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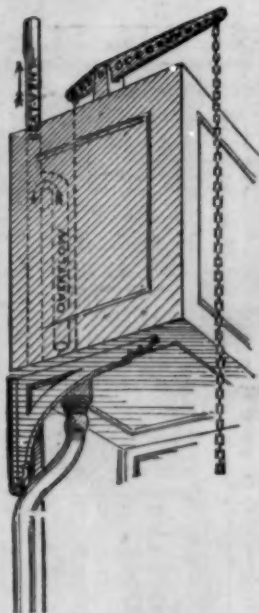
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SUMMARY:—

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MR. NORCROSS, of Worcester, who is by far the most extensive builder in this country, and perhaps in the world, as well as the owner of many quarries of nearly every sort of building stone, and ought thus to know what he is talking about, makes a communication to the *Springfield Republican* about the stone-cutters' demonstration in Boston, which, although somewhat alarmingly personal, gives an interesting view of the details of the quarrels and of the management of the Freestone-Cutters' Union. While he acknowledges that there are good men in it, he says that "the bad element is constantly in control," and compares the Union to "the association of grinders which Charles Reade tells about in his story of *Put Yourself in His Place*." We imagine that the same comparison has occurred to a good many people, who remember how the tools in Mr. Carew's shop, during his struggle with the Union last year, were twice collected by unknown hands and thrown into the dock, and who have observed, as we have, the relentless cruelty with which non-Union men are hunted out of the places where they, for the moment, find employment; but even the Grinders' Union of the story, although it blew men up with gunpowder if they transgressed its rules, conscientiously kept its doors open to new members, while the New England Freestone-Cutters' Association last year "closed its books," shutting out all further accessions to its numbers, and placing the monopoly of the entire trade in the hands of five or six hundred men, who, in the present state of the law, are allowed to prevent any one else, no matter how skilful or industrious, from earning his living by cutting freestone in New England. As there are probably at least a thousand skilled freestone-cutters in New England, the action of one-half of them, and those controlled, as Mr. Norcross says, by the "rum and loafer element," in shutting out the other half from all participation in the business, is only surpassed in coolness by the claim, publicly made, that the object of its performances is "the defence of human rights."

THE Annual Report of the Boston Manufacturers' Mutual Fire Insurance Company furnishes its usual amount of interesting and useful information in regard to the causes of fires in mills. It is curious to notice the evidences of steady improvement in mill-construction, as well as the novelties, so to speak, in incendiary conditions, which the insurance engineers have constantly to meet and study. Among the latter, the most important is probably the practice, which has within the last year become very common, of sending from the South

bales of cotton containing crushed seeds, the oil from which heats in the bale and causes spontaneous combustion. The presence of such crushed seeds, which were totally unknown in baled cotton until within a few years, is probably due to a change in the process of ginning, but many fires have already occurred from this cause. The principal improvement to be observed in mill-construction is undoubtedly the more general introduction of efficient automatic sprinklers, which are credited with having extinguished nearly one-half the fires, while pails of water conquered a large part of the rest. The action of the sprinklers is well described by the observation of a mill-hand, who reported to the manager that the cotton in the picker-room had caught fire, but that just at that moment, by a "curious coincidence," the water-pipe burst and put the fire out all by itself, and it is interesting to see how accurately these little watchmen open just where they are needed, and how energetically they fight for their owners. In one case, the mill was struck by lightning during a thunder-storm, and smoke was seen issuing from the belt-tower, an extremely dangerous place, as it communicates with all the stories of a mill. The fire-pumps were started and the hose laid to the tower, but, on investigation, no fire was to be found, but only a single automatic sprinkler in operation just over the bearing of the main shaft on the first floor, this little device having subdued a fire under conditions which, as the report says, no other form of fire-apparatus has yet been able to cope with. Another incipient conflagration, under very different circumstances, was also extinguished by sprinklers in a curious way. On the evening of the Fourth of July, a rocket came through a window into a weave-room in a cotton mill, and exploded under the looms, of course setting fire instantly to several of them. The room was furnished with automatic sprinklers, which immediately opened, and when the watchman, who had heard the explosion and the subsequent sound of the spray from the sprinklers, arrived at the spot, the fire was nearly out, and a few minutes' further sprinkling extinguished it entirely.

IT is said, we do not know with how much authority, that one of the buildings for the Exhibition in 1892 in Chicago will be an iron tower, sixteen hundred feet high. The plans of the tower, which have already been made, propose a structure in the shape of a truncated cone, four hundred feet in diameter at the base, and two hundred and seventy-six feet at the top. No elevators are to be used, but the ascent will be made by means of spiral roadways. One of these, the outer one, consists of a staircase, with steps seventy feet long, which will serve for pedestrians and for a double line of cars, which are to run at intervals of one minute each way. Within this outer spiral is another, of a grade so gentle that carriages can be easily driven up and down. Near the top is to be a hotel, ten stories high, with restaurants and so on. The scheme does not seem impracticable, and there is certainly an advantage in getting rid of the elevators for ascending. The elevators in the Eiffel Tower are said to have caused so much seasickness that the majority of the passengers went no higher in them than the first landing, and the ride in them was at best uncomfortable; while the ascent of the Chicago tower, in roomy cars, which, by their spiral movement, will show a constantly changing prospect, seems likely to be a very agreeable experience, and particularly so to the residents of the Mississippi Valley, to most of whom the inspection of a landscape from an elevation of sixteen hundred feet will be a novel experience.

MR. EBENEZER L. ROBERTS, a well-known New York architect, died at his house in Brooklyn last week. Mr. Roberts was born in Connecticut in 1825, and was first apprenticed to a carpenter; but, when twenty-five years old, he came to New York, and soon established himself as an architect, gaining an excellent reputation. He designed the Standard Oil Company's Building on Broadway, the Ninth National Bank, the Baptist Church of the Epiphany, on Madison Avenue, St. Paul's Methodist Church, on Fourth Avenue, the Phoenix Insurance Company's Building in Brooklyn, and many other important structures in the sister cities.

THE issue of *Engineering* for February 28, which is devoted entirely to an historical and technical description of the Forth Bridge, is the most extraordinary feat that technical journalism has ever accomplished. It contains seventy-six

large quarto pages of text, illustrated with one hundred and sixty diagrams and engravings, and, in addition, seventeen double-page, half-tone engravings; even on the thin paper used for foreign circulation, each copy of this issue weighs one pound and thirteen ounces, and yet a single copy sells for six pence! Do our subscribers, who often heap scorn upon us when we now and then draw their attention to the fact that their own interests are intimately connected with the amount of advertising we can gather into our own pages, imagine that these six pennies present the cost, and a profit thereon, of manufacturing such an amazing issue as this Forth Bridge number? Neither *Engineering* nor any other journal could give its subscribers such an excess of value for their money if it did not enjoy the support of advertising manufacturers and dealers, and it could not have this support if English advertisers did not understand the value to themselves of advertising in technical journals to a greater extent than do Americans, and if English subscribers did not take the trouble to make sure that English advertisers should "hear from" the cards they place in it. It would be a direct benefit to themselves if our own subscribers would only properly appreciate the fact that all architectural journals—in this country at least—have to contend against the stubborn fact that architects are not themselves the consumers of the goods which dealers advertise, and so do not have occasion to put themselves in communication with such advertisers in a way to prove to them that they are "hearing from" their advertising outlay. It would seem in face of this undeniable fact that our subscribers would see that it is for their own interest to assure dealers that they do see, note and remember the facts they advertise. When we receive the same kind and amount of support that *Engineering* enjoys, we, too, can be as enterprising. We know that we are just stewards of the income that passes through our hands, we believe that our sense of justice will not wane when that income is many times what it is now, and we can assure our subscribers that in place of giving them as now a journal which costs only twice or thrice what the subscriber pays for it, we can then give him one which costs even ten times the subscription price.

A CONTRACT has actually been signed for the construction of the East River Tunnel, which is to cross the channel between South Street, Brooklyn, and Broome Street, New York, and operations are to begin within a few weeks. The tunnel is planned on a new, if not questionable system, known by the name of gravity transit, the profile of the tunnel being similar to that of a double toboggan-slide, so that trains, after starting from one end, will coast down a steep hill for about one-fourth the distance across, then, by the impetus thus gained, travel along a level road for two-thirds the remaining distance, and then, having arrived at the foot of the opposite slope, be dragged up, by a cable or otherwise, to the farther terminus. It is obvious that this principle of design is very suitable to a submarine tunnel, where descent must be made on each side, and the history of mountain railways shows that steep grades may be traversed with safety, but the experiment of setting a train loose, without power of checking its own progress, to coast down a steep hill, is a new one.

AT a recent meeting of the Architects' and Engineers' Society of Munich, Professor Ernst Fischer, of the Technical High School, gave an interesting lecture on "Lead Pencils." According to him, the first people to devise some more convenient writing instrument than pen-and-ink, or sticks of charcoal, were the Italians, who had, in the sixteenth century, pencils made of a mixture of lead and tin, with which they executed what are now known as "silver pencil" drawings. At this time graphite was known, and occasionally employed for rough drawing, but the quality of the material then found was poor, and its principal use was for making crucibles, for which a great deal of coarse graphite is still consumed. In 1564, during the reign of Queen Elizabeth, a deposit of pure graphite was found at Borrowdale, in Cumberland, and for centuries afterward the Borrowdale graphite held a monopoly of the market. Great efforts were made to develop and perfect the manufacture of pencils, made from this graphite, tempered with clay, and enclosed in wooden cases, and they were exported from England all over the world. The administration of the Borrowdale mine was very judicious. By six weeks working every year enough graphite could be extracted to make all the pencils that could be sold at a remunerative price, and this limit was strictly adhered to, although the value of the six weeks' product was about two hundred thou-

sand dollars. This graphite was so pure and uniform that for many years the leads for pencils were sawed from solid blocks, which were cut first into slices, and then into slender bars. The round leads for ever-pointed pencils were made by turning the ordinary pencil bars in a lathe. The strictness of the English monopoly stimulated Continental manufacturers, not only to try to discover graphite deposits at home, but to make pencil leads out of graphite dust, cemented with gums or sulphur. In this they were partially successful. In Bavaria several small mines were opened, and both in Germany and France tolerable pencils were made out of graphite dust, compressed into moulds in a vacuum; but the English pencils held the first place until some twenty or thirty years ago, when the Borrowdale deposit suddenly gave out. By this time, the German pencil manufacturers had perfected their processes, so as to make good pencils with their own graphite, and the familiar name of A. W. Faber, which belonged to an establishment founded in Nuremberg in 1760, began to be seen on pencils in every part of the world. In 1871, John Peter Alibert, while prospecting for gold in the mountains of East Siberia, near Irkutsk, found in a valley some pieces of pure graphite. He was sensible enough to give up his search for gold, and endeavor to develop his new discovery, but it was not until 1879 that the Alibert Mine, after the expenditure of an immense amount of money, was brought into profitable and regular operation, probably with the financial aid of the Fabers, who contracted with Alibert for the entire product, and still control it. The quality of the Siberian lead appears to be excellent, and the Fabers now send out, from their Nuremberg factory alone, nearly a million pencils every working day.

IT will be remembered that the Minister of Commerce in Hungary recently adopted some energetic reforms in the way of passenger rates over the Government railways, dividing the country into "zones," and fixing the price of tickets in such a way that travel in the remoter and less densely populated regions was cheaper than in the more populous districts. A supplementary regulation was put in force last month, less radical, perhaps, but very convenient for the public, and, one would think, likely to be profitable for the railroads. Under the new regulation, railway tickets are sold, not only at the stations, but at all post and telegraph offices, in all hotels, and at places specially provided for the purpose. These tickets are good for transit through the number of zones marked on them, beginning the trip anywhere. They may be had for a single journey or to go and return; they are good at all times, and on all trains, and may be sent to any distance from the point where they are bought, to be used by friends or others. For the information of persons not yet accustomed to this novel fashion of railway administration, a pamphlet of explanation is given without charge to any one who asks for it. Railway officials will look with much curiosity to see the results of the new management, but it certainly seems as if some of the innovations were particularly well suited for adoption in this country, which, like Hungary, is vast, thinly settled, and traversed by great systems of railroad which have now hardly business enough to pay their operating expenses.

THE *Scientific American* says that the paraffine process, applied to the Egyptian obelisk in the Central Park, New York, for the purpose of preserving it from the effect of the weather, has rather increased than diminished the disintegration of the surface, and, at the present rate of decay, the obelisk will be entirely unrecognizable in sixty or seventy years. The most injurious part of the application seems to have been the preliminary heating of the stone, which opened the seams, burnt out the fungi which had accumulated in them, and served to keep out the weather, and, by expansion, opened new seams. The workmen, also, knocked off pieces where seams appeared, and confess to having removed nearly half a ton of fragments from the beautifully polished and sculptured surface, while the actual amount was probably much more. It seems to us that there should be no delay in getting the stone under cover. Few people probably know that there is, or was, a large piece of polished and sculptured Egyptian syenite, apparently a part of a broken obelisk, in the garden of a house at Waltham, ten miles from Boston. Thirty years ago or more, this stone, which was brought from Egypt as a curiosity by the owner of the estate, was in good preservation, but we believe that it decayed rapidly later. If it is still in place, it would be interesting to know its present condition, as a warning of the fate which awaits the New York obelisk unless a room can be found to put it in.

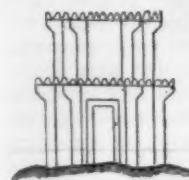
MILITARY ARCHITECTURE.¹—I.

Fig. 1. Fortress of the Time of Menephtah I.

NO whatever remote period we trace the history of the human race, we encounter evidence that the struggle for existence is coeval with the life of man. At first it was a conflict of individual against individual, but, when the social instinct had awakened, it expanded into warfare between different peoples.

As soon as man had learned how to build himself a dwelling, he was compelled to protect it against attacks from without; so that, along with the development of civil architecture, there was a corresponding development of military architecture. The latter, therefore, comprises all the methods of construction as applied to the defence of localities, as well as the special buildings designed to shelter troops. This branch of architecture then presents two main divisions, *Fortifications* and *Barracks*.

A marked correlation, due to the character and tendencies of their originators, evidently exists between civil and military structures of the same period, and in the same country. But, setting aside certain general elements, the two kinds of architecture are distinguished from each other by dispositions which are peculiar to each, because they are destined to answer special needs.

The points in common belong to the method of construction and to architectonic details; but the accommodation of a structure to its position constitutes one of the characteristics of fortified works, and concerns the military engineer alone.

Military engineers have been guided from earliest times by the same principles; the only change has been in the mode of application, and the reasons for such variations are to be sought especially in the improvement of weapons. Military architecture has, therefore, been undergoing transformations down through the centuries, while still preserving in each age the character impressed upon those imposing or mysterious ruins which have been brought to light by the patient toil of archaeologists.

ANCIENT PERIOD.—EGYPT.

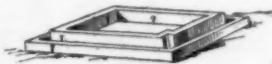
We learn from historians and from epigraphic monuments that the Egyptians turned their attention to works of fortifications even in remotest antiquity. Diodorus Siculus relates that Sesostris caused a wall, 1,500 *stadia* in length, to be constructed from Pelusium to Heliopolis, to guard against the incursions of Arabs and Syrians (*"Hist."* lib. 1). Heliopolis itself, which, according to the Biblical account, was a flourishing town in the days of Joseph, doubtless possessed at that early period the walls which can still be traced. The fortified city of Tanis, in Lower Egypt, already existed in the time of Abraham.

Without, however, going back to such a remote age, valuable information concerning the primitive Egyptian fortresses can be obtained from a painting on the Tomb of Rotei at Beni Hassan el Gadim. This is a monument of respectable antiquity, since it dates from the twenty-second century before our era.

The general character of the fortresses of the Egyptians was dictated by the nature of their country, which was flat and subject to inundations, and at the same time by the comparative weakness of their poorly-armed nomad enemies. They had nothing to fear but the scaling of their defences, and against this mode of attack the elevation of the walls was the most efficient protection. No heed was given to trace or flanking; the enceinte was oftenest of rectangular shape, with no towers and no outworks other than the external counterforts, which were usually built to assure the stability of the walls (Figure 1). To escape the inundations of the Nile, the fortress proper was constructed on a platform made of the earth from the surrounding canals, and protected by a lower exterior wall (*"Herodotus,"* II, 97, 137).

The military post at Abydos, known under the name of Choumet-*ez-Zerib* (Figure 2), offers a very well-defined type of this general disposition (Mariette, *"Abidos,"* Desc-t-II).

It may seem astonishing that there are so few remains of Egyptian military architecture, but this fact is readily explained when we recall that, although stone was used in the erection

Fig. 2. Military Post of Choumet-*ez-Zerib*.

of temples and tombs, military structures were almost exclusively of the ordinary building material of the country; that is, of crude brick made from the clay of the Nile and dried in the sun. Time finally destroyed the clay, sparing only those monumental stone gates which, in their enigmatical isolation, so long defied the investigations of travellers.

ASSYRIAN EMPIRES.

