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ARCHITECTURE

ENGINEERING

DECORATION

211 TREMONT ST.

CONSTRUCTION

BOSTON MASS.

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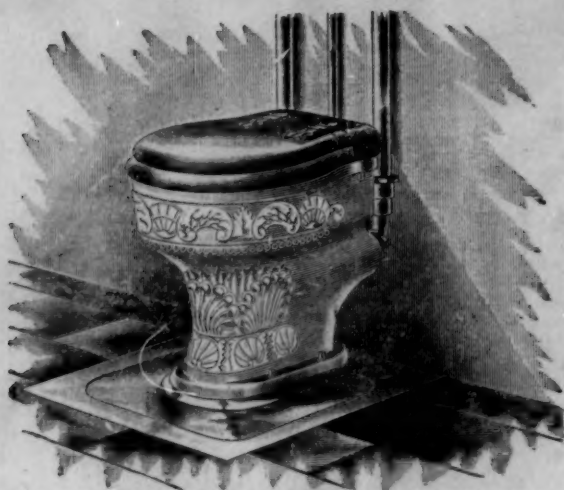
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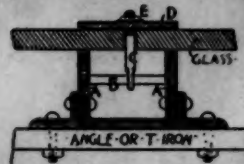
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VOL. XLVII.

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JANUARY 5, 1895.



SUMMARY:—

The McKaig Government Buildings Bill.—The Appointment of Colonel Waring as Street-cleaning Commissioner of New York.—Attempts at Coöperative Manufacture at Pittsburgh, Pa.—The Merits of Coöperation in Industrial Undertakings.—Labor's probable Attitude towards them.—The Proposed Nile Reservoir.—The Preservation of the Ruins at Philæ.—Our Last Week's Illustrations.	1
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IT should not be forgotten by architects that the question of opening the design of public buildings to the profession is now before Congress, the so-called McKaig Bill, providing for this under satisfactory terms, having been reported favorably to the House of Representatives by the Committee to which it was referred, and awaiting only a vote; while the Senate has still to await the report of its Committee upon it. The time of Congress has been so much taken up with more important matters that this has been necessarily postponed; but it seems probable that there will be time at the present session to consider less urgent questions, and it is much to be hoped that this may be acted upon at the first opportunity, and the friends of public art may do much to secure such action, by calling the attention of their acquaintances or representatives in Congress to the bill, and explaining the importance of having it enacted into law.

THERE is much of good augury in the fact that Colonel George E. Waring, Jr., has been selected by the new Mayor of New York as Commissioner of Street-cleaning. We need hardly explain what such an appointment as this means for the people of the city. New York has had enough, and more than enough, of officials who never had an idea in their lives beyond filling their pockets secretly with other people's money, and it is quite time that it had the services of men who understand and love the work that they are called upon to perform, and who have been brought up from childhood to look with horror on every kind of trickery and oppression. New York is rich enough, and generous enough, to employ the ablest and best professional men in the country, and it is to be hoped that the reign of the system under which the honest men who innocently endeavor to serve it are shoved aside unpaid, while ignorant knaves make fortunes by stealing the money entrusted to them for the work that they pretend to perform, is at an end, and that henceforth the expenditure of the taxpayers' millions will be put under the control of people who could be trusted with private funds. From a political point of view, it is rather a misfortune that just at this juncture the American Society of Civil Engineers should, for the second or third time, reject Colonel Waring's application for membership in that very influential, capable and honorable professional body. Those who do not know the facts may seek to use this blackballing as a weapon of political assault, whereas a question of professional ethics is the stumbling-block, the point at issue being Colonel Waring's right to patent the system of drainage which has conferred such immeasurable benefits on Memphis and other places.

SOME experiments of great interest are being tried in Pennsylvania. According to the *New York Tribune*, "a fever of coöperation in manufacturing enterprises appears to have seized upon this great labor centre [Pittsburgh.]"

"Recently several glass and iron plants have been started on a coöperative basis." Going into details, it says that a number of striking glass-workers have organized a coöperative company, with a capital stock of fifty thousand dollars, and have purchased an idle factory, belonging to the United States Glass Company. This factory, it appears, was partially burned, some months ago, and abandoned, but the inhabitants of the town have subscribed funds to aid the new proprietors in repairing it. At Wittmer Station, near Pittsburgh, a factory for making druggists' glassware is being built to be managed by a coöperative association; and the *Tribune* mentions three other glass-factories which will be, or are already, conducted in the same way. In Hubbard, Ohio, an idle iron-mill has been leased by workmen, who will operate it on the coöperative plan, the owner participating in the business with the men.

TO our mind, this movement seems one of great importance. Coöperative manufacturing is, of course, no novelty here, but the cases have been so scattered, and, in all probability, so much influenced by local or personal influences, that it has been difficult to form from them any valuable opinion in regard to the merits or demerits of the principle. Now, however, the coöperative factories seem likely to play an important part in the glass industry, and the average of their successes or misfortunes will give a better indication of the way in which coöperation may be expected to affect the manufacture, and the people engaged in it, than anything yet available. It is well known that, in Europe, coöperative industry, in the form of profit-sharing association, is declining. In England, the trade-unions, which are all-powerful, have set their faces sternly against participation in profits, which, as they say, no doubt with truth, "tends to lengthen the working day, and multiply extra hours; to attach the workman to his shop, by the fear of losing his dividend at the end of the year, and forms an obstacle to the general raising of wages." We need hardly say that the opposition of the trades-unions to coöperative industry is good evidence in favor of it. Their chief end, so far as we can see, as well as their most conspicuous tendency, is to reduce workmen to the condition of a caste of slaves, without ambition, happiness or hope, mere automatons in the hands of the unscrupulous tyrants who exploit them. To the union magnate, a workman who loves his work and his shop, who is willing to help his employer, and earn additional comforts for his family, or something to add to his savings-bank account, by working extra hours on occasion, and who, worst of all, finds that by trying to work intelligently and effectively for his employer's interest, he increases his own income substantially, is an abomination, to be thrust down, and kept down, lest the difference between him and the untrustworthy shirks who follow at the heels of the union rulers should become too conspicuous.

IT is, therefore, not to be expected that coöperative manufacturing will ever meet with the approval of the Friends of Labor, but the friends of their fellow-men may, we think, welcome renewed progress in a movement which has within it the possibility of revolutionizing, not only industrial, but moral and social conditions. The theory that ten or twenty intelligent men cannot carry on a business as well as one has long been exploded, coöperative industrial establishments having quite as good a reputation for honesty and prudence as the average of those managed by individuals. The real difficulty to be overcome is the unwillingness of men to work together for the common good, without jealousy or dissensions; and in the effort to overcome, even, at first, for the selfish end of increasing the profits of the business, the feelings which foster discord, lie long perspectives of brotherly concord and happiness. In other ethical aspects, the principle of coöperation presents even greater attractions. After the lesson has been learned, that all those who have a pecuniary stake in any business must take pains to know whether their money is being honestly used, the financial management of a coöperative establishment is comparatively simple. Where so many persons know what is going on, dishonest scheming is impossible. It is often said that coöperative establishments cannot succeed, because their "business secrets" would be disclosed; but the business secrets which cannot be disclosed in a manufacturing

establishment are not generally those which the stockholders would be best pleased to know about, and the most solid and successful corporations are, almost without exception, those which make the fullest and frankest public statements of their affairs. To the individual members, also, the habit of considering money obligations, and the sense of responsibility, must be of inestimable value. To have a pecuniary interest of one's own in the business, and to have a share in the control of other people's money, while they undoubtedly tend, as the unions fear, to attach a man to his shop, and to induce him to work sometimes extra hours, also tend to attach a man to his family and friends, and lead him to deny himself for their comfort, to lay by a provision for those dependent on him, and, in short, to conduct himself like a man, instead of a slave.

LE GENIE CIVIL contains an article of extraordinary interest, on the proposed Nile reservoir, by M. Boulé, the French member of the Commission of three engineers appointed to examine and consider the matter, who, it will be remembered, made a minority report, protesting strongly against the destruction of the beautiful ruins on the island of Philæ, which would be the result of carrying out the scheme approved by his colleagues. It seems that the Egyptian Government had long desired to increase and assure the fertility of the Nile valley, by constructing reservoirs along the upper course of the river, in which the flood waters could be stored, and released as required for irrigation, in accordance with a scheme originally proposed by a Frenchman, the Count de la Motte, who read a paper on the subject before the Geographical Society in Paris, in 1880, after his return from a journey of investigation in Nubia.

AS M. Boulé says, Egypt is the Nile. The limit of habitable and cultivable land is the line reached by the inundations of the river, and beyond is the desert. To extend the inundated area is to beat back the desert, and set in its place life and prosperity. As agriculture is at present managed in Egypt, the crops are divided into two classes, the winter and the summer growth. The annual inundation, in lower Egypt, usually reaches its height in the latter part of September. As the flood recedes, the seed is sown on the wet mud left by the retreating water. It grows rapidly, and the crop is harvested in the spring. By the middle of May, the river is at its lowest point, and, except where artificial irrigation is practised, the ground remains dry and unproductive until the following winter. Where, however, the flood-waters have been captured in basins or canals, so as to make them available for irrigation during the summer, the most valuable products of Egypt can be raised, and these irrigated fields alone furnish the Sefi, or summer crop, of cotton, rice and sugar-cane, which constitute the greater part of the agricultural wealth of the country. Under the present conditions, the labor of irrigation for the summer crop is very great, and the autumn floods often, if they are of unusual volume, break down the barriers and canals of the irrigating systems, or, if they are scanty, fail to fill the reservoirs; so that the most important part of Egyptian industry is burdened with great uncertainty, as well as expense. It is thus evident how great is the importance to the country of controlling the Nile. To regulate the level of the floods would be, as M. Boulé says, hopeless, unless the great lakes in the interior of the continent could be utilized as reservoirs, for it would be impracticable to form in the Nile valley storage-basins large enough to contain the surplus of the flood-waters, which come down at the rate of fourteen thousand cubic metres a second, and, in a few weeks, cover lower Egypt with water to an average depth of twenty-four feet. It is, however, possible to make storage-basins which, without attempting to hold back the floods, will retain water enough to help materially the irrigation fields of Lower Egypt during the dry season; and it is this project that the Egyptian Government wished to have considered. In 1893, the Egyptian Ministry of Public Works received, from the engineers whom it had detailed to study the whole question of reservoirs, four reports, relating to four different schemes. The one of these which it placed first, as offering the greatest advantages, contemplated throwing a dam across the Nile, in the narrow channel just below Assouan, which, it will be remembered, is situated at the foot of the first cataract, while Philæ is just at the head of the cataract. The second project contemplated a similar dam at Kalabsheh, a little above Philæ, and the third provided for a dam at Silsileh, some miles below Assouan. The fourth scheme was one originally proposed by an American,

Mr. Henry Cope Whitehouse, the brother, we believe, of the well-known Chicago architect, and consisted in cutting a canal from the Nile to the Wady Rayan, a depression in the desert, not very far from Cairo. The fact that a dam at Assouan would submerge Philæ was soon known, and protests were made by various learned bodies; and the Egyptian Government, apparently desiring to put the responsibility for the decision upon some one else, selected three hydraulic engineers of great distinction, Sir Benjamin Baker, of London, M. Boulé, of Paris, and Signor Torricelli, of Rome, to examine and report upon the four projects which had been submitted. These three experts reached Egypt in February, 1894, and examined the ground, and, returning to Cairo, prepared to submit their report. It was evident enough that the Egyptian Government preferred the Assouan scheme; and the English and Italian experts, after proposing some modifications of it, agreed together upon a report, endorsing it as a whole, and submitted this report April 10, leaving Cairo for home the same day. M. Boulé, who disapproved of the plan for engineering as well as archæological reasons, prepared a minority report, which he presented April 18. Meanwhile, he had been kept waiting until the 16th for a copy of the reports of the proceedings of the Commission, and never knew at all what his colleagues had said in their report, until he read it later among the official publications of the Egyptian Government.

THE question of the æsthetic and historical importance of preserving the ruins of Philæ has been already sufficiently discussed, and, although M. Boulé, like a true Frenchman, believes that such a monument should not be sacrificed without urgent necessity, it is his objection to the Assouan plan as an engineering project which is here most interesting. In their report, Baker and Torricelli advised that the dam described in the plan of the Government engineers should, to prevent it from being carried away by floods, be immensely increased in thickness and height, adding, according to their estimate, more than two million dollars to its cost. M. Boulé thinks that, even with this addition, its resistance to great inundations would be rather problematical, and its form unsuited to its task of keeping back a portion of the water, and letting the rest pass; and he observes that, if built to the height advised in the Baker-Torricelli report, it would flood the entire width of the present Nile valley above it, to a distance of more than a hundred and fifty miles. This would cover all the habitable soil permanently with water, leaving nothing but the river and the desert, and would, as he says, tend to set the frontier of habitable Egypt at Assouan. This, he thinks, would be politically a great misfortune. He points out that it would be quite possible for a hostile power, in control of the great interior lakes, to close the outlets from them in such a way as to cut off, at least temporarily, the flood-waters from the Nile, and thus practically annihilate civilization in Lower Egypt; and he considers that the true policy of the Egyptian Government lies in advancing population, and extending cultivation, along the Nile valley above the cataracts. It would be neither difficult nor expensive, he thinks, to build small storage reservoirs, in the manner already pointed out by Count de la Motte, in such a way as to improve the navigation of the various cataracts. It is true, as he says, that, for a given amount of storage, several small reservoirs would cost more than one large one; but, while one large one, at or near Assouan, would render Nubia uninhabitable, a small one, at the first cataract, would render that navigable for steamboats, would improve the fertility of the territory above, and would attract population and traffic to the region. Later, a similar work could be carried out at the second cataract, and industry and civilization extended another stage. Lower Egypt, meanwhile, profiting constantly more and more by the storage-water from above, until, with an ample supply of reserved water for summer irrigation in Lower Egypt, the country would have gained, with a new, fertile and prosperous territory, a firm foothold along the Nile valley toward Khartoum, and with it political security against the turmoils through which so much blood and money have been wasted in the Soudan.

WE hope we may be allowed to express our satisfaction at the way in which our last week's illustrations of Mr. Kilburn's beautiful Colonial Club have been received. Speaking as unprejudiced connoisseurs, it seems to us that the rendering made by the Heliotype Company of the excellent negatives taken for us is not often surpassed in such work.

