

PRICE 15 CENTS.

DECEMBER 22, 1894.

THE
AMERICAN ARCHITECT
AND BUILDING NEWS

VOL. XLVI.

* REGULAR EDITION *

NO. 991.

ARCHITECTURE

ENGINEERING

DECORATION

211 TREMONT ST.

CONSTRUCTION

BOSTON MASS.

CONTENTS.

EDITORIAL SUMMARY.
SPECIFICATION FOR STRUCTURAL STEEL WORK.
THEATRES. — IX. — CRITERION, LONDON, ENG.
LETTER FROM BALTIMORE.
THE GIBBON COMMEMORATION.
THE HORSES OF APOLLO.
CONSTRUCTION. — XXVIII.
EXHIBITIONS.
NOTES AND CLIPPINGS.

ILLUSTRATIONS.

ENTRANCE FRONT OF HERALD BUILDING, NEW YORK, N. Y.
[Heliochrome issued with International and Imperial Editions only.]
ACCEPTED DESIGN FOR THE BALTIMORE COUNTY COURT-HOUSE,
BALTIMORE, MD.
[Issued with the International and Imperial Editions only.]
THREE COMPETITIVE DESIGNS FOR THE BALTIMORE COUNTY
COURT-HOUSE, BALTIMORE, MD.
[Issued with the International and Imperial Editions only.]

ITALIAN CAPITALS.

[Issued with the International and Imperial Editions only.]
STAIRCASE TURRET OF THE CHATEAU, CHATEAUDUN, FRANCE.
DETAIL OF THE SAME.
THE UPPER TOWN AND THE CHATEAU, LOCHES, FRANCE.
APOLLO AND THE MUSES IN THE BOSQUET D'APOLLON, IN THE
PARK AT VERSAILLES, FRANCE.

Additional Illustrations in the International Edition.

MAIN STAIRCASE IN THE BUILDING OF THE METROPOLITAN
LIFE INSURANCE COMPANY, NEW YORK, N. Y.
[Gelatin Print.]
BAS-RELIEF ON THE FORMER HOTEL DE ROHAN, PARIS,
FRANCE.
[Copper-plate Etching.]
THE SPHYNX.
THE CITY BANK, LUDGATE HILL, LONDON, ENG.
THE ALLIANCE ASSURANCE OFFICES, PALL MALL, LONDON,
ENG.

The Mayflower PORTABLE FIREPLACE.

Open Franklin Wood Stove, Made
from a set of Old Colonial Patterns,
Ornamented with Brass Balls and
Brass Rosettes.

**A PERFECT SUBSTITUTE
for a Brick Fireplace at
ONE-THIRD THE COST.**

For Heating Parlors, Chambers,
Summer Residences, Halls,
Libraries, etc.,

IT IS WITHOUT AN EQUAL.

Made in two sizes.



HAS all the attractiveness of the open
Fireplace or the more expensive
fancy Coal Grate, with greater heating
and ventilating capacity than either.

IS MADE TO LAST A LIFETIME.

It can be used in any room, whether
there is already a fireplace there or not,
and requires only a joint of smoke-pipe
to connect with the chimney. Can be
fitted for burning coal if desired. Shipped
safely to any part of the country. Send
for special circulars and terms.

Architects will find the large size
(weight 355 lbs.) very desirable to
specify for Halls and large apartments.

SMITH & ANTHONY COMPANY, MAKERS,

48 to 54 Union Street, Boston.

56 Beekman Street, New York.

217 Lake Street, Chicago.

The Best Galvanized Iron

ought not to require specification, for a first-rate
job of difficult work can't be done without it,
and a first-rate job costs less with it than an
honest attempt at a first-rate job without it.

Every first-rate metal-worker probably knows
that Apollo is true to gauge and flat and bend-
able.

It is of some little account that the top and
bottom sheets of a bundle are cushioned against
the bands; and so are delivered almost without
blemish, just as the top and bottom sheets pro-
tect the inside sheets from the bands in other
makes.

Apollo Best Bloom is the trade-mark. It
costs a little more in large quantities. This is
the only reason that other galvanized iron is sold
at all.

APOLLO IRON AND STEEL CO

PITTSBURGH PENNSYLVANIA

WORKS AT APOLLO

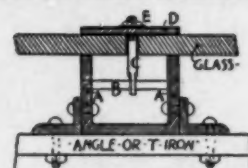
G. BICKELHOUP, PATENT



**METALLIC
SKY-LIGHT
WORKS.**

242 and 245 West 47th Street, New York.
Telephone: 675 39th St. a few doors west of Broadway.
Send for Catalogue.

PARADIGM SKYLIGHTS



See our full page ad. of June 2, 1894.

PARADIGM CONSTRUCTION COMPANY,
41 Pine Street, New York.

**VAILE & YOUNG'S
Patent Metallic Skylights.**



Without Putty.
Construction adapted to
all forms and styles of
Skylights. Thousands of
feet in use have proved
its superiority. Particu-
larly adapted for Depots,
Mills, Factories, etc.,
where large and continu-
ous lights are required.
Send for Illustrated Cat-
alogue.

126 N. Calvert St., Baltimore, Md.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLVI.

Copyright, 1894, by the AMERICAN ARCHITECT AND BUILDING NEWS COMPANY, Boston, Mass.

No. 991.

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

DECEMBER 22, 1894.



SUMMARY:—

The Test Suit over the Competition for the New York City-hall.—Explosion of a Heating Boiler in a School-house.—Death of Count Ferdinand de Lesseps.—The Ladies and the Calhoun Monument, at Charleston, S. C.—The Proposed East River Bridge.—The Convention of the National Federation of Laborers, at Denver.	121
SPECIFICATION FOR STRUCTURAL STEEL WORK.	123
THEATRES.—IX: CRITERION THEATRE, LONDON.	124
LETTER FROM BALTIMORE.	126
THE GIBBON COMMEMORATION.	127
THE HORSES OF APOLLO.	128
CONSTRUCTION.—XXVIII.	129

ILLUSTRATIONS:—

Entrance Front of the Herald Building, New York, N. Y.—Accepted Design for the Baltimore County Court-house, Baltimore, Md.—Premiated Design for the Same.—Two Competitive Designs for the Same.—Italian Capitals.—Staircase Turret of the Château, Châteaudun, France.—Detail of the Same.—The Upper Town and the Château, Loches, France.—Apollo and the Nymphs in the Bosquet d'Apollon, in the Park, at Versailles, France.	
Additional: Main Staircase in the Building of the Metropolitan Life Insurance Company, No. 1 Madison Avenue, New York, N. Y.—The Horses of Apollo, Bas-relief on the former Hôtel de Rohan, Paris, France.—The Sphinx.—The City Bank, Ludgate Hill, London, Eng.—The Alliance Assurance Offices, Pall Mall, London, Eng.	131
EXHIBITIONS.	131
NOTES AND CLIPPINGS.	132

IT is so difficult to overcome a fixed habit, that there is good reason for requesting our subscribers to take particular heed this year, in filling out their checks for next year's subscription, to make the payee accord with the corporation's title as expressed in the subscription bill. A little care in this respect will go a long way to minimize the trouble which will naturally fall upon the former publishers and ourselves.

THE suit of Messrs. Audsley and Audsley against the City of New York, for services in making competitive drawings for the new City-hall, has been brought up in the United States Circuit Court, and the Corporation Counsel has filed the answer of the City to the suit. In substance, the answer pleads two defences. In the first, it says that the architects rendered no service, and that the City-hall Commissioners are ready to return the plans as soon as a demand is made for them. In the second, it says that the Commissioners never refused, as the petition alleges, to make a decision with regard to the competing plans, but that it was prevented from carrying out its agreement by the action of the Legislature in passing a bill prohibiting the removal of the old City-hall, and, in consequence, preventing the erection of a new one on its site.

WE always regard it as highly discourteous to discuss questions pending before a court, in advance of the consideration of them by the court itself; but it will not, we hope, be amiss to suggest, for the benefit of future promoters of competitions, that the position taken in the last defence, that, after the architects have done their work, in accordance with the Commissioner's invitation, the latter are under no obligation to pay for it if the Legislature steps in to prevent carrying the plans into execution, is not a very strong one. We do not remember that any provision was inserted in the circular of invitation to architects, to the effect that the promised compensation should not be paid if the Legislature should make it inconvenient or impossible to erect the building represented in the designs, and we do not know how, in any other way, a condition that the payment of their promised compensation should be contingent on the action of the Legislature could be saddled upon the architects. The Legislature has not forbidden the city to pay the architects what it promised to pay them. Even if the Legislature should pass such a statute, it would be void, as impairing the obligation of the contract entered into by the architects and the city, so that we cannot see how any act of the Legislature could affect the question at issue, under the contract as it exists. In the other defence, that the architects have rendered no service, we

suppose that there is concealed some technical point which is not visible to a layman's eye, for the idea that an architect who, in response to an invitation from a man to make competitive plans for his house, sends him plans made in accordance with his programme of conditions, renders him no service, is somewhat startling to the ordinary mind.

EVERY few weeks, some glaring instance is reported of the reckless stupidity and meanness with which school authorities trifle with the lives of children. If half the crimes against decency and common-sense were perpetrated against grown people that are every day committed against the most precious part of the community, indictments for manslaughter would fill the dockets of the courts; but the children are helpless; they do not know what they are entitled to, and they have neither courage nor disposition to complain, and, as a reward for their modest patience, their lives and health are sacrificed without mercy. One of the worst cases of criminal neglect of this sort yet reported occurred in a Massachusetts town not long ago. On a mild afternoon, three or four weeks ago, a terrific explosion occurred in a school-house, in which two hundred children were busy over their work. The floor of the first-story room over the heating apparatus was thrown upward, but, fortunately, settled back again on its supports, instead of falling into the cellar, so that, of the children who occupied the room, only a few were slightly injured. That indefatigable friend of school-children, Chief Wade, of the Massachusetts State Police, immediately sent an inspector to ascertain the cause of the explosion, and the report of the inspector, Mr. Hawley, is interesting reading for parents.

ACCORDING to this report, the school-building was heated by an ancient square boiler, of cast-iron plates, varying in thickness from half an inch to barely a quarter of an inch, not stayed in any way, and furnished with a safety-valve an inch and a half in diameter, connected with the boiler by a three-quarters-inch pipe. The value of this charming contrivance had been already proved by an experience of the janitor, who left his fire one day with the draughts on, and found, when he came back, the safety-valve, which had been set to blow off at seven pounds, wide open, while the boiler-pressure, as shown by the gauge, stood at twenty pounds. On the day of the explosion, this same janitor, although the weather was mild, built a big fire of anthracite, shut the fire-box door, left the automatic damper open, and went off to look after another school-house, which was also under his charge. When he left the building, the gauge showed four pounds pressure; but, as the inspector says, it is natural to suppose, and the evidence of the wreck clearly indicates, that, the radiators being shut off, and the heat from the fire constantly increasing, the pressure rose until the boiler gave way, the miserable little safety-valve being totally inadequate to relieve the strain. This story would be bad enough, but Mr. Hawley incidentally reveals worse things. Instead of an inadequate safety-valve, he says that in many Massachusetts school-houses, heated by steam, there is no safety-valve at all. The statute relating to steam-boilers requires that a fusible plug shall be put in every boiler, which will melt when the water in the boiler runs so low as to expose it to the fire; but Mr. Hawley finds that even this is often omitted, the boiler consisting simply of a shell, the pressure in which is controlled, apparently, solely by Divine Providence.

IN the death of Count Ferdinand de Lesseps, the world loses a very conspicuous, if not very illustrious figure. Neither as an engineer nor as a financier did he ever show even mediocre ability, and he died as a criminal in the custody of the courts; yet long after his sentence for fraud has been forgotten, his name will be honored as that of a man whose untiring energy, enthusiasm and amiability served to carry to completion undertakings which no one else, probably, could have brought to a successful issue. His fame will rest principally on the scheme for the cutting of the Suez Canal, which he appears to have conceived more than sixty years ago, when he was consul at Alexandria, but was not able to carry out until 1854, when, being again in Egypt, as a guest of Mehemet Said, he spoke of his project to Saïd Pasha. The latter requested him to draw up a detailed statement of his plan, and, two years later, the matter had gone so far that a concession

was granted by the Viceroy of Egypt. The next step was to secure capital for the undertaking, and for this it was necessary to satisfy engineers of its feasibility, which was not an easy task. In 1859, however, a company was organized, and soon after, the work of excavation was begun. In 1863, on the death of the Viceroy of Egypt, the Sultan of Turkey made claims upon the Canal, which were finally adjusted by the Emperor of the French as arbitrator, and, in 1865, when de Lesseps was sixty years old, small steamboats were enabled to pass from the Mediterranean to the Red Sea. Four years later, the Canal was formally opened to commerce. For some years, de Lesseps was perhaps the most prominent subject in Europe, and his name was undoubtedly used by men younger and more crafty than himself to cover schemes of which he knew nothing. In 1881, when de Lesseps was seventy-six years old, the Universal Oceanic Panama Canal Company was formed, with his name in the most conspicuous place in the list of officers. This Company was supposed to have been formed to carry out a plan which he had devised for cutting through the Isthmus of Panama, but it is quite unlikely that he had ever formed any definite plan of the sort. In fact, as he himself told the members of the American Society of Civil Engineers, when he visited this country, he was not an engineer, but a financier, as he called himself, or, as we should say, a promoter. A promoter he certainly was, and one of extraordinary eloquence and ability; but it suited the men who intended to use him for their own purposes to represent him as a consummate engineer, whose success with the Suez Canal had been one of engineering skill.

