECTIONS OF THE CHAPEL OF THE CHATEAU OF CHANTILLY, CHANTILLY, FRANCE. RESTORATION BY M. H. DAUMET, ARCHITECT.

[Copper-plate Engravings.]

HOUSE OF HERR RUDOLF MOSSE, LEIPZIGER-PLATZ, BERLIN, GERMANY. HERR JULIUS BENDLA, ARCHITECT.

[Gelatin Print.]

LEPROSERIE DE ST. LAZARE. BY D. J. BLOW.

MAREUIL. BY D. J. BLOW.

ST. SAVIOUR'S CHURCH, WESTON-SUPER-MARE, ENGLAND. MR. SYDNEY J. WILDE, ARCHITECT, WESTON-SUPER-MARE, ENG.

THE erection of this church will shortly be commenced. The local blue limestone with Bath stone dressings will be employed in building the external walls. The interior (except the chancel, which will be lined with freestone) will be lined with buff-bricks with Bath stone dressings, and red rubbers for bands and vousoirs of arches. The shafts of the arcade columns will be of red Mansfield stone. The church when completed will provide seats for about 800 persons.

THE TAKING-DOWN FROM THE CROSS.

FROM a cartoon by G. Guffens.

Owing to the late arrival of a steamer we were unable to publish this in its proper sequence.



WE welcome Mr. Moore's book¹ with unalloyed satisfaction. For some generations past much sentimental admiration, and even enthusiasm, have been both in England and America displayed towards Gothic architecture. Its picturesque and poetic aspects are indeed so pronounced as naturally to excite such emotions in the minds of those who are sensible to what is grand or impressive in art or nature. But of real knowledge and appreciation of architecture, whether Gothic or other — such knowledge and appreciation as must form the basis of any justified opinion — there is to this day perhaps less than in regard to any other branch of art. This is partly, no doubt, to be accounted for by the absence of any adequate or satisfactory literature on the subject in the English language. Literature can, indeed, not always be relied on to create either interest or knowledge, as has been abundantly proved in France, where in spite of the flood of light which has been thrown on the native architecture by Viollet-le-Duc, Quicherat, De Caumont, Lenoir and other French writers, it still remains, in the epigrammatic words of Victor Hugo, "*inconnue des uns et méconnue des autres*"; regarded as indeed an interesting phase in architectural history, but as hardly worthy to be reckoned among those serious studies which the State engages to teach to its pupils. But this indifference rests in France on an intellectual bias which does not exist in the Anglo-Saxon mind — the bias in favor of the Classic

¹ "Development and Character of Gothic Architecture." By Charles Herbert Moore. London and New York: Macmillan & Co.

spirit and the Classic forms, and it is probable that in England and America there is more knowledge and appreciation of Gothic architecture than of Classic.

Such as it is, however, it stands sadly in need of increase and improvement, and in this view we regard Mr. Moore's book as of very great importance and value, as calculated to give definiteness and precision to the conception of Gothic architecture.

He has elucidated, as no English or American writer has done before, the principles on which Gothic construction rests, and the successive steps through which it reached the completeness and perfection of Amiens and Rheims and Paris; and he has shown the peculiar closeness of the connection between construction and design which distinguishes true Gothic perhaps above all other architectural styles. It is a work involving long and patient research, the most careful personal examination of the typical monuments of the style in France and England, and a comparison of their individual features in which the type was subject to continual variations. Mr. Moore has done the work so thoroughly that we cannot see that it will need to be done again.

His primary object is to displace the prevailing notion that Gothic is a matter of design only—that a building is Gothic if it has pointed arches and a particular class of mouldings and other details. So far is he from admitting this to be the important point, that he goes to the opposite extreme and maintains that the style is dependent mainly on construction. "It is only," he says, "in a secondary sense that it is correct to speak of styles as different, in which there are no fundamental structural differences. Pointed architecture is not, in the strict sense, a style distinct from that which is round-arched, for pointed arches in apertures do not differ essentially from round ones." Mr. Moore adopts, as his foundation, the admirable exposition of the development of the Gothic style which M. Viollet-le-Duc has given in his "Dictionnaire," and which he thus summarizes: "He has shown that Gothic architecture came into being as a result of a development of a new constructive system of building. A system which was a gradual evolution out of the Romanesque, and one whose distinctive characteristic is, that the whole character of the building is determined by, and its whole strength is made to reside in a finely organized and frankly confessed framework rather than in walls. This framework, made up of piers, arches and buttresses, is freed from every unnecessary encumbrance of wall, and is rendered as light in all its parts as is compatible with strength in a system whose stability depends not upon any inert massiveness, except in the outermost abutments, but upon a logical adjustment of active parts whose opposing forces produce a perfect equilibrium. It is thus a system of balanced thrusts as opposed to the former system of inert stability. Gothic architecture is indeed much more than such a constructive system, but it is that primarily and always. And so fundamental and far-reaching is this mode of construction as the distinctive principle of Gothic, that it may be taken as a rule that wherever we find it developed, there we have a Gothic building even though the decorative system connected with it may retain many of the Romanesque characteristics. And, on the other hand, wherever this principle of thrust and counterthrust is wanting, there we have not Gothic, however freely the pointed arch may be used and however widely the ornamental details may differ from Romanesque types."

This theory of the essential characteristic of Gothic architecture Mr. Moore follows loyally to its utmost limit; tracing first the rapid evolution in a single half-century of the complete Gothic cathedral from the Romanesque church; the development of the vault with its system of independent ribs, the adjustment of vaulting shafts in groups, of which each member carried its particular rib, the gathering of the weight and the thrusts of the vaulting at fixed points on the external wall where they are met by the flying-buttresses, the gradual disappearance of the wall between the buttresses and the enlargement of the window till it fills the whole space under the longitudinal vault-rib, and finally the clothing of this framework with its appropriate decoration of sculpture. In this account we have for the first time in English, so far as we know, a clear, compact, complete and accurate statement of one of the most remarkable continuous and logical developments in the history of art, of which the result was the matured and completely organized Gothic cathedral. Mr. Moore declares, and we think he is justified in declaring, that in its perfection this creation exists only in France, and that the so-called Gothic churches of other countries are but imperfect and, for the most part, pale reflections of it, presenting many of its forms, and embodying some one portion and some another of its constructive framework. To these imperfectly developed churches he, therefore, denies the name of Gothic, characterizing the architectures of Germany, Italy and Spain as Pointed architectures, and as, for the most part, "totally different in their nature" from the Gothic of France.

Well, it is, perhaps, no more than a matter of definition, but it seems to us scarcely worth while to be so rigorously exclusive. If a man were denied the name of Christian unless he possessed all the Christian virtues, the Church would languish; and we can all recall a goodly number of churches, both great and small, in France and England, in Italy and Spain, which could not pass Mr. Moore's test of completeness, but which in character and feeling belong to the same great family with the majestic cathedrals of the best age in France. Mr. Moore regards certain features of a completely Gothic church as fundamental which we cannot regard as other than points of detail, and as constructive which seem to us features of design.

The presence of the longitudinal wall-rib, the assignment of a distinct vaulting-shaft to each rib of the vault, the connection of the vaulting-shafts with the nave-piers, the abolition of the clerestory wall—these are, indeed, features which determine and illustrate the Gothic cathedral in its highest and noblest development, but they are not fundamental, and they are so far from being points of construction that in every case where they exist the conditions might be reversed without sensibly affecting either in one way or the other the stability of the building. They are points of design, by which the construction is expressed and emphasized, and they illustrate most forcibly the artistic instinct of the great mediæval builders, and the fastidiousness and refinement with which they studied to perfect their designs.