A SYRIAN TEMPLE RUIN.



The Six "Sentinels," Temple of the Sun.

It is impossible to visit any of the ancient ruined cities of Syria without a feeling of interest which is intensified by a touch of sadness. The thoughtless traveller looks at the vast ruins, enormous colonnades, huge capitals rich in sculpture, and passes on with a wondering comment. The historian enters deeper into their meaning and they become to him the battle-ground of nation after nation. But to the artistic mind they are the records of a past grandeur and show us what we must have lost and of how much we have no authentic record in detail.

This thought struck me most forcibly in exploring Baalbek, whose ruins are among the most vast in Syria and of stupendous grandeur. I longed for a Pausanias who might have walked through the old city as he did through Athens, remarking carefully upon the visions of marble and statuary, which I know must have stood on every hand, the votive offerings which must have lined the temple walls, the bronze, ivory or even golden statues; or better, giving us some glowing descriptions of the figures still standing in their niches, which might perchance have rivalled an Olympian Hermes, or a beautiful Athene.

But no such good luck favors us, and we are obliged to rely upon imagination to people the temples with worshippers, and the niches with their appropriate occupants; and yet, with all this lack of life and spirit in detail, Baalbek stands to-day the most interesting ruin in Syria. Oriental writers help us a little in the task, for they describe the ancient city as one of the most beautiful cities of Syria, enriched with palaces of great magnificence, monuments of artistic workmanship, temples of stupendous size and beauty, by virtue of its situation abounding in luxurious trees, and withal a city where, indolence being the result of wealth, studied enjoyment was the legitimate outcome and the natural pursuit of the people.

As I read these descriptions, six tall white columns rise up before my mind and carry me back to a little hotel window in the small village that surrounds the ruins of Baalbek. We had mounted a diligence at Beyruth, and in company with the genial American Consul, Mr. B——, had climbed the mountains which run far back of the Mediterranean seaport and disappear into the distant mist-surrounded snow-capped peaks. No more beautiful road could be imagined than this road over the Lebanon Mountains between Beyruth and Damascus. The road winds up and up, in zigzags, which constantly change the view from the mountains to that over the sea away below, until at last, just before passing the brow of a hill which forms one side of the wild and romantic glen of Humane, we come to a standstill and gaze in wonder at the glorious view. Mountains are on all sides, some snow-capped, and from these the breezes come cool and invigorating. Beyruth lies miles away and hardly distinguishable, and, beyond all, the Mediterranean Sea—a sheet of azure blue, on which specks reveal the presence of ships, but which ends at a soft horizon-line which marks the limit of vision.

In the glen below, the little town of Humane which once sheltered Lamartine and gave the town its notoriety, nestles in a bower of plantations. We have clambered up 5,000 feet above the sea and the scenery is wild and grand beyond description, and fragrant with the odor from the huge groves of trees which form the famous Cedars of Lebanon.

When we have travelled thirty miles we approach the little town of Shtaurah which consists of a few straggling houses and two

hotels. The low archway of the smaller one is inviting, and a rude staircase winds up over the arch and gives access to a balcony on which stands a Syrian youth who smiles a welcome as we make our choice. The smile grows broader when we accept the welcome, spoken in French, for this lad turns out to be a student in his way, and has been mastering the idioms of the far away and, to him, unknown country.

Entering, we are assigned a large room adjoining the dining-room, whose windows open on the rear court, and are at present occupied by a couple of the barn-yard fowl, who also bid us as good a welcome as their knowledge of language will allow.

Thinking to be forehanded in getting a carriage for the morrow to Baalbek, I told the young Syrian lad that we wanted the best team the proprietor could give us, but was dumbfounded when he said there were fifteen people ahead who were to take the large teams and mules and that we would have to wait a day or so. "Not so," I confidently told him, "for whether any one else has a carriage or not, I am bound to have the best one you have," and that the getting of it beyond the reach of any one else meant just a mid-jidie (or a dollar) to himself. Verily the preacher was no traveller who affirmed that "the love of money is the root of all evil." The love of the dollar won us the day and our team besides; whether the "root of the evil" came to the boy after we had gone, we never knew. At one o'clock in the morning the youth knocked softly at the door, laid out his scheme, received one-half his fee, the remainder to be paid when we should enter the carriage. It is needless to say we started early, before our neighbors were astir.

Upon turning off from the main road to Damascus the scenery changes completely. It follows through fertile plains skirting along the base of the Lebanon range. To stir up one's mind, add interest to the trip and start up a sort of retrospection of time we come to a building about 210 feet long, which the natives confidently assert is the tomb of Noah! What Mark Twain might have remarked at this point, it is hardly possible to guess. Certainly, we argue with our driver, after the adventures of the Biblical mariner by sea, it would be natural to seek some point away up high, back from invading floods—and, on the whole, tradition may be true. To look with distrust on anything the natives tell one is a sign of arrogance, and we are therefore happy to know that we have seen so remarkable a structure, and are careful also to let the native guide know that we are thus edified.

After several hours' travel away to the east, and at the foot of the Anti-Lebanon range, ruins can plainly be seen with the glass, and passing over the intervening plain we return to the vision which greeted our eyes as we looked out of the little window, and saw the grim acropolis of ancient Heliopolis, and the six white columns which stood out in the moonlight against the soft blue sky of a Syrian night. Almost under our windows too, was the little circular Temple of Venus, where the goddess of youth and beauty, surrounded by her nymphs, was wont to bestow her favors in the licentious rites instituted by her admirers.

Such a night is enough to make the historian use all his powers to pierce the gloom that seems to envelop the early history and origin of the city which must have surrounded these ruins. But, although legend and tradition have been plentiful, no authentic data can be set down, although undoubtedly the city was known by some other name. Joshua speaks of the "City of Baalgad in the valley of Lebanon under Mount Hermon." This comes pretty close to a good description, but Hermon is fifty miles south of the present location, and this reference to a city 1450 B. C. does not seem to be tenable. Others have affirmed that it was constructed by Nimrod and his giants after the flood. Our guide believes it to be the oldest city in the world, and backs up his argument by the old tomb of Noah, near by. His position stumped us to answer, for, if old Noah's bones were laid where our good fellow affirmed that they were, it was just barely possible, yes, even probable, that he had planted the ancient city before us.

To Solomon also is ascribed the honor of its birth, since in I Kings, ix, it is stated that "Solomon built . . . Baaeth and Tadmor in the wilderness . . . and in Lebanon." Now Tadmor is recognized as the city of Palmyra, and it is quite tenable to hold that the two glorious cities of Baalbek and Palmyra were referred to. The date then would be about 1000 B. C.

Such reasoning is easy, but the proof not authentic.

The more reasonable explanation of the name, however, has nothing to do with its ancient name, whatever it may have been. Baal was a recognized god, a deification of the Sun whose sanctuaries were erected in many pagan cities. The plain between Lebanon and Anti-Lebanon was known as Beka'a, and it is more reasonable to suppose that the name Baalbek simply signified that it was a city of Baal in Beka'a. And throughout the Græco-Roman period the city was referred to as Heliopolis.

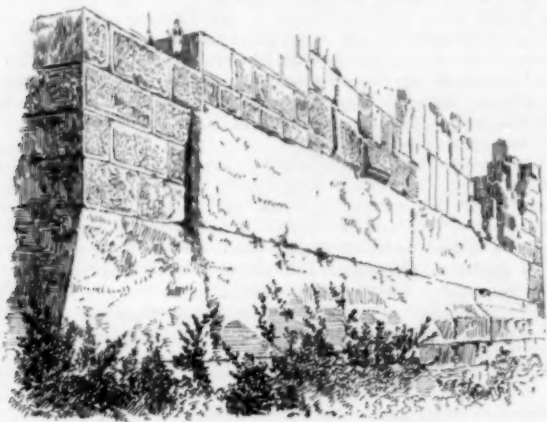
We have just come, however, from Egypt with its wonderful remains. We know that the Egyptians came into the land of Syria, and the Ramesseum at Thebes in its hieroglyphics states that the king journeyed thither and built huge structures and dedicated them to their gods. At Abu-Simbel also, these expeditions are described minutely, and the districts pointed out correspond to the plain of Lebanon. The foundations of the chambers under the great Baalbek temple are constructed in the same manner as many in Egypt, and the general plan of sub-structure is much the same. I shall, therefore, beg to believe that Baalbek was made notable, if not founded,

by the Egyptians, and, furthermore, that that old hero of marvellous works, Rameses II, is responsible for the above foundations and substructures of the Temple of the Sun. Surely the sun of such a people, the builder of such marvels of architecture in Egypt, might well have been their author.

Just as these Egyptian finger-marks are discernable in the substructure, so we are certain that the colossal platforms and the bevelled masonry under the peristyle of the Temple of Baal was of Phœnician work. And as we proceed with such deductions, history begins to assist us, for we know that under Græco-Roman domain the whole structure was reconstructed, Julius Cæsar formed a Roman colony, and the Temple of Jupiter and the Temple of the Sun were added to the already magnificent structures of the Acropolis.

The ruins having been used by the Arabs as a fortress, parts of them have been built up high above the surrounding plain and form a veritable acropolis. To the eye, from the village, it seems three-score feet high, possibly, and the walls are encircled by a swift-running stream, clear as crystal, near which are masses of tall trees with white trunks not unlike our native poplar. The tops just reach the temple platform, and the scene is exquisite and full of poetic feeling.

To the west the character of the work changes materially. Here are the cyclopean walls of the Phœnicians, which are the wonder of every one who sees them, and call up the question of ancient methods of raising heavy stones. Six gigantic blocks of stone seem to form a sort of substructure to the work above. The stones are 30 feet long and about 13 feet high, cut with perfectly smooth faces, so carefully jointed that the joint is hardly visible, and even in measuring these stones with the tape-line the joint is passed over by the eye. Above them, next come some stones which measure 64 feet in length and 14 feet in height. The old wall above these cyclopean stones was probably of Græco-Roman work, but it has been



Cyclopean Wall.

more-or-less pulled down, and all around are evidences of the rough work of Arab fortifications, consisting of column bases, friezes, capitals and bits of priceless detail.

In regard to the huge stones of which I have spoken, the quarry near by is interesting because there is one stone half cut out and left by the ancient builders. It is 69 feet 3 inches long and 14 feet square, and as we look at it we are caught questioning ourselves as to the resources of these unknown masters of past ages. To our modern eyes it would seem no easy task to construct lifting-machines for such weights, and true it is that no modern work has ever been erected calling for such gigantic morsels. It is possible, however, that a recent discovery has given light on this point: it is at least an interesting addition to our knowledge. At Salkhat in the Hauran, which is that part of Syria beyond the Jordan, the fragments of an ancient lifting-machine have been discovered. The crumbling decay of ages and the corroding rust of metal has still left its traces on a simple gigantic lever, the fulcrum of which was supported on a huge tripod pedestal. Both of the members were composed of huge trees bound together with straps of metal, and the one found showed a height of 60 feet. The huge pivot was metal, and a large cage of iron chains and bars hung from one end, while a gigantic grip was attached to the other end. Fill the cage now with small stones until it balanced the huge single stone, swing the lever around to the required position, and the work was accomplished — and the puzzle solved.

But to return to the ruins. Passing around again to the east, we enter the Acropolis through a rough board gateway, at once plunging into the underground passages under the Temple platform. Only a part of them are now open, but Roman inscriptions show that they were at some time occupied by soldiers, and were undoubtedly used as stables. Several hundred feet ahead, a glimmer of light gives evidence of the exit on the court side, and on emerging the whole scene of ancient splendor is before the eye. It takes but the magic wand of imagination to fill out the picture. Back of us is the great court, on the right our six white columns, remnants of the Temple of the Sun, and on the left the Temple of Jupiter.

Walking directly east, passing through the Great Court, and thence through the hexagonal court to the pronaos, the limit of our survey in this direction is attained, for here is the façade of the grand portico of the Temple of the Sun. The broken wall, later built up to ensure safety, shows stumps of the twelve columns of the

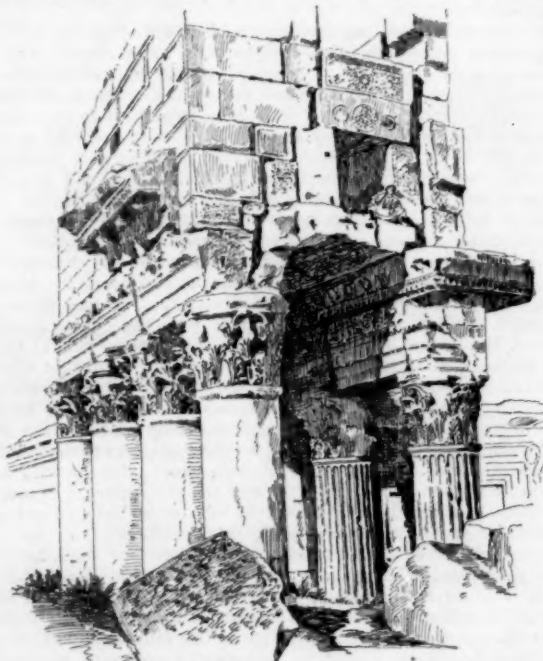


Construction of Domes: Temple of Baal.

pronaos, and originally a magnificent flight of steps gave entrance to the Temple. The measure of this opening shows that the steps were about 150 feet wide, an enormous width, but not out of proportion with the tremendous scale of every part. It is interesting to note an inscription, of Roman time, on the bases of two of these columns. It was evidently a sort of artistic sop thrown out to the gods for protection, and gives a hint as to the decorative effect of the pronaos. "To the great gods of Heliopolis. For the safety of our lord Antoninus Pius Felix Augustus and of Julia Augusta, the mother of our lord of the camp, of the senate of the country, Aurelius Antonius Longinus, chief of the First Antonian Legion, of his own free will caused two brazen capitals of columns to be overlaid with gold at his expense."

The steel tape shows that this porch is 180 feet long by 137 feet deep, including the wings, before which were two Corinthian columns of exquisite detail, with niches and pilasters all around the chamber thereby formed. Statuary must have played an important part of this grand porch, for pedestals are seen on every hand. It would be interesting, indeed, if some of these could be unearthed in order to note their style and value. It is here indeed that we miss our Pausanias!

