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THE proposed consolidation of the Departments of Architecture and Music in Columbia University with the courses in history and practice of fine-art connected with them, into what may be called a rudimentary school of fine-arts, has given occasion for a discussion which cannot fail to be of value, whichever side those interested in it may take. For the present, the plans of the Trustees of the University contemplate nothing further than a more complete correlation of the courses which they already offer. Except in architecture and music, they do not profess to offer a complete training in any art, and their view, that while all men of education may derive benefit from some knowledge, practical, as well as theoretical, of the arts of painting and sculpture, those who are in preparation for the careers of architecture and music will find great advantage in a concentration, if we may use the expression, of the artistic atmosphere in which their years of study are passed, is abundantly justified by experience. Notwithstanding the conservatism of the plan described by the Trustees in their official announcement, it seems to be assumed by the public that the University will later undertake to turn out graduate painters and sculptors as well as architects and musicians; and the artistic community has taken for its theme of conversation this assumption rather than the actual scheme proposed.

AMONG the comments which have appeared in the newspapers on the subject, the greatest weight should perhaps be attached to a letter from Professor Russell Sturgis, addressed to the President of the University, and published in various newspapers. Although we cannot entirely agree with Professor Sturgis in some of his ideas of artistic education, most of his letter is of great importance and value; and while it does not seem to us to be quite relevant to the actual scheme proposed by Columbia University, it is, as an essay on the general subject, which is one of the most pressing now before the community, well worthy of extended circulation. As an accomplished and learned artist, and an experienced teacher, Professor Sturgis finds it necessary to call attention in the most emphatic manner to the necessity of technical training, above everything else, in the education of those who are to practise painting and sculpture. These, he reminds us, are manual arts. Undoubtedly, they are the greatest of the manual arts, but this does not alter the fact that skill of hand and eye is absolutely essential to both of them, and that without this manual skill no intellectual power, and no mental training, can ever produce good works of sculpture or painting. As, in his judgment, the manual skill requisite for the practice of these arts can only be acquired by many years of constant endeavor, he thinks that for persons destined for an artistic career, it is necessary, instead of sending them to college, to hurry them through such instruction in "their native tongue, arithmetic and other

simple studies" as they can acquire before the age of fifteen, and then set them at the manual practice of their chosen art under a good master, "all day long and every day," "until the master finds that his apprentice has grown up to his own stature." After this, Professor Sturgis says, "If the university should wish to teach this artist in his later life, when the young man, already a master in his art, feels the need of more literary cultivation than he has had hitherto, then, to his mature mind, and his faculties of perception and acquisition trained, though not in the literary way, the university may offer literature, language, science,—what you will." "It would be a noble thing," Professor Sturgis continues, "to have such a course of collegiate studies for the grown man. On the other hand, nothing but injury to the artist's career can come from anything like a serious attempt to teach him any of those things which are contained in the language of words during the years which he should devote exclusively to his artistic training."

IT would not be easy to state a position in clearer terms than these, and the community has reason to be grateful to Professor Sturgis for giving to the discussion a perfectly definite form at the outset. We need not say that no university would pretend to take boys of eighteen, and in four years turn them out accomplished artists, so that the question is not whether college training or a long apprenticeship is the best preparation for an artistic career, but whether one excludes the other, so that the man who has spent, let us say, six years in his university course, and in the preparation for it, is thereby cut off from the hope of ever acquiring the manual skill necessary for the successful practice of the graphic arts. In answering this question, while we have Professor Sturgis's own weighty opinion on one side, supported by that of Mr. Ruskin, who declares that to color well "requires your life,—it cannot be done cheaper"; it seems to us that there is a great deal of evidence in favor of the opposite view. It is always difficult to say what a man might have accomplished if his training had been something else than what it was, but every one will recall the names of many successful artists trained in the universities, and trained, too, at a time when university training did not include the slightest trace of the artistic cultivation which Columbia University proposes to afford its students during the four eager and susceptible years of their college life. Not even Professor Sturgis can deprecate more earnestly than we do the old American fashion of talking about the arts, instead of practising them; but this fashion is rapidly passing away, and the American artist of the present day understands as well as any one that he must make his impression upon the world with his brush or chisel, and not with his mouth. With this conviction, aided by the wholesome competition which now exists, not only between American artists among themselves, but between them and the French and English and German artists whose works are hung beside theirs at the great international exhibitions, the painters and sculptors who will, in the next generation, represent this country are not likely, as it seems to us, to be injured by college training, but the reverse. It is very possible that the loss of continuous manual practice during a part of four or six years may show itself in the work of a college-trained artist; but it seems to us that this loss will be more than made up by the greater power of mental concentration, the deeper sympathy, and the simplicity of taste and dislike of affectation, which are cultivated, if not developed, by university life. No one has more frequent occasion than the artist to observe how greatly the hand is influenced by the mind. A strong impression of beauty of form, or color, or expression will betray itself even in the work of an unskilled artist, as multitudes of specimens of archaic painting and sculpture show us; while mere handling has never brought more than temporary fame to an artist of cold heart, or of dull and irresolute mind. There is still a tendency in the arts, a survival, possibly, from the artificiality of the seventeenth and eighteenth centuries, to exalt technique at the expense of sentiment. Professor Sturgis himself shows something of this tendency, perhaps, when he says, of an art more familiar to our readers, that "architecture as practised in modern times is not a manual art, but is a combination of an intellectual but non-artistic study with science, and with artistic traditions now embodied in books"; and we hope that

some, at least, of our readers will agree with us that this tendency, now happily going out of fashion before the tide of life and aspiration and conscious power which is advancing over the American people, should be resisted by all who desire to help in the development of the fine-arts which will surely follow. There is no place where true sentiment finds a more congenial home, and where conventionality and affectation are more uncomfortable, than in a university; and we hope and believe that in this way, if in no other, our great colleges will be able to take an important part in the movement which lies so near the hearts of all American artists.