WHEN the work began on the Panama Canal, it was found that the engineering problems involved had practically not been considered at all, and, rather than confess this fact to the stockholders, the honest managers of the enterprise allowed the money which came into their hands to be squandered in useless experiments, while the dishonest ones filled their pockets with the funds so ineffectually guarded. The scandalous history of the enterprise is too fresh in the minds of our readers to need repetition, and we presume that most of them have already come to the conclusion, which seems to be shared by the French public, that the old man whose name was used to attract subscribers to the enterprise knew very little of what was going on about him. However, the French are very stern in their dealings with dishonesty, and even ignorance of what has been done under his name will not altogether excuse a man from responsibility for it; so it is not surprising that, in the end, he was found guilty of participation in the frauds which had ruined so many of his countrymen. The sentence passed upon him and his son was, however, reversed later, and he never really knew that he had been judicially condemned.

THE ladies of South Carolina are having an expensive experience in the matter of the Calhoun monument in Charleston. Some forty years ago, when the memory of the great Nullifier was greener than it is now, and dollars were probably more plentiful in South Carolina than they have been since his doctrines were put in practice, the women of his native State undertook to raise money to erect a monument to Calhoun. Some seventy-five thousand dollars had been raised, and invested in United States bonds, when Calhoun's disciples conceived the idea of extirpating the United States flag from South Carolina by means of powder and ball. This attempt was persisted in, with incidents which need not here be related, until the flag was forcibly replaced by Sherman's army. On the approach of the Federal forces, Mrs. Snowden, the treasurer of the monument fund, sewed the bonds into her clothes, and escaped from the city. The occurrences which followed in South Carolina were unfavorable to monument-building, and it was not until 1887 that a statue of an arm-chair, with a tall gentleman standing beside it, was erected in Charleston at a cost of forty-four thousand dollars, and paid for with a part of the funds which Mrs. Snowden had taken care of. Although the statue was designed and executed in Rome, the monument was never quite satisfactory to the surviving subscribers to the fund, or to the people of Charleston, and, not long ago, the resolution was taken to pull it down, break up the bronze and erect a new monument, with a new statue on it. Messrs. Renwick, Aspinwall & Renwick, of New York, were selected as the architects, and Mr. J. Massey Rhind, of New York, was chosen in competition as the sculptor.

The base of the old monument will be retained, but, in place of the block with an arm-chair on it, a column and pedestal will be erected, bearing at the top a colossal figure of the great South Carolinian. Enough of the original fund still remains to pay the cost of changing the monument, and its dedication, which, it is hoped, may take place in the autumn of 1895, will be observed with special ceremonies.

THE Long Island Railroad Company has already received proposals from the bridge-builders for the erection of its great cantilever bridge over the East River, by which it is to reach its new terminus in the City of New York. The bridge is to cover the distance from the Long Island to the New York shore in three spans, the middle one of which is a land span, extending across Blackwell's Island, one pier standing on each edge of the island. The span over Blackwell's Island measures six hundred and thirteen feet in length, while the two water-spans are each eight hundred and forty-six feet in length. The height of the roadway above flood tide is one hundred and thirty-five feet, the same as that of the Brooklyn Suspension Bridge, but the railroad company's bridge is to be a sort of hybrid between a continuous girder and a cantilever construction. The system adopted, which seems to have been due to the consulting engineer, Mr. Charles M. Jacobs, is admirably adapted to the circumstances. Blackwell's Island, which is a ledge of solid rock, affords an excellent foundation for the two great piers of the middle span. The distance between these piers being comparatively small, while sufficient opportunity can be found for erecting false works, it is easy to cover this span with an enormous girder, which is much more readily extended out over the water-span, as a cantilever, than is the case where the cantilever, for the sake of balancing it, must be extended simultaneously each way from one pier. A pier at each shore end carries a small cantilever girder of the usual type, extending in each direction. One projecting end of this cantilever extends inland, and connects with the approach work, while the other projects over the water, toward the cantilever which projects from Blackwell's Island, the usual intermediate girder being hung between them. Simple and sensible as this disposition is, the execution of the scheme will involve the employment of a vast amount of metal, the weight of the steel necessary being estimated at nearly forty thousand tons. The connections are to be made with pins, the largest of which are eighteen inches in diameter, and weigh three tons each. The enormous scale of the work in general may be inferred from the fact that the main girder across Blackwell's Island is one hundred and twenty feet high, from the top of the piers to the surface of the upper chord. The terminal station in New York will cover an entire block, between Second and Third Avenues. The tracks, in order to enter it, cross the tracks of the Second Avenue Elevated Railway, but at an elevation of twenty-five feet above them, so that, while no traffic will be interfered with, the Long Island trains will connect closely with both the Second and Third Avenue elevated lines. The importance of this direct connection to the Long Island road, and to the development of Long Island itself, is almost incalculable. No other railway entering New York possesses anything like such facilities for transferring passengers to all parts of the city, and it seems hardly too much to say that this connection alone will build up on the Long Island Railroad a vast suburban district, such as New York greatly needs.

THE Convention of the National Federation of Labor at Denver appears to have been attended with the usual amenities. Hardly had the Convention been called to order, when a member informed the assemblage that he had proofs that the officers of the Federation "sold" their position and influence for the sake of private gain. An uproar followed, but the production of specific charges appears to have been happily averted, and sufficient order was restored to make it possible to hold an election, which resulted in the defeat of President Gompers, and the election of McBride in his place. The malcontents being appeased by this victory, peace reigned until another member happened to object to the present administration of affairs. He was immediately denounced as a "scurilous whelp," and attempts were made to put him out of the room. Again, however, the attention of the combatants was skilfully diverted to the Knights of Labor, who were not there to reply, and, after freeing their minds at the expense of the rival organization, the delegates dispersed.

SPECIFICATION FOR STRUCTURAL STEEL WORK.

THE enormous increase in the employment of steel for commercial buildings, which has come about within the past few years, has found architects to a certain extent unprepared for its use, and in many cases has forced them to turn the details over to engineers, especially in such cases as have involved the use of many tons of metal in the shape of large spans or of numerous stories. Whatever may be the final attitude taken by the public in regard to the advisability of the excessively tall structures which have multiplied so rapidly in the various large cities, the use of steel, and to a very large extent the skeleton construction as well, has come to stay. The architect is accordingly obliged to, at least in a very large degree, be familiar with steel construction.

It may almost be accepted as an axiom, that anything which tends to reduce the bother and personal care required of an architect in connection with merely practical details will leave him freer to give his more undivided attention to the architecture as such. Consequently, any system which reduces the architect's work in connection with the designing of structural steel-work is worth considering.

The common, and at first glance the most obvious method of designing structural steel-work in connection with a building is for the architect to prepare scale-drawings, showing the detail in every portion of the work, with all sections, connections, rivets, joints, etc., clearly indicated, so that when the drawings are submitted to the contractors for estimates there will be no room for independent variations, but each builder will figure upon exactly the same thing. At first thought, also, this is the better and the fairer way. The experience of the writer, however, seems to show that results may sometimes be accomplished with far less work.

In preparing the specification and plans for the rebuilding of Tremont Temple in Boston, considerable study was expended upon the sections of steel columns to be employed, and upon the exact forms of girders which would be most desirable. The architects were visited by agents representing all the different makes of wrought columns in the market, and it soon became manifest that a specification which limited the bidding to any particular shape would also correspondingly limit the number of bidders and might not secure to the owners of the property the lowest figure for the steel-work. Furthermore, the facilities for working metal by the different companies are such, that what might be the cheapest form of manufacture for one concern would not be the cheapest for another. As it was desirable to obtain the lowest market-price for structural steel-work which would accomplish a certain result, the plans and specifications were accordingly prepared as follows:

Framing-plans were made showing the beams and locating girders and columns. The sizes of beams were marked on the plans. No sizes, however, were given for either built girders or columns. In the case of the former the spans were indicated, likewise the total loads and the extreme permissible breadth and depth. Diagrams were also given, showing the loads in each story on each column, together with the outside dimensions which the columns could occupy. The specification provided that the steel throughout was to be inspected in the usual manner at the expense of the general contractor from the melt to the cars. The steel was required to stand at least 50,000 pounds per square-inch tension with 35,000 pounds elastic limit, and the contractors were given liberty to proportion the built girders in any way they saw fit, provided the indicated loads were properly supported. The contractor was required to submit strain-sheets for all girders, joints and connections, as well as copies of all shop-drawings, which were to be approved before the work was executed. In regard to the columns, the specifications provided that they might be of Z-bar or any other marketable type, or compounded of channels, angles and plates, but must be proportioned to safely support the load for which they were figured, the maximum strain upon the metal not exceeding six tons per square inch for a length equal to ninety radii of gyration. Strain-sheets for these columns were to be made satisfactory to the architects by the contractor, and all joints and connections proportioned to the floor-loads. In addition, the specification contained the usual clauses in regard to riveting, the quality of the metal, the style of framing, unit resistances, etc.

When this specification was submitted to the builders it gave rise to a certain amount of adverse criticism. In some cases the builders asserted that the specification allowed the steel contractor to do just what he pleased and that the work was not sufficiently detailed to enable close figures to be obtained. The fact, however, that in the final bids the figures for ironwork varied by less than one per cent on a contract running up over \$100,000, is ample proof that such form of specification does not give a great latitude to the bidders. On the contrary, it is extremely doubtful if the bidding would have been any closer, or even as close, had all the joints and connections been detailed in advance and each contractor been obliged to bid upon a definite set of plans.

After the strain-sheets had been submitted by the contractor, these were gone over independently by the architects and by an expert engineer, and thoroughly revised, such corrections being made as were necessary. From time to time also, the shop-drawings were submitted for approval. In this way, the architects were relieved of a great deal of unnecessary work, while at the same time

an absolute control was maintained over the construction in all its details.

It may be said in this connection that the writer has yet to find a steel firm which is satisfied with the drawings which an architect prepares for the structural work. In nearly every case the manufacturers prefer to make their own shop-drawings, and if an architect goes to the trouble of preparing details of the steel work any further than are necessary to give dimensions, heights of stories, spacing of beams, etc., his labor is practically thrown away, for such drawings are immediately re-made so as to be in accordance with the usage of the particular manufacturer who has the work in hand.

The same is true, to a certain extent, regarding the larger and more thoroughly equipped building-firms, most of whom have draughtsmen of their own constantly employed in revising the architect's drawings and calculations; and from the wide range of practical experience which is peculiarly the builder's inheritance, he is often enabled to make a very considerable saving in the construction of a building without in the slightest degree affecting its entire stability or compliance with building-laws, while, under similar circumstances, the architect might be inclined to err so largely on the side of safety as to use a great deal more steel-work than would be necessary. A large building was erected some time since involving about two million dollars, the builder of which offered to frame the entire structure for \$50,000 less than the contract price, provided he was required to proportion the metal simply in accordance with the building regulations and the loads the floors had to carry. It would manifestly be to the advantage of the owners of a piece of property to give a builder such an option at the time the figures are made, rather than after the contract is settled; provided, of course, no risk is incurred which would involve the essential character of the building.

The steel-work of Tremont Temple is by no means completed as yet, but the results thus far have been very satisfactory. The construction includes heavy columns which are built into the wall at each side of the main hall, supporting enormous plate-girders spanning nearly seventy-five feet, upon which are borne the upper three stories of offices. The girders themselves weigh as high as thirty-eight tons each, and the loads on the columns run as high as four hundred tons. A section of the columns and of the girders was suggested by the architects on the framing drawings, but before the final plans were adopted, these sections had been changed a number of times, until they were brought to the shape which the steel contractors felt was most economical for them to build and to set in place. As the mere setting alone of one of the girders would amount in cost to more than the variation between the two lowest bidders for the steel-work, it is manifest that by such a system of specifying as has been described, the owner would probably get the advantage of the highest possible economy on the part of the builder.

The custom of simply specifying dimensions, but not sizes, of metal for girders and columns is by no means new in engineering practice, though the writer does not know of its having been followed in connection with extensive structural steel-work in a building. A very common practice with engineers in calling for bids for railroad bridge-work is to make a very complete specification of the requirements, leaving each bidder free to design the form of truss or girder which he can build most economically in accordance with the specification. This has undoubtedly been the cause of the high excellence which has marked so much of the work of our large bridge-construction companies. Every pound of metal is used to its best advantage. Full measure can be given under a specification of this sort, so that the building is absolutely strong in all its parts, — assuming, of course, that the engineer or architect understands his business, — and at the same time not a rivet nor a pound of metal is wasted. Few architects have the experience necessary to economically design structural steel-work, but with a method of specification such as has been described above, and by calling for bids only from reputable and capable firms, the very best of results can be secured and at the lowest possible price.

The writer is not prepared to say that the foregoing is necessarily the best, or even the correct way of specifying structural steel-work. It does, however, save a great deal of work, and where the builder or the steel-contractor intends to re-draw all of the detail-drawings, there is surely no call for the architect to prepare them. Such a system will probably secure lower figures. It enables one to check the calculations more thoroughly, since not only are the sizes figured by the builder at least once, but they should also be revised very thoroughly, at least twice, by the architect or his agent. It further puts all responsibility for measurements, connections and methods of setting where such responsibility properly belongs — upon the builder. On the other hand, the writer is inclined to believe that, generally speaking, such a method of procedure will involve more time. The builder is rarely able at once to grasp the details of arrangement in a building, and is very apt to take more time in drawing out the details of construction than would be expended by an architect, especially as the drawings prepared by the builder would have to be approved by the architect before they could be elaborated into shop-drawings. Such a system, moreover, is not practicable for small jobs, and it requires a very close supervision, together with a wider practical knowledge on the part of the architect, than is involved in the mere ability to use a hand-book. Furthermore, it would not be wise to trust the working-out of the drawings to any but a thoroughly responsible and experienced builder, preferably

one who is used to bridge-construction. But, given an architect who is able to check such drawings, and a builder who is able to prepare them, it would seem as if the liberty which such a method of specification would allow, would be to the decided advantage of both the architect and the owner, without in any degree compromising the former's position.