Three entrances next lead to a court 200 feet across, which, curiously enough, is hexagonal in form, a strange design surely, for



Colonnade at Entrance to the Temple of Jupiter.

the exterior angles do not conform themselves easily to chambers, as they are V-shape and unornamented by sculpture. But the four sides of the hexagon form chapels, as it were, each entered through a porch of four columns, the wall in the rear enriched with corbelled pedestals and niches for statuary.

Three more doorways next give entrance to the Great Court, and we here see some evidences of Egyptian influence, for on each side are semicircular niches with high stone flanks which are of the same shape and nature as the pylons of Egypt. The Great Court is totally different from any arrangement that we have seen. No continuous colonnade flanks the sides of the court, but, instead, there are



Temple of Venus.

on each side three recessed chapels, two with four columns and one with six columns, and between these chapels are two semicircular niches of exquisite design. The order of these niches is Corinthian, the entablature plain, with highly-enriched cornice, and the huge stones of the shell-like roof are, in many parts, perfect. Below is a pilastered wall with pedimented niches which undoubtedly contained colossal statues, and it is obvious that the lower part of the wall was enriched with tablets. Traces of a basilica are seen in the centre of this court, and Constantine is named as its builder. Indeed, a huge base with raised platform is still seen, which gives evidence that a sacrificial altar stood there in the old days of paganism, and it was from the centre of this huge court that the smoke of the offering ascended and could be seen from the neighboring country around.

We stand on this platform and look toward the west. Our six sentinel columns rear their exquisite forms against the blue sky, and the great platform of the Temple of the Sun stretches out with a vastness that is astonishing.

Think of the history that lies beneath those huge stones! For it was here that the great Phœnician Temple of Baal stood, and in its place, later, came the grandest and most exquisite temple-work of which history gives record. It consisted simply of a rectangular colonnade of fifty-four columns, without a cella. Whether it was ever intended to complete the walls within the colonnade is unknown, but if it was so intended, it is strange that no foundation of such a wall can be found. A huge section of the entablature still remains *in situ*, and shows what a profusion of ornamentation there must have been in the completed colonnade. The columns are 75 feet high in themselves, and the entablature 14 feet higher. The shafts are 7 feet 3 inches in diameter, and the southern side of the colonnade fell outward, so that the huge drums lie like the vertebrae of some huge monster, dismembered but retaining their relative position. Look at the sketch, and the figure of our faithful dragoman may give a faint idea of the relative size of man and these ruins of antiquity.

Since the peristyle stood high above the court-yard and some 50 feet above the plain below, the effect from the distance must have been wonderfully impressive. Indeed, it is so now, and the sketch will enable one to form a faint conception of its ancient grandeur.

One can hardly help wondering about the exact ceremonial that took place high up above the plain. Was there some huge stylus centrally located, upon which at a certain hour the rising sun fell and cast its mighty shadow upon the recumbent and reverent body of worshippers? Was there an offering upon the central altar whose fires were kindled daily by the concentrated rays of the sun god, who, rising, caused it to burst into flame and ascend toward the orb which gave it life? Or was there, as at Athens, some colossal statue of a deity standing enthroned in its glory, or through its priests giving out oracles of weal or woe from its capacious interior? The latter idea seems the most probable, as it was an old trick of the gods, known from one end to the other of the pagan priesthood, moreover remnants of a secret staircase are discernable.

It is impossible to roam around over this area of elevated ground without thinking of the Athenian Acropolis. Here, as at Athens, was a town surrounding this central feature of religious life. In this case the elevated effect was gained partly artificially, while at Athens it was natural. But here, as at Athens, arose before the eyes of the people a grand central lesson, to which their thoughts daily turned, to enriching which their small means went, and to which they looked, in turn, for the favors of the gods. This similarity became the more apparent from the south, where, built up high above the stream below, stand the high walls of the Temple of Jupiter with many of the columns still erect. The Temple is larger than the Parthenon, and being in the Corinthian order of

architecture is richer, but the distant effect is not unlike that at Athens. It is the best preserved monument of Græco-Roman art in Syria, and is 227 feet long by 117 feet wide.

We climbed around to the east, this being the original entrance, and here, too, are the ruins of a flight of steps seen in a hole of excavation, for the debris of ages has filled-in around it so that its base cannot be seen. Climbing up on a pile of stone and broken drums a nearer view of the detail is obtained. The entrance must have been of wonderful beauty, for the profusion of ornamentation is here seen in the highest degree of perfection, some say almost to debasement of style; but I do not agree with this view at all, the very style of the Corinthian almost inviting the profusion of detail.

The outer peristyle was upheld by 42 plain shafts and a rich entablature, but the inner columns of the pronaos were fluted and exceedingly rich. Looking up, it is observed that the soffit between the columns and the cella wall is composed of huge stones divided into hexagonal panels, each one containing a god or goddess enriched amid a mass of sculpture. Thus were the gods depicted as constantly looking down upon the people and noting their very life.

Look at the huge column on the south side; it has fallen bodily against the cella wall, but not even such a shock has served to break the iron-dowelled bond of the drums. The bases of its mates all around lie exposed; enormous stones lie scattered about, and the whole scene is inspiring in the highest degree from its magnitude and beauty of detail.

The entrance portal must have been most beautiful in its perfect state, for its wide architrave, frieze and cornice was a mass of enrichment, and the supporting brackets are well proportioned. It has always been a question how far enrichment might be carried without detriment, but it seems to me that, given the purity of form and proportion of members, purely Classical enrichment adds rather than detracts from the work. This doorway is the best example of this matter, and is here most satisfactorily answered to my mind. The lintel was in three pieces, but the central voussoir being displaced by an earthquake in 1759, it was found necessary later to build a pier under it, which, however, covered up a most interesting carving on the soffit. A photograph taken before the pier was required shows a spirited eagle with outstretched wings, a caduceus in his talons and a garland in his beak, which is held at the ends by genii. What the significance of this enrichment was, if any, I do not know.

The interior of the temple is choked up with debris of cornice and column, but the two divisions are marked by a screen with steps entering the sanctuary beyond. The length is 125 feet and the breadth 68 feet.

The dividing screen must have been very beautiful, for on each side was an enormous slab with figures in alto-rilievo, which told of the sacrificial processions that undoubtedly took place from within its walls. Back of the slabs were massive enriched pillars and from the debris it seems to show that an arch sprang from the pillars.

Before entering the sanctuary, however, note that the side walls of the Temple were formed by engaged columns of the Corinthian



Side of the Temple of Jupiter.

order, between which were niches with pedimented hoods, under which are the bases for statues. Again, it is shown how large a place sculpture occupied in the minds of these builders, and one longs to know more in regard to their characters.

Return now to the entrance and people the sanctuary in the rear with the crowning feature of this Temple. It could have been no

other than the colossal statue of Jupiter, for it was here that the people assembled to consult the oracle and receive the response of the god. As in the Temple of Isis at Pompeii, a secret stair led to the interior of the image, and it was from the lips of the statue that the priests spoke. This passage is still seen. That this fact was known to the people, however, is not at all sure, for the priests acted upon the supposition that the gods spoke through them and undoubtedly so taught the people. Herodotus remarks that "these priests assert, though I cannot credit what they say, that the god himself comes to the temple and reclines on a bed in the same manner as the Egyptians say happens at Thebes in Egypt; in the same way, also, the priestess who utters the oracles at Patara in Lycia, when the god is there is shut up during the night in the temple with the god."

But at any rate we have only to build up once more in our minds these broken walls, fill the niches with statues, and rear the colossal god in his sanctuary.—then approach with the multitude, and we can better understand the enthusiasm of the people, who, resting their faith upon the promises of the gods, saw the incense ascend from the altar, and heard the voice from the sacred shroud of smoke. The decision of fate was accepted, and the destiny of a nation oft-times hung upon its interpretation.

We leave the Temple enclosure, retrace our steps through the passages of the Great Court, and are soon at the hotel once more. The sun has set, the moon has risen from over the long range of distant mountains, and as we look from the windows once more, the six white sentinel columns stand out from their soft background and rear their heads heavenward.

CHARLES A. RICH.

IMPROVED METHODS OF HOUSE-DRAINAGE.¹

MR. PRESIDENT AND GENTLEMEN OF THE ARCHITECTURAL LEAGUE:—

YOUR committee has honored me with an invitation to prepare a paper for this meeting, and has left me entirely free to select some topic from the wide and constantly growing field of sanitary engineering. The sanitation of houses, school-hygiene, hospital-construction, rain-baths domestic gas-lighting, the sanitary features of the laying out of cities, water-supply, fire-prevention and fire-extinction, the safety in theatres and halls of amusement,—these were some of the numerous subjects which occurred to me as being of interest to the members of the Architectural League.

After thinking the matter over for some time, I concluded that it would be better to select a subject in which I have been most actively engaged in the past years. Accordingly, I decided to speak to you on "Improved Methods of House-drainage," although I was well aware of the fact that I could not attempt to treat the matter from any novel point of view. For while the subject is of paramount importance, and one in which every architect takes an interest, it has been quite frequently discussed, and there are numerous books, pamphlets, essays and lectures which go into the matter very fully.

I can, therefore, assure you that it is with the utmost diffidence that I come before you to-night to give a brief address on what many of you will doubtless consider a dry and uninteresting subject.

My endeavor will be to explain some important improvements which have been brought about in the past ten years in the art of draining houses.

To begin with, one quite noticeable improvement relates to drainage plans. Until a comparatively recent period of time, it was an exception to find elaborate plans and sections of the plumbing and drainage system of buildings. The location of the plumbing-fixtures was, to be sure, indicated on the floor-plans of the building. Beyond this, very little information was given. It was not usual to mark the number and sizes of soil-pipe stacks, neither was the run and course of the drains indicated on the plans. I believe I am not mistaken in stating that in architects' offices, the practice of making a special drainage-plan began with the enactment of the plumbing-laws. At least, I remember distinctly that, when as chief engineer of a house-drainage company, it was my privilege, about ten years ago, to estimate in some of the prominent architectural offices in this and in other cities, I was given plans to estimate on where the drains and soil-pipes were neither shown, nor enumerated or described in the specifications. All this has undergone a great change in the past few years.

Owners of buildings are much benefited by the plumbing-laws which require plumbing-plans to be filed in the City Health or Building Departments. Even where in the actual construction of the work, the drainage-plan is, more or less, modified, there is kept on record a usually tolerably accurate plan, showing the position of pipes, in case of future reference. In important cases, a revised drainage-plan is subsequently made, showing the work as actually put in. The contractors are benefited by it, because they know better on what work and what quantities to base their estimate. Their workmen on the building are, likewise, benefited, because they can find, by referring to the plans, where the pipes are intended to be run. The architects and the building superintendents are benefited, because they do not have to answer so many questions to the foreman in charge of the plumbing and drainage, and because their

time is not so much taken up at the buildings in course of construction with the laying out of the sometimes complicated work. The many advantages, resulting from well-considered drainage-plans, become particularly apparent in the case of large and important structures, such as hotels, hospitals and modern office-buildings.

Another improvement relates to plumbing and drainage specifications. While formerly plumbing specifications were somewhat indefinite and too general in character, with the inevitable result that estimates for the work ran widely apart, it is now universally recognized that plumbing is a question of vital importance in building construction, and much more care is exhibited in the preparation of the specification. Other things being equal, it is self-evident that the more thoroughly detailed and accurate the specifications are—which does not necessarily mean elaborate—the closer will the bids for the work run, and the more will the finished work conform to the expectations of the architect or his client. In this connection, permit me to state that the too general use of the printed blank-plumbing specifications of the Building Department for contract work is not, in my judgment, to be approved. Such blank forms may be exceedingly convenient and labor-saving for the inspectors of the Department, but for all, except the smallest houses or tenement buildings or simple warehouses, they are not sufficiently detailed. A contract for a large job should be based on a separate type-written or printed specification. Too much care cannot be bestowed upon the specification. It is my experience, and doubtless it is yours, that the number of extras in the final plumbing bills is inversely in proportion to the completeness of the specification. I refer here, of course, only to the extras which the architect finds himself compelled to order, owing to omissions in the original specifications, and I do not include those sometimes quite numerous extras, which owners or building-committees require.

Now let me turn to the question of materials. Here, too, we cannot fail to find numerous and important improvements. Formerly the house-drain inside the building consisted of earthenware pipes. The soil-pipes were run of lead pipe, with hand-made seams. You are, I trust, sufficiently aware of the objections to such materials. Happily, they have gone out of use. The first improvement consisted in using iron pipes for drains and soil-pipes. For many years it was customary to use the so-called light or standard plumber's soil-pipe. When the testing of drains by the water-test began, the objections to these pipes at once became apparent, it being a most difficult matter to caulk joints in light pipes so as to be permanently air and water tight. Hence, it came about that, at least in the case of the better class of buildings, extra-heavy cast-iron pipes were specified. From this time dates the curious practice, which I have often met, of specifying heavy pipe for the main drain, and light pipe for the vertical soil and waste pipe lines. Still later, when the practice of "back-airing" traps began, we find heavy pipes specified for both, the drain and the soil-pipe system, whereas light pipes were considered sufficiently good for vertical lines of vent-pipes. A chain is not stronger than its weakest link, and I know you will agree with me that it was a mistake to use two grades of pipe for the soil, drain and vent pipe system of a building. As is well known, the use of extra-heavy pipes is now in this city compulsory in all classes of buildings, from the cheapest tenement-house to the finest private mansion. It is, perhaps, well that the rule is compulsory, for otherwise we should find unscrupulous plumbing contractors and speculative builders still making use of what they must know is an unsatisfactory material for drainage. Cast-iron pipe, even of the heaviest and best quality, is apt to have sand-holes or imperfect seams, hence by far the greatest security lies in ordering from the manufacturers, pipes and fittings which have been tested at the foundry by hydrostatic pressure.

