

THE INLAND ARCHITECT AND BUILDER.

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THE INLAND ARCHITECT AND BUILDER

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Architects and Builders throughout the West will confer a great favor on the Editor of this Journal by sending him news pertaining to the craft in their section of the country, particularly items of new buildings.

THE INLAND ARCHITECT AND BUILDER will spare no endeavor to furnish valuable news and information to those interested, professionally or incidentally, in the planning, building, decorating and furnishing of homes or commercial or public structures. A variety of attractive illustrations will be presented in each number, the best of engraving and printing contributing to their production.

THE INLAND ARCHITECT AND BUILDER has a larger circulation in the West than any building journal in the country. Advertising rates are very reasonable, and will be made known on application. We take pleasure in directing attention to the high character of our advertisements.

Special Notice.

FOR the past eight months letters have come to us from the principal cities in the East, and also from those along the line of railroad from St. Louis to Denver, addressed to R. C. McLean, editor of this journal, indicating that a swindler by the name of W. H. Gault was passing himself as Mr. McLean, and securing cash for subscriptions and advertising cards. As we became aware of his operations, we used every means to stop his swindling by publishing him, etc., but without success. Recently he turned his attention to the *Furniture Review and Interior Decorator*, of New York, personating Francis J. McAvoy, its proprietor, and, being published as a swindler by him, was cleverly caught in Baltimore. It was then discovered that his attention had been directed to numerous other papers, forged checks, etc., which proved the case to be beyond excuse, and on the 5th instant W. H. Gault was sentenced to two years in the penitentiary. This sentence is most severe, and falling upon a young man it seems doubly so, but the public must be protected, and when a young man with talents that would give him at least a fair living and a respectable standing in society goes deliberately into the swindling business, he can expect nothing but the law's punishment when he is caught, as he will be sooner or later. Our subscribers and the public should insist upon seeing the credentials of any party soliciting for or representing this journal in any way, and all trouble will be avoided.

UNDOUBTEDLY among the important subjects that will engage the early attention of the present Congress will be what is known as the office of supervising architect—a bureau unknown to law that has in some inscrutable way attached itself to and become recognized as a component of the treasury department of the United States. Whatever may have been the animus that projected the recent inquiry into the administration of this office by its late chief, Mr. Hill, or whether any of the charges made were sustained or not, are questions of little significance compared with the graver matter brought to the surface by the somewhat, necessarily perhaps, superficial investigation, viz: the disbursement, unchecked by the common safeguard of a bondsman, of millions of dollars annually of the public money through that unauthorized channel; the assumption of making the plans for all government buildings; the deciding as to what materials shall be used in their construction; fixing the terms of all proposals, etc., etc. That Congress, now that a wide publicity has been given to these unprecedented assumptions of power, will not permit such an anomaly in our government to exist any longer, but will endeavor to provide some other method that will be freer of possible abuse, and furnish a better class of public buildings, is morally certain. How shall this be done? As some suggest, by legalizing the present bureau and hedging it about with restrictions and safeguards? We confidently assert the labor involved in that public trust is beyond the powers of any one architect, though he were endowed with the genius of a Wren, and no amount of tinkering on this abortive office will turn the results from ignominious failures. The recommendation of the committee of investigation more nearly meets the issue, *i. e.*, a board of supervising architects in lieu of one person. We are heartily in accord with this idea of a multiplicity of counsellors, yet see a difficulty likely to arise from its adoption, and but one way to successfully surmount it. Who shall compose such a board, and how shall its members be chosen? From the architects and builders of the country? If so, to whom shall be delegated the power of their selection, if they are to represent the best elements of those professions? Here is the difficulty to be encountered, an almost insurmountable one in view of the object aimed at, as, if by any chance the formation of such a board should be dependent on partisanship, the government would soon be in the predicament of the man who was abscessed of one devil to let seven others worse than the first get possession of him.

THE only certain way to avoid the possibility of such a deplorable result would be, as we have heretofore suggested, to assign the government architecture to the war department, there to be reassigned to that eminently practical branch of the army, the corps of topographical engineers, out of which body an intelligent and competent board could be formed equal to all the architectural emergencies of the government. Such a supervising architectural board would be out of the pale and influence of party successes or defeats, and would possess that permanency which insures the purposes for which it would be organized, the longevity of administrations having no effect on its life. The duties of this corps are largely constructive, much of them of a purely architectural character. In point of fact, to it and that other equally practical branch of the army, the ordnance corps, is the country indebted for most of its noted and stable architecture, displayed in our national arsenals, armories and fortifications. Congress need

not go out of Washington to find evidences of the fitness and ability of the engineer corps to deal with this matter. The marble wings of the capitol building were designed, planned and supervised by a topographical engineer. So, too, the aqueduct at Washington, the war department building also, and that greatest in the world arch of masonry, the arched bridge over Cabin John's Creek, Va.; and we hardly need to mention the wonderful achievement of Col. Casey, the placing of a new foundation under the Washington monument, after it had been built to an altitude of 150 feet, an architectural engineering accomplishment without its parallel in architectural history. We sincerely trust when the question of the supervision of the public buildings comes up for consideration, Congress will view the situation from a patriotic standpoint and not from the lower level of party interest, and by a wise enactment create a bureau of public building supervision constituted of this corps, and make such provision as will throw open to the architectural genius of the country the designing and planning of all the public edifices hereafter to be erected. By such a course, with such a board of judges on the merits of plans and materials to be used; with the right recognized that every successful competitor should superintend the construction of his own designs, aided by a consulting architect furnished by the corps, there would be no more architectural abortions foisted on the government to the public shame. Parties rise, fall, and are forgotten, but the nation continues: hence the architecture of a nation should be monuments, epitomizing for all time its intelligence, civilization, wealth and grandeur.

THE drift of the educational world is strongly in the direction of industrial training. Witness the kindergartens, Felix Adler's school for "creative work" in New York city, Mr. Leland's school for carving and repoussé work in Philadelphia, and many other enterprises in our own country, not to mention the great schools of Europe, upon which royal and imperial aid has been beautifully bestowed. The expression "Manual Training," in an educational sense, seems to be applied specially, if not exclusively, to education in the use of tools, and several experiments in this direction have been and are in progress, which are attracting the attention, not of teachers only, but of all interested in education. Of these the most prominent in America is the Manual Training School of the Washington University, of St. Louis, which is now in the fourth year of its existence, with an enrollment at the present time of two hundred pupils, its first class of twenty-nine graduates having completed the prescribed curriculum in June last. This course consists of the mathematics, physical sciences and English literature usually taught in a high school, with the addition of mechanical drawing, and two hours of instruction per day in the use of woodworking and ironworking tools, with and without machinery, the whole covering a period of three years. The success of the school has exceeded the expectations of its most sanguine friends, and the school is really no longer an experiment. Another promising move in the same direction, though for the present confined to a lower plane, or, rather, occupying only a part of the ground occupied by the St. Louis school, is that lately inaugurated in Boston, in connection with the public schools. The school board of that conservative city has advanced very cautiously. Last January a vacant room in the Dwight School was fitted with carpenters' benches, and furnished with the necessary tools. An instructor was employed, and eighteen boys, pupils in the Dwight School, received instruction in carpentry two hours per day for four months, without interference with their ordinary studies. The impression made by this simple and comparatively inexpensive

experiment is shown by the action of the Boston school board on November 13 of this year, which fully commits the board to a system of tool instruction in the public schools of that city. The committee on Industrial Education state that their report "is the result of long and careful consideration of a subject whose importance is so generally recognized that it seems hardly necessary for us to repeat the arguments already adduced in its favor." "What we were requested to do, and have here done to the best of our ability, was to propose a feasible and economical plan of grafting manual training upon our public school system."

THE plan which was adopted by the board is, in brief, this: That certain unoccupied rooms in the basement of Latin School be furnished with benches, tools and materials sufficient for the instruction of twenty boys in each room so used; that competent teachers be secured; that each room thus prepared "be visited each half day in the week by successive delegations of twenty boys from the different grammar schools in the neighborhood." In this way the class of twenty boys could have two hours' instruction in toolwork per week, being in attendance at the grammar school nine half-days per week, and at the workshop one half-day. Two hundred boys could thus be instructed in carpentry every week by one teacher. This is certainly a very modest beginning. The committee stopped here, not because its members regarded this as sufficient for the needs of the case, but because they knew it would be "useless to ask [the city council] for the appropriation of a sum of money for the establishment of a separate and fully equipped industrial school, where instruction and practice in the use of tools could be combined with mathematics, drawing and the English branches of a high school course, as in the Manual Training of Washington University at St. Louis,—a model institution of its kind, whose like, it is to be hoped, will eventually exist in Boston." Such a school, modeled very closely after that at St. Louis, is soon to be opened in Chicago, in the elegant building of which we present an engraving in this issue. The Chicago Manual Training School is the offspring of private enterprise and liberality, and to the Commercial Club of this city Chicago owes the existence of an institution of which any city might be proud, and for which the citizens of Boston, with all her "solid men," have thus far sighed in vain. The school was incorporated under the laws of the State of Illinois, April 11, 1883. Its control is vested in the following board of trustees: E. W. Blatchford, president; R. T. Crane, vice-president; Marshall Field, treasurer; William A. Fuller, secretary; John Crerar, John W. Doane, N. K. Fairbank, Edson Keith, George M. Pullman. The object of the school is thus stated in the articles of incorporation: "Instruction and practice in the use of tools, with such instruction as may be deemed necessary in mathematics, drawing, and the English branches of a high-school course. The tool instruction as at present contemplated shall include carpentry, wood-turning, pattern-making, iron chipping and filing, forgework, brazing, and soldering, the use of machine-shop tools, and such other instruction of a similar character as may be deemed advisable to add to the foregoing from time to time, it being the intention to divide the working hours of the students, as nearly as possible, equally between manual and mental exercises." It is the intention of the board of trustees to open the school as soon as possible—certainly by the first day of February, if not earlier. The examinations for admission will probably be held during Christmas week; due notice will be given of time and place. The director of the school is Mr. Henry H. Belfield, for many years principal of the North Division

High School, of this city. We presume that he is prepared to furnish whatever information concerning the school our readers may desire.