The following is suggested as a specification to be used, which it is believed would cover all the points:

SPECIFICATION FOR STRUCTURAL STEEL-WORK.

Material.—The entire structural framework, as indicated by framing-drawings, is to be of wrought steel.

Inspection and Tests.—The steel-work is all to be inspected, from the melting to the final delivery of the finished work on the cars, such inspection to include thorough surface, mill and shop inspection, to be at the expense of the general contractor, and be made by a competent inspector satisfactory to the architects, to whom all reports are to be made. Physical tests shall be made from each melt, and from each thickness from each melt varying by more than one-fourth inch.

The test specimens shall fill the following requirements:

Ultimate tensile strength, 60,000 to 68,000 pounds per square inch.

Elastic limit, minimum, 35,000 pounds per square inch.

Elongation in 8 inches, minimum, 25 per cent.

Reduction in area, minimum, 40 per cent.

Bending Test.—Bent 180° flat around a curve whose diameter equals thickness of specimen without sign of cracks on convex side.

The phosphorous in all steel shall not exceed 0.10 per cent. Certified analyses shall be furnished on each melt. No work is to be delivered until it has been approved and stamped by the mill inspector.

Drawings.—Shop-drawings, copies of architects' drawings furnished, templates, reversed templates, patterns, models and all necessary measurements at the building are to be made by the contractor at his own expense.

Beams.—The floor and roof beams are to be of sizes and weights indicated on plans and disposed as there shown. Where beams are shown side by side they are to be bolted together with fillers or separator-plates at least once every eight feet, but not less than three times in each span. Where beams are framed together, the flanges are to be shaped so that the web shall fit closely, with no clearance.

Girders.—The plans and sections indicate the total loads on all built girders, and the maximum permissible depth and width. Within these limits they are to be proportioned by the contractor to safely sustain the designated loads and their own weight, the permissible strains per square inch being as follows:

Extreme fibre stress.....	16,000 lbs.
Compression.....	12,000 lbs.
Tension.....	15,000 lbs.
Shearing.....	10,000 lbs.
Direct bearing including rivets.....	18,000 lbs.

No section of metal is to be used of a weight of less than six pounds per foot, and no plates of less than three-eighths-inch thickness.

The contractor is to submit strain-sheets for all girders, joints and connections, which are to be made satisfactory to the architects. All shop-drawings are to be submitted for approval to the architects.

In proportioning the webs of plate and box girders, one-sixth of the area may be taken as resisting bending-moment.

All web-plates must be reinforced by angle stiffeners wherever the distance between the flange angles is greater than seventy times the thickness of web. The distance apart of stiffeners must not be more than the total depth of the girder. All stiffeners are to have filler-plates and must be fitted closely against flanges, top and bottom. Stiffeners must also be supplied over all bearing-points and at points of concentrated loading.

Both flanges of girders are to be of same section.

Columns.—The loads which the columns will bear are indicated on sectional drawings, together with the approximate permissible dimensions in plan. These columns may be of the Z-bar or any other marketable type, or may be compounded of channels, angles and plates, but must be proportioned to safely support the loads for which they are figured, the maximum strain upon the metal not exceeding six tons per square inch for a length equal to ninety radii of gyration, the metal being increased in accordance with the formula $17,100 = 57 \frac{l}{r}$. Strain-sheets for these columns are to be made satisfactory to the architects and all joints and connections properly proportioned. The columns are to be so built as to be continuous through the stories from bottom to top, the plates being lapped vertically and all the joints being made of strength equal to strength of the column itself.

No column-plates are to be less than three-eighths-inch thick.

All columns are to be proportioned to sustain the loads indicated for them without any support from lateral bracing or from masonry walls, and in proportioning the area of metal to the length of column the least value of r is to be used.

Rivets.—All machine-rivets are to be of mild steel, all field-rivets of refined iron. No rivets are to be used in tension.

The pitch of rivets is to be not less than three times nor more than eight times the thickness of the thinnest outside plate, nor more than six inches. The distance between the edge of any piece of metal and the centre of a rivet-hole must never be less than one and one-quarter inches.

In determining the number of rivets, an excess of twenty-five per cent is to be allowed for all field work.

Rivet-holes may be punched or drilled, but must not be more than one-sixteenth of an inch larger than the diameter of the rivet. If punched, the work must be done so that the hole shall be straight, clean and sharp, so that rivets can be driven without drifting. All joints in riveted work must be fully spliced and the ends before splicing must be dressed straight and true, so that there will be no open joints

All angle plates and knees and bent beams are to be bent while hot. When finished they must be free from seams and cracks and without initial strain.

Connections.—All connections and splices are to be field-riveted with hot rivets.

All beams framed together are to have angle-iron connections at least three and one-half inches by three and one-half inches, and as long as the web of the beams and placed each side of the same with properly-proportioned rivets. The ends of all girders and beams resting on columns are to be riveted to the brackets with two three-quarters-inch rivets through the bottom flange, with an angle-iron riveted twice to top flange and twice to the column, or a similar connection of proper strength, depending upon the style of column used. The ends of all beams and girders resting on a wall or pier are to have one and three-quarters-inch by one-half-inch iron anchors bolted to the web with two five-eighths-inch bolts, the other end turned around a one-inch diameter wrought-iron spear, sixteen inches long, set vertically, in no case less than four inches from the end of the beam or girder.

Plates.—Cast-iron plates are to be provided and set under the ends of all beams and girders resting on masonry. The plates under girders are to be proportioned to the loads as figured, the plates being of sufficient size to distribute the load so that the stress on the brickwork shall not exceed fifteen tons per square foot. Under beams the plates are to be the equivalent of at least twelve inches by twelve inches by two inches for a single fifteen-inch beam, or twelve inches by twenty inches by three inches for two fifteen-inch beams bolted together. The column base-plates are to be proportioned for loads of thirty tons per square foot on the granite levellers, or fifteen tons per foot if resting on brickwork. These may be cast or wrought.

Painting.—Before leaving the shop, all steel-work is to receive one coat of Harrison's "Black Anti-Rust Paint." When the framework is in place, it is to be gone over and all rivets and exposed portions retouched with black paint. The whole is then to receive one coat of Harrison's "Red Anti-Rust Paint."

No material shall be painted until approved by the inspector, nor painted where exposed to rain, nor when in an improper condition, nor shipped until the paint is dry.

C. H. BLACKALL.

THEATRES!—IX.

CRITERION THEATRE, LONDON.



BY the courtesy of Mr. Frank Verity, I present in this number to the readers of the *American Architect* the drawings and description of London's underground theatre which was designed and carried out by the late Mr. Thomas Verity, the father of the gentleman to whose kindness I am indebted. Mr. Thomas Verity held in reference to theatres the important official post of professional adviser to the Lord Chamberlain, the authority who grants the licenses to the majority of the London play-houses, and Mr. Frank Verity, upon the death of his father, was appointed to this office.

The Criterion Theatre is situated beneath the Criterion Restaurant, Piccadilly Circus, the very centre of the gayest part of fashionable London, round which the theatres, music-halls and cafés abound.

¹ Continued from No. 990, page 112.

No part, other than the entrances of this theatre, is above the pavement-level. In the original scheme for this building, the part now occupied by the theatre was intended as a music-saloon, but during the course of carrying out the work his idea was extended, and Mr. Verity converted his music-saloon into what it now is.

From a paper read by Mr. Verity before the members of the Royal Institute of British Architects, in January, 1879, it is gathered that the restaurant was the main object of the undertaking which Messrs. Spiers & Pond, the noted refreshment contractors, placed under his care, and that the theatre was a mere adjunct. Mr. Charles Wyndham has, however, under his management made the Criterion Theatre as famous, if not more so, than the restaurant.

Although the subject of this paper is the Criterion Theatre, it is so mixed up with the restaurant that, in spite of being technically a separate structure, I am forced to dwell somewhat upon the arrangements for the restaurant, as well as the theatre.

The principal entrance to the restaurant, which is in the centre of the Piccadilly façade, is under a large recessed archway, opening

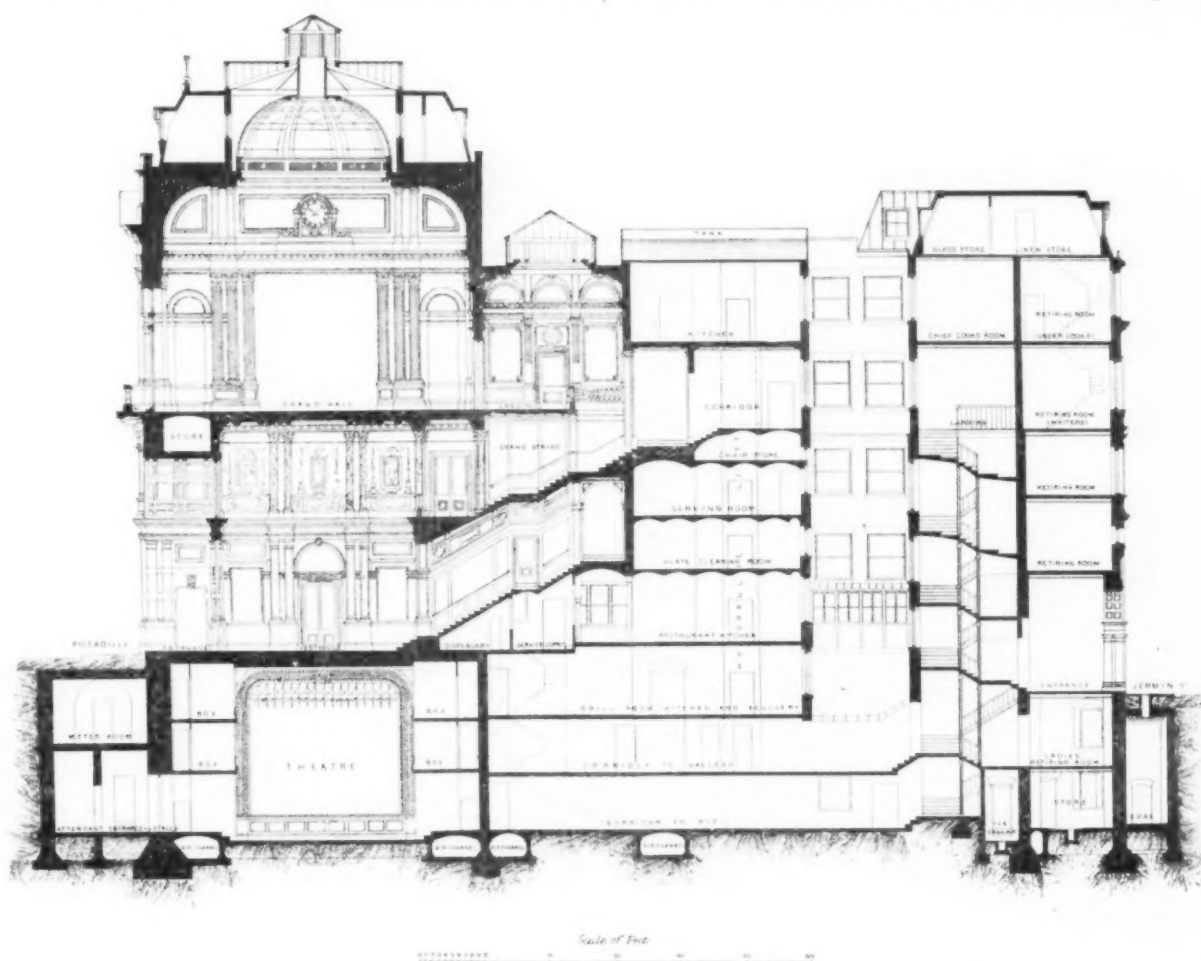
On the right of the vestibule is the restaurant, seventy feet by thirty feet; on the left is the buffet, ninety feet by twenty-five feet, with smoking-rooms beyond.

On the first floor is a dining-room on the west, fifty feet by twenty-five feet, devoted to "diners Parisiens," while there is another room of the same size on the east of the staircase; several other smaller dining-rooms for private parties occupy the remaining space of this level.

The grand dining-hall, eighty feet by fifty feet and thirty-five feet high, is on the second floor, running the whole length of the Piccadilly façade, lighted by a range of windows as well as by a large glazed dome.

The kitchens and serveries [sic] are arranged in a central block of six successive stories, one over the other, corresponding in level with the different rooms, and in communication with one another by means of lifts and staircases. In the basement are the grill-room, kitchens, vegetable kitchen, general scullery, knife, fork and glass rooms, and such-like room pertaining to a restaurant.

Dormitories for the bar-maids and rooms for the managers are



into a rectangular vestibule thirty feet by twenty-five feet, rising through two floors and forming the central means of communication with all the public rooms. The principal staircase, leading to the table d'hôte and dining-rooms on the first floor, is ten feet wide, and is situated immediately opposite the central entrance door.

arranged on two stories round the dome-roof over the grand hall. The entrances to the stores, the grill-room and the pit and gallery of the theatre, as well as to the stage, are all situated in Jermyn Street, a street at the back of the building running parallel with Piccadilly.

Since Mr. Verity read his paper before the Institute, the demands of the business carried on by Messrs. Spiers & Pond compelled them to extend the premises under the advice of this architect. These extensions are shown upon the plans.

It has been explained by Mr. Thomas Verity that the idea of an underground theatre was first suggested to him by the Athénée in Paris, but he has related that, whereas, that was only partly sunk, his building is entirely below the ground, and what is over it we have already seen. It was not, the architect said when describing the building, originally intended as a theatre, but as a concert-room constructed with a square gallery, and it was not until the entire carcass was built that it was determined to convert the room into a theatre.