The most recent improvement, as regards this point, consists in the more extensive application of screw-jointed, wrought-iron pipe for drainage purposes, particularly in the case of high buildings. Having been, to some extent, personally connected with the introduction of this system in the Eastern States, I cannot help remarking that a wonderful change in opinion has taken place, in architects' offices, and to a certain extent also in plumbers' shops, regarding the merits of wrought-iron pipe, and the use of screw-joints in place of lead-caulked joints, for purposes of drainage. It is scarcely ten years ago, when it was my privilege as engineer of a now defunct house-drainage company to discuss with architects the advantages incident to the new method of drainage. A few architects went on record as in favor of the screw-joint construction. The majority, however, guided in many cases by the advice of the plumbers, estimating in their offices, were opposed to the use of wrought-iron for drain, soil and vent pipes. The pipes which were used then by the advocates of the screw-jointed wrought-iron system were without exception protected against rust, either by a thorough application of coal-tar, or by dipping the pipes, while heated, into a bath of hot asphalt, or else the pipes and fittings were made rustless by the Bower-Barff process, or finally, galvanized pipes were used, particularly for vent lines. You will readily understand my surprise, to find at the present time, buildings in which plain wrought-iron pipes are used for purposes of house-drainage, the pipes not being in any way protected against corrosion. The mistake—for mistake it is—can be explained only by the fact that the Building Department requires cast-iron pipe to be plain and uncoated, but wrought-iron piping should, in my judgment, always have some protecting coating against rust.

¹ A paper read at the monthly meeting (December 5, 1894) of the Architectural League, by Wm. Paul Gerhard, C. E., Consulting Engineer for sanitary works.

Other improvements, relating to materials, consist in the more extensive use of drawn-lead traps, and of brass traps, in place of cast-lead pipes, or of lead traps with hand-made seams. I must, however, sound a note of warning against the use of certain brass traps with cast partitions, which are often found to have sand-holes, and are then, of course, only a delusion and afford no protection against sewer-air. The use of very light brass tubing, for exposed waste or vent pipes, should be guarded against, as also the use of light brass traps, or of traps with rough inside surfaces. Finally, the brass pipe should be of iron-pipe size, i. e., full bore, and not restricted in diameter.

I pass on now to the consideration of important recent improvements regarding the sizes of pipes used for drainage purposes and the manner of laying the drains. Of the old brick drains of large size, square in shape and ill-adapted to the removal of household wastes, it is not necessary for me to speak, as they belong to a former generation, although they are occasionally, even now, unearthed in the overhauling of older mansions. Up to within a recent period, it was the custom to use for house-drains, round pipes which were much too large in diameter to perform their function in a proper manner. Even the smallest house had a six-inch drain; larger buildings had nine, ten and even twelve inch pipes. There is no advantage, and there are considerable disadvantages, in using pipes of too large bore. The old-fashioned absurd ideas regarding the necessity for large pipes are now abandoned. The use of small drains is a distinctive achievement of modern sanitary drainage. It is usual, at present, to use a four-inch pipe for the smaller houses. An average-sized four-story dwelling can be sufficiently sewered by a five-inch drain, and a six-inch sewer is sufficiently large for a mansion. Extensive buildings, such as institutions, office-buildings, etc., may require a pipe of larger discharging capacity, but in that event it is preferred to use two or more drains of restricted size as being more liable to be self-cleansing.

To illustrate: The entire waste water from the plumbing fixtures in such an extensive building (vertically) as the Manhattan Life Insurance Company's building, comprising two hundred and five wash-basins, twenty-four sinks, fifty-two urinals, sixty-two water-closets and including all the roof-water, besides various other wastes, is successfully removed by means of two six-inch pipe-sewers laid with a fall of one-quarter-inch to the foot.

The same principle applies to the soil and waste pipes of houses. Formerly five and six-inch soil-pipes were commonly used in private houses, and the sink waste-pipe was, at least, three, and often four, inches in diameter. It is now the rule to make soil-pipes of private dwellings four inches, and kitchen-sink wastes are purposely restricted in size to two inches, in order to be more self-cleansing. As regards the branch wastes from fixtures, the modern tendency is to use small pipes, and not only a vast improvement, but also economy in design, is thereby effected. The traps under fixtures are likewise restricted, with the advantage that they are kept better flushed. It is, under any circumstances, a difficult matter to keep traps perfectly clean, but better results are undoubtedly attained where the diameter of traps is restricted, in order to concentrate the stream and thus utilize the same in scouring the channel.

One other point in connection with sizes of waste-pipes is worth mentioning: I refer to the rain-water or conductor pipes. The sizes of these pipes—in fact, of all vertical pipes—cannot be determined by mathematical rules. Whereas, sizes of horizontal or graded pipes can be calculated accurately by means of hydraulic formulas, or by tables evolved from these, I know of no rule by which to determine the diameters of leader-pipes for roofs of given areas and of known pitch. I have likewise been unable to find rules derived from practical experience, or from actual tests and experiments, although I have hunted high and low for them. The only rule which I was able to find was in a recent German architectural text-book, according to which publication the diameter of a leader-pipe may be determined by allowing an area of one square inch in the pipe for each sixty to seventy square feet of roof-surface. I presume the smaller size is intended for roofs of a flat pitch, and the larger size for steep roofs. It is not stated for what rate of rainfall the rule is applicable. Speaking generally, heavy rainfalls are much more frequent in our climate than in Germany, so that I should advise increasing, where this rule is followed, the diameter obtained, somewhat, to provide for efficient roof-drainage in case of very heavy sudden showers. This question of determining the size of conductor-pipes is one that constantly occurs to architects and sanitary engineers, and it is to be hoped that experiments may be undertaken tending to the solution of the problem from a practical point-of-view.

This brings me to another question, viz: The manner of laying drains. Whereas formerly drains were buried in the ground, and thus became entirely inaccessible, it is now much preferred to carry the main drain of a house in plain sight, above the cellar-floor, either suspended from the ceiling, or fastened along the cellar wall. Until quite recently it was the rule, where the drain was unavoidably laid beneath the cellar floor, in order to drain fixtures on this level, to place the drain in a trench formed of brick walls with a concrete bottom, and covered with an iron cover. The drain was thus kept accessible in its entire length. A few architects and some engineers still favor this method of construction. In my judgment, it is more preferable, after the underground drains have been thoroughly tested and made watertight, to bed the same in the concrete, and to rely for access upon a number of suitably-placed and suitably-ar-

ranged cleaning hand-holes, made accessible by brick man-holes, with iron covers. Underground trenches, as usually built, are too liable to become rat runs, to accumulate dampness and dirt, and to constitute harboring places for vermin. Such inspection and cleaning hand-holes are very desirable in a drainage system, and they should be abundantly provided even where the pipe is carried above the floor, in order to avoid the cutting of pipes, a habit only too common with thoughtless mechanics in case of a stoppage in the pipes.

Let us now give brief consideration to a further point, in which house-drainage has been greatly improved. Some years ago plans for the drainage of houses were submitted to me, in which the water-closet pipes or soil-pipes were kept separate and distinct from bath, lavatory and sink wastes. This double system, as you will readily comprehend, rendered the drainage system much more complicated and vastly more expensive without any corresponding advantage. This mistake, doubtless, arose from following too closely the prevailing English practice as described in the English text-books on plumbing. In the absence of any practical American books on house-drainage and plumbing, architects had to rely largely, ten and more years ago, on the study of English works on drainage. It is not necessary, nor even desirable, to do this nowadays, as there are available several good books on the subjects by American authors, which clearly describe the American practice. Other features of the English practice of draining houses, which are equally inapplicable here on account of differences in the climatic conditions, are the placing of the soil-pipes on the outside of the house, and the running of the smaller wastes, such as bath and basin wastes over outside gullies.

A further curious mistake, which I have encountered in plumbing plans, is the requirement that in case of bath-rooms with water-closets located vertically over each other on succeeding floors, there should be a separate line of soil-pipe for the bath-room of each floor, thus entailing a needless complication, a multiplication of soil-pipe stacks and a greatly increased cost of the plumbing. The exactly opposite principles are followed to-day: the work is simplified as much as possible; plumbing fixtures in houses, planned by architects, are grouped together, and the drainage is concentrated, as far as practicable, in a single line of pipe, thus securing an abundantly flushed line, and economy in construction.

Not very long ago, the pipes pertaining to the drainage system of a house, were universally put out of sight and the fixtures concealed by expensive but useless cabinet-work. Drains were placed under the cellar floor and rendered inaccessible, soil-pipes were built into the walls, waste and vent pipes bedded in plastered partitions, supply-pipes were run under hard-wood or tiled floors. In case of accident to any of the pipes, nobody knew where to look for them, floors were torn open, the plastering cut, rich wall-decorations destroyed in the efforts to reach the pipes. One of the chief features of modern work is the exposure of all pipes. Architects and owners have now become accustomed to this improvement; there are many who even fancy the new arrangement. By a clever study of the house plans, it is often feasible to carry pipes exposed, i. e., outside of walls or partitions, even on the parlor floor. I have found on this floor the main pipe lines kept accessible by a hard wood hinged pipe-casing, in some houses built by our most prominent architects. What a great contrast with the builders' method of the past of boxing everything up,—pipes, fixtures and all!

Just a few words on the so called open arrangement of fixtures. A decided improvement in the character of workmanship has been brought about by the improved method of keeping plumbing-fixtures exposed to view. The advantages from the point-of-view of maintenance of cleanliness and ease of inspection are too apparent to need further discussion. I wish to dwell, however, for a moment, upon one point which seems to be less well understood. In conversation not long ago with one of our busiest architects, he remarked that the open arrangement of plumbing-fixtures entailed a largely-increased labor on the part of servants and, therefore, was not looked upon with favor by householders. This is, without doubt, true of exposed nickel-plated piping. It must not be overlooked, however, that nickel-plated work and exposed work are not one and the same thing. You can have one without the other. From a sanitary point-of-view, a job may be equally well, and equally safely done if constructed of lead and afterwards merely painted or bronzed. Where more elaborate or expensive work is desired, the piping may be electro-copper bronzed or finished in oxidized silver, which do not require the constant polishing which nickel finish needs to keep it bright.

Whereas in former years plumbing-fixtures were scattered all over the house, necessitating a complex system of plumbing-pipes, and often endangering the health of the occupants by ill-contrived and defective fixtures placed in the bedrooms, the modern practice of architects, and one which cannot be too highly praised, is to confine plumbing work to the bath-room, to the kitchen, pantry and laundry. The necessary fixtures are placed, as far as the house-plan permits, in vertical groups, and all appliances, and the water-closet and slop-sinks in particular, are placed in well-lighted and well-ventilated apartments.

There is one mistake, however, which is still frequently committed, to which I beg permission to draw your attention. The mistake to which I allude is the placing of the water-closet in the same room where the bath-tub or the wash-basin are located. This is objectionable on æsthetic as well as on practical grounds. It is particularly

so in the case of the smaller houses, and in apartment-houses, with only one bath-room. In more elaborate houses of rich people, where there are several bath-rooms, the separation of the water-closet is not so necessary for practical reasons, but I think that a bath-room with a water-closet can, in all cases, be made much more inviting by contriving an ornamental screen, or a low partition separating the water-closet from the other fixtures. The partition may be lined with marble or tiling and its upper part may be constructed of open fretwork. I have in mind several exquisitely-finished bath-rooms, designed by progressive architects, in which this division of the room was made a successful and greatly-appreciated feature.

Much improvement is noticeable in the selection of suitable and sanitary plumbing appliances.

The objectionable pan-closet is seldom encountered in modern plumbing-work, plunger-closets are out of date, valve-closets are no longer fitted up, and improved water-closet troughs have taken the place of the former privy sink. Wooden laundry-tubs are no longer common, because better tubs of non-absorbent material may be obtained cheaply.

As regards the most important sanitary fixture, namely, the water-closet, the number of apparatus of different make and construction is legion. Practically, however, the choice lies between only a few approved types, viz: the flushing-rim long hoppers, which are good but require a large quantity of flushing water, and the improved pedestal short hoppers; the siphon and the siphon-jet closets; and finally, the so-called wash-down closets, having a vigorous and direct flush. You may notice that I do not include in this list the wash-out closets, because while I do not wish to condemn them too severely, I cannot bring myself to regard them with much favor. They have several objectionable features, which do not commend them to me as a perfectly sanitary fixture. They are, notwithstanding these facts, very popular at the present time. Popularity, however, is not always a just criterion of fitness, for the same thing may be said to have been the case with the Jennings and the Zane plunger-closets, with the Hellyer or valve closet, etc., all of which are now out of date.

Two points require careful attention, where porcelain water-closets are used, one is the floor-joint, which being on the sewer side of the water-closet trap, must be made tight. The other is the connection between the piping and the earthenware horns of the bowl. If these are made rigid, breakage of the earthenware is the result of the slightest settlement of the floor. A flexible connection is, therefore, much to be preferred and can now be obtained with many of the types of closets named.

The limits of this paper do not permit my discussing in detail the requirements of water-closets, and I must pass on to review briefly the other plumbing appliances of houses.

Speaking of wash-basins, we may distinguish four principal types, viz: 1, tip-up basins; 2, chain-and-plug basins; 3, open stand-pipe overflow basins; and 4, secret waste-valve basins.

Tip-up basins are generally condemned, because in their usual form they have objectional features. If the receiver could only be arranged so that it would not become foul, or that it was readily accessible for cleaning, this type of basin would have many merits. It is, without doubt, very convenient in use, has no concealed overflow, no chain and plug, is rapidly emptied and flushes its waste pipe and trap well at each discharge.

The objections to the second type, the common chain-and-plug basin, are too well known to need further comment. It is proper however, to state that there has recently been put upon the market some modified forms of this type, which I consider great improvements upon the ordinary type. One is a siphon-basin, which empties rapidly, and flushes its overflow at each discharge. The overflow channel is so shaped that when the plug is inserted in the bottom of the bowl and the same filled with water, the overflow is trapped. In office-buildings and in hotels, where a stand-pipe-overflow basin or a bowl with waste-valve is too expensive and too complicated for general use, the siphon form of basin has much to recommend it. The other improved form is a chain-and-plug bowl in which the waste outlet has been greatly enlarged, and which has the usually hidden overflow channel made much shorter and accessible by means of a removable strainer.

The third type of basin has an open stand-pipe overflow, and there are numerous modifications of the device for raising the stand-pipe. From a sanitary point-of-view this type has, undoubtedly, the greatest merit of all forms, still my experience has been that the general public is hardly sufficiently educated in sanitary matters to appreciate its merits. By many this form of basin is utterly condemned on account of its odd shape and appearance. The favorite form of basin is just the one which has the most objections from the hygienic standpoint, namely, the bowl with secret waste-valve. To discuss its objectionable features in detail would lead us too far.