SINCE our last issue we have to record three serious occurrences, two of them involving loss of life,—the collapsing of the new State House at Madison, Wis., causing the death of four workmen; the falling of a large four-story building at Buffalo, N. Y., also causing the death of four men; and prostration of a large church building at Pittsburgh, Pa., after the walls were ready for the roof. Each of these disasters followed close on the heels of the other, the Wisconsin State House disaster taking place early in the afternoon of November 8. The two last occurrences happened at too remote a distance for us to know more of the causes than the general newspaper report, which attributed their demolition to a high wind prevailing, made possible in the Buffalo instance by alleged faulty construction and too much weight on the roof. With regard to the Madison disaster, we have more definite information gathered by a special messenger to Madison, and the reports of other experts who examined the work on the ill-fated building, so that we believe that our deductions as to the real cause of the disaster—we cannot call it an accident—is as near the truth as it is possible to come. The facts of the case are these: The south wing of the Capitol building was under construction and the roof was being put on at the time of the collapse. The wing was nearly square. The outer walls were brick veneered with stone. Inside, and dividing the basement and first story, were three brick walls twelve inches thick, divided by piers, or rather pilasters, two feet square. From these pilasters nine-inch iron columns, resting on iron plates one foot square, were carried upward to the succeeding floors and the roof. At the top of each series of columns were placed iron girders which held the floor joists. On the under series of girders from floor to floor were placed the following series of columns above it (without any apparent provision for resisting lateral strain). It will be observed there were no capstones put upon the pilasters on which the iron columns rested—only a simple foot-square iron plate. Certainly this recital shows weak planning and faulty construction. First, the brick pilasters should have been at least three feet in thickness instead of two, and the brickwork protected by a properly proportioned capstone, while the iron plates should have been the size of the piers. Care would have been taken by a proficient to have estimated the weight they were to resist and proportioned them accordingly, and had that weight distributed equally. Not knowing the weight they were called upon to sustain, we cannot criticise the dimensions of the nine-inch iron columns, but certainly, constructing them in sections or parts, as is authoritatively alleged these columns were constructed, was not only a deviation from accepted practice, but a criminal act in violation of every law of building equity and common sense. For it is asserted that the firm, some obscure ironmonger in the interior of the state, had not a ladle large enough to run a whole column and was forced to run them in sections. Of course the iron chilled after each part was run, and they were so badly “cored” that one side of a column was often inches in thickness while the opposite was left a mere shell.

THERE were several theories and suppositions in evidence as to the manner in which the catastrophe occurred—one that a side wall that was supporting a few floor joists, that had previously been cracked, had given away, and that the side walls, softened by water from the roof, were too weak to resist the pressure; but the preponderating evidence

shows the giving away of one of the central piers, by the iron columns on and over it crushing into the brickwork—testimony that is supported by the statement of facts given above as to the construction. The coroner's jury, in its verdict, placed the blame on the architect and contractors. It was not shown that the architect who planned and supervised the construction was negligent of his duties during construction so far as he knew; in fact, he is given a character for perfect honesty and integrity; nor that the general contractor did not produce a fair quality of masonry; and as to the consulting architect, his duties were not clearly defined, and his responsibility is in the measure of his connection with the work, he probably acting only where his advice or opinion was asked for, though his having inspected the working drawings before the structure was commenced, and given his assent to their correctness, would place his responsibility with that of the architect in charge, as far as faulty designing was concerned. We do not wish to say they are to be entirely exonerated from blame, but we would place the burden elsewhere than on their shoulders, namely, the Capitol Commissioners, who, by the “Cheap John” or competitive system of procuring plans, took the sure and certain method of getting only mediocre, or worse, plans for the superstructure—a false economy that appears to have governed the contract-letting as instanced in the foundrywork. We have time and again made war against this system in vogue with commissioners for public buildings, to get plans and contracts cheap (?), and until a sensible and businesslike system is adopted we shall continue to have this class of manufactured accidents ready to happen on the slightest provocation, with their natural concomitants, waste of public money, and the taking of innocent lives. The people of Wisconsin have no one to blame for the calamity that has happened at their State Capitol more than their public servants, as, if they had employed for the designing of their State House any one of the expert architects they called to view the ruins, and awarded their contracts in the same businesslike manner, there would have been no opportunity for this criticism, nor any regrets over waste of money and lives.

THERE have been several attempts made to organize a Real Estate Brokers' Association, or Board, in Chicago, all proving failures; but now it would appear a revival of the subject, through the Real Estate and Rental Association, promises better fortune. The Real Estate and Rental Association, organized something over a year ago by such real estate operators as were rental agents also, and felt the pressing need of closer intercourse in the interest of their clients, have found the organization to so fully meet the need as to be considered stalwart. The Association now proposes to enlarge the area of its usefulness by extending its membership to others of their class than for which it was originally instituted, a movement incited by several recent important transfers of properties through the instrumentality of the intermingling of its members at the Association rooms, and which might otherwise have been yet unconsummated. As the movement is yet in its incipency, it cannot be foretold what the final development will be, yet the more sanguine are looking forward to the establishment, around the nucleus of the R. E. and R. A., of a board where real properties may be put on the market somewhat after the manner in which it is done in the real-estate exchanges at the East, that is to say, partaking of the nature of a call board. The real estate business of Chicago has grown to such a stature, that some better method for the ready purchase and sale of properties than isolated practice is required, and more than probable the method will result from the present agitation.

WILL county, Illinois, commissioners should be awarded the blue-ribbon by the architectural profession, for, upon the pressing need for a new county court-house being presented, they did not take the old stereotyped and likewise disreputable method of asking architects to contribute plans and specifications for nothing, offering a few hundred dollars as a bait where the outlay amounted to thousands; nor did they spend the county money in paying for a number of sets of plans by different architects; but having communicated with the architectural profession and finding upon what terms they were individually willing to work, they selected a good, reliable architect at a regular and standard price, and have gone to work in a businesslike and systematic manner to organize success. This is the first case of which we have knowledge in the history of public building where such an honorable and businesslike course has been pursued. While we present our congratulations, we hope that they will aid their architect in every way to produce a creditable structure, by trusting fully to his ability for its perfection, and that other commissioners of public work may "tact tent," as the Scotch say, and go and do likewise.

SINCE the mills have shut down, the editor of the *Mississippi Valley Lumberman* has turned his attention to writing on architecture—Minneapolis architecture. Hear him:

"It is said God made man in a fearful and wonderful manner, but for this reason the Almighty is not chargeable with, or to be called to account for, the creation of Minneapolis. We are no architect, and possibly have no right to have an opinion, but when we walk up and down the avenues of the city and note the architecture of the business embryo center of this mundane sphere, we are led to exclaim—what next? The cheap balloon Dolly Varden styles prevail, with useless projections, bay windows, cornices, cupolas, towers, minarets, porticos and mortgages, with all the colors of the rainbow to give tone to the styles. Many of these incongruities are chargeable to the depravity of the tastes of the people who have come here, bringing their prejudices in favor of the Hottentot style, the Esquimaux fashion, the Cockney notion, the Hacienda proportions, the Tepee regularity, the correspondence of the frontier cabin, the Ionic, Doric, Corinthian, Gothic, and all imaginable and inconceivable styles. A Gothic church with Corinthian pillars, an Esquimaux spire and an Egyptian interior, would come too near monotony in architecture to be even passable. Business houses 20 feet front, 100 feet deep, five stories high, with huge granite portals calculated to hold up one corner of the world, are just in fashion. Short buildings with long ells. Long buildings with short ells. Tall slim buildings with acute-angled tops. Flat squatty buildings with quarter-pitch roofs. Blood-red structures with broken zigzag lines of white. Green houses with fiery red trimmings. Mud colored residences with green mouldings and crimson sash. Houses that are mostly windows and a la Mexican houses in their lack of openings."

It is painful to be presented with such an exhibition of want of culture as this. It seems impossible that any man in this enlightened age should be so inappreciative of one of the most pronounced styles of architecture of the times, the *acme* of modern attainment, viz, the "conglomerate," as to even attempt a criticism of it. Well, before the mills get to running again in the springtime, familiarity with it may do much toward improving his taste.

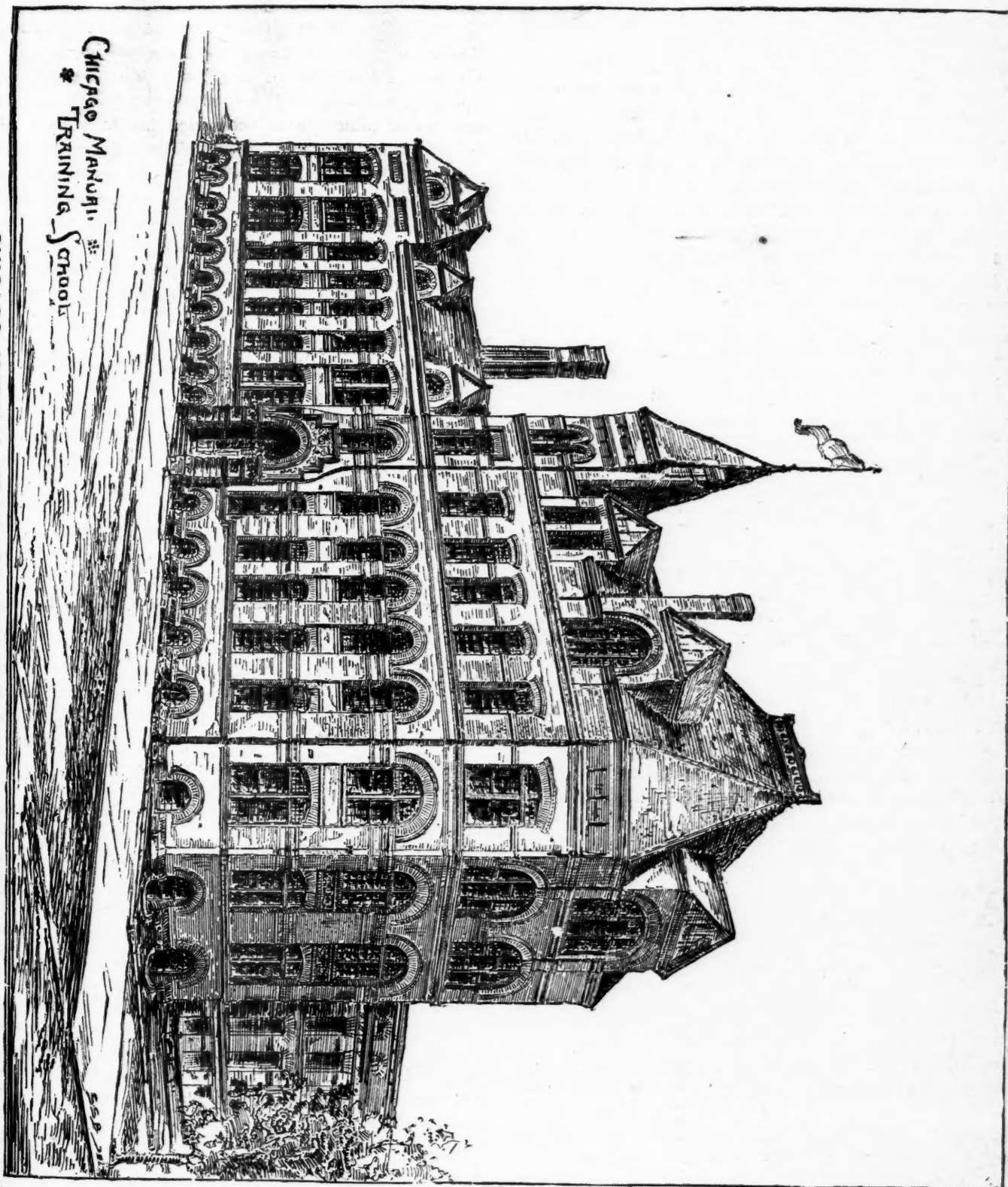
AN important ordinance has been introduced and is pending before the city council of St. Louis, relating to the regulation of plumbing. The ordinance provides that no person shall carry on the business of plumbing unless his name and place of business are on file in the office of the Commissioner of Public Buildings, and all changes of places of business must also be duly reported and recorded there. Under other provisions of the bill, every building shall be separately and independently connected with the public sewer, and in the absence of a sewer with a cesspool of such size as the commissioner may dictate. All drain-pipes must be of iron within the building, and for a considerable distance without the building, and shall be of a thickness of not less than $\frac{1}{8}$ of an inch for pipes of 4 inches in diameter, and $\frac{5}{32}$ of an inch for pipes of 5 and 6 inches in diameter. All iron pipes, before being used, must be subjected to both the water and kerosene test, and be coated inside and out with coal tar, pitch, paint, or some equivalent material. Joints of pipes must be made with molten lead, and where iron pipes connect with other pipes, shall be connected with air-tight brass ferrules. No steam exhaust shall be connected with any drain-pipe or public sewer, and where water-pipes are exposed