Mr. Verity had not to comply with the regulations now enforced in London with regard to this kind of building, otherwise he would have been compelled to abandon his project, for the rules made since this building was erected do not allow a theatre under another building, or one sunk below the ground deeper than one story, the floor of the pit not being permitted more than fifteen feet below the pavement-line. However, Mr. Verity relates how the position of his theatre was at the time somewhat severely criticised, and that all kinds of prophecies were made concerning it, some even going so far as to say that the audience would be stifled; but from careful observations of the temperature he assured himself that it compared very favorably with most other theatres. This was, of course, in the days before the introduction of the electric-light, which has since been installed in the Criterion Theatre.

The ventilation of this house was carried out by artificial means, at the time, and indeed one may almost say even at this time, the Criterion was, and is, the only mechanically ventilated theatre in London. The planning of the arrangements for ventilating and warming naturally involved considerable difficulties, owing to the structural conditions. These, however, were overcome by obtaining numerous air-shafts in the necessary positions for carrying away the vitiated air and introducing the fresh air. For the ventilation of the theatre, there was provided a fan four feet six inches in diameter, which draws a supply down a series of air-shafts into a chamber under the floor of the theatre. From this chamber, shafts are carried up the walls to diffuse the air at the different levels around the whole of the auditorium. The incoming air is warmed in winter by hot-water coils, cooled in summer by a water-spray.

The vitiated air is extracted by a central perforation, and is drawn out by an extract-shaft four feet by three feet, running up the entire height of the building, showing how Mr. Verity availed himself of every means possible to make the air in his theatre pure. It is interesting to note that in order to increase the power of this shaft, the waste heat from the restaurant grill-stove, and the products of combustion from the sun-burner are carried up the centre in independent iron pipes. Additional extract-shafts are situated over the stage and over the back of the gallery.

The entrance to the stalls and dress-circle are on the right of the Piccadilly façade, those to the pit and gallery are in Jermyn street. The construction of the theatre is, on the whole, of fireproof materials, the corridors and staircases being entirely fireproof.

The theatre occupies below the ground the entire length of the Piccadilly front, being eighty feet long by fifty feet wide and twenty-seven feet high — quite a small "house." It is divided into pit and stalls on the lowest floor, balcony or dress-circle and boxes on the first tier, and gallery and boxes on the upper tier, and will seat about one thousand persons. There are extra exits into Jermyn Street from stalls, balcony, etc. The stage is twenty-five feet deep, having a proscenium-opening twenty-two feet wide. The dressing-rooms are in a separate block approached from Jermyn Street.

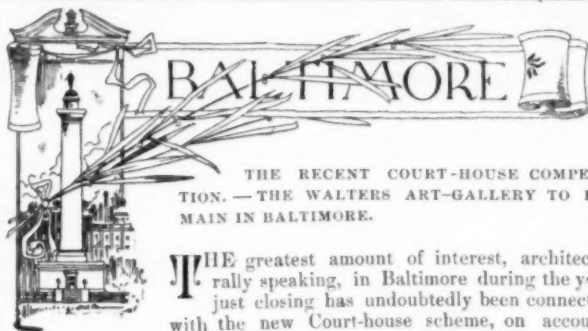
Such is what I have termed London's underground theatre, the notes for the description of which are culled from the architect's own report with the permission of his son. Since the construction of the Criterion, several theatres have been built in London, partly sunk below the surface, that is to say, with the pit underground and the first tier on the pavement-level. The argument used when speaking of the "safety" of these houses is that, should a stampede take place, the people rushing up stairs would be less likely to stumble than those rushing down stairs. This argument can be, and has been, applied to the case of the theatre we now have before us, since to reach the street every one has to go up some steps.

I have omitted to mention the arrangements made for the gas-lighting of the house. All the burners at the back of the circles are let-in to recesses in the walls, and shut-in with glazed doors, and have an extract-flue over them to take off the products of combustion. The sun-burners and stage batten-lights are also ventilated in like manner, an admirable provision worthy of being copied where gas is still used.

ERNEST A. E. WOODROW.

[To be continued.]

DESTRUCTION OF INDIAN HIEROGLYPHICS. — The Wenatchee Indians of Washington are protesting against an act of vandalism and sacrilege committed by the Great Northern Railroad Company. The workmen of the Company lately blasted out some big rocks near the Indian settlements, which were covered with hieroglyphics. The rocks were the sacred record of the Wenatchee tribe, and the inscriptions told of their chiefs and battles, and the whole history of the people. The Indians are naturally intensely indignant, but it is a frequent occurrence for relic-hunters and tourists in the Northwest to rob the graves of Indians of all sorts of articles, and even to disinter and rob bodies of ornaments, and no redress is obtainable. — *Philadelphia Telegraph*.



THE RECENT COURT-HOUSE COMPETITION. — THE WALTERS ART-GALLERY TO REMAIN IN BALTIMORE.

THE greatest amount of interest, architecturally speaking, in Baltimore during the year just closing has undoubtedly been connected with the new Court-house scheme, on account, not only of the cost of the proposed building and the amount of the city's funds involved therein (a matter that often evokes the expression of architectural interest and criticism from sources where enlightenment in art matters is not suspected), but also because of the extent of the building and the conspicuous site, the personal interest that the courts and lawyers naturally felt in what was to be done for their future comfort and convenience, as well as the general public attention drawn to the competition where many local firms were known to be competing with especially-invited outside men and the world at large. The local press kept this interest alive by frequent paragraphs and editorials, till, finally, during the few days intervening between the statement that the actual award had been made to "number fifty-seven" and the announcement that this number was discovered to belong to a local firm, [Messrs. Wyatt & Nolting, of Baltimore,] the interest arose to something like a genuine enthusiasm. The commendable professional feeling and methods which had so far guided the action of the committee were still conspicuous in settling the terms of the agreement between the city and the architects, consistent with a rather conservative feeling in protecting the city's interest, while entering a somewhat new field in contracts, for which Baltimore furnished no precedent directly bearing on the subject, and in which the unusual condition had to be met of providing for the cost of a building for which only a little more than one-half of the required amount had yet been appropriated from the public funds, while it was particularly desirable that the architects should at once enter into an agreement to make working-drawings and specifications for a building whose probable cost would be nearly double the amount already appropriated for the purpose. It, however, proved to be a case easily solved by the clever skill of lawyers, and confidence and amicable feelings on both sides. The public exhibition of the ten premiated designs made it evident that while some of the others possibly showed a somewhat more monumental treatment, in plan at least, than the accepted one, it was with the neglect of conditions specially required by the letter of instructions and further by the sacrifice of important features of practical utility and convenience in the general arrangement.

A rather peculiar incident occurred in connection with the assignment, after the award, of the proper names and addresses to the various designs. These, by instructions, were to be enclosed in blank envelopes accompanying each portfolio. It was noticed that two portfolios among the seventy-nine sent in, had no envelopes or addresses of any kind with them, and had to be laid aside as "unknown." The author of one of these designs had, however, meanwhile discovered his accidental omission, and wrote an anonymous letter to the committee, enclosing a blank envelope containing his address, with some description of his design sufficient to enable them to identify it — all of which was perfectly legitimate and allowable. The other competitor knew nothing of the fact that his envelope had been lost in the transmission, till all the awards had been made and published. This unfortunate happened to be a Baltimore man, and upon his interviewing the committee in the matter, he learned that, owing to some other irregularity, one of the awards to another local man had to be reconsidered, leaving one of the local prizes of \$400 yet unappropriated. Under these peculiar circumstances, Professor Ware kindly consented to have all the local designs submitted to him for further consideration. Unfortunately, however, as compensation for the mishap, the new award did not fall to the anonymous design.

Another fact clearly illustrated by the exhibition was the difficulty evidently experienced by all the competitors — a common stumbling-block in all such designs — of composing a monumental and dignified façade of large extent with any sort of truthful expression of the purpose and interior scheme, where there is necessarily a complicated arrangement of many large and small rooms of widely varying dimensions and heights, and all to be adequately lighted and ventilated. The problem of giving the principal entrances their due expression on the façade, without making them mere features of surface decoration, running over more than one story, and also of treating the vast wall-spaces with simplicity and dignity, without either leaving them barren and crude, or applying architectural ornamentation too rich and elaborate for a building of such character — a great Hall of Justice — was again a difficulty that made itself evident in all the designs, and was not met most happily in those from offices prominent in the country for their successful solving of similar problems.

The world of art was startled a few weeks ago by the news of the

death of William T. Walters, as, because of his habitually quiet and secluded habits of life, the fact of his serious illness had not become very generally known. So few and so isolated in the wide area of America seem the genuine patrons of his character, that in the death of such as he, a sense of shock and loss is felt by all who appreciate the higher aims in American progress in art, and there is a consciousness that the immediate results, from various direct and indirect causes, might be some important changes in the present status of art interests and collections. All that a community owes to one of its great benefactors is always more clearly and sharply brought to view by his unexpected death than at any other time. This is certainly the case to-day in Baltimore in regard to Mr. Walters. All the deserved prestige to the city that the rare collection he has gathered by careful thought, fine taste and large expenditure within the walls of his house, as well as his gifts of the bronze groups in Mt. Vernon Place, and his own strong personality, so well known both at home and abroad, is now appreciated even more thoroughly than ever before. The vital interest to the city was, naturally, the future disposition of that great gallery which for the last twenty years has by its own worth made Baltimore conspicuous in the art world. Because of the admiration and pride the city always felt for this treasure, it might almost be pardoned the fancy that it had, in some way, become inalienably its own, and the sudden reminder that this was not so, and the bare possibility that this gallery might now be scattered or moved bodily elsewhere, brought with it a sense of impending calamity. Respecting, however, the reserve which Mr. Walters always maintained in regard to his affairs, and recognizing the fact that the status of the gallery had always been that of a private collection, very generously opened at fixed times to the public, the expression of opinion was as guarded as good taste and proper feeling in the matter would require.

The sense of relief and gratification, then, was very general when it was known that the terms of the will required that the gallery should be kept intact, and that for this purpose, while it was left to Mr. Walters' two children, either one of them should possess it as an entity by paying to the other one-half its assessed value. The only other disposition of the gallery surmised, was that it might possibly have been left to the Metropolitan Museum of New York, in which Mr. Walters was deeply interested. One cannot but feel that, while this would have been a worthy addition to a great and growing institution, honored in both the giving and the receiving, nevertheless, as unique and beautiful as the Walters gallery is, in the huge city of New York, where wealth rapidly buys up what the world has to sell and continues to add one big thing to another, after a lapse of years this might be only one among others of great gifts to the Metropolitan Museum, largely losing its identity in the mass. Whereas, while it remains in Baltimore—its original home, where it has become so long identified with the city, and dear to the hearts of the people—it gains in importance by its very separation from other collections, and will always have the additional charm that both itself and its founder will be loved and honored by an entire community through coming generations.

THE GIBBON COMMEMORATION.



exhibition is now open in London which has excited no little interest, and has attracted a considerable number of visitors. It consists of a collection of portraits, books, manuscripts and personal relics of Edward Gibbon, the author of the "*Decline and Fall of the Roman Empire*"; the first centenary of whose death is in this manner being commemorated. The idea of the exhibition originated with Mr. Frederic Harrison; by whose influence it was carried out, under the auspices of the Royal Historical Society, a national air being given to it by the trustees of the British Museum kindly housing the collection in the King's Library.

The pictures exhibited include the well-known half-length portrait of Gibbon, by Sir Joshua Reynolds; one or two evident copies of the same; a so-called portrait by Romney, but with no resemblance to him; the portraits of Mrs. Gibbon and Lady Acton, mother and cousin of the historian; besides those of the Earl and Countess of Sheffield, his life-long friends. The face of Gibbon is not pleasing; it is very short, very fat, and with a pronounced double chin; the hair is brushed back from the forehead and tied in a bag-wig. He wears a red coat and lace ruffles to his shirt. Besides the portraits there are several views of the family seat, Buriton Manor and the church there, near which his father was buried; but of greater interest are the water-color sketches of places in Lausanne so intimately connected with the great historian, viz: his house, the pavilion in the garden with Gibbon seated in one corner; and the terrace; places where he lived and worked, now unfortunately merged in the Hôtel Gibbon and its garden: all traces being lost of even the summer-house where he wrote the last lines of his immortal work, feeling as he says in a letter to a friend "as if a load was taken from my heart."

The present proprietor told a recent visitor that he wished there had never been a summer-house, for every one asks where it stood, and "I really don't know." One day, however, two of your fair countrywomen swooped down upon the place, armed with camp stools, being determined to stay there till he told them the exact spot, which

they insisted he must know. So, in despair, the poor man took them to a spot in the grounds and said, "to the best of my belief, the summer-house stood there."

Some silhouettes by Lady Diana Beauclerk and Mrs. Brown are very clever and amusing; they depict Gibbon taking snuff, showing off his clumsy figure to perfection. In a glass case are some fine miniatures; one, a fine example of Bone's work, is set in pearls and forms a locket, having hair at the back; also a medallion bust by Wedgwood, his court sword and buckles, gold watch and snuff-box, and the copper-plate for visiting cards, shorter and broader than the shape in vogue at present; a family Bible, said to have been always at his bed-side, and other personal belongings. Besides these we see packets of old playing-cards, the backs used for various memoranda; e. g., a catalogue of his library and notes-of-hand, such as: "*Bon pour cinq-cent livres à Blondel mon valet de chambre, E. Gibbon, £500, à 1 April, 1789.*"

"*Bon à moi-même pour trois cent soixante livres. E. Gibbon, à 1 Juillet, 1785.*"

From these articles, which in ordinary lives would be passed by, we turn with lively interest to the books, manuscripts and letters to and from some of the literary giants of last century. Here we see Macaulay's copy of the "*Miscellaneous Works*" with his notes on the margin; Gibbon's own copy of the "*Decline and Fall*" with many notes and emendations in his own hand, and the copy given "As memorials of friendship and esteem to Lord Sheffield." A few extracts from the correspondence will be of interest, doubtless:

[Gibbon, to Lord Sheffield on the breaking up of Lord North's Ministry. London, July, 1782.] "Every hour teems with a fresh lye. In short, three months of prosperity has dissolved a phalanx, which has stood ten years' adversity. Next Tuesday, Fox will give his reasons, and possibly be encountered by Pitt, the new Secretary or Chancellor, at three-and-twenty."