The empires of Babylon and Nineveh, sometimes rivals and sometimes joined under one sceptre, possessed the same civilization and the same arts.

The Babylonians dwelt in the centre of a clayey plain, where trees and rocks were very rare, and they were, therefore, compelled, like the Egyptians, to build their fortifications of brick. They consolidated these, however, by beds of bitumen and reeds, which they had at hand.

The Ninevites, although possessing stone quarries, built all their edifices of brick, a custom doubtless borrowed from their neighbors; but they used stone for the basements and revetements. The monarchs were accustomed to have their exploits engraven on these revetements, which were of a fine-grained limestone.

The military scene which we reproduce (Figure 3) is from a bas-relief of the Palace of Khorsabad. It is very characteristic, and shows that the fortresses erected on rocky eminences

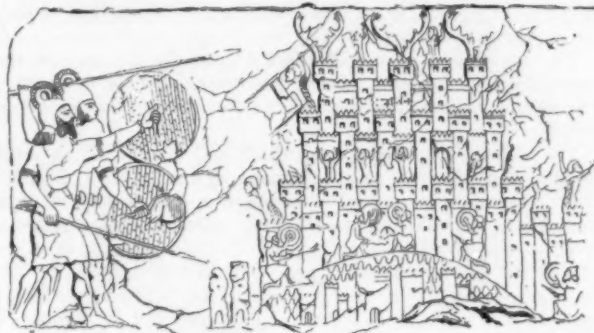


Fig. 3. Bas-relief from the Palace of Khorsabad.

often comprised several concentric enceintes; these were sometimes strengthened by detached works. Unlike Egyptian enceintes, which were almost always destitute of towers, the fortifications represented on Syrian monuments are abundantly provided with them. A crenellated battlement juts over the facing of the towers, and presents the appearance of machicolations.

GREECE AND THE COASTS OF ASIA MINOR.

During the heroic period, that is to say until toward the twelfth century before the Christian era, Greece was divided into a multitude of separate small States. These were governed by kings, who established their dwellings in central positions or on elevations, whence, like the feudal lords of a later time, they could keep watch over their domains and detect the approach of an enemy. Under shelter of the fortifications reared about these abodes of the petty Hellenic tyrants, temples were erected and cities grew up around their foundations.

The oldest Greek constructions all belong to the Cyclopean or Pelasgic system. They consist of enormous masses of rock piled together in a rudely polygonal disposition. The citadel of Tiryns (Figure 4) offers a curious example of this arrangement (*Schliemann "Tiryns"*).

The ancient part of the wall of Mycenæ, which is supposed to date back to the sixteenth century B. C., presents, on the contrary, an example of regular polygonal disposition. The blocks are fitted together, sometimes with great nicety, but with no mortar or cement of any sort.

Between the time of the Trojan War and the wars with Darius and Xerxes (from the twelfth to the fifth century B. C.), the cities of Greece gradually grew in importance. Suburbs were one by one surrounded by walls, so that a city became at



Fig. 4. Plan of Tiryns.

¹From the French of A. de Rochas and G. Esptallier in Pinnat's *"Encyclopédie de l'Architecture et de la Construction."*

length an aggregation of quarters, each of these with separate fortifications. In such cases the original enceinte remained as the main fortress and took the name of *acropolis*.

It was during this period that the regular polygonal disposition, with vertical or oblique joints, was definitively adopted, and that towers began to appear in the walls. These were at first erected only at the angles and near the gates, but the

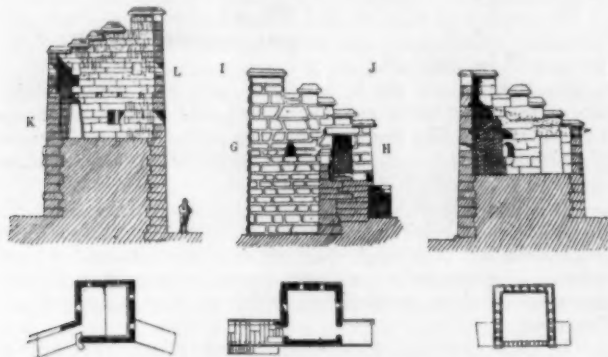


Fig. 5. Towers of Messene.

number was increased later on. The oldest are round, the most recent square, as at Messene (Figure 5); at Gortys they are regularly spaced, about 115 feet apart.

The foundation of the Persian Empire by Cyrus, and the expeditions of the great eastern powers against Greece gave a new development to the methods of fortification on the soil of Hellas.

The cities along the coasts, which had been built at some distance from the sea, as a safeguard against pirates, fortified their defenceless ports and established a secure way of communication with them between long parallel walls; Athens, Megara, Argos and Corinth furnish examples of such cities.

Was the military architecture of Greece indigenous to the country, or was it in some measure derived from Oriental peoples dwelling in Asia Minor? This question is difficult of solution. The sea was a bond of union, rather than a means of separation, between Hellas and the rich cities along the shores of Asia Minor. In both, the development of the arts was nearly simultaneous, and an examination of the fortifications around Heraclea of Latmus or Sardis, for example, discloses a close relationship with Hellenic enceintes of the same period.

The industrious and independent Phœnicians, on the other hand, though doubtless derived from the ancient Assyrians, brought an ingenious sagacity to the construction of their port defences (Figure 6); unfortunately, the long sieges of the times of the Crusades render it difficult to determine with certainty the epochs of existing Phœnician ruins; it is rather in the colonies of this little nation of merchants that we must look for the best examples of its military architecture; for instance, at Lixus in Mauretania Tingitana (now Morocco), at Thapsus and Hadrumetum, and above all in the formidable walls of Carthage, heir of the mother city, and whose engineers, later on, built Eryx and Syracuse in Sicily.

In the fourth century B. C., notable progress was made in the art of siege and consequently in the art of fortification; the impetus was due mainly to Dyonisius, Tyrant of Syracuse, and to the Macedonian engineers of Philip and Alexander.

The ramparts, instead of merely encircling the cities, were now forced to occupy the naturally strong points of the ground by means of salients, behind which the intervening curtains did not meet [Rhodes]; this is the first appearance of the dominating principle of modern fortification.

The need of a less divergent flanking became apparent. The trace *en crémaillère* was adopted for all long sides running in a right line.

Then the square towers were built in such fashion as to present always a salient angle to the enemy; the object of this was, not only to break the force of projectiles hurled from the huge engines of this period, but also to allow of a complete lateral flanking.

The curious didactic treatise of Philon of Byzantium gives a very good summing up of the rules admitted in the art of fortifying cities during the second century B. C.

The curtains were strengthened by making them of earth confined between two face walls, as at Pompeii (Figure 7).

In other cases the ramparts comprised a mask wall, strengthened on the city side by a series of vaults supporting the terre-pleine [Rhodes, and Aurelian's Wall at Rome].

At this period, a broad ditch was always dug before the walls. Philon even demanded that there should be three



Fig. 7. Walls of Pompeii.

trenches, as at Rhodes, so as to prevent the assailants from setting up their hurling engines within 560 feet of the enceintes: beyond this limit catapults throwing projectiles weighing a talent could not harm masonry.

The influence of Philon of Byzantium was felt over the entire eastern basin of the Mediterranean down to the time of the Crusades. However, in the fourth century, in large cities



Fig. 8. Byzantine Enceinte of Constantinople.

like Constantinople and Nicea, attention was directed less to what may be termed the Byzantine engineer's geometrical dispositions of detail, and more to the securing of defensive force by doubling the lines of fortification (Figure 8).

ROMAN EMPIRE.

The Romans made no innovations in the trace of the fortification; they merely imitated the Greeks, to whom they often showed themselves inferior on this point. But in the application of the art they were able to bring to military construction methods in which they were unrivalled (Figure 9).

What the Greeks could not teach them, since the political constitution of Hellas had never suggested its need, was the application of this art to a *plan d'ensemble* for the defense of a country's frontiers. The Empire, in its ceaseless growth, soon felt the necessity of protecting its borders against turbulent

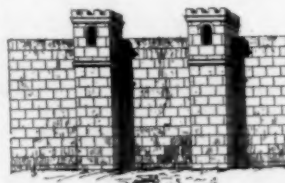


Fig. 9. Walls of Verona: from the Arch of Constantine.

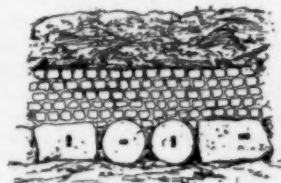


Fig. 10. Part of the Exterior Wall of the Castellum of Jublains.

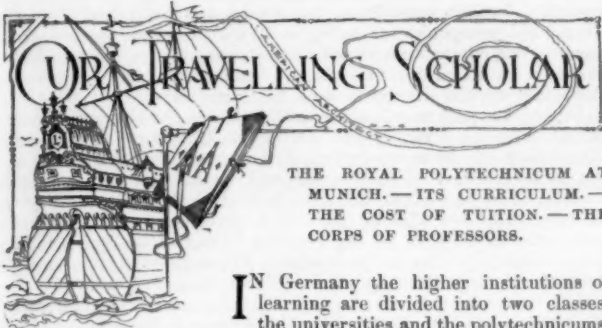
neighbors. Valentinian covered Gaul with fortified posts, and all through the south of this most favored dependency of the Empire, as well as along the German frontier, their imposing remains are still to be seen. But the dikes thus thrown up against the threatening tide of barbarian invasion were all in vain. They were scarcely finished when the men of the North

swept past them, carrying away the civilization of the ancient world, and with it the art of fortification as it had been developed by the experience of ages.

GALLO-ROMAN PERIOD.

During the struggles of the dying old world and of triumphant barbarism, which was poorly protected by Roman weapons, every city turned its attention to its own defences. The noblest monuments were levelled to the ground to furnish material for fortifications; in these hastily constructed walls quantities of sculptured fragments and shafts of columns are found (Figure 10).

[To be continued.]



IN Germany the higher institutions of learning are divided into two classes, the universities and the polytechnics. The latter class, in which the Royal Polytechnicum, at Munich, holds high rank — covers the usual technical courses, mining, mechanical and civil engineering, chemistry, architecture, etc., and are placed on a level with the universities. Its students enjoy the same privileges — free admission to the galleries, collections, museums; reduced admission to the theatres and the use of the libraries of the State. The completion of a regular course, also leads to a doctor's degree, but only after a special examination covering all the work of the previous years has been passed with a sufficient degree of merit, besides the term-examinations and those at the end of the second year. The course requires four years of study, but even the *gymnasium* student, with his excellent preparation, is advised to extend it through five years. I need not dwell upon the facts that attendance, examinations and the following of a prescribed course are at the option of the individual and also that baccalaureate degrees are not granted.

The course in architecture as printed in the prospectus of the Munich institute for the School-year 1889-90 is as follows:

FIRST YEAR.		SECOND TERM.	
FIRST TERM.		SECOND TERM.	
Higher mathematics.....	4 2	Higher mathematics.....	4 2
Descriptive geometry.....	4 4	Descriptive geometry.....	4 4
Physics.....	6	Physics.....	4 4
Construction.....	1 4	Construction.....	1 4
Elements of ancient architecture	1 4	Elements of ancient architecture	1 4
Shades and shadows.....	1 2	History of the fine arts.....	4 4
History of the fine arts.....	4 4	Freehand drawing.....	4 4
Freehand drawing.....	4 4		
SECOND YEAR.		THIRD YEAR.	
General chemistry.....	5	Mechanics (as particularly applied to architecture).....	2
Mechanics and graphical statics.....	7	Construction.....	6
Materials.....	3 6	Materials.....	6
Ancient architectural history.....	2	Ancient architectural history.....	2
Elements of Medieval architecture.....	2 4	Elements of Medieval architecture.....	2 4
Elements of Renaissance architecture.....	1 4	Elements of Renaissance architecture.....	1 4
Freehand drawing and from the antique.....	4 4	Linear perspective.....	1 2
		Freehand drawing and from the antique.....	4 4
THIRD YEAR.		FOURTH YEAR.	
Stereotomy and stone-cutting.....	5 2	Stone-cutting.....	4
Heating and ventilation.....	3	Heating and ventilation.....	2
Planning of public buildings.....	4 8	Planning of public buildings.....	4 8
Medieval architecture (designing).....	4	Medieval arch. (designing).....	4
Elements of Renaissance architecture.....	2	Elements of Renaissance architecture.....	2
Perspective.....	1 4	Perspective.....	1 2
Freehand drawing.....	4 4	Tunnelling, road-building, etc.....	4 4
Modelling.....	4 4	Freehand drawing.....	4 4
		Modelling.....	4 4
FOURTH YEAR.			
Designing (Renaissance).....	14	The style of the Renaissance.....	2
Designing (Gothic and Romanesque).....	4 4	Designing (Renaissance).....	14
Decorative.....	1 4	Designing (Gothic and Romanesque).....	4 4
Esthetics.....	1	Estimates.....	1
Machinery (a consideration of the mechanical appliances an architect has to deal with).....	3	Railroad engineering.....	2
Building-laws.....	3	Sanitary engineering.....	1
Freehand drawing.....	4 4	Freehand drawing.....	4 4
Modelling.....	4 4	Modelling.....	4 4

In the outline of the course given above, the numbers following each subject respectively indicate the hours of lecture and practice-work devoted to it weekly. Instruction is much aided by the large collection of plaster-casts, photographs and other facilities at the command of the professor, which in each department are provided with full consideration of the requirements of those who are to use them. Not only can access be obtained to such property as may belong to the Institute itself, but also to the large collections of the State which are centred at Munich, the acknowledged art-centre of the empire, notable among which are the Glyptothek (devoted to sculpture and containing the groups from the pediments of the temple at Ægina, restored by Thorwaldsen — a treasure, and an important link in the history of Greek sculpture); the old Pinakothek (old masters); the new Pinakothek (masters of modern painting); Museum of Industrial Art; collection of vases, the National Museum (fine collection of old furniture, wrought-iron work, etc.), not to dwell upon the ethnographical, zoological, paleontological, mineralogical collections, which, although of no particular interest to the architect, yet serve to give Munich the position it holds. I may also mention the library which contains one and a quarter million volumes and the small, but well-chosen library of the Polytechnicum. By "elements of ancient architecture," etc., in the schedule above is meant a study of the details and characteristic points which tend to make up a style. These are first considered — the student copies mouldings, carvings, parts of buildings, etc., and finally whole buildings; then the subject is treated historically, its best examples are brought to his notice and descriptions are entered into. After this training he is supposed to be capable of designing in that style and problems are given him accordingly.

The school-year is divided into two *semesters*. The winter *semester* lasting from the fifteenth of October until the fifteenth of March; then after a vacation of about a month the summer *semester* begins and continues until the fifteenth day of August.

Should the architectural student find time lying heavily upon his hands, with an average of fifteen hours in the lecture-room and twenty-five per week in the draughting-room, he can join several other courses, the pursuance of which will prove beneficial to him in his future career: to wit, water-coloring, photography, stenography, lectures on ornament, a systematic study of the paintings in the old and new Pinakothek (under F. v. Reber), seminary work at the National Museum (Professor Graf), and English, French and Italian. The absence of any modern language in the course may be traced to the fact that the German youth after having completed his preparatory education, and before entering the University, has a pretty fair knowledge of English as well as French.

Much has been written of the customs at the great German universities at Heidelberg and elsewhere. Suffice it to say that such information may be applied here. Technical schools have their *corps*; *corps* have their beer-drinking members, and the beer-drinking members have their small caps and big beer-drinking dogs, as well as the universities.

Were I in the field as a future *savant* it would be a source of gratification to me to see what a respectful attitude is preserved towards the members of the faculty. And it seems but just that the efforts of men who devote their lives to a pursuit, success in which is not attended with the usual reward and distinction gained in other walks of life, should, at least, be acknowledged.

Lectures usually last forty-five minutes and end with the hour. At the instant the hands of the clock, which is in every room, indicate the quarter passed the professor appears, bowing in all directions to the class which has risen to greet him. With his appearance all noise has ceased, and when he reaches the platform to make his final bow, the class seats itself and the professor proceeds without interruption until the clock indicates the close of the hour. The class again rises as the professor leaves the room and then disperses.

It is needless to say to all who know anything of the German character that all such boyish pranks as are indulged in in the French schools, and everything of that class, which he puts down as being *ohne sinn*, finds no foothold here. On the contrary, silence and quiet reign supreme in a German draughting-room. This may be one of the good results of non-compulsory attendance. Who can tell! But certain it is, that the student who does not like to see military or primary school discipline brought into a university and acts accordingly, is not haunted by a phantom in the shape of a small black letter — ordinarily innocent enough in its aspect, but when neatly marked on a term's report seems quite terrible — which all subsequent study and a good examination cannot prevent. His daily presence may be a gratifying sight even to the German professor, but it is not the only "open sesame" to an honorable completion of a course.