AN interesting question has come up in connection with the Boston elevated railway, in a suit by an owner of a house on Harrison Avenue for damages sustained from the construction and operation of the road in front of the building. The claimant asks for compensation, not only for the darkening of his windows, the dust raised by the trains and the annoyance caused by the moving lights at night, but for the noise caused by the traffic. On the other hand, although there is no doubt that the Boston elevated railway is a very noisy affair, the corporation holds that its charter, interpreted in connection with the general statutes of Massachusetts in regard to railways, protects it from claims for damages on this score. The question is exclusively one of law, but the decision will be awaited with interest by owners of real-estate on the line of the road, as well as by the public. In fact, the interest of the public is, perhaps, greater than that of abutting owners, for juries, where, as in the present case, a man's rents have fallen off six hundred dollars a year since the building of the road, would be likely to award him suitable compensation on general principles, without inquiring how much of the loss was due to noise, and how much to dust and darkness; while the public, which has no claim to damages, suffers much more from the noise than it does from the dust and the moving lights of the trains. In many ways the engineering of the Boston rapid-transit lines is worthy of highest commendation, and for the benefit of the community, if not of the railway corporation, it seems as if something might be done to mitigate the deafening racket which attends their operation.

CERTAIN excavations made in the basement of the old New York Hall of Records have brought to light some interesting historical evidences. The building was erected in 1756 as a debtors' prison, but twenty years later, when the city was occupied by British troops, it was appropriated for military purposes, and was used for the confinement of prisoners of war. It was placed particularly in charge of the Provost Marshal, Cunningham, and was called the Provost Prison, to distinguish it from the sugar-houses and other buildings, and the hulks in the harbor, which were utilized for similar purposes. The horrors of the prison-ships have been often described, but Cunningham seems to have done his best to make his Provost Prison as uncomfortable a place of residence for captured "rebels" as the rotten hulks anchored in the harbor. Among other devices which he employed for disciplining his prisoners, among whom was for a time the brave Ethan Allen, was a "slow gallows," provided with a noose which tightened very slowly around the neck of the sufferer, so as to prolong his agonies. The room in which this instrument was placed is still intact, as are also several other underground cells, in one of which can still be seen the cavity made in the brick wall by some Revolutionary prisoners, who attempted to escape in this way, but were discovered, and all executed by the "slow gallows." Their bodies are said to have been buried under the cellar floor, and the workmen employed in the present repairs have actually dug up bones, apparently human, which have been, of course, carefully preserved by the authorities. On the completion of the new Hall of Records, the old building is to be used as a Revolutionary Museum, for which it is well adapted.

THE perennial discussion of the best methods of metallic construction has been given a new turn by the appearance of a letter in the *Scientific American*, from Mr. George L. Morse, a well-known expert, earnestly advocating a return to the old-fashioned cast-iron columns in buildings, in place of steel. He says, of course with reason, that cast-iron columns are not only cheaper, but are less liable to corrosion, and much less readily affected by heat; and he surmises that the greater familiarity of engineers with steel, as used in bridge and girder work, may have led them into a preference for the material about which they know most which is not quite justified. He

observes that with high, narrow buildings, in which wind-bracing is necessary, steel verticals must be employed, as wind-bracing cannot easily be applied to cast iron; but under ordinary circumstances, he thinks it very desirable to use cast-iron columns in exterior work wherever possible.

AS this is a view of the matter which comes up every few years, and is, of course, eagerly adopted by contractors, who understand perfectly the difference in price between steel and cast-iron, it may be well, from the practical standpoint of the architect, to observe that the periodical removal and abandonment of the use of cast-iron for verticals has been due much less to the ignorance of engineers and architects of the properties of this material than to the conviction born of their experience, that it is, in most lofty buildings, unsuited to the conditions. Mr. Morse says that cast-iron columns cannot be used where wind-bracing is necessary; but bracing is practically needed in every building over six stories high, not merely to protect it against the effect of wind, but to prevent the racking which may occur from a great variety of causes, as well as to give security against those variations of the frame from true vertical lines which, a few years ago, used to occur so frequently, and which are so detrimental to the strength and endurance of the construction. Again, while good cast-iron is an excellent material for many purposes, bad cast-iron is a very poor material, and it is much more difficult to detect flaws in cast-iron columns than in steel ones, while a defect in a cast-iron vertical, perhaps with twenty stories resting on it, similar to the defects which have brought down hundreds of cast-iron columns under a comparatively trifling load, might have terrible consequences.