[To the same on Sheridan's speech at the impeachment of Warren Hastings.] "which included a compliment much admired by a certain historian of your acquaintance. Sheridan, in the course of his speech, sunk into Burke's arms; but I called this morning and he is perfectly well. A good actor!" — London, 14th of June, 1788.

[From William Robertson, the historian, thanking Gibbon for the gift of second and third volumes of the history.] "I can recollect no historical work from which I ever received so much instruction; and when I consider in what a barren field you had to glean and pick up materials, I am truly astonished at the connected and interesting story you have found." Edinburgh, 12th May, 1781.

[From Adam Smith, to thank him for the last volumes.] "I cannot express to you the pleasure it gives me to find that, by the universal judgment of every man of taste and learning, whom I either know or correspond with, it sets you at the very head of the whole literary tribe at present existing in Europe." 10th Dec., 1788.

[Gibbon to Lady Sheffield.] "Should you be very much surprised to hear of my being married? Amazing as it may seem, I do assure you that the event is less improbable than it would have appeared to myself twelve months ago. Not that I am in love with any particular person—I have discovered about half a dozen *wives* who would please me in different ways by various merits. Could I find all these qualities united in a single person, I should dare to make my addresses, and should deserve to be refused." Lausanne, October, 1784.

The holograph will is with these papers, and, like all his writings, is clear and delicate. It commences thus: "It is superfluous to request that all my funeral expenses be discharged without delay." . . . "I give to M. William de Séver, of Lausanne (whom I wish to style by the endearing name of Son), certain legacies."

We close this paper with some remarks on the manuscripts, decidedly the chief feature of the exhibition. Gibbon left six sets of papers styled "My Own Life," dealing with it at different times. In one on his life at Oxford, he says that he arrived there "with a stock of erudition that would have puzzled a doctor, and a degree of ignorance of which a schoolboy would have been ashamed," where he found the fellows of his College "immersed in port wine and Tory politics." The portion of his journal describing his visit to Italy, where he says "I lived with the dead," concludes with a famous passage "It was at Rome, on the 15th October, 1764, as I sat amidst the ruins of the capitol, that the idea of writing the decline and fall of the city first started to my mind; the whole college of cardinals were as nothing to me."

Gibbon bequeathed all his papers and much personal property to Lord Sheffield, whom he appointed his executor. In 1796, Lord Sheffield published a volume containing much correspondence and unpublished papers entitled "*Miscellaneous Works*," and in 1814 a new and greatly-enlarged edition; but at his own death he prohibited, by a clause in his will, the publication of any further papers. In his speech at a meeting in connection with the centenary, Sir Grant Duff, P. R. H. S., in the chair, Mr. Frederic Harrison drew special attention to "the extraordinary manner in which the '*Mémoires*' are pieced together so as to form a *pot-pourri*," concocted with the greatest freedom; "not many paragraphs occur in which some phrase is not deleted or varied." Probably this was done to shield his memory from the charge of unorthodoxy or anything detrimental, as the following incidents will show:

Gibbon was sent as a youth to Lausanne to the care of Pavillard, a Calvinistic minister, in order, as his father wrote, that his tutor might now "confirm him once and for all, in Protestant principles."

This was the result of an impulsive union with the Church of Rome made by Gibbon.

In February, 1755, he wrote to his aunt, Miss Porten, telling her of the success of his father's experiment; and of his experience of "a joy extremely pure, and the more so as I know it to be not only innocent, but laudable." Lord Sheffield stops here and gives no hint that more followed. The complete letter is now given to the world by the British Museum, to whom it belongs; and the continuation puts a very different complexion on Gibbon's temper and mode of life at that date: "Could I leave off here" after speaking of the satisfactory change in his religious opinions, "I should be very glad; but I have another piece of news to acquaint you with." He tells his aunt in detail, that he had been playing at faro, and had lost heavily. He has no money, his creditors are pressing for payment, and the thought of the anger of his father, who waits for proofs of his religious conversion, terrifies him. His feelings come to a point in the postscript: "I shall make no use of any other prayers than this plain recite [*sic*] of my situation. If it produces no effect on you, nothing else would. Remember only that my term [allowed by his creditors] finishes March 15th. I tremble for your answer, but beg it may be speedy. I am too much agitated to go on.

"I am, dear Kitty, your unfortunate nephew, E. GIBBON."

His aunt, apparently, did not come to his assistance; for his step-mother has scribbled across the top of his first page: "Pray remember this letter was not addressed to his mother-in-law [herself] but to his aunt, and an old cat as she was to refuse his request." Gibbon was only eighteen at this time, and it shows that he was not the precociously staid youth that his admirers have hitherto believed him to be; when we read a confession from his own pen, of a boyish escapade with the usual accompaniment of great remorse. This result of Lord Sheffield's manipulation of the papers, seen in the light of the holograph journal, is so startling that a hope was expressed at the meeting alluded to, that the present earl would issue a new volume of the letters and papers of the illustrious historian, confided to his ancestor. We should mention that the various objects in the interesting collection were lent by Lord Sheffield, M. de Charrière de Sévery, and the Museum of Fine Arts, Lausanne, and have been very well arranged; full descriptive labels being appended to each.

THE HORSES OF APOLLO.



Fountain in the Bassin d'Apollon, Versailles, France.

WE believe, though not quite sure on the point, that amongst the architectural casts which the French Government sent to the World's Fair and subsequently presented to the City of Chicago or the Columbian [Marshall Field] Museum was one which presents one of the most graceful triumphs of the French Renaissance in the field of sculpture. If a cast of Robert Le Lorrain's beautiful bas-relief is not to be seen at Chicago, it can be seen by any visitor to the Palais du Trocadéro, at Paris, who, if not content with the copy, can travel to the other end of the city and inspect the original sculpture on the wall of the Imprimerie Nationale, where a wise and discriminating artistic sense has preserved it in the place it originally held, over the entrance to the stable of the Hôtel de Rohan as the building was once known. The merit of the work is such that it is instantly perceived: never have we known Lorrain's horses of Apollo at the drinking-fountain to be thrown on the screen without meeting more instant and prolonged applause than any other subject of similar nature. Other subjects may be as animated or as skilfully handled as sculpture, but it is difficult to find one where grace of conception and poetry of motion is so married to skill of manipulation.

This building in the Rue Vieille du Temple, occupied as the Government printing-office since 1808, was once known as the Hôtel de Strasbourg, but better known as the Palais Cardinal, because of its occupancy by that Cardinal de Rohan who played so important a part in the world-famous scandal of the "queen's necklace." How isolated, how relatively known or unknown this bas-relief originally was we do not know, but the fact that it is nearly nine feet high and fifteen feet wide is testimony to its importance, and leads one to wonder that it has escaped the wrath of the *canaille* who, in the many uprisings since its creation, have wreaked such wanton vengeance on the unoffending offspring of art.

This escape, which was probably due to the position of the bas-relief on the interior wall of a court-yard, was shared in large measure by the sculptures that adorn the famous stables at Chantilly, which were probably saved from sharing the destruction which the



Bas-relief by W. Theed on the Queen's Mews, Buckingham Palace, London.

mob visited on the equestrian statue of Anne de Montmorency only because it was in a hurry to get back again to Paris, while to reach the sculptures that decorate the cornice and pediments of this building would have taken too much of the time that the vagabonds found so valuable, now that they had the chance to use it in violence and mischief, the love of which was theirs by right of inheritance. Who the sculptors were, who executed the work at Chantilly, presumably under the direction of the architect Jean Aubert, is not known, and to tell the truth, it is hard to determine the real artistic worth of much of the work as the figures are placed so high above the ground; but they do wonderfully good service in aiding the general richness of effect. The chief feature, however, the bas-relief in the semicircular tympanum over the great door, shows a group of uncaparisoned horses which is very effective, and has something of the artistic quality of the bas-relief at the Imprimerie Nationale. This bas-relief is so noticeable and so easily within reach of those bent on mischief, that the suggestion may be hazarded that its escape may have been due to the fact that, by the time the mob had accomplished its main object, night had fallen, and they really were ignorant that an attack on the stable would give them the same sort of pleasure they had already enjoyed. Whether this group of horses at Chantilly was a portrait group or not, there is no means of knowing, but we may as well fancy that, just as the bas-relief on the former Hôtel de Rohan represents the watering of the horses of Apollo, this one at Chantilly shows the same steeds after they have drunk their fill and been turned out to pasture.

For some reason or another, sculptors have preferred to associate Apollo rather than Neptune with horses, even in cases where the presence of water and the actual position of the group would seem to require the presence of the marine deity, rather than that of his heaven-climbing nephew. Although, to be sure, there is the group of Neptune and his car in the famous fountains at Schonbrunn and Potsdam. But on the other hand, there is the group equally famous, even if it is only of lead, of Apollo and his car in the Bassin d'Apollon at Versailles, the work of the sculptor Jean Baptiste Tuby.

In the park at Versailles there is also another very curious group, or series of groups, in which the association between Apollo and the horse is made evident. One of the cleverest and most successful feats ever effected by a landscape architect is the semi-secluded and altogether bewitching Bosquet d'Apollon, where in the middle of what appears to be a copse of wild-growing trees, is to be found a small and placid pool from whose clear surface the visitor whom chance causes to enter the grove sees reflected the gloomy image of a large cave that overhangs one bank. On looking from the reflection to the original there is seen beneath the arched opening a marble group, more than life size, which represents Apollo receiving the flattering attentions of his nine attendant muses, while in shallower recesses upon either side are a pair of horses in their turn receiving at the hands of mermaid and triton! that attention that their long diurnal course has earned for them. These three groups, the large middle group by the sculptors Girardon and Regnaudin, and the other two the work of Gilles Guerin and the brothers Gaspard and Balthazar Marsy, seem here to have at length found their natural and intended position after an extended series of trials in other places. In the seventeenth century they formed the central features of an ambitious grotto in *rocaille* work somewhere in the interior of the palace, where they were about as much out of harmony with their surroundings as one could well imagine. We fancy that the majority of visitors never guess that this grotto is not a natural one, or, at least, one hewn out of the living rock; but in reality it is a cunning piece of construction which does honor to the artist and landscape gardener Hubert Robert, and a moment's close observation will reveal the joints of the

huge voussoirs and those between the drums of the great pillars in the background.

These two cases are not the only ones at Versailles where Apollo is inseparable from the steeds which brought Phaethon to grief. As one leaves the *cour d'honneur*, he sees in front of him across the wide roadway two large groups of low buildings, now occupied as the School of Artillery and the School of Engineering, which were, at the time they were originally built by Mansart, known as the Grandes and Petites Ecuries. In the semicircular tympanum above the central door of each building is a very animated and seemingly excellent piece of sculpture in high relief, one of which, at least, appears so far as can be determined from a distance — since the sentries allow no one to enter the enclosure — to represent Apollo in his chariot.

Doubtless, there are many other instances where sculpture of this special kind and representing this particular subject is to be found decorating stable buildings, but they are not by any means as common as one would expect. A very notable instance of this kind of adornment, though the Classical incident selected by the sculptor is a very different one, is to be found in the pediment of the Queen's Mews at the side of Buckingham Palace, London. In this case, the sculptor, William Theed, chose as his subject Hercules destroying the mares of Diomedes. The reason why this particular subject appears in a sculpture upon a London building may lie in the fact that the British Museum is situated in the same metropolis, and that a fairly noticeable circumstance is that amongst the large collection of works of Etruscan art stored in this building are many small bronzes, some of excellent character, and some painted pottery which represent over and over again in ever varied form this fable of Hercules and the canabalistic mares of Diomedes.

CONSTRUCTION.¹ — XXVIII.

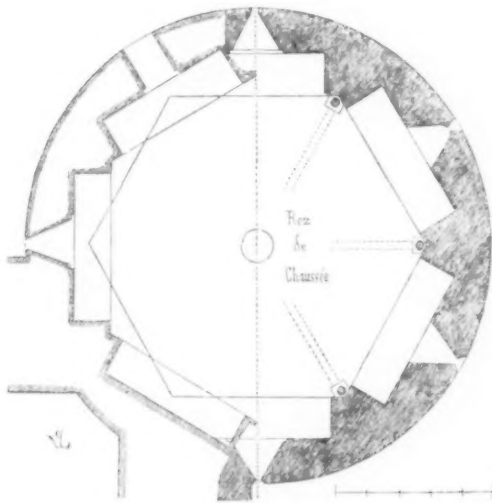


Fig. 143. Angle Tower of the Chateau de Coucy.