Mr. Moore follows his story of the rise and development of the French Gothic with a condensed account of "Pointed construction" in England, Germany, Italy and Spain. In the first of these chapters, his analysis of the English churches seems to us eminently just as well as historically complete. He states emphatically enough, but not too strongly, their inferiority at all points to the French churches, and justifies his statement by abundant illustration and argument. Of the architecture of the Continental nations outside of France, his account is less complete than we could wish, less than ten pages of text being given to Italy, and less than five to Spain. We hope that in another edition he will think it worth while to expand this portion of his work; and, when this is done, we are sure we shall not see the Cathedral of Milan dismissed with a contemptuous line as "in many respects but a travesty of Gothic." The statement is true, no doubt, but how far is it from being the whole truth, or even the chief truth, concerning this great church, of which the interior is, in spite of all obvious criticisms, one of the noblest and most impressive in the world.

Mr. Moore has an admirable and most instructive chapter on the sculpture of the French cathedrals—an alluring subject, which we are glad to see treated by a hand at once so loving and so judicious. No great school of plastic art has ever, we believe, been so little appreciated as the architectural sculpture of the Middle Ages. It has commonly been estimated according to its greater or less resemblance to the Classic sculpture of antiquity or to that of the Italian Renaissance; and such a standard is absurd, because the conditions under which the respective works were produced and exhibited, and the purposes they were made to serve, were absolutely different. The Gothic work is architectural or associative sculpture, and is to be judged in its associative character as an integral part of the architecture, and as such it has never been equalled in any age for force, variety, expression and appropriateness.

The book is amply illustrated with nearly two hundred wood-cuts, well-chosen and of somewhat unequal merit; the best being those from Mr. Moore's own admirable drawings, and the worst some of the general views copied from photographs.

A book so comprehensive, so compact, so clear in statement and so interesting in the treatment of its great subject, is well-suited not only to increase the general knowledge of Gothic architecture, but to become a text-book for special students, and we are glad to know that it has already been adopted as such in one of Mr. Norton's courses at Cambridge.

The Architectural and Building Monthly is the title of a new journal which has lately been added to the ranks of periodicals devoted to the interests of architecture and building. It is published by A. J. Bicknell, New York, and each issue contains a number of illustrations from original drawings.



THE CINCINNATI CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE Architects of Cincinnati met at 2 o'clock P. M., April 22, 1890, for the purpose of reorganizing the Chapter in that City. Nine members were present.

President McLaughlin called the Cincinnati Chapter A. I. A. to order, and, upon motion of Mr. Rapp all members of the Cincinnati Chapter W. A. A. were admitted to membership in the new Chapter. This was done so as to merge the two societies into one. The motion was carried. The meeting then adjourned for five minutes and the Cincinnati Chapter W. A. A. was called to order, and, upon motion adjourned *sine die*, thus consummating the consolidation of the two organizations into the Cincinnati Chapter of American Institute of Architects, which was again called to order and the following officers were elected to serve for the year beginning the third Thursday in April:

Samuel Hannaford, *President*; George W. Rapp, *Vice-President*; Chas. Crapsey, *Secretary*, and H. E. Siter, *Treasurer*.

Mr. Rapp moved that the old Charter of the Cincinnati Chapter of the American Institute of Architects be hunted up; this motion was carried and the Secretary was appointed as such Committee.

Upon motion a Committee of two were appointed to look up quarters for the Chapter and report at the next meeting. The chair appointed as such Committee, Messrs. Siter and Rapp.

Upon ballot the meetings were fixed for the third Thursday of each month at three o'clock P. M. Matters of general interest to the profession were discussed and upon motion the meeting adjourned.

CHARLES CRAFTSEY, Secretary.



[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.]

QUEBEC AND MONTREAL ARCHITECTS — THE PROPOSED FORMATION OF A PROVINCIAL ASSOCIATION.

MONTREAL, CANADA, April 23, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In your issue of the 19th instant you say in Canadian news that "the architects of the province of Quebec are talking about the formation of a Provincial Association and seeking legislation on the lines of the Association of Ontario." So far you are right, but the other particulars I beg most respectfully to contradict.

A meeting of over twenty architects was held in Montreal and both English and French members of the profession were most enthusiastic in the formation of a society and elected an organizing committee to report at an early meeting.

It was the wish of the meeting that the scheme should take the form of a Provincial one, and the architects in Quebec have been written, to get their co-operation.

I have so far failed to see that the French and English architects in this province are "separated by a wide gulf."

"This natural racial dislike" — as you state — does not appear among our architects here. We may have our trivial jealousies. What professions have not? And so far from a feeling of "hatred" of each other, there is a close and friendly brother-feeling, as our quiet and business-like meeting proved.

I hope you will rectify your misleading statements in your next issue and wish us success in our undertaking.

Respectfully yours, CHRIS. CLIFT,
Secretary pro. tem.,

Proposed Architectural Association for Province of Quebec.

BOOKS ON POMPEIIAN ARCHITECTURE.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I am desirous of obtaining some books on the architecture of ancient Pompeii, and also some views of some of the dwellings of the patricians of that city, if such views are obtainable. Will you kindly advise me in the matter if you have any such information at your command? Your kind attention will be appreciated by

Yours very truly, X.

[SIR WILLIAM GELL's book on Pompeii is the fullest. Owen Jones's "Grammar of Ornament" gives ideas of the color-decoration, as does also Racinet's "Ornement Polychrome" and Racinet's "Costumes," which contains very clever colored interiors. There are many other books on the subject. — EDS. AMERICAN ARCHITECT.]

BOOKS.

PHILADELPHIA, PA.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Some time since I wrote you for information concerning books upon certain stated subjects; viz., a good work upon masonry construction — sewers, bridges and buildings; a work treating upon the geology, etc., of building-stones; a work upon theatre planning and construction. I have received no reply thereto. As I have in the past received some valuable assistance in this direction from you, your attention will greatly oblige

Yours truly, HERBERT P. KELLY.

[The best book on masonry construction yet published is Professor Baker's "Treatise on Masonry Construction." A report was published some time ago by the United States Government on the "Building Stones of the United States," which is the best authority on the subject. For the general subject, perhaps the South Kensington text-book on "Materials" would be as useful as anything. For theatre planning and construction, the appropriate chapter in "Gwilt's Cyclopædia," with a comparison of articles and plans in the technical journals, is the most available material in English. There is an antiquated French book on the subject, in several volumes, and Garnier, after the completion of the Opéra, published a book on "Le Theatre," which is useful; but the modern construction of theatres is a very different affair from that of twenty-five years ago. — EDS. AMERICAN ARCHITECT.]

BOOKS ON ARCHITECTURE.

CHICAGO, ILL.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — As I think you are well posted about books pertaining to architecture, I wish to ask if you can recommend Nicholson's

"Architecture" as a good book for a student's use, and if there are any others that you think are better, please let me know. Trusting you will favor me with a reply when convenient.

Yours, OLE A. SCHYE.

[NICHOLSON's "Architecture" is a very old-fashioned book, but a good and thorough one of its kind. His chapters on Carpentry and Joinery are the best that we know of in any book. Gwilt's "Cyclopædia of Architecture" is, perhaps, the most useful single book for a beginner. — EDS. AMERICAN ARCHITECT.]

BOOKS ON PLUMBING AND DRAINAGE.

NEW YORK, N. Y.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — What do you consider the best publication from which one can learn not only the principles of plumbing and drainage, but also the proper method of making drawings for same.

Yours, etc., T. P. N.

[BAYLE's "House Drainage and Water Service"; Buchan's "Plumbing," W. Stevens Hellyer's books, and those by J. P. Putnam, W. P. Gerhard and others. — EDS. AMERICAN ARCHITECT.]

BYZANTINE AND RENAISSANCE ORNAMENT.

BUFFALO, N. Y.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I am in want of some good illustrations of the Byzantine ornament and carvings; also, of the Italian Renaissance. I wish you would inform me what you can recommend representing nicely those styles of architectural carving.

Very respectfully yours, WM. T. CROSS.