The charges are based upon the number of hours taken weekly. The privilege of attending a lecture is paid for at the rate of two marks and one-half (60 cents) per term; laboratory and draughting-room work at the rate of one mark and one-half (36 cents.) A matriculation-fee of ten marks is required, and also three marks per term for the sick-fund. Should a student be taken ill during his course, he is given a private-room at the hospital and excellently cared for. He himself must pay a nominal sum, I think amounting to twenty-five cents a day, the remainder of the expenses incurred being paid out of the fund's treasury.

Among the names of those connected with the architectural

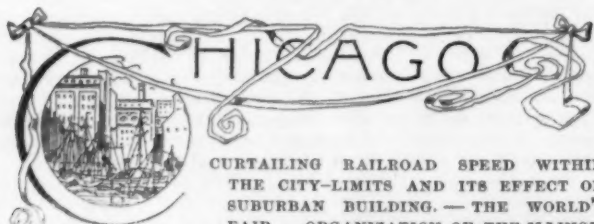
faculty at Munich, we see those of F. v. Reber, Jos. Bühlmann, Fried. and Aug. Thiersch, A. Geul, Freiherr v. Schmidt, Dr. Wm. Wittmann, Dr. H. Graf, G. v. Bezold and others.

Other institutes of technology are to be found at Aix-la-Chapelle, Berlin, Darmstadt, Brunswick, Stuttgart, Dresden, Hannover and Karlsruhe, whose courses do not materially differ from the one here.

Although, as already stated, attendance is not obligatory, the student must register for at least twelve hours weekly. In summing up the number of hours, three hours of draughting may be taken as equalling two in the lecture-room.

Before you can enjoy all the privileges of the student and are duly considered a member of the school, and after you have presented your diploma and have paid all your fees, there is still another form to comply with, that of introducing yourself to the Director. From him you receive a copy of the rules of the institution, which you are supposed to read, but usually do not. You then place your name in the register; you are now fit to shake hands with the Director, who, with a few words of congratulation, bows you out of the room. At last you can breathe easily. Now you are free, unmolested you can attend to your studies for years and years, until you choose to take an examination. These are thoughts which pass through your mind, and for a moment your bosom swells with praise, as you see within your grasp hidden treasures of knowledge which are soon to be yours. But the moment passes, just soon enough, to be brought back to the realities of life by the I-should-like-a-pour-boire look on the countenance of the attendant who helps you on with your overcoat. Apropos, I have often thought that the life of an attendant or a waiter must be a most exciting and a happy one. What is the pleasure of the gaming-table, where it is either win or lose, or the anxiety of the player as he eagerly watches the revolving wheel, compared with that of the waiter as he looks from aloof upon the victim, who is his game of chance, who is the dame fortune which never brings him losses but only gain or naught? And what interesting factors enter into the problems on the theory of probabilities with which he deals!

THEO. F. LAIST.



CURTAILING RAILROAD SPEED WITHIN THE CITY-LIMITS AND ITS EFFECT ON SUBURBAN BUILDING.—THE WORLD'S FAIR.—ORGANIZATION OF THE ILLINOIS CHAPTER, A. I. A.—THE SPRING EXHIBITION AT THE ART INSTITUTE.

ALTHOUGH the recent growth of the suburbs has been so remarkable, just at present those interested in them are much exercised over a question that the railway companies are agitating in regard to the rate of speed of trains running within the city-limits. Since the last spring election the city proper extends out onto the limitless prairies, and now includes many villages which were heretofore considered strictly suburban towns. A city ordinance provides that the speed of trains within the limits shall be only ten miles an hour. Up to the present time this ordinance has never been lived up to. There is killed, on the tracks entering the city, one man a day on an average, and as the trains are not run at the rate prescribed by law, the damages assessed to the railroads are much heavier than they would otherwise be. Thus the matter stands; the railway companies say they will conform to the law until the city fathers see fit to change the ordinance, and between these two august bodies the feeble suburbanite seems fated to suffer. As it will take an hour and one-half to come from towns, from which the running time was formerly three-quarters of an hour, the indications are, that the growth which usually comes to the outside districts each spring, will this year be much retarded, and building in the suburbs come to a temporary standstill. Of course, it will not be lasting, and it looks now as if the question of rapid transit for the suburbanites would be settled within the next few years. Some of the roads have offered to build viaducts at every third street, provided the city will arrange for the two intervening ones. Some of the roads advise walling-in the tracks, some sinking them, but nothing is settled except the fact that hundreds of trains bearing thousands of busy men and women, impatient to reach or leave their places of business, will creep in and out of the town every morning and night.

The means of rapid transit to the remote parts of the city are, however, being increased, and this will naturally lead to building in the new districts. The cable-cars, maligned and abused as they constantly are by their patrons, do bring people into the heart of the town from the northern and southern limits much more rapidly than did the old-time horse-cars. There is much talk, and some activity, on the elevated-road subject. The West Lake Street road is already in process of construction, and the charter for the West Randolph Street one has been granted. Both of these roads, when completed, will open up as desirable residence-quarters large tracts of land on the West Side, which have hitherto been considered too remote from business centres to be available. There has been for

some time much vague talk of an elevated road for the South Side, to be carried down through the continuous alley which runs between Wabash Avenue and State Street. Should both of these sections of the city obtain elevated roads, the North Side would not be long in following their example. These contemplated changes make desirable sites for dwellings uncertain things, and the continued good character of a neighborhood doubtful. The city is fast outgrowing its old accommodations: the dangerous tendency seems to be to give it larger ones than it really can fill, and so tax its strength too much, forgetting that it is "large for its age." The certainty of the World's Fair being held here of course helps along the feeling that more extensive accommodations, at least, must be gained before 1892, to permit the successful entertainment of a large number of guests.

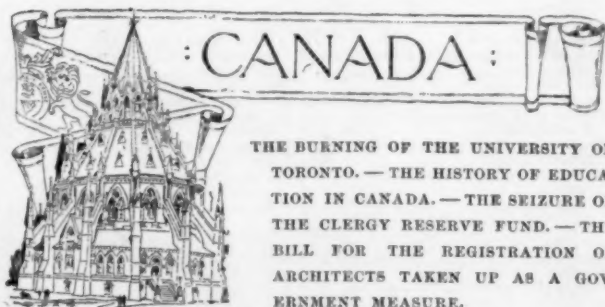
Nothing is as yet decided about the site of the Fair, though the pros and cons of the different localities are being vigorously discussed. Various committees are being appointed and different World Fair companies are being incorporated. The predictions in our previous letters we now see fulfilled, and the enthusiastic desire to obtain the Fair for our city is only equalled by the zeal with which the actual work of the enterprise is being undertaken.

During the past month the consolidation of the Chicago Chapter of the American Institute and the Illinois Chapter of the Western Association has been accomplished, though all the details have not yet been realized. The Chapter will be known as the Illinois Chapter of the American Institute, instead of the Chicago Chapter. It was considered wise to take the more comprehensive name, in case there should ever be any occasion hereafter for legislation on subjects pertaining to the profession. The articles of incorporation have already been taken out under this name.

The Constitution has not been finally adopted, and, consequently, the obtaining of the charter from the American Institute has been delayed. It was considered advisable to have the Constitution printed and distributed among the members, that more thought could be given to it than in an informal discussion. The Constitution, as reported, is framed more on the model of that belonging to the Illinois Chapter of the Western Association than on the one of the old Chicago Chapter of the Institute, with the exception that the Executive Committee is composed of the officers, rather than of a board made up of members of the Association. The special subject for discussion is that concerning honorary members, some being in favor of granting them all the privileges of active members, and some being opposed to doing so. According to the proposed Constitution, members of the Chapter must, at the expiration of two years, become members of the Institute or resign from the Association.

Heretofore the Chapter of the Western Association has formed a decided contrast to that of the Institute in the amount of work accomplished by it. The former has been active in all measures which would be of benefit to the profession, and, in fact, generally alive to all architectural interests. The latter association has been more noted for lack of interest, except in such matters as pertained to the flesh-pots of their occasional dinners. It is now intended to infuse some of the spirit of the old Illinois Chapter into the new one, and make it a power working for good results in this section of the country.

The Art Institute is at present holding its annual spring exhibition, which, with the neighboring collection of the Verestchagin pictures and the "Angelus," make a group well worth seeing. The building of the Art Institute has been enlarged and remodelled this winter, and now throws open for the first time its new galleries. The changes are too extensive to be dwelt upon in this letter.



THE BURNING OF THE UNIVERSITY OF TORONTO.—THE HISTORY OF EDUCATION IN CANADA.—THE SEIZURE OF THE CLERGY RESERVE FUND.—THE BILL FOR THE REGISTRATION OF ARCHITECTS TAKEN UP AS A GOVERNMENT MEASURE.

THE destruction of the University of Toronto by fire on the evening of February 14th last has been more than a "nine days wonder" and topic of conversation, for it was nothing less than a national calamity, and although it has been somewhat fully written about in the daily press, such a subject deserves special recognition in architectural journals, if only for the sake of placing the matter on record. But in this case there is a deeper interest awakened: a university is an important vertebra in the backbone of a country, an important wheel in the machinery of its progress; every country that possesses a university cannot but feel deeply for this loss to Canada, and many have been the letters of sympathy received by the authorities from sister institutions. Like a very large proportion of fires the cause was carelessness, and in this case carelessness

of a most unwarrantable character, such as should, indeed, be made criminal. One hears often of miners sitting and smoking on kegs of gunpowder, and it is hardly less foolhardy to carry a tray full of lighted coal-oil lamps. If they had not been lighted, possibly the fellow carrying them would not have stumbled, but as they were he had to use more caution, and that very fact made him trip. Instantly there was a blaze, and in less than half an hour one wing of the building was enveloped in flame, a steady wind converted a little fire into a "burning, fiery furnace," and the meagre supply of water was totally insufficient to cope with it. I have seen a good many great fires, but I never saw a fiercer. Convocation Hall stands north and south, attached to the rest of the University at its south end but standing clear of all buildings otherwise. The wind was from the northwest and swept through the window openings, blowing out the flames through the windows of the east side horizontally for ten feet at least, and, as the stonework calcined, the walls were honeycombed with flame, the stones appearing set in a network of flame. The whole hall inside was a mass of furious flame, no smoke being below the eaves-line.

Blame for the lack of water can only lie with the University authorities themselves. The building stands in grounds of its own, therefore any mains in it could be only private property; the city had no power to deal with the matter. Of course additional mains and increase of protective arrangements were "in course of contemplation," but the stage of action had not been reached. A curious incident, showing just how far the fire and heat went and then stopped, is related. In a vault was a package of money in bills lying near one of the walls, the outside bill had its outside face so charred and scorched as to be unrecognizable, but the back was good, and the bill was accepted by the bank.

The University was always considered one of the finest buildings of Toronto, if, indeed, it did not take the first place, and certainly at the time of its erection there was no building in the Dominion to hold a candle to it. It was built from the designs of Messrs. Cumberland & Storm, architects, of Toronto, in the round-arched or "Norman" style of Gothic. Mr. Cumberland has long since been "resting from his labors," but Mr. Storm, who is also President of the Ontario Association of Architects, still practises in Toronto. When the work of the building was first commenced in 1856, bricks were to be purchased at \$4.50 per thousand, and one of our worthy aldermen recalls the fact that at that time he was a teamster and employed in carting these bricks. Stone was the principal material, however, from Georgetown, with dressings of Ohio, and internal corbels, caps, and so on of Caen stone. The building was completed in June, 1860, having taken just under four years in erection at a cost of a trifle under \$360,000. Such a building erected now would cost nearly double the sum, but, happily, the foundations are intact and part of the building, and it is thought that a sum of \$250,000 would restore the building to its former condition. The insurance amounted to \$90,000, and the Provincial Government have voted \$160,000 to make up the amount. So much for the building, but there is the library to be replaced, the rooms to be furnished, and for these purposes a further sum of nearly \$200,000 must be raised by subscriptions. The city of Toronto intends to give \$50,000, and the rest will, no doubt, be forthcoming before long. The library was valued at \$150,000 and insured for \$50,000, so there is a clear loss there of \$100,000. The Government, in giving their contribution suggest that all speed should be used in the reconstruction, that, if possible, it may be reopened by the first of October next.

The history of education in Canada is a long chapter of vehement contention, and, for the exhibition of strong feeling and violent animosities, this subject compares well with other bones of contention that have from time to time stirred up the country. The present University has superseded the old King's College, which was an endowed institution, with its Chair of Theology and its regular morning and evening services, just like the colleges of English university towns. But Dr. Egerton Rierson, whose name passes down to posterity as the founder of the educational system of Canada, spent all his life trying to bring about a change in this system. The result was that the University College was founded without a chair of theology, and no services were to be held in the buildings. It was to be an institution for secular education entirely. But the great cause for ill-feeling and dispute was the manner by which the money for this building and educational purposes throughout the province was obtained. It was none other than the seizure of the "Clergy Reserve Fund." Up to this time the public education had been in the hands of corporations, or even private individuals, assisted by small Government grants and public subscriptions. In this move the Government took possession, and have since had entire control of the subject, and the education-tax upon all lands forms really the heaviest burden to be borne by the freeholders. As an instance of the principle of taxation for this purpose, I may mention the remark of an old gentleman the other day. He said: "Look at my land up in the Northwest; well, I don't suppose there's a child within fifty miles of it, but, nevertheless, I have to pay the tax." The seizure of the "Clergy Reserve Fund" meant the application of tithes which had hitherto been used for the support of the various rectories to secular purposes, and, this being the case, numerous rectories had to be suppressed, as there were no funds to support them. A certain number were provided for "forever." This was all brought about in the interest and for the benefit of the various sects and denominations, who could not, of course, approve of

the principle of the Clergy Reserve Fund, whereby only Protestant (or Church of England, rather) ministers were supported. Trinity College, Toronto, was another outcome of this movement. Subscriptions were raised in the province and in the old country, whereby this theological college was provided in the place of the superseded King's. A remark was made (after the passing of the Act of Parliament on the subject) by an eminent Queen's Counsellor of Toronto, now living, to Dr. Rierson, on the occasion of a discussion which resulted in the decision that even "prayers" were not to be read in the building, that is rather amusing. The Queen's Counsellor said to Dr. Rierson: "Now you have got a godless institution." "Oh, dear! no," said Dr. Rierson, "our Act of Parliament specially says it is not so"; the statement of the Act being sufficient, apparently, to the Doctor's mind, to make up for the absence of all religious observances.

There is not much doubt now as to the result of the efforts of the Ontario Association of Architects to obtain legislation in the interest of the public and themselves. The Provincial Government considers the matter of such vital importance to the public that their houses should be carried out under the direction of competent men, and that all buildings of every kind should be properly constructed and supervised, that they have taken it up, made it a Government measure, and this practically insures its passage this session. Did ever any country or part of a country enjoy such an enlightened government? But it is too soon to remark here upon the clauses of the Act; when it has passed will be time enough. There may be some alterations; anyhow, by the time this letter is published it will have gone a long way towards becoming law. Of course, the one misfortune to the public is that every one now practising as an "architect," whether competent or incompetent, is entitled to registration under the Act, and it must be some time before the public are sufficiently awakened to recognize the competent from him who loudly boasts that he is competent; and, therefore, to the many foolish sheep who go after this hireling, there may be years of trouble and regret. But such is nature: every one must buy his own experience, and if he thinks that the loudest howler must consequently be the best architect, why all one can say is: "The more fool he!" Some trifling opposition has been offered to the bill, but it is of a character hardly likely to carry weight. It is fattered by some practitioners who think themselves above "associations," and do not like the idea of having to conform to laws. Such men, in fact, who like to be free to say and do what they like, to gull the public to their heart's content, to do any dirty trick so long as they get enough to live on, are not likely to approve the Act. But every honest architect has the success of the bill at heart, and when it is considered that no less than ninety-three per cent of all the architects practising in the Province are in favor of the bill, the character of those *not* in favor of it can be pretty accurately gauged. Such an Act should have been brought up by the public rather than the profession, but, since the profession has shown the public what is necessary for their safeguarding, and how the ranks of qualified men are sullied by here and there a "blackleg," they begin to see that they need some protection against these wolves in architects' clothing.



QUARREL BETWEEN THE PRESIDENT OF THE NEW SOUTH WALES INSTITUTE OF ARCHITECTS AND ITS MEMBERS. — COLLAPSE OF AN OLD HOTEL. — CENTENNIAL HALL.

SYDNEY, N. S. W.

THE New South Wales Institute of Architects, after a struggling existence of nearly twenty years, has fallen on evil days. An unseemly quarrel has taken place between the President, Mr. Hunt, and several Fellows, who considered that they themselves had been personally insulted, and the Institute generally placed in a false position by Mr. Hunt's mistaken ideas of government, which they characterized as "tyrannical and dictatorial." A special general meeting of the Institute was convened, at which some personalities were exchanged, and a formal motion, expressing want of confidence in the present management of affairs by Mr. Hunt, was moved, and would certainly have been carried by a large majority, if the President had not adopted the extraordinary course of declaring the discussion adjourned for a month. This, of course, only tended to make matters worse, and the meeting broke up in disorder. To still further complicate the proceedings, the gentleman from whom the Institute Rooms are leased suddenly took possession of the furniture, books, papers, etc., and announced his intention of holding them until his claim for rent was satisfied. And here the humiliating episode ends — for the present. The sequel must soon come, however; for if Mr. Hunt persists in retaining his present position, he will find himself ruling over an Institute which exists only in name. Without going into particulars regarding the various causes which have led to this rupture, it may be confidently asserted that the President has

succeeded in alienating the sympathies of the very men in the profession, without whose assistance the Institute could not exist. At the same time his errors have been purely errors of judgment; he is an undoubtedly able architect, and an extremely energetic man, and even his enemies admit that he has throughout acted with the best possible intentions; but the results have been decidedly unfortunate, both for him and for the Institute.