BUT when a powerful seigneur wished to build a fortress he was not reduced to solicit gifts from his vassals, to kindle the zeal of the lukewarm and to rely on time and his successors to complete that which he begins. He wished his chateau in his lifetime; his need was pressing, immediate. Richard Coeur-de-Lion stopped for nothing when he wished to build the fortress of Andeli, the Chateau Gaillard — neither usurpations nor sacrifices, nor coercion, nor money; he proceeded to build the stronghold in spite of the Archbishop of Rouen, although the City of Andeli belonged to him. Normandy is put under the ban at the instigation of the King of France. The affair is carried up to the Pope who decrees a fine in favor of the prelate and raises the ban. But during these protestations, these menaces, these discussions, Richard does not lose a day; he is on the spot overseeing and spurring on the workmen; his fortress rises, and in a year it is done and well done — the scarp and the moats finished, the place in a complete state of defense and one of the strongest in the North of France. When Enguerrand III built the Chateau de Coucy, it was in preparation for an approaching and terrible struggle with his suzerain. A month of delay might frustrate his ambitious projects — hence even to-day it is evident that the enormous works carried out by his orders were prosecuted with a surprising rapidity — a rapidity that brooks no negligence. From base to summit the same materials, the same mortar, even more, the same workmen's marks were there; we have counted more than a hundred of them on the faces which are still visible. Now each workman's mark belongs to one particular stone-cutter, as is the case to-day in Burgundy, in Auvergne, in the department of Lyons.²

¹ From the "Dictionnaire raisonné de l'Architecture Française," by M. Viollet-le-Duc, Government Architect, Inspector-General of Diocesan Edifices, translated by George Martin Hussey, Architect. Continued from No. 990, page 118.

² The marks cut on the exposed faces by the stone-cutters were made to allow the foreman to keep track of each one's work; these marks prove that the work was paid for by the piece, by the job and not by the day; still further they indicate the number of workmen employed, for each had his own.

A hundred stone-cutters to-day give the following proportions of the other trades, on the bases of a construction like that of Enguerrand III:

Stonecutters.....	100
Draughtsmen,	
Fitters,	20
Blacksmiths,	
Mason's laborers,	100
Derrickmen,	
Setters,	
Graders,	
Laborers,	200
Mortar mixers,	
Masons and helpers.....	200

To supply the work-yards:

Quarrymen and lime burners....	100
Sand-diggers.....	25
Teamsters and helpers.....	50
	795

say in round numbers eight hundred (800).

Eight hundred workmen occupied entirely with masonry, presuppose an almost equal number of carpenters, iron-workers, plumbers, tile-layers, paviors, cabinet-makers and painters (for all the inside work of the Chateau of Coucy was painted on fresh plaster). We must then admit that there were at least sixteen hundred workmen busied in the construction of this fortress. If we examine the edifice, the uniform way in which the work is gotten out and set, the perfect unity of the conception in *ensemble* and details, the uniformity of profiles, show a promptness of execution which rivals that which we see to-day. Such activity resulting in so perfect a structure is found only by exception in religious constructions, as, for instance, the façade of Notre-Dame at Paris, in the substructure of the Cathedral at Rheims, in the nave of the Cathedral of Amiens. But these are only special cases, while in the fortresses of the Middle Ages, from the twelfth to the fifteenth centuries, the traces of this haste may always be found at the same time with an excellent execution, well-conceived plans, studied details — no hesitation, no experiments.

Let us take, for example, one of the corner towers of the Chateau de Coucy, each of which is fifteen metres in diameter over all, not

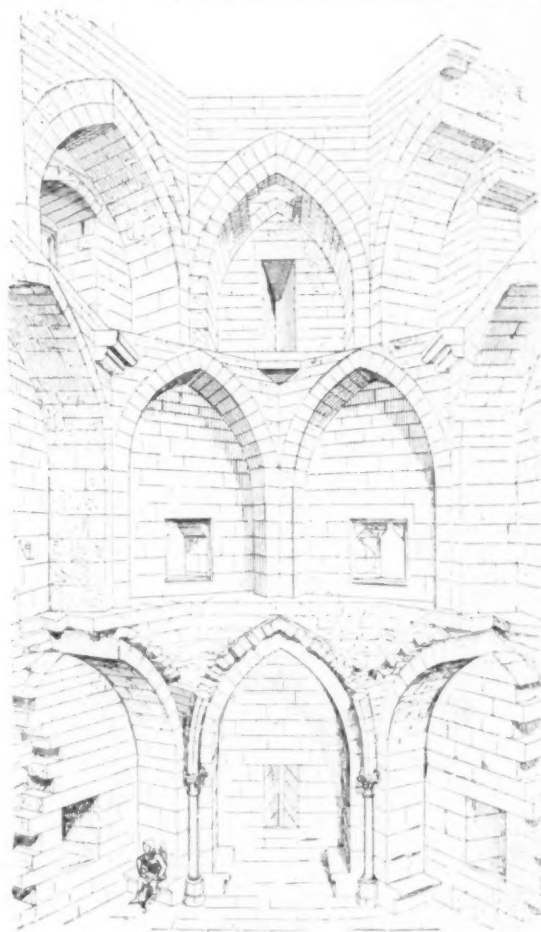


Fig. 144. Angle Tower of the Chateau de Coucy.

including the lower weatherings. Each of these towers has five stories in addition to the roof. The lower story, whose floor is a little above the exterior grade, is vaulted in cupola form between walls whose thickness is about 3.50 metres beside the weathering.

Above this story, which is nothing but a cellar intended for provisions, rises a story hexagonal within and vaulted with transverse arches.

The other stories are floored over. Figure 143 shows the superposed plans of the stories above the cellar. The piers of the hexagon are alternately placed, solids over voids, so that in perspective section we see that the abutments are built over the keys of the arches in tierce-point, forming niches between the piers as shown in Figure 144. This construction avoids the weakening which ordinarily occurs in a cylinder enclosing niches placed one above another; it also admits piercing loop-holes over-lapping one another and commanding all points of the horizon. We assume the vaulting of the lower story above the cellar to be suppressed, in order to show the general effect of the construction. Access to this cellar was had only by the circular opening pierced at the summit of the vault. It is easily seen that such a construction, resting upon a solid foundation and a lower story with very thick cylindrical walls and reinforced by an exterior talus, buttressed at each story by over-lapping piers, ought to bid defiance to all the efforts of the sapper; for, in order to overthrow a tower thus built, it would have been necessary to undermine half of its diameter, not an easy task at the top of an

escarpment and in the face of a garrison commanding subterranean issues to the outworks.

Let us now examine the construction of the Keep of Coucy, built by Enguerrand III, about 1225. It is a cylinder of more than thirty metres over all with a height of sixty metres. It comprises three vaulted stories, each thirteen metres in height and a crenellated terrace. The ground-floor line is five metres higher than the bottom of the ditch, and from this interior floor-line level as far as the pavement of the ditch, the cylinder splays out conically.

The masonry forming a solid cylinder for the height of the two lower stories is five and a half metres thick above, and is further consolidated by interior piers forming twelve counterforts carrying the spandrels of the vaults.

Figure 145 gives in perspective a section of this enormous tower. The lower niches are cut through half-way of their height by the arches *A*, making out-of-the-way places for storing arms and tools. In the second story, the niches between the counterforts rise as high as the vaulting and form wall-arches for it. In the third story the construction might be made lighter; therefore the cylinder is set back on the interior so as to form a raised gallery *B* enabling a larger number of people to assemble in the upper hall. But it is essential to explain the remarkable construction of this gallery. In plan a quarter of this story of the Keep gives Figure 146. On the twelve piers *AB* are carried the transverse overhead arches *C*, acting as wall-arches for the large central vault *D*. These piers *AB* have their two lateral faces parallel. From the points *b* spring other transverse arches *G* parallel to the arches *C*, but wider, and intersecting at their spring the skewed surfaces of the piers. On the transverse arches *C* and *G* are sprung the pointed cradle-vaults *EF*. Other cradle-vaults *IK*, parallel to the sides *L* of the twenty-four-sided polygon, rest upon the jambs *e*, on the faces *M* and on the corbelled supports *O*. The perspective section looking from the point *P* gives Figure 146a which explains the penetrations of the arches and vaults into the skewed vertical surfaces. The plan 146 and the perspective section 146a show clearly that the architects of the early

part of the thirteenth century had familiarized themselves with the most complicated combinations of vaults and that they knew perfectly well how to vary the disposition of them according to the necessities of the case. We are no longer dealing with constructions.

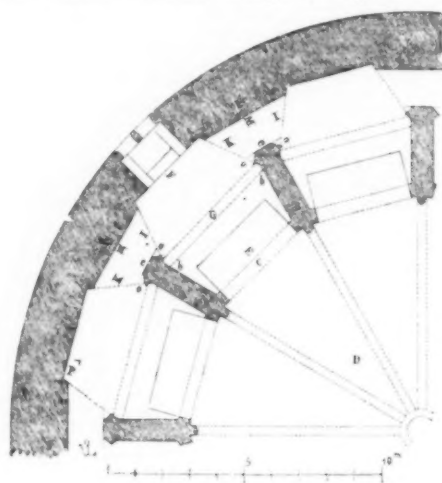


Fig. 146.

These piers which broaden out so as to bind themselves more strongly to the outer cylinder and buttress it by means of the vaults *IK* of plan 146, show very intelligent observation of the effects which can be produced in such enormous structures; and, as a matter of fact, although the engineer Metzeau exploded a small mine in the centre of the stronghold in order to blow it up, he succeeded only in shooting the vaults up into the air and in cracking the tower in three different points without overthrowing it. The enormous cylinder acted like a tube charged with powder, throwing out the vaults as if they were grape-shot. This upper gallery carries a large open *chemin de ronde* *D* (see Fig. 145) and the central vault was roofed with lead.

At *E* (same figure) are wooden tie-beams 0.30 centimetres square forming a double dodecagon at each story and joined to radiating ties *K*, also of wood, which meet at the centre of the vault. The three central vaults are each composed of twelve semicircular groins with wall-arches whose keys are placed upon the level of the central key; the triangles between the twelve groins are constructed in

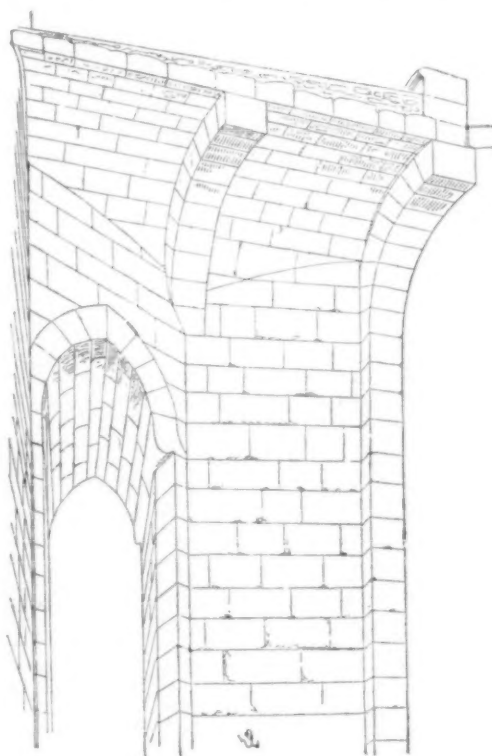


Fig. 146a.

accordance with the ordinary method. Thus each one of the twelve bays being very narrow relatively to the diameter of the vault, it results from this that the groins only carry the radiating walls up to about two-thirds of the vault and that this central construction being

very light has, nevertheless, a powerful bracing action to the centre of the cylinder. There is no other system of vaulting outside of the Gothic system which admits such favorable treatment and this should be distinctly recognized. The whole structure from top to bottom is made of dimension stone, 40 to 45 centimetres height of beds, with squared faces, roughly, but accurately dressed. In proportion as the art of besieging places becomes more methodical, military constructions improve in character, the materials employed are larger and better selected, the walls thicker and better laid, the backing filled in with more care and the mortar better mixed and stronger. During the thirteenth century the military constructions were made with the greatest care, the means of resistance offered to attacks singularly ample. The walls of small ashlar or rubble used during the eleventh and twelfth centuries are given up as a general thing; instead, they are made of hard dressed stone, having sufficient bearing into the wall so as not to be easily torn out by the crow-bars or pickaxes of the pioneers. In the backing

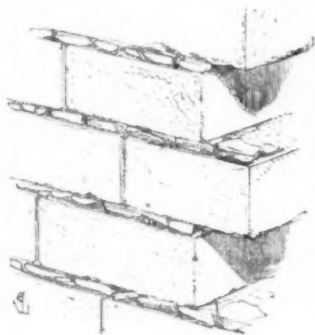


Fig. 147.

are frequently found bonding courses of stones and relieving arches buried in solid masonry. The parapets are composed of through stones, the exterior surfaces admirably fashioned. As late as about 1240, it frequently happens that the courses are laid on very thick beds of mortar (0.04 to 0.05 centimetres) mixed with spawls of hard stone (Fig. 147); but this proceeding which gave to the beds of the courses great adhesion on account of the quantity of mortar used,¹ had the inconvenience of facilitating the introduction of the pioneer's crow-bar between the beds to detach the stones. On the contrary, dating from this epoch the beds of mortar of the courses forming the faces of fortification are thin, about 0.01 centimetres, sometimes less, the edges of the stone are sharp, without spawls and their rough faces frequently form projecting bosses so as to mask the position of the beds and joints (148). It was, in fact, difficult to force the joints of stones thus faced, either by sapping, by battering-rams or any of the engines made to beat down walls.

[To be continued.]



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

ENTRANCE FRONT OF THE *Herald* BUILDING, NEW YORK, N. Y. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Heliochrome issued with the International and Imperial Editions only.]

ACCEPTED DESIGN FOR THE BALTIMORE COUNTY COURT-HOUSE, BALTIMORE, MD. MESSRS. WYATT & NÜLTING, ARCHITECTS, BALTIMORE, MD.

[Issued with the International and Imperial Editions only.]

PREMIATED DESIGN FOR THE BALTIMORE COUNTY COURT-HOUSE, BALTIMORE, MD. MESSRS. J. A. & W. T. WILSON, ARCHITECTS, BALTIMORE, MD.

[Issued with the International and Imperial Editions only.]