Regarding that valuable fixture for personal cleanliness, the tub or bath-tub, with its various modified forms, such as the foot-tub, the sitz-bath, the hip-bath, the bidet, etc., I would state that tubs of wood lined with copper are less used than formerly in private houses, probably because they always require some sort of wooden casing, and also because they lose their bright appearance in use. Enamelled iron tubs, standing free from the wall and raised from the floor, constitute a satisfactory sanitary fixture, which is only surpassed by the beautiful all-porcelain bath-tubs. Both kinds of tubs are now obtainable with a glazed roll rim, thus doing away entirely

with all woodwork. I ought, perhaps to mention in this connection, that a great improvement in the manufacture of American earthenware has recently taken place, and that it is now for the first time possible to obtain porcelain bath-tubs made in this country. In regard to the appliances used for holding water in the bath-tub and for emptying the same, much of what I said of wash-basins applies here. In this matter I may appear to you old-fashioned, when I state that my decided preference is for an open stand-pipe overflow.

For baths in public institutions, for baths in factories, and for people's baths, there is a growing tendency to discard the tub-bath in favor of the rain or spray bath, which is greatly superior from a sanitary point-of-view, besides having many economical advantages.

Slop-sinks and housemaids' sinks are obtainable in a variety of serviceable forms, most of them excellent from the sanitarian's point-of-view. I would only remark that a flushing cistern is quite as essential in the case of a slop-sink as in that of water-closets. An ingenious and novel arrangement consists in a slop-sink, which flushes itself automatically each time slops are emptied into it.

Kitchen sinks are likewise obtainable in a variety of materials. This fixture is much improved by changing the dribbling stream passing through its waste into a quick and effective flush. Attempts in this direction have been made, with some success, and the devices employed are certainly worth considering. Incidentally, the question of avoiding the kitchen grease nuisance is thereby solved, in a better way, to my mind, than by the employment of grease-traps at the sinks, which invariably constitute a nuisance, are usually forgotten or neglected and are not to be recommended. I must content myself with a mere allusion to the subject.

Of urinals, it is only necessary to mention that in private houses their use is not to be encouraged, as the fixture is very difficult to keep clean. In offices and in public buildings, such as hotels, railroad stations, court-houses, etc., the fixture is a necessity, and great attention is required not only in the fitting-up, but in its maintenance. The projecting lip of porcelain urinals seems to me to be of doubtful advantage. One point in the fitting-up of the fixture is worthy of mention: the bowls are generally set up too high from the floor-slab. I find it is better to set them at a height not exceeding twenty-two inches from top of lip to floor-line, instead of twenty-four to twenty-six inches, as is customary. The floor-slab is thereby kept more readily free from drippings.

In fitting-up plumbing-fixtures, the chief aim should always be the avoidance of woodwork at and around them. All fixtures should stand free from the walls and be accessible on all sides. Even the seats of water-closets are now attached directly to the bowl, the closet thus stands absolutely free and detached from the wall, and the entire fixture can be reached for cleaning and for repairs. In one respect, however, modern plumbing-fixtures are open to considerable improvement: I refer to the undesirable noisiness accompanying the flush and the discharge of the fixtures. This problem, as experience teaches, is not easily solved.

The time at my disposal permits only a brief allusion to the testing of plumbing work. All work should be tested before acceptance, as knowledge of the safety of the plumbing-work can only be obtained in this way. I regret to say that I have found only very few mechanics doing plumbing who apply to their work any test, except where this is specially insisted upon by the architect or the engineer. To my mind, it is one of the most important duties which architects owe to their clients, to see to it that all work is tested. For new work we have the water test and the air-pressure test. This should include not merely the main horizontal lines and the vertical stacks, but likewise all the branches, and the brass-ferrule joints. The finished work should be tested by the peppermint or by the smoke test, which help to show imperfections in the joints of nickel-plated piping and at the floor-joints. In the inspection of old work, the water test, which is the best test, cannot, for obvious reasons, be applied, and here the smoke test, or the test with oil-of-peppermint, intelligently applied, give valuable indications as to the condition of the work.

A great step forward would be made and plumbing-work vastly simplified, by abolishing, or at least, modifying, the trap-vent system.

There are at present two quite different methods of arranging the system of trapping the fixtures in a building. In the one system, which is in accordance with the majority of plumbing regulations, and is the one at present enforced in New York City, all traps must be back-aired or vented. We thus obtain a duplicate system of pipe-lines, the work is complicated, more expensive and may become more unsafe, on account of the greater number of pipe joints and the possibility of "by-passes." The other system—the one-pipe system, as we may call it—is distinguished by its greater simplicity, economy and, as I maintain, by its greater safety. This method substitutes non-siphoning traps or anti-siphon trap attachments for the cumbersome method of back-airing. In this system, all main soil and waste lines must be quite as fully ventilated by extending them the full size up to the roof as in the usual method. All fixtures are located directly at the lines carried up to the roof, or within a very few feet of the same. Siphonage of the traps is impossible under the ordinary conditions, quite as much so as in the back-airing system. You will find the majority of plumbers opposed to the new system: for while it simplifies the work, it reduces the amount of piping used and thereby the cost of the work. There is also much prejudice against the proposition, many plumbers seeming to fear that by putting themselves openly on record as in favor of it, they

would by others be considered as not quite up to date in plumbing matters. The fact remains undisputed — and I have demonstrated it in many cases in my practice — that the new method is, at least, quite as safe as the old one. I venture to predict that in a very few years plumbing-laws will be so modified as to leave it optional with the owner or architect of a building which method he will adopt.

This leads me to say a few words in regard to plumbing rules and regulations, in particular of those in force in New York City. Further advancement in plumbing requires the revision and improvement of the plumbing-laws of the Building Department. Far be it from me to underrate the good which the present rules have accomplished in the past. Ours is not, however, an age in which we can at any time afford to stand still. Constant progress is made in every department of construction and the researches of the practical sciences are everywhere utilized and embodied in actual practice. Let us hope to see soon a revision of our plumbing laws. Be it remembered that the plumbing rules of our metropolis are being largely copied by other cities. We cannot afford to fall behind in this matter. Our present rules are too indefinite in many details; they are much too arbitrary in others. Take, for instance, the question of sizes of drain-pipes, of soil-pipes, of vent-pipes, the diameter of traps, etc. There is certainly now sufficient practical experience available to lay down more definite rules as to sizes. The rules should also in the future prohibit fixtures which sanitary science has long ago recognized as being absolutely bad. Pan-closets, wooden sinks and wooden wash-tubs should be discarded, and privy sinks should no longer be tolerated.

Before leaving the subject of interior drainage, I wish to consider for just a moment the prevailing practice of doing plumbing work. It is without doubt feasible to have plumbing work done by day's work by a contractor of known integrity, at a certain agreed commission or profit on the net cost of labor and material without thereby unduly increasing the cost of the work. Still, as a rule, the owner prefers to make a contract for a lump sum or stated figure. In that case, the recent practice, particularly in the case of high office-buildings, of putting the plumbing — and for that matter the heating and power plant, the electric work and the elevator machinery — in the builder's general contract, for a consideration which usually amounts to much more than the fee of experts who would plan and superintend the work in the owner's interest, cannot be commended. There is not, to my mind, a single feature of merit in it, and there are, on the other hand, good reasons why these branches, which comprise the domestic engineering work of buildings, should be kept separate and under the direct control of the architect or the mechanical, electrical or sanitary engineering expert who may be associated with him.

In conclusion, let me say a few words about the outside drainage and final disposal of the sewage, particularly of country houses, not within reach of sewers. These are questions which rarely concern the architect directly, but about which it is nevertheless useful for him to keep informed.

In the case of city houses the outside drainage is apparently a very simple matter, consisting merely in the continuation of the house-drain to the public or street sewer. Still, even the sewer connection requires attention, as is proved by a recent case which happened on the upper west side of this city, where a builder and his plumber connected a whole row of dwellings to the pipe-sewer in the street by merely breaking holes into the sewer and sticking the house-drains through it.

The final disposal of the sewage from habitations becomes a very difficult and sometimes troublesome matter in the case of country and suburban houses, not within reach of sewers. The purity of the local water-supply must be maintained, the contamination of the soil and likewise the pollution of the air must be prevented at all hazards. To accomplish this, the disgusting and health-menacing cesspool and the privy nuisance must be done away with. Bad as a single cesspool is, the evil is only aggravated by the method sometimes pursued of having one cesspool for the water-closet wastes and another for the kitchen-sink wastes, or by having a series of cesspools with connecting overflows.

Two methods of sewage disposal have been devised by engineers which offer a successful solution of the problem. One is the system of sub-surface irrigation, the other the disposal of sewage by irrigation over the surface. Inasmuch as the chief requirements are that sewage be disposed of not alone without injury to health, but also without offence to sight or smell, it is not often practicable to run the sewage over the surface of the ground near the house. Where plenty of land is available, and located at such an elevation that sewage can be conducted to it by gravity, surface-irrigation is by far the best, the cheapest and the simplest mode of disposal.

The other system, the sub-surface irrigation system, has been in successful use in many country places. It has often been described and illustrated, and in a paper like this it is out of the question to go into details. The chief features of this system are the following:

1. Carry the sewage from the house in a tight pipe conduit leading to a sewage or flush tank.
2. Collect the sewage in a double-chambered tank, the first chamber being intended to retain the solids and kitchen grease, while the second and larger tank receives the liquid sewage by a deeply-trapped overflow from the first chamber.
3. Discharge the liquid sewage once or twice a day, by means of an automatic siphon, into an outlet pipe, leading to the sewage field.

4. Distribute the sewage by means of a main conduit with laterals, into a system of absorption drain-tiles, laid with open joints, in trenches twelve inches deep, covered up with earth.

I will not describe the details of the system. I wish to warn you, however, against having such work done by contract. Frequently have I been asked by clients and by architects, to undertake sewage-disposal contracts, but I have always declined to do so. I know that others undertake such contracts, but the results are seldom entirely satisfactory. Often the mistake is made of laying an insufficient number of absorption tiles; with the result that after a season's work the field becomes overcharged with sewage. I also find sewage-disposal systems laid out by others giving trouble because the tiles are laid with too steep a grade, in which case it invariably happens that the bulk of the sewage runs to the lowest end of the field, where it often breaks out on the surface. In other instances, again, I find the distributing tiles laid two, three and sometimes even four feet below the ground surface. This mistake arises from a lack of knowledge of the principles of the system, which require the sewage to be discharged into the upper well-aerated layers of the soil, or the sub-surface, where the action of the bacteria converts the sewage and the particles of organic matter attaching to the earth into harmless elements.

A bad layout of the distributing tiles invariably results in failure. Sometimes the system proves unsuccessful from the omission of the first or intercepting chamber, in which case the tiles become choked in a short time. Insufficient attention to the flush-tank is another frequent reason why the method fails to give satisfaction. Owners of country houses, after adopting this method of disposal, generally make the mistake of assuming that the same is automatic and hence needs, after completion, no further attention. The fact is that nothing is automatic in the system except the siphon for emptying the flush-tank, but every part of the system, including the siphon, needs attention and intelligent care and occasional cleaning.

As regards the flush-tank, it may be either an open or a closed tank, the latter being preferable in all cases where the flush-tank must be placed near the house. The open tank, if at a distance from the house, is better, because it is more readily accessible and easier to clean. The tank may be circular in shape or else oblong. It is generally built of brickwork, lined with Portland cement. Colonel Waring, who introduced this system from England, has suggested lining such open sewage-tanks with enamelled-face brick, or with marble. I agree with him that this is quite desirable on the ground of greater cleanliness. But in my own practice, I have not been able to meet clients who were willing to incur the extra expense involved, and where I am associated with architects in such work, I find they prefer putting marble or slate or enamelled-face brick, where it will show to better advantage.

There are a great many other things which I would like to bring before you if time permitted. In closing this paper, I thank you for your courteous attention, and trust that some of the points brought up may be new to you, though I fear that to such a progressive body of architects I have but re-told an old story.

THE GOVERNMENT BUILDINGS BILL.

WE publish herewith, a copy of the Bill relating to the reorganization of the Government Architect's office, which was introduced into the House of Representatives by Mr. McKaig, and into the Senate by Senator Brice, under the following circumstances:

This Bill originated with a few architects in New York City, who happened to learn that notwithstanding the controversy between Secretary Carlisle and the American Institute of Architects, the Treasury Department was anxious to reorganize the Supervising Architect's office, and to have a bill introduced to this effect, because of the many objectionable and illegal features of previous bills — notably the "Tarsney Bill" — which made them undesirable as well as inoperative.

The "McKaig Bill," which was draughted by Mr. George B. Post, of New York, in consultation with these New York architects and with the Treasury Department, embodies an entirely new idea which is based on the very satisfactory lines under which a number of Government Departments — notably the Light-house Department — have been conducted most successfully for a number of years; by placing the initiative and professional work under the management of an expert board, of the highest standing, under whose direction the work would be distributed for the best advantage of the country, of the work, and of the profession; leaving the administrative work in the hands of the Government, where it belongs.

The Bill, as originally draughted, was revised a number of times, by the Committee of Architects on the one hand, and by the Treasury Department on the other, and as introduced was entirely satisfactory to all parties concerned. Though many of the minor details may not apply to individual cases in individual sections of the country, they had to be adjusted so as to cover the entire territory, and also so as to meet administrative, legal and other objections not generally appreciated by the profession at large. The powers of the Commission are such as to enable them to modify these details from time to time, as they find it necessary and wise.

The principle of the Bill, namely, the instituting a Commission of high character to have charge of the architectural work of the Government, and to distribute the work amongst the most skilful architects in the country, is unquestionably a correct one.

The Bill has received the approval of the Secretary of the Treasury. It has passed the Committee on Public Buildings and Grounds, of the House, whose indorsement could not be stronger, and the Bill is now regularly before the House. Owing to its introduction at the end of the last session of Congress, at a time when the House was entirely absorbed by the Tariff revision, it was impossible to have a day set for its consideration and passage; therefore it had to go over to the present session of Congress.