Another large hotel — The Métropole — was opened here a few days ago. The building itself, to which I have alluded in a former letter, is extensive and commonplace, though I believe the internal arrangements are excellent; and the bedrooms of which there are 250, are all well-lighted and ventilated. The amount of the contract for the erection was £80,000, and the furnishing, etc., is said to have cost another £70,000. The building is, of course, fireproof; but so, I believe, were several of those destroyed recently in the Boston fire, of which we have as yet received only some meagre cable information.

The choir portion of St. Mary's Roman Catholic Cathedral has just been completed, and is to be opened with imposing ceremonies on Sunday next, January 26, which will be the 102d anniversary of the foundation of the Colony. This reminds me that a building in Lower George Street, which is supposed to have been built in the beginning of the present century, and which has long been used as an hotel, fell suddenly a short time ago, and buried two persons in the ruins. No particular cause can be assigned for the collapse. A heavy thunderstorm was passing over the city, and, after an exceptionally heavy peal, the building cracked and groaned, and without further warning, bricks and falling timbers rained about the ears of the astonished inmates, who, with the exception of the ill-fated two who perished,



The Centennial Hall.

managed to escape into the street, just as their late abode became a shapeless mass of débris. The structure seems to have failed in much the same way as the wonderful vehicle described by the "Autocrat of the Breakfast Table," which "ran a hundred years to a day," and then suddenly resolved itself into a miscellaneous heap of firewood and old iron. The subject of the Sydney catastrophe was situated near the wharves, and on the night previous to the accident no fewer than 136 sailors are said to have slept in the ill-fated building! A sailor's luck is proverbial; but on this occasion "the sweet little cherub" who is understood to look after the interests of all sea-farers, must have been especially watchful.

The Australian Association for the Advancement of Science (founded on the lines of the well-known British Association) held its Second Annual Session in Melbourne last week. Among many papers, interesting and otherwise, there was one on "The Laying-out of Towns" by Mr. John Sulman, F. R. I. B. A., who is at present practising his profession in Sydney. He objects to the rectangular, chess-board pattern common to Australian towns, and recommends a system which shall "resemble that marvel of ingenuity a spider's web, than which nothing can be better devised for rapid access to all parts of its surface. Immediately around the central nucleus," which Mr. Sulman suggests, should be the Town Hall — "the business quarters would be located, while retail trade would naturally extend for some distance along the main arteries of traffic; and farther out, as the spaces between the main lines become wider, the residential quarters would find their place. But these should not be extended too far, without a break, and if the admirable example of Adelaide (South Australia) could be followed, by introducing a belt of park lands, the gain to the health of the town or city would be great. Beyond this belt of open ground, as the town increased in size, suburbs would naturally spring up, and these according to local conditions would

naturally sub-divide themselves into residential or manufacturing. One of the latter should, in all cases, be restricted to the use of noxious trades." Esthetically considered, Mr. Sulman is certainly right; and as to the utility of the scheme, perhaps some reader in Indiana can furnish information, for I am told that Indianapolis practically embodies in its planning the system herein advocated.

Since my last letter the Centennial Hall has been opened with great pomp and ceremony, and a lavish expenditure on the part of the Mayor. This hall is, correctly speaking, the Town-hall proper, but for many years we have been accustomed to speak of the existing building by that name, though it consisted only of the necessary offices and the vestibule. Some distinction was, therefore, deemed necessary, and the new hall was accordingly dubbed "Centennial" for no better reason than that the Council intended that the opening should take place in the Centennial year, viz., 1888. This intention was, however, frustrated by the builders; and the title is, therefore, if only for this reason, a misnomer, even when the absurdity of applying the term to a building is set aside. "Centennial Hall" it is, however, and Centennial it is likely to remain; the name is euphonious, and the meaning is of only secondary importance.

The hall itself was designed by Mr. T. H. Sapsford, the late City Architect, who died, however, before the work had proceeded very far. He was succeeded by Mr. George M' Rae, under whose supervision it has been finally completed in spite of many difficulties and much official interference.

Externally the building, though wanting in breadth and simplicity of treatment, is remarkably effective. The architects, certainly, were very heavily handicapped in being compelled to keep their portion of the work in harmony with the existing structure, while, at the same time, discarding its atrociously bad detail and excess of ornament. As a consequence the result is not altogether happy, for the new building has a strongly marked individuality, and it appears ashamed of its inability to impart any of its own dignity to the characterless and insipid construction to which it has been attached. This want of unity is unpleasantly apparent, and greatly mars the general effect.

Internally the hall is still incomplete, for the great organ, described in a former letter, is not yet in position, and the painted decorations of walls and ceiling are not begun, but good proportions and excellent detail create, on the whole, a decidedly favorable impression. The camber of the iron girders in the ceiling is, however, too noticeable, and destroys that appearance of flatness which is naturally expected, and the exaggerated size of the various mouldings causes the hall to look considerably smaller than it is represented to be. This defect, however, seems inseparable from most Renaissance interiors, from St. Peter's downwards; and the whiteness of the Keen's cement, with which the walls are finished, rather emphasizes, perhaps, the fault in the Sydney instance.

The ceiling is divided into bays by moulded and panelled ribs, and the central panel in each bay is dome-shaped, with radiating flutings. These domes are utilized for lighting purposes, and for getting rid of the vitiated air. The whole of the ceiling-surface — about 2,500 square yards — has been constructed in embossed zinc, screwed together and afterwards soldered. The only drawback to this otherwise excellent ceiling, to my mind, is that a great volume of sound may produce a certain amount of vibration which will interfere seriously with the acoustic properties of the hall. There is a considerable echo at present, but this may be caused by the empty space which is presently to be occupied by the organ, or it may be attributable to some other source; but it does not seem altogether improbable to suppose that the resonance of the metal may have something to do with it.

The following table shows the dimensions of the Centennial Hall, in comparison with those of other large halls — used for similar purposes — in various parts of the world:

DIMENSIONS OF HALL.

Name of Hall.	Length. Feet.	Width. Feet.	Sup. Area. Feet.
Centennial Hall, Sydney.....	166½	85	14,110
Town Hall, Preston.....	147	95	13,965
Public Hall, Glasgow.....	185	75	13,875
Philharmonic Hall, Liverpool.....	135	102	13,770
St. George's Hall, Liverpool.....	169	75	12,675
St. George's Hall, Bradford.....	152	76	11,552
Surrey Music Hall.....	152	76	11,552
Melbourne Town Hall.....	147	72	10,584
Free Trade Hall, Manchester.....	135	78	10,530
Exeter Hall, London.....	133	77	10,241
City Hall, Chicago.....	150	64	9,600
St. Martin's Hall, London.....	121.6	71	8,626
Birmingham Town Hall.....	130	65	8,450
Barnsley Town Hall.....	144	58	8,352
St. James's Hall, London.....	136	60	8,160
Paisley Town Hall.....	136	60	7,800
Devonport Town Hall.....	100	67	6,900
Bolton Town Hall.....	129	56	6,272
Salter's Hall, Droitwich.....	100	69	6,700
Public Hall, Southport.....	112	59	6,600
Reading Town Hall.....	97	69	5,829
Hastings Town Hall.....	100	58	5,800
Chorley Town Hall.....	100	58	5,800
Blackburn Town Hall.....	114	50	5,700
Middlesbrough Public Hall.....	100	56	5,600
Manchester Town Hall.....	100	50	5,000
Public Hall, Ramsgate.....	112	41	4,592
St. Helen's Town Hall.....	96	45	4,320
Public Hall, Todmorden.....	96.9	44.6	4,305
Battersea Town Hall.....	106	40	4,240
Kensington Town Hall.....	80	52.9	4,220

"The Eolus Water-spray" system has been adopted in connection with the ventilation of this hall, and seems to act perfectly.



THE NEW BOURSE DU COMMERCE.—THE
ANCIENT HALLE AU BLÉ.—THE DECO-
RATIVE PAINTINGS ON THE DOME.



THE Quartier des Halles, formerly consisting of narrow streets, old and dirty, is in the way of being completely transformed, and it is already traversed by large streets bordered by fine new buildings. Two new and important structures have contributed toward the absolute transformation of the physiognomy of this quarter: the post-office, which we have already spoken of, and the Bourse du Commerce, lately opened. On the site of this edifice was erected, in the thirteenth century, the Hôtel de Nesle, later the palace of Catherine de' Medici; again later, it became the Hôtel de Soissons. This was destroyed in 1763 to make room for the Halle au Blé. The present Bourse du Commerce retains some reminders of these different structures. Of the palace which Jean Bullant built about 1572 rises a last vestige: this is the astronomical column of Catherine de' Medici, which is 26 metres high, and was formerly enclosed in the circular façade of the Halle aux Farines, which M. Le Camus de

lately opened. On the site of this edifice was erected, in the thirteenth century, the Hôtel de Nesle, later the palace of Catherine de' Medici; again later, it became the Hôtel de Soissons. This was destroyed in 1763 to make room for the Halle au Blé. The present Bourse du Commerce retains some reminders of these different structures. Of the palace which Jean Bullant built about 1572 rises a last vestige: this is the astronomical column of Catherine de' Medici, which is 26 metres high, and was formerly enclosed in the circular façade of the Halle aux Farines, which M. Le Camus de Mezières built in 1762 in concert with M. De Viarmes, provost of the merchants, and the writer Obolin. Originally, this hall was not covered. It was only in 1782 that they built a first dome of wood, which was destroyed by fire October 16, 1802. In 1810 the architect, Joseph Belanger, conceived the idea of covering the rotunda of the Halle au Blé, which has a superficial area of about 1,200 metres, with a dome of iron and copper—a feat which was considered an extraordinarily bold one for that time, when builders did not have at their disposal the perfected apparatus of to-day. All the pieces had to be wrought out with the hammer, and united together leaf by leaf. This framework has been preserved. The copper was taken off and replaced with glass, to give more light and air to the present rotunda.

In 1880, the Central Committee of the Chambres Syndicales of Paris presented to the Municipal Council a petition begging that Paris, like Lyons, Marseilles, Bordeaux, Le Havre, Rouen and Lille, might have the benefit of an official Bourse du Commerce. The Council was favorably inclined, and several projects were presented wherein the ancient Halle au Blé was utilized, with enlargements and an opening-up of its approaches. After three years' discussion and conference, it was decided that the City of Paris should concede for sixty years to M. Blondel, architect, the Halle au Blé and a zone of territory measuring about 2,630 metres, divided into two islands, as it were. For his part, the *concessionnaire* engaged to transform the Halle au Blé into a Bourse du Commerce and to erect on these two "islands" two annexes, within eighteen months at most; besides, for sixty years he agrees to pay an annual rent of 300,000 francs. The hall will be free; the offices in the Bourse itself will be let at twelve to fifteen hundred francs a year, according to the tariff which has been arranged by the Council in consultation with the Chamber of Commerce, and the latter body will take charge of the leasing and administration of the building.

Such, in a general way, is the work which has lately been finished, and which has necessitated the expropriation of sixty-seven property-holders occupying an area of 10,857 metres.

Before entering the Bourse, let us glance at the two structures whose facades on the circular Rue de Viarmes, which surrounds the

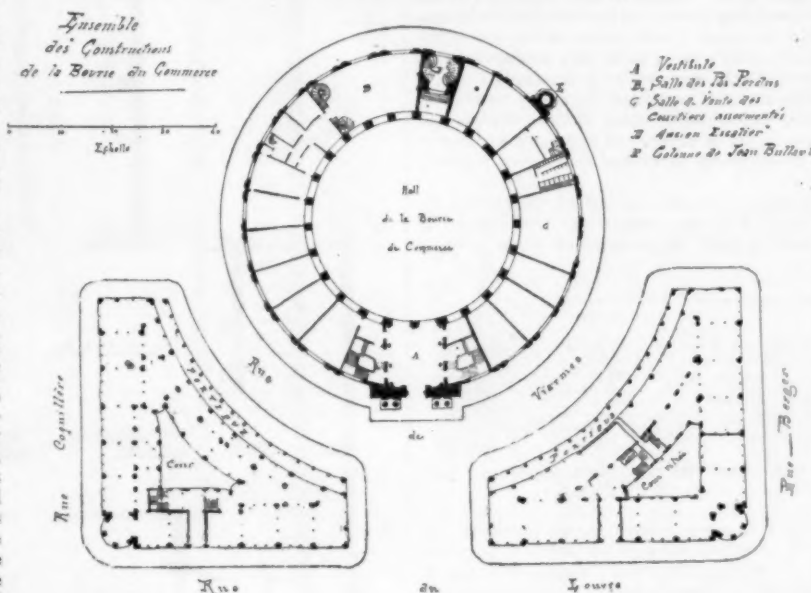
structure, rest on Doric colonnades like that of the Theatre Française. The style of this colonnade is grand and rich, and aids in giving this side of the Bourse a decorative air which the other side lacks, as there the old houses are still standing. Of the Halle au Blé, the metallic dome has been preserved, and, consequently, the interior wall. No more have they destroyed the remarkable double spiral staircase, by which people ascend by two spiral flights crossing one another, but never meeting, in the same way as in the staircase at Chambourd. This staircase is directly opposite the principal entrance, and is close to Bullant's Column. A basement four metres in depth has been dug under the hall for the installation of the heating apparatus, the electric-light machinery, the store-rooms and laboratories and improved ovens. The outside circular wall, which is a metre and a half in thickness, has been destroyed and replaced by a thinner wall, which does not have to resist, as the old one did, the thrusts of two tiers of stone vaults. The buildings surrounding the hall contain a first floor, an entresol and two stories above, the upper one of which is in the roof. At the height of the first story is an iron balcony which commands the hall, and a second balcony of stone crowns the entablature at the height of the second story. The second story contains, ranged about the circular hall, a large vestibule, rooms for correspondents and reading, offices of the telephone and telegraph, the secretary's room, toilet-rooms, clothes-rooms and a general hall of waiting decorated with a chimney-piece copied after that by Jean Goujon in the Louvre. Two spiral staircases of carved wood lead from this waiting-hall to another room in the entresol, called the Salle de Filières, where, at the end of each month, tradesmen gather for the liquidation of their accounts. Independently of these different rooms, the ground-floor is also occupied by offices and private rooms. The two most important offices are occupied by the *Sindict Generale* and *La Compagnie des Courtiers Assermentés*, which, on the floor above, expand themselves through several large offices. In the second story are found the appraisers' rooms, which are connected with all

the professional syndicates and administrative offices of such syndicates. A central circular passageway, lighted from above, separates the offices opening on the hall from those which face the street. The exterior aspect of the monument owes its greatest originality to the round form which is rarely encountered, and the ancient dome of Belanger, which has been so ably utilized and restored. The style is Classic, and the Doric ordonnance of the circular façade is interesting as a study of the order, since it is treated with firmness, and the proportions are happy. Coupled pilasters support an entablature which projects between the bays, the frieze of which is ornamented by discs be-

between the triglyphs. In the bays between these coupled pilasters, circular-headed openings light the entresol and give access to the ground-floor. At the first story, the square-headed windows are divided into two openings by a pilaster, which forms a mullion.

A balustrade crowns the façade and conceals the gutter; it is interrupted at the right of the coupled pilaster by pedestals upon which will later be placed statues of the principal cities of France, which will thus furnish a crowning feature for the edifice. The principal entrance is accented by a grand pediment carried on four coupled Corinthian columns. The tympanum is decorated with the arms of the City of Paris, supported by two genii, and crowning all is an allegorical group representing the City of Paris protecting Art and Industry. This fine bit of sculpture is due to the chisel of the author of the monument to General Chanzy, M. Croisy. The projecting angles of this pediment are surmounted with groups which represent children upholding a caduceus, due to the same artist. A large full-centred door gives entrance to the vestibule. Above a stone balcony, supported by lion-headed consoles, forms a projection before one full-centred opening, which is divided into three parts by two stone mullions. The general effect of this entrance is less satisfactory as to proportion. It lacks firmness. The completely isolated columns are too wide apart. The door and the bay above are too squat, and fail in not making a single *motif* projecting from the background in place of being separated and absolutely cut by the stone balcony as now.