MR. WILLIAM BARCLAY PARSONS, the Chief Engineer of the Rapid Transit Commission of New York, proposes an interesting plan for the relief of the congestion of travel over the Brooklyn Bridge. The plan, which is approved by Mr. Lindenthal, the Commissioner of Bridges, is, in brief, to change the grades of the railway-tracks on the bridge and its approaches, so that the cars, instead of starting from the street-level at Park Row, will be underground at that point, continuing thence by tunnels northward and southward, the northern tunnel extending to the new Williamsburgh bridge and returning to Long Island over it, and the southern tunnel extending to Maiden Lane, and thence, under the East River, back to Brooklyn; the tracks thus forming two loops, one to the northward, and the other to the southward, tangent only in the portion crossing the bridge; so that both the trains and the trolley-cars cross the bridge only in one direction, the trolley-cars returning to Brooklyn through the Maiden Lane circuit, while the trains return by the Williamsburgh bridge. Mr. Parsons's plan contemplates a station on Park Row, adjacent to the Rapid Transit station, so that passengers from the upper end of Manhattan Island may step directly into the Brooklyn cars; and he also proposes to erect on the site of the present Manhattan bridge terminal, facing west over the Park, an important municipal building, with archways under it, through which foot-passengers and ordinary vehicles can reach the bridge.

SOME of our Western grain-growers might take a hint from the German farmers, who have formed an extensive association to protect themselves against oppression from corporations. As every one knows, the sugar-beet is one of the principal products of German farms, and from the sugar-beet is made alcohol, as well as sugar. A combination has long existed between the great sugar-refiners, which has enabled them, not only to control the market for refined sugar, but that for raw sugar and beets, inasmuch as the farmers, having practically no customers outside the combination, are obliged to sell to the latter at its own price, or to have their beets left on their hands. In the matter of alcohol, which is made from the inferior beets and raw-sugar wastes, the farmers have been wise enough to join in the formation of a "cartel," similar to that existing among the owners of the German coal-mines, by which prices and output are regulated for the common benefit, at the same time that the members are protected against the dictation of monopolies. The plan has proved so successful that it is not unlikely that similar "cartels" may be formed to regulate the sale and production of other agricultural products; and our wheat-raisers, who are said occasionally to suffer from combinations of millers and exporters, might do well to watch the proceedings of their foreign brethren.

THE ROMAN GALLEYS OF LAKE NEMI.



HEN, from the top of one of the surrounding hills, one's glance sounds the clear waters of Lake Nemi, one perceives a mass of confused forms, with rounded contours and indistinct lines, and divines that they are drowned objects sleeping there from the times of the grandeur of Rome in the crystal liquid of the "Speculum Dianæ." They are lying there patiently in their dress of sea-weed and mosses until the indolent posterity of the conquerors of the world pluck them from their repose to ask them to throw light on that departed civilization which has left them there.

In fact, this volcanic shell with its luxuriant vegetation, this placid and sombre lake, sleeping in the midst of the thick and encircling forests, this amphitheatre of hills, these almost perpendicular gradins covered with bushy trees through which, here and there, penetrate imposing cliff-fronts burned by the sun, this oval lake of Nemi, is, in a word, one of the corners of Latium where there is still vigorous the memory of the glorious age of Rome; and it is a veritable amphitheatre whence, at times, there appears to ascend a mysterious influence. Ilex and chestnut crowd together on the banks, like spectators motionless on the gradins through waiting centuries; in a corner below the village, the orchards flower in the springtime with the thousand rose-tinted stars of peach-trees, the white constellations of the apple-trees, and these gay tints cut across the melancholy green of the trees as in the Roman circuses the podium of the vestals must have stood out athwart the pressing and vulgar crowd of spectators. Here is a flagged path over which, in former times, the litters of the Roman matrons used to pass in going to consult the Oracle of Diana, for this lake, these forests and these mute cliffs, the thick shadows and lively colors of this countryside were only the crown of the temple of the goddess of the woods and chase; it is here that the dynasty of autocrats, who formed the veritable expression of the limitless power and frightful wealth of the Roman Empire, at the same time that they condensed in themselves all the faults and vices which brought about its decadence, used to come to enjoy a spectacle of which nature had borne all the cost. Sumptuous villas once lined the shores of the lake and rose stage over stage above the surrounding slopes; treasures of art came hither demanding a framework from this incomparable landscape; the very water cradled palaces and floating temples.

When the pitiless decadence, the barbarous fatality broke the last energies of the Latin world, everything here fell into ruin, was destroyed and rotted away, forgotten, buried under the fertile soil or beneath the placid waves. It only needs to remove this earth, to sound with one's eyes these sleeping waters, to discover the remains of an epoch, its *spolia opima*, its rich objects and its imperishable souvenirs.

Museums have been enriched with findings which have been made in the environs of Lake Nemi. Beneath the slime and under the moss, treasures have already been found; but what was not the surprise of the world of artists and savants when it was announced, a few years ago, that two floating houses had been seen sleeping a few metres beneath the water's surface, and with what impatience were attempts made to bring them to dry land!

You were probably informed of this occurrence at the time, as well as of the discovery of certain artistic bronzes belonging to the mysterious ships sunk to the bottom of the "Speculum Dianæ." But difficulties without number speedily presented themselves, which caused the abandonment of the attempt to save these ships; silence would doubtless have fallen definitely upon the matter in spite of the great interest in it, if, recently, one of the engineers who had a share in the first researches had not been overcome with remorse because of so complete an act of forgetfulness and had not once more brought forward the matter of the galleys of Nemi, and suggested a new scheme for bringing about their salvage, a system which offered far less difficulty than those which had been attempted earlier under the impulse of feverish impatience.

