

PRICE 15 CENTS.

9764

DECEMBER 16, 1893.

THE AMERICAN ARCHITECT

AND BUILDING NEWS

VOL. XLII.

* REGULAR EDITION *

NO. 938.

ARCHITECTURE

ENGINEERING

DECORATION

211 TREMONT ST.

CONSTRUCTION

BOSTON MASS.

CONTENTS.

EDITORIAL SUMMARY.
ARCHITECT, OWNER AND BUILDER BEFORE THE LAW.—XXXII.
REGENSBURG.—I.
CARVING IN PARIS.
THE "ARTS AND CRAFTS" EXHIBITION, LONDON.—II.
FRENCH DECORATIVE ART.
THE DISTRIBUTION OF POWER FROM NIAGARA.
BOOKS AND PAPERS.
SOCIETIES.
COMMUNICATIONS.
NOTES AND CLIPPINGS.

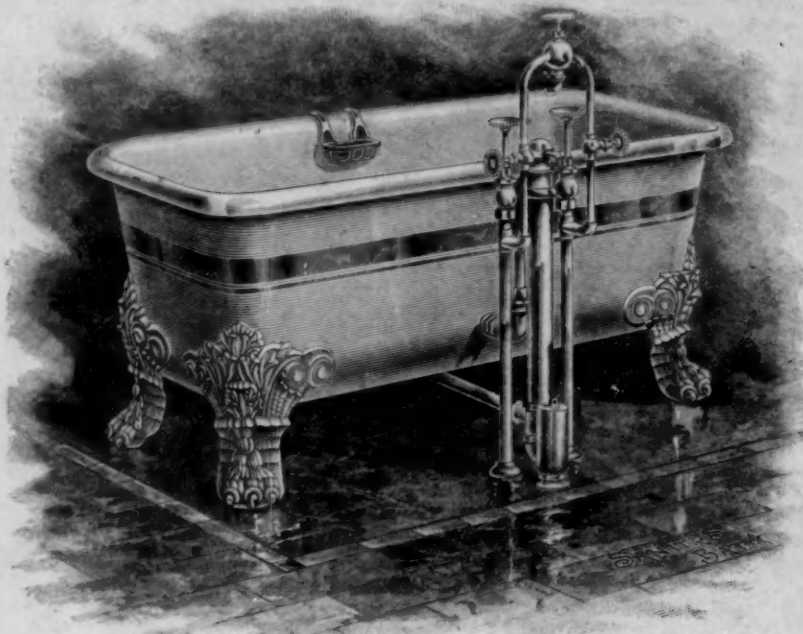
ILLUSTRATIONS.

CONGREGATIONAL CHURCH, PROVIDENCE, R. I.
[Gelatine Print issued with the International and Imperial Editions only.]

COMPETITIVE DESIGN FOR THE RIDGE CLUB, BAY RIDGE, L. I.
STRONG HALL, VASSAR COLLEGE, POUGHKEEPSIE, N. Y.
DETAILS FOR THE CORN EXCHANGE BANK, NEW YORK, N. Y.

Additional Illustrations in the International Edition.

THE JAVANESE THEATRE, WORLD'S COLUMBIAN EXHIBITION,
CHICAGO, ILL.
[Gelatine Print.]
"WORK-HORSE AND LABORER" STATUE ON THE COURT OF
HONOR, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.
[Gelatine Print.]
HALTON, HERTS.—THE RED ROOM,
RESIDENCE AT ERDINGTON, ENG.
DRESDEN.



The.... SANITAS BATHS

with the most improved Sanitary Fixtures.
The illustration shows our new Fixture
with Trap above floor, Bell Supply, Hot
and Cold Mixer, Hand Spray Shampoo
Attachment with Sanitas Lift in combina-
tion with Enamelled Iron Roll-Rim, Roman
Tub, finished in White Enamel and Gold.

The co-operation of architects and owners
solicited in the introduction of these high-
grade specialties.

SMITH & ANTHONY CO.,

48 to 54 Union St., Boston.
56 Beekman St., N.Y. 217 Lake St., Chicago.

THE BEST
is the
CHEAPEST

APOLLO

ROLLED FLAT
COATED SMOOTH
WARRANTED SOFT

GALVANIZED IRON

TRADE MARK
"APOLLO BEST BLOOM"

& ROOFING PLATE

TRADE MARK "APOLLO BEST ROOFING"

ASK YOUR JOBBER FOR THESE BRANDS

Apollo Iron & Steel Company

MANUFACTURERS
OFFICES
VANDERGRIFT
BUILDING,

GEO. G. MURTRY,
President.
W. B. RHODES,
Secretary.
WALLACE P. BACHE,
Treasurer.

PITTSBURGH,
PENNSYLVANIA

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.

METAL SKYLIGHTS

Proof against leaks from weather and condensation.
Sheet metal cornices
and
Building trimmings.

E. VAN NOORDEN & CO.,

383 Harrison Ave., - - BOSTON, Mass.

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 contin-
uous lights are required.
Send for Illustrated Cat-
alogue.

216 N. Calvert St., Baltimore, Md.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLII.

Copyright, 1893, by TICKNOR & COMPANY, Boston, Mass.

No. 938.

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

DECEMBER 16, 1893.



SUMMARY:—

The Extra Edition of World's Fair Illustrations.—The Common Method of Cement-testing.—The Movement to replace the "Peace Monument" at Washington by a Monument to Isabella and Columbus.—Fire Service in Europe and Asia.—Exhibition of Inventions at Copenhagen.—Protest of French Architects against the Invasion of the Esplanade des Invalides, Paris.	129
ARCHITECT, OWNER AND BUILDER BEFORE THE LAW.—XXXII.	131
REGENSBURG.—I.	133
CARVING IN PARIS.	135
THE "ARTS AND CRAFTS" EXHIBITION, LONDON.—II.	135
FRENCH DECORATIVE ART.	137
THE DISTRIBUTION OF POWER FROM NIAGARA.	137
BOOKS AND PAPERS.	138
SOCIETIES.	139

ILLUSTRATIONS:—

Congregational Church, Providence, R. I.—Competitive Design for the Ridge Club, Bay Ridge, L. I.—Strong Hall, Vassar College, Poughkeepsie, N. Y.—Details for the Corn Exchange Bank, New York, N. Y.	
Additional: Fountain and Portion of the German Government Building, World's Columbian Exhibition, Chicago, Ill.—Interior of the Congregational Church, Providence, R. I.—Halton, Herts, Eng.: the Red Room.—Residence at Erdington, Eng.—Dresden.	139
COMMUNICATION:—	
Walls for a Court-House.	139
NOTES AND CLIPPINGS.	140

As a sufficient number of the subscribers to the Regular and Imperial editions have already assented to the proposal made to them regarding an extra issue of illustrations of the World's Fair buildings, to make the scheme practicable, the offered illustrations will accordingly be issued to these special subscribers on December 23. Any persons who have forgotten to notify us of their desire to obtain these illustrations, which are well worth the price, \$3.50, are requested to notify us to that effect without further loss of time.

THE *Engineering Record* has some remarks upon the value of tensile tests of neat cement, which, like all the editorial articles in that excellent journal, are worthy of attentive study, although we do not agree with the conclusions drawn in them. Speaking of the old-fashioned test of steel, where the test was made on a small rod, rolled specially for it, instead of on a piece cut from the ingot itself, it says that "almost precisely the same absurdity is being practised with the utmost assiduity in another field of construction," this field being that of masonry, where, as it says, cement specifications "continually insist upon the most exacting requirements in the testing of neat cement." It thinks, not without reason, that, as neat cement is practically never used in engineering masonry, and as it is notorious that some cements which test well neat do not show the same excellence where the briquettes are made with sand, it would be better to specify that the cement should show a given result with the same sort of sand, in the same proportion, that it is intended to use in the actual work. It says in summing up, "We do not wish to be understood as holding that the information derived from the tests of neat cement is not valuable and useful, for it certainly has some value, and is interesting, but we do insist that the decisive resistance test ought to be made with the mortar, and, further, with mortar made from the actual sand to be used in the work."

SO far as tests intended to guide the architect's or engineer's judgment of the cement are concerned, this view of the matter is unquestionably correct, and, in important work, tests of briquettes made with the sand intended to be used, and several sorts of cement otherwise approved, ought to be made, and probably would be; but it is hard to see how specifications could with advantage propose any given resistance of briquettes so made as the test to which the cement offered by contractors must conform. All cement dealers of any credit know what tensile strains their cements will endure neat, and can provide with certainty a material which will ful-

fil any reasonable demands of this sort, but to undertake to furnish cement which would show a given resistance when mixed with a given proportion of sand of which they know nothing, would be pure guesswork, unless the inconvenient process were gone through of sending samples of the sand to all the cement dealers, for special test. It would, of course, be comparatively easy to require a certain resistance with briquettes of a given proportion of cement and crushed quartz of specified fineness, but here the engineer, to determine whether the contract had been fulfilled, would have to supply himself with crushed quartz for testing, which would be inconvenient, and, after all, he would not know much more than before about the probable behavior of the cement and the actual sand to be used. Although, as the *Engineering Record* says, a cement which gives high results neat may give poor ones with sand, it is generally the case that such cements are badly ground, the coarser particles acting as a strong aggregate in the neat cement, while they count simply as sand where the cement is used for mortar. Obviously, the way to avoid such cements is to specify, not only the neat tensile strength, but the fineness, and this is what is usually done. Although certainty cannot be reached by this method, it has the great advantage that, if the requirements are not unreasonable, several brands can at once be offered by any dealer, any one of which can be supplied by the thousand barrels, if necessary, of a quality known to be uniform, and to fulfil the conditions both as to neat tensile strength and fineness, and the architect or engineer can, if he wishes, ascertain for himself which sort works best with the sand to be used in the work, and, under the present conditions of construction, we do not see how any better general test can be applied. The case is very different from that of steel testing, in that the examination of a three-quarter-inch rod, specially rolled from a given ingot, gives hardly any indication of the probable behavior of, say a huge eye-bar, forged from the same ingot, but, perhaps, differing greatly in texture, or uniformity of structure, from the skilfully prepared test-piece, while the tensile test of a briquette of neat cement, although it may not represent the conditions to which the cement will be subjected in the actual work, at least shows the quality, in this respect, of the whole barrel, or consignment, and the inferences drawn from the briquette test will generally hold good for all the cement of that brand.

THE New York *Times* is making an earnest struggle against the purchase by the Government, and the erection in Washington, of a group of statuary, by Turini, of New York, representing Columbus and Isabella. It seems that, several years ago a bill was passed by the Senate, appropriating seventy-five thousand dollars for the removal of the "Peace Monument," now standing in Pennsylvania Avenue at the foot of Capitol Hill, to some other place, and the substitution for it of a statue of "Columbus." It was then currently reported that Turini, whose title to fame appears to rest upon his rather unsuccessful statue of "Garibaldi," in Washington Square, had already modelled the "Columbus" statue which was to replace the "Peace Monument"; but the Senate bill was referred to the Library Committee of the House, which never returned it. More recently, a second attempt has been made to carry through what seems to have been the original scheme, by the introduction and passage in the House of a bill which does not mention the "Peace Monument," or an appropriation, but permits John Turini, of New York, to show his group of statuary at the Capitol. What would be the result of this exhibition, if the Senate should concur in the permission, it would be, of course, impossible to predict, but the *Times* thinks that some favorable opportunity will be seized to call up the original bill, which has already been passed by the Senate, and hurry it through the House, or in some other way secure the infliction upon the country of another of the second-rate pieces of sculpture which are already too numerous in Washington; and it begs Congressmen to be on the alert "to block any such game."

WHY Congressmen should vote to impose inferior works of art on the first city in the nation, it is impossible to conceive. The idea of their having any selfish interest in the matter is entirely inadmissible, except so far as the members from the district in which the favored artist resides may

have political debts to pay to his friends; and the only explanation seems to be that the other members are too good-natured to object to any suggestions that may be made to them in regard to such unimportant matters. If this is the case, it is certainly desirable that influential journals, like the *Times*, should unite in defence of the public, and it should be remembered that personal influence is very effective at Washington, and it might as well be exercised against, as in favor of, the reckless benevolence that squanders the people's money in encouraging engaging mediocrity. Fortunately, the present Congress, and, we hope, a good many Congresses to come, will think twice before appropriating seventy-five thousand dollars for anything as little needed as a new second-rate statue in Washington, and, by the time that the Treasury is in condition to encourage the fine art again, it is to be hoped that the public taste in regard to them, which is developing with extraordinary rapidity, will have advanced beyond the stage at which it mistakes gravestone images for sculpture.

FIRE AND WATER prints some information about fire-service abroad, which is not only interesting, but valuable to architects. It seems that Fire-Commissioner Murphy, of Massachusetts, was sent to Europe as a delegate to the recent International Convention of Firemen, and made many observations on points relating to his profession, some of which he described recently in an admirable address delivered before the Massachusetts State Firemen's Association. Like every other expert observer, Mr. Murphy ascribes the immunity from destructive fires enjoyed by the great European cities to their solid construction, of incombustible materials, and to the subdivision of the space inclosed in them, which he justly considers the most important point of all. Contrasting London with an American city, he says that, out of the six hundred thousand buildings in London, there is not one constructed of wood, nor could he find one with an undivided floor-area of much over three thousand square feet. Moreover, the London buildings are low, and better protected in detail than ours, the electric wires in them, for example, being insulated and protected with extreme care. Comparing such a town as this with the older portions of New York and Boston, something like half the area of which, according to the insurance maps, is occupied by wooden buildings, while warehouses nine, ten or eleven stories high, with wooden beams and floors, often presenting an undivided floor-area of twenty thousand square feet or more, and crammed to the roof with inflammable goods, occur at frequent intervals all through the most crowded parts of the city, the wonder is not that American cities should suffer so much more from fire than those of Europe, but that the skill of the American firemen should be able to save anything from destruction. As to the effect of a large floor-area in increasing risk from fire, Mr. Murphy says emphatically that no matter how carefully a building may be constructed of iron and masonry, unless the floor-area is limited by numerous fireproof walls, the merchandise contained in the structure will alone make a large fire, and probably cause the building to collapse. This fact has been demonstrated over and over again, not only in Boston and New York, but in Paris, London and Hamburg, where habitual security has led to an undue extension of the floor-limit in warehouses. Not often, therefore, having a destructive fire to deal with, the foreign firemen are far behind ours in quickness of action. Mr. Murphy says that a fire broke out in the royal palace in Rome not long ago. It was four hours before the engines arrived on the scene, and by that time the fire had burned itself out. In Paris, Mr. Murphy found what looked like an attempt to imitate the American system. There are only twelve steam fire-engines in all Paris, but, on going into one of the engine-houses, he discovered harnesses hanging from the ceiling, and the other conveniences for gaining time familiar here. A practice alarm was, however, given for his edification, and, he was somewhat astonished to see the firemen go into the stalls, and lead the horses out, and then lift down the harnesses from their hooks, carry them to the horses and put them on.

WHEN we cross Europe, and come to Asia, we come to a more familiar state of things, at least so far as construction is concerned. In the Japanese cities, as is well known, the walls of the houses are of bamboo, and the interior

partitions of paper. Naturally, fires are frequent, and spread rapidly, but the houses are small and the damage soon repaired. It is related that a few years ago, an American resident, who had observed the operations of the native firemen, and compared them with the process of putting out a fire at home, thought it would be a good speculation to bring over an American hand fire-engine. He imported a small one, and had it taken to the next fire, which it summarily extinguished. Proud of the success of the machine, he proposed to the authorities that they should buy it, but, after some deliberation, his offer was rejected, on the ground, as he was officially informed, that if such machines should be brought into use, the carpenters would be deprived of the employment which they now found in rebuilding the houses destroyed. This novel view of the matter indicates that the rights of labor are well understood in Japan, and we commend the idea to the consideration of our trades-unions. There are possibilities of eloquence in the thought that the enslaved working-men of America are ground down under the iron heel of the insurance companies and concoctors of building-laws, and in the alluring picture of the harvest of jobs which would follow the suppression, by dynamite perhaps, of fire-extinguishing apparatus, which should prove a mine of wealth to the labor orators, whose sources of inspiration have been running rather dry of late. If people should object to being burnt up in their dwellings for the sake of pleasing the Central Labor Unions, as it is conceivable that they might, another blow for the down-trodden might be got in at the expense of the public by a plan which is said to be followed in some Turkish towns. When a fire breaks out, the department immediately rushes to the spot, and there halts, while a colloquy is held with the owner of the premises, to determine how much he will pay for having the fire extinguished, and nothing is done until he comes to terms. It may be imagined that the varying circumstances of the conflagration, such as the approach of the flames to the room where his cash-box is hidden, or the screeching of his wives or children in the burning building, give an opportunity for effective bargaining with the proprietor such as only a walking-delegate could take full advantage of, and the enrolment of firemen among the Knights of Labor might, with judicious management, result in a transfer of cash to the pockets of those who directed their efforts, which would exceed even the profits to be derived from threatening the railroad companies.