to the frost they must be packed with mineral wool or equally good material. Grease traps shall be connected with the waste of every hotel, eating-house and restaurant. Other important matters connected with an intelligent system of plumbing have received, under this proposed law, the same special and specific attention, so that it would seem by its adoption a proper sewerage, at least, will be secured at that city.

ARCHITECT Henry Lord Gay, a gentleman well known to the architectural profession, has arranged to open a permanent exhibit and exchange for building materials and appliances in Chicago. This enterprise will benefit not only those whose profession or occupation has to do with the designing and construction of houses, but the general public as well, giving as it will an opportunity for personal inspection, in which a man can determine for himself what bricks, lumber, roofing, plumbing and decorative material, etc., are best for use, and if he can do so by visiting a permanent exposition of these articles, he will have simplified the matter of building very much, and secured a better habitation. Instructed attendants will receive all visitors and give any information that may be desired, so that people are likely to be attracted to it as a means of pleasant and profitable recreation. The stimulus which will be given to good building, by the competitive exhibits, will be one of the encouraging features of the undertaking, and as its success lies largely in the hearty coöperation of the architects, builders and building-supply men, we bespeak for him such recognition as his enterprise certainly warrants. We believe there is a pressing need for just such an exhibit, and that it will grow in importance with the growth of the building industry in the West. Mr. Gay proposes to throw the exhibit open to the public February 1. A large building has been secured in a central location. Admission will be free to the general public.

SOME recent fires have again demonstrated the suicidal policy pursued by our city government in permitting the telegraph and telephone wires to remain above ground. The firemen have power to and do cut them, but this is not easily nor quickly accomplished where, as is frequently the case, over one hundred wires are strung on one set of poles. The city has ordered them down, and one company strung two or three cables along the streets, and there the matter dropped. One company, the Postal Telegraph, is deserving of special commendation, and we would say patronage, because their lines are placed under ground; and in this they not only avoid the interruptions to their business, but are showing that the placing of wires under ground is thoroughly practicable and only a matter of a little extra cost to the companies, and should be insisted upon by public officer and private citizen until it is accomplished; and instead of the skyview above our streets presenting an appearance resembling a fine sieve, all will be clear, our architectural effects will not be marred, or our lives placed in danger by a network of wires overhead.

THE plan for Bertholdi's great statue of Liberty has been finally settled upon. It will consist of three parts. The lowest will be of granite or some other dark stone—ashlars decorated with broad shields bearing the coats-of-arms of the different states of the Union, and separated from the middle part by bold cornices. In the middle the stonework will be of a rugged style, such as was used by the Etruscans, in which "the masses are squared, but left rough in front." Above this will come the third and highest part, with upper and lower galleries, and with a graceful row of pillars with Ionic capitals. Above this will stand the colossal statue.



Chicago Manual
Training School

CHICAGO MANUAL TRAINING SCHOOL.—S. S. Beman, Architect.

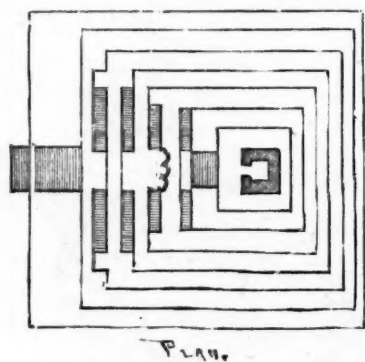
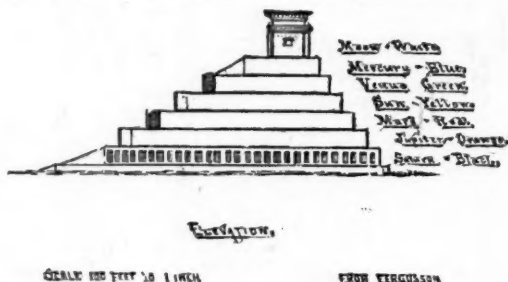
Architecture.

LECTURES DELIVERED AT THE UNIVERSITY OF CHICAGO.

BY W. L. B. JENNEY, ARCHITECT.

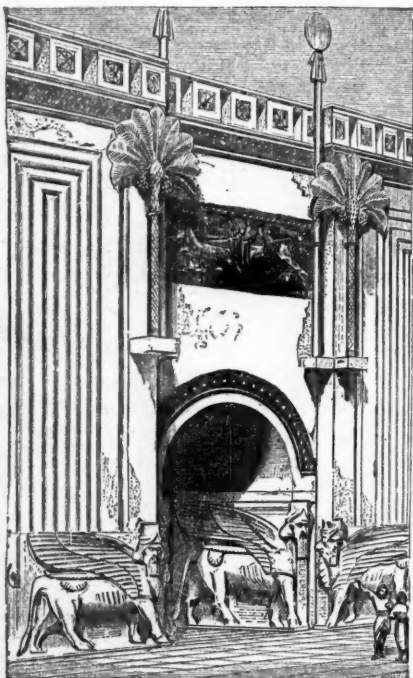
PART IX.—ASSYRIA (CONTINUED).

THE oldest temple we know of at present was at Warka (Erech of the bible), on the Euphrates below Babylon, built at least 2000 B.C., and now so utterly ruined that it is difficult to make out what it was like. The typical example of the Chaldean temples is that of Birs-Nimroud.



No. 1. Birs-Nimroud Restored.

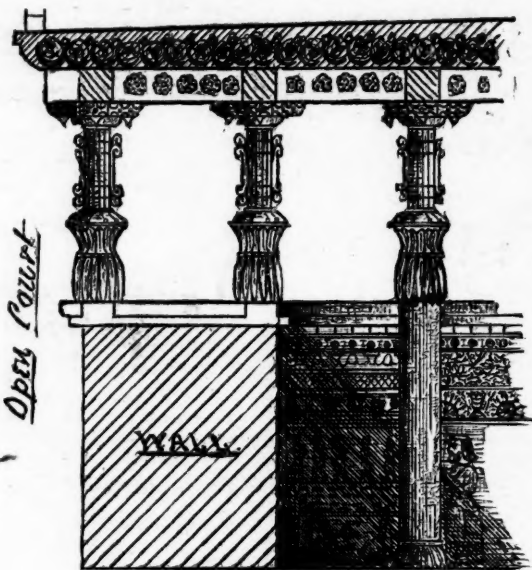
This temple was dedicated to the seven planets, and adorned with the colors of each. The seventh or top story was evidently the cella or sanctuary of the temple. There were several methods of external coloring employed. The most curious was covering the brick or plaster with a glaze after the work was otherwise finished, and then firing by some process not yet understood. Another was by the use of enameled brick, and another by dipping small ornamental forms of clay in color and building into the walls, or setting them in the plaster forming the wall surface. Some of this class of decorations were very rich and ornamental.



No. 3. Entrance to Assyrian Palace.

The Assyrian palace was built upon a terrace raised some thirty feet above the plain, for the purpose of increased dignity and for defense. These terraces were built of sun-dried brick with an external protection of stone. There were flights of stone steps for those on foot, and long slopes for chariots, connecting the plateau of the terrace with the plain below. The palace occupied but a portion of the terrace, leaving room for a drive for chariots, and for soldiers when needed, against the parapet which crowned the top of the slope. There were several courts within the palace, with an entranceway formed by a broad arch flanked by huge human-headed winged bulls. These bulls seem to have belonged to the order of sacred things, and were typical of strength, speed

and intelligence. The plans of these palaces show a thickness of walls and partitions of some twelve to fifteen feet. It was these thick walls that formed the second story.



No. 4. Section of Assyrian Palace.

The roof was formed of logs, and covered with clay mixed with straw and pounded hard; then covered with a coating of bitumen, and then another layer of clay, forming a thickness through which the heat of the sun could not penetrate.

The rooms of the first story were used during the day. The ingenious arrangement protecting them from the heat of the sun, and the cool breezes of the evening could be enjoyed from the top of the walls. The walls were built of sun-dried bricks, the lower eight feet wainscoted with slabs of sculptured alabaster, on which is told in the bas-reliefs and in the cuneiform inscriptions the history of the king, his wars, his sports and his cruelties, together with figures of the Gods, sacred trees and religious ceremonies. Many other things were there, pertaining to the manners and customs of the times. We have learned from Babylon and Assyria that much supposed to be of Greek origin was derived from the valleys of the Euphrates and the Tigris, and originated with a much older civilization. The clay walls above the wainscot and ceilings were decorated in color. The floors were underdrained and often paved with tile.

These palaces when occupied by the king and his court presented a scene of Asiatic magnificence, whose influence can be detected on the one hand through the Byzantine, Saracenic and Moorish styles to the Gothic of Western Europe, and on the other through the Grecian and Roman, though less perceptible, to the same point.

There are two legends, that were read from terra-cotta tablets discovered in an Assyrian palace, that are very curious. The writings commence by stating that the tablets were made to preserve legends long since old. One is known as the legend of the Creation. It seems that the gods had made the earth, and while looking upon it one of them remarked that it would be a good place for folks in their image, so a god was sent down to make some. He landed and looked about him for a smooth, sandy spot, and taking off his head he peppered the sand with his blood; then putting on his head he seated himself on a stone to contemplate the result. Soon there sprang up a crop of men, women and children; then the god arose and preached them a sermon, gave them some good moral instruction, and told them to pray to the gods and be happy. All went well for a time, but the old serpent crawled around and beguiled the women, when everything went by sixes and by sevens.