[If you mean what is now called Byzantine ornament, the examples generally followed are those shown in Revolt's "Architecture Romane," which has been republished here. The real Byzantine work is, perhaps, best studied in Ruskin's "Stones of Venice" and photographs of Venice and Ravenna, and in the photographs of St. Sophia at Constantinople. The books on Byzantine architecture in Asia, such as those of Texier and Pullan, contain little useful detail. For the Italian Renaissance, there are many excellent books, but perhaps the most useful studies for carving would be found in Raguenet's serial publication, back volumes of which can be readily obtained. — EDS. AMERICAN ARCHITECT.]

PROCESSES FOR COPYING PLANS.

MONTREAL, CAN.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Would you be so kind as to give in the *American Architect* more details on the process of copying plans (as said to be used by Messrs. Burnham & Root, in a previous note in the *American Architect* and in *Engineering and Building Record*). I would be pleased to know the working of such a process, in so far as it would not interfere with the professional privileges of the promoters of the idea.

Yours, J. VENNE.

[ALL we know is what has been published. Possibly Messrs. Burnham & Root may be willing to make the process public, for the benefit of the profession, but we imagine that skilful manipulation has a good deal to do with its success. — EDS. AMERICAN ARCHITECT.]

BOOKS AND PRINTS.

GALVESTON, TEX., March 15, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I trust you will pardon me for my boldness in writing you this letter, but if you will kindly give the answers to the following questions I will feel very grateful to you.

I am studying architecture and noticed the sketches in Normandy, by Herbert Railton, published in the *American Architect* of February 22.

I wish very much to study this style of sketching, and would be pleased if you would tell me if I can obtain them in book form, from whom, and the price. If I cannot get this, will you please recommend one in the same style.

Would you also tell me the price and publishers of a standard work on the different architectural styles.

Also if I can obtain photogravures from the old editions of the *American Architect* separate from the text, and if so at what price per dozen. Trusting you will have the kindness to answer, if possible,

I am, yours respectfully, F. J. M.

[We do not think the Railton sketches can be had in book form. "Coaching Days and Coaching Ways," by W. Outram Tristram, contains many illustrations by Railton, and numerous reproductions of his sketches may be found in the *English Illustrated Magazine*. The best books of sketches are those of Samuel Prout, published many years ago. The best book on architectural styles is Fergusson's "History of Architecture," published by Dodd & Mead, New York, price about \$5 to students. The gelatine prints, which we suppose are meant, can be obtained most cheaply by buying the back numbers of the *American Architect* in which they have appeared, and which can generally be supplied, at 15 or 25 cents each, according to the edition which contains them. The International edition, which began this year, and contains nearly all the real photogravures, besides the principal selection of gelatine plates, can only be had by subscription, as the edition is limited. — EDS. AMERICAN ARCHITECT.]

FIRE-WALLS.

CHICAGO, ILL., April 25, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In your issue of the *American Architect* for April 19, 1890, we notice in the communication from Chicago, that the writer in speaking of the fire-walls of the Farwell Buildings, says, that the walls consist "of a twelve-inch brick wall, lined on each side with a two-inch layer of concrete. The concrete veneering was applied by a case of boards being first built two inches from the brick, and the space filled with concrete, and the boards knocked away again after the cement had hardened."

Now, the above is entirely erroneous. We were the architects of the building and superintended its construction.

There was no brickwork at all used in the construction of these party-walls. But they were built entirely of concrete, made of Utica cement, sharp sand and stone-shale from the banks of the Michigan canal, which was brought on canal boats direct to the building, and walls made two feet thick in basement and ending at sixteen inches thick in top story.

A twelve-inch wall, with a two-inch scale of concrete on each side the entire height of the building, would, in our judgment, be a very poor wall. Respectfully, JOHN M. VAN OSDEL & Co.

[We are glad to have this correction, and entirely coincide in the opinion that a twelve-inch brick wall with two inches of concrete on each side would be a very poor affair. It would be next to impossible to prevent the interior brickwork from settling, and throwing off the concrete scales.—EDS. AMERICAN ARCHITECT.]

FIREPROOF STAIRWAYS.

NEW YORK, N. Y., April 29, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In your issue of the 16th ult. you publish plan, section, elevation and description of a "fireproof stairway for factories and workshops," applicable also to other kinds of buildings, and which your correspondent, Mr. Charles H. Rau, claims to be something new.

Tenement-houses with stairways identical to those illustrated were built on Christopher Street, in this city, several years ago. Stairways on this plan have been built in Glasgow and Edinburgh, Scotland, for twenty-five years, at least; and in the barracks of the British army this kind of stairway is almost always the one adopted.

Mr. Rau need not fear "that this device may be . . . encumbered by any patent gotten out afterwards by unscrupulous persons trying to make money out of other people's (presumably his) ideas."

One disadvantage I can see in using this stairway in factories would be that the continuous lines of shafting, usually aimed at by engineers, would be interfered with. Yours truly,

DRAUGHTSMAN.



LOST ARTS IN BURMAH.—Dr. Forchhammer has, according to a correspondent of *Indian Engineering*, just completed two large volumes of his archaeological researches in Upper Burma and the Arracan Division. The chief centre of his surveys were confined to Pagan, the ancient capital of the Talaung dynasty, situated in the Pokoko district. The survey of the ruins of this ancient city was begun in December, 1888, and from inscriptions found in the Pegu district it was traced that remnants of the ancient city will be found on the hills east of Shweyigon and Ananda Pagodas. From these interesting volumes we learn that Pagan contains a number of curiously constructed shrines built against the steep sides of ravines, and an interminable labyrinth of artificial caves perforating all the sides of the hills for miles and extending to the banks of the Irrawaddy, apparently constructed for the accommodation of Buddhist monks. Fac-similes of the inscriptions (some on slabs six feet high) have been copied. The inscriptions are engraved in Burmese, Talaing and Pali characters. The dates go so far back as A. D., 1050, to the close of the last century. Some of the huge granite pillars are traced to have been originally brought from Thaton after the overthrow of the Talaing dynasty. Some clay tablets bearing Nageri inscriptions have also been copied. The walls around the town are said to have been constructed by Indian masons; also a number of Hindu temples which exist in this locality. Most of the structures are constructed of brick, although many contain stone slabs to ensure stability. The main styles of the buildings are classified as follows:

- (1) A pyramid, octagonal square or circular at base, solid brickwork throughout, no interior, often with lateral flights of stairs to the top.
- (2) Temples with well developed interior and central chamber, over which rises a spire.
- (3) Temples with interior galleries and ante-chambers on four sides with entrances from without, the hall being a massive square.
- (4) Massive circular bell-shaped structures, similar to shrines in Ceylon.
- (5) Subterranean monasteries with intricate passages and caves constructed some fifty feet below ground level.

The report concludes with specimen drawings of ornamental carving in stone and wood combined with beautiful variegated tiles. The paint-

ing and other decorative art exhibited on these temples disclose an art now lost by the Burmese.—*Invention*.

DETECTING LEAKS IN UNDERGROUND GAS-PIPES.—A German paper thus describes a method of detecting leaks in underground gas-pipes: Test-holes are sunk in the ground along the lines of the gas mains, and half-inch wrought-iron pipes about three feet long are inserted. In the upper ends of these pipes small glass tubes are placed, each tube containing a slip of paper moistened with chloride of palladium. The test-papers turn black under the influence of illuminating gas, the rapidity and distinctness of the reaction depending upon the strength of the palladium solution and upon the volume of escaping gas. Under the most unfavorable conditions, however, an exposure of the test-paper for a period of fifteen minutes is considered long enough to show whether or no gas is present. The test-holes should be placed about six feet apart, and should not reach below the line of gas-pipe. The main object is to penetrate the more or less compact surface material of the street, so that the gas in the ground has a direct and convenient means of escape. In many of the streets of Frankfurt-on-the-Main, especially those having asphalt pavement, one-inch pipes lead through the asphalt and the underlying layer of beton, their lower ends extending to within a short distance of the gas mains. These escape-pipes are filled with pieces of sponge and are closed with cork stoppers. The pieces of sponge are renewed from time to time. The pipes have been found to overcome, to a considerable extent, the annoyance of digging up the streets for long stretches with the view of locating leaks in the main.—*Boston Transcript*.