I hasten to tell you that there is some chance that a decisive effort may be attempted to recover these rich relics which I mention; riches of inestimable artistic worth; for, apart from their rare sumptuousness, these floating houses surely represent a marvel, unique, which stands out from among all those memorials of our ancestors which up to this day we have discovered. This is not a palace, a temple, a public building, it is not a new example of Roman architecture, but it is a unique specimen of Roman naval art. Our King, Victor Emmanuel III, has just examined the scheme which would allow, as I have just told you, the bringing of these ships to dry land. He has shown himself disposed to accept the patronage of the committee which has this end in view. For the rest, here is a short description of what this new scheme is:—

Until now, the investigations have been carried on by divers who have studied the positions and dimensions of the two ships, and all that has been discovered has been owing to their efforts. But one fact had been discovered which made the saving of the ships almost impossible without lowering the level of the whole lake, and this fact is that they are in a large part buried in the mud, which has, as it were, riveted them to the place where they sank. Now, a sufficient lowering of the level of the lake presented almost insurmountable difficulties; so, for the moment, they were about to renounce all hope, if a new discovery had not turned up a short time ago which completely changed the situation. The lake of Nemi, like its neigh-

bor, the Lago Albano, both enclosed in ancient craters, has an outlet pierced in the flank of the hillside which allows the overflow of its waters. You doubtless know under what historic circumstances, during the siege of Veii, the outlet of Lake Albanus was pierced; as to that of the lake of Nemi, there is the most complete ignorance as to its origin. But now we know that it is of a comparatively recent date, for another outlet, at a lower level, and still in good condition, has been discovered. It would be sufficient, then, to remove the matter which obstructs this ancient outlet, and, in parenthesis, besides the fact that in this way the two Roman ships could be saved, one could at the same time dry off the site of the ruins of the villa which Julius Cesar had built on the shores of Lacus Nemoensis, and which were covered by water after the level of the lake had been raised by the change in the level of the outlet.

A tradition prevailing among the inhabitants of the village of Nemi, built almost perpendicularly above the lake, has always maintained that Roman galleys did exist beneath the waves. One circumstance confirmed this popular notion and the legends which prevailed for centuries, and that is that fishermen casting their nets to take the delicate fish which breed in quantities at the bottom of the lake have often had to abandon the attempt to bring their prey to the surface because the nets became entangled amongst obstacles which at first were of an unknown character. It was, therefore, approximately known about what spot in the lake must be sounded in order to discover these ships, for there was only one obstacle which could exist at such a place. Sometimes, moreover, bits of rotten wood were torn away and brought to the surface.

About the middle of the fifteenth century, Cardinal Prospero Colonna, Lord of Nemi and Genzano, two villages staged one above the other upon the hillsides which surround the lake, had had his imagination impressed by the tales which were current among the peasants; the legend, according to which the relics of the richness of the Roman emperors were rotting beneath the waters, seemed to him all the less ridiculous because he was so thoroughly versed in Greek and Latin letters and the arts; consequently, he would not have been at all unwilling to have his name attached to an enterprise which might assure him an imperishable glory. It must be remarked in passing that as for these sentiments, although any one of reasonable intelligence might hold them to-day, they were at that time really meritorious, for then the cult of antiquity was hardly in fashion or held in honor; the noble monuments of Rome had undergone numberless vicissitudes without finding in the popes and the lords of the aristocracy friends anxious to preserve for posterity these precious relics; the tomb of Cecilia Metella, the theatre of Marcellus, the Colosseum, the baths, the mausoleums, all that the barbarians had respected, were no more than fortresses about which the princes waged wars whose bloody struggles discolored Rome; and, when peace followed the civil wars of the Middle Ages, every ancient edifice was held to be merely a quarry from which any one, provided he was strong enough, could carry away bits of stone to build his dwelling, statues to decorate his palace and columns to adorn his churches. In short, this was the time when the Palazzo Farnese was built, and the Barberini and Cancelleria, and so many others, out of stones coming from the Colosseum, times when they overthrew a pagan temple in order with its precious marble columns to ornament a Catholic church.

Unfortunately, Cardinal Colonna, in spite of his wealth and learning, had not the means and apparatus adapted for so difficult a piece of salvage as that of the galleys of the lake of Nemi. He had to content himself with bringing from Genoa sailors of miraculous cleverness, capable, as it appears, of living beneath the water for minutes at a time, and swimming like veritable fishes. These past-masters in the art of diving set themselves at work and were not long before they definitely proved the existence of two large sunken ships. They even tried to save some portions of them, but we cannot too much felicitate ourselves that their efforts were not pushed with perseverance, for their means and methods were of the most primitive kinds. They dove to the bottom and fastened to the wood of the structures which they wished to raise great iron hooks made fast to ropes operated from the surface. One portion of the prow of one of the galleys, however, gave way and was brought to the bank.

All the wise men of science and letters in Rome, and Pope Pius II himself, hastened incontinently to the place. An author of the time has transmitted to us a recital of the astonishment which this learned assembly exhibited before such a "find" and a description of the bit of the prow plucked from the ship. "It was composed," says he, "of big planks, 3 inches thick, of the wood named larch-wood; it was covered all over with a good coating of yellow or purple, and upon this were fixed with thick bronze, not iron, nails a large number of leaden plates."