THE Industrial Society of Copenhagen will hold in January, 1894, an exhibition of new inventions, including particularly those suitable for use in Denmark, Norway and Sweden. The Copenhagen Patent Office, a private corporation, which devotes itself to the sale of patents or patented articles, will coöperate with the Industrial Society in promoting the success of the exhibition. No charge will be made for space, or for motive power, but exhibitors must pay the expense of freight, packing and fitting-up. Application for space must be made before December 1, to the Industrial Society, Copenhagen.

THE Société Centrale of French architects has interposed in the affairs of the City of Paris, in a way which is, happily, getting to be not uncommon here, but is rare in France. It will be remembered that an underground railway is already in process of construction from the southern part of Paris to the centre, where a terminal station is to be built. The present plan is to set this station in the esplanade of the Invalides, and the Société Centrale has formally and energetically protested against the sacrifice of this "jewel of the national patrimony" to the exigencies of a railroad company. The protest says, with truth, that the open spaces in the central portion of Paris become more necessary as the city increases in extent, and that the esplanade of the Invalides, particularly, in connection with the superb planning of the streets which surround it and the church, form a grandiose composition, admired by the whole world, which should not be intruded upon for a purpose which could just as well be carried out by other means. It will be interesting to learn whether the Government pays any attention to this remonstrance. While the French authorities regard artistic proprieties with far more respect than ours do, they are not very much disposed to take other people's advice in regard to them, and the Société Centrale will be fortunate if it carries its point.

ARCHITECT, OWNER & BUILDER BEFORE THE LAW.¹—XXXII.

HOW CONTRACTS MAY BE MODIFIED.

WHILE a contract, once entered into, will be enforced by the courts, if necessary, with a strictness which sometimes unpleasantly surprises builders of the easy-going sort, there are various ways in which the persons who have made the agreement can, by mutual accord, set it aside, or modify it. In general, the methods by which a contract may be modified, or wholly or partially annulled, may be divided

AGREEMENT OR WAIVER.

into two, agreement, and waiver. By the first method, the change to be made is considered by the parties to the contract, either at the time of making the contract, or subsequently, and provision made for the change by mutual understanding. In very many cases,² the original contract contains provisions for the modifications that are likely to be made, such as additions to, or deductions from, the work to be done, extension of time of completion, and so on; but if it does not contain such

SUPPLEMENTARY AGREEMENTS.

provisions, supplementary agreements may be made, in modification of the original contract, which will have equal force with it, and will be interpreted in connection with it. It is held by most courts that an agreement in modification of a contract may be verbal, and will still be valid, even though the original agreement was in writing, unless the original contract expressly provides that no modification shall be made except in writing; but there are exceptions to this. For example,

CHANGES IN CONTRACTS WITH CORPORATIONS.

the rules applying to the validity of contracts with corporations, which were described in their appropriate chapter, apply equally to any modification of such contracts, and those who are interested in such agreements should see, if any modifications are to be made in them, that the changes are made with the necessary formality, or they may suffer for

CONTRACTS UNDER SEAL.

their carelessness. In the case³ of contracts under seal, also, a special rule is followed by some courts, which say that, "while a simple contract reduced to writing may be varied or changed in any way by a subsequent verbal agreement, it is otherwise as to contracts under seal, which cannot be varied by a mere parol contract, whether in writing or not, since such a contract is inferior to the original." The origin of this distinction is probably to be found in the idea that a sealed document expresses stipulations entered into with such extreme solemnity and care that they should not be allowed to be set aside by the less deeply pondered conclusions of an ordinary agreement; but, as contracts with corporations are almost always under seal, and those with private individuals are very frequently so, the point should be borne in mind. In practice, the distinction appears to be a technical one, but even a technical mistake in the conduct of a lawsuit may cost an honest claimant a large sum. A man once contracted under seal⁴ to build two houses for the defendant, and to have them ready on a certain day, for five hundred pounds. The evidence showed that the parties, by a parol agreement, had extended the time of completion, and the houses were completed within the extended time, though not within the time originally set. The contractor sued for the contract price, alleging fulfilment of his agreement. His counsel was too good a lawyer to claim that the parol agreement could vary the terms of the sealed contract, but he argued that it was such evidence of performance that the defendant was estopped to say that there had not been substantial performance, within the terms of the original agreement. The court, however, held that there was no performance, and that the evidence did not support the declaration. In a somewhat similar case,⁵ which was also decided against the claimant, on technical grounds, Lord Kenyon said that the parol agreement might be sufficient whereon to found an action of assumpsit, but it could not be the foundation of an action on a covenant under seal,

whereby the parties had bound themselves to perform a different contract.

So in this country, where it has been held that "A contract⁶ sealed cannot be rescinded or released by a parol agreement." In Illinois, however, it has been decided that a contract, even under seal, may be changed by a subsequent verbal agreement to pay an additional sum for the same work and materials mentioned in the original, and the written contract⁷ will then remain in force, except as to the price to be paid; and if the work is done under the same, it will be binding.

IMPLIED AGREEMENTS FOR CHANGES.

In cases of the ordinary sort, the question whether there was any actual agreement between the parties to modify the original contract is often an important one. As we have seen, an agreement may be implied, so that a man may be held as strictly to a bargain to which his assent can be inferred only from his acts, as if he had written out its terms and signed them, provided that his acts give unmistakable evidence of his intention, and that the other party has not agreed that no bargain between them shall be valid unless expressed in writing.

Even such an agreement may not wholly exclude the validity of verbal or implied modifications of an existing contract. In a Massachusetts case,⁸ where a written contract for building said that extra work should only be paid for if executed in accordance with a written order, and the builder sued for payment for work done on merely verbal orders, the Supreme Court said that "Attempts of parties to tie up by 'contract their freedom of dealing with each other are futile.'" "The contract is a fact to be taken into account in interpreting the subsequent conduct of the plaintiff and defendant, 'no doubt, but it cannot be assumed, as a matter of law, that 'the contract governed all that was done until it was renounced in so many words, because the parties had a right to 'renounce it in any way, and by any modes of expression 'they saw fit.'" In this case, most of the extra work was done after the completion of the original contract, and, in regard to that which was done before the completion of the main contract, and which consisted in building drains, it was proved that the defendant asked the plaintiff to build the drains, and promised to pay for them; so that the question before the court was not whether the proviso of the original contract, requiring written orders for extra work, should be disregarded, so much as whether the stipulation should be considered as extending over subsequent and independent work, which was not thought of when the original contract was made.

In a Nevada case,⁹ the evident intention of the parties has been permitted to overrule the written agreement on another ground. In a contract between a building-committee and a builder, it was stipulated that changes might be made from the plans, "on request of the building-committee, provided the extra price, or deduction in price, for the same is mutually, or by arbitration, agreed upon before such a change is made." Changes were ordered and made, but the price for them was not agreed upon as the contract required. The evidence showed that the contractors were willing to agree upon a price, and urged the building-committee to fix it, but the committee refused, continuing, however, to order changes. The Court held that this conduct amounted to a waiver of the clause inserted in the contract for the owners' benefit.

The United States Courts¹⁰ hold a similar doctrine. In a suit against the Government, to recover pay for extra work, where the contract provided that no claim should be made for extra work unless first agreed upon in writing, it was held by the Court of Claims that such a clause did not bind the parties, so as to avoid a transaction implying a verbal agreement for extra work, but that it was inserted in Government contracts merely to limit the powers of architects and superintendents. The judge said, "Courts cannot transmute a contract into a 'statute of frauds, nor attach to the agreement of the parties the 'irrevocable mandatory attributes of a statutory provision.'" . . . "A provision in a written contract declaring that no claim for 'extra work shall be made unless it was required and agreed 'upon in writing is merely a condition, which may be waived 'by subsequent oral agreement.'" The Court said further,

¹ Continued from No. 905, page 63.

² *Sherwin vs. Rut. & Bur. R. R.*, 24 Vt. 347. *Porter vs. Stewart*, 2 Aiken, 417. *Little vs. Holland*, 3 T. R. 590. *Phillips vs. Rose*, 8 Johns. 393.

³ *Little vs. Holland*, 3 T. R. 590.

⁴ *Heard vs. Wadham*, 1 East, 619.

⁵ *DeLaeroix vs. Bulkley*, 13 Wend. 71.

⁶ *Cooke vs. Murphy*, 76 Ill. 96.

⁷ *Bartlett vs. Stanchfield*, 148 Mass. 394. See also, *West vs. Platt*, 127 Mass. 367-72; *O'Donnell vs. Clinton*, 145 Mass. 461-3.

⁸ *Truckee Lodge vs. Wood*, 14 Nevada, 293.

⁹ *Ford vs. U. S.*, 17 Ct. Cl. 60. See also, *Rude vs. Mitchell*, 97 Mo. 365.

"Where a public agent requests a departure from an express contract, and the change ordered is of such a nature that he may reasonably suppose that no additional expense will be caused thereby, the contractor is bound to speak, or he will be deemed to have consented to make the substitution at the contract rate. But where the change is of such a nature that it must necessarily involve additional cost, no such notification is necessary, and the contractor will recover reasonable compensation."

It would, however, be dangerous to assume that the ordinary contract clause, declaring that no claims for variations shall be valid unless the work was ordered in writing, or unless the price has been previously agreed upon, can with impunity be disregarded. Scores of cases¹ show that where the two parties have really intended that a formal order shall be given and accepted, in any manner that they choose to specify, for work to be considered as extra, and have expressed their intention in the form of a contract, the courts will give effect to their intention, no matter how anxious one of the parties may be, later, to escape from his agreement; and it is to be remembered that a written stipulation of this sort will be preferred to any verbal understanding or conversation that might modify its effect, and even to another, but less definite clause in the same contract, which would seem to contradict it. As an example of the strictness with which a written stipulation is enforced by courts, in disregard of verbal additions or explanations, a New York case² is instructive. A written contract was made to deliver stone, "to be of the sizes and qualities such as the engineer in charge of the work shall approve." This contract was made with certain stonecutters, and at the time of making the agreement the quarrymen, who were the plaintiffs in the case, showed the defendants a large quantity of stone in the yard, and at the quarry, saying that this stone was a sample of the stone they would supply. The stone actually delivered, however, was inferior in quality to that shown, and cost much more to work, and the stonecutters refused to pay for it, although it was approved by the engineer. The quarrymen sued for the price, and the stonecutters, in their defence, endeavored to show that the stone furnished was not according to sample, and had cost more to work. Three successive courts, including the Court of Appeals, excluded this evidence, and gave judgment for the plaintiffs, the Court of Appeals saying that "The written contract between the parties must be regarded as containing the whole of their agreement upon the subject-matter thereof, and as merging therein all prior and contemporaneous conversations, stipulations and negotiations in relation thereto," and that parol evidence tending to show that the stone was to be like a certain sample, while the written contract said that it was to be such as the engineer approved, must be excluded.

In another case,³ where the written contract said that extra work was not to be paid for unless ordered in writing, and containing another clause, saying that "the engineer may direct alterations in, and additions to, the work," it was held that the latter clause was not to be construed as affecting the validity of the former one; and, where a contract provided that work should only be paid for as extra, if executed in accordance with a written order,⁴ a New York court even refused to admit evidence showing that the work had been done, unless the written order for it was at the same time produced.

EXTRA WORK IN EMERGENCIES.

Even where the contract contains a stipulation that variations or additions shall only be made in accordance with written orders or agreements, it seems to be the case, however, that in cases of emergency the architect or engineer may cause extra work to be done, to the extent necessary for the safety of the building, and that the owner can be required to pay for it. A bridge was once built in Indiana, by written contract,⁵ under the supervision of a superintendent appointed by the County Commissioners. After the signing of the contract, the superintendent required the work to be done in a manner which made necessary more masonry work, and more filling, than was contemplated by the original contract. The Commissioners refused to pay for this additional work, on the ground that it was done voluntarily by the contractor, and that the county

could only be bound by contract made with the Board. The contractor sued, and the case was carried to the Supreme Court. The Court, after examining the statute providing for the erection and repair of bridges, which said that "For the erection of any such bridge, the said Board shall appoint one or more discreet persons as superintendents thereof," and provided further, that such superintendents should receive proposals, and let contracts to the lowest responsible bidders, and require surety for the due performance of the contract, said, "It is thus seen that the superintendent has power to let contracts for the construction of bridges, and to superintend the work. We think that this makes the superintendent the agent of the county for the purpose of the construction of the bridge or bridges, and that he may bind the county by requiring work to be done beyond that contemplated by the contract. Such authority in the superintendent is necessary for the county, in order that the structure may turn out to be substantial and lasting; and it is proper, in order that the contractor employed to perform the extra work may have a remedy therefor. If it should be foreseen by the superintendent, after the letting of the contract, that the work performed or contemplated by it would be insufficient or defective, the county might be greatly the loser if he could not require such additional work as would make it substantial and permanent, and bind the county therefor."

So in New Jersey, where a contract⁶ had been made for building a tunnel, and extra work was found necessary, it was held that the contractor must be allowed payment for it.

Great caution is, however, necessary in any attempt to take advantage of this principle. As we have already seen, the courts hold that an architect has no authority to order changes or additions, unless the contract expressly gives him that authority, and an order given by him, without such authority, for work necessary in emergency to prevent injury to the building, if allowed at all, would probably be so on the ground that an architect is the agent of the owner for seeing that his building is carried out properly, and according to his wishes, and that, in this capacity, he is authorized to take such steps as may be necessary, in emergency, to save his employer from loss, whether the contract expressly gives him such authority or not.

VERBAL ORDERS FOR EXTRAS.

In practice, it very frequently happens that, notwithstanding any stipulation in the contract that orders for variations which either increase or diminish the cost of the work shall be valid only if given in writing, the owner, as his building assumes shape, or his intentions with regard to it undergo change, orders various alterations verbally, without waiting for the more tedious process of writing out the order, or agreeing upon a price for the change, and is honest enough to pay for the work so ordered, without endeavoring to escape liability on the ground that the orders were not given as provided in the contract. Even where no verbal orders have been given, an order may be implied from the conduct of the owner, and orders of this sort are much more likely to be inferred, if he has already waived the contract stipulations in some other way. Such looseness in dealing with a contract is objectionable, as a waiver of the written agreement in one case opens the door for claims on the part of the contractor to be paid for following all sorts of innocent suggestions from the owner; but, if the parties, after abandoning their own agreement, fall into dispute, the courts will deal fairly between them. The principle governing such cases is well stated in a decision⁷ of the United States Circuit Court, which held that "Extra work done on houses built by contract in writing cannot be recovered for, unless there was a separate contract between the parties that such extra work should be done by the builder, and paid for by the owner, or unless the owner, while the houses were building, requested the builder to do the extra work, knowing that it was not comprehended in the written contract, and that the cost of the houses would be thereby increased. The mere circumstance of the owner's knowing that the extra work was doing, and not objecting to it, does not raise a contract on his part to pay for it; but is evidence which may be given to the jury, tending to prove that there was an agreement that the extra work should be paid for by the owner."

It is to be observed, moreover, that where the written contract requires orders in writing for variations, if the owner

¹ Trustees vs. Platt, 5 Bradw. 567. Condon vs. Jersey City, 14 Vr. 452.

² Thomas vs. Hunt, N. Y. App. Sept., 1867.

³ White vs. S. R. R., 50 Cal. 417. Trustees vs. Platt, 5 Bradw. 567.

⁴ Sutherland vs. Morris, 45 Hun. 259.

⁵ Board vs. Byrne, 67 Ind. 21.

⁶ Seymour vs. Long Dock Co., 5 C. E. Gr. 397.