THE NADRAI AQUEDUCT.—The great Nadrai Aqueduct in India carries a canal 150 feet wide or thereabouts across 15 arches of 60 feet span. In an account by the correspondent of *Engineering* it is stated that the foundations, which are on circular wells, all go down some 55 feet below the bed of the river which the aqueduct crosses. The 15 arches are divided by abutment piers into groups of five spans each, the abutment piers have each two rows of wells, and the single piers one row. Thanks to the simple expedient of building the work in a pit dug out of dry land through which the river was subsequently diverted, the work of sinking the 268 wells went on without interruption throughout the year. It is probable that no other well-sinking job has been so systematically worked out—and, indeed, in the beds of active rivers there is no such chance of careful administration—for as the river rises and falls the conditions to be dealt with change completely. The aqueduct carries the Lower Ganges Canal across what is known locally as a nuddee—i. e., a water-course that draws its water-supply from the plains of Hindustan, and not like what are here known as the rivers proper from the mountains. The canal that goes over the top draws in ordinary years a revenue from the land it waters of some 50,000 pounds sterling a year, and a work that secures that revenue at a cost of 300,000 pounds sterling had much need to be pushed on with the utmost expedition. Fortunately, owing to favorable rain-fall during the four years that the aqueduct was under reconstruction, the loss of revenue actually experienced was but a tenth of the total. Had the case been the other way, the loss of food crops in even one year would have far overtopped the price of the work.—*Providence Journal*.

THE ACCIDENTS ON THE EIFFEL TOWER AND FORTH BRIDGE.—The great monsters of mechanical skill and genius call for the sacrifice of a great deal of life and limb in their construction. The greater the engineering feat the more extensive is the loss of life. In the construction of the Eiffel tower, for instance, twenty-six lives were lost, according to the official returns of the French Government; but it is said that this number would be largely augmented if the names were given of men who died from injuries received during the construction of the tower and of others who were killed and whose deaths were not reported owing to the hue-and-cry which was raised after the first two dozen lives had been sacrificed on the great structure. The number of men who were injured during the construction of the Eiffel Tower has been placed at 6,000. This enormous showing is accounted for by the fact that every injury was reported and registered which received treatment from the official surgeons. When a man bruised his finger he went to a Government surgeon to have it dressed, and a clumsy workman thus got on the list a dozen or two times a year. Serious injuries were a very small proportion of the whole. On the great Forth Bridge in Scotland, a list of forty lives lost has been published; but there is no record of injuries.—*New York Sun*.

AN OLD LONDON HOUSE.—Another of the old houses in London is threatened with demolition; though considerations not aesthetic may save it, after all, from the final fate. Curiously enough, neither Timbs, Hare nor Thornbury mention it; we gleaned our own first brief hint from a kind "sentimentalist" in the press, who made an unnoticed protest against the destruction of just so much of an object-lesson in literature and history. The house is not far from St. Paul's, between Cannon and Upper Thames Streets, on the east side of College Hill, and numbered 21 and 22. It has a wide, low stone portico, mortared, with ample double arches, surmounted with elaborate carvings, said to be the work of Grinling Gibbons, as is indeed likely; the two entrances open directly upon the street. Inside the great gates, with their ancient bolts and chains, are the square paved court-yards, one much finer than the other; and beyond again, the dwelling itself, of brick, and flat-walled, without gable or bow-window, between a glaring recent building and the church. A sign hangs out, advertising offices to be let, and it is evident that offices have been let there any time these two hundred years. The place seems in good repair; there is a pleasant seventeenth-century entrance hall, with carved garlands intact over the doors and on the ceilings. Overhead is the staircase, where swords jingled, and long silks, in a kindred rustle of laughter, swept the floor, on the way to a minuet; beneath are the vaulted cellars, where Dryden's Zimri kept his wine. For the memory which pervades the lonely place is just that of the vagabond Duke of Buckingham, nearly first in his

brilliant worthlessness, of the vagabonds of his day. The house was his house, and it rings with the arraignment of his first poet's tingling lines. It is a still place, where little traffic comes, left to clothe itself in soft yellows, and dream of the "dancing, drinking and unthinking time." It might be hard for anybody, even an American with money and a sense of the picturesque, to get up an enthusiasm for the reprobate, whose child-effigy, over his murdered father's tomb in the Abbey, where he also lies, is handsome enough for an angel's. Not Dryden alone, but Pope, afterwards, did him immortal honor in lines too famous to quote. As everybody knows, the second duke died in a village inn, poor and alone. Whatever he was (and the same praise may be given to every courtier his contemporary, and to the King who saw fit gravely to reprove him for his atheistic talk), he was no hypocrite. When a clergyman of the establishment called to see him, and asked of the dying freely in what religion he had lived, he replied gallantly: "In none, I am well pleased to say; for I should have been a disgrace to any. Can you do me any good now, bestir yourself and do it!" Any one who has had occasion to be wearied of cant might wish 21 College Hill preserved as a beacon to warn wit and strength from base courses, and to encourage the Pharisees in the sole virtue saved from the shipwreck of a man. There is a motto on the arms in the immediate neighborhood: *Hinc spes effulget*. Hope and other good rays must always shine from honesty, even when it belongs to a George Villiers.—*Louise Imogen Guiney, in Boston Post.*

DESTRUCTION OF THE CHURCH OF THE HOLY SEPULCHRE, JERUSALEM.—In the year 1897 the Armenians appeared but as strangers in the Church of the Holy Sepulchre; they possessed only a poor chapel situated in one of the galleries of the nave. The nakedness of this chapel contrasted with the wealth of the nation. Besides this it was ready to fall into ruins, and the Armenians had several times solicited permission to repair and embellish it. After many ineffectual petitions they determined to set fire to their chapel—to destroy it—in the hopes that the privilege of rebuilding their fallen sanctuary would be more easily obtained. They thought that they could master the flames so as not to spread beyond their chapel; but the fire speedily reached all the galleries, and sprang up to the dome of the church; the Corinthian columns which supported the nave were thrown down; the dome of the church, which was made of cedar, could not long resist the fire—it fell with the upper part of the nave, and in its fall crushed the Holy Sepulchre. The flame spread to the Calvary, and all the altars were burned. The tombs of Godfrey of Bouillon and of Baldwin disappeared in the course of the general destruction; eye-witnesses have assured me that the tombs of the two kings had been spared by the fire, and that they were destroyed by the Greeks themselves in the midst of the confusion of the conflagration. The tombs of the two kings were as it were the Palladium of the Latin monks; they were the glorious title-deeds of the monasteries of the Holy Land; and the Greeks, the enemies of the Latin convent, wished to get rid of these monuments. At present two stone benches covered with a mat fill the place of the two tombs; the ashes of Godfrey and Baldwin, mingled with the ashes and rubbish of the fire, profaned and cast to the winds, are lost from the soil of Palestine.—*M. Poujoulet, in The Architect.*

CATANIA.—Perhaps 90,000 souls exist in Catania. The palaces which border her principal streets are very new, splendid and great; perhaps the Biscaria palace which houses vast stores of Greek sarcophagi, terra-cottas, vases, and sculptures excavated from the lava, being the most imposing. Then there is the Marina, where the lowly gather and listen to the music of government bands, a filthy place much loved by the lazzaroni. But the Bellini garden, out on the heights towards Etna, is surpassingly beautiful; and in this you will see military officials resplendent in uniforms and decorations, lords and princes covered with insignia of rank, all the really interesting aristocracy of Catania, and truly the most winsome, soulful-eyed, empty-headed women of Sicily. Of the Græco-Roman remains, the theatre can be visited by the use of guides and torches. The ancient Odeum is near; and in Archibusuri Street will be found what is left of the Roman amphitheatre. Under the Piazza del Duomo, adjacent to the great cathedral, are the Roman baths; but the best preserved specimens of these are seen underneath the Carmelite church, where there still remain, in marble, the warm bath, the hot-water bath, the vapor bath, and the fire-room and the disrobing-room. There are many mediæval half-ruined structures of interest in Catania; while the unfinished monastery of San Nicola is, excepting that of Mafra in Portugal, the largest and most imposing in all Europe.—*Commercial Advertiser.*