The interest in the interior of the Bourse rests principally upon the grand paintings which decorate the fair surface of the dome:



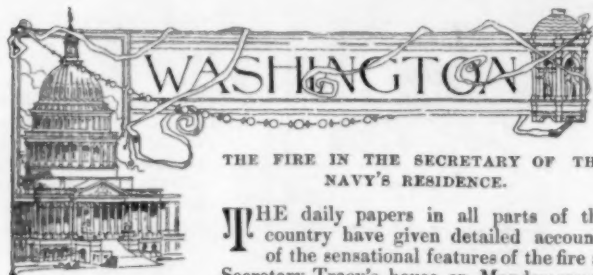
*Ensemble
des Constructions
de la Bourse du Commerce*

- A Vestibule
- B Salle des Pas Perdus
- C Salle à Vente des
Courtoises assorties
- D Ancien Escalier
- E Colonne de Jean Bullon

these, divided into four parts, symbolize commerce in different parts of the world. The large space is reserved to Europe, and two panels are devoted to it. In one, very ably composed by M. F. H. Lucas, we see on the left workmen black with coal-dust, their naked bodies bent under the weight of sacks of coal, directing themselves towards a factory, whose chimneys are seen in the background. At the side, in a clearer and more lively tone, French harvesters in the midst of the golden grain drink with the pretty gleaners. Farther on Spanish *manolas* are emptying their baskets of oranges, which roll out in cascades, and near them Greeks and Turks are chatting together, resting upon their richly ornamented muskets. It is a gay and luminous painting, which contrasts well with the second panel consecrated to Europe, which represents Russia in particular. M. Langée has powdered with snow a ship, from which is being discharged a cargo consisting of lumber, fish and furs, the principal products of Russian commerce. This decoration is the least successful of the four. It is heavily treated, and is composed without great display of art. The America, by M. Luminais, has much better qualities. In the centre of the panel, naked savages, absolutely ignorant of the benefits of civilization and commerce, are entrapping a jaguar for the sake of his skin, from which to make a breech-cloth, probably. At the right, buffalo-hunters form a very well-treated group, and on the left, Europeans are unbalancing their merchandize. In the background the smoke of an approaching train crossing the pampas obscures the sky and allows a glimpse of Christopher Columbus standing upon the bow of his ship, and seeming very proud that without his aid M. Luminais could never have accomplished his decorative composition. We next come to Asia and Africa, combined by M. Clairin in a charming panel full of light, color and movement: European tradesmen are being joyously welcomed by the pretty little Chinese and Japanese girls clothed in rich stuffs, who are evidently delighted with the Parisian trumpery spread before them. In the background a blue and sunny sea stretches out as far as the horizon. Here proud and haughty Moors of Morocco wrapped in their great burnouses, and wearing pointed broad-brimmed hats, are spreading before the eyes of the Europeans beautiful carpets, arms and damascened work, while in the centre, ill-looking Malays embushed behind a rock, lance and creese in hand, seem little disposed to accede to the suggestions of making a trade.

These four grand decorations are separated by *motifs* treated in grisaille, by M. Mazerolles, and form, in spite of the difference of interpretation, a fairly homogeneous whole. They bear witness to the importance which is being given to similar decorative painting in all our public buildings.

Very modern in its appearance, the decorations of the Bourse du Commerce are slightly tinged with the Classic spirit of the whole building, which has called for a total expenditure of seven or eight million francs.



THE FIRE IN THE SECRETARY OF THE NAVY'S RESIDENCE.

THE daily papers in all parts of the country have given detailed accounts of the sensational features of the fire at Secretary Tracy's house on Monday morning, February 3, 1890. It will, without doubt, interest the profession to read a more technical version of the affair, giving probable cause, method of progress, and damage caused to the building by the fire.

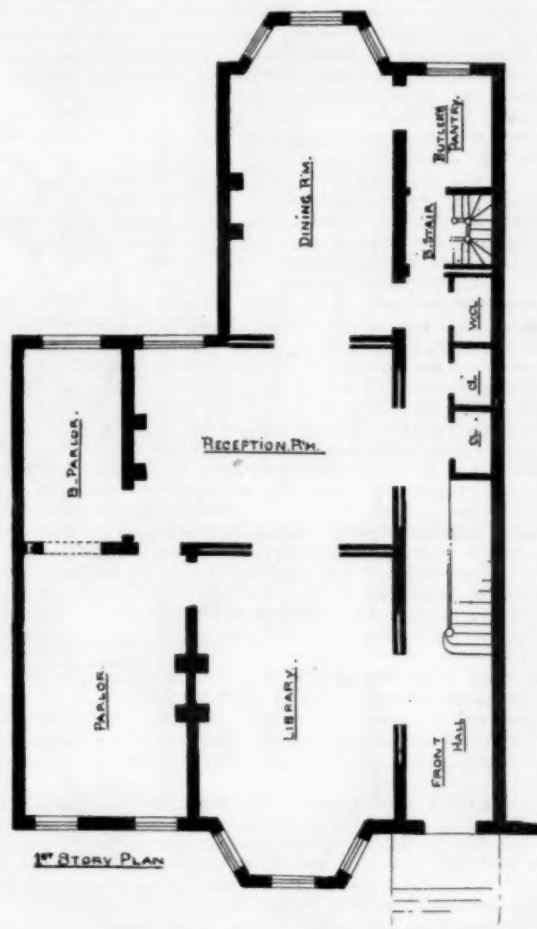
On Wednesday morning, I received permission to go through the building. The house was just as it had been left after the fire, except that the larger part of the furniture had been removed. I first made a careful investigation of the basement, everything was here intact. The steam-heating apparatus was one of the ordinary house-boilers, made to blow off at a low pressure, the safety-valve being weighted at ten pounds. The ceiling of the basement had not been broken through in any place even by the water running through from above. There was a space of fully three feet between the boiler and its smoke-flue and the ceiling. The heating was principally indirect; the coil boxes and floors above them were in perfect condition. There was a small gas-engine in the front-cellar room, which was apparently in good condition, and there were no cracks or crevices in the ceiling by which gas could have passed into the rooms above.

It was clear that the fire did not originate in the cellar, although our Building Inspector at first attributed it to the leakage of gas from this engine. The gas would have had to find its way through the unbroken ceiling and floor into the room above where the fire started, whereas, it would certainly spread throughout the basement before this could have occurred.

Another expert, a Government Steam Expert, this time, attributes the fire to superheated steam. We all know that steam cannot, when in contact with water be heated to a greater degree than that normal to its pressure. In this case it would have been 240, only a

little above the temperature of boiling water. But as the floors over, and wooden boxes around the coils are intact, it is not necessary to show the fallacy of his reasoning. It is clear the fire did not start in the basement.

It is equally clear that the fire originated on the first floor, in the room called the library. This room had all its walls and ceiling finished in natural wood, which, I understand, had been finished in oils and varnishes. At the time of my inspection the entire surface, not a space as large as a dime being overlooked, was one mass of charcoal. Although this wood was only half an inch thick, in many places it had not been burned through, but there were several places where it had been broken through after the fire, disclosing the fact that the back of the panelling was unaffected by fire, although it stood out from the wall at least four inches, and would have formed an excellent conduit for the conveyance of fire, if it had originated from the gas, steam, or smoke pipes in the cellar. The condition existing locates the fire directly in this room. The window-shutters, which were folded back in the boxes, had only the exposed side of the one flap charred. The evenness with which the fire spread itself over the entire room, and, judging from the depth to which the wood was affected, the short time that it must have burned before it was extinguished was remarkable. I examined the fireplace, but there was no sign of a fire having been lighted in the grate that morning, or of there having been one the day before, there were neither coal, cinders, ashes, or kindling-wood. I pulled away some of the wood from around the boiler flue, which goes up through this room, it was bright on the side next the flue, charred on the side next the room. A defective flue was certainly not the cause of the fire. The rapidity with which the fire extended from this room



was phenomenal. In the testimony of the coroner's jury the following facts were brought out.

About 6.55 A. M., a colored man saw fire in the front bay-window, he ran up the front steps and rang the bell. The butler came to the door, and then was first informed that the house was on fire. They opened the sliding-doors between the hall and library. The butler says the room appeared one mass of fire, he ran up the steps and aroused the family by knocking at their doors. The sliding-door was left open, although the butler thought he closed it. It was found in the brick pocket only slightly burned, while the other leaf was charred over its entire surface. When the butler reached the third story there was so much smoke that he found it necessary to return by the back stairway. A few minutes after seven the engines arrived, at 7.10 Miss Tracy's body was on the sidewalk, and at 7.38 the fire was out. By reference to the plan, the condition of the

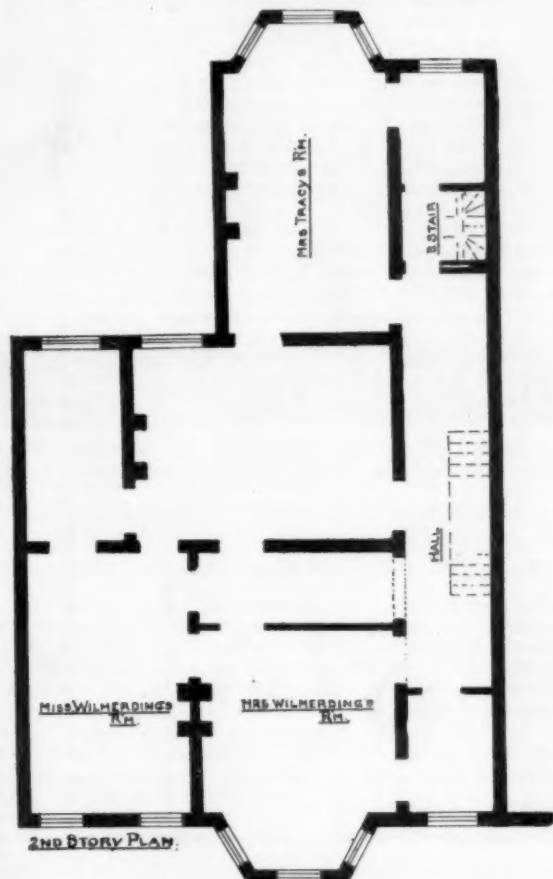
other rooms on the floor will be readily understood. The front parlor, with hinged doors between that and the library, one of which had been knocked down by the firemen, had only the top of the door cornice slightly charred. The walls, ceilings, and mantels were black with smoke. The back parlor was badly smoked. Between the library and reception-room there was a pair of sliding-doors, one leaf of which was out of the pocket; this was charred completely on the library side and slightly on the reception-room side. The mantel was charred on the top, but the large mirror in the over-mantel was affected only by smoke. The sliding-doors between reception-room and dining-room were closed, and slightly charred on reception-room side. The inside of dining-room and pantry were not affected by the fire and only to a very limited extent by the smoke.

The hall was the highway of communication between the library and the other portions of the house. When the butler left the sliding-door open, the fire must have spread to the wainscoting of the hall, which was about four feet high, thence to the steps. There were a number of closets under the steps with shelves, which were burned entirely in two.

The back stairway was closed off from the front hall by a sliding-door, which was badly charred on the hall side, but it was a sufficient barrier to prevent the fire from passing into the back hall, which was affected by smoke only in the two first stories.

There is little doubt that all the family might have saved themselves by going down the back stairway. It is a good illustration of the uselessness of expecting people to avail themselves of unusual methods of egress in time of emergency.

The fire passed up through the hall, destroying banisters and rails



in the second story, burning the bed-room doors nearly through, but the fire itself apparently did not get into the bed-rooms on this floor where all the family, except Miss Tracy, slept. None of the wood-work in these rooms was charred, but the paint was blistered by heat at the end of the room farthest from the hall. The ceilings, walls, and woodwork were black with smoke. The fire passed down the T-shaped portion of the hall shown in plan, which had clothes-presses in it, but did not burn through into any of the bedrooms, although it did get through into the front bath-room, and charred the woodwork slightly in that one room.

The fire seemed to have increased in intensity as it passed towards the roof, where it spread, burning all the roof timbers, leaving only a limited number of pieces in place. The ceiling-joists falling transferred the fire downward to the third story, where it did more or less damage in every room. The back portion of the third story was a mansard roof, which, of course, furnished additional fuel for the fire. The roof is a wreck and the third story about the same, although the fire in no case has burned through the floor into the

second story. The frame of the stairway between the second and third story is so badly burned that it is ready to fall.

The cause of the fire not being due to a defective flue, the heating-apparatus, an open fire, or a gas-explosion, is something of a mystery.

It must have originated, as the fire-marshal thinks, in a lamp explosion. The only explanation would be a lamp, or incendiaryism, and there seems to be nothing pointing in the latter direction.

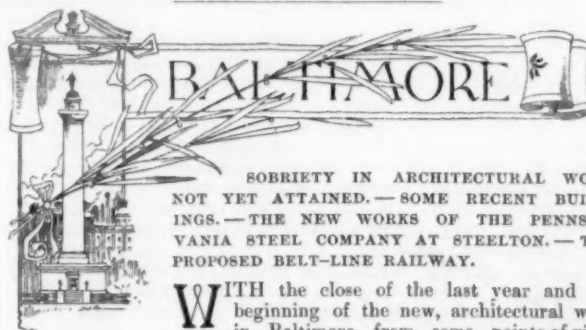
In his report, Fire Marshal Drew says:

"I am of the opinion, while, of course, there is no direct proof, that this fire originated from the explosion of a coal-oil lamp, a large double-burner duplex-lamp being kept on a table within the circle formed by the large bay-window, which lamp was lighted every night. It is very likely that when the family retired the night before the fire instead of extinguishing the light the blaze was turned down low and left burning, which is a very dangerous practice, as from this cause the wick is apt to become crusted, preventing a free flow of flame and keeping the heat below the crust, thereby causing the thin brass work of which the burner is composed to become so hot as to generate gas within the bowl of the lamp, causing the same to explode. If this was the case, as I have every reason to believe, pieces of the lamp being found scattered in different directions over the floor within the lines of the bay-window, and, taking the surroundings into consideration, the bay-window being heavily curtained with silk and lace draperies and in close proximity to the lamp, the three doors leading from this room being also heavily draped with silk portieres, the room itself being cased in panel-work of wood, both wall and ceilings, and this being heavily coated with hard oil and varnish, it would take but a very short time to envelop the entire room in flames."

It has been stated that Mrs. Tracy put this lamp out before retiring, but it is possible that in turning it down low she may have failed to put it out while thinking she had done so.

There is also a lesson to be learned from this fire that may be used in reference to fire-escapes. Nearly all fire-escapes stop at the second story, or have an extension ladder, which ladies and children could not work.

In this case Mrs. Tracy jumped or fell from the second story back room, and Mrs. and Miss Wilmerding from the second story front room, when in one minute, from the testimony, they would have been rescued with ladders. Of what use would the ordinary fire-escapes have been in this case?



WITH the close of the last year and the beginning of the new, architectural work in Baltimore, from some points-of-view, may be said to be fairly active, although just at the moment a large proportion of it is, perhaps, confined to a few offices; but the dictum from these few would undoubtedly be that the profession is now flourishing from both an artistic and a lucrative standpoint—a fact possibly true if the standard is a question of quantity, the amount of good material employed, and substantial building and mediocre design produced, accompanied, apparently, by a remarkable degree of self-satisfaction on the part of each office with its own work, and an equally unanimous disapproval of that of all others.

There certainly are to be found, however, here and there, among the later designs, some very good bits of architecture indeed; but this result still gives one a sort of impression of being somewhat accidental, and the fact that the last design from any office is marked by merit and interest does not seem to insure the next thing from the same hand (or, at least, over the same signature) from being conspicuously devoid of either quality. Should a thoroughly unprejudiced professional expert be imported to give an architectural criticism upon what he finds in Baltimore, the result would probably greatly surprise both architect and client. It is doubtful, however, if it would have the slightest effect upon the already-formed opinions of the architects themselves, while the public, in their blissful ignorance and local pride and prejudice, would loyally follow the prophets of their own country.

It may be claimed, not without some reason, perhaps, that however true the fact, it is not desirable to have an open expression of such an opinion; but certainly a frank recognition and statement of any regrettable condition of affairs is a much longer step towards its correction than either indifference to it or purposely ignoring it. It is not to be denied, however, that there are probably two or three men in the profession who are, perhaps, not absolutely satisfied with the perfection of what they have already done; who see possibilities of progress for themselves, as well as for others; and who also recognize it as a fact, when they find themselves sometimes doing a good

feet; outside length, 512 feet; dome, inside, 200 feet; dome, outside, 240 feet; height to ball at base of a cross on dome from floor of church, 555 feet; height to ball at base of a cross on dome from level of One Hundred and Tenth Street, 596 feet; height of front towers from One Hundred and Tenth Street, 360 feet. The dome is placed on the line of One Hundred and Twelfth Street.

DALMENY CHURCH, LINLITHGOW, SCOTLAND.¹

[Issued only with the Imperial and International Editions.]