The other is the legend of the Deluge, which Noah tells to Nimrod, how the gods appeared to him and told him that the world would be destroyed by a deluge, and commanded him to build a ship. When the ship was ready he embarked with his family and friends and his servants, and taking on board a pilot and crew he set sail and touched at a point of land where he took his menagerie on board and proceeded on his voyage. It rained seven days and seven nights. The pilot run the ship aground on a mountain. Then Noah sent out a swallow, which soon came back; he then sent out a raven, which, finding plenty of food, did not come back.



The waters having subsided, Noah disembarked and proceeded to the top of the mountain, where he built an altar and sacrificed to the gods who gathered at the burning. These legends, of which I have given but a brief outline, are told at great length, and are to be found in the works of George Smith, known as "Assyria Smith."

We must not judge Assyrian art by the standard of Greek art, for they were of two very distinct orders. Greek art depended upon beauty of outline and exquisite modeling, and upon elegance of proportion,—the highest refinement in art. Assyrian art was a gorgeous, barbaric display of rich color and a profusion of surface ornament. It is not easy to imagine a more magnificent effect than the court of an Assyrian monarch must have presented, in the best days of the empire, with all its pomp and stately ceremonials, in the gorgeously decorated halls of one of these great palaces.

Building-Stone.

PAPER READ BEFORE THE CHICAGO ACADEMY OF SCIENCE,

NOVEMBER 27, 1883.

BY W. L. B. JENNEY, ARCHITECT.

CHICAGO is very rich in building-stone—in quantity, quality and variety. Lake Michigan and Lake Superior afford cheap transportation for the Vert Island sandstone of Canada, which is being used in the Royal Insurance Co.'s building; for the Marquette sandstone and for the marble of Delta county, Mich., etc., while the chain of lakes connecting with the canals opens to us the quarries of the sandstones of northern Ohio and the red sandstones of New York and Connecticut, and also all the granite quarries of New England; and not only these, but also the quarries of Scotland, from which we receive several varieties of granite and one excellent red sandstone, while our great system of railroads brings to Chicago every known building-stone in the country that is worth the transportation. We have the greenstone of Philadelphia, the Buena Vista stone of the Ohio river, and the rich cream-colored limestone from Minnesota, the beautiful white, red and black Hollowell & Bodwell granites from the Maine quarries, the Wirt Island or McArthur red sandstone, and many others as well as our local quarries, so that it may well be called an "embarrassment of riches," rendering somewhat complicated and uncertain the problem of finding the best stone for each special design.

A building-stone is one which by its chemical composition and physical structure is capable of resisting atmospheric influence and sustaining considerable pressure, and when used for architectural purposes the color and texture are matters of material importance, for they form a part of the design. It is easy to see the importance of the numerous contrasts that the great variety of the stone before us offers to the architect.

In large cities the consumption of coal, particularly bituminous coal, by the numerous manufactories, the decomposition of organic matter, etc., generate gases that contain deleterious substances that are absorbed by the rain, fog and dew, and thereby deposited on the surface of the stone and taken into the pores. The conditions are then favorable for injurious action of the chemicals.

These destroying substances consist of sulphuric, muriatic, nitric and carbonic acids. They will soon disfigure the surface and edges of porous stone composed largely of the carbonates of lime and magnesia, and will ultimately destroy the stone, though the lime required to be so serious as to affect the stability of the work is usually beyond the lifetime of the building. Still, there are many examples where the delicate tracery of Gothic windows has been entirely eaten away.

For architectural work, the appearance of the stone is a matter of great importance.

1. The stone must weather well, or, however handsome it may be at the outset, the work will soon become very untidy and be seriously disfigured.

2. The stone should be free from soft spots, flaws, blotches, from any considerable quantity of iron, and from petroleum. The Buena Vista sandstone, used for the old Board of Trade and the Custom House buildings, contains, in many parts of the quarry, both iron and petroleum. The iron soon develops in large iron-rust spots, and the petroleum in great green spots that will ruin the appearance of any building. You all, doubtless, remember the old Second Presbyterian church that before the fire stood on the corner of Washington street and Wabash avenue. It was built of prairie stone, that is filled with petroleum, or allied substances, that the heat of the sun soon brings to the surface, where it collects the dust and soot and presents a very untidy appearance. It is surprising to see such stone used in a private city residence. It is, however, valuable for rustic work in parks or grounds.

Stones of a laminated structure should be built into the work so as to expose the edges and not the face of the laminae to the weather, for if the face is exposed lamina after lamina soon scale off. The difference in strength is not great. Some experiments in England showed a loss of one-seventh inch by placing the strata vertical.

The numerous samples before me show that Chicago is very rich in varieties of building-stone. They come to us from the North, the South, the East, and the West; from Canada to Tennessee; from the coast of Maine to beyond the Mississippi; and represent every degree of hardness and softness, and every variety of texture and color.

The question, What stone shall be used? arises with every building erected. The appearance, after a few years' exposure, in the building

should govern every choice. This can readily be learned after the stone has been used for some time in similar external conditions. But it often happens of late that new quarries are opened or stone presented in Chicago that heretofore has only been used in the country, and the architect must judge of the qualities of the stone for city use by an examination of a few specimens.

The atmospherical conditions in the country are very different from the city. For example, I examined the Bedford stone in a court-house in a small town near the quarry, built some ten years before. The stone was whiter than in the building near by that was just being completed. I also visited Louisville, and saw the same stone in some dwelling-houses in the residence quarter. Here the stone had a soft, light gray color, about the color of unbleached linen. I also examined the same stone in buildings in the center of the business quarter, where it was exposed to much smoke and dust, and here it was a very dark, cold gray, about the color of an old shingle roof after a rain. In the first two instances this stone presented a very handsome appearance, while in the last it was black, dingy and unattractive. The weathering qualities of this stone, as regards durability, were excellent in all three instances.

Speaking generally, in comparing stones of the same class, the least porous, most dense, and strongest, will be the most durable in atmospheres which have no special tendency to attack the constituents of the stone.

When we are forced to judge of the qualities of stone for building purposes from specimens only, we may acquire a certain amount of information from the following tests:

A recent fracture, when examined through a powerful magnifying glass should be bright, clean, and sharp, with the grains well cemented together. A dull, earthy appearance betokens a stone likely to decay.

Its resistance to crushing may be ascertained by crushing one-inch cubes. This test is of more or less importance, according to the use to be made of the stone, and in important buildings should certainly be approximately known. It is claimed by some authorities that it gives some idea of the ability to resist frost, but I think that this test is only valuable in comparing stones of similar character—sandstone with sandstone, etc.

An important test is to compare the new stone with a well-known similar stone by immersing the two, after thoroughly drying, in water for twenty-four hours, and weighing the stones, both before and after immersion. As a rule, the best stone absorbs the least weight of water. I find a table published with the South Kensington Notes on Building Construction: Good granite absorbs one-half per cent of water; indifferent granite absorbs one per cent of water; very bad granite absorbs three per cent of water; very durable sandstone absorbs eight per cent of water; moderately durable sandstone absorbs ten per cent of water; very bad sandstone absorbs twenty per cent of water; good limestone absorbs thirteen to sixteen per cent of water.

There is an examination known as "Brad's test." Small pieces are immersed in a concentrated boiling solution of sulphate of soda, and then hung up for a few days in the air. The salt crystallizes in the pores of the stone and sometimes forces off bits and even quite large fragments. Weigh the stone before and after the test, the difference gives the exact amount detached. The greater this is, the worse the quality of the stone.

The acid test consists in immersing the stone for several days in a solution of water to which one per cent of sulphuric acid and one per cent of H. Cl. is added. The effect on the stone, as compared with the effect upon a well-known stone of similar character, will give some idea of the power to resist a city atmosphere.

There is a test known as the C. H. Smith test: it is for the purpose of learning if the stone contains earthy or mineral matter easy of solution. Thoroughly wash and even soak the stone to be tested, and then chip off thin flakes of the size of a dime or a quarter of a dollar, and put them to soak in a glass, covering them with distilled water, and covering the glass to keep out any dust; allow the glass to stand quiet at least a half hour and then agitate by giving the glass a circular motion; decant off, and examine the water. If it is clear, it shows that the stone is highly crystalline and well cemented, but if the specimen contains uncrystallized substances or earthy powder, the water will be milky or turbid.

(To be continued.)

New York's Tallest Building.

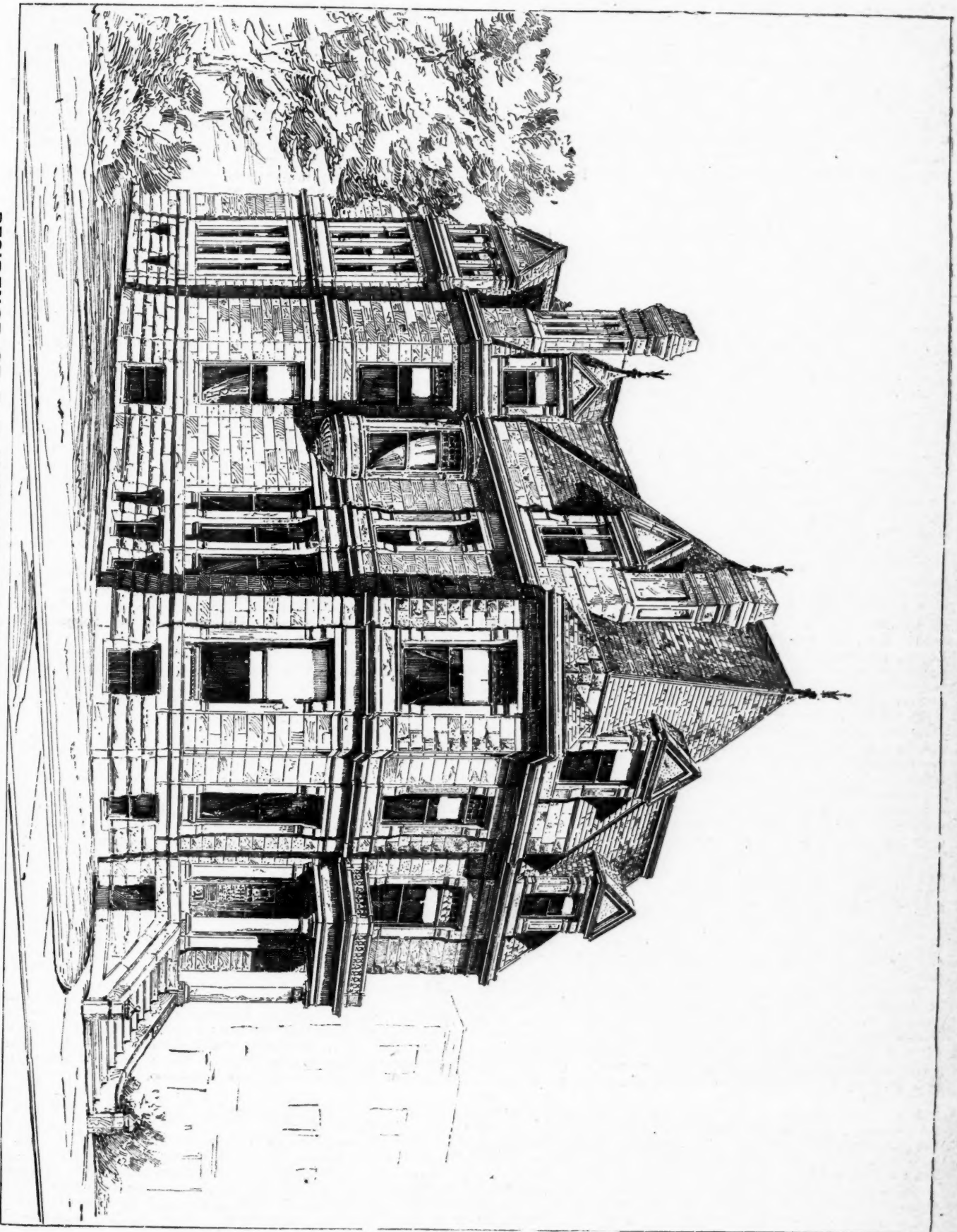
APPLICATION has been made to the Building Inspectors' department of New York city for a permit to construct an apartment-house at the corner of Seventh avenue and Fifty-seventh street, to be one hundred and eighty-two feet from curb to line of roof. The building will be fifteen stories high, and will have a cupola forty feet high on the top of the building, making the peak two hundred and twenty-two feet above the curb line, or only sixty-two feet lower than the spire of Trinity Church. The estimated cost of the structure is \$650,000.