⁷ Belt vs. Cook's etc., 3 Crauch. 666.

chooses at one time to give verbal orders for extra work, he cannot afterwards insist that subsequent verbal orders are invalid. Although verbal orders are sometimes hurriedly given, as occasion demands, and as soon as practicable afterwards ratified by a written order, so as to bring them within the strict intention of the contract, without, probably, exposing the owner to the presumption of having intended to waive the contract stipulation, it would obviously be unjust to allow an owner to give verbal orders for various things, and then claim that some of these orders were valid, while others were invalid, as conflicting with the condition of the contract. This point has been covered by a New York decision,¹ which says, "A written contract may be waived, either in whole or part, by parol, and after it has been thus waived by one of the parties, neither he nor any one acting under him can reinstate it."

[To be continued.]

REGENSBURG.—I.



The Ostenthor.

A CITY which contains some early Romanesque churches and a cathedral more beautiful in many respects, and certainly far more interesting than Cologne's; a city which still retains a large portion of its old wall and moat, and most of its watch-towers; a city whose town-hall is little changed from the times of the old Kaisers, and whose dungeons are still in so perfect a condition that the municipality could revert to the ways of their ancestors and torture their fellow-citizens unknown to the rest of the world; such a city cannot fail to be attractive in the highest degree to all lovers of art and archaeology.

Regensburg was colonized by the Romans, and the discovery in 1885 of the remains of some baths at a little distance from the Ostenthor (Porta principalis dextra) seems to prove that it was occupied by them as early as the reign of Domitian; but it was a century later that the town became a military stronghold, Castra Regina or Reginum. The probable boundary of the Roman town passed from the Porta prætoria (the river gate), through the Ostenthor, round by the Taxis-strasse, the Petersthor, Bachstrasse, and Wahlenstrasse, (Wallerstrasse, Wallgang, Wall—Vallum). The Porta prætoria was discovered in 1885, the Bischofshof having been built on to it. The arch of the gateway consists of thirteen roughly-hewn stones, one metre long and ninety centimetres broad. On the east side is a tower of two stories, and on the west, the foundations of another.

But it is the Mediæval town which fascinates the artist; the narrow streets with high-pitched roofs and battlemented walls, the bay-windows, the tall square towers, with loop-holes in the walls, the quaint old inns with their wrought-iron signs, and the remains of innumerable convents.

Regensburg, Ragenaburg, Ragesburg or Reganesperc takes its name from the river Regen which flows into the Danube just opposite the town; but if the weather be usually such as we experienced, the old city may have been called after the rain which pours down upon it so unmercifully. In 788 it became the capital of the kingdom of East Franks, and was for many centuries one of the

wealthiest and most important of the free Imperial cities. Pilgrims and Crusaders passed through it on their way to the Holy Land; and from 1563 until 1806 it was the seat of the Imperial Diets, the ambassadors living in the street which still bears their name (Gesandten-strasse), and occupying houses upon which we still see their arms emblazoned. The old stone bridge, rising considerably in the centre, was built in 1135. It has lost two of its towers, but the remaining one upon the Regensburg side forms a picturesque entrance-gate.

The bishopric was founded somewhat earlier (739) by Winifred, a native of Crediton, Devon, who, under the assumed name of Boniface had been created Archbishop and Primate of all Germany in 732. In his "Essays in Ecclesiastical Biography" Sir James Stephens gives the following eloquent account of St. Boniface: "In the Benedictine abbey of Nutsall, near Winchester, poetry, history, rhetoric and the Holy Scriptures were taught in the beginning of the eighth century by a monk, whom his fellow-countrymen called Winifred, but whom the Church honors under the name of Boniface. He was born of noble and wealthy parents who had reluctantly yielded to his wish to embrace the monastic state. Hardly, however, had he reached middle life, when his associates at Nutsall discovered that he was dissatisfied with the pursuits by which their own thoughts were engrossed. As, in his evening meditations, he paced the long conventual avenue of lime-trees, or as, in the night-watches, he knelt before the crucifix suspended in his cell, he was still conscious of a voice, audible though inarticulate, which repeated to him the Divine injunction 'to go and preach the Gospel to all nations.' Then, in mental vision, was seen stretching out before him the land of his German ancestry; where, beneath the veil of the customs described by Tacitus, was concealed an idolatry, of which the historian had neither depicted nor probably conjectured the abominations. To encounter Satan in this stronghold became successively the day-dream, the passion, and the fixed resolve of Boniface; until, at length, abandoning for this holy war the studious repose for which he had already abandoned the world, he appeared in his thirty-sixth year, a solitary and unfriended missionary, traversing the marshy sands and the primeval forests of Friesland." But not having met with much success in converting the pagans, he returned to Nutsall, and was chosen abbot by the chapter of his monastery. In 719 he begged the bishop of Winchester to annul the election, and once more quitted his native land, "to solicit the aid of Pope Gregory II, in his efforts for the conversion of the German people." This he obtained, and leaving Rome, he travelled into Thuringia and Bavaria, and penetrated into the wilds of Saxony, converting and civilizing the people, and founding monasteries, into which he introduced copies of the Holy Scriptures. Pepin-le-Bref, whom he had crowned and anointed, appointed him the first bishop of Mainz; but in his seventy-fourth year he renounced his bishopric, and devoted the rest of his life to missionary work. "Girding around him his black Benedictine habit and depositing his copy of St. Ambrose's 'De Bono Mortis' in the folds of it, he once more travelled into Friesland, and, pitching his tent on the banks of a small rivulet, awaited there the arrival of a body of neophytes, whom he had summoned to receive at his hands the rite of confirmation. Ere long a multitude appeared in the distance advancing toward the tent; not, however, with the lowly demeanor of Christian converts drawing near their bishop, but carrying deadly weapons, and announcing, by their cries and gestures, that they were pagans, sworn to avenge their injured deities against the arch-enemy of their worship. The servants of Boniface drew their swords in his defence; but, calmly and even cheerfully awaiting the approach of his enemies, and forbidding all resistance, he fell beneath their blows—a martyr to the faith he had so long lived, and so bravely died, to propagate. His copy of Ambrose, 'De Bono Mortis,' covered with his blood, was exhibited during many succeeding centuries at Fulda as a relic."

The splendid church erected in 1835 at Munich by Ludwig I, is dedicated to the apostle of Bavaria, and the frescoes with which it is decorated, record incidents in the life of the saint. The building is almost identical with the basilica of St. Apollinaris Nuovo at Ravenna, the series of medallions in the spandrels of the arches representing (in the modern church) St. Benedict, as founder of the order, St. Boniface, and his fellow apostles of Bavaria—St. Willibald, St. Corbinian, St. Rupert, St. Emmerau, St. Cylien, St. Magnus, abbot of Füssen, and other Benedictines.

Regensburg is a net-work of small streets and alleys paved with cobble stones, and bearing as extraordinary names as many in the good City of Norwich. A little street of barely a hundred paces long is called Gässchen ohne End.² Then we find Gichtgasse,³ Wermt strasse,⁴ Entengang,⁵ Hundsumkehr,⁶ Eck zum faulen Schinken,⁷ (now called Eck zum Vaulschink), Fröhliche Türkenstrasse,⁸ Zur Schönen Gelegenheit,⁹ Hinter der Flasche,¹⁰ Roter Herzfleck,¹¹ Many of the oldest churches of the town have been so completely spoilt in the seventeenth or eighteenth centuries, that little of any value remains. The Niedermünster, built in 1152 by its abbess, Kunigunde, the Alte Kapelle in 875, and the Obermünster in 1010,

² Endless Lane, or lane without an end or outlet. This is curious as giving a clue to the meaning of our own endless streets. There is one at Salisbury, which is, I think, the only street in the town without an outlet, thus giving a reading of the word "endless," which is just the opposite to that which we usually apply to it. ³ Gout or Palsy Lane. ⁴ Wormwood Street. ⁵ Duck Lane. ⁶ Dog's Turning Place. ⁷ Putrid Ham Corner. ⁸ Merry Turk's Street. ⁹ A Happy Opportunity. ¹⁰ Behind the Bottle. ¹¹ Red-stained Heart.

¹ Wood vs. Perry, 1 Barb. 114.

by Abess Wiborg, assisted by the Emperor Heinrich II, all belong to the early Romanesque style, but Rococo ornament and decoration have so disfigured them that they afford no interest to any person of taste—unless the Black Virgin brought from Palestine (from Gethsemane) in 950 by the Empress Jutta, and a picture of the "Holy Mother," painted by St. Luke, and given to the Emperor Henry II by Pope Benedict VIII in 1014, may be considered interesting. The former is undoubtedly only ancient and Byzantine in type, and style of workmanship; whether our faith be of sufficiently robust a character as to enable us to believe in the authenticity of the evangelist's signature upon the picture, is a question for each individual to decide for himself. Besides the Roman remains already mentioned, the town possesses a relic of the castle, the "Römerturm" or "Heidenturm," a square tower of solid rough masonry, and probably the oldest building in Regensburg.

The Cathedral of St. Peter, though not nearly so large as those of Cologne, Strassburg and Ulm, is, in many respects, more interesting. Begun in 1275 by Bishop Leo of Thundorf, the work crept on for three centuries, leaving the towers unfinished until our own time. They were completed in 1869 and are 107 metres high, the spires much resembling those of Cologne, but of better proportions. The plan "is much more German than French in its arrangements, having three apses instead of a *chevet*. The side-aisles are wide in proportion to the central one, the transept subdued, and altogether it is more like the old round Gothic basilica than the French church,"¹ and although the building went on from 1275 until 1534, the architects kept sufficiently to the original plan, as to prevent any want of harmony in the main structure of the church, or of the details, which are pleasing and elegant throughout. The west porch is peculiar, and unlike those of most other churches. It is triangular in plan, having a pier built out onto the steps. From this pier, an arch springs on each side and joins the main wall right and left of the portal, thus forming a double porch. The interior is imposing with its fourteenth and fifteenth century stained-glass and old tombs. Notable is the middle window of the choir, depicting St. Walburga, and the tomb of the Prince-bishop Philipp, erected by his brother, Duke Maximilian I, in 1598—a life-sized kneeling figure in bronze occupying a position in the centre of the nave. The arrangement of the side-chapels is also peculiar. Instead of being built out from the wall, and forming part of the plan of the church, they are small



The Draw-well.

canopied structures supported by four pillars, after the manner of a *baldachino*. One of them in the north aisle is ornamented with statues of Heinrich II and Kunigunde. Similar in treatment is the draw-well in the south aisle. It is 60 feet deep and still has its old wheel, chains and bucket. Upon the shaft which supports the canopy are figures of Christ and the Woman of Samaria, by Wolfgang Roritzer (1501), the sculptor of the elegant *Sakramentshäuschen* on the left of the high-altar; not so tall as the one by Adam Kraft in St. Lorenz, Nürnberg (which is about ten feet higher), it is almost as beautiful. The frontal of the high-altar is an elaborate work in silver, but of little artistic value. It was the gift of Bishop Anton Ignaz,

Graf von Fugger (1767-1787). In the north aisle is a bas-relief by Peter Vischer, over the tomb of Margaret Tucker (1521), representing our Blessed Lord and the Sisters of Lazarus.

The treasury is a model to some other churches, and is evidently cared for lovingly by its custodians. It is well-lighted, and all the valuable contents are excellently arranged in strong, handsome oak cases with drawers. Unlike one of the Hildesheim churches, which only provides a common deal closet for its precious tenth-century filagree and jewelled processional cross, the sacristy of the Dom at Regensburg is protected by iron doors, and the cases are all lined with iron. The treasury contains a great many specimens of the goldsmith's art, although war in the shape of Bernhard von Weimar and his Swedish soldiers, robbed it of no less than 1456 pounds-worth of silver. The most notable contents are the chalice of St. Wolfgang (d. 994) and a Limoges enamel *châsse*. The pedestal of the former is of the fourteenth century. The St. Andrew's cross is a beautiful filagree and niello work set with precious stones, somewhat similar to the St. Bernward's cross at Hildesheim, but not so fine, and perhaps of slightly later date. Another cross of Bohemian workmanship, gold literally covered with precious stones, was the gift of King Ottokar. Amongst the relics is the hand, black with age, of St. Chrysostom, brought from the Holy Land. In another

case are monstrances, a thirteenth-century pyx, and some exquisite Spanish and Brussels point-lace ornamenting albs. Our guide evidently took pride in showing us his treasures, and finding us sympathetic, he displayed the contents of the drawers, filled with exquisite specimens of old embroidery. Entire sets of vestments of the thirteenth, fourteenth and fifteenth centuries, corporals, jewelled mitres, altar frontals and the chasuble of St. Wolfgang. The orphrey of this vestment is intact, but the foundation is modern.

On the north side of the Dom is the *Esel-thurm*, erected temporarily instead of a scaffolding, and taking its name from the asses who carried up the building-materials upon their backs. In the cloisters, which have been completely spoilt by fantastic and tasteless Renaissance ornament, are two most interesting buildings of much earlier date than the cathedral. The Alte Dom, or Stephens Kapelle, is the oldest known example of German basilican churches. It has no west entrance, a peculiarly German arrangement, but that end of the church is occupied by a low gallery supported by stunted pillars and round arches. Upon each side are ten vaulted niches in the thickness of the walls, at the upper part of which are small windows; and at the east end is a somewhat larger semi-circular recess in which stands the stone altar, a solid block,

hollowed out for the reception of relics and having at the lower part a row of little round arched apertures. As there is a tradition that the body of St. Wolfgang was placed upon a bier in this chapel in 994, we have some idea of the date of its foundation, although no authentic records are extant.

The Allerheiligen Kapelle was built in 1160, over the grave of Bishop Hartwich II. It is sometimes called the Baptistry, though why, it is difficult to say, as it is evidently a small memorial chapel. Having somewhat the appearance of a circular church, it is



Allerheiligen Kapelle.

in reality, a square plan, surrounded by three apses, and surmounted by an octagonal dome with eight windows.

The fourth side of the square forms the entrance from the cloisters—and the only one. In the eastern apse is a stone altar supported by Romanesque pillars, and upon the walls are the remains of fresco paintings. Seen from the opposite side of the cloisters, it is a picturesque object rising from the long, unkempt grass, in its simplicity and beauty.

Of all the religious foundations of Regensburg, the Benedictine monastery of St. Emmeran was the largest and most important. Founded about 652 by Theodo IV of Bavaria, to atone for his son's sin in falling upon and killing the saint through some error, it quickly became noted as a school and seat of learning, and as a repository for manuscripts and books. The monks were also famous for the manufacture of a beautiful purple-red dye, made from the insect *coccus polonicus*; and we find from the annals of the year 1031, that the work of collecting these creatures was the duty of the peasants of certain communes.

Charlemagne enlarged the convent, and his successors added to its riches and importance, and many were the notable Bavarians who were educated within its walls, and buried within its precincts. Abbot Gawibald who died in 761 became the first bishop of Regensburg, and up to the time of St. Wolfgang the two offices seem to have been held simultaneously. In 1295 the abbots were raised to princely rank, and sat upon the episcopal bench at the Imperial Diets.

The main entrance, a late Romanesque façade built about 1049-61 and painted in fresco, is now closed, and a great part of the monastic buildings are in a state of ruin. Behind the porch is a grass-grown fore-court which was formerly the main entrance to the convent. It has an open arcade round it, and on one side, a detached tower built in 1575. Here, almost hidden amongst the grass and weeds, in charmingly picturesque disorder, are the tombs of abbots and monks; and upon one side, under the arcade, a calvary erected by the Imperial Master-of-the-Mint Lerch in 1513, as a propitiation for his sins in slaying one of his servants. One reads in the annals of the town, of ears being cut off for far smaller crimes; why then should a patrician expiate his sins by giving of his superfluity, of that which cost him little? In the paved part

¹ Fergusson.

of the court from which the church-door opens, is the so-called Heinrichstuhl, an ancient stone seat upon which the Emperor Heinrich II was wont to rest. The chronicles relate that when St. Henry held his court at his birthplace, Heinrichsburg, an ancient feudal castle upon the Danube, and probably the Roman Abudiacum, he was in the habit of walking into Regensburg daily to attend an early mass at St. Emmeran. The distance was some eight or nine miles, and when he arrived too early, he rested himself on this somewhat chilly and uncomfortable arm-chair.