"THE small village of Dalmeny stands a short distance westward of the great north road from Edinburgh, where it approaches Queen's Ferry. Unlike other Scottish villages which generally consist of a narrow and filthy street, where the dwellings are as densely crowded together as if they were in the centre of a city, the few houses of which Dalmeny consists are separated by a broad green, and they have a clean, airy, healthy appearance. Abundance of woodland, scattered over picturesque broken ground, is in its close vicinity, and occasional glimpses may be had of the scenery of the Frith of Forth and the distant ranges of hills. In this quiet and pleasant spot, stands, almost entire, one of the most truly venerable and interesting specimens of ecclesiastical architecture of which Scotland can boast. Dalmeny Church is in the purest Norman style. It is a simple quadrangular edifice without tower, aisles, or transepts, although an unadorned projection on the north side may possibly have been added as the commencement of a transept. The windows have all the small Norman arch with toothed mouldings. A horizontal moulding runs along either side near the roof, which appears to have consisted of a series of intertwined curves like the letter S laid longitudinally, but which seems to have been supposed by the architect who has restored part of it, to be a succession of crescents lying with their concave sides alternately upwards and downwards. Above this is a row of carved heads, presenting the variety characteristic of such buildings. The main entrance door is in a porch projecting to the south, the archway of which is supported on two plain pillars with Norman capitals. There are over this door the remains of a line, concentric with the arch of sculptured figures and animals, many of which are fabulous, and have a considerable resemblance to those which appear on the ancient sculptured stones scattered throughout Scotland, by which the acuteness of antiquarians has been so effectually baffled. On either side of the arch are the remains of a statue, and from a curved mark on the masonry, connecting the two together, it may be inferred that some moulding—probably in the form of a cord—united them together. Over this doorway is an arcade of interlaced Norman arches highly ornamented. In front of the porch lies one of those old stone coffins, frequently found in Scotland, of which the interior was cut out in such a shape as to fit accurately to a body swathed in bandages like an Egyptian mummy, there being a circular cavity for the head, a channel shallower and narrower to contain the neck, and a larger excavation for the rest of the body, broadest and deepest at the place where the shoulders are to lie, and becoming narrower and shallower towards the extremity corresponding with the feet. Archaeology has not yet thrown any light on the period when the narrow house first assumed this substantial character; but it is observable that stone coffins of this description are generally found near the places where the most ancient existing churches stand, or where such edifices have existed, but are no longer standing.

"The interior of this small church has a fine massive simple effect. The chancel is in the form usually called an apse, and consists of a semicircle with the arc outwards, under a groined arch, the ribs of which are deeply moulded and ornamented with tooth-work. The small chancel is, according to a common arrangement, lower than the rest of the church, and the difference in height has been very skilfully adjusted in such a manner as to enhance the effect of the perspective from the western end. The arching of the chancel appears to be in its original condition. The two departments into which the rest of the church is divided, appear to have been in some measure restored on the pattern of the chancel. The church has been fitted up with pews and a gallery, and it is much to be regretted that portions of the shafts of the pillars, and some other parts of the internal stone-work, have been cut away for the purpose of economizing the space, and facilitating the transit through the church. The fabric was repaired, and in so far as restoration seemed necessary, put in its present position in 1816."²

THE GREAT HALL, CRAIGIEVAR CASTLE, ABERDEEN, SCOTLAND.¹

[Issued only with the Imperial and International Editions.]

"THIS fine specimen of the Franco-Scottish fortified mansion hides itself in the unheard-of parish of Leochel, one of the most remote and pristine districts of the north. It is sometimes inhabited and is in good preservation. Its uses, as a fortress against the Highland reiver rather than as a mere dwelling-house, are recalled by all its attributes of sullen strength, and not less startlingly by the admonition round the shield, by which the adventurous intruder is warned against the temerity of awakening sleeping dogs. All its details have been so fully developed in the accompanying plates,

that a description of them is unnecessary. Not many years ago, the general effect of the edifice was destroyed by the presence of two towers, which have fortunately been removed. They were built by an architect who would not condescend to study the style of building peculiar to the north, and, being called on to make additions to a castle, could do so no otherwise than in the English baronial style. All that is now to be regretted is, that, to make room for what he probably considered decided improvements, he had altered some parts of the original structure. The landscape around will be as unsuitable for the spreading pomp of an English hall, as it is in accordance with the tall narrow clustered tower. It is a succession of bare round hills, brown with heather, save where the white masses of granite crop outward, like the bones of the earth projecting through its skin. Throughout these lonely hills and glens the remains of ancient warfare are thickly scattered. Weapons, generally made of stone, are frequently dug up; the outlines of the hills are in some places altered by ancient embankments and intrenchments; a cairn marks the spot where Macbeth is said to have fallen; and near it are the ditches and embankments of a fortification, which even the sceptical Lord Hailes believed to be as old as the days of the renowned usurper. These matters, however, carry us into a far earlier period of history than any with which Craigievar Castle can be associated. The domain belonged of old to the family of Mortimer, who are said to have commenced the building of the castle, but lacked funds for its completion.³ It was purchased in 1611 by William Forbes of Menie, a cadet of the worshipful family of Forbes of Corse, who had a history, then rare among the Scottish country gentlemen, as we are told that he, 'by his diligent merchandizing in Denmark and other parts, became extraordinary rich.' 'He completed this castle,' says the same writer, 'and plaistered it very curiously.'⁴ His son and successor, William, was created a baronet of Nova Scotia in 1630. Sir William Forbes was one of the few Aberdeenshire lairds who, in the troubles of the seventeenth century, adopted the cause of the Covenant. He was one of the Commissioners at the Treaty of Ripon, and a man of note, both in the field and in the cabinet, during those wild times. He frequently appears in the picturesque pages of Spalding, and his domain was subjected to such inroads as the following: 'He [John Dugar, a Highland freebooter,] did great skaith to the name of Forbes—such as the Laids of Corse, Leslie, Craigievar and some others; abused their bounds and plundered their horse, nolt, sheep, goods and geir, because they were the instruments of Gilleroy's death; and the Forbeses concluded to watch his coming and going, and to get him if they might.'⁵

"It is a remarkable circumstance, however, that many of these remote northern fortresses are more eminently connected with the literature than with the warlike history of the country. A few miles on the one side of Craigievar stands Crathes, the ancestral abode of Bishop Burnett and his eminent kinsman; while on the other side Craigston recalls the name of the fantastic scholar, Sir Thomas Urquhart. Craigievar is in a similar manner connected with literature, chiefly ecclesiastical. The elder brother of the merchant who founded the family was Patrick Forbes, Bishop of Aberdeen, a man eminent for the unambitious sincerity with which he discharged the duties of his office, and held honors which were rather thrust on than desired. Like Robert Leighton, he had the rare fortune, while filling a prelate's chair, to make himself acceptable, by his moderation, his Christian virtues and his learning, to the enemies of Episcopacy. He was the author of some works known to the curious in ecclesiastical literature, and was the object of many able posthumous eulogies, published in a collected form as 'Funeral sermons, orations, epitaphs and other pieces, on the death of the Right Reverend Patrick Forbes,' reprinted for the Spottiswood Club. The simple people of the district had their own way of commemorating his theological triumphs. In connection with the ruins of his Castle at Corse, it is said, 'tradition bears, and the common people still believe, that the Devil visited the Bishop in this Castle; that they differed; and that the Devil, on his departure, carried away with him the broad side of the Castle, on the stone stairs whereof they still pretend to point out his footsteps.'⁶ His son, John Forbes, was the leader of that band of Aberdeen Doctors who carried on a tough controversial war with the Covenanters, on whose side his cousin was doing battle with the sword. His theological works, published at Amsterdam in 1703, in two volumes folio, are well-known, even beyond the circle of theological students."

HIGH SCHOOL BUILDING, CAMBRIDGE, MASS. MESSRS. CHAMBERLIN & AUSTIN, ARCHITECTS, BOSTON, MASS.

HOUSE OF J. R. BURNETT, ESQ., MOUNTAIN STATION, ORANGE, N. J. MR. F. W. BEALL, ARCHITECT, NEW YORK, N. Y.

HOUSE OF G. W. FRANK, ESQ., KEARNEY, NEB. MESSRS. FRANK, BAILEY & FARMER, ARCHITECTS, KEARNEY, NEB.

TOWN-HALL AND CENTENNIAL HALL, SYDNEY, N. S. W.

¹ New Statistical Account, Aberdeen, p. 1109.

² View of the Diocese of Aberdeen, (Spalding Club,) p. 599.

³ History of the Troubles, i. 85.

⁴ Old Statistical Account, vi. 220.

¹ It should always be kept in mind that these illustrations from the "Baronial and Ecclesiastical Antiquities of Scotland," [1845] by R. W. Billings, are republished very largely for the sake of giving instruction in one manner of the rendering of architectural drawings.

² New Statistical Account, Linlithgowshire, p. 102.

[Additional Illustrations in the International Edition.]

PALACE OF COUNT PALLAVICINI, VIENNA, AUSTRIA. HERR VON HOHENBERG, ARCHITECT.

[Gelatine Print.]

HOUSE OF HERR J. BENIC, KARLSTADT, CROATIA, AUSTRIA. HERR HANS PRUCKNER, ARCHITECT.

[Gelatine Print.]

PAINTING OF M. PUVIS DE CHAVANNES IN THE NEW SORBONNE, PARIS, FRANCE.

[Gelatine Print.]

ALL SAINTS CHURCH, FINCHLEY ROAD, ST. JOHN'S WOOD, LONDON, N. W. MESSRS. CHRISTOPHER & WHITE, ARCHITECTS, LONDON, ENG.

We publish this week an illustration of the new tower and spire, and conversion of the original base for a tower into a porch, at All Saints Church, Finchley Road. The whole of the work has been done at the expense of the Rev. H. S. Eyre, who was for some years the vicar of the parish. On examination it was found that the foundation for the original tower and spire were not sufficient, owing to the proximity of the Underground Railway, which has been constructed since the church was built. It was therefore necessary, either to pull down the original base and carry the foundations down to the level of the bottom of the railway, or to build the tower and spire on the other side of the church. On the whole, it was considered better to convert the original base for tower into a two-story porch, and to build the new tower and spire on the south side, as this permitted of a more picturesque arrangement of the west front, and was at the same time more convenient for the congregation during the execution of the work.

FOLKTON MANOR HOUSE. MR. E. J. MAY, ARCHITECT.

MILL POND FARM, CRANBROOK. MR. M. E. MACARTNEY, B. A., ARCHITECT.

ACOCKS GREEN BUILDING ESTATE, BIRMINGHAM, ENG. MESSRS. ESSEX & NICOL, ARCHITECTS, BIRMINGHAM, ENG.

The elevations are carried out in Adderly Park red bricks, with Corsham Down stone dressings and finishings, the roofs being covered with red tiles.



THE OPENING OF THE ENLARGED MUSEUM OF FINE ARTS.—THE CASTS, NEW AND OLD.—THE PAINTINGS.—THE JAPANESE COLLECTIONS, ETC.

THE Museum of Fine Arts was opened to "private view" on Tuesday, preliminary to its being opened to the public. The collections in each department have been greatly increased, and now compare favorably with those of museums of art abroad as well as in America. In the number of casts of classical sculpture, the museum now stands third, the Berlin Museum easily leading the list with 2271, while that of Strasburg has 819, as compared with 777 in the Boston Museum. The Japanese collection is now unrivalled and is likely to remain so, as a similar collection could scarcely be made in Japan, so depleted have the best works of Japanese Art become. The collection of glass, pottery and porcelain, while not large, is exceptionally fine, and the art galleries have now in their midst a room devoted to the Barbizon School, which has examples of the very highest merit. But, apart from the quantity of works exhibited, there are two things to be especially noticed in the Boston Museum under the new order of things, the fact that there has been exceptional discrimination shown in choice of material, and that the material has been extremely well-arranged. It has been so long the custom that a Museum of Fine Arts should be a mere *olla podrida* of all sorts of things, that it is most encouraging to recognize the acknowledgment of the use of a museum as a source of instruction, either actual or by suggestion.

This is especially manifest in the arrangement of the casts of classical sculpture, which is made chronological, and at the same time produces an increased artistic effect, as each room has a character of its own and is not a mere collection of incongruities.

The casts have also cards upon their pedestals, stating not only the subject, but the date, the locality where found, the name of the sculptor, and the present locality of the original, a marked change from the lack of method of previous years, when the uneducated were left purely to conjecture and surmise.

The additions to the building, begun by Mr. John H. Sturgis and completed by his successors Sturgis & Cabot, have been carried around three sides of a rectangular court of which the older building forms the north side and the additions the two ends and the south side.

The plan shown will give an idea of the disposition of the rooms.

The walls of the court, which are in buff brick, reflect much light and all the rooms are excellently lighted.

The entire first floor with the exception of the two rooms for Egyptian and for the Greek, Roman and Etruscan antiquities, has been devoted to casts of sculpture, arranged with the exception of the Renaissance rooms and the Egyptian rooms, by Mr. Edward Robinson, curator of Classical Antiquities.

Entering as formerly into the central hall, which remains practically unchanged and turning to the right, the first room entered is the Egyptian and Assyrian room, containing bas-reliefs from Nimroud and Koyunjik of sieges and of the hunt, and a large relief of Sete I, attacking a city of Palestine.

Next is a room of Archaic Greek sculptures of the sixth century, B. C., including the Selmunte metopes, the Assos reliefs, the Samian Hera, and the especially fine relief of a figure mounting a chariot from the Acropolis Museum at Athens.

Near the north wall is a pseudo-Archaic pedestal showing the later affectation of the earlier forms.

Next are two pre-Phidian rooms, the central group in the first being that of the Tyrannicides, Harmodias and Aristogeiton, erected at Athens, a group of great power. It is interesting to compare the heads of the two figures, that of one being the original of the Archaic type, while the other is the head of an athlete, of the fourth century B. C.

On the western wall is the western pediment of the Zeus Temple at Olympia, with the contest of Apollo and the Centaurs, while the eastern pediment is on the north wall; opposite is the western pediment of the Aegina Temple, with the contest over the body of Patroclus, while below are the Discobolos and the Marsyas of Myron.

The second pre-Phidian room is especially interesting from its examples of the works of Polycletes, of which there are three. An Amazon in the Berlin Museum, the Doryphorus of Naples, the Diadumenos from Vaison. The great dignity, simplicity and breadth of the work of Polycletes could not be better shown. In the centre is the boy extracting a thorn (the Spinario) from the Capitoline Museum and there are also the Discobolos of the Sala della Biga in the Vatican and the Borghese Achilles of the Louvre.

The chronological sequence is here broken by the necessary introduction of a room which has been devoted to small bronzes and busts. The busts are arranged in three rows around this room, the Archaic busts being placed on the right of the entrance. There is a very interesting comparison of similar types made in several cases, where the heads of six different athletes are placed side by side, while the head of the Hermes of Olympia is placed above them, showing a uniform type and manner of handling.

The same comparison has been made with several heads of Aphrodite, including the so-called Clytie. The busts of the Emperors are on the south wall. The central case of the little bronzes from the Berlin Museum is exceedingly interesting. Similar types here also have been placed beside each other, as those of Aphrodite, of Athena and of Heracles. The sequence is again resumed in the Parthenon room, which, as is the Hall of the Caryatides at the other end of the building, is one of the most effective rooms in the Museum. The eastern and western pediment-sculptures of the Parthenon are upon two large pedestals in the centre of the hall, with copies of Carey's drawings, on the sides of the pedestals.

The cella frieze is carried around the entire room in two rows, so that the Panathenaic procession can be followed by the eye much better than in the British Museum. On the north wall is a small model of the Acropolis, and between the windows is the small statuette of Athena from the Acropolis Museum, with the attributes of the Athena of the Parthenon. The Phigalia frieze alone, placed under the ceiling on the north wall, is the only piece of sculpture which does not belong to the Parthenon.

The metopes are high on the south wall. It is a most agreeable surprise to find the pedestals in this room painted light, thus forming a consistent whole with the sculpture. Everywhere else in the building the pedestals are dark, and create disturbing spots of color. The long south corridor has examples of the Hellenistic period from the fourth century B. C. The principal figure at the west end is the "Victory of Paionios," mounted upon an abbreviation of its pedestal. On the south wall are funeral stèles, while on the north wall are the Nereids of the Xanthos monument (which are labelled "Victories" in the Metropolitan Museum in New York), the Niobe group and the relief of the Siege of Troy found in Lycia.

The central portion of the corridor is divided by screens projecting from the walls into double alcoves, of which the first is filled with the works of Praxiteles, with the Hermes of Olympia in the centre, the Apollo Sauroktonos of the Vatican on one side, and the "Marble Faun" of the Capitoline on the other. Beside this "Faun" is a torso of another and much finer copy from the Louvre.