In the House Committee's report to the House, recommending the passage of the Bill, they state, among other things:

"Your Committee do not believe that the beneficial results that should be obtained, are obtained under the existing methods of planning and constructing public buildings of the United States.

"While the employment of the best artistic thought, and best and most approved systems of construction and equipment ought to be represented in the public edifices of this great nation, the contrary of these propositions is the result obtained under existing methods.

"Your Committee are advised that the best and highest types of artistic thought and architectural skill in European countries is found in the Government buildings of those countries, while in this country the reverse is the rule, and superiority of architectural design is represented in State, Municipal and private buildings, and not those erected by the General Government.

"A comparison of modern buildings, erected by private citizens and corporations, with those belonging to the Government of the United States, will show, as to the former, constant progress in construction and artistic expression, and continual increase in economy of construction, while in the case of the buildings of the United States there has been but little, if any, advancement. The buildings constructed recently by the United States, as compared with those constructed a quarter of a century ago, show a marked deterioration of artistic quality. The cost has been, relatively and positively, much greater than those of private buildings of the best type.

"Your Committee has been furnished reliable and trustworthy information and data, showing the cost of the best type of buildings constructed for States, municipalities, corporations and private citizens, ranges 38 to 50 cents per cubic foot of space, while the cost of buildings constructed by the United States ranges from 50 cents to \$1.00 per cubic foot." . . .

"The conditions and results which your Committee thus call to your attention, necessarily follow the methods and practices now employed by the Government." . . .

"It now transpires that the time of the Supervising Architect is wholly employed in matters of administrative detail, and the architectural work of the office, the plans, designs and specifications, are prepared by mere copyists — cheap clerks." . . .

After entering elaborately into the present duties of the Supervising Architect, and showing the physical impossibility for one man to find any time for designing, the Report continues:

"The Supervising Architect rarely sees one of these buildings while in course of construction. Its construction is generally under the supervision of some local carpenter or builder, who never made any pretense to architectural knowledge or study; whose appointment was secured not because of his skill, but because of the political influence he could marshal, and whose greatest solicitude is to prolong the tenure of his employment by delaying the completion of the work." . . .

"A building, which, if the property of a private citizen would be constructed in months, when erected by the Government requires years for its completion. . . . A public building at Detroit, Mich., where the construction was authorized eleven years ago, and \$1,300,000 appropriated by Congress years since, the foundation-walls are not yet completed.

"Indeed, the abuses in the method above referred to, have become so serious that the Committee cannot conscientiously recommend public buildings at many places where the economical and convenient transaction of the business would require or justify such buildings could they be provided at a cost not greatly exceeding the necessary expenditure by a private owner for similar purposes.

"Of the Bills reported from this Committee during the present session, many are so reported only under the assumption that the buildings contemplated can be erected under some plan less wasteful than now in operation.

"The scope and purpose of the measure herewith presented is designed to remedy the many evils herein pointed out. To give to the country a better type of architecture in its buildings, and to stop the wasteful extravagance which is the necessary result of the present methods." . . .

"The measure does not abrogate or take from the Supervising Architect any of the functions or authority belonging to the office, which, under existing conditions, he is capable of performing. He will remain and continue the representative of the Government, and perform all the duties that now pertain to his office, excepting the designing and preparation of drawings and specifications for such buildings, and the local supervision shall be subject to his approval." . . .

"In fact, this measure is intended to make him what the title of his office indicates, the Supervisor of Architects; not the Government's architect, but the supervisor of the architects of the Government's works. Therefore, your Committee recommend the passage of the Bill."

In the Senate, the Bill was introduced in the Senate and referred

to the Committee on Public Buildings and Grounds too late for its consideration, and has not yet been reported upon by this Committee.

To summarize: In the House, the Bill is regularly before the House, and as soon as a day can be set for the discussion of the same, it can be passed. In the Senate, the Bill is before the Committee, and as soon as it can be reported to the Senate and a day set for its discussion, it can be passed.

The Bill has received the approval of the Committee of the House, of the Secretary of the Treasury, of the Press, and of the profession. It has been before the profession for nearly a year. Numerous meetings of different professional societies and notably of the American Institute of Architects have taken place in the meanwhile, and its endorsement has been unanimous. Many Senators and Congressmen have been seen individually, and without exception have commended the Bill, and promised their support; many of them in writing. Up to the present date there has not been a single objection raised to the Bill, by the Public, by the Government, by the Representatives of the Government in the Senate or House, or by the profession; on the contrary, it has received the most positive and hearty endorsement.

The Bill should pass both Houses with little or no trouble, because:

1. It is purely administrative in its character.

2. Its object is to correct an inefficient system which was instituted years ago, and which has become not only obsolete, but positively pernicious.

3. It does not interfere with the present system, in so far as that system is efficient, but tends to relieve the present system of a burden to which it is not equal, and to enact proper measures to provide for this part of the work.

4. It asks for no appropriations or expenditure of money, but aims on the contrary, to effect economy in the expenditure of the moneys, and to raise the character of the work to the highest standard of the present age.

5. In raising the standard of the work, it will raise the standard of the art, create new incentive, bring forth new men, new opportunities, and result in covering this country with monuments which will eventually compare with those of other countries, and in time, perhaps, excel them.

6. It has received the hearty approval of everybody concerned or interested, on whichever side of the question they may be.

7. It will not legislate out of office any of the present office-holders — many of whom have served the Government faithfully for many years — because the work now in hand under the present system, and the maintenance of the buildings now completed, will demand the services of this force for many years to come, and it only applies to future work.

8. It will relieve the Secretary of the Treasury of all work of an expert character, for which he must necessarily depend upon outside advice, by placing at his disposal in this connection, an expert Board of the highest standing.

9. Not only will the buildings be equal to the best types that are erected in the United States, both artistically and constructively, but they will be built, as stated by the Committee of the House, at a saving of at least 30 per cent on the actual cost of construction, at least three years in the time of construction, saving not only the interest on the cost of the land and the cost of construction, besides salaries of superintendents, watchmen, etc., during this period — the cost of repairs and maintenance due to suspension of the work, but also three years rent for temporary quarters pending completion of buildings.

10. It can be demonstrated by figures that under the new Bill, with better buildings, erected in a much shorter time, the cost of the construction of the buildings, the commissions of the architects, and the necessary appropriation for the Supervising Architect's office, the United States Government would save at least one million dollars per annum, as compared with the present system.

J. M. CARRÈRE, Secretary.

By order of the Legislative Committee on Government Architecture:—

Permanent Committee: Bruce Price, Chairman; Ed. H. Kendall; and John M. Carrère, Secretary.

Advisory Committee: R. M. Hunt, Chairman; Chas. F. McKim and Geo. B. Post.

[NOTE. — Copies of the Circular, for distribution, can be had on application to Mr. John M. Carrère, 44 Broadway, New York.]

INFORMATION. — The Committees on Public Buildings and Grounds are as follows:

HOUSE.	SENATE.
JOHN H. BANKHEAD, Ala., Chairman.	GEO. G. VEST, Miss., Chairman.
JOSEPH ABBOTT, Texas.	JOHN W. DANIEL, Va.
WM. M. MCKAIG, Maryland.	SAMUEL PASCO, Fla.
TIMOTHY J. CABBELL, N. Y.	CALVIN S. BRICE, Ohio.
JOHN L. BRETZ, Indiana.	JOHN B. GORDON, Ala.
CORNELIUS A. CADMUS, N. J.	JUSTIN S. MORRILL, Vt.
BENJAMIN F. GRADEY, N. C.	MATTHEW S. QUAY, Pa.
ALBERT S. BERRY, Ky.	WALTER C. SQUIRE, Washington.
ROBERT C. DAVEY, Louisiana.	JOSEPH M. CAREY, Wyoming.
SETH L. MILLIKEN, Maine.	
WILLIAM SUMIT, Idaho.	
ELIJAH A. MORSE, Mass.	
MYRON B. WRIGHT, Pa.	
JOHN M. WEVER, N. Y.	
DAVID H. MERCER, Nebraska.	

A BILL TO PROVIDE FOR THE SECURING OF PLANS AND FOR THE ERECTION OF THE PUBLIC BUILDINGS OF THE UNITED STATES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President, by and with the advice and consent of the Senate, shall appoint a commission on public architecture consisting of three architects of high scientific and artistic attainment and large practical experience, and two officers of the Engineer Corps of the United States Army. If necessary, a separate appointment of any or all of three members of the commission who are architects may be made for each building under consideration, and members of the commission for one building may act upon other buildings. That the commission, under the general direction of the Secretary of the Treasury, shall discharge all the administrative duties relating to the procuring of designs and the appointing of architects for all buildings hereafter erected by the Government of the United States.

SECTION 2. That the Secretary of the Treasury shall be the president of the commission *ex officio*, and the Supervising Architect of the Treasury Department shall be a member of the commission *ex officio*. In the absence of the president of the commission, one of the members shall be elected as chairman by ballot, and he shall preside at the meetings and perform such other duties as the rules of the commission may prescribe; and the Supervising Architect of the Treasury shall act as secretary of the commission.

SEC. 3. That the Secretary of the Treasury shall convene the commission whenever, in his judgment, the exigencies of the service require it.

SEC. 4. That the commission shall adopt rules and regulations governing competition in the procuring of designs, and for the government of its meetings and the general performance of its duties. The members of the commission shall be paid their actual expenses and subsistence and a *per diem* allowance of \$10 while actually engaged in the performance of their official duties, but no *per diem* allowance or salary shall be allowed to any civil or military officer on account of his being employed on the commission, but his actual travelling expenses and subsistence shall be paid while engaged thereon.

SEC. 5. That in case the limit of cost provided by law is \$100,000 or over, the commission shall select by ballot, for each building, five architects to prepare designs in competition; in case the limit of cost is less than \$100,000, the commission may, in its discretion, select by ballot an architect without competition. No architect shall be eligible for entering as a competitor, or for appointment, who has not had at least ten years' experience as an architect-in-chief, and unless he can satisfy the commission, through work already done by him, or otherwise, that he is competent to take charge of the economical construction of the building. The commission shall cause to be made and issued to competing architects, surveys, schedules of requirements for the building, limitations of cost, and all facts which might control or influence the character of the required design. The commission shall specify the number and character of the drawings required, and fix a definite time for their completion. The Secretary of the Treasury, upon the recommendation of the commission, shall pay to each unsuccessful competitor, to reimburse him for expenses incurred in preparing the competitive drawings, the following amounts: For designs for buildings to cost not more than \$150,000, the sum of \$150, and for each and every \$100,000 of the limit of cost of the building above that amount, the additional sum of \$100; but in no case shall more than \$1,000 be paid to any unsuccessful competitor.

SEC. 6. That the commission shall reject and return to the author any drawings which have failed to exactly comply with the requirements and regulations adopted by the commission for the competition, and no compensation for their preparation shall be paid, and the author thereof shall be debarred from all further participation in the competition. The commission shall carefully examine the drawings of each competitor in competition and shall select one design as the design of the proposed building, and shall recommend its author as the architect for that building and return forthwith all other drawings to their authors. The Secretary of the Treasury shall thereupon appoint the architect so recommended and he shall perform all the customary duties performed by an architect in private practice, namely: The making of all preliminary sketches, the modification of his designs to meet possible requirements of the commission, the preparation of a set of general working-drawings to procure estimates; the preparation of a set of general details on a larger scale, a set of full-size drawings for moulded, carved or ornamental work, and a set of all other original drawings and specifications required by the commission. He shall supervise the construction of the building, and no payment shall be made to any contractor until the certificate of the architect has been received by the Secretary of the Treasury that the work has been executed in conformity with the contract. He shall file a complete set of the construction drawings in the Treasury Department, from which all duplicates shall be made, which duplicates shall be paid for out of the appropriation for the building. The architect shall be paid for his services a fee of five per centum upon the total cost of the work and the usual travelling expenses. The expenses of the commission and the fees of the architect shall be paid by the Secretary of the Treasury out of the appropriation for the building in the erection of which they were incurred.

SEC. 7. That the Secretary of the Treasury, upon the recommendation of the commission, shall authorize the architect to employ a competent clerk-of-the-works, at a salary to be established by the commission, and he shall be paid for his services out of the appropriation for the building.

The "McKaig Bill" is known as H. R. 7470. 53d Congress, 1st Session. The Report is known as 53d Congress, 2d Session. House of Representatives, Report No. 1370.

The Rules of the House and Senate permit that the Bill should be made the subject of a special order, having a special day set for its consideration and passage.

Copies of Bill and Report can be obtained by addressing the Clerk of the House.

SEC. 8. That the Supervising Architect of the Treasury Department, under the direction of the Secretary of the Treasury, shall be the representative of the Government in all matters connected with the erection and completion of public buildings and the payment therefor. He shall receive proposals for the work, and, with the approval of the architect of the building, he shall award the contracts therefor. He shall perform all other duties that now pertain to his office, except such duties as are vested by this Act in the architect of the building.

SEC. 9. That all Acts and parts of Acts inconsistent with this Act are hereby repealed.



SOUTHERN CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

THE annual meeting of the Southern Chapter of the American Institute of Architects will be held at Memphis, Tenn., on the 8th, 9th and 10th of January, and it is most important that every member should attend this meeting, as matters upon which the vitality of the organization depends will be laid before the meeting, and must be discussed and acted upon.

I desire to impress upon members the value of organization, and to urge the maintenance of an association upon which the welfare of our profession and the interest of every individual member so greatly depend. By organization and united effort we can accomplish results where individual endeavor would fail. Such organization influences more respect and a better appreciation of our profession, and can obtain legislation to establish the rights of architects and exert influence in obtaining favorable decisions before the courts.

In addition to this, these meetings and interchange of views promote a kinder feeling, a unity of fellowship and a combining of effort to further the artistic, scientific and practical efficiency of the profession. Our Chapter is young, and time has not been given it to accomplish these aims and objects, but its efforts are being felt throughout the country, and its power for good will increase with time, and be recognized by all.

Let us, then, for a few days at least, lay aside all personal and private interests and attend this meeting, and lend our aid and influence to the good cause.

M. J. DIMMOCK,

President Southern Chapter A. I. A.

AMERICAN INSTITUTE OF ARCHITECTS.

THE first meeting of the Board of Directors of the American Institute of Architects for the year 1895 will be held in Chicago, January 7, 1895.