DRAINAGE OF HOUSES IN INDIA.—Mr. Framjee Aderjee, of 26 Ezra Street, Calcutta, is urging upon the Calcutta Municipality, with all the enthusiasm of an inventor, says *The Indian Engineer*, a simple method he has devised for preventing the accumulation of germ-bearing matter in drains. According to the system at present in vogue, the water-tanks are within the houses, and the drains are flushed or not according to the carelessness or otherwise of the occupants. Mr. Framjee would place the tanks outside, and have the water let on regularly by Municipal servants. Then, the street drains now have a small stream of water running through them night and day, which never fills the channels, and therefore, cannot clean them out. According to Mr. Framjee's plan, the water would be allowed to collect in tanks, and would be let into the drains at intervals in such a volume that all refuse would be carried before it. Mr. Framjee has a model of his system, in which the working is clearly shown, and the contrivances are also shown by which an overflow of water may be prevented. So far the plan seems excellent, and its adoption may be recommended; but there is a further and totally distinct part of the plan, which the inventor is unwilling to disclose at once. It is a plan for brushing the drains and so preventing the adhesion of sediment to bottom and sides. Nobody denies that this, if it could be done, would be a desirable thing,

and Mr. Framjee thinks he can do it, and at the same time effect a saving instead of an increase in the present cost of cleaning the drains.—*Invention.*

SARCOPHAGI FOUND IN ITALY.—Near Viterbo, in the district of Colledo, a chambered tomb has been discovered, with a vestibule adorned by two columns. The cell contained two sarcophagi of travertine, in which were found a golden ring and some gold thread, remnants of the rich clothing of the deceased. Between Vetralla and Capranica a marble sarcophagus has been unearthed, adorned with bas-reliefs, representing the myth of Theseus and Ariadne, of severe and simple style.—*Exchange.*

THE EMPRESS OF AUSTRIA'S NEW PALACE AT CORFU.—The Empress of Austria, is building a magnificent Pompeian Palace at Corfu, which will have cost nearly half a million sterling by the time it is ready for occupation. It is on a charming site on top of a steep hill, and is being constructed of marble brought from Carrara, while the interior is to be decorated with the rarest woods. The gardens will be laid out in terraces with fountains, and both the house and grounds are to be illuminated by electricity. Three hundred men are now employed on the building operations.—*Boston Post.*

TRADE SURVEYS

THE remarkable indifference manifested by money-lenders and financial authorities throughout the East to the growing and even threatening demands of the silver inflationists in the West is due more largely to political considerations than anything else. There is less confidence in the monometallic idea than formerly existed. People of all classes now begin to have less fear of an abundant supply of silver money, and paper money based upon silver, than years ago, and there is a disposition to at least try the experiment, since it seems that the experiment cannot be avoided. Powerful political sentiment in the West favors a currency expansion, and the wise heads in the East see that it is to come, and are preparing to adapt themselves to it. Very many interests are identified, temporarily, at least, with this movement for an increased supply of money, and these interests are anxiously awaiting a change of policy which is to bring them opportunities for greater speculative effort. Old theories and standards are being either revised, or entirely upset and replaced by new ones concerning money and its functions. Nearly all the larger railway systems are furnishing good reports of traffic and earnings. Railway securities are in better request on both sides of the water, but, at the same time, public confidence in these securities grows but slowly. Financial and business interests are anxious to see what Congress will do with reference to the railway and other important questions, knowing that the actions of that body are not always directed by the highest degree of wisdom. The industries throughout the country have been more or less unsettled by the labor agitations of the past three or four months, but, now that the crisis is over, plans which have been held in abeyance for a long time will be developed and vigorously carried out. A great deal of new work will be heard of within the next thirty days. Manufacturers in nearly all of the larger cities have been contemplating an expansion of their producing capacity, but have held back until this time; but their work, when presented, will be most urgent. The railroad-builders have in contemplation a great deal of construction work, and, now that the way is clear, they will push it through. Throughout New England, a great deal of small house and shop building will be done. The industries of these States are in an exceptionally prosperous condition, and scores of establishments have more work than they can conveniently attend to. The output of our industrial establishments generally is greatly in excess of last year; the exceptions to this rule are insignificant.

The paper manufacturers are perhaps not as confident of a booming demand as they were a year ago, but nearly all the paper-mills are busy, and stocks are not depressing prices. The makers of machinery and electrical supplies are exceptionally busy. The boot and shoe manufacturers have had a very good winter and spring trade. The hardware manufacturers have done well. In the Middle States a similar condition of things exists. So far as the iron trade is concerned, there has been no lull in demand, although prices have declined to the lowest point known for a year or more. The steel rail-mills in Pennsylvania are crowded with orders, and there are now inquiries in the market for over 100,000 tons of rails, according to reliable late advices. Bridge-building material is in very urgent demand, to cover requirements created by the erection of several large bridges over Western rivers. The coal-producers of the anthracite region report an improving demand. The bituminous coal-producers along the Allegheny Mountains are producing over 250,000 tons of coal per week, and marketing every ton of it. In Western Pennsylvania a satisfactory condition of things is reported with reference to the great industries located there. The possibility of a general strike among the iron and steel workers is contemplated; but it is not yet certain that the employers in that industry will be forced to face such an emergency. Throughout the Ohio Valley the greatest activity prevails in iron, steel, coal and building interests; all the smaller industries there are thriving, owing to the wonderful development that has been made in West Virginia, Kentucky, Tennessee, Ohio and Indiana. Within the past year or two the Ohio Valley has regained much of the activity which was lost at the time when the Ohio River ceased to be a grand highway, owing to the active competition of the railway lines between the Allegheny Mountains and the Mississippi. River travel is now increasing, and that our inland water-ways are to be used still more is proven by the immense amount of work now in hand at inland boat-yards. Throughout the entire valley agriculture is also prospering. Eastern manufacturers and jobbers report, from time to time, a greatly increased demand for all kinds of machinery and manufactured products from the region of country lying 500 miles west of the Mississippi River. Throughout that belt scores of small towns have sprung up, there has been a wonderful development of small manufacturing interests, and the section is receiving the benefits of an outflow of capital and population similar to that with which the South has been favored in recent years. Real-estate is advancing steadily. The railroad companies are finding it profitable to construct much new mileage; labor is being attracted to this section, and the manufacturing interest located there are prospering as they are perhaps nowhere else in the country.