Our Illustrations.

Page 147. Residence for P. C. Hanford, Esq., to be built on Calumet avenue, near Twentieth street. The walls will be built of Connecticut brownstone, and the structure when completed will cost \$40,000. In design, the exterior is extremely tasteful, and the owner's wish is to secure a thoroughly elegant and harmonious interior, all the details of which have not as yet been fully decided upon. The foundations have been commenced.

Page 145. Odd Bits from an Architect's Sketchbook, by F. Wm. Fieder, architect. Carved wood panel, hall mantel, in two designs, side-board, etc., from original designs.

Page 143. Chicago Manual Training School, Twelfth street and Michigan avenue, S. S. Beman, architect. The main building is four stories and basement in height, with an extension of three stories. It covers about 100 by 80 feet, is built of pressed brick, and will cost \$50,000.



RESIDENCE OF P. C. HANFORD, Esq., CHICAGO.—Jaffrey & Scott, Architects.

PAUL C. LADYBURN, DEL.

Architectural and Building Notes.

ARCHITECTS O. J. PIERCE & SPEYER are planning a block of ten houses to be erected on Vincennes avenue.

THE latest work in stained glass by Messrs. Healy & Millet is that for the new Episcopal church at Ravenswood.

ARCHITECT GEO. H. EDBROOKE has plans for flat-building at 329 East Indiana street, for Mr. D. D. Fanning, to cost \$12,000.

ARCHITECT H. REHWALDT has plans for a brick dwelling at 216 and 218 Ohio street, for Mr. H. Wedemeyer, to cost \$10,000.

ARCHITECT GEO. LEHMAN is building a freight depot for the Cincinnati, Pittsburgh & St. Louis Railroad Co., to cost \$20,000.

ARCHITECT S. V. SHIPMAN has plans for a flouring mill at 68-77 North Canal street, for Echert, Swan & Co., to cost \$50,000.

ARCHITECT JAMES R. WILLETT has planned store and flat building at 2013-15 State street, for McKee & Tuphill, to cost \$13,000.

ARCHITECT J. N. HILTON has completed plans for a flat-building at the northwest corner of State and Huron streets, for Mr. James Kirkland.

ARCHITECT W. H. DRAKE has plans for a brick and stone dwelling, to be erected at 3008-10 Calumet avenue, for Mr. C. D. Wetherell, to cost \$25,000.

ARCHITECTS WHEELLOCK & CLAY have plans for a residence, 30 by 54, two stories, basement and attic in height, with front of green-stone, rock-faced and laid irregularly, to cost \$12,000.

ARCHITECT GEO. A. MASTERS is fast completing the reconstruction of the Lyceum Theater on South Desplaines street. The owner, Mr. Jos. Downey, is spending \$50,000 upon the building.

ARCHITECTS BURNHAM & ROOT have made plans for a residence for Mr. Baldwin at No. 2925 Prairie avenue. It will be two stories and basement in height; front of Anderson pressed brick.

ARCHITECT J. C. COCHRANE has plans for a two-story residence, to be erected on Michigan boulevard, south of Twenty-fifth street, for Mr. Godfrey Snyder, \$40,000. Also a modern stable, to cost about \$4,000.

ARCHITECTS ADLER & SULLIVAN have completed plans for a business and office block, 50 by 70, to be erected on the east side of Jackson street, between State and Dearborn streets, for Mr. E. L. Brand, to cost \$15,000.

ARCHITECT S. S. BEMAN has drawn plans for a very handsome residence for Dr. F. Nelson, to be erected on Indiana avenue, near Twenty-sixth street. It will be of Anderson pressed brick with brown-stone trimmings, and will cost about \$16,000.

THE *Inter Ocean* real estate man came out *strong* on the recent meeting of the Master Plumbers' Association of Chicago, in the issue of November 25. He not only gave the names of the members present at the roll call, but also a full list of the membership.

ARCHITECTS FURST & RUDOLPH have planned a schoolhouse 70 by 100 feet, containing twelve schoolrooms and one audience-room, to be built of common brick, pressed brick and stone trimmings, situated on Newberry avenue, near Twelfth street. Cost, \$40,000.

THE belt courses of red terra-cotta around the new Commercial National Bank, and the other terra-cotta ornamentations furnished by the Perth Amboy Terra-Cotta Co. show well in connection with our western brick. It is of a solid and uniform texture, and has because of its excellent quality become a staple in the Chicago building material market.

ARCHITECTS BAUER & HILL have planned an emigrant hotel for the German Society for the Protection of Emigrants, to be built on Clinton street, between Van Buren and Jackson streets, 75 by 110 feet. The front will be a handsome one of stone for the first story, with the three higher stories of Chicago Anderson pressed-brick and stone trimmings. The work will not be commenced until spring.

A FINE sample of fireproofing is now observable in the new Board of Trade building, where the P. B. Wight Fireproofing Company are placing perhaps the largest contract for this material ever let in the West. Particularly interesting is the encasement of the mammoth wrought-iron columns, which support the tower, in light porous terra-cotta, a material that is light in weight, yet is almost a perfect nonconductor of heat.

ARCHITECT OTTO H. MATZ has let the contracts for three two-story-and-cellar stone-front buildings, one store, and five flats, on O'Brien near Union street, 60 by 50 feet, to cost \$11,000. The interior finish is red oak. Mr. Matz is building on North State street, for Mr. John Huber, a two-story-and-basement brick building, 35 by 80, to cost \$8,500, and is also letting the contracts for a three-story-and-basement brick building, stores and flats, on Ogden avenue, for Mr. William Burk, to cost \$7,000.

THE Northwestern Terra-Cotta Co., of which Messrs. True, Brunkhorst & Co. are the proprietors, are not only the pioneers in the making of red terra-cotta in the United States, but are the first firm in the West to place a large sum of money in a plant, and employ first-class artist for designing. They also make buff and other colors in patterns unique and beautiful. The capacity enables them to turn out immense quantities of material which is largely in demand throughout the entire West.

THE Ottawa Tile Company have commenced supplying the hollow tile for arches of nine floors and the partitions of the Pullman office building and also for the furring of the outside walls. This company have been awarded the contract for the fireproofing of the new Sibley warehouse and the J. D. Parker office building, and the residence of Wilbur F. Story, on Grand boulevard, Hyde Park. The demand for fireproofing material is such that the enlargement of the plant at Ottawa is not too great to be run to its full capacity in the production of their excellent material, a fact that gives a positive indication of an increasing demand for fireproof buildings, both public and private.

THE building situation in Des Moines is illustrated by the following, taken from the *State Register*: "Three or four lonesome looking brick-layers were at work on the new Masonic building yesterday. The rest were standing about, or loafing at home, reading the President's message, and pondering over the stubbornness of contractors who will not pay more money for wages than they receive for their contracts." If Chicago brick-layers are foolish when they strike in the spring, what is the mental condition of those referred to who are striking at the end of the season?

THE Board of Managers of the World's Industrial and Cotton Centennial Exposition have adopted the design proposed by G. M. Jorgenson, architect, of Meridian, Miss., for the main building. It will be 1,500 feet long, 900 feet wide, with 1,000,398 square feet of floor space, including Music Hall in the center, with a seating capacity of 12,000 persons. The design also provides for main offices, telegraph office, newspaper department, fire department, police, hospital, waiting-rooms and life-saving apparatus. Ten plans were offered and three premiums awarded. The building will be the largest exposition building ever erected, except the one in London in 1862.

ARCHITECTS COBB & FROST have completed plans for an elaborate and picturesque residence for Mr. George C. Walker, of Chicago, to be erected at Geneva Lake, Wis. The house will be 60 by 80 feet, constructed entirely of wood, upon a foundation of rough boulders. It will be three stories high, but so designed as to give it a low, broad appearance. The structure will be sheltered by a high, steep roof broken by dormers and gables, and a large veranda will run around three sides of the first story. The same architects are building two houses for Mr. W. F. Myrick on Groveland Park avenue. They will be in pairs and will have unique and attractive cut-stone fronts, each 23 by 50 feet in size and two stories and basement in height.

THE American society of mechanical engineers were tendered a reception by the Yale & Towne Manufacturing Co. at their works at Stamford, Conn., on the 2d ult. This included a thorough inspection of the works, and the many mechanical productions of this company, which include some of the most remarkable inventions in the way of cranes, differential pulleys, scales, the bank and lock department, where perhaps the finest exhibition of timelocks in the world is made, and a special inspection of the huge testing machine owned by this company of 151,000 pounds capacity, the working of which was fully described to the visitors. A substantial lunch was served, and the occasion was one of great pleasure and profit to those of the engineering fraternity who were so happy as to have been in attendance.