The church has two choirs, that at the east end, apsidal, the western one, square. The latter, the Dionysiuschor, is raised some feet above the level of the church, and has stalls round three sides of it. The ceiling is of panelled wood, with portraits of Benedictine fathers painted upon the central spaces. Underneath this choir is the crypt and tomb of St. Wolfgang. Unfortunately fire and the eighteenth century have in a great measure destroyed the Romanesque character of the church; but a good many tombs, mostly with recumbent figures, of more or less interest, have survived these and other destroying agencies. Amongst the latter are those of St. Emmeran; Queen Uta, wife of the Emperor Arnulf, thirteenth century; Heinrich von Bayern (d. 995); Warmund von Wasserburg (d. 1020); the Emperors Arnulf and Ludwig (the child); and in the crypt of the eastern choir, the relics of St. Ramwold. The finest is the recumbent tomb bearing the name of Aurelia, 1026, with an effigy of the Blessed erected in 1335. She was supposed to be a French princess driven from her home to escape a disagreeable marriage, and coming to Regensburg during the abbacy of St. Ramwold, she passed fifty-two years of her life in fasting and prayer, and was buried in a Roman sarcophagus bearing the name of Aurelia upon the lid.

The treasury contains a silver *châsse*, some relics of St. Emmeran (1423), two Romanesque candelabra, St. Wolfgang's pastoral staff, and an ivory ciborium. But these are only a tithe of the valuables which formerly belonged to the convent, and which Bernhard of Weimar found so useful for converting into money, as for example, a beautiful gold altar frontal and cross laden with one thousand precious stones, made for Bishop Tuto between 894 and 930.

The numerous conventual buildings secularized in 1803, and the beautiful cloisters with their twisted columns, now form part of the palace of the Prince of Thurn and Taxis.

S. BEALE.

[To be continued.]

CARVING IN PARIS.

IN the *Portfolio*, Mr. P. G. Hamerton has begun a series of illustrated papers on "Parisian Architecture since the Empire." The following extract will suggest the spirit in which they will be composed:—

One of the most important changes in the new tendencies of French architecture is a disposition to estimate commercial sculpture at its proper value, that is, simply to do without it. One cannot imagine that it would add in the slightest degree to the happiness of any true lover of what is delicate and genuine in the fine arts, to live in a house that had been carved all over with coarse festoons of impossible leaves and flowers, alternating with heads of unnatural animals. There comes a time when these things are not only superfluous but wearisome, as carved furniture vexes a taste that is not either infantine or barbarous unless it is intelligently designed. In the new Parisian architecture carving is often rejected altogether, and when admitted it is not employed without reserve. So far the change is in the Classical direction. Superabundant carving does not belong to the ages when sculpture is at its best, but to ages, such as our own Elizabethan, which from the artistic point of view are still essentially barbarous. I do not wish to undervalue the Parisian carvers of ornament. They are the best in the world, and it is just because they are capable of doing refined work under good architects that they ought not to be set to vulgar commercial work. Let them be employed in realizing beautiful designs without the hurry of rapid manufacture. The advance of the critical faculty, whilst discouraging the mere trade of carving, would be favorable to the art. There are, by this time, a number of new houses in Paris on which sculpture has been employed sparingly, but in the most important positions and isolated by restful margins of plain stone.

The reader probably knows the calcareous stone of which Paris is built, and which comes from inexhaustible quarries chiefly to the north of the capital. Superb blocks of it are brought into the city every day on massive trucks drawn by long strings of horses. The fronts of the new houses are always substantially built and the heavy white stones may be seen protruding and awaiting the hand of the carver, who turns them into brackets, cornices or carved panels. The temptation to carve such stone is almost irresistible. It is soft and pleasant to chisel, yet not so soft as to refuse to take sharp edges, and it does immediate justice to the sculptor's intentions, the surface being uniform in its dead whiteness. In the days when there was hardly any coal smoke in Paris, the stone first turned yellowish and then gradually passed to a light golden-brown, whilst the surface became harder as time went on. In such favorable conditions as these it is not surprising that sculpture should have been overdone and vulgarized, so that the tendency is now rather towards other modes of decoration. The case reminds me of a change of

fashion that occurred lately in the ceramic art. A new way of decorating faïences had been invented and brought to great perfection by a few practitioners, particularly by one lady artist of distinction. Then came imitators who vulgarized the process and established a low scale of prices, to which their betters had to conform, but not without a sacrifice of quality. The public perceived the deterioration and withdrew its encouragement, so the art fell to the ground and was abandoned. The art of ornamental sculpture in stone is in danger of sharing the same fate. One reason against its continued prosperity is the demand for color in external decoration, which has sprung up during the last few years. Panels of painted faïence or colored marbles are let into the walls, and so are courses of glazed bricks. As these give a good and sometimes a brilliant decorative effect, the need for sculpture is hardly felt, and a very little of it suffices. The present tendency in this direction was foreseen many years ago by Viollet-le-Duc, when he gave amongst the illustrations to his "*Entretiens sur l'Architecture*" an example of a shop and house front constructed as an iron framework, the space being filled-up with bricks faced with colored faïences. Another modern tendency has the effect of making sculpture almost superfluous. Artistic wrought ironwork has been better understood than formerly, and produced more abundantly for balconies. It can be made the principal decoration, and in a few instances it has been made the almost exclusive decoration. There is a new house in the Rue des Bernardins of plain brick with hardly any structural interest except a loggia on the top, yet it is rich enough in consequence of its balconies of wrought-iron, which are ingeniously connected together so as practically to mask the otherwise too great simplicity of the masonry, and the whole produces quite a satisfactory effect as the reader may judge. He will observe a stone house beyond, which is, in fact, a school, and which also shows the present tendency to originality in Parisian building if we compare its windows with those of the Rue de Rivoli. The loggia or open gallery, so common in Italy, and occasionally met with in old French châteaux and towns, has been very rarely adopted in Paris, but it is beginning to appear rather more frequently in the new houses, and is a most valuable architectural feature on account of the variety it gives to a design as well as a lightness to the upper story that can be equalled by no other arrangement. In the bright sunshine, which is not rare even so far north as Paris, the loggia gives superb effects of light and shade, as well as an excellent opportunity for the introduction of color. With good judgment the architect has answered the lightness of the loggia by introducing heavy stone arches in the basement, where they have to carry the weight of the edifice. It is very characteristic of France, where architecture has always been valued on its own account, that this house has been erected in one of the narrowest and most obscure little side streets of the capital, unfrequented by the fashionable world. — *The Architect*.

THE "ARTS AND CRAFTS" EXHIBITION, LONDON.¹—II.

THE score or so of pieces of furniture in the exhibition will not detain us long; we gladly note, however, an attempt, more or less successful, on the part of the Society to fulfil its great aim, viz, to bring art to the homes of the people. Of this, the rosewood sideboard by Mr. R. Blomfield is an instance: a good design of moderate size, ornamented by inlays of satin-wood and a rich red-wood, it is all one can wish. His print-cabinet, in oak, walnut and ivory, is small, but compact, both design and workmanship being excellent. Mr. Spooner sends a sideboard and cabinet in oak, both severely simple in design and ornamentation. A specimen of a good design by Mr. Spooner, well and inexpensively carried out by the Wood Handicrafts Society, is a lady's work-cabinet in oak, stained green, with neat brass fittings; the front letting down to form a table, adds to its apparent usefulness. The rosewood settee, with back and seat caned, by Mr. Blomfield, is roomy and comfortable. That by Mr. Alma Tadema, is of the form familiarized to us in his pictures of Roman interiors.

Mr. Cave's cottage pianoforte, designed for Bechstein, is of plain oak, and decidedly utilitarian in appearance; it has a narrow shelf under the desk, and the lights are fixed on the top of uprights in continuation of the front legs, — which may be an improvement.

The few chairs present no noteworthy features, nor do the tables.

Among the really good exhibits of fireplaces, we select one, designed and modelled by Mr. G. Jack, on account of its quaintness and the general air of comfort it gives by its size. It is of cast-iron, with beaten and polished iron lintel, fender, etc. On the left cheek are the following lines:

THE FIRE MY GLITTERING FATHER IS,
TH' EARTH'S MY MOTHER KIND,
THE SEA MY YOUNGER BROTHER IS,
BUT ME NO MAN CAN FIND,

while between the lines are the sun and birds — a tree — and fishes. On the opposite cheek the new moon and stars, with the words, — "Who can stand against His cold?" The chimney-breast above is also by Mr. Jack; of modelled and colored plaster, in a sort of lattice pattern, with very natural sea-gulls flying across it, suggesting storms without.

The splendid chimneypiece for the Duke of Portland, designed

¹ Continued from No. 937, page 122.

and executed by Messrs. E. Wilson & Pomeroy, is really a poem in alabaster, illustrating as it does, one by Mr. William Morris, named "Rapunzel." The carving in the centre of the chimney-breast is very fine, and represents the heroine, who wears a coronet, leaning over the parapet of the castle; her hair, yards and yards of plaits, being let down at the bidding of a witch, who climbs up by it, as a short quotation will best explain:

RAPUNZEL, *log.* "Is it not true that every day
She climbeth up the same strange way
Her scarlet cloak spread broad and gay
Over my golden hair?"

WITCH. "Rapunzel, Rapunzel,
Let down your hair."

RAPUNZEL. "See on the marble parapet
I lean my brow, strive to forget
That fathoms below my hair grows wet
With the dew, my golden hair."

To the right and left are medallions, one with the Prince weeping in the wood; and another with the witch crooning over her caldron. The over-mantel is without carving, but has large inlays of dark mother-of-pearl, which also occurs below as serpents.

Also for Welbeck Abbey, to be placed in the private Chapel, Messrs. H. Wilson & Pomeroy exhibit an alabaster font, embellished by elaborately-carved symbols and inlays of mother-of-pearl, the brass bowl for which, with a cross and pair of vases, was manufactured by Messrs. Longden.

Sir F. Leighton sends his modelled studies for "Perseus and Andromeda," "The Daphnephoria" and "The Gardens of the Hesperides."

In the same room is the design by Mr. F. W. Pomeroy for a tablet to be erected in Holy Trinity Church, Chelsea, by the members of the London Art Workers' Guild, to the memory of the late Mr. J. D. Sedding, "To record the affectionate admiration in which they hold the memory and art of their Past Master." The profile in bas-relief is a faithful likeness of one whose talents and worth will not easily be forgotten by those who knew and loved him.

There are several shields, sconces, trays and vessels for household use in beaten copper, decidedly the best of the former being two in repoussé work by Mr. Walter Crane; a sconce in bright, hammered steel and the ornamented copper mug, designed by Mrs. Alfred Waterhouse, and executed, as is much of the metalwork, by various rural industrial societies, thus increasing its interest.

The few brass and copper table-lamps and certain candlesticks, etc., designed by Mr. W. A. S. Benson, owe their excellence to the simple elegance of the design and good workmanship. We may say the same of some of the dishes and salvers in hammered silver, by Miss Middleton, Birmingham Municipal Art School, Miss Edwards and Mr. Catterton-Smith, respectively.

The Guild and School of Handicraft send a case containing pieces of hammered hollow-ware in various metals, from which, for its beauty, and high artistic merit, we must select a gold bracelet with onyx and gold pendants.

The painted enamels for buckles, brooches, etc., executed at the Finsbury Technical College, London, must also be highly commended for both design and finish. Messrs. Powell & Sons exhibit a few specimens of the exquisite glass for the table and for ornament, for which they are so justly renowned.

An altar front designed by Mr. Lethaby, and executed by Messrs. Farmer & Brindley, is very rich in color, being a panel of lapis lazuli, arranged by Mr. Brindley, with a border of mother-of-pearl.

On the floor of this west room, we see the so-called "Hammer-smith Carpet," designed by Mr. Morris and made at his factory. It is evidently based on Arabian and Persian models, but just misses the subtlety which gives to these their ever-enduring charm. Unfortunately Mr. Morris has selected so delicate a scheme of color that it cannot last, and is even now beginning to fade.

Some few examples of the highly decorative gesso-work demand special notice: Mrs. C. Wylie's "Veiled King Death," Mr. Bone's "Return of the Vikings," and "The Days of Creation," by Mr. Silver. The first is wonderfully novel and attractive; it is in tempera and gesso, and represents Death with wings of the deepest indigo, wearing a mantle of the same hue, brightened by gold, while around his gold and jewelled crown is a silver halo. In his right hand he has a golden dart, and in the left a clasped book, which rests on a sun-dial. The face, pale and with deeply sunk eyes, seen through a thin gray veil, wears an expression, firm, yet withal so regretfully tender that we forget we are gazing on the semblance of one who is, to many, the "King of Terrors." Butterflies are appropriately carved on the frame. Mr. Bone's small panel is very masterly in conception, its only fault being that the sea is absolutely smooth. "The Days of Creation" is in the style of, but a long way after, Mr. Burne-Jones. The designs for printing textile fabrics are all more or less good, but present no special features and the same remark may apply to the wall-papers. A new departure has been made, viz: That of having workmen on the spot, cutting the blocks and rollers in wood and copper with which to print certain designs; an interesting process, but rather noisy.

We might fill a page with descriptions of the embroidery, but forbear. Suffice it to say that the portières, table-centres, piano and sofa backs, etc., are all that the most fastidious could desire. The

embroideries in silk or wool from the Royal School of Art Needlework, the Leek Society and the Langdale Linen Industry, are all distinguished by the high artistic merit for which these various schools are now so famous.

Mr. Morris is seen both as artist and poet in some hangings, a portion of which is shown, for Kelmscott Manor. They are composed of white linen embroidered in wool; the design on the curtain being a pomegranate tree in full bloom, about which are flying birds with gay plumage, such as jays and parrots, all the colors being most rich and harmonious. Worked on the hanging is a little gem of a poem by Mr. Morris, of which it is difficult to omit any part:

The wind 's on the wold
And the night is a-cold,
And Thames runs chill
'Twixt mead and hill.
But kind and dear
Is the old house here,
And my heart is warm
'Midst winter's harm.

Rest, then, and rest,
And think of the best.
'Twixt summer and spring
When all birds sing
In the town of the tree;
And ye lie in me
And scarce dare move
Lest earth and its love
Should fade away
Ere the full of the day.

I am old, and have seen
Many things that have been,
Both quiet and peace,
And wane and increase;
No tale I tell
Of ill or well,
But this I say,
Night treadeth on day,
And for worst and best
Right good is rest.

The south room is entirely devoted to books. In the centre Mr. Morris has one of his hand printing-presses at work, while two or three cases contain specimens of beautiful printing from the deservedly famous Kelmscott press; and as both type and ornaments were designed by Mr. Morris himself, the result is in most instances pleasing and good. It is a mistake, however, for Mr. Morris to expect us to follow him in his love of Gothic printing; that belongs to the past, with the hand printing-press and the spinning-wheel. In this busy nineteenth century, books require to be so printed, that literally "he who runs may read."

The bookbinder's skill is exemplified in two cases of bound books and covers. One of these is from the "Dove's Bindery": the designs are by Mr. Cobden-Sanderson, the tooling and finishing showing no depreciation of the technical skill so attractive at the last Exhibition. The second case contains binding and covers designed and executed by Miss Nichols, Mr. and Miss Maccoll, Sir Edward Sullivan, and others, besides some from the famous house of Zachsendorf. These latter consist of the poems of Wyatt, Surrey and Herrick designed by Mr. Lewis F. Day and tooled by F. Maullen; they are all richly gilt and in the best taste; the two volumes of Herrick being very suggestive of the quaint conceits of the poet.

Among the studies for book illustration with which the walls are covered and adorned, we note first those for the 1857 edition of Tennyson's poems by D. G. Rossetti, the title-page and frontispiece for Christina Rossetti's "Prince's Progress" and his beautiful "Dante's Amor" "that moves the sun and stars," a design for the centre panel of a cabinet, the crescent moon bearing the face of Beatrice.

The two new editions of Hans Andersen's tales just published by Mr. G. Allen, one an *édition de luxe* as regards the quality of the paper and size, will owe some of the popularity they will certainly meet with to the hundred or so of illustrations and initial letters by Mr. A. J. Gaskin of the Birmingham School of Art. He has so thoroughly entered into the Old-World spirit, and charming simplicity of these delightful fables as to shed an additional beauty on a book ever welcome to children, old and young. We may add that Mr. Burne-Jones has expressed his warm approval of this work of one who is an evident disciple.