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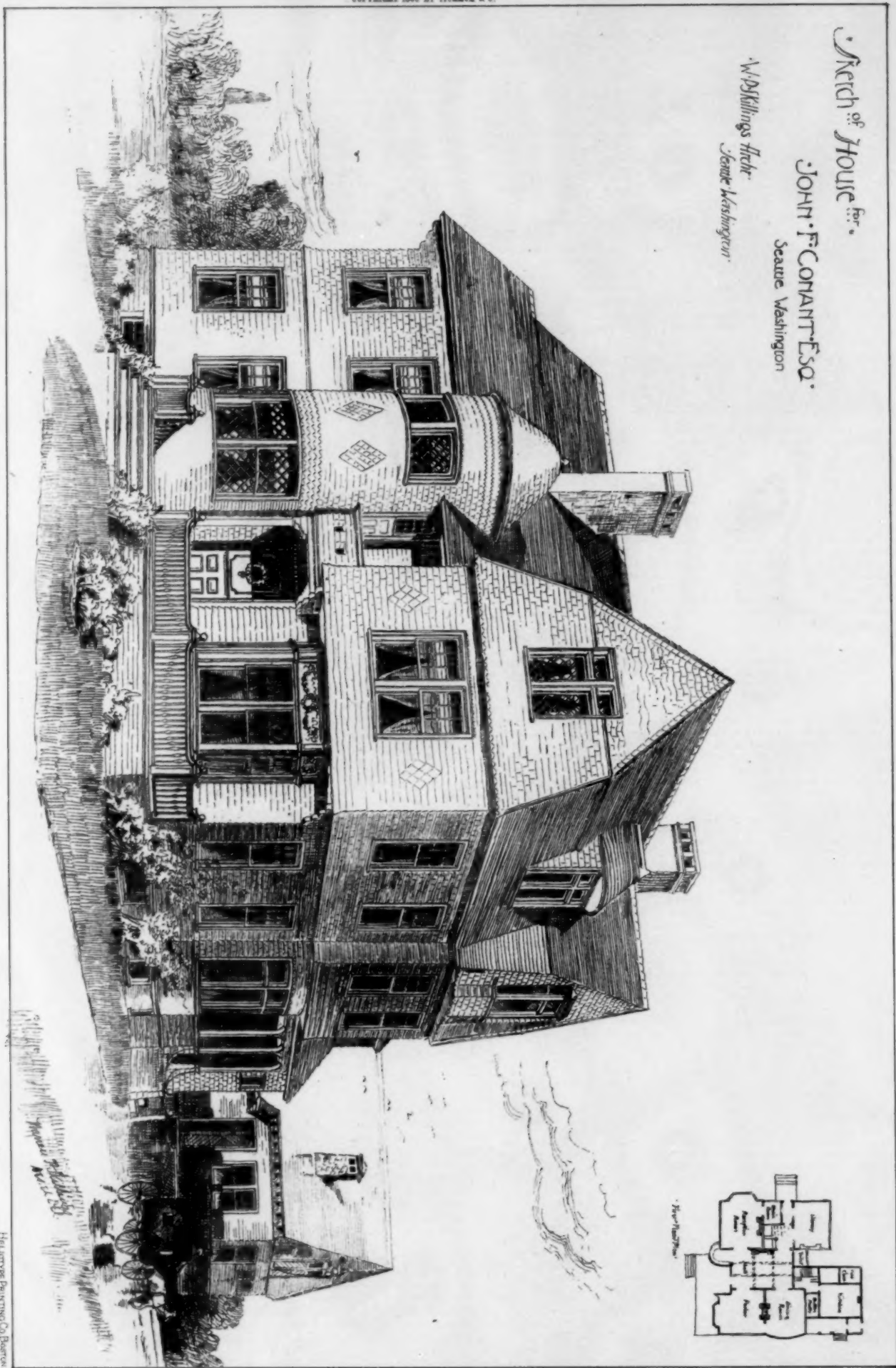