COMPETITIVE DESIGN FOR THE BALTIMORE COUNTY COURT-HOUSE, BALTIMORE, MD. MR. G. T. PEARSON, ARCHITECT, PHILADELPHIA, PA.

[Issued with the International and Imperial Editions only.]

COMPETITIVE DESIGN FOR THE BALTIMORE COUNTY COURT-HOUSE, BALTIMORE, MD. MR. ALEXANDER HAY, ARCHITECT, NEW ORLEANS, LA.

[Issued with the International and Imperial Editions only.]

ITALIAN CAPITALS SKETCHED BY MR. J. W. CASE, LATE HOLDER OF THE ROTCH TRAVELLING-SCHOLARSHIP.

[Issued with the International and Imperial Editions only.]

¹It must be remarked here that mortar has greater cohesive force in proportion to the mass employed; a very thin bed of mortar is *burned up* (as the masons say) by the stone, and becomes a powdery layer, chipped up, without adherence, because in placing the stones these rapidly absorb the water contained in the mortar, and this drying too quickly loses its quality.

STAIRCASE TURRET OF THE CHÂTEAU, CHÂTEAUDUN, FRANCE. DRAWN BY MR. W. CAMPBELL.

DETAIL OF THE SAME. DRAWN BY MR. J. C. HALDEN.

THE UPPER TOWN AND THE CHÂTEAU, LOCHES, FRANCE. DRAWN BY MR. D. A. GREGG.

APOLLO AND THE NYMPHS IN THE BOSQUET D'APOLLON, IN THE PARK AT VERSAILLES, FRANCE. DRAWN BY MR. H. B. PENNELL.

SEE article "The Horses of Apollo," elsewhere in this issue.

[Additional Illustrations in the International Edition.]

MAIN STAIRCASE IN THE BUILDING OF THE METROPOLITAN LIFE INSURANCE COMPANY, NO. 1 MADISON AVENUE, NEW YORK, N. Y. MESSRS. N. LE BRUN & SONS, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

In richness of effect, in harmony of coloring, in the choice of material and to a considerable degree in propriety and delicacy of design, the staircase-hall of this building is one of the most notable things that any American architect has accomplished, and is a better achievement than the designing of the exterior, which was published in this journal April 7, 1894, for there much of the detail seems somewhat small in scale for its actual position. Inside, the proportion seems better and though the hall is lofty, the beholder from the gallery can note that the harmonies of scale are well preserved. Although the marbles, alabasters and granite with which the hall is finished were imported, all the workmanship was performed in this country, including the Mosaic-work in the coved ceiling. A notable fact is that the marble work is all solid, not veneered.

THE HORSES OF APOLLO, BAS-RELIEF ON THE FORMER HOTEL DE ROHAN, PARIS, FRANCE. ROBERT LE LORRAIN, SCULPTOR.

[Copper-plate Etching.]

SEE article elsewhere in this issue.

THE SPHINX. DRAWN BY MR. W. W. ROSWORTH.

THE CITY BANK, LUDGATE HILL, LONDON, ENG. MR. T. E. COLLCUTT, ARCHITECT.

THE ALLIANCE ASSURANCE OFFICES, PALL MALL, LONDON, ENG. MR. R. NORMAN SHAW, ARCHITECT.



BOSTON, MASS. — Exhibition of Millet's "Sower" and other Paintings loaned by Quincy A. Shaw, also, Ancient Chinese Buddhist Paintings: at the Museum of Fine Arts.

Loan Collection of Etchings by Whistler: at the St. Botolph Club, December 17 to January 3.

Exhibition of Pictures of New England Life by New England Painters: at Jordan, Marsh & Co.'s, opened November 27.

Dielman's "Marriage of Dr. Le Baron," and Water colors by William Adam: at Williams & Everett's, 190 Boylston St., opened November 26.

Exhibition of Paintings by J. H. Hatfield: at the Boston Art Club, December 10 to 22.

CHICAGO, ILL. — Water-color Exhibition: at F. Keppel & Co.'s, 1 Van Buren Street.

CLEVELAND, O. — Eighteenth Annual Exhibition of the Cleveland Art Club: December 17 to 22.

NEW YORK, N. Y. — Thirteenth Annual Autumn Exhibition of the National Academy of Design: opens December 10, closes January 5.

Loan Exhibition: at the Metropolitan Museum of Art, New North Wing opened November 5.

Fifth Annual Exhibition of the New York Water-color Club: at the Galleries of the American Fine Arts Society, 215 West 57th Street, December 1 to 22.

Zschille Collection of Arms and Armor: at Tiffany & Co.'s, Union Square.

Exhibition of Historical Book-bindings: at the Grolier Club, December 6 to 27, also, Etchings and Drawings by Whistler, until December 22.

Pastels after Celebrated Originals in European Galleries, by J. Wells Champney: at Knoedler's, 170 Fifth Ave., closes December 23.

Pictures by Adolph Artz: at William Macbeth's, 237 Fifth Ave., December 1 to 22.

Loan Exhibition of Works by Pucis de Chavannes: at the Durand-Ruel Galleries, 339 Fifth Ave., December 15 to 31.

Pictures by Elihu Vedder and Water-colors by Herbert A. Oliver: at the American Art Association Galleries, Broadway and East 23d St.

"Little Girl Pictures" by Miss Maria Brooks and Water-colors by Dutch Artists: at H. Wunderlich & Co.'s, 868 Broadway, opened November 24.

Paintings by A. C. Howland: at the Avery Galleries, 308 Fifth Ave., December 4 to 22.

PHILADELPHIA, Pa. — Sixty-fourth Annual Exhibition of the Pennsylvania Academy of Fine Arts: opens December 17, closes February 23. The special exhibition of Architectural Drawings closes February 5.

NOTES AND CLIPPINGS

THE SUTRO BATHS.—The Sutro baths exceed the famous Roman baths of antiquity, in size as well as equipment. The largest of the Roman baths had about two hundred feet of frontage, to use the modern commercial terms of designation. Two of these great bathing-places might be dropped within the Sutro baths and still leave room enough for men to walk and women to flirt. Adolph Sutro is a skilful engineer, and he enjoys solving problems in construction or breaking through difficulties in mechanics as he enjoys invigorating exercise. He designed the building over the bath, devised the plan for water-supply, invented and patented the apparatus for heating the water. The Sutro tunnels, second series, are part of his scheme of construction. With the ocean at his feet, the breakers dashing against the rocks, Mr. Sutro deemed that nature had so well provided power to send the water to the bathing tanks that artificial means would be unnecessary. Therefore, with much noise and enthusiasm, he blasted out a basin in the solid rock. Over the edge of this basin comes the water of the huge rollers. Instead of riding the crest of the wave, Mr. Sutro traps the crest of the wave and uses it for his own purpose. From the basin the water flows through tunnels and canals, passes gates until it reaches the reservoir, where it is warmed by the Sutro patent process, and then it flows into the great tanks in the huge glass and steel building. On the road to the tanks through the canals and the tunnels the water has to pay toll of sand. Of course, it would not do to have the waves carry their load of sand into the baths, so a settling-place is provided. By automatic arrangement, also the device of Mr. Sutro, the sand is washed back into the ocean, while the water, cleared, goes on its course through the tunnels and canals to the tanks. Sometimes the tide is very low, and sometimes the ocean, even at the cliff, is quiet. There might be times when the water could not dash over the rocky wall into the basin. Artifice is employed to take the place of nature when nature is in a quiet mood. An emergency-pipe pokes its black proboscis under the waves, and a pump can draw through it five thousand gallons a minute whenever the five thousand gallons are wanted in a minute. Having made enough tunnels to admit the water, sandless and tepid, to the tanks, Mr. Sutro had to provide for sending the water to sea again, that the ocean might not be drained. Dropping out the water at the place at which it was taken in would not be satisfactory. Mr. Sutro did not want the baths to be receiving the same water over and over again. That plan would be too easy. In it were no obstacles to overcome. He laid an outlet pipe through tunnels probably several hundred feet long, and through this the water will flow from the tanks and return to the sea several hundred feet from the place whence it was taken. The water that comes in through the tunnels must fill six tanks. The largest of these, the main swimming-tank, is two hundred and seventy-five feet long, and at the place of greatest breadth is one hundred and fifty feet wide. The other tanks are smaller. Some will be used for ladies and children, some for beginners; each one has its particular use. One tank will be filled with cold salt water for swimmers who want a shock. Then there is a little tank filled with fresh water, supplied from the Sutro water-works on the bluff above. — *San Francisco Examiner*.

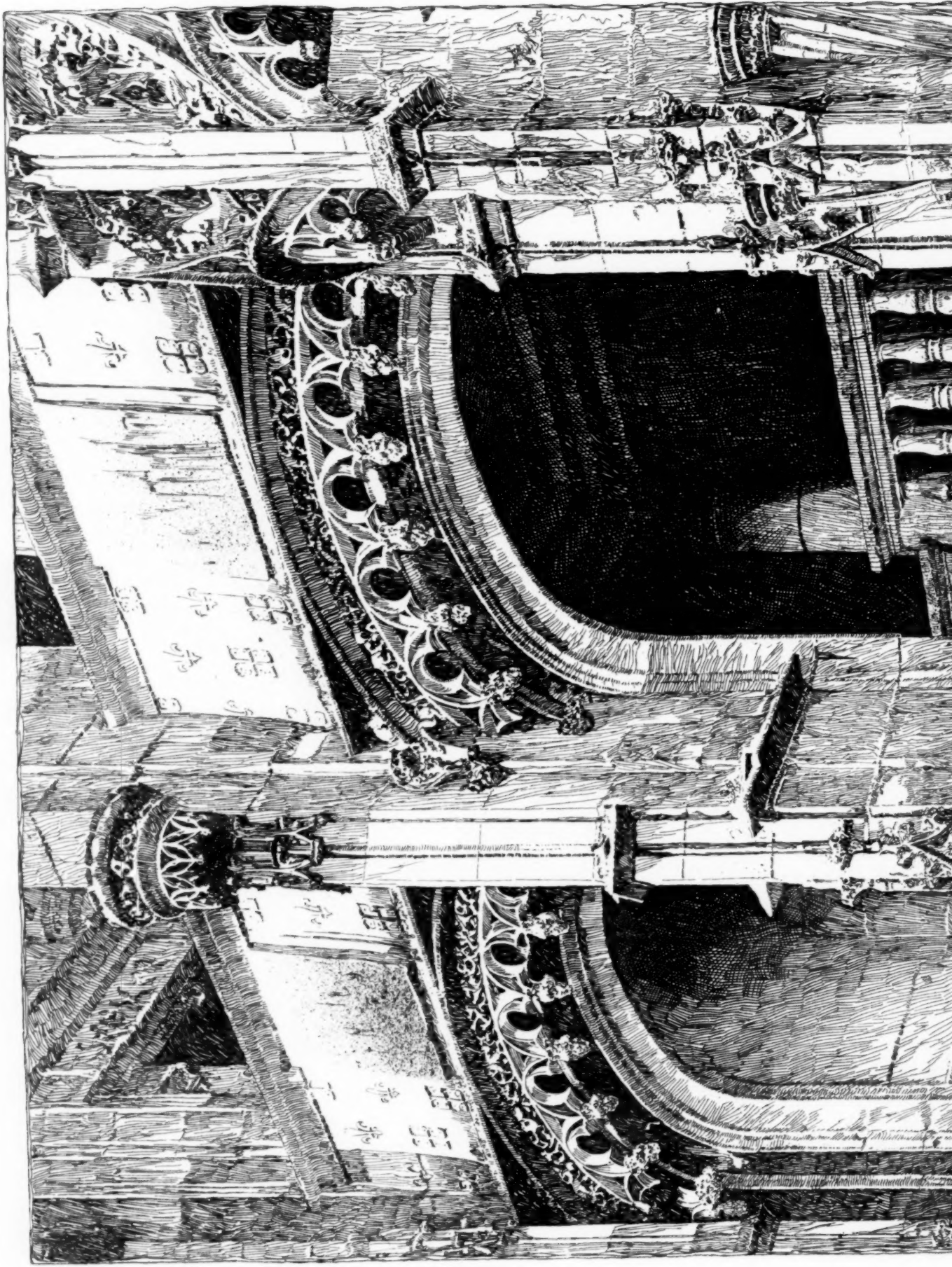
WORDS OF SILVER.—And here is an example of Philadelphia plain talk—not in a speech, but in a newspaper; but it is just as bracing and humbug-destroying in a newspaper as it would be in a speech. How many of us here in Boston, brethren, would dare to talk in this refreshingly-saucy way of a public building which was the joy and pride of many thousands of our misguided fellow-citizens? It is from that solid, untrammelled and clean old newspaper, the *Public Ledger*: "The proposal to spend \$5,000, \$500 or \$5 for a ceremonial unveiling of the Penn statue on the occasion of its elevation to the crown of the tower of the Public Buildings is absurd and preposterous. It would be obviously grotesque to formally unveil a thing which has stood unveiled in a public place for years; it would be ridiculous to celebrate the elevation of this statue—which is probably as inartistic a so-called 'work of art' as there is on the face of the earth—to the top of a tower—the hideous deformity of which alone renders it interesting—of a structure which is not only a monument of the crudest incongruity of architecture, but which is similarly a monument of jobbery and extravagance of such enormous proportions as to have no existing example. Is the proposed celebration intended as an honor to the Building Commission or to William Penn? The former naturally do not want a public ceremony that will again invite public attention to the fact that their work has already cost \$18,000,000, that it has been going on for a quarter of a century in increasing ugliness and extravagance, and that no man can tell when the ugliness and extravagance will have an end. If William Penn could come to life and stand on the top of that hideous mass of stone and iron, and look down upon a public park obliterated, and the two noblest streets of his city ruined by having that architectural monstrosity, called the Public Buildings sprawling over them, he would, after his wise, honest fashion, denounce the thing itself and every one responsible for it, and for shaming his honored name by connecting him in any way with it. The kindest, best thing of all, would be to keep forever veiled, not only the statue, but the tower and the building also." Perhaps it is even better, for the public good, to have newspapers which will tell the truth, like that, than to have good statues and architecture. — *Boston Transcript*.