PAUL C. LAUTRUP, whose reputation as an architectural designer and draughtsman is national, has turned his attention almost wholly toward water-color and black and white line perspective drawing. Artists who have seen Mr. Lautrup's water-color sketches pronounce them the highest of their class, and in line drawings his style is so distinct as to be readily distinguished from that of any other architectural draughtsman in this country. Mr. Lautrup has in hand a large amount of work for architects of distant cities as well as at home. The draughtsmen who do this class of work well being rare, and as it is not in demand except where the architect wishes to make a special exhibit of his plans, or for publication, it is much more convenient to engage one who is fully competent and who makes such work a business. Mr. Lautrup's office is at Room 33, 157 Washington street, Chicago.

ARCHITECT H. M. HANSEN has prepared plans for a block of five houses, two stories and cellar in height, fronts of Anderson pressed brick trimmed with stone and terra-cotta, to be erected on Clybourne avenue, between Perry and Cooper streets, for Mr. L. C. Stebbins. A double store and flat building, 50 by 70, four stories high, front of Anderson pressed brick with terra-cotta and cut-stone trimmings, to be erected at Nos. 1178 and 1180 Milwaukee avenue, for Mrs. L. Johnson. A flat-building, 22 by 45, three stories high, Anderson pressed-brick front, stone trimmings, for Mr. C. D. Meyer, to be erected on Delaware place, east of Rush street. Store and flats, 22 by 65, three stories high, front of Indiana pressed brick, cut-stone and terra-cotta trimmings, for Mr. John Clifford, to be erected at No. 351 East Division street, and a flat building, 24 by 45, for Mr. J. W. Kindt, on Lincoln near Belden avenue.

THE new rolling and pipe mills, which have been the principal object of interest at Kewanee, Ill., for the past few months, are now in successful operation. The dimensions of the rolling-mill is 75 by 200 feet, with an L 40 by 175 feet. Beside these there is a building covering the gas-producers, 40 by 150 feet, and another for the boilers, 40 by 110 feet. They are all heavy frame structures, covered overhead and on all sides with corrugated iron, which work consumed over forty tons of this material. The buildings complete cover an area of over two and one-half acres. The capacity of these works will approximate one hundred tons of pipe and tubes per twenty four hours, and will give employment to from one hundred to one hundred and fifty men and boys, which, in connection with the Haxtun steam heater-works department, will make a working force of over five hundred. The first iron was rolled on Wednesday, the 21st ult., and the pipe-mill is now in operation.

THE architects of Indianapolis held a meeting on the 6th inst., for the purpose of arranging to send applications for membership to the American Institute of Architects, with the ultimate intention of establishing a local chapter. The meeting was a decided success. The object of the meeting was brought forward by Mr. Wallingford, who has been a member for two years, and who called the attention of those present to the many advantages gained by such membership. For instance, in the Eastern cities the various chapters largely assist in forming building laws and arbitrating at competitions. The annual conventions of the institute are rare architectural treats, while the local meetings for discussions of various problems will promote a better general feeling in the profession. The following applications were sent on by Mr. Wallingford: B. H. Enos, Charles Mueller, J. H. and A. H. Stem and E. J. Hodgson. Several others will follow.

Lumber Notes.

THE product of the Chippewa is estimated at 130,000,000 feet.

THE Minneapolis mills, up to November 1, cut this season 302,151,300 feet.

WITHIN three years the number of sawmills in Arkansas has increased from 319 to over 1,200.

LEADING Canadian lumbermen are seeking to obtain a bounty on manufactured lumber to the United States.

A TRACT of 1,840 acres of pine-land in Clark county, Wis., was sold to a lumber company at La Crosse for \$68,000.

IT is stated that there will be fully 100,000,000 feet of logs in the Menominee, Wis., boom at the close of the season.

THE total number cut of Duluth mills amount to about 175,000,000 feet with some 50,000,000 feet of logs hung up in the streams.

FOREIGN capitalists have just bought a large tract of timber-land, in southeastern Arkansas, said to contain 460,000,000 feet of timber.

THE F. & P. M. railroad has hauled to the Saginaw river this season, up to October 1, over 40,000 carloads of logs. This constituted 1,400 trains.

THE stock of American walnut in England, at latest advices, was reported as large, and mostly held at high price. Few recent transactions have taken place.

THE amount of lumber shipped from the Saginaw river the present season up to the present time will not vary much from 75,000,000 feet short of that of last year.

MR. E. RICE, of the Big Falls Lumber Co., Stanton, Mich., who owns 60,000,000 feet of pine on Jump river and is about to sell it to the Dalles Lumber Co., of Eau Claire.

THERE has been rafted out of the Beef Slough, on the Mississippi river, this year 440,000,000 feet of logs, which is the largest amount ever rafted out on any previous year. There are yet a number of logs remaining in the slough.

A MICHIGAN lumberman, who recently looked over the redwood belt of California, says that he measured one tree that was 375 feet long, and saw plenty of them that were 300 feet high. He saw the logs cut from one acre that scaled 1,000,000 feet, and from fifteen acres were taken 12,000,000 feet.

THE Mexican government has contracted with Mr. Oscar A. Droege to plant 2,000,000 trees in the valley of Mexico within four years, from March 15, 1884—500,000 a year, in such places as the government shall choose. The contractor pledges himself to establish a number of nurseries and to have in them each year at least 800,000 ash, 35,000 willows, 120,000 poplars, 60,000 eucalyptus trees, 60,000 trenosjapones, 60,000 mountain cypress cedars, 60,000 acacias, and 120,000 of miscellaneous varieties. The trees must be in plantations of from 50,000 to 100,000 each, and Mr. Droege has to maintain them for two years after planting. He is not compelled to plant trees along the highways, however. Three graduates of the school of agriculture are to be received into the nurseries each year, there to study the science of forestry. He is also to raise fruit and other useful plants for free distribution. There is to be translated from the German every year a work on arboriculture of recognized merit. An inspector is to superintend, and Mr. Droege is to receive annually \$40,000 (£8,500) till the sum reaches a total of \$200,000 (£42,500).

New Publications.

A MANUAL FOR YOUNG ARCHITECTS, STUDENTS, AND OTHERS INTERESTED IN BUILDING OPERATIONS. BY T. M. CLARK. J. R. Osgood & Co., publishers.

This is a well written, concise treatise on building as it is carried on at the present day, and fills a niche in agricultural literature so admirably, that students, and others not professional architects, but called upon to direct building operations, will be glad to possess.

PRACTICAL GEOMETRY. BY JAMES A. MONCKTON. W. T. Comstock, publisher, 6 Astor Place, New York. \$1, bound in cloth.

This work is a series of lessons beginning with the simplest problems, and in the course embracing all the geometry likely to be required for the use of every class of mechanics, or that are needed for instruction in mechanical schools.

ARCHITECTS' AND BUILDERS' POCKET COMPANION AND PRICE BOOK; consisting of a short but comprehensive epitome of decimals, duodecimals, geometry and mensuration; with tables of U. S. measures, sizes, weights, strengths, etc., of iron, wood, stones, brick, cement and concretes. Quantities of material are given, sizes and dimensions of wood, brick and stone; and full and complete bills of prices for carpenters' work and painting; also rules for computing and valuing brick and brickwork, stonework, painting, plastering; with a vocabulary of technical terms, etc. BY FRANK W. VOGDES, architect, Indianapolis, Ind. Enlarged, revised and corrected. Philadelphia: Henry Cary Baird & Co., 810 Walnut street. Price \$2. Sent by mail free of postage to any part of the world.

This work has been known to architects and builders for some years past, and this new and revised edition now brought out will be highly appreciated.

THE ART INTERCHANGE. WM. WHITLOCK, publisher, \$3 a year, 140 Nassau street, New York.

The Art Interchange for November, 1883, has, besides its very valuable and serviceable Notes and Queries, two designs—Phlox and Pinks—for china painting; an embroidery design for a cushion from the Royal School of Art Needlework, South Kensington; an Althea design for vase decoration; several designs for drawn-work and for stained-glass decoration. Mr. W. H. Eggleston, Jr., a practical artist and designer in Mosaic Glass, contributes a paper on the subject, and there is a practical elementary article on Hammering Brass—the kind of home art work now uppermost in interest. In the next issue a number of designs for Brass Hammering and Sketching

on Linen will be given. The prize literary questions, under which the current novel of the "Bread Winners" was so interestingly discussed, are continued by the propounding of two more Open Questions, taken from Mr. Howell's "A Woman's Reason." For these a similar prize is offered.

The Art Interchange is published fortnightly, at \$3 a year, by Wm. Whitlock, 140 Nassau street, New York.

CHICAGO STREET FRONTS. Illustrated by a set of thirty photographs. Published by J. W. Taylor, 146 La Salle street, Chicago. \$12 per set.

In reviewing this set of photographs it is hard to speak of them in proper terms, because of their obvious superiority in a photographic sense to almost every other similar attempt to illustrate street architecture. Besides being excellent prints, marvelously clear and sharp of outline, the line of perspective is exceedingly well chosen, and each front gives to the beholder all that was intended to be presented. As a piece of mechanical work, they will compare favorably with the best, while from the standpoint of enterprise Mr. Taylor is to be greatly commended in securing for public view the best architecture our city can boast of and hold it before the eyes of the youth of the profession, and bid them observe and profit by those forms and examples that have been born of the genius that crowns the architectural profession. Mr. Taylor deserves well of the profession for placing in their hands so valuable a collection of architectural photography. Two new sets of views are promised in the near future.

CATALOGUE AND PRICE-LIST OF KEUFFEL & ESSER, IMPORTERS AND MANUFACTURERS OF DRAWING MATERIALS, NEW YORK, 1883. Seventeenth edition. 127 Fulton street, and 42 Ann street, New York. Price fifty cents.

The well-known and popular drawing-material house of Keuffel & Esser, of New York, whose peculiar griffin-head and claws trademark is stamped upon most of the drawing-instruments and paper now in use, have issued an unusually handsome and complete catalogue containing cuts and descriptions of almost every instrument used or known to the architectural or engineering draughtsman. So noted has the annual catalogue issued for almost two decades by this firm become, that this year they were compelled, at undoubtedly enormous expense, to procure new cuts because of the copying of them by other houses in the same line of trade. The cuts represent clearly the goods manufactured by Keuffel & Esser, and should materially aid in the selection of drawing materials. The house which this mark represents is probably the largest, best known and popular of their line among the architectural and engineering professions, and long trial has given their goods so enviable a reputation for correctness and practical utility that they compete successfully with any others, domestic or imported. The catalogue also shows a long list of drawing papers, the Paragon, Universal and Duplex being the special brands manufactured. The different departments of the house are arranged throughout systematically, and as a thorough exposé of the facilities and resources of the celebrated house of Keuffel & Esser, this catalogue is perfect, while typographically it is clear, concise and pleasant to the eye, the cuts being of unusual clearness and artistic in arrangement. In Chicago catalogues can be procured from Gustav Hinstorff, 48 Dearborn street, who represents Keuffel & Esser by making a specialty of their goods. Messrs. Keuffel & Esser deserve the congratulations of the trade upon their catalogue for 1883-4.