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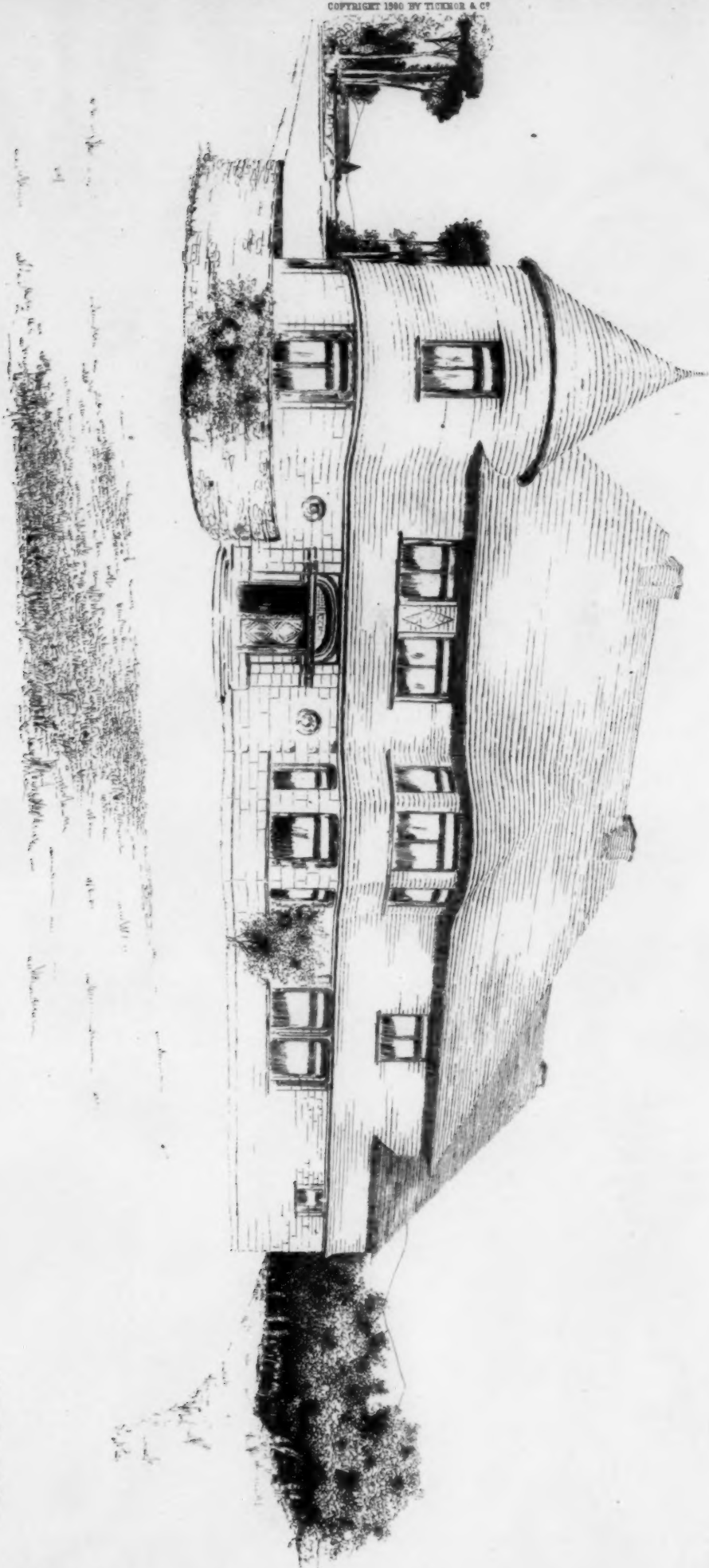
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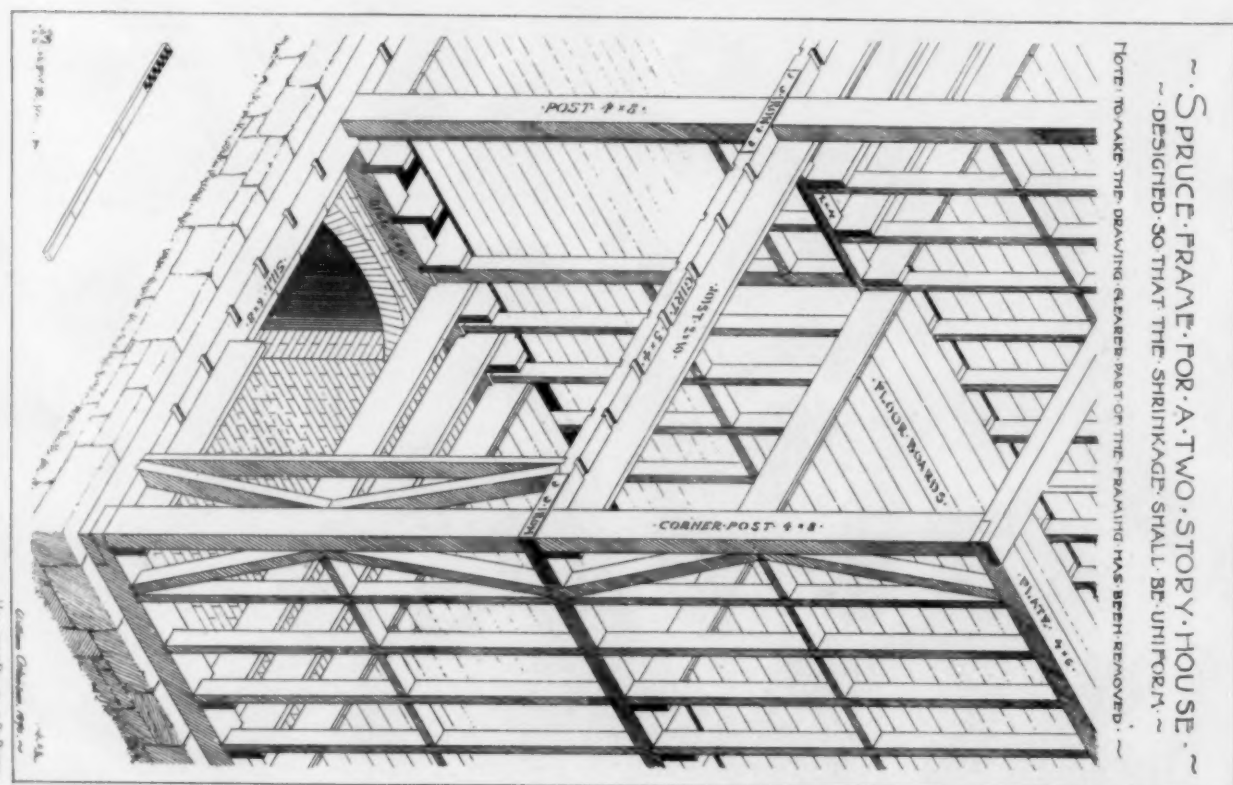
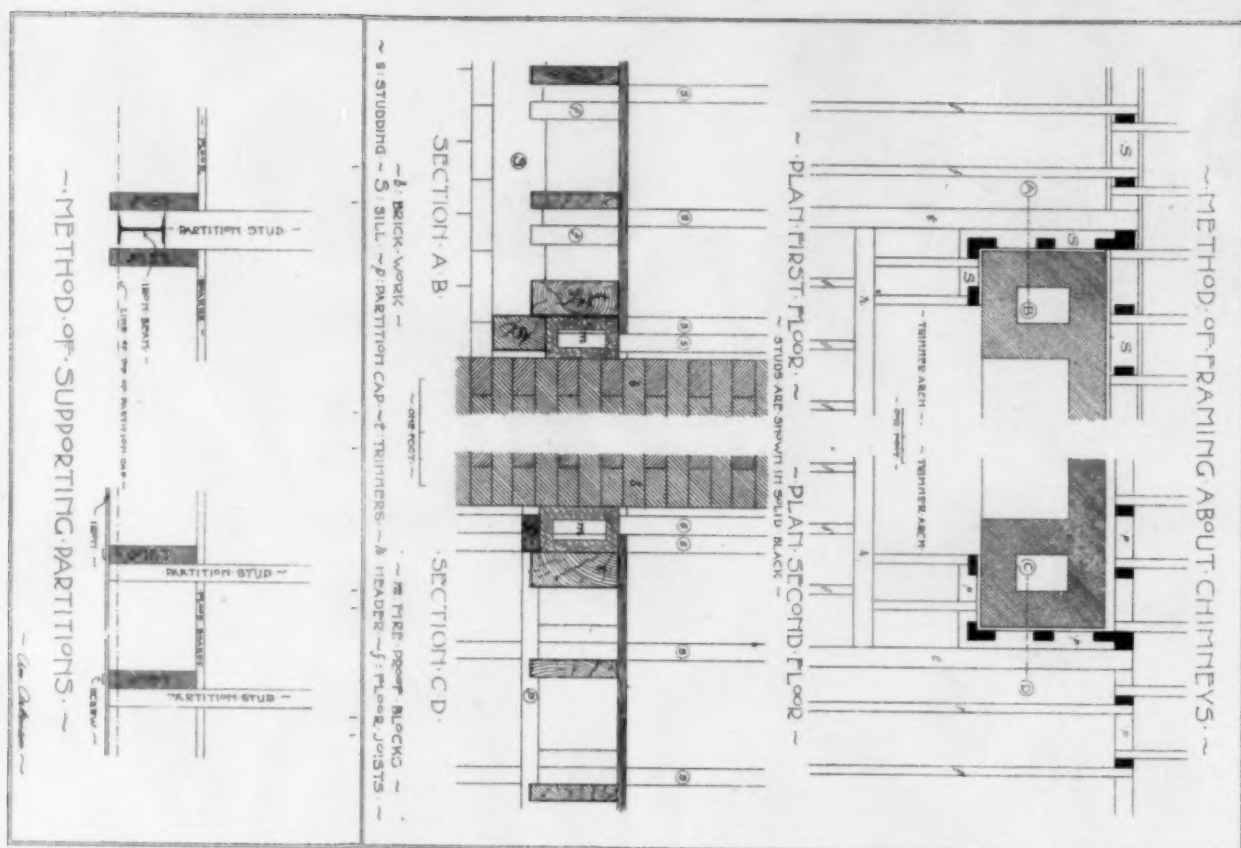
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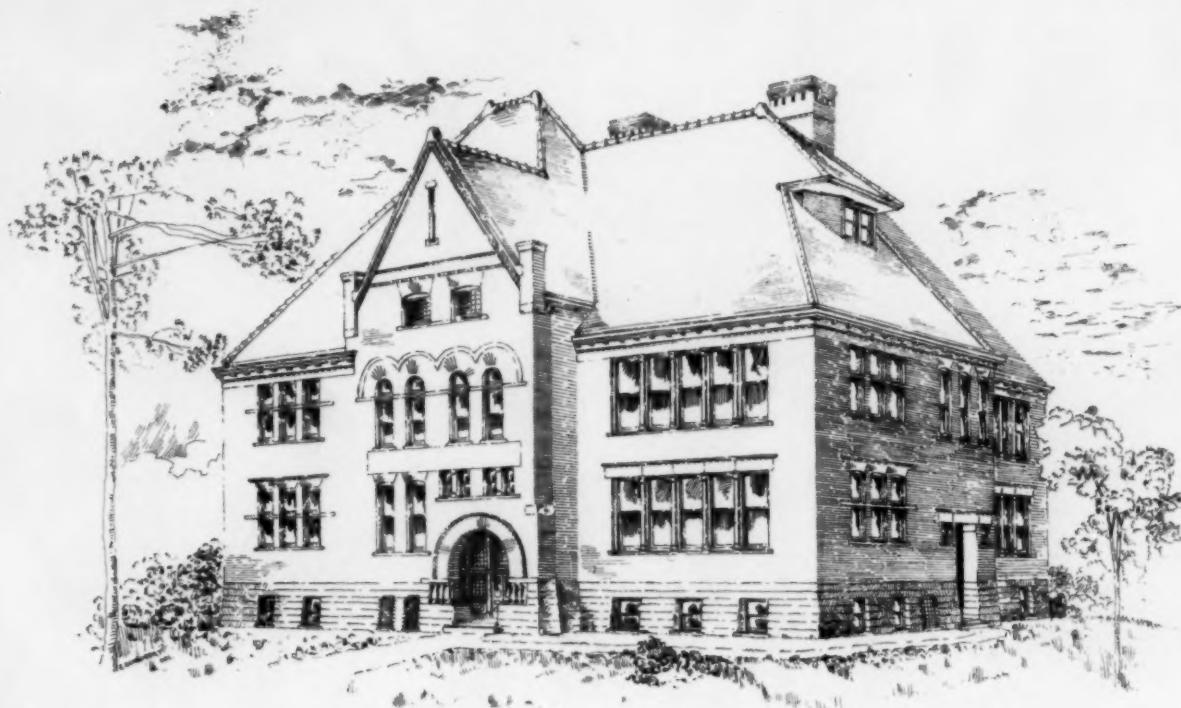
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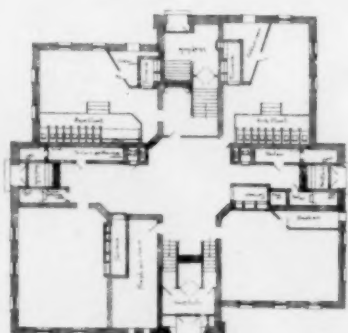