Another discovery of the time was that of the leaden pipes which brought to the ships fresh water from neighboring springs. It was understood from these things that one was really in the presence of two floating houses, two lacustral palaces rather than simple galleys; and these leaden pipes bore inscriptions from which could be deduced that which tradition already affirmed; that is to say, that these submerged dwellings had been built by Tiberius. All these objects were disposed of, we now do not know how or where; they have never been rediscovered in our time.

A century later another attempt was made. A certain Francesco de Marchi, a Bolognese soldier, this time himself descended to the bottom of the lake, using one of the rudimentary instruments which

allowed him to breathe for a certain length of time under water. We don't know quite what this instrument was, for De Marchi left only an incomplete description of it, in which he simply said that the invention was due to Maître François de Lorraine, and that the latter had made him swear never to reveal to any one by what mechanism the renewing of the air was effected.

De Marchi details his discoveries at length, but it seems to be plain from his tale that he made only a single descent of any length of time — an hour — during which he bound together and had pulled to the surface a large quantity of beams and planks of cypress-wood and pine. He said that he saw great iron rails eaten by rust, small bronze nails which fixed leaden plaques over the bottom, and brought away portions of the brick floor, 3 spans wide in each direction and 4 inches thick, also another portion of flooring of a beautiful red enamel. He also saw chambers in the interior of the ship, and leaden pipes, but nothing of what he brought to dry land remained, for robbers, thinking that they were stealing the secret of his submarine machine, carried away everything.

Another spell of silence, this time lasting for three centuries. But tradition was not going to abandon its belief after the experiments which we have spoken of had proved the existence of the vessels, whether they were built by Tiberius or by some other emperor.

Finally, on the 10th of September, 1827, Chevalier Annesio Fusconi made a new attempt. He employed a diving-bell invented by Dr. Halley, and this instrument stood for an immense advance, since eight workmen could work at the same time, receiving air through a pump placed on a raft above. This is how Fusconi tells the success of that day's work: —

"The workmen descended in the diving-bell, and after a short time gave the signal agreed upon; we pulled them up, and they brought us, amid the unanimous applause of those present at the operation, bricks framed in iron with the inscription 'T I B. C A E S,' and several metal nails." Later success did not give the lie to this first descent. "We did the same things on the following days up to the 28th of this month, a date at which a round metal object, which the workmen could never properly describe, was made fast to be pulled to the surface, but the ropes gave way."

But once more the robbers appeared, for, during the winter, the investigations were suspended, and they seized the apparatus of the unfortunate Fusconi. Let us pity the misfortune of this generous man who had paid out of his own pocket 30,000 francs for the construction of his machines. But it must be agreed that the proverb "Misfortune is good for something" has some truth in it, seeing that Fusconi, in his ignorance, proposed simply to draw the vessels from the water bit by bit, believing that it was impossible to recover them whole. The objects which he had discovered were those which his predecessors had seen: bits of wood, nails, leaden pipes, and, moreover, a bronze capital, marble tablets, a fragment of grille-work bearing the inscription "T I B. C A E S," and forty large bricks of terra-cotta, two of which were framed in iron, as were those described by De Marchi. Fusconi also said that his workmen saw at the bottom of the lake statues, columns and metal beams which could not be drawn out of the water because the cables would not stand the weight and broke during the operation.

A large portion of the objects recovered at this time were purchased for the Academy of St. Luke by Cardinal Camerlingue.

All that precedes relates to efforts made in the time of the government of the Popes to save the Roman galleys, but the great political changes took place after 1827, the time of Fusconi's explorations, and new obstacles were created, while science considerably minimized those obstacles which caused the failure of the attempts made up to that time.

The rights of the State in artistic treasures have been recognized for a long time; the Pacca edict against the exportation of anything which might have the character of a work of art was the first affirmation of these rights and dates from the commencement of the nineteenth century. Later, when Italy was organized as a single kingdom, the régime of objects of art was definitively fixed, always in a manner favorable to the State. This brought it about that every private attempt at saving the Roman galleys encountered insurmountable obstacles. The State claimed its rights in any objects which might be discovered, hindered all speculation in their value, and especially prevented their exportation. No one, therefore, was inclined to cast into the water enormous sums for the good pleasure of the Italian Government, who, on its side, is generally thinking of other things than archæology. On the other hand, the lake of Nemi is private property, one of the fees of the very ancient patrician house of the Orsini, and this fact made it impossible that any one should undertake to investigate the galleys without the authorization of Prince Orsini.

In any other country, let us say in passing, both government and prince would perhaps have been rivals in their ardor for the recovery of the Roman ships, if it were only for the sake of having their names attached to an enterprise capable of making its author forever celebrated; but here it was quite otherwise. In 1895, a Roman antiquary was making some excavations in the neighborhood of the lake and particularly on the very site of the famous Temple of Diana and had the idea — which may have been suggested to him — of seeking by skilful sounding the exact position of the galleys, with the hope of saving at least some parts of them. He entered into a contract with

the Orsini family in which he bound himself to attempt at his own risk and peril the necessary researches, and had them begun at once by a diver at the point indicated by tradition and the earlier explorers as that where the Roman galleys had been rotting for centuries.