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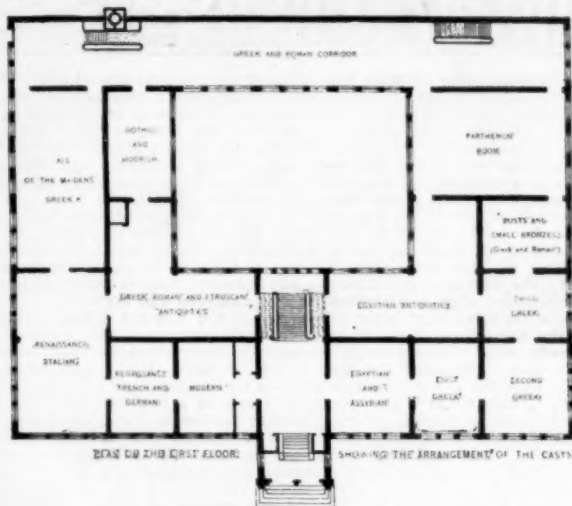
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The second alcove has the resting *Hermes of Herculaneum* from the Naples Museum in the centre, on one side the *Ludovisi Mars*, on the other the *Apoxyomenos*, on the south wall the *Alcestis* relief from the base of the column to the Temple of Diana at Ephesus, with the capital above; while on either side of the entrance to the third alcove are two of the best of the new acquisitions: the youthful *Dionysos* from Hadrian's Villa, found a few years ago, a very simple, beautiful figure, and an athlete pouring oil into his hand, from the *Glyptothek*, Munich, an extremely vigorous and active figure, with fine pose, especially to the head.

The third alcove has in the centre the "Uffizi Wrestlers," on the sides the Eschines and the Sophocles, and three new statues: an exquisite dancing "Bacchante" from Berlin, "A Boy," also from Berlin, and the "Eros" of the Capitoline, by Lysippus.

The fourth alcove has also two new statues: the "Venus Genetrix" from the Louvre, and the "Eros" of Praxiteles from the Vatican. Beyond these are the "Menander" and its companion, the "Posidippos" (a new cast). The "Demosthenes," "Ariadne," and



"Agrippina" and the Capitoline "Venus," and two new casts, "A Youth" from the Villa Albani, and the "Orestes and Electra" from the Villa Ludovisi. At the end is the upper portion of the Choragic Monument of Lysicrates, and, on the staircase, reliefs from the Column of Trajan. The vista through this south gallery is especially fine.

The Hall of the Caryatides has the Caryatide Portico at one end and the Pergamon Altar relief at the other, and in the centre groups of the dying Gauls. On the sides are examples of the Pergamon School: the "Laocoon," Barberini Faun, and the "Diana of Versailles," Torso of the Vatican, Satyr from the Theatre of Dionysos, Athens, and the seated Athlete (bronze) recently found in Rome.

This completes the Classic Collection, which is very full and representative, and, as will be seen, arranged most successfully.

The chief acquisitions in the Renaissance room are the Siena pulpit, the additional figures needed to make the Tombs of the Medici complete, Michael Angelo's "Moses," the Donatello "St. George" from Or San Michele, Florence; the Tomb of Ilaria from the Cathedral at Lucca, the Tomb of Guadarello Guadarelli from Ravenna, the Marsuppini Tomb in Santa Croce, by Desiderio da Settignano; two Lucca della Robbia tympana, several of the Innocenti from the Hospital, and an exquisite group by an unknown hand of the meeting of Elizabeth and Mary from the Church of S. Giovanni fuor Civita, Pistoja, and the small figure in the Court of the Palazzo Vecchio, Florence. These, with the Baptistry Gates and numerous architectural casts, represent the School of Italian Renaissance comparatively well.

In the French and German Renaissance room the most important addition is Peter Vischer's King Arthur from the tomb of Maximilian, Innsbruck. This noble figure quiet, dignified, yet full of energy, is the best of the mediæval bronzes. The tomb of the children of Charles VIII at Tours, is a charming work. There is a bust of Henry III, by Germain Pilon, the praying Madonna of Nuremberg, and a number of statuettes by Peter Vischer from the Sebaldskirche, Nuremberg. But this collection is meagre, and could, with advantage, be increased.

The last room has work of modern sculptors: a bas-relief of two children by Augustus St. Gaudens. One of the lions for the staircase of the new library by the younger St. Gaudens (probably should only be criticised as a sketch, but certainly has the paw awkwardly turned and lack of broad treatment in the mane, the head, however, is fine), two excellent busts and the interesting study for the Gallaudet statue by French. A good bust by Warner, groups by Dengler and an Aristotle by Mora —. The remaining rooms on the first floor are the rooms for Egyptian, and for Greek, Roman and Etruscan antiquities.

The Way collection was the nucleus of the Egyptian department.

and it has now been augmented by fragments from the Temple of Bubastis, of Hathor and of lotus capitals, and by several granite reliefs. The Egyptian Exploration Fund Society has made important additions to this department within the past three years, and it is now one of great interest.

The Greek, Roman and Etruscan antiquities are in cases, containing a fine collection of vases, terra-cottas and bronzes. Of these the case containing the figurines from Myrina, given by Mr. Brimmer, is one of the most interesting. These figurines are exquisitely modelled, and have great grace and delicacy.

The series of terra-cotta busts, obtained from Signor Lanciani, are also full of interest. There are also in this room the marble head of Apollo given by Herr Von Bulow, and a charming head found in Rome, given by a class of young ladies.

The last room has architectural fragments, Gothic and Moorish; from Lincoln Cathedral, and from the Alhambra and the Alcazar at Seville.

Ascending the staircase and turning at the landing, the first thing seen is the Victory of Samothrace upon a pedestal representing the prow of a trireme, a diminished suggestion of the actual pedestal to the statue. In the hall above are several modern pieces of sculpture, of which the latest is Falguière's "Diana," a wretched piece of modern French realism.

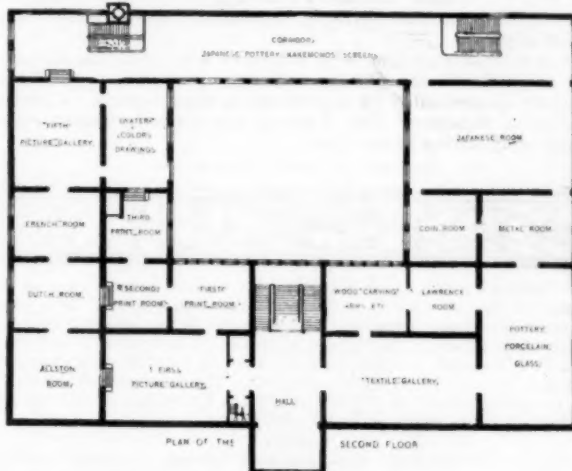
Turning into the picture-gallery, which is now filled with large canvasses, mostly by followers of the Venetian School and the French Classicists, two new pictures, however, are prominent, Turner's "Slave Ship," still as full of color as ever, and destroying everything near it; and opposite the "Marriage of St. Catharine," by Paolo Veronese, loaned by Mr. Quincy Shaw. This latter is a really fine Veronese, and at once assails both in color and drawing the integrity of the examples of the Venetian School about it. The altarpieces are interesting, but mediocre. The two pictures of the Spanish School which have been ascribed to Velasquez, and have a slight resemblance to the work of Spagnoletto, are perhaps the next best things in the gallery. The Bouchers are rather worse than usual with Boucher, the study for the Judith head by Vernet, is brutal, the Fragonard "Fountain of Love" is colorless and poor.

The Allston room is now entirely filled with the work of American painters, among whom Gilbert Stuart easily leads with a series of fine portraits. The Copleys are sadly disappointing, and the Pages, Newtons, Peales, Heals and Trumbulls are interesting archeologically.

The next room contains ten pictures of the San Donato collection, all interesting. The "Rabbi" of the Slater collection a very fine Rembrandt; a beautiful van der Weyden, "St. Luke Drawing the Portrait of the Madonna"; and a good Holbein.

The next room is the best of all the galleries. It contains examples of the Barbizon School: Corot, Millet, Diaz, Rousseau, Troyon, Daubigny and also several Coutures, a Jacque, a Delacroix, a Géricault, etc.

The finest of these are from the Slater collection. An exquisite Corot, "Nymphs and Fauns," is one of the best of his works; near



by is a very fine wood interior by Diaz, and there is a wonderful twilight in the woods, by Rousseau, that is a most remarkable piece of work.

The Delacroix "Columbus" is naive, it so frankly imitates Titian's "Presentation of St. Catharine." Altogether this room contains a very exceptional collection of fine paintings.

The last of the large picture galleries is filled with contemporaneous work of American artists, mostly Bostonians, with the exception of the east wall, on which are hung a fine Gérôme "L'Eminence Gris," a richly toned Meissonier "The Guard-room," four Coutures and Regnault's "Automedon"; opposite are Hunt's canvasses, disappointing as a whole, though with some masterful exceptions. Fuller's "Arethusa," Vedder's "Sea Serpent," Abbott Thayer's "Angel" and La Farge's "Magi" are the more important of the remaining works. The La Farge is full of color, and as usual, bodiless in drawing. The small Vedders are delightful bits of

color. The smaller Gaugengigl holds its own besides the Meissonier above it. It has not the mellow tone of the Meissonier, but it has much more life and character, and is not a mere model study as the Meissonier certainly is. Other artists represented, and in nearly every case well represented, are Cole, Thomas Robinson, Johnston, Vinton, Inness, Thompson, Pearce, Picknell, Caliga, Henry Walker, Ritter, Bolton Jones, Allen, Enneking, Benson, Duveneck, Vonnoh, Tolman and Mrs. Whitman. The collection is not only representative, but it is sound, healthy work in most cases, and has a certain high impulse in it.

The water-color gallery has not at present a very remarkable collection, with the exception of two frames of Millet's sketches. Ross Turner's "Garden" is as attractive as ever and Rimmer's studies are very interesting. The etchings and engravings have been most attractively arranged by Mr. Köhler.

The long south gallery has at its east end a very beautiful collection of Italian and French decorated MSS. recently loaned to the Museum, and the remainder of the entire gallery is taken up on one side by Japanese Kakemonos (pictured scrolls) largely from the Fenellosa collection and on the other by Professor Morse's collection of Japanese pottery. Both of these collections are the most complete of their kind in existence and cannot be rivalled, as it is now impossible to collect similar works of equal merit in such large quantities. The Kakemonos number several hundred. Several of the richest of them bear a curious resemblance to the Giotto's and Cimabue's of Padua and the Benozzo Gozzoli frescoes in the Riccardi Palace in Florence. The Morse collection numbers approximately 4,000 pieces, of all shapes and colors and glazes, with each piece classified.

The next room contains a superb collection of Japanese works of art. Swords and guards, bronzes, lacquers, silks, armor; the larger proportion collected by Dr. William Sturgis Bigelow. This collection is to be supplemented by a still larger collection including several hundred Kakemonos, now on its way from Japan.

The metal room has its central case filled with the yachting cups won by General Paine, the technical work finely done, and most of the designs extremely bad.

The remainder of the room is filled with metal work of all kinds, periods and nationalities. A Venetian wrought-iron door opens into a small adjoining room, the coin-room, which contains fac-similes from the British Museum of several hundred Greek coins and is to receive the Rindge collection, which is one of the largest of the private collection of coins.

The porcelain, glass and pottery rooms remain much as before with some few additions. The Cloisonné, Persian, Chinese dragons-blood and Japanese blue china cases are the finest. There are many fine tiles which put to shame the modern examples, and some very interesting and fine examples of modern dragons-blood vases.

The Lawrence Gallery, the Textile Gallery and the Wood-carving and Arms room have undergone very little change.

It will be seen from the foregoing that the Museum is not only of the utmost value to the student, especially in the Departments of Casts, of Japanese Art and of Painting, but that it is arranged in a most effective manner, giving an impression of thorough knowledge, and of dignity.

It is quite worthy now to be compared with Museums abroad, a fact which the Berlin Museum authorities recognize, by publishing regularly an account of its acquisitions in their reports. Certainly the Boston Museum of Fine Arts can now create an interest which should bring students from afar.

NOTES AND CLIPPINGS

A CORNER IN THE LATH MARKET.—A curious consequence of the failure of the ice crop is a corner in the lath market. The small schooners that have heretofore been engaged in the bringing of laths to this market have all been engaged by the ice companies to bring ice from New England, and the stock of laths on hand having been consumed, a desperate shortage has resulted. The price of laths to arrive was yesterday quoted at \$3 per thousand, a figure that laths have not reached for many years. — *New York Times*.

LONDON'S TOWER BRIDGE.—Last week brought to a most satisfactory conclusion the construction of the two huge river piers embraced in Mr. Jackson's first contract for the Tower bridge over the Thames. The area covered by each of these piers, which are founded at a depth of sixty feet below high water, is, it is said, larger than that of any other bridge pier in the world, covering no less than 16,500 superficial feet. Active preparations are now going on for the erection of the steel superstructure by Messrs. William Arrol & Co. — *Pall Mall Gazette*.

UTILIZATION OF WALNUT LOGS.—It is stated that a practising attorney of Sella, Iowa, has made a large amount of money not only for himself, but for the Iowans, by buying up the stray walnut logs of the State and shipping them direct to Germany and England. Last year between 1,200 and 1,500 car-loads were shipped, nearly all picked up in Iowa. Few among the early settlers of the State ever dreamed of the value that walnut trees would possess, and that within a quarter or a half of a century after settlement. Thousands of fine trees were cut down, burned, or allowed to rot on the ground, or split up for old-fashioned rail-fences. Now buyers rummage every mile of territory in

the State to find logs, and put them on the cars to be carried thousands of miles across the ocean to be worked up in fine furniture for the adornment of European palaces. — *New York Commercial Advertiser*.

INDIA RUBBER PAVING.—A German engineer, Herr Busse, has made some experiments with India rubber pavement in the town of Linden, in Hanover. The first attempt was made on the carriage road over the Goethe Bridge, and the result was so favorable that the work was extended. Experiments are now being carried on in Berlin and Hamburg, and the results have been extremely satisfactory. India rubber is said to combine the hardness of the stone pavement with the elasticity of asphalt, but rubber pavement does not become so slippery as asphalt. Of other unusual materials for pavement it may be mentioned that, both in St. Petersburg and Constadt, cast-iron is used to a considerable extent for the pavement of streets, the surface being, of course, cast in such a manner as to give the horses a safe footing. — *Engineering and Mining Journal*.

TRADE SURVEYS

If manufacturing interests have adopted any peculiar line of policy this year in contradistinction to the policies of former years, it consists in the policy of contracting away ahead for raw material, or more or less finished products. An examination which has extended over some twenty odd industries, reveals the very interesting fact that the same policy of anticipation has been followed in each and every one. This is something new. In past years, manufacturers, builders and buyers of all kinds have been content to purchase what they wanted from time to time, in fact, any other course was never thought of nor suggested by then existing conditions. All conditions have changed within a few years, and the practice of arranging for supplies of all kinds for future requirements has become quite general. Whether we look at the iron industry, the lumber trade, the mining industry, the shoe-making industry or any industry, great or small, the same general policy of buying far ahead is being adopted and carried out. The occasion for this change is not easy to assign, but it is not difficult to foresee the advantage of it. It virtually fixes production and prices. It virtually saves the commercial community from those ups and downs which have characterized business in former years. It acts as a balance wheel, or rather as a governor, to guide on the one hand and to warn on the other. It introduces a new principal or rule of action into business. It adds an element of safety, of which modern commercial development stands much in need. It furnishes an element of security and protection which will make panics and depressions less frequent. It is simply one great step toward the organization of industries and business upon a more comprehensive, rational and enduring basis. This custom will become more and more general. The adoption of this method of doing business is destined to accomplish more to control and check and hinder the unjust operations of trusts than any other one thing that could be named. The reason for this assertion is, that the immediate purpose of trusts is to restrict on one hand and enhance on the other. The purpose of this policy of forward buying is not to restrict or enhance, but simply to secure to every buyer his requirements at fixed or fixable market values. In financial circles there is a renewal of that uncomfortable apprehension that constantly arises as to a sufficiency of currency for the business interests. The surplus reserves are again down to the water's edge. Good financial management can, of course, restore them; but let it be noted just here at what cost. The cost of that restoration of surplus is the greater or less deprivation of borrowers of money necessary to conduct business. It is in the power of a comparatively few men to bring shop men and farmers by the tens of thousands within searing distance of the sheriff. That is just where hosts of them are now. More or less crude remedies have been suggested.