Mr. C. Gere and Mr. New each exhibit some spirited sketches for book illustration. We should have mentioned with praise the three decorative paintings for the Birmingham Town-hall by Messrs. Gere, H. Payne and S. Meteyard, respectively, all of which we gladly welcome as evidence of the high character of the work done at the Birmingham Art School, of which they are students.

We had hoped to be able to give our readers a few lines on the Exhibition just opened here of French Decorative Art, but what can be said of plush picture-frames, roses painted on pianofortes, wall-papers which are bad both in color and design? The French decorative artists had an opportunity of rivalling and even of outshining those of England, and have miserably failed. We have all along surmised that art was not advancing in France at the rate it was in England, and now we are sure of it.

The etchings prove undeniably that in this respect France still bears the palm, but etchings can by no stretch of the imagination be considered purely decorative objects.

FRENCH DECORATIVE ART.

THE Grafton Gallery in London has opened its doors to the rivals of Messrs. Morris and Walter Crane—Frenchmen, devoted to the decorative arts. There is little which is new to visitors to Paris, who care to investigate the art of that city beyond the precincts of the Louvre and Luxembourg; but to the ordinary Londoner most of the work here exhibited for the first time must be exceptionally original. If the inspiration from which English decorative art mostly draws is in the main Mediæval or Italian Renaissance, France, on the other hand, looks to Japan as her master. One sees the Japanese influence in the colored engravings of M. Guérard's "Rabbit," in M. Boutet's "Girl" and in M. Lepère's "Jeunesse passe vite, Vertu!" Quaint and original also are those of MM. Maufra, Besnard and Renoir; flat coloring outlined by a black line, no perspective and the brightest of tints.

Turning round, are those exquisite specimens of glass from the manufactory of M. Leveillé—doubtless well-known to visitors to the Chicago World's Fair?

M. Charpentier exhibits two exquisite lock-plates in steel, with bas-reliefs of boys singing and playing the violin. Only the heads, shoulders and hands appear; but in the realism of the treatment and the sad, emaciated faces of the boys, the works of Donatello come to mind. "Le chant" is as thoroughly the *gamin* of Paris, as the little S. John, by Donatello, is the Florentine beggar; both artists draw their inspiration from Nature, and both from the same class of Nature's children.

The Deck pottery is largely represented, and most beautiful some of it; notably the gourds with Renaissance designs upon a jade ground.

M. Delatre's colored etchings are very original, reminding one of the hand-colored prints of one's childhood—the figures just outlined and flat tints laid on. Specially beautiful of this series are "In the Garden" and the "Old woman at a window." Beauty perhaps is a term some may take exception to in relation to these etchings, but it is the beauty of feeling and sentiment.

A piano, decorated with Japanese lacquer panels, style Louis XVI, shows that even that ugly instrument can be embellished—I mean ugly in form, for scarcely anything can be less interesting than the modern piano? This particular "cottage" is really a beautiful work of art. A "grand" hardby of satin-wood decorated with poppies and butterflies, by Mlle. Desbordes, is elegant, but I prefer the sober richness of rosewood, bronze and lacquer.

In the matter of advertisements, France sets us an example as in most things artistic. The large posters issued by M. Grasset are at once effective, striking and original. Some French examples of posters are vulgar, no doubt, and err in the manner peculiar to M. Van Beers, but they are nevertheless clever; English bills of the same kind—high-heeled ladies skirt-dancing, and ballet-girls standing on one toe, are equally vulgar, but instead of being clever, are intensely stupid and inane.

Perhaps the most beautiful object in the galleries is a bronze knocker, by M. Injalbert, a work by the *cire perdue* process, which equals the best examples of the Italian Renaissance. Oddly enough, furniture, a branch of decorative art in which the French are preëminent, is all but unrepresented. This is a pity, for even the modern styles of furniture shown in the '89 exhibition were quite worthy a journey to London, and some of the imitation Louis XVI and Louis XV cabinets were as beautiful as the originals in the Louvre.

PENGUIN.

THE DISTRIBUTION OF POWER FROM NIAGARA.

FOR years past we have been persistently told that we are being beaten in mechanical progress by America. The globe-trotter, fresh from his travels, relates that the fastest locomotives are to be found across the Atlantic, that the output of pig-iron in the States is greater than here, that the blast-furnaces get through double the work of the best Middlesbrough practice, that every village has its electric-lighting station, and that the length of electric tramway is to be measured by thousands of miles. These, and many other unpleasant comparisons, he showers broadcast, because no answer can be given to them which his understanding is capable of grasping. It is useless to point out to him that progress in America follows the direction of the needs of the country, and that in a country governed by different conditions, and having other needs, the same phenomena might indicate the reverse of progress. Such conditions are not capable of being set forth in the concise form necessary for his prompt extinguishment, and his habit of superficial observation prevents him from giving sufficient attention to understand a lengthened explanation. It was, therefore, with feelings of gratification that, some two years ago, Englishmen learned that the body of New York financiers, who had determined to utilize some part of the energy of the Falls of Niagara, had come to Europe to be advised as to the best methods of carrying out their enterprise. This, at least, furnished direct proof that we were not

altogether behind our cousins in engineering science, and furnished a telling answer to unpatriotic detractors. Later on, when Prof. George Forbes was appointed consulting electrical engineer to the Cataract Construction Company, the whole of his colleagues in London felt that a high compliment was paid to the English branch of the profession, and one that could scarcely have been expected, since both the continent of Europe and the States furnish better grounds for gathering experience in the transmission of power by electricity than any to be found here. Had the post been offered to a Swiss or German engineer, the choice would have appeared only befitting, and would have been accepted here as quite natural.

The announcement that Professor Forbes would read a paper on the 9th ult. before the Institution of Electrical Engineers drew a large audience, eager to learn how far the rumors current as to the designs adopted were correct. The distribution of 100,000 horsepower is such an immense stride in advance of anything hitherto attempted, that the responsibility of deciding on the system to be adopted is not one to be lightly undertaken. Of course it was known that the alternate current would be adopted—it has long ceased to be a matter of speculation as to whether it or the direct current is best suited for the purpose. But speculation ranged over single-phase, double-phase and multi-phase currents; over high-tension generators *versus* step-up and step-down transformers; over synchronous and non-synchronous motors; over overhead lines and conduits, and many other points. In a general way, Professor Forbes satisfied the curiosity of his audience, although he left them in the dark as to many matters of detail.

His plans may be briefly described as a series of compromises between what he would like and what he can get. The most noticeable feature is the adoption of low frequency of current. After many experiments, he settled on 16½ alternations per second as the most advantageous number, as compared with the 42 of Ganz, 76 of Siemens, 100 of Brush and 133 of Westinghouse. But he found that machines built to fulfil this condition would be too heavy to be placed at the end of the shafts of the 5,000 horse-power turbines that are being constructed, so he altered the figure to 25 alternations. As regards voltage, the conveniences of keeping the generator to a moderate figure, and transforming up onto the line, were evident. But it was found that transformers to step up from 2,000 volts to 20,000 volts and down again, would be as expensive as the generator, and thus double its cost. The desirability of producing current of the final pressure was thus made evident, and 20,000 volts were adopted as the standard. This was not an extravagant figure, and did not represent any great advance upon what had been done before. At Deptford, where one pole of each generator is put to earth, the voltage is 10,000, that is, the greatest difference of potential between the line and earth is the same as in an insulated system working at 20,000 volts. This is so well understood that several European contractors would readily undertake to supply dynamos to work at this pressure. But in America the case is different; experience there stops at 2,000 volts, and manufacturers could not be found to undertake machines to withstand more than 5,000 volts. The engineer had, therefore, the choice of advising that the machines should be imported, or of reducing his pressure. He chose the latter; the import duties would have been exceedingly heavy on foreign machines, while the national feeling would possibly have been wounded at their introduction. Consequently the original plan was set aside, and 2,000 volts adopted as the standard for the first three machines. These machines are to give a two-phase current, that is, there will be two separate circuits in them, so disposed that the current in one will be 90 degrees in advance of the other. These currents can afterwards be utilized in any way that is most convenient. They can be used separately to drive synchronizing motors, or together in Tesla motors; they can be more easily rectified than a single-phase current for use in street-railways, electro-metallurgy, etc. The prospective output of the Niagara works is so large that provision must be made to fulfil all important demands, however different they may be.

It is intended to run the mains, which are eventually to extend to Buffalo, some twenty miles distant, in a culvert of such dimensions as to allow a man to walk through. Provision is made for a large number of conductors. This conduit is already in course of construction for a length of 2,500 feet, to carry the conductors to the Pittsburgh Reduction Company's works, who will be one of the first customers.

Such are the main features of the scheme which Professor Forbes expounded to his audience at great length. He disclaimed any great originality for them, and took his audience very fully into his confidence as to the reasons which influenced him in his decisions. He set out with the determination that he would produce one kind of current only, and that his machines should be both interchangeable and capable of working in parallel. He would not have one kind of machine for arc-lighting, another for incandescence-lighting, another for electro-metallurgical work, and so on. Such an arrangement would have doubled the outlay for plant, for no machine would ever have been working at its full capacity. Now in America parallel-working is practically unknown, and manufacturers are naturally cautious as to how they enter into guaranties for their accomplishment. "It is a matter of common knowledge," said Professor Forbes, "that parallel-working is assisted by lowering the frequency." This, then, was one of his reasons for choosing a low figure. Another was the desire to render it possible to use ordinary continuous-current dynamos as synchronizing motors, by the addition of rings attached to the

commutator bars in such a way as to communicate with each alternately. Such motors work well with alternate currents of low frequency, particularly if the fields and armature be carefully laminated. Professor Anthony reports that small motors of this kind "run very nicely where the alternations do not exceed 25 per second," and that "at 8 per second, large motors could be run with perfect success." No doubt it will be a convenience for people in the neighborhood to use this type of motor for small work, but the amount of power they will require is not likely to be so large as to render it worth while to modify the plant for their accommodation. Professor Forbes devoted considerable time to this point, but he had other reasons to urge in defence of low frequencies. He recalled the fact that it had been thoroughly established that the performance of synchronizing motors is very much improved by using low frequencies. Also that those that have used the motors with rotating field of the two-phase or three-phase type, have all been obliged to reduce the frequency of the current to get the best results. It is found that in every self-starting alternating motor, whether multi-phase or otherwise, the effort at starting is increased by lowering the frequency. He added:

"I wish to repeat that, from what I have seen in the workshops of all advanced electricians in the last year or two, I am confident that in the near future single-phase alternating-current motors, self-starting on full load, will be largely used; and there is not the slightest doubt that all of these work far better with low frequencies. In fact, as Mr. Brush once said to me when I was discussing this matter with him, 'Really, your best plan would be to lower the frequency so much that you get a direct current.'

"Whilst speaking of low frequency in relation to motors, I must say that I have much greater hopes of obtaining a good commutating device with a low frequency than with a high one; and I will also state that I have great hopes of important advantages coming to us from the invention of such a commutating appliance which will enable us to furnish street-railway companies, electro-metallurgical works, and other consumers with the direct current without the use of any heavy revolving machinery at the transforming station."

The advantages of low frequencies are not confined to the motors; they also pertain to the conductors. An alternating current of high frequency tends to confine itself to the outside of the conductors, thus increasing the total resistance; the impedance of the line is also increased by the magnetic field formed between the go-and-return wires. Again, there is greater tendency to discharge from an electrified conductor into the air, and the difficulty of insulation is increased. On the other hand, with low frequency, the capacity of the cables is less troublesome, and there is less loss of static charge by heating of the insulation. Abnormal rises of electric pressure in the mains above the pressure generated by the dynamos, due to the resonant effect produced by the capacity of the cable and the self-induction of the circuit, may be reduced by lowering the frequency.

While Professor Forbes dwelt at very considerable length on the advantages of low frequency, he did not pass over its disadvantages. The first is that low frequency is not suitable for electric-lighting directly. We should imagine that the Niagara Falls Power Company will not be anxious to undertake too much lighting, except at very much higher prices than they are charging for power. What they require are customers that will take current all day long, and, if possible, all night too, and not those that only want it two or three hours out of the twenty-four. If lighting commenced when the factories closed, the source of demand would be very convenient, but unfortunately, in the busy season, it begins early in the afternoon. The City of Buffalo, however, is going to be lighted from Niagara; at present, steam-engines to the amount of 3,000 horse-power, are at work driving the arc-lights there, and it will be a simple matter to replace these by alternate-current motors. In this case the frequency is of no account. Experiments made by Professor Forbes show that a 16 candle-power 50-volt incandescent-lamp shows a flickering almost up to 25 periods per second, and up to 28 periods if it be over-incandesced. A 100-volt lamp shows a perceptible flicker up to 28 periods. With arc-lamps there is very bad flickering at 37½ periods per second; at 40 periods, it is still bad; at 45 periods, it is just possible to notice it on a printed page held close to the lamp, but it is not visible when reading at a distance of 10 feet. At 50 periods, the only means of detecting anything of the sort is by looking directly at the arc; nothing is seen when reading a book, either with the opal shade on or off. In the lamp tried the current was 14.2 amperes, the pressure 26 volts, and the carbons Siemens and Halske's best cored variety.

The efficiency of transformers in relation to the size and cost also falls off as the frequency is lowered, but not so much as is sometimes supposed; the increased cost is not in proportion to the lowering in frequency, because a higher induction can be used. Mr. Steinmetz has shown that the loss due to hysteresis varies as the induction raised to the power 1.6, and it is this loss must be kept constant when the frequency is varied. Professor Forbes deduces from this law the fact that in any transformer, if the hysteresis loss is kept constant, its power of doing work varies in proportion to the frequency raised to the power of 0.4 (but it is probably unwise to increase the induction so much as to saturate the iron). It follows, by doubling the frequency, there is got out of the same transformer 132 units of work instead of 100. By quadrupling the frequency, 174 units are got. If the frequency be reduced one-half, the cost of a transformer is increased 50 per cent. Professor Forbes continued:

"The lowest price which has been quoted for large transformers is \$3.52 per horse-power, at a frequency of 42 periods per second. In halving the frequency the extra cost would, therefore, only be \$1.76 per horse-power. It becomes, then, a matter of inquiry whether the benefits to be derived by lowering the frequency in such a proportion would compensate for the extra expenditure as indicated. I am thoroughly convinced that the gain is far in excess of this amount. I shall have occasion to discuss the superior efficiency of motors at low frequency; and in most types of motors I think it safe to say that in passing from 42 periods to 21 periods, or varying the frequency in that proportion, we have a gain of at least 3 per cent in the efficiency of the motors. Neglecting altogether the increased value of the motors from this cause, there is 3 per cent more power at our disposal, which, at only \$10 per horse-power per annum, or, capitalized at 5 per cent, represents an increased value at \$6 per horse-power of the plant, against which we have the increased cost of transformers—only \$1.76. It appears, then, pretty certain that, from a purely economical consideration of the question, a lower frequency than any which has hitherto been adopted is advantageous."

Professor Forbes gave a general description of the machinery that is being constructed.¹ The turbines are each of 5,000 horse-power. They are placed at the bottom of a large pit, and their shafts are carried vertically to the surface, where they are connected to the generators. These have the armatures fixed, and inside the machines, while the fields revolve outside them, the fields being formed of a ring of iron with the poles projecting radially inwards. The armature coils are wound independently, and can be removed and changed. They are fixed in slots in the fixed armature. The field magnet is of forged steel, supported by a spider with eight arms; the pole pieces are bolted to the steel rim. The field coils are of copper-strip. The hub of the spider is fixed to the upper end of the shaft, which is supported by two bearings, each of which has four radial arms. Space is left between these arms, and also between the arms of the spider, for portions of the turbine-shaft to be lifted through, if necessary for repairs.

The evening of the 9th ult. was entirely occupied by the reading of the paper, and the discussion was deferred for a fortnight. At the time of writing it has not commenced, although before this reaches the hands of our readers, the first night's debate will be concluded. It is certain that a very hot controversy will be raised, for not only are many of Professor Forbes' decisions debatable, but by giving his reasons at such length he has made many openings along which he can be attacked. It is on the question of frequency of alternations that the chief battle will rage. The engineers who have adopted higher standards, will come forward to defend them as applicable to all purposes, even to power-distribution at Niagara; they will certainly assert that their machines will work perfectly in parallel with their present frequency, and that no improvement would be found by adopting a lower figure. It will be a very interesting debate, and is likely to extend over several nights. — *Engineering*.