The results of these attempts are known; it was an unexpected revelation, a very thunderclap. Much was spoken at that time about the marvellous bronzes of Lake Nemi, and especially of the bronze head of Medusa, a piece which far exceeded all that any one had hoped for in the way of the splendors of these floating palaces. How many artists of the Renaissance, even the greatest ones, would have been happy to sign their names to such a morsel! This head is treated with great skill; the beauty of Medusa is heightened by the expression of atrocious suffering which she endures; the artist who created the bronze profoundly realized the misfortunes of this mythical personage and the terrible power which the gods granted to her as chastisement for her faults and pride.

The archæologists were equally interested in the bits of enamelled work and vitrified compositions which evidently belonged to mosaic floors. This mosaicwork seemed to form an "opus sectile," that is to say, a pavement composed of marbles of different colors, cut in shapeless pieces of regular size fitting one against another, so that when everything was in place designs and figures of the most beautiful effect were produced. This rich "pavimentum" is more beautiful and richer than those famous ones which are found in the palace of Caligula on the Palatine.

Such was the success of the investigations carried on about the first galley. But the existence of a second one could not be doubted because of the attempts made in the earlier centuries, so they came upon new discoveries, the most important of which was a bronze hand resting upon a plaque of the same metal and which was apparently a "manus averrunca," that is to say, an amulet against bad luck, which was ordinarily placed at the stern of ships to attract favors and the protection of Fortune. This "manus averrunca" must have belonged to an epoch earlier than that of the bronzes of the first galley; it is by the rigidity of the forms and the harsh lines of the fingers that the archaic character of the bronze is recognized.

But the Italian Government, fearing that the antiquary who had undertaken the partial salvage of the ship might do damage in his attempts to get hold of some of the objects of value, laid an injunction on him, and ordered that an official inquest should be held to study above everything the position and the dimensions of the galleys in order that later they might determine the most practicable way of raising the vessels from the water. The inquest, which was entrusted to a naval officer and some divers from the Government arsenals, gave the best results and the most exact data: the first galley is 20 metres from the bank; its length is 64 metres, its breadth 20; the stern is at a depth of 5.3 metres; the prow is lower, being 12 metres below the surface; the broadside has given away about the centre for a length of 3.4 metres. The second galley lies 50 metres from the bank; its length is about 71 metres, its width 24.4; its stern lies at a depth of 16.6 metres, and the prow pitches towards the centre of the lake to a depth of 22 metres. This galley has given away for a length of 2 metres on the starboard side. The distance between the two galleys, from centre to centre, is about 200 metres.

It must be noticed that these investigations have had to be carried out on a steeply inclined bottom, since there is a difference of about 17 metres between the stern of the first galley and the prow of the second, and there is some apparent probability that a certain number of the ornaments, furniture and utensils which were aboard may have slipped down to still greater depths. The hulls of the galleys, as I have said above, are not entirely free; the first is almost wholly submerged in mud and slime; there is only the upper portion of the deck which is free. A deck seems to start from the stern, which has a peculiar form like a fan, towards the centre of the ship. The second hull emerges from the mud for a length of about 40 metres, but the stern is completely covered; the interior, however, seems empty.

The manner in which these galleys were built, a manner which caused the liveliest wonder amongst the first divers, deserves to be briefly described. Planking is fixed to the framing by copper nails; they are lapped and held in place by long bolts; moreover, they are made fast on the inside by pins of resinous wood. The planking is covered with a compact cement over which is stretched some thick woollen stuff. And, finally, everything is protected by the plates of lead which we have mentioned.

Now let us turn to the methods which might be used in the salvage of these vessels. There are two distinct methods: first, the absolute hoisting of the vessels from the water, and, second, the lowering of the level of the lake. The first method would be preferable; for the lake of Nemi being one of the most picturesque in Italy, affording a landscape of extremest beauty, that artists and foreigners who come to Rome hardly ever miss visiting, it would be a great pity to remove one of its decorative features, this little pool of tranquil water, the "speculum Dianæ," which really forms its chiefest ornament. But for the system of direct hoisting, it would be necessary to construct a small city on rafts above the vessels and clean away in some degree the bottom of the lake in order to remove the mud, and then, possibly, slide ropes under the hulls and set in motion cranes of great power. All this presents a very grave inconvenience. Almost all of the objects of art which used to form the riches of these galleys have slipped out of the hulls and now lie buried in the slimy mud at the bottom. One would run great risk, therefore, of withdrawing from the water only the carcasses of the galleys, to say nothing of

the difficulty of saving them whole. The engineers could not gather a very exact idea of their position and the force of the resistance which would be opposed to the cranes, and the least error in the distribution of the strain, which ought to be regulated according to the weight of that portion of the ship to which it is actually applied, might compromise the outcome of the enterprise.

They are thinking of making a decisive attempt which may be crowned with the most startling success because there has been discovered, as I said above, an outlet at a lower level than that through which to-day the lake discharges its overflow, and which is in a better condition. This is Roman work, a long tunnel with a considerable section, measuring 1.6 metres by 1 metre. All that would have to be done would be to clean away obstructions and through the cleared outlet the level of the lake could be lowered by 9 metres. Then they would build at its mouth the short arm of a siphon, dipping below the water, and through its successive layers of water, which still covers the floating houses of Tiberius, could be sucked out of the ancient crater.