Applications for membership and matters requiring the attention of the Board should be sent to the Secretary, so as to reach Providence by January 4; after that date, they should be sent to the Secretary, care of D. H. Burnham, Esq., President American Institute of Architects, "The Rookery," Chicago.

All drawings to accompany applications for membership should also be forwarded to Chicago, as above, so as to reach there before January 7.

ALFRED STONE, Secretary.

CLEVELAND ARCHITECTURAL CLUB.

THE premiated designs in the first regular competition of the Club, upon the subject, "An Entrance to a Residence in Masonry" were: first, W. D. Benes; second, G. B. Bohm; third, J. W. Russell; fourth, F. Baird; fifth, H. S. Nelson. The subject for the January competition is a "Transfer-station for the Public Square."

HERBERT B. BRIGGS, Secretary.



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

NORTH FRONT OF INDEPENDENCE HALL, PHILADELPHIA, PA.

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

ANDREW HAMILTON has generally been credited with the design, though he was not an educated architect, but an amateur. The wall inscription states that the building was begun in 1732 and Andrew Hamilton is named as the architect and superintendent. We are inclined to accept this record as correct—the more so because of the general methods of practice in Colonial days—when architects were poor and mechanics had been trained in England on work of dignity and magnitude, and brought over with them a knowledge of detail and books of plates from which good detail could be evolved.

FORT DEARBORN BUILDING, SOUTHWEST CORNER CLARK AND MONROE STS., CHICAGO, ILL. MESSRS. W. L. B. JENNEY & W. B. MUNDIE, ARCHITECTS, CHICAGO, ILL.

The construction is a steel skeleton, fireproofed. All the walls and floors are carried story by story independently, on the columns. The wind-pressure is in part counteracted by widening the connections of the outside girders to the columns by gusset plates. (This was the subject of Mr. Jenney's paper written for the last Convention of the American Institute of Architects.) The street-fronts are brick and terra-cotta. Size of building, plan 80' x 90', height 150'.

ENTRANCE AND ELEVATOR HALL OF THE SAME.

THE TAYLOR BUILDING, ESSEX ST., BOSTON, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON, MASS.

SECOND NATIONAL BANK, PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

[Additional Illustrations in the International Edition.]

A CORNER OF THE DIRECTORS' ROOM IN THE BUILDING OF THE METROPOLITAN LIFE INSURANCE COMPANY, NEW YORK, N. Y. MESSRS. N. LE BRUN & SONS, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

THE SOUTH FRONT OF INDEPENDENCE HALL, PHILADELPHIA, PA.

[Gelatine Print.]

QUEEN'S HALL, LANGHAM PLACE, LONDON, ENG. MR. T. E. KNIGHTLEY, ARCHITECT.



[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.]

A CORRECTION.

ALBANY STREET, LONDON, ENG.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—A printer's error in omitting capitals to "New Gallery" in an article of mine, in Number 986, *American Architect*, seems to make the latter appear as a notice of the same exhibition as that criticised in Number 975. But they were two distinct exhibitions: one at the Grafton Gallery, the other at the New Gallery.

Yours faithfully, S. BEALE.



BOSTON, MASS.—*Winter Exhibition and Ancient Chinese Euddhist Paintings, also, Line Engravings, Mezzotints, and Etchings by Rembrandt*: at the Museum of Fine Arts.

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

Delorme's "Blacksmith" and Dielman's "Marriage of Dr. Le Baron": at Williams & Everett's, 190 Boylston St., until January 12.

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

Loan Exhibition of Portraits: at the Art Institute, January 2 to 10.

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

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

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

George Inness Memorial Exhibition: at the Galleries of the American Fine Arts Society, 215 West 57th Street, opened December 27.

Halsted Collection of Works by George Inness: at the American Art Galleries, closes January 9.

Pictures by Hubert Vos: at Ortgies Galleries, 306 Fifth Ave., closes January 8.

Water-colors of Holland and Venice by F. Hopkinson Smith: at the Avery Galleries, 308 Fifth Ave., January 7 to 19.

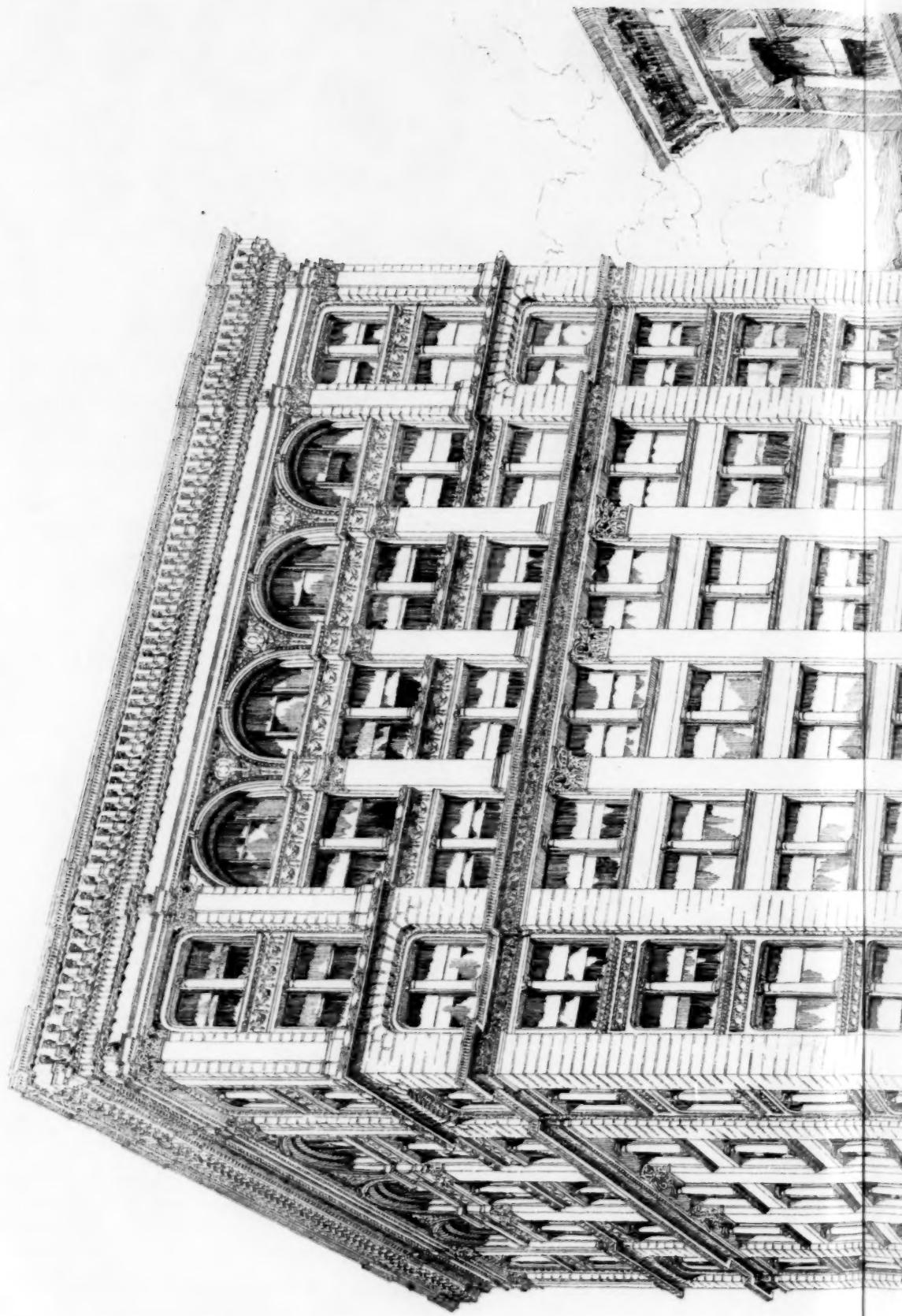
PHILADELPHIA, PA.—*Sixty-fourth Annual Exhibition of the Pennsylvania Academy of Fine Arts*: opens December 17, closes February 23. The special exhibition of Architectural Drawings closes February 5.

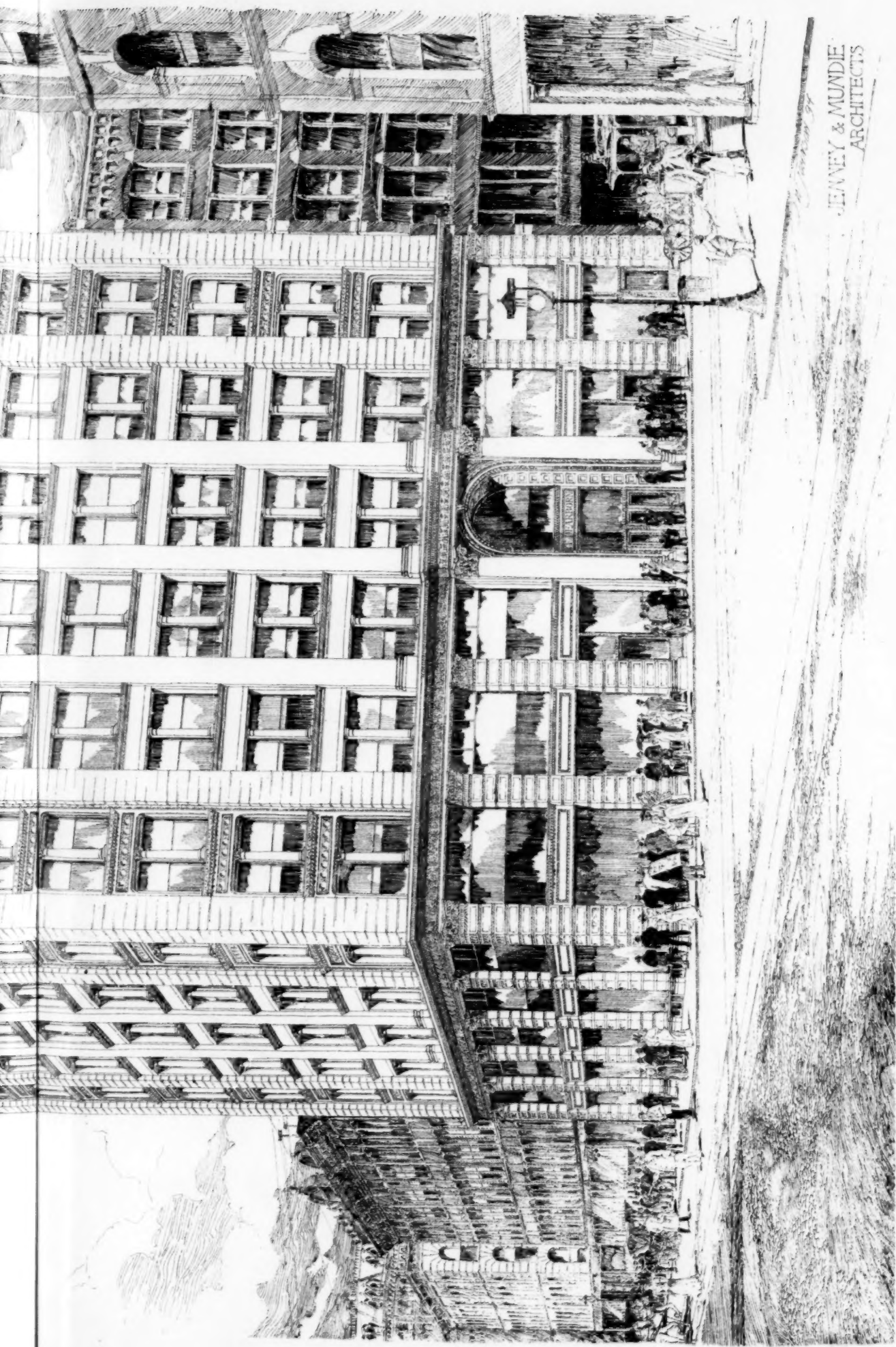
NOTES AND CLIPPINGS.

THE METROPOLITAN MUSEUM'S ORIGIN.—At the dinner given at the Union League Club last week to Robert Gordon, of London, by the trustees of the Metropolitan Museum of Art, Mr. Samuel P. Avery made a speech of some historic interest: "As Secretary of this company," he said, "I desire to call attention to the appropriateness of the giving of this compliment to one of the founders of the Metropolitan Museum of Art in the Union League Club, for the first action which resulted in the foundation of our Museum was taken by the Art Committee of the Union League Club, when it called a public meeting at the old Club-house, corner of Madison Avenue and Twenty-sixth Street, on the evening of November 23, 1880, for the purpose of considering what steps were necessary to start such an institution. George P. Putnam was the Chairman of this Art Committee. Other members were John F. Kensett, George A. Baker, Vincent Colyer (dead, but not forgotten), W. Whittredge, J. Q. A. Ward and S. P. Avery as Secretary. William Cullen Bryant presided at this meeting of citizens representing all classes and professions. One of the results was the appointment of a committee of fifty to carry on the work. Twenty of this committee eventually became trustees. Fourteen of these are still living, and some are with us this evening. Our friend, Mr. Gordon, was one of these founders of the Museum, which was incorporated in 1870, and, as a trustee and treasurer, was a faithful worker until he removed to England. But before this period he had shown his love for the art and the artists in forming a collection of the works of our native painters, which now adorns his English home, and some of us remember how he proved his interest in the cause of art and of humanity by his practical lectures on the processes of engraving and printing before attentive audiences in the 'slums' on the east and west sides. These plain talks were illustrated by specimens and by the actual tools and presses needed for their production. All of our trustees have responded to this tribute to their friend and old associate except three who are in Europe and three who are ill or had prior engagements. Our number could have been largely increased had we space to include the host of artists and others who are anxious to show that absence has not lessened their affection for Robert Gordon."—*The Collector*.