BOOKS AND PAPERS.

THE composition of mortars used about a building is so often neglected in practice, that every intelligent study of the subject should be welcomed, even though the books which have been written on the subjects of lime and cement are very numerous. Somehow there is no lack of theory upon the subject, and of very excellent theory also, but so long as the mixing of mortar is left in the hands of ignorant workmen, just so long will theories continue not to be put in practice. The manual by A. H. Heath,² recently published, emphasizes the fact that without good mortar there can be no good building, especially in these latter days when so many forms of construction are devised in which the adhesive and cohesive qualities of mortar count for so much. It is probably safe to say that nowhere in the world is the mortar-work so poorly executed as in the United States. Every architect knows the almost impossibility of persuading masons to fill the joints in stone and brick work, and even the best written theories but accentuate the fact that the binding qualities of good, well-mixed lime or cement mortar are often sadly neglected. We are only just beginning to realize the possibilities of mortar and to apply to its use in building-operations the care in selection, in testing and in mixing, to which engineers have been accustomed for years. A few suggestions from Mr. Heath's book gives an idea of the possibilities which are so seldom utilized by the architect. Thus, the addition of finely powdered brick-dust, provided the bricks have been made of a plastic greasy clay and not of sandy clay, confers the property of hydraulicity upon pure lime. A method is sometimes adopted which consists in mixing together chalk and a plastic greasy clay, adding this mixture to the lime and thereby greatly strengthening the resulting mortar. Of course this is nothing more than a crude preparation of Portland cement, but if rightly used it serves to greatly increase the possibilities of lime. It

¹ See *Engineering*, vol. liv, page 782.

² *A Manual on Lime and Cement, their Treatment and Use in Construction*, by A. H. Heath. London: E. & F. N. Spon; New York: Spon & Chamberlain. Price \$2.50.

is sometimes claimed that the addition of a small amount of loam to lime-mortar will greatly increase its efficiency, the real fact being that the loam acts in two ways, first, by making the mortar more easy to work under the trowel, and secondly, by adding some of the elements which go to make up the strength of cements. Of course, however, all loams would not possess these qualities. In India it is customary to mix with the lime, whether for mortar or plastering, a proportion of coarse sugar syrup or molasses, adding about one-half pound of sugar syrup dissolved in two gallons of water, or from one-eighth to one per cent of the syrup added to the lime. About thirty-five per cent by weight of sugar syrup, liquid, may be used to the unit of lime for mortar mixing. The effect is to retard the evaporation of moisture, and it is generally considered that the syrup assists in setting the mortar and increases its strength by fifteen to twenty per cent, in three to four months. Mr. Heath's book is very clear and comprehensive in its treatment of the subject, being confined to fact rather than theories, and is especially good for its analysis of the different tests of cements and also for its elucidation of the chemical attributes of the various mortars and cements.

A COLLECTION of a hundred landscapes by contemporary painters, many of them reproduced from their own masterly drawings and others satisfactorily engraved on wood, the whole well-printed on good paper and sold at a moderate price, is surely something which many artists and art-lovers would be glad to get. And they can find it in "*Paysagistes Contemporains*," published in two parts, folio size, by the Librairie de L'art, Paris, at three francs each part. Black-and-white draughtsmen can learn much from a careful study of such noble specimens of their craft as those by Edwin Edwards, Grandsire, Rapin, Theodore Rousseau and Zuber, and Americans can take just pride in the fine drawing by their countryman Bloomer, from his own painting of the "Old Bridge at Grez." Though the greater part of the painters represented are French, there are examples of the work of German, American, English, Belgian, Dutch, Italian and Swiss artists.

A companion work to this is devoted to modern *genre* painters and includes excellent copies of the pen-and-ink work of De Nittis, of Jozef Israels, of De Neuville and Du Mourier, of Jean Beraud and Hubert Herkomer. Drawings in other mediums by Louis Leloir, Leon Lhermitte, Millet and Gerôme are also given. As the names cited show, this gathering also is international in character, and one of the best things about it, from a practical point-of-view, is the liberal scale on which many of the pictures are reproduced, full-page being the rule and not the exception in "*Peintres de Genre Contemporains*."

WE remember, once upon a time, meeting a Boston architect then lately returned from a Western trip, during which he had tarried for a short time in Indianapolis, who spoke of its rawness and crudity and expressed the opinion that nothing good in art could come out of that Nazareth. Yet here we have *Modern Art*, a new quarterly hailing from that same city of Indianapolis, whose printing and paper is excellent both in taste and execution, and would be thought worthy of commendation if it bore the imprint of some leading Paris or London publisher. Much of its text, too, is well worth reading and the illustrations include, among others, admirable reproductions of works by Rossetti, Fortuny and Bonnat, while the many original head and tail pieces scattered through the pages are — most of them — really decorative.

THAT valuable series of art-biographies "*Les Artistes Célèbres*" has lately been augmented by three new volumes, formed of M. Michel's work on the family of the Van de Velde, M. Bouchot's on that of the Clouets and M. Lhomme's on Charlet.

M. Michel tells at more or less length of all the artists bearing the name of Van de Velde; Jan I, Jan II, Esaias and Willem the elder, but, as is right, devotes most of his space to the two greatest painters who bore that patronymic, Willem Van de Velde the younger, marine painter, and his brother Adrian, painter of landscapes and animals. Willem, first among Dutch sea-painters, and, therefore, first among all such save the English — it is fitting that the two nations which produced the best sailors should also give to the world the best marine painters — had a powerful influence on Turner, who said of one of his pictures, "Ah! that made me a painter." Adrian died young, yet left behind him a great number of works finished with much detail, and some admirable etchings of animals, in all this curiously resembling Paul Potter, whom he rivalled.

François Clouet, court-painter and *valet-de-chambre* to Francis I, as was his father Jean before him, has had ascribed to him portraits of his royal patrons, Francis II, Charles IX, and other eminent personages, but is better known by his pictures of Mary, Queen of Scots. The book which M. Bouchot has devoted to an account of his life and labors and those of his artist-relatives, contains also a chapter on Corneille de Lyon and another on the School of Clouet.

The volume on Charlet is by the same author, who prepared for

¹"*Paysagistes Contemporains*," Paris: Librairie de L'art; "*Peintres de Genre Contemporains*," Paris: Librairie de L'art; "*Modern Art*," J. M. Bowles, Indianapolis, Ind.; "*Les Van de Velde*," par Emile Michel, Paris; Librairie de L'art; "*Les Clouets*," par Henri Bouchot, Paris: Librairie de L'art; "*Charlet*," par F. Lhomme, Paris: Librairie de L'art.

this series the life of Raffet, who was Charlet's pupil and who surpassed his master. The glorification of the grenadier, the Old Guard, the veterans of the First Napoleon, was a favorite theme with Charlet, whose work as a painter is less important than his lithographs, of which he executed nearly two thousand. Various examples of these — patriotic and satirical — are reproduced in M. Lhomme's interesting monograph, which, like the others of this series, is well-printed on good paper and lavishly illustrated.



DIRECTORS' MEETING OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE next meeting of the Board of Directors of the American Institute of Architects will be held in New York on Monday, January 8, 1894. We have been requested by the Secretary to remind all persons intending to apply for membership to send their applications to the Secretary at Providence, so that they will reach him by the 4th of January. Drawings may be sent directly to the rooms of the New York Chapter of the American Institute of Architects, 18 Broadway, instead of sending them to Providence.



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

CONGREGATIONAL CHURCH, PROVIDENCE, R. I. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

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

COMPETITIVE DESIGN FOR THE RIDGE CLUB, BAY RIDGE, L. I. MESSRS. PARFITT BROS., BROOKLYN, N. Y.

THE estimated cost of this building was \$20,000.

STRONG HALL, VASSAR COLLEGE, POUGHKEEPSIE, N. Y. MR. FRANCIS R. ALLEN, ARCHITECT, BOSTON, MASS.

DETAILS FOR THE CORN EXCHANGE BANK, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

FOUNTAIN AND PORTION OF THE GERMAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatine Print.]

INTERIOR OF THE CONGREGATIONAL CHURCH, PROVIDENCE, R. I. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

HALTON, HERTS. — THE RED ROOM.

RESIDENCE AT ERDINGTON, ENG. MESSRS. ESSEX, NICOL & GOODMAN, BIRMINGHAM, ENG.

THIS residence has recently been erected for Dr. Donovan. The building is faced with red pressed-bricks, and has red Hollington stone and Bracknell rubber brick dressings. The roofs are covered with brindled tiles.

DRESDEN, AFTER A DRAWING BY SAMUEL PROUT.



[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

WALLS FOR A COURT-HOUSE.

MEMPHIS, TENN., December 4, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you kindly give me the following information through the columns of your valuable journal, of which I am a great admirer:

I have a court-house to build, the first story of which is fourteen feet in the clear; the second story is twenty feet in the clear; and the court-room has a clear span of sixty feet for the trusses. Now, will you kindly inform me what should be the thickness of the brick walls on the first floor, also, the thickness of those on the second floor and if that part of the wall should be strengthened by making the wall thicker at the points where the trusses rest; also inform me how wide the breast of the pilasters should be in case you recommend them. What distance apart should trusses be placed?

By answering this as soon as possible, you will greatly oblige,
Yours truly,
YELLOW FEVER.

[The necessary thickness of the walls depends on so many considerations, such as the quality of the brick and the mortar, the character and spacing of the trusses, the way in which the first story is divided, and the manner in which the second-story floor-beams are tied to the walls, that it would be impossible to give any safe rule. However, as a guide, we may say that with the best bricks, thoroughly bonded, and laid in cement, with the trusses designed so that there could never be any thrust to them, and spaced not more than twelve feet from centres, the first story divided by brick cross-walls, and the court-room not over one hundred feet long, we might, if the utmost economy were necessary, feel justified in making the first story outside walls twenty inches thick, and the upper walls sixteen inches thick, with pilasters twenty inches thick, and at least three feet wide on the face, under each truss. To make this safe, however, the wall must be solid, not faced with pressed-brick. If such facing is used, the thickness of it must be added to the rest, as it is of little or no use in making the wall stable, or aiding its supporting power. As to the trusses, much depends on the design of the roof, but we should not, with wooden trusses, wish to set them more than twelve feet apart from centres. — Eds. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

THE MARBLE STAIRCASE IN THE MAINE CAPITOL. — It seems that there is additional work for the repairer at the State House at Augusta. It turns out that there is a weakness in the support of the base of the marble stairway which is so admired by visitors. It is the main stairway which one takes to reach the second floor of the new wing. A prominent official states that when the stairway was placed in position the iron girder which supports it settled in the centre about one inch. This, necessarily, would cause a drop of about an inch where it connected with the landing at the top. To make the stairway come flush with the landing the foundation beam was jacked up an inch, raising the steps. It is said that Architect Fassett also examined this weakness at the time he looked over the library floor, and that measures will be taken to strengthen the stairway by placing two iron pillars beneath the girder in the basement, which can be handily done. The stairway is a very heavy structure of stone and iron, which, added to the ponderous fireproof floor of tile and marble, made too much for the beam. — *Lewiston (Me.) Journal.*

AN ANCIENT CANAL DISCOVERED IN THE CRIMEA. — An Odessa engineer, by name Melhukoff, has lately made a remarkable discovery in the Crimea, in the shape of an immense ancient canal, which the discoverer accounts as one of the wonders of the world. The length of this work is nine kilometres, depth ten metres, and breadth about five metres. It passes alongside the present town of Perekoppe, and near the ancient Greek town of Neapolis. Both Pliny and Strabo write of this great canal. In Theodosia the gigantic head belonging to a statue of Hercules has also lately been discovered. There is little doubt that the Crimea and the Caucasus contain many undiscovered archaeological treasures. — *London Exchange.*

GERMAN PROCESS FOR DRYING WOOD. — The London correspondent of the *Manchester Courier* hears that a German process for drying woods has been tried, and apparently with some success, by a firm of Canadian lumbermen. It consists briefly in placing the timber for twelve days in chambers heated by steam, and then in another room to dry. The plan, it is said, entirely gets rid of sap, and has been found most efficacious with juicy woods like beech and birch. It is certainly the case that timber prepared by this means is largely used in Germany, and particularly in Bavaria. At the same time, it is stated that this artificial seasoning is not nearly so efficacious as that produced by natural means. Woods thus forced into maturity are apt later on both to warp and to rot. The constructors of the German Navy have altogether declined to use wood so prepared, though it has been found useful for fencing and other kinds of cheap carpentry.

BORING TO A DEPTH OF 6,500 FEET. — The deepest boring of which we have any knowledge up to the present time is at Parvshowitz, in the district of Ribnik in Western Silicia. The depth attained is 6,508 feet, and the diameter of the hole is only 2.75 inches. The work has been temporarily stopped in order to lower special thermometers, which have been made with great accuracy, into the hole for the purpose of obtaining the temperature at different depths. The boring will then be resumed, and it is hoped that a depth of 8,200 feet will be reached. The method of operation is that the Hammersmann tubes are used, great lengths of which can be operated at once. The first tube has a diameter of 11.8 inches, and is provided at its lower end with a diamond-cutting edge which acts as a drill. The pipe is then screwed, as it were, into the ground, and when it has been entered completely a small special mechanism permits the cutting-off of the column of debris at the base, whence the core which has been formed in the interior of the tube, and which exactly represents the geological formation, is removed. This is then raised to the surface of the ground and

the diamond-pointed cutting edge is raised to the surface and a second and longer tube screwed on, having as its outside diameter the inside diameter of the first one, and it is also provided, on its lower extremities, with a new diamond-pointed cutter. This tube is then dropped into the hole, it is stopped by the first boring, and they begin to screw it down as in the case of the first. When the two tubes are thoroughly imbedded in the ground, the first operation is repeated and the core withdrawn, and thus by successively screwing on to the end of the tube one whose external diameter is equal to the internal diameter of the preceding one, the work is carried on. — *Revue Scientifique.*

METHOD OF WASHING SMOKE. — The *Birmingham Gazette* states that the directors of the Birmingham Mint have adopted a practicable method of remedying a long-endured nuisance. The thick, black volumes of smoke proceeding from the high chimney-stack of the local mint have long been a serious annoyance to the district, and the shopkeepers in particular have suffered to no inconsiderable extent from the same source of trouble. The Mint Company have suffered perhaps as largely as any one in the vicinity, and has had on many occasions to answer the complaints of the Health Inspectors and to pay heavy penalties incident to the proceedings that have from time to time been taken. Recently, a gentleman who owns a large joinery establishment at Newbury, Berkshire, expressed his willingness to wash the smoke by an original process of his own. The invention which he has introduced at the mint has met with the entire approval of the directors of the company, and has also given satisfaction to the health authorities of the city. An opportunity was afforded a representative of the *Gazette* of inspecting this extraordinary arrangement of making black into white. First the smoke is drawn from the stack by a powerful fan, and it is then forced through a revolving cylinder into a tank filled with water. Perforated beaters are affixed to the back of the cylinder, and these drop into the water and scrub or wash the smoke, which is put back into the chimney in the form of a perfectly pure vapor. The solid carbon which is washed from the smoke is brought out at the bottom of the tank all bubbling and boiling over, to all appearances a black foaming froth. The arrangement of the apparatus allows an inspection of the washing-process, and of the vapor, which, after the cleansing has been performed in the tank below is perfectly white and odorless, and is thrown through the chimney into the air as steam. It is an interesting fact that the black extract is admirably adapted for use in the composition of paint and printing-ink, while the ammoniated water remaining after the process of washing possesses the properties of a powerful disinfectant.