As you see, this scheme is fairly practicable. The cost of the undertaking would not be enormous, and what would be a very great advantage, and practically the one condition under which these famous vessels can be saved, is that the work would be done, as it were, on dry land.

This is what they are undertaking to carry out, a campaign which has long been the dream of Italian and foreign archaeologists, and it would be very helpful if the King should decide to accept the patronage of the committee which is going to be formed. He is young and bold, and has already given proof of a high degree of erudition. He cannot fail to be interested in the events we here speak of.

Already there is talk of erecting a Roman naval museum where might be deposited these Roman barques and all the ornaments and rigging which might be recovered. This would be one more attraction for Rome, and one can feel certain that it would be carried out with care and intelligence, for although in Italy things are undertaken with considerable sloth, yet, when they are undertaken, they are carried out properly. H. MEREU.

TECHNICAL AND SCIENTIFIC BOOKS.¹

“THOSE who are actively interested in engineering education cannot help but feel a certain sense of responsibility for the remarkable record of industrial development which the last few decades have made. For substantiation of such claim attention need but be called to the captains and other officers of industry who have been trained in the technical schools of the country. The inadequacy of the engineering education of thirty years ago for present conditions is scarcely more obvious than the fact that engineering education of the present will not suffice for the future. Present methods, continued indefinitely, would develop leaders, as they have done in the past, but the question of a debatable nature may be raised: Is the country better off with a few great engineers or a large number who are capable? Perhaps the most serious limitation upon engineering education at the present time is its failure to reach the rank and file of industrial workers, a limitation which is steadily increasing in degree. In spite of the fact that some of our advanced technical schools are free from tuition charges, it is evident that only a very small percentage of the inhabitants seem to be endowed with the privilege or opportunity of attending such institutions. It has been estimated that one per cent of the pupils of the grade-schools continue their work beyond the high-school.

“It seems to be the predominating idea at present that increase in efficiency of engineering education lies mostly with reference to the instruction of the favored minority who are able to attend technical schools. This is shown by the action of the leading engineering-schools in increasing the height of the barrier commonly termed entrance-requirements, thus more noticeably decreasing the percentage of those permitted to attend. A college education gives to its possessor an advantage over his fellow-men and almost ensures for him promotion to the more important positions, thus serving in a considerable degree to remove the less fortunate from the line of promotion. This stratification which appears to be developing, placing the technical graduate in the upper layer and creating an engineering aristocracy, is to be deplored as contrary to the American doctrine of equal opportunity for all. By the very progress of the technical graduate the outlook for the shop-man or machine-laborer is darkened, for, seeing the higher positions apparently closed to him, he will lose that incentive which is the underlying foundation of American enterprise, hope of advancement. He will feel that he is born to a position in life from which he cannot rise. The solution of this problem as to how such condition may be avoided is perhaps the most difficult and important task which those interested in technical education have to undertake; but there is no doubt that American ingenuity will find a way of satisfactorily solving this, as it has done other great problems. Various experimental solutions are now under trial and others have been proposed. Among the former are the so-called correspondence-schools, summer-schools for artisans, which at least one of our universities has instituted, night-schools, classes conducted by the Y. M. C. A., instruction offered by manufacturers, and various other methods, each of which has its own advantages and disadvantages which it is not my purpose to discuss.

“The great school for the industrial worker is the shop or the factory. The worker in this school is in a laboratory of the most efficient sort, in which he can develop efficiently, if he will develop, his brain, together with manual skill and dexterity. The workman must first be taught to realize that unthinking skill can never hold its own against brain-training. After instilling this feeling, every possible opportunity should be given to make the work of brain-training as simple and efficient as possible. The correspondence-schools, in having enrolled over a quarter of a million students, have demonstrated the state of intellectual hunger which prevails among the industrial workers of the country. In addition to demonstrating the existence of this hunger, at least some of the schools have done much toward satisfying the same. The proficiency of the industrial worker lies largely in his knowledge of the laws of nature and their applications and limitations, and an ignorance of such laws determines to a large extent the difference between the mechanic and the engineer. Such laws and applications may be learned from books, and in this fact lies the opportunity which the libraries have for furthering industrial progress.

“There are various ways in which the librarian's work may be to the advantage of engineering education, by which term is meant the dissemination of knowledge which bears upon and influences industrial development. The library may supply such scientific and technical literature as will meet the requirements of those who wish to use the same for recreation or for general information, and therefore including writings of a popular nature. The library may stimulate interest in scientific and technical matters among high-school students and others who are to choose their life's work. The means may also be offered to technical men for continuing their studies, or in carrying on investigation, for which purpose a good reference equipment is requisite.

“The library, in placing at the disposal of the workman-artisan class the literature best suited to their needs may accomplish results of inestimable value. ‘The vast number of workers, so important to the future welfare of the Republic, deserve and are in need of more consideration and encouragement for self-education than are those who constitute what are known as our educated classes.’ It is to the means of giving aid to this class that I wish especially to point. Libraries have been and are at the present time very inefficiently dealing with this matter, the following remark recently made by a prominent technical man emphasizing this point: ‘Instruction in engineering literature is not organized, it is not looked after, it is not cared for, yet it is one of the most important questions. On entering a modern public library one finds excellent reading-lists upon almost any topic in history, art, literature and some science, but none on engineering or technical subjects.’ A study of methods of increasing the efficiency reveals some of the causes of inefficiency, principal among which is the lack of a sufficient number of books, and, what is equally harmful, the presence on the shelves of books whose influence is not only indifferent but actually harmful.