SOLDERING ALUMINIUM.—There is probably no metal so well adapted for the manufacture of wind-instruments, field-glasses and similar work as aluminium, but the use of this material has been limited by the difficulty of soldering. Aluminium oxidizes so readily that it is exceedingly difficult to secure a clean metallic surface free from oxide, which is essential if the solder is to make a proper joint with it. Mr. Ludwig Olivers, a Swedish inventor, has, however, discovered that if a suitable solder is used, the metal may be "tinned" by rubbing it with a wire brush under a layer of molten solder. This brush removes the oxide from the surface of the aluminium, and air being excluded by the layer of molten solder, the latter has time to unite with the clean metallic surface thus prepared before the aluminium has a chance of oxidizing again. In practice, the aluminium is heated to a temperature of 450° Fahrenheit by placing it on a cast-iron plate heated by a furnace. The stick of solder is then rubbed on the aluminium, where it melts and is caused to unite with the joint by the use of a wire brush, as described above. A demonstration of the method was given by the British Aluminium Company of 9 Victoria Street, on Friday last. The most striking example of the effectiveness of the joint produced was, perhaps, the soldering of a strip of aluminium end-on to the middle of a second strip, the two strips making right angles with each other. An attempt to separate the two, by bending the soldered strip backwards and forwards, only succeeded in breaking the aluminium, the material itself proving weaker than the joint. Samples of aluminium tubes, formed by soldering, were shown, and the process of joining two such tubes together in the same way was also exhibited. Plates of iron, copper, etc., were also faced with aluminium in a similar manner. The British Aluminium Company are, we may add, about to start works for the production of aluminium within the United Kingdom, the whole of our supply being, at present, imported.—*Engineering*.

AN ITALIAN EXHIBIT INJURED AT THE CHICAGO FAIR.—The petty and even greater scandals attached to the Chicago World's Fair on direct accountability of the United States Government still continue to come to light. Now we learn, by the Rome correspondent of the *Herald* of New York, of a decidedly "curious" incident, which has hitherto remained unknown to the public. It occurred in connection with the Columbian mementoes sent by the Pope to Chicago. In transportation to the United States one of the most beautiful and valuable of the mosaics was broken. To understand what a great misfortune it would have been had the damage been irreparable, it is only necessary to say that this mosaic was quite unique, because of the period in which it was made, the artist, the subject and the style which it represents. Besides this, these mosaics take, one might almost say, the best part of a lifetime to execute. It is not yet positively known how the damage occurred, and it was not exhibited at all at the World's Fair. What is characteristic is, that the Vatican was at once informed of this in all its details, while the correspondent is positively assured that the United States Government was kept in total ignorance of the affair. The exhibits had arrived in Italy, among them the broken mosaic, and still there was silence from Washington. At the Vatican, Cardinal Rampolla, Secretary of State, and the Holy Father himself, were more hurt at what to them was inexplicable conduct on the part of the American Government than at the fact itself. Last month a letter from Mr. Gresham was conveyed to Cardinal Rampolla, in which the State Department assured the Holy See that the misfortune had just been learned, apologized earnestly for the delay, and expressed the utmost regret for the damage. Mr. Gresham begged Leo XIII to allow the Federal Government to have, at their own expense, the best Italian mosaicist repair the break. It is fortunate for the owners of the mosaic that it was not repaired in this country by an "expert" selected by a Senate Committee.—*The Collector*.

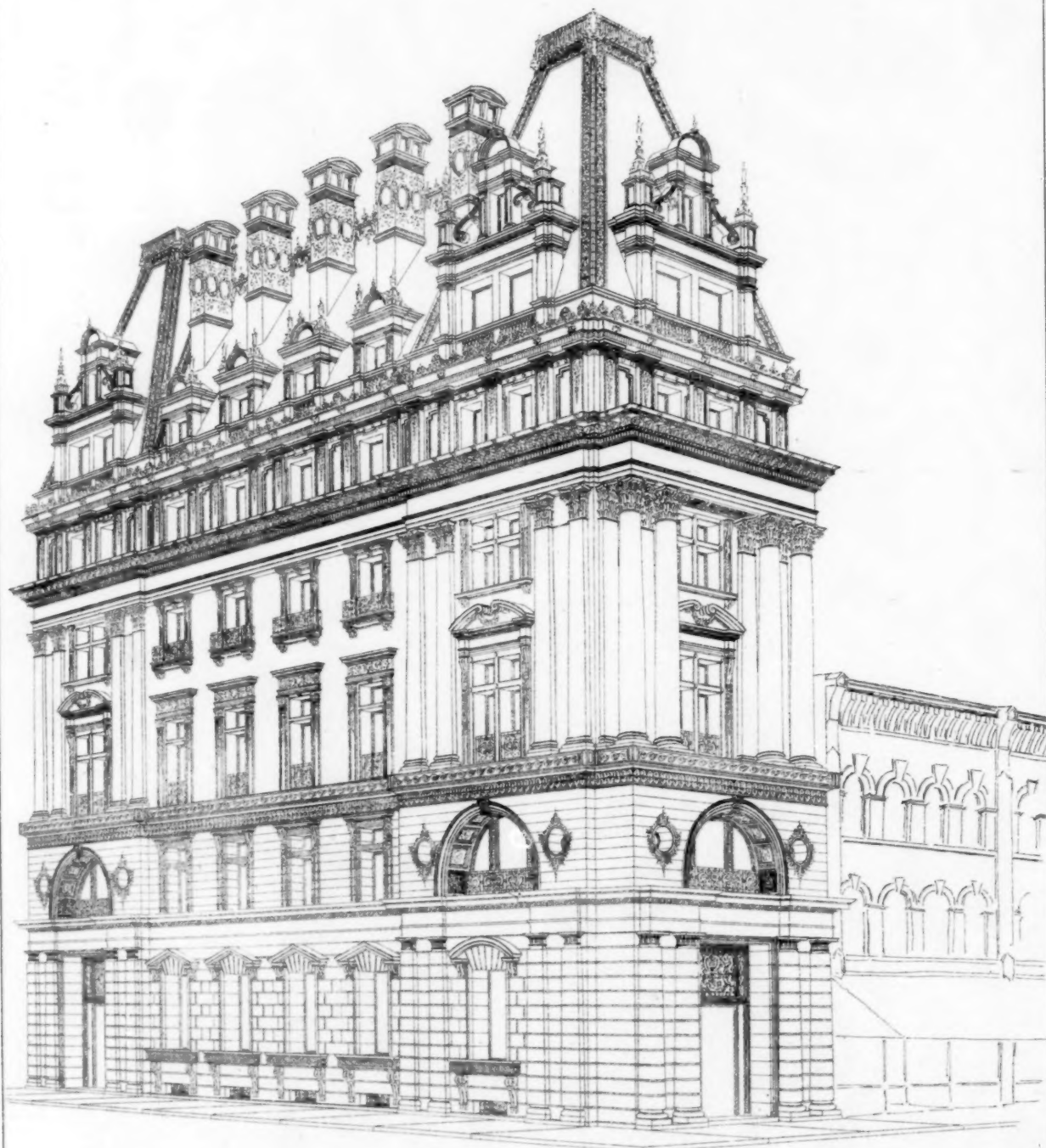


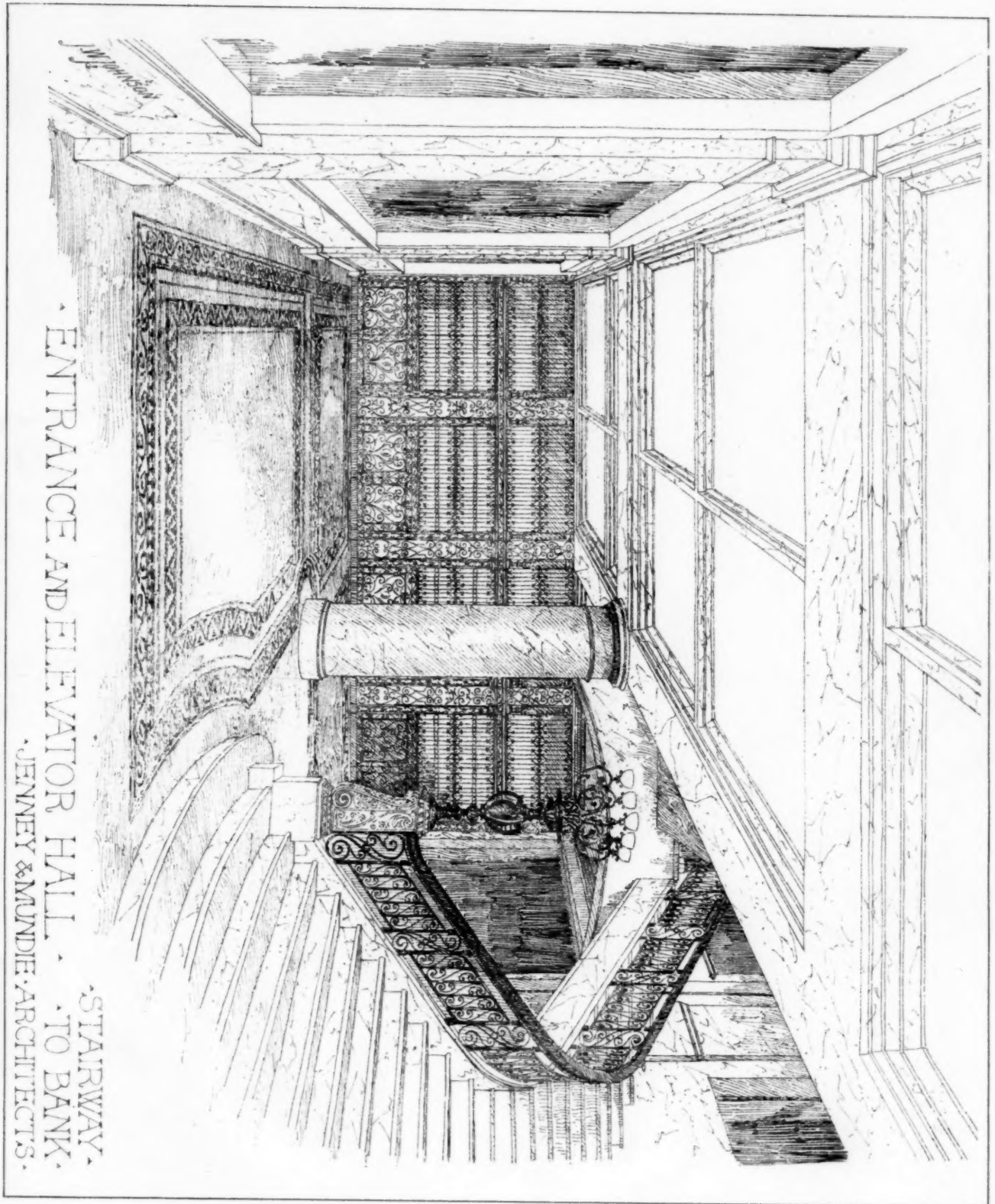


J. H. MUNDIE
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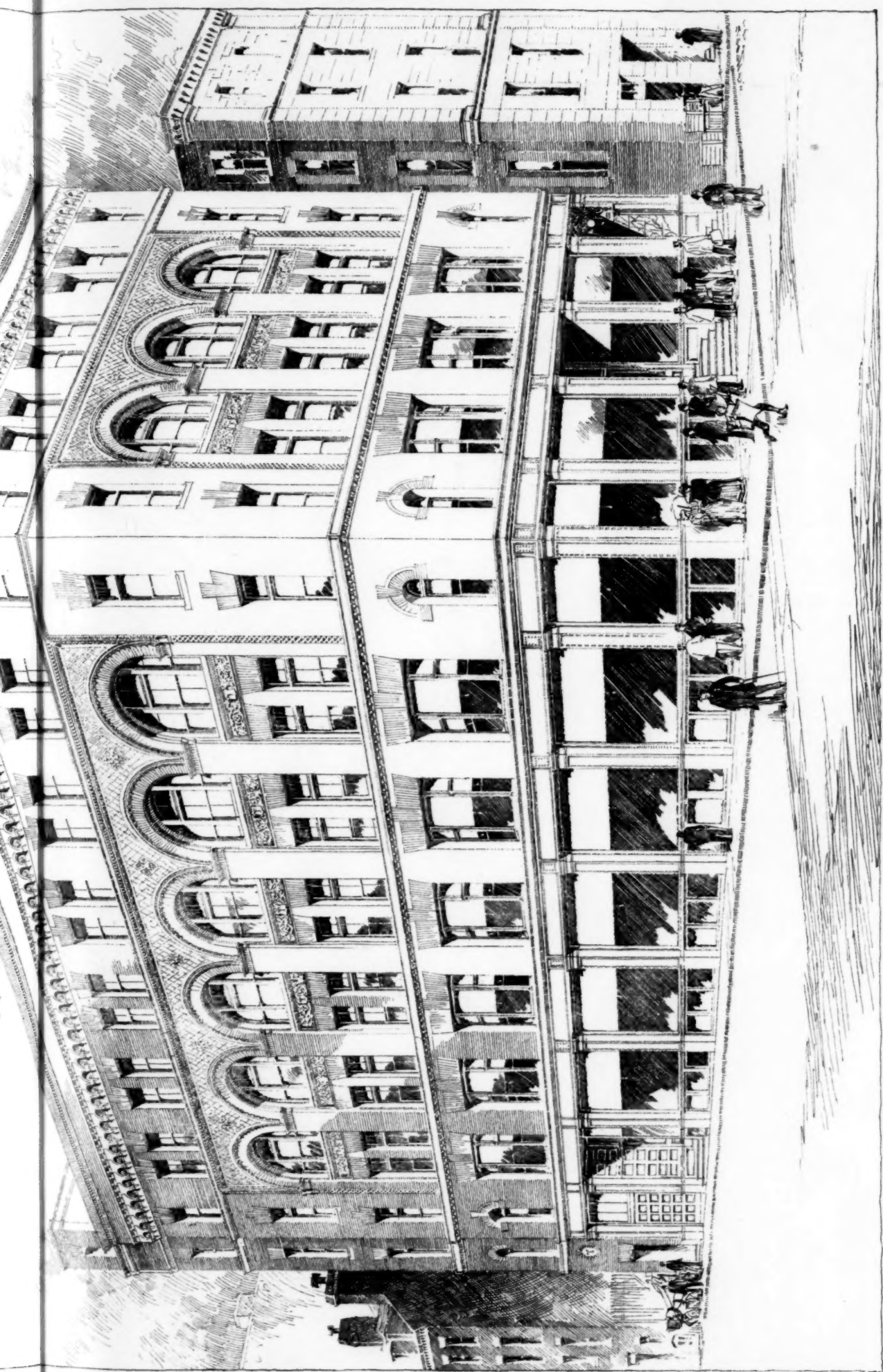
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