The Builders' Weekly Reporter, London, Eng., is a most welcome visitant to our sanctum. Devoted to architecture, engineering, sculpture and the decorative arts, it affords a comprehensive view of what is going on in the world in these several specialties, particularly in the Old World. It is edited with marked ability, and deserves the high place universally accorded to it. We are largely its debtor.

The Georgia Capitol Competition.

Editor of Inland Architect and Builder:

DEAR SIR,—In an article on the "Georgia Capitol Competition" in the November number of the INLAND ARCHITECT, we think that you do architects great injustice, when you state that they can prepare such drawings as are required by the Capitol Commissioners for the sum of \$1,200 or \$1,500, when every architect very well knows that it will cost him ten times that amount when properly done. Such statements do architects great harm, especially when made in the editorial columns of an architectural journal, in leading people to believe that architects' profits are enormous at the regular rates; and so they would be, were such statements correct; for take this one case, which at two or three per cent, the lowest rates, amounts to \$16,000 or \$24,000, which only cost him \$1,200 or \$1,500 to earn, and on this basis the Georgia Commissioners are offering reasonable compensation for their designs, barring the competition.

Hoping that you will do the profession justice in the future and make ample atonement for this one error, we remain,

Yours truly,

CAUKIN & RAE.

When the editorial in question was written it was intended to refer simply to the preparation of exterior plans, such as are called for in the first two articles of the invitation, and referred to mere outline sketches, such as are usually sent in in response to competitive invitations. The utter absurdity of the demand set forth in the remainder of the "invitation" would preclude all serious attention to it, for no architect would go to the expense involved in preparing detail plans and estimates of material involving a cost of from \$24,000 to \$36,000 upon the simple invitation of a state or county board, and in the face of "any or all plans rejected." Our friends are quite right in calling our attention to the matter, but are assured that it is impossible for to secure full detail plans, specifications and estimates upon labor and material for the same, in response to "invitations to architects," as it should be to secure drawings of any sort in such cases from reputable architects.—[ED. INLAND ARCHITECT AND BUILDER.]

Synopsis of Building News.

Bloomington, Ind.—The outlook for the coming season is beyond precedent. More work is projected than can possibly be done with present facilities. There has been destroyed by fire something over \$325,000 worth of buildings, which adds to the prospect for a very lively "boom."

Architect Jno. Link: Bady Bros., two frame dwellings, 30 by 40 feet, cost \$1,000 each; A. Robinson, contractor. American Roof Co., frame factory with tin roof, 132 by 100 feet, cost \$3,000; J. Williams, contractor. J. R. East, two-story frame dwelling, 36 by 57 feet, cost \$2,000; A. Robinson, contractor. Samuel Smith, two-story frame dwelling, 40 by 45 feet, cost \$2,600; H. J. Nichols & Son, contractors. T. H. Sudbury, two-story brick marble-shop, tin roof, 25 by 85 feet, cost \$3,000; same contractors. All of the above under way. N. N. Hill, two-story stone business-house, 40 by 100 feet, cost \$10,000; projected.

Chicago, Ill.—Every advantage is taken of the open winter and building seems as active as in the summer season. Many buildings that were projected for next spring are already under way; and if the favorable weather continues many new foundations will be put in and the superstructures carried up to, or toward, completion. So much activity prevails, our architects have neglected us for this month.

O. J. Pierce & Spenser, Architects: Union Mutual Life Insurance Co. of Maine, ten three-story bricks with stone trimmings and slated towers, 18 feet 9 inches by 58 feet, seven on Vincennes avenue, two on Oak avenue, and one corner of Vincennes and Oak avenues; aggregate cost, \$50,000; contracts being let.

Architects Furst & Rudolph: For Richard Healy, block of two stores, with flats above, basement, three stories and attic high, on the northwest corner of Archer avenue and Main street; cut-stone front; cost \$20,000. Mrs. C. Sullivan, store with flats above, basement and three stories high, on West Twelfth street near Jefferson; cost \$10,000. D. E. Healy, store with flats above, basement, three stories and attic high, northwest corner of Archer avenue and Fuller street, pressed brick front and stone trimmings; cost \$12,000. William Fleming, block of four-flat buildings, cellar and three stories high, 100 feet front, Morgan street, near Van Buren, pressed brick front, with stone trimmings; cost \$30,000. J. J. Cohen, block of three apartment houses, basement and three stories high, each house arranged for two families, northwest corner of Wisconsin and Loneragan streets, cut-stone front; cost \$32,000. Louis Schumacher, flat-building three stories high, Morgan street, near Blue Island avenue, pressed brick front and cut-stone trimmings; cost \$6,500. E. A. Saalfeld, three-story flat-building, Garfield avenue, near Orchard street, Anderson pressed brick front, with cut-stone trimmings; cost \$8,500. J. H. Haaker, a flat-building, three stories high, Ontario street, between Wells and La Salle, pressed brick front, with stone trimmings; cost \$7,000. Jacob Hissler, store with flats above, three stories and basement high, State street, between Thirty-fourth and Thirty-fifth; cost \$10,000. John Dahmke, block of two stores, with flats above, basement and three stories high; also ice and smoke houses, West Lake street, near Western avenue; cost \$22,000. F. W. Weber, block of ten stores, with flats above, basement and three stories high, Halsted street, near Twelfth, pressed brick front, with stone trimmings; cost \$17,000. Henry Gnadinger, block of three stores with flats above, basement and three stories high, West Twelfth street near Loomis, Anderson pressed brick front with cut-stone trimmings; cost \$25,000. Anton Rupp, flat-building, basement and three stories high, Groveland Park avenue, near Twenty-ninth street; cost \$7,000. Adolph Ober, two dwelling houses, basement, two stories and attic high, corner of Fulton street and Oakley avenue; cost \$12,000. E. R. Schall, block of three dwelling-houses, basement and two stories high, 75 feet frontage on Prairie avenue, near Thirty-third street, cut-stone front; to cost \$13,000. A. Hottinger, flat-building, four stories and cellar high, Sedgwick street, corner of Sullivan, cut-stone front; to cost \$14,000. C. F. Blaul, three-story flat-building with addition to adjoining two buildings, Desplaines street, near Depuyser; to cost \$12,000. Henry Furst and Peter Neu, block of two flat-buildings, cellar and three stories high, brown-stone fronts, West Congress street, near Loomis; also two barns for same parties; entire cost \$22,000. Mrs. M. Gail, residence on Michigan avenue near Sixteenth street, basement and two stories high, pressed brick front, stone trimmings; to cost \$8,500. William Henneberry, residence on West Jackson street, basement and two stories and attic high, cut-stone front, with mansard roof; to cost \$12,000. Jacob H. Beidler, building for manufacturing purposes, basement and four stories high, 150 by 75 feet, Waldo place, between Union and Halsted streets; to cost \$25,000. Horn Bros., furniture factory, 42 by 130 feet, basement and four stories high, with engine and boiler rooms, West Superior street; cost \$11,000. Theo. A. Kochs, manufacturing building, basement and four stories high, northeast corner Wells and Erie streets; cost \$20,000. John Kummer, residence, northwest corner Ashland avenue and York street, basement and two stories high, cut-stone front; cost \$11,000; also barn for same; cost \$1,800. John Corlies, residence, Ashland avenue near York street, basement and two stories high, cut-stone front; cost \$10,000. St. Francis Catholic Congregation, the Rev. F. Kalvalage, pastor, a schoolhouse 70 by 130 feet, basement and three stories high, arranged for twelve school-rooms and one large audience room in upper story; to be faced with common brick, trimmings of cut-stone and pressed brick; the building is being built on Newberry avenue, near Twelfth street, and when completed will cost \$40,000.

Cincinnati, O.—The present condition of building is good and the outlook quite encouraging.

Architect Geo. W. Rapp: Felix Bahlmann, two-and-a-half-story brick dwelling, 60 by 35 feet, Woodburne avenue, Walnut Hills, cost, \$9,000; Kemme & Rosentel, contractors. Louis Ballauf, two-and-a-half-story brick building, slate and tin roof, 43 by 63 feet, cost \$10,000; Walnut Hills Club, one-and-a-half-story frame, composition roof, parlors, billiard-room, bowling alleys, etc., cost \$4,000, Kemme & Rosentel, contractors.

Denver, Col.—The building status is good and the prospect for the coming season is very encouraging. During September sixty-two building permits were granted of value, \$199,475, and in October fifty-seven were issued, representing \$100,660. The most important of the buildings were: L. J. Laws, two-story brick dwelling, 30 by 60 feet, on Grant avenue, cost \$8,000; E. P. Brink, architect. Denver street Railway Co., four-story brick stable and car barn, 100 by 125 feet, on seventeenth street, cost \$50,000; J. W. Roberts, architect. Henry Gebhart, two-story and basement brick dwelling, 40 by 65 feet, on Downing avenue, cost \$8,000; E. P. Brink, architect. Campbell, Rusk & Forman, three frame and one brick dwellings, foot of Thirty-first street, cost \$25,000; Harvey & Washburne, builders. R. A. Long, double two-story brick dwelling, 47 by 60 feet, cost \$8,000; F. E. Edbrooke & Co., architects. Dr. Wagner, three-story and basement brick store building, 25 by 60 feet, and two-story brick shop, 25 by 25 feet, on Larimer street, cost \$7,000; Wm. Fuayle, architect. Mrs. Roach, two-story brick store block, 44 by 61 feet, on Larimer street, cost \$8,000; J. H. Littlefield, architect. T. M. Patterson, additions and alterations to residence, corner of Walton and Seventeenth streets, cost \$6,000; R. S. Roehlaub, architect. Belmont & Hanson, roller-skating rink, one story brick, 63 by 149 feet, Sixteenth street, cost \$8,000; F. E. Edbrooke & Co., architects. Adaline Rusk, two-and-a-half-story brick dwelling, 35 by 70 feet, and one-and-a-half-story brick barn, 25 by 35 feet, Sherman avenue, aggregate cost \$17,500; same architects. A. T. Lewis, two-story block of eight stores, 35 by 125 feet, sixteenth street, cost \$10,000; Truesdell & Co., architects.

Architects Seely & Hall are building an \$8,000 Masonic Hall at Longmont, Col.; Architect R. S. Roehlaub has completed the plans for a school-building at Colorado Springs, Col., to cost \$15,000; Architect J. M. Nichols is engaged on the plans for a M. E. church building to cost \$100,000.