THE INSURANCE HISTORY OF THE WHITE CITY. — We have many pleasant recollections of the great Fair, says *The Investigator*, and one not the least is its insurance history. From the first we insisted that the insurance men of the country should lend aid and countenance to the project, because without insurance the Fair would have been impossible. We realized also that it would be possible to destroy all the insurance companies of the country if they wrote freely on the values that would be piled up in the White City and there should come a destructive conflagration. While many of our contemporaries were insisting that, owing to the character of the buildings, there would surely be a great loss, we were asserting that Chicago pluck and energy would prevent anything of the kind. The buildings grew rapidly and insurance was called for. The managers of the Exposition promised all possible protection, and agreed to appoint a committee of insurance men to have supervision of the insurance interests, and also agreed to abide by suggestions made by such committee. Accordingly the committee was appointed, and known as "The Insurance Auxiliary Committee of the World's Columbian Exposition." Its members were: Fred S. James, chairman; R. S. Critchell, O. W. Barrett, W. A. Alexander, J. H. Moore and R. A. Waller. This committee worked early and late during the constructive period of the World's Fair, and when that was past was ever on the alert. It caused the management of the Fair to put in trained firemen, and not amateurs, to protect the grounds, and all during the exposition there was on hand a fire-department superior to that in the service of cities of 50,000 to 100,000 people. These men were equipped with the best apparatus. A fire-boat was built especially for service in the lagoons; the Columbian Guard was under military discipline, and was available for fighting fires. The committee insisted that fire-stops should be placed under the floors of the enormous buildings; that hollow columns be filled, that the electric-light wires be installed after the most improved methods, that the petroleum fuel supply-plant be reconstructed and a thousand other things be done. All these things took time and cost large sums of money, and meanwhile insurance was being rapidly taken out on the buildings and contents. Millions of dollars were written by the companies, and in many quarters there were fear and trembling. Not so among the Chicago men. They insisted that the companies could safely write on the buildings at a reasonable premium, and they are now enjoying well-earned satisfaction over the outcome. In the midst of their labors O. W. Barrett, one of the most earnest workers on the committee, died, much to the regret of his co-laborers. David Beveridge, who acted as assistant secretary of the committee during the constructive period, and whose experience and attention were of great value, resigned, and was succeeded by S. T. Collins. The cold-storage warehouse horror was regrettable, but the committee was in no wise to blame therefor, and the insurance companies suffered but little on account of the disaster. The committee, in order to be on the safe side, devised a sliding scale for the decrease of the policies on the buildings at the Fair, and as a result there is now but one-fifth of the value of the policies written on the buildings in force, and this expired December 1. The companies have received from the Exposition company over \$250,000 in premiums, and the losses paid are less than \$10,000. This is a most excellent result, and we join with the auxiliary committee in rejoicing that they are able to give so good an account of their stewardship.

y
e
t
q
i-
e
s
a
e
d
y
d
d
e
o
i-
y
:
x-
y
n
e
ne
t-
00
e-
n
g
er
l,
ed
a
st
ly
re
nd
ne
n,
e.
st
rs.
ee
on
as.
ee
ed
on
es
of
x-
on
an
ry
of

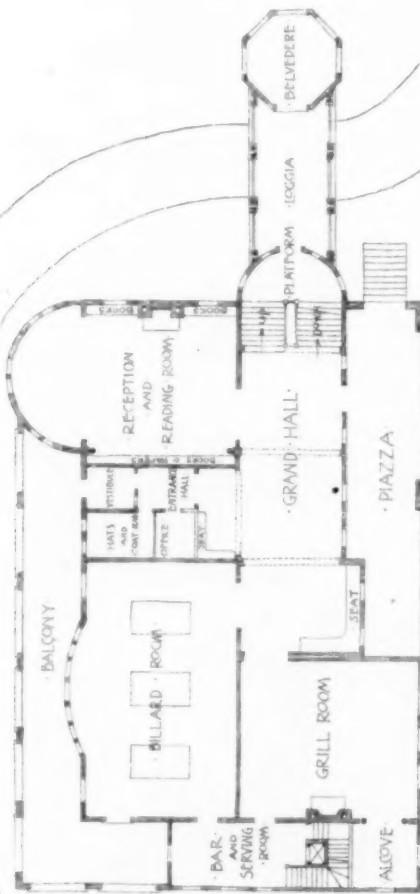
SHEDS

COMPETITIVE PLAN

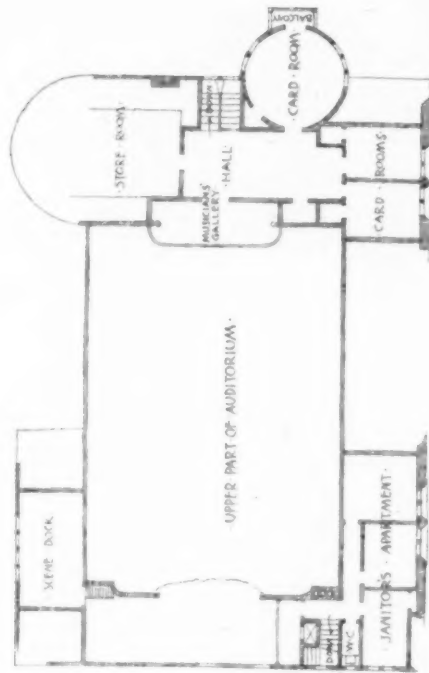
FOR

RIDGE CLUB-HOUSE, BAY RIDGE, L. I.

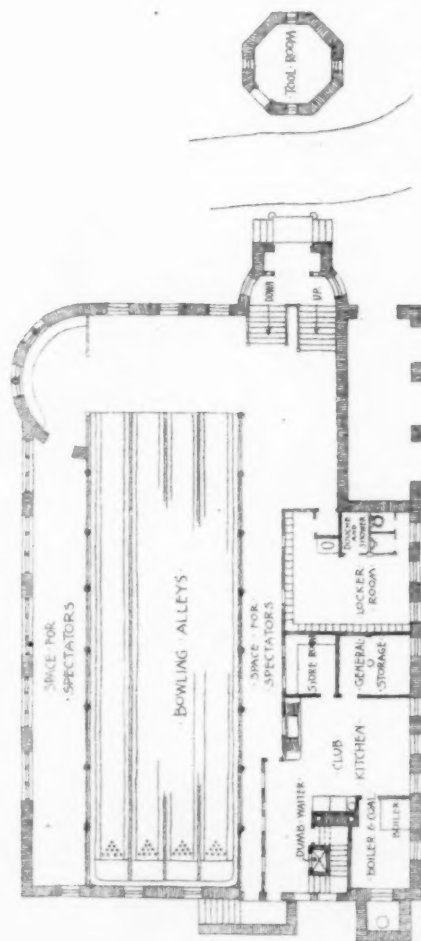
PARFITT BROS., Architects.



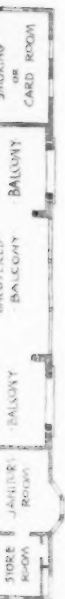
FIRST FLOOR PLAN



ATTIC PLAN



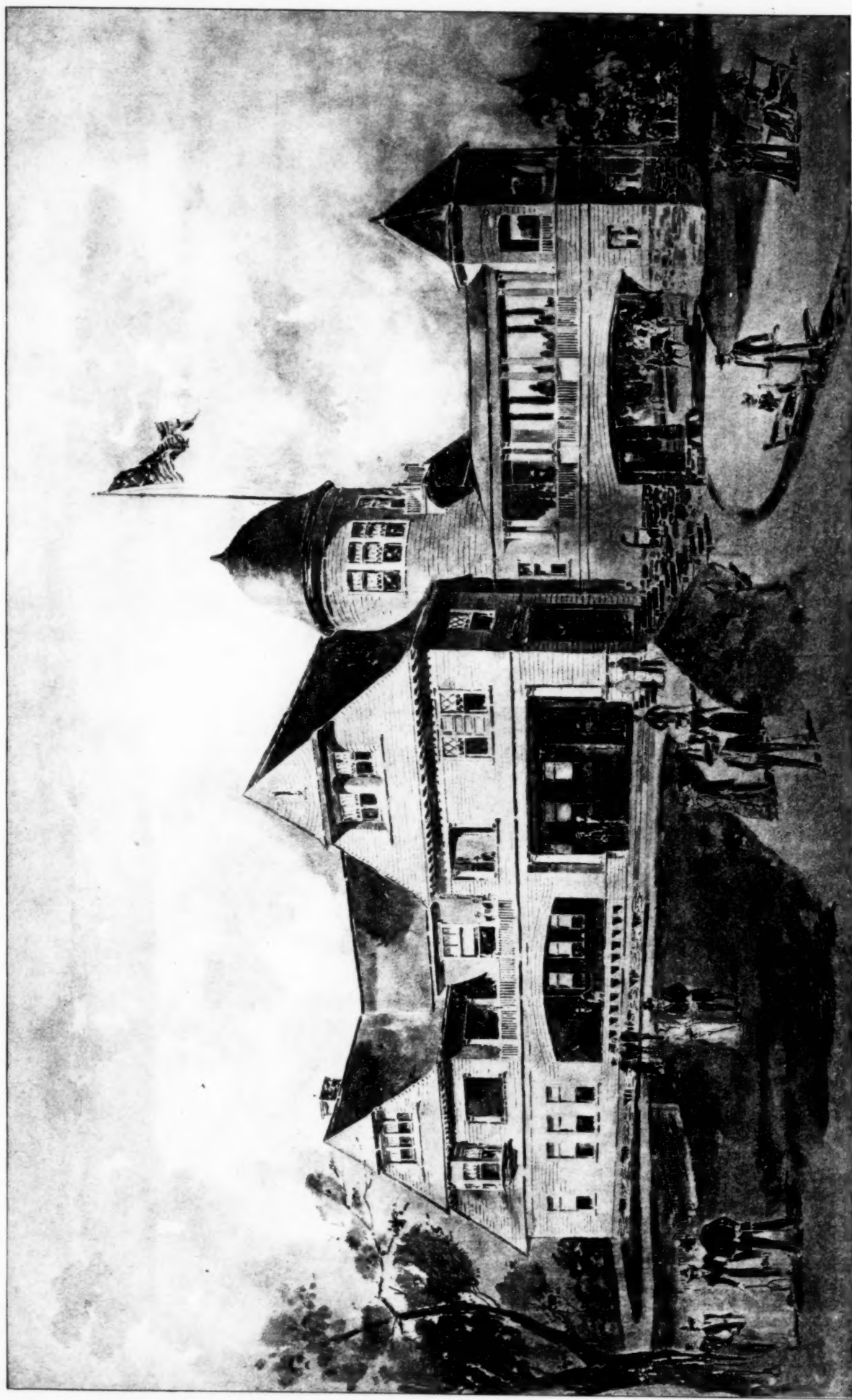
SECOND FLOOR PLAN

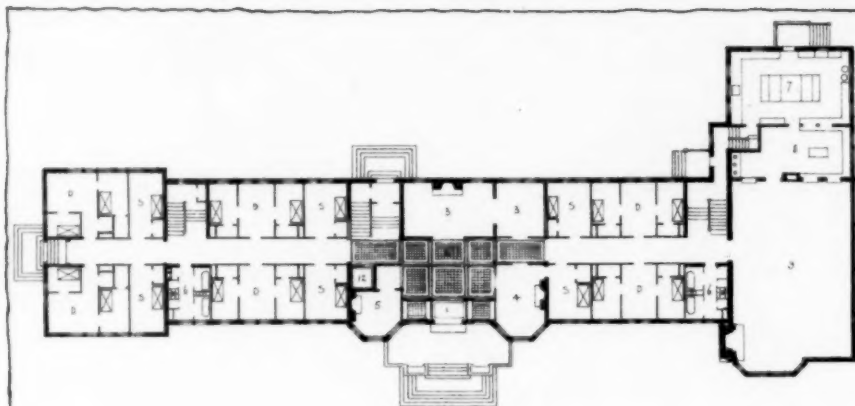


SECOND FLOOR PLAN



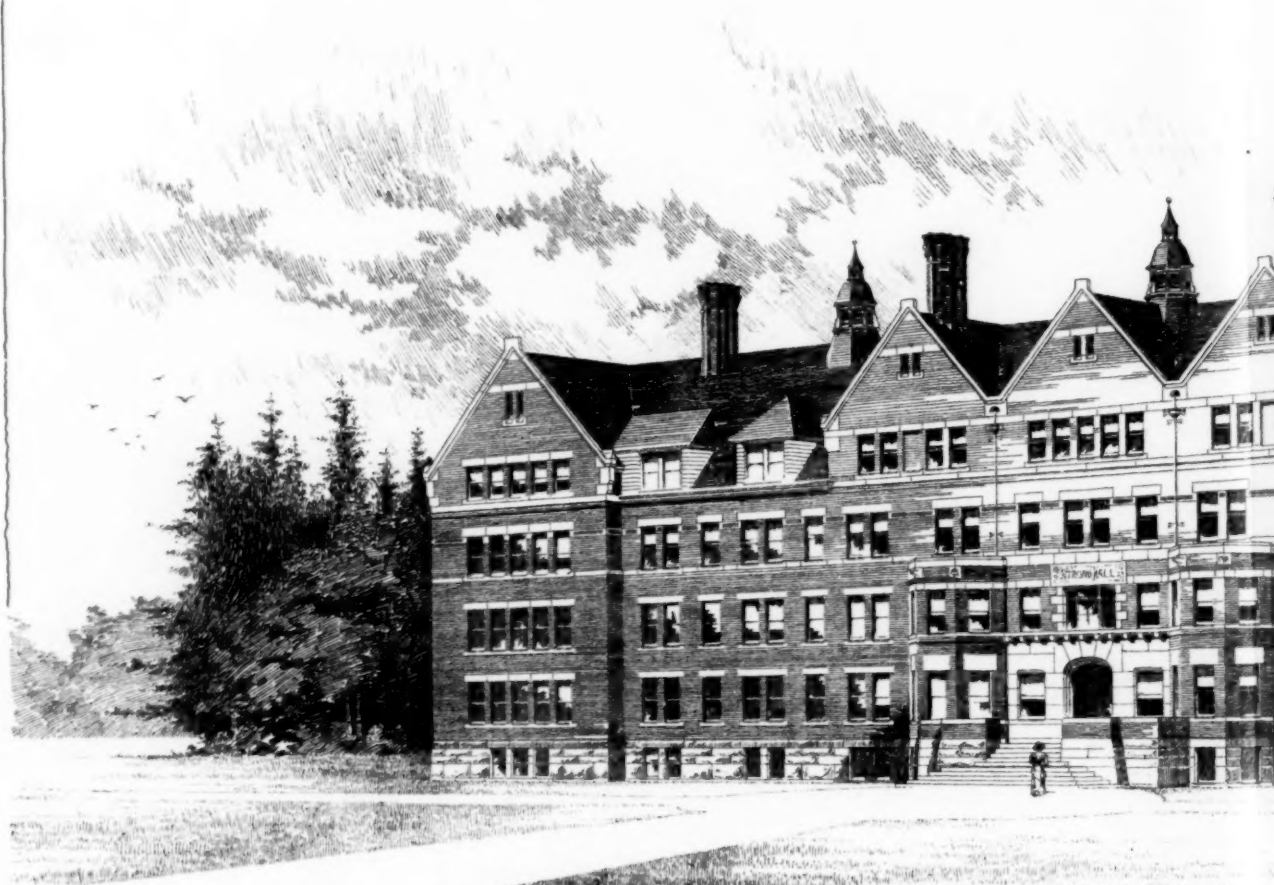
BASEMENT PLAN





• FIRST STORY •

- | | |
|---------------------|----------------------|
| 1- VESTIBULE. | 7- KITCHEN. |
| 2- HALL. | 8- SERVING ROOM. |
| 3- PARLOR. | 9- DINING ROOM. |
| 4- MATRON'S PARLOR. | 10- LINEN. |
| 5- RECEPTION ROOM. | 11- SERVANT'S ROOMS. |
| 6- TOILET. | 12- ELEVATOR. |
| S- SINGLE ROOM. | D- DOUBLE ROOM. |