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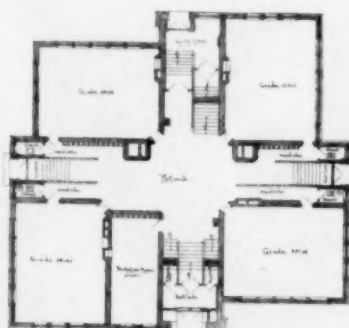




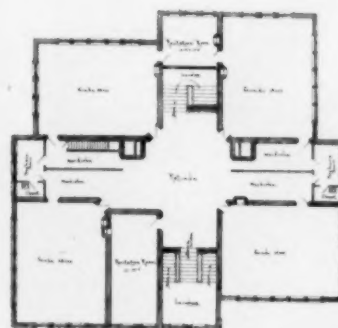
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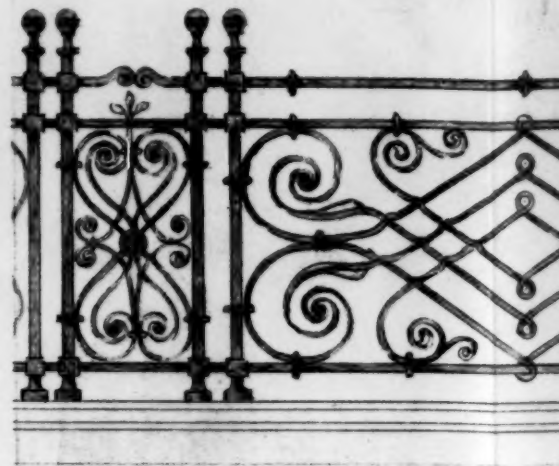
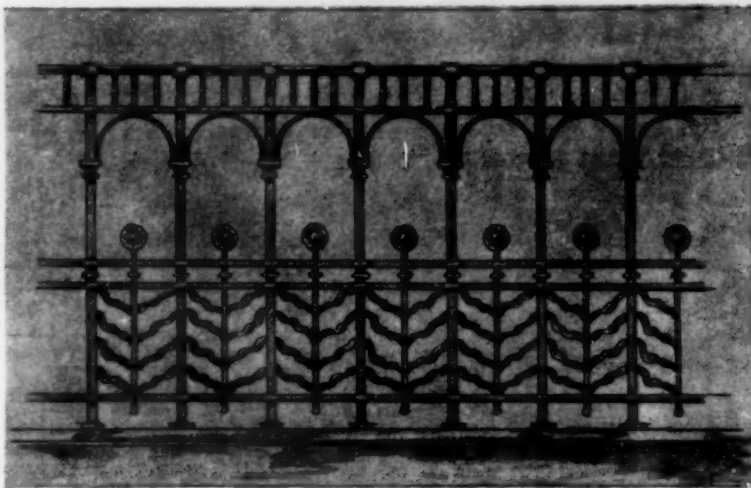
Basement Plan



First Floor Plan



Second Floor Plan

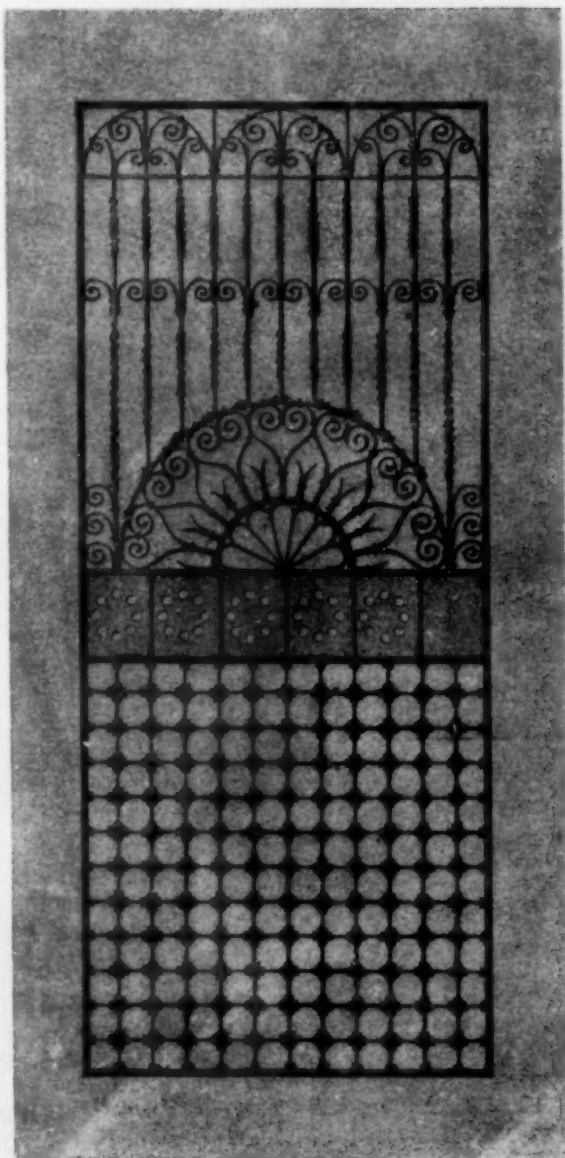


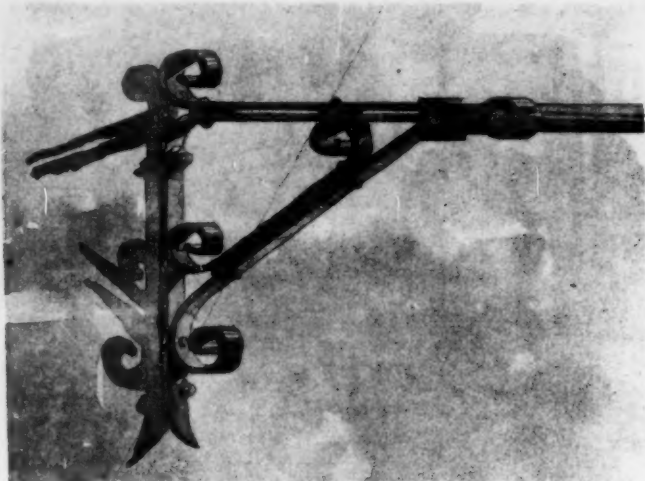
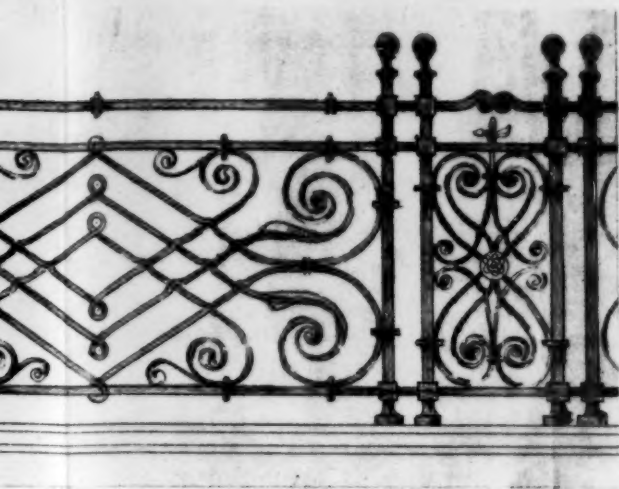
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