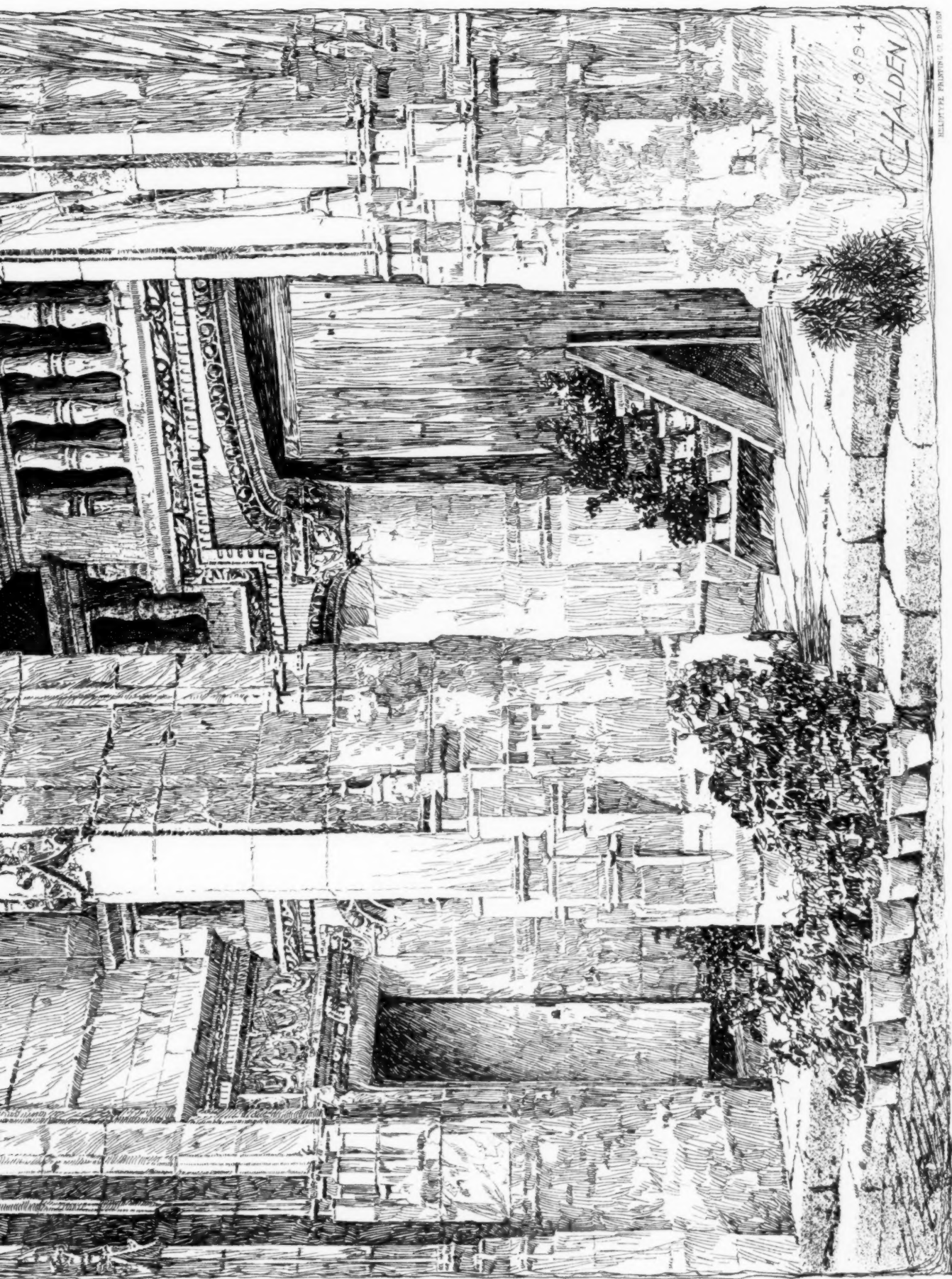
THE PROPOSED STATUE OF BALZAC.—Fate seems to be inimical to the erection of a statue of Balzac, the novelist, in Paris. It will be remembered that when the project was announced there was only a tardy and illiberal response, for the sum received amounted to only 25,000 francs. A further sum of 10,000 francs was promised when the statue was set up. The whole arrangements were entrusted to the Société des Gens de Lettres. They confided the commission, in October, 1888, to M. Chapu, the sculptor, and allowed him 5,000 francs on account. He promised to deliver the work in eighteen months. M. Chapu fell ill, and when he died, in April, 1891, the model could not be utilized. The Société gave another thousand francs to his family as a sort of compensation for withdrawing the commission. M. Rodin was next selected, who received 5,000 francs with the commission and engaged to deliver the statue in eighteen months—that is, on January 6, 1893. Another instalment of 5,000 francs was granted when applied for. M. Rodin in due course submitted a model which was not considered satisfactory. He is a realist, and as Balzac's figure was not of an heroic sort, being rotund and heavy, it would be contrary to the sculptor's principles to represent the novelist as a sort of Apollo. The members of the Société were disappointed. M. Rodin endeavored to alter his model, but as his theory of art was at stake he could not go far. In seeking M. Rodin, it was natural to suppose that what was desired was a portrait of Balzac as he appeared to his contemporaries, and not an attempt to create an ideal. The sculptor was not satisfied with his changes, and in the hope that time might bring a solution, he asked for a postponement until the middle of 1895. The Société acceded, but on condition that M. Rodin return the 10,000 francs. The sculptor had no objection, but some of his friends have persuaded him that the demand was unwarranted, and must not be complied with unless under conditions which will give a litigious character to the transaction. What may happen nobody can foresee. The case almost corresponds with that of the Wellington Memorial. The Société must have known all about M. Rodin's work, and might easily have imagined the kind of figure he would produce. A sculptor of his eminence cannot be expected to adapt his work to suit all tastes, and accordingly it does not seem worthy on the part of a Society of Authors to imitate the conduct of the late Mr. Ayrton, by considering only the financial aspect of the case. — *The Architect*.

A TANK ON A SMOKESTACK.—A novel use of a smokestack has been made at a French industrial establishment. Where an elevated tank was desired for storage of water and to give pressure, the main smokestack of the works was utilized as a pedestal, and the tank was thus elevated seventy-five feet above the ground at a minimum expense. The tank is annular in form, the inner and outer walls being concentric with the chimney and a little distance removed from it. The tank is supported on a stone sill ring built onto a brick corbel on the chimney, and is held by radial angle-iron struts. Ladders pass between the tank and the chimney and down into the tank, which has the customary supply, discharge and overflow pipes. An umbrella-shaped sheet-iron roof covers the tank and probably has orifices to permit a circulation of air in summer and prevent it in winter, as it is stated that the annular air-space prevents any appreciable warming of the water from the hot gases in the chimney, while sufficient heat is received to prevent freezing in winter. The volume of the reservoir is about 3,532 cubic feet, its weight, empty, eleven tons, and one hundred twenty-two tons when full. No statement is made concerning the location of this chimney, but it would appear that where foundations are easy and ample such a utilization of a smokestack for a tank-pedestal might prove convenient and economical if the construction were not too unsightly, and if sufficient stiffness or ample guying against the possible great wind-strains is provided. — *American Engineer and R. R. Journal*.

THE BROTHERS VAN DER DONCK.—From 1850 to 1890 few picture-dealers were better known in both Europe and America than the brothers Francis and John Van der Donck of Brussels and Paris. They formed part of the historical syndicate which bought the famous Millet, and under their paternal care Verboeckhoven, Madou, Clays, Willemis and last, but not least, Alfred and Joseph Stevens achieved fame and fortune. The Van der Doncks exercised a predominant but unobtrusive influence on modern Belgian art, although they were rarely at home to outsiders at either of their places of business, where paintings worth several millions of francs were always to be found. Both brothers were collectors and antiquaries *à la mode*, and they accumulated in the course of a long and successful career an immense quantity of priceless bric-à-brac, with which they adorned their private houses. Apart from pictures, they could rarely be induced to part with any of their treasures. Francis Van der Donck died in 1892, and his brother last year. In consequence of their decease the whole of their private collection comes into the market, and MM. Le Roy of the Place du Musée, Brussels, have prepared a superb illustrated catalogue of the furniture, plate, bronzes and watches. Among the three hundred and fifty lots are some matchless antique watches, and a unique Empire dinner service reputed to be one of the finest known. — *Boston Herald*.

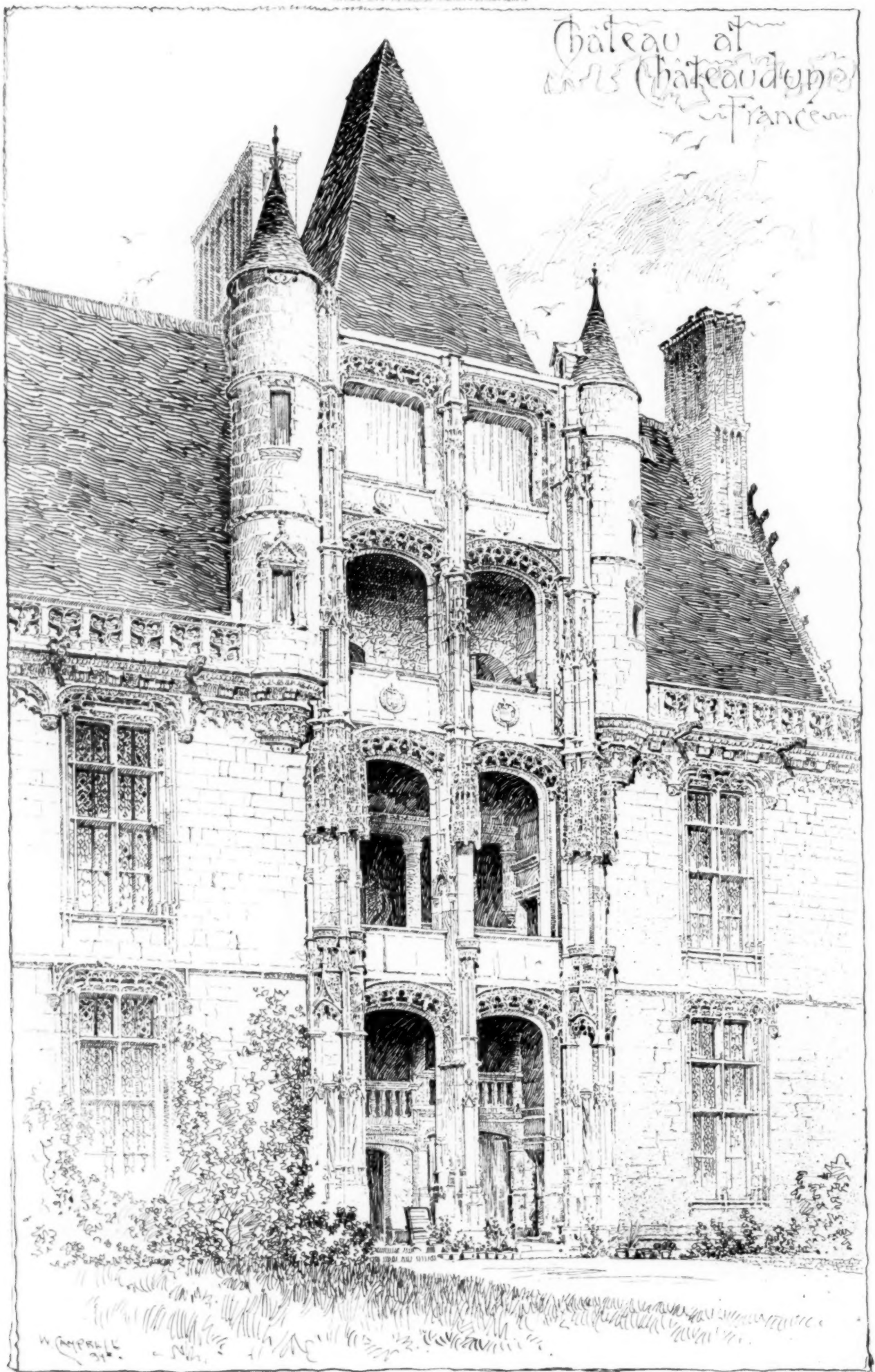
HIGH SMOKESTACKS FOR FACTORIES.—Aside from the fact that tall chimneys are better for the public health, by lifting the deleterious product of combustion far into the upper air, it would seem that technical considerations alone might recommend them. But there has been a fad lately for low chimneys in factories, and Mr. W. B. Le Van expresses the weighty opinion that they are a mistake. As to first cost, there is no saving over a high, well-proportioned chimney, and the entire drift of manufacturing requirements demands the building of high chimneys, so as to enable more fuel to be burned in a given time and space, thus increasing the power and output of the boilers. A rapid draught is equivalent to a large fire-grate area, and has the advantage that the heat is transmitted much more rapidly to the boiler by reason of the higher temperature obtained. Moreover, in many industries, the goods produced are liable to be spoiled by smoke and smut permeating the lower strata of the atmosphere. — *Cincinnati Commercial Gazette*.





DETAIL OF STAIRCASE TOWER CHATEAU CHATEAUDUN FRANCE.

Chateau at
Chateaudun
France





Renell

BOSQUET D'APOLLON, VERSAILLES, FRANCE

BRISTOL PRINTING CO. ENGLAND

L O C H E S F R A N C E

THE UPPER TOWN
AND THE
CHATEAU