♦ STRONG HALL ♦

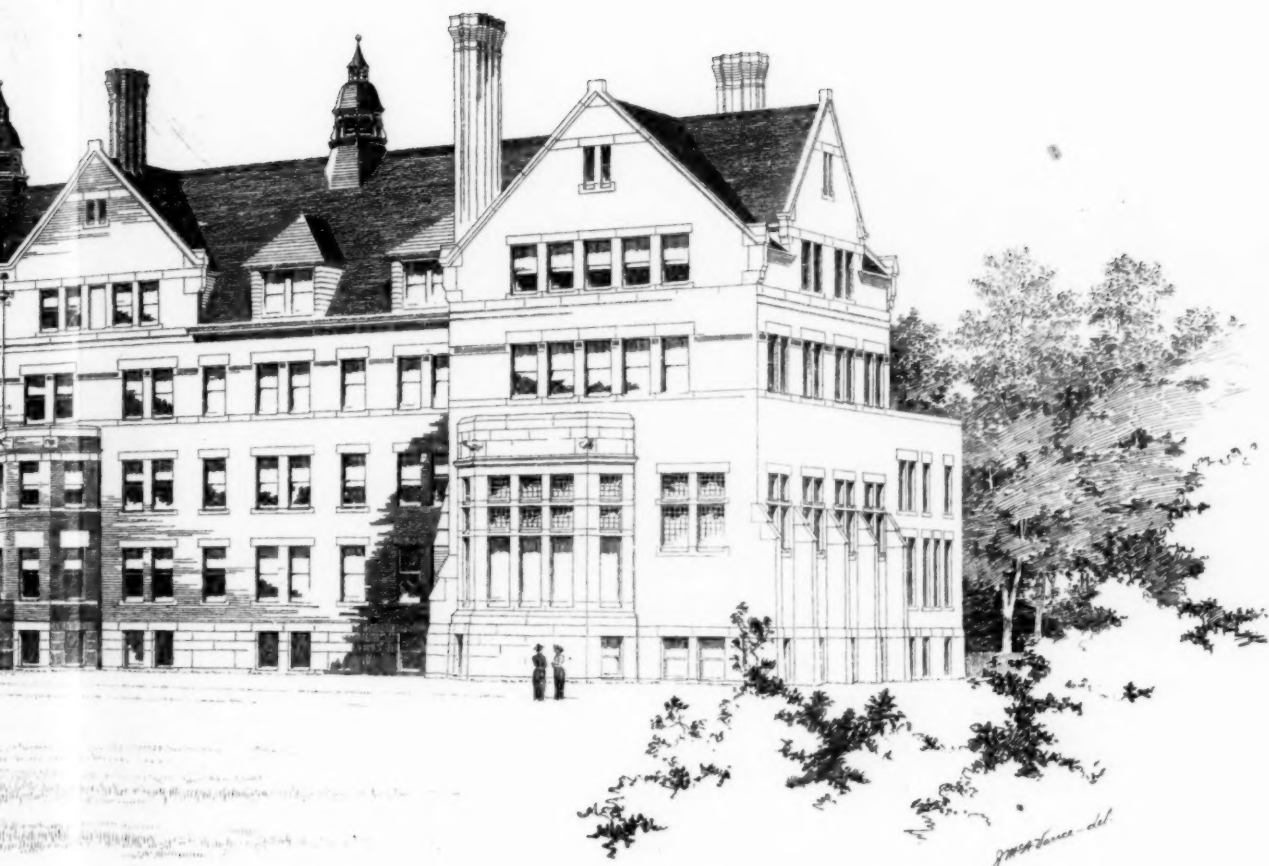
NEW DORMITORY FOR VASSAR COLLEGE

• Poughkeepsie • N. Y. •

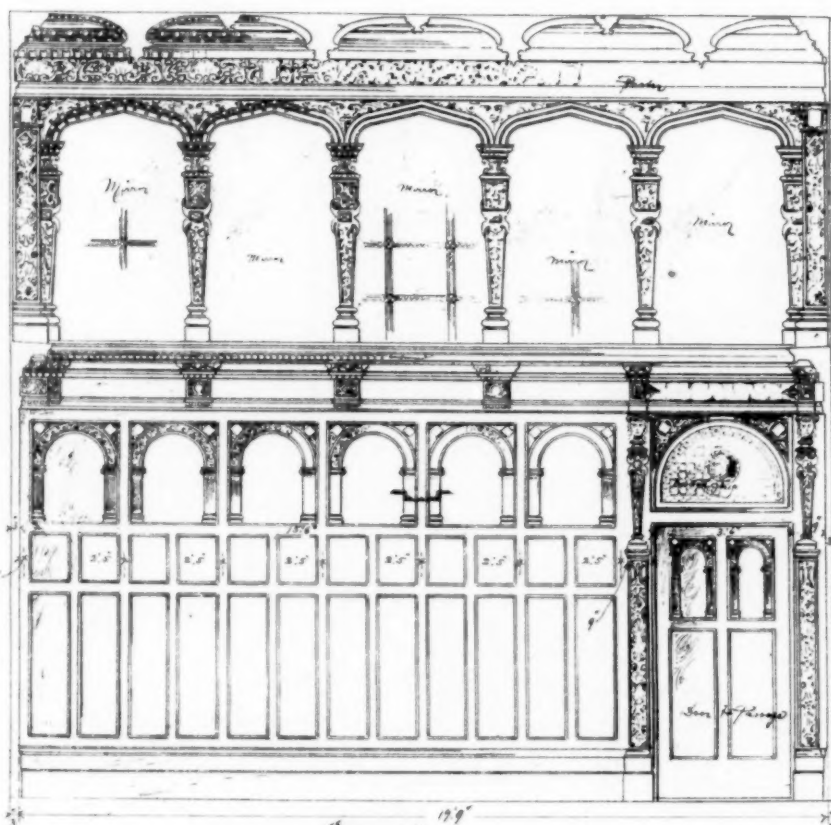
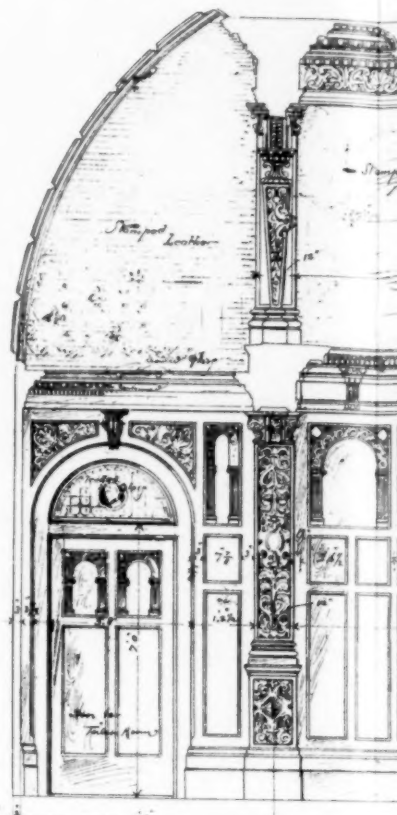
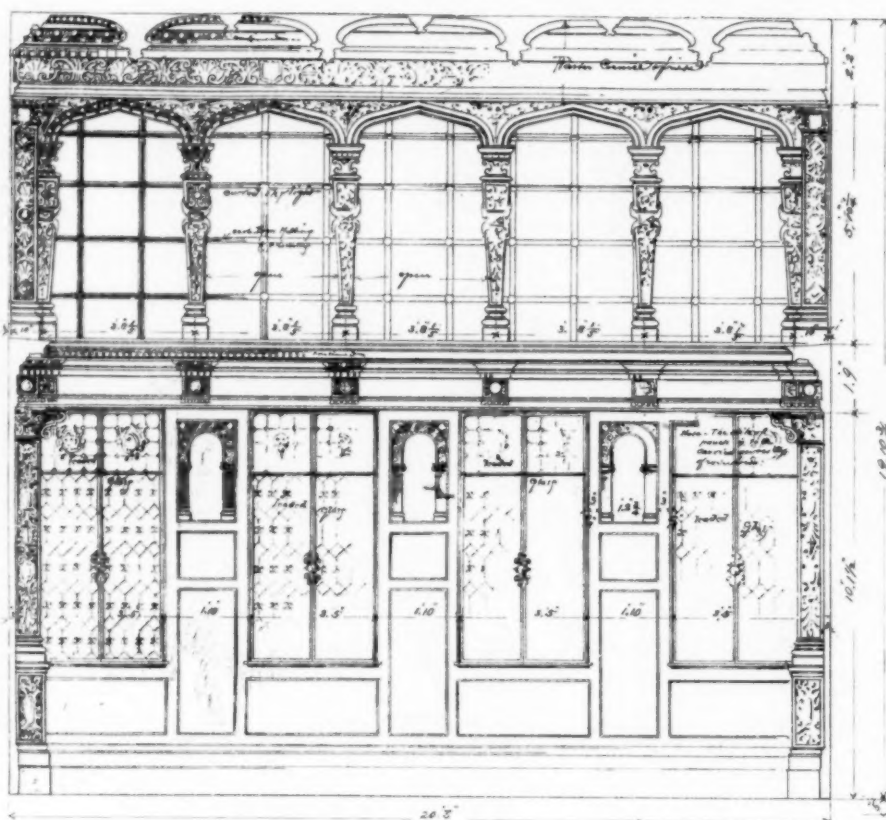
FRANCIS B. ALLEN • ARCH'T • BOSTON • MASS. •



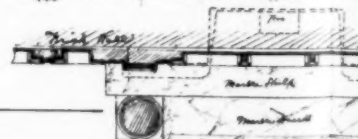
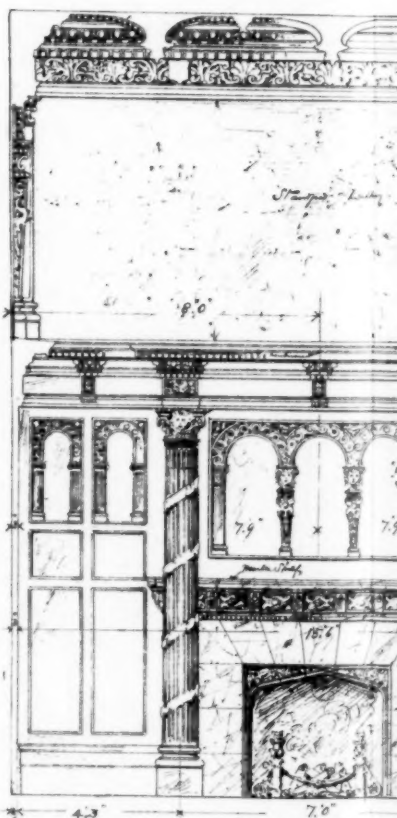
• SECOND STORY •



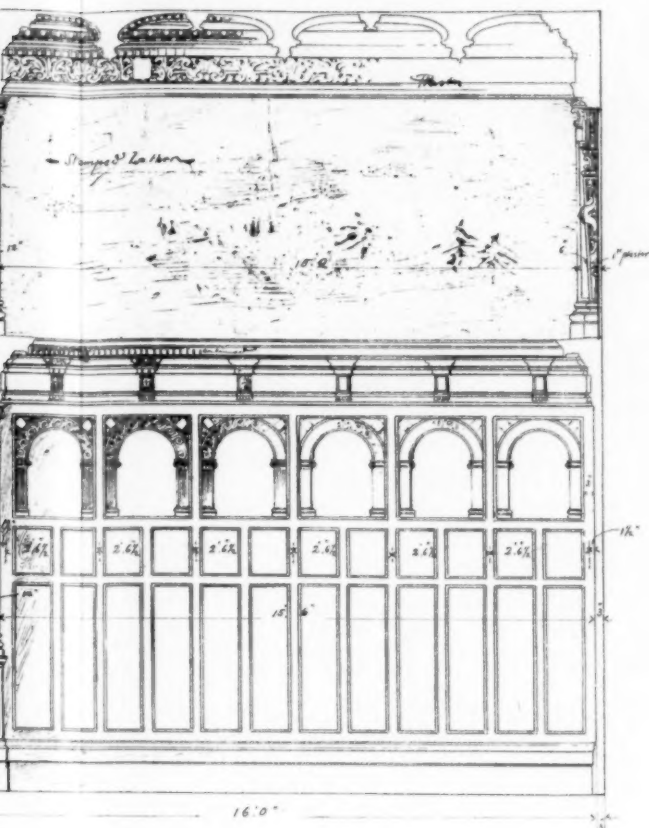
North



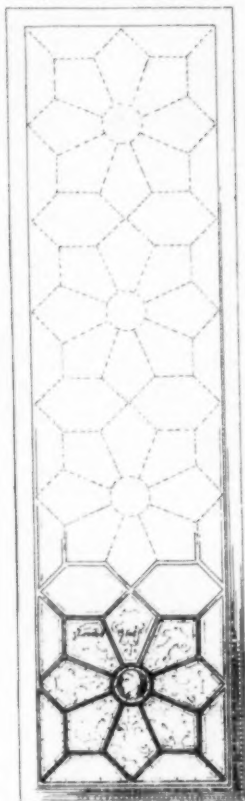
South



East



Ceiling Light.

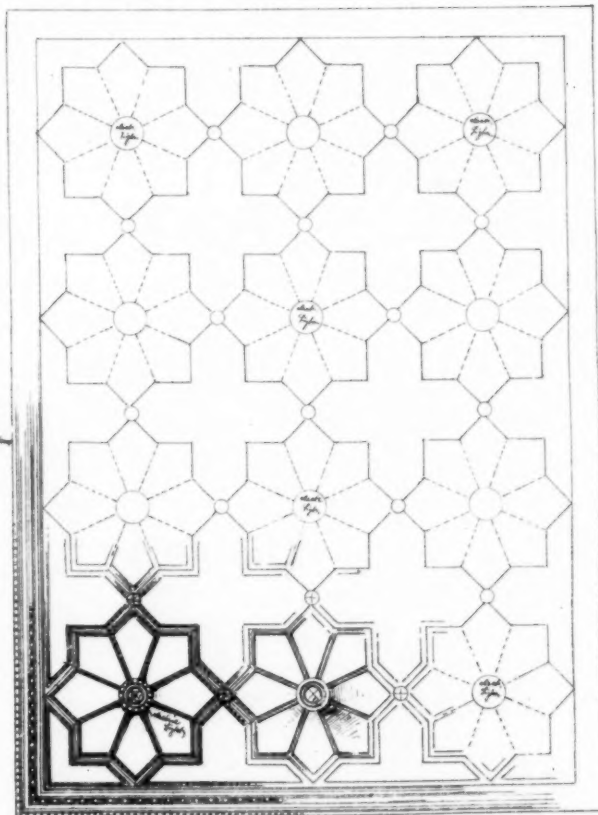
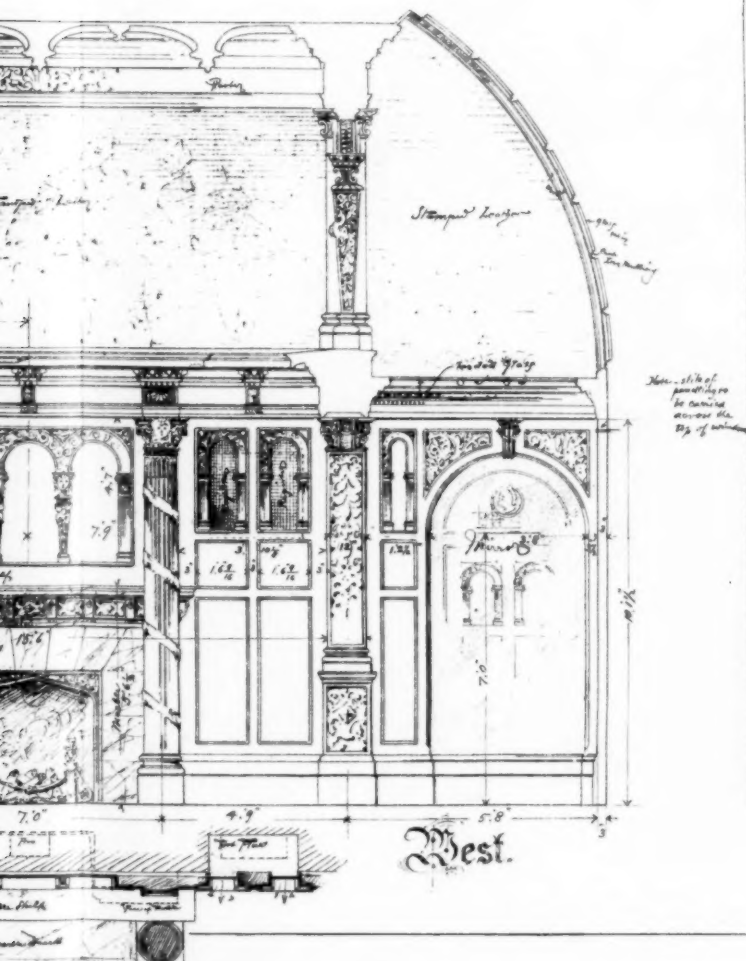


Corn Exchange Bank

William & Deane Street.

R. D. Robertson, Architect.
160 Fifth Ave.

Director's Room



Plaster Ceiling.

PRICE \$ 3.50



9774²

WORLD'S FAIR
EXTRA of the
AMERICAN AR-
CHITECT