Agriculture has, perhaps, been unduly stimulated in the West, and this has resulted in a surplus of farm products that keeps prices very low. Supplies in farmers' hands, it is said, are beyond calculation. Manufacturers, on the other hand, bitterly complain that they are doing business at the narrowest margins ever known. Restrictions have already set in in several directions, notably among the anthracite miners, the Western wire nail-makers, among the ingrain carpet-makers, and in some lines of hardware. Possibly this restriction may be necessarily extended into other lines. The enormous amount of capacity which has been provided necessitates the question: "Where are markets to be found?" A balancing factor is wanted in our economic system; viz., the increasing, or the means of increasing, the consuming power of the individual. Recent railway returns show that the volume of business for February is 12 per cent over that of last year, and for the past two months the increase is 13 per cent. The exportation of wheat is attracting widespread attention, the increase of crop this year over last being 10,000,000 bushels. Foreign markets are likely to continue to absorb our surplus, which amounts, according to one authority, to 136,000,000 bushels, and, according to another, 156,000,000 bushels. During the present cotton season we have sent abroad over \$200,000,000 worth of cotton, an increase of 18 per cent. over same time last year. The exportation of bread-stuffs, provisions, cotton and petroleum for February were \$52,000,000 in value, an increase of \$10,000,000 over the same month of last year. For eight months past, our increased exports of these products amounted to \$76,000,000 worth. A glance at railroad earnings furnishes much encouragement. The published reports show that 149 roads, during February, earned \$63,000,000 in round figures, as against \$6,000,000 for same month of 1889, an increase of \$7,000,000. The Southern roads have made the best record. The Southwest is coming up. The Pacific roads are doing well. Western provision-markets show great activity. The "Soo" Line is the thorn in the side of the Western railroad situation, and agreement seems to be impossible as long as that bushwacker is loose. The general business situation continues healthful, and there are numerous evidences of activity in the near future. Eastern jobbers report excellent distribution. Western jobbing-houses are springing up nearer and nearer to the new markets. The mining interests of the Rocky Mountain region are expanding every month—a fact shown in the increasing demand for labor, machinery and facilities for smelting and utilizing the mineral products of the region. Every sound from the South betokens greater industrial activity. The possibilities of developing a profitable export trade between Gulf and South Atlantic ports, with Central and South America, are leading to the projection of a good many ship-building enterprises, which railroad companies are asked to help forward.

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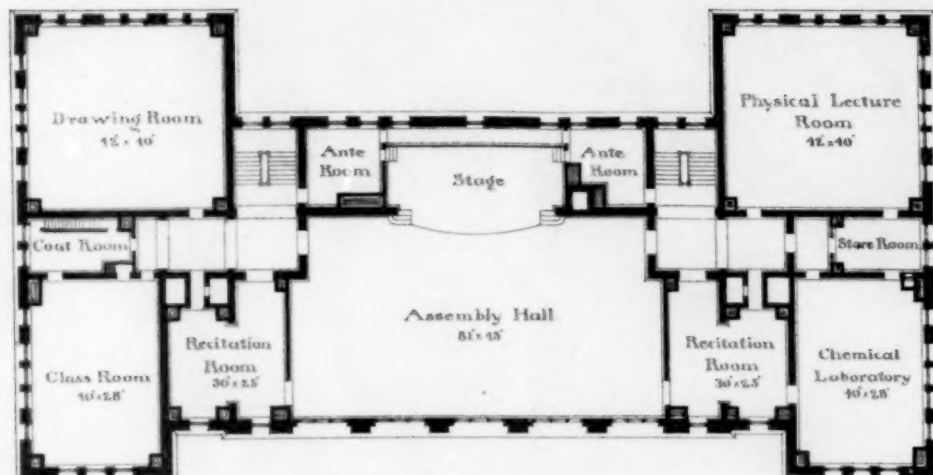


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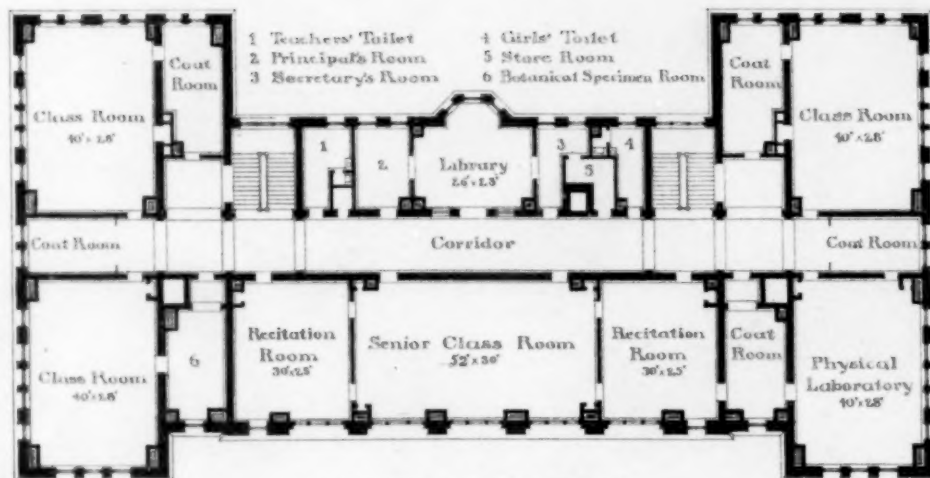
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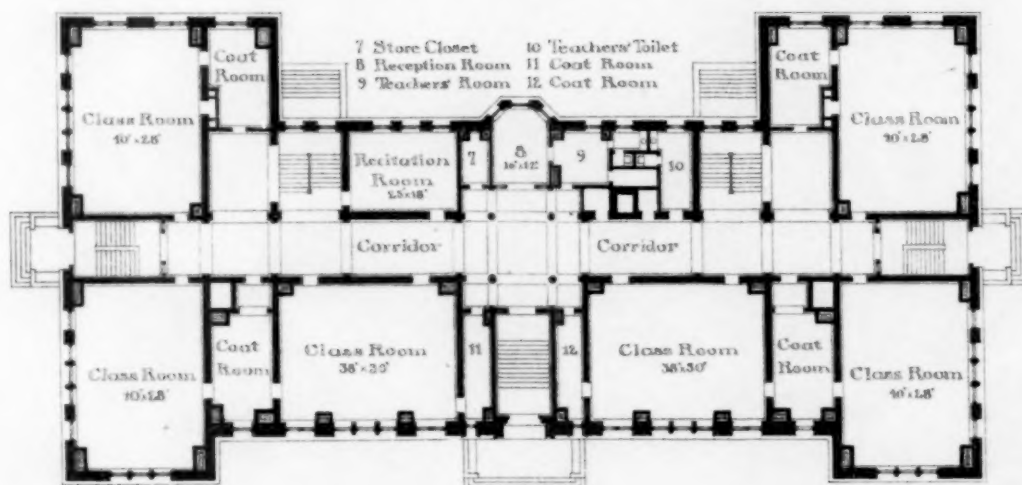
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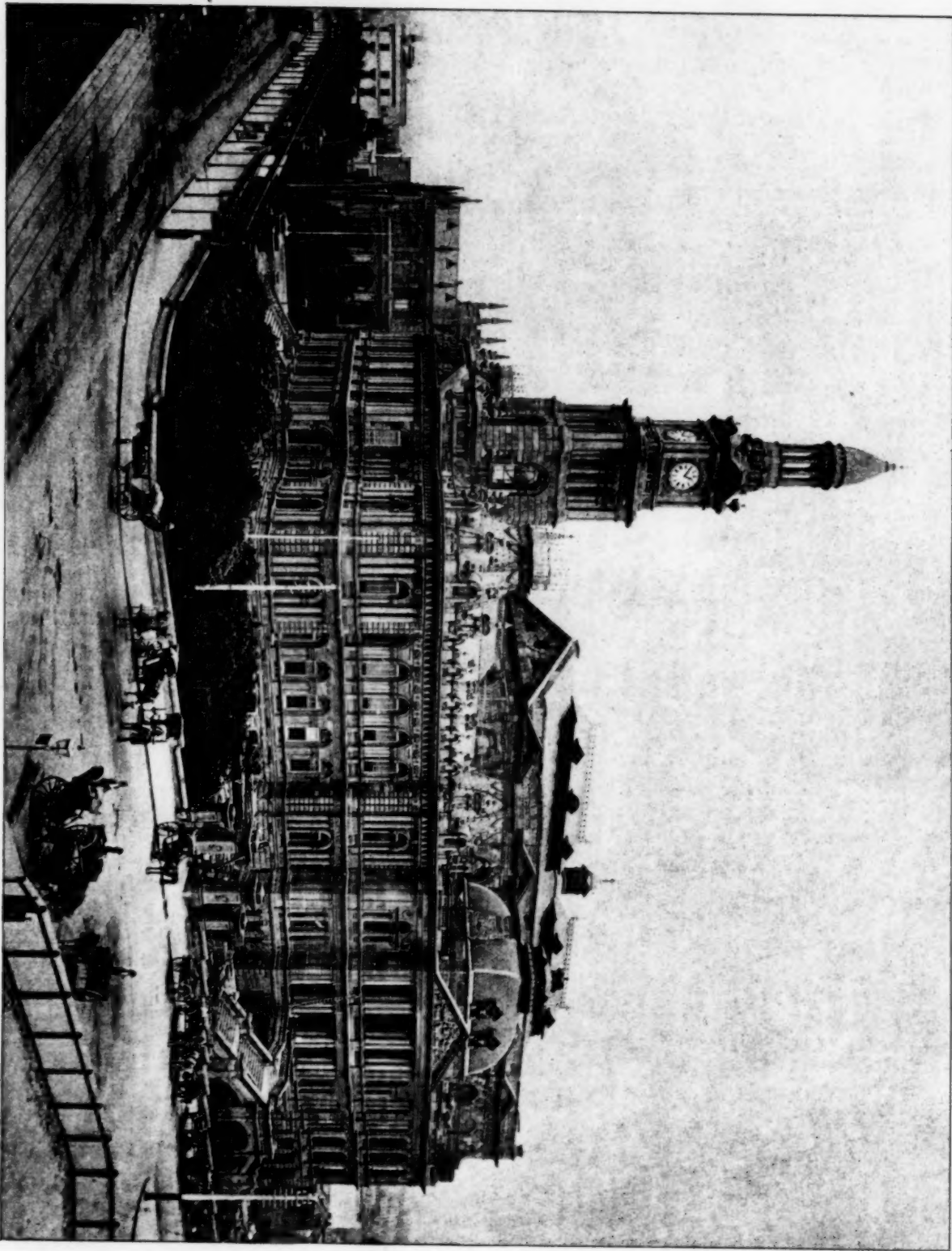


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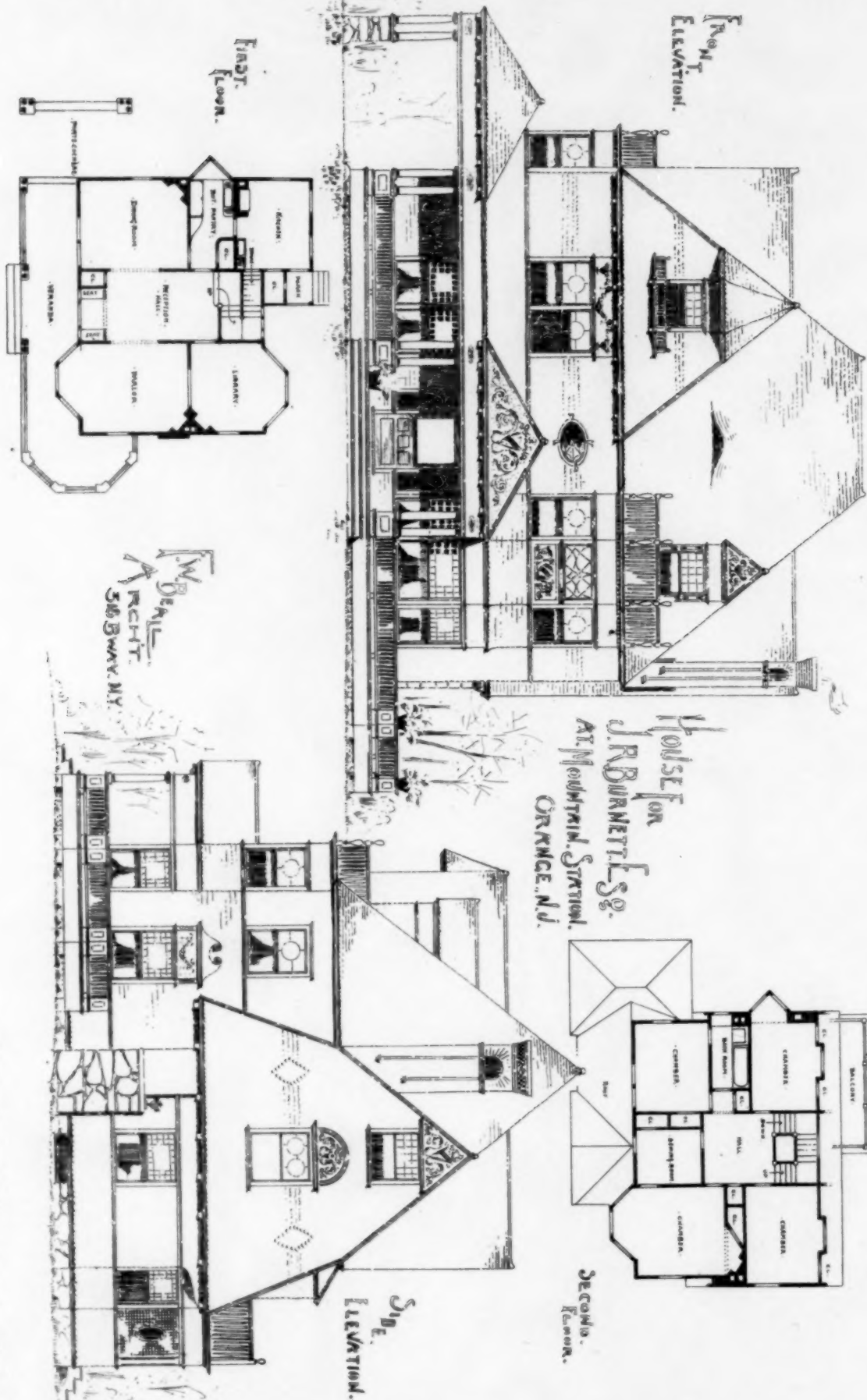
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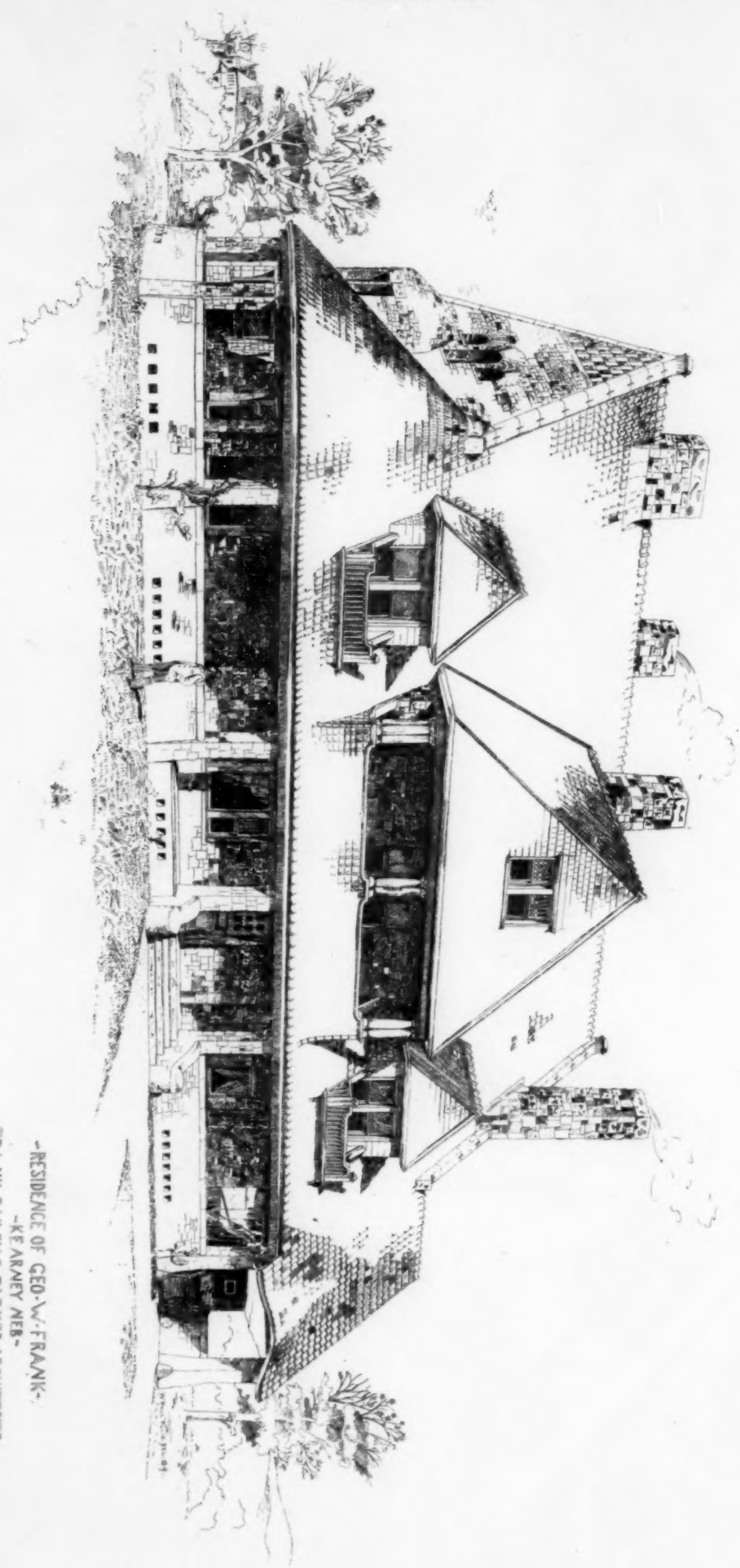
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