Des Moines, Ia.—The building prospect for 1884 promises as much or more activity than that of 1883. Some sixty or seventy business houses will be built besides and much other building. A \$400,000 hotel is a sure thing, and three or four churches, two schoolhouses and several French flats are about settled upon. The general outlook for the entire state is good. Architects already have considerable work in their offices for spring projects, embracing stores, office-buildings, tenement houses, etc.

Architect C. H. Lee: For E. F. Dick, three-story and basement brick, stone trimmings, slate and tin roof, 22 by 132 feet, cost \$20,000; H. C. Hanson, three-story and basement brick and Asbestine stone, Asbestos roof, 40 by 107 feet, cost \$22,000; Dakota Territory, Agricultural College building, four stories, brick with stone basement, 68 by 80 feet, cost \$30,000; Guthrie Co., Ia., courthouse, three-story, brick veneer with slate mansard, 58 by 78 feet, cost \$21,000; Independent School District, Panora, Ia., two-story brick veneer school-building, slate roof, 62 by 65 feet, cost \$9,600 (the above just completed); Independent School District, Gilbert, Ia., one-story school-building, stone and brick walls, slate roof, 38.6 by 40 feet, cost \$2,250; Independent School District, Grant, Ia., school-building, brick and stone walls, slate roof, 34.6 by 29 feet, cost \$1,965 (nearly completed); Odd Fellows, two-story and basement, frame hall, with stores, 24 by 60 feet, cost \$2,340 (under way); Citizens and A. F. M., Oakland, Ia., two-story town hall and lodgeroom, 30 by 70 feet, cost \$3,500; Geo. W. Jones, double brick tenement house, three stories, 43 by 60 feet, cost \$5,000 (projected).

Architect W. L. Plack: For W. S. Pritchard, three-story brick building, front Chicago pressed brick, terra-cotta trimmings, stores and offices, 22 by 132 feet, cost

\$15,000, E. G. Kimble, contractor (almost completed); S. B. Gaston, three-story brick building, front Chicago pressed brick, galvanized iron trimmings, stores and offices, 20 by 80 feet, cost \$7,000, Hermann Hand, contractor; A. T. McCaiger, frame cottage with tower and verandas, cresting and finials on roof, 28 by 43 feet, cost \$3,000, F. S. Whitney, contractor; H. C. Senteny, Queen Anne cottage, frame, 25 by 38 feet, cost \$2,100, Poulson & Willets, contractors (above just completed); Syndicate Block, three-stories high, brick trimmed with stone, quite elaborate, six stores and offices, 80 by 120 feet, cost \$37,500, W. Christy, John Bailey and Seaver & Co., contractors (nearly completed); Wesley M. E. Church Society, one-story brick, amphitheater seating groined arched ceiling, exterior trimmings, galvanized iron and artificial stone, 70 by 116 feet, cost \$20,000, Louis Sommar, contractor; Percival & Hatton, French flat, four stories, Chicago pressed brick with brown-stone trimmings, fourteen oriel windows, 45 by 88 feet, cost \$27,000, L. A. Robertson and S. C. Wherry, contractors (above ready for roofs); Geo. Garver, additions, remodeling and new roof to three-story brick, 45 by 62 feet, cost \$2,700, A. Oleson, contractor; W. H. Dickenson, remodeling interior of frame residence in mahogany and oak, cost \$3,200, E. J. Kimble, contractor (above under way); C. W. Pitcairn, block of two-story tenement buildings, pressed brick, stone trimmings, plate glass, cost \$12,000, John Bailey, contractor (material on the ground).

Kansas City, Mo.—Work is still going on, and the outlook is good. There are twenty-five architects in Kansas City, and none complaining.

Architect L. L. Levering: H. H. Lyman, two-story eight room residence, brick, cost \$2,600; W. H. Strayer, two-story nine room residence, brick, cost \$5,000 (done by the day and nearly completed); A. B. Mathews, brick addition to residence (nearly completed), cost \$3,500; B. M. Brake, two-story eight-room residence, brick, cost \$2,500 (just completed); Christian Society, church-building, brick, with stone trimmings, basement with auditorium, provincial spire 183 feet high, 105 by 60 feet, cost \$36,000 (will be completed by January 15). With the exception of the church, above was November work.

Louisville, Ky.—Outdoor business about closed for the season. The outlook for business the coming season is highly encouraging.

Architects McDonald Bros.: Clinton, Hickman Co., court-house, three-story brick and stone, fireproof offices, 65 by 79 feet, cost \$22,000; J. M. Cosley, contractor. John Coputon, four-story building, pressed brick and stone, stores and flats, 116 by 71 feet, cost \$33,000, let in detail. (Above under way.) Robert Otter, brick dwelling, cost \$7,500, J. F. Calloway, pressed brick dwelling, cost \$8,500. (Above just completed.) Williamsburg, Shelby Co., court-house, cost \$20,000. (Being got ready.) Southern Exposition Building, 920 by 620 feet, cost \$209,000. (Finished during the summer.) Princeton, Gibson Co., Ind., court-house, stone, terra-cotta and pressed brick, fireproof throughout, 90 by 120 feet, cost \$120,000; J. G. Miller, contractor. Lawrenceburg, Ky., jail, stone and steel, cost \$8,000. Mt. Sterling, Ky., jail, stone and steel, cost \$10,500.

Minneapolis, Minn.—Notwithstanding the lateness of the season, during November quite a number of new buildings were under way, as if the building "boom" of the year was disinclined to submit to the inevitable, is yielding to the foregone certainty that 1884 will be more remarkable in the number and cost of buildings than even this thrifty season has been. All architects and builders are in elated spirits over the prospect held out by the coming year. The following is the status of the month just gone, from the 11th to the 30th, relative to the buildings under way:

Wm. Duhakes, residence, cost \$6,000; E. Patton, house, cost \$1,800; M. Devereaux, dwelling, cost \$2,500; Jo. Graves, double house; J. P. Keller, store building; Richard Pew, dwelling, cost \$1,500; Jno. Fleetham, dwelling, cost \$5,000; Byers & Augurs, new brickworks, 66 by 30; D. Mahone, house, cost \$3,000; H. H. Bradwell, house, cost \$2,000; H. R. Purysan, house, cost \$2,000; McMillan & Hastings, house, cost \$2,000; M. Mahn, house, cost \$1,500; E. Eichhorn, double tenement, cost \$4,000; Mrs. Lemers, double house; J. P. Just, dwelling, cost \$3,000; E. Brosins, two-story brick bakery, cost \$3,500; L. F. Menage, two three-story frame; J. H. Rowell, two-story frame store-building; H. W. Smith, two-story frame store-building; E. B. Wakenau, double house, frame; J. C. Clifford, dwelling, cost \$3,000; C. C. Clendenin, dwelling, cost \$2,500; W. W. Whitmore, dwelling, \$3,000; U. Thomas, two stores; R. F. Farrington, double house; G. F. Bockas, dwelling, cost \$2,500; Herman Westfal, large icehouse; D. K. Adams, dwelling, cost \$3,000; H. L. Swan, dwelling, cost \$3,000; Chas. Robedean, dwelling, cost \$4,000. The armory was in the plasterer's hands, the West Hotel nearly under roof, and the Chamber of Commerce slated. Among the prominent projected buildings, already on the *tapis*, are: block of houses for C. A. Burney, red brick, brownstone and stucco work, cost \$12,000; jobbing-house building for W. E. Steel, cost \$20,000; double tenement for F. McDonald, cost \$5,000; a 1,000,000 bushel elevator for the Minneapolis Elevator Company, cost \$125,000.

Richmond, Va.—The outlook for winter work is poor, but more encouraging for next spring.

Architect Geo. C. Moser: C. E. Whitlock, alterations on three-story store-building, new front, pressed brick, Barea-stone trimmings, galvanized iron cornice, terra-cotta panels, etc., cost \$6,000. (Out for bids.) Chas. H. Talbot, block of three three-story and basement houses, pressed brick and Portsmouth stone, pebble brick belt, terra-cotta panels, etc., 84.5 by 98.5 feet, cost \$28,000; contractors, Jas. Fox, Ellis Redford and A. F. Brown. (Under roof.) B. Samuels, alterations in three-story store front, pressed brick, Barea-stone and galvanized cornice, cost \$6,000. (Projected.)

St. Paul, Minn.—Season about closed; prospects for next year indicate the buildings will be more of a commercial character than for the past season, and the amount to be expended promises to exceed the expenditure of 1883.

Architects Carpenter & Foltz: Chamber of Commerce, six stories, pressed brick fronts on two sides, stone trimmings, 50 by 130 feet, cost \$90,000. Capitol Bank, six stories, Philadelphia brick and granite front, fireproof throughout, cost \$60,000. C. Eggleston, Lakeside cottage, two stories, frame, 30 by 42 feet, cost \$4,000. Wm. Hanson, two-story frame cottage, 30 by 32 feet, cost \$3,000. (All of the above projected.)

Architect S. Walter Stevens has just completed for H. E. Thompson the plans for one of the most notable buildings yet erected in St. Paul. It will have a combined frontage of nearly 500 feet, and an altitude of four stories. The first story will be divided into fifteen stores, each with the best glass fronts yet seen in the city. The upper stories will be divided into suites of living apartments, provided with all modern improvements. The building will be heated with steam throughout from boilers placed in another building. Hot and cold water will be carried over all the floors, and elevators connect the various floors in addition to the staircases. The building will be thoroughly fireproof, besides provided with fire-escapes, standpipes, etc.

The plans for the new Capitol building have been accepted, and the architects have been given liberty to make it the handsomest building in St. Paul. The building is to stand between the Gilfillan block and the Merchants, fronting thirty feet on Jackson street and running back ninety feet, and will be six stories in height, rising ten feet above the Gilfillan block. The material for construction will be Philadelphia pressed brick. The trimmings will be of quartz jasper and a fine quality of granite.

ARCHITECT JOHN C. COCHRANE has been engaged by the commissioners of Will county, Ill., to erect a county court-house.

ARCHITECT W. W. BOYINGTON was called to Madison, Wis., by the governor and capitol building commissioners and given full charge of the rebuilding of the south wing of the capitol, which recently collapsed, and the reconstruction of the north wing, which is in an unsafe condition.

T. L. JOHNSON, the popular representative of Keuffel & Esser, of New York, reached home just in season to eat his Thanksgiving turkey, after a very successful and thorough trip through the Western States.

ASBESTOS has, through the earnest efforts of reliable manufacturers and the coöperation of intelligent architects, become a large factor in the fireproofing of buildings. The H. W. Johns Manufacturing Co., who are the largest and best known makers of this material, are placing their building felt in some of the largest structures now under way. In Chicago the floors of the mammoth warehouse being built for the National Tube Works Co. are all being laid with the H. W. Johns Manufacturing Co.'s asbestos, and the new depot for the Western Indiana Railway Co. is lined with this excellent material.