“Certain branches of engineering and science, especially those capable of spectacular treatment, have been subjected to a flood of literature during recent years. The greater part of such literature, in spite of popularity as shown by calls for the same, is not only unreliable and worthless, but is actually harmful and a hindrance to true progress in engineering education. It is to be deplored that those who represent the most advanced learning in their profession seldom indulge in the writing of elementary books, since the financial reward for such work is not comparable to that which may be received in more strictly professional work. The writing of the elementary book is therefore left to the amateur engineer. The public demand may seem to make it necessary to place many undesirable books on the shelves, but it seems to me that just as much care should be used in barring misleading books in science and engineering as in excluding those which are detrimental from the moral standpoint.

“In arguing for the organization and more efficient operation of scientific and engineering departments in the public library, with the view of helping especially the working-class, I am well aware that nothing new or heretofore untried is being presented. I will anticipate some of the objections which may be raised against this system for industrial betterment. It will be argued that certain libraries have maintained technical departments at considerable expenditure of capital and labor, but that little interest has been manifested in the same by the people who were to be benefited. It is true that only a small percentage of the industrial workers seem to have an ambition to rise, strange as this statement may seem, and even if possessed of such, few have the enterprise to do the extra work necessary to further this ambition. The results, however, which can be effected by ministering to the requirements of those who have both ambition and enterprise, even though such number be small at present, is a sufficient argument for carrying on the work. In this way the library may serve as a net spread wide to catch the talent which the country produces.

“It may be said that manufacturers have installed libraries in connection with their works, and have even offered free instruction to their employes. The indifferent success which such attempts to improve the men have met points to possible failure for public libraries, if they take up this work. It has been a matter of common experience, however, that advantages such as gratuitous instruction offered by employers are seldom appreciated by employes, for the majority become suspicious of the intentions, feeling that such efforts are being made in the interest of capital rather than of labor. To the library this is a matter of less moment, for the public may be

¹ Portions of a paper by Prof. C. F. Burgess, of the University of Wisconsin, read at the Annual Convention of the American Library Association, June 20, 1902.

made to have a feeling of ownership, which is synonymous with a feeling of interest. There may be means whereby the library may increase such interest. An experiment with this in view is to be tried by the public library at Madison, Wis., during the coming winter. It is proposed to have a series of informal talks, or lectures, given to the employes of local factories upon technical subjects which may be of interest to them, a small charge to be made for the course. The proceeds are to be used for the benefit of the technical library, books and periodicals being purchased which will be of most service to the contributors. Experience has shown that a free course of lectures will not retain the interest of the audience as will a course in which money is invested, and in addition to retaining such interest, it is thought that the investment of the proceeds as before mentioned will increase the interest in the library. The lectures are to be given by local engineers and professors of the College of Engineering of the University of Wisconsin. Almost any public library can easily get up such a course of talks, as the technical men of the community will readily lend their assistance.

"The library to be a place of study requires a good list of reference-books and journals. Current technical and trade-periodicals would be a drawing card, and those who possess, even to a minor degree, the ability of self-education, will find here their mental nourishment. In almost every industry there are now technical books and trade journals and catalogues of very high educational value which may be acquired at a very small cost. A most valuable part of engineering and scientific literature is in such publications, and with bound volumes of the same the librarian might readily compile reading-lists for those who desire to look up any particular line. By suitable scientific instruction the usefulness of the industrial worker to society is increased, his horizon is broadened, the dignity of his calling is developed; and no other agency seems as universally suited for furnishing such instruction as does the public library."

A NEW YORK STUDIO.

AWAY up above the bustle of the street on the corner of Sixth Avenue and West Fortieth Street is a suite of apartments that, to say the least, is a novelty in New York. Mr. A. A. Anderson, an artist, who for many years presided over the art-colony at Paris, has erected on this corner a building known as the Bryant Park Studios, of which Mr. Charles A. Rich was the architect, and while laying out the whole building for the exclusive use of artists and patrons, he has therein built a suite for himself as an example of what he deems a studio should be. Choosing for himself the westerly side of the building, across the north ninth and tenth stories for his entrance, and the whole of the upper central part for his working-studio, the whole suite shows the perfection of plan which is possible with a thorough knowledge of the needs of an artist.

Entering a small private hallway one is admitted to the private living-suite of the owner, which contains also a small studio. The first room is the reception-room, a most perfect example of Louis XV decoration. The walls are moulded into panelwork of pure white, having the ornamentation of most exquisite design, with the large emblematic centre cartouches of raised work in low-relief. The ceiling, also laid out in panels of refined design, is elaborately ornamented in relief, and the doors are carved in the beautiful flowing lines of the period. All this ornamentation was made in Paris by Parisian workmen. Opening from this room is the chamber, also in the same style, of simple design, with marble mantel, circular ceiling ornamentation, and walls covered with delicate French silk in upright stripes.

To the south is a bath-room of marble and tile.

Returning and passing through the reception-room, beyond is the small studio, a room 25' x 25' in size and 20 feet high, in the style of Francis I. The room is formed by dark oak panelled wainscoting 10 feet high, with an ornamental carved band-course for its capping, above which the room is again panelled off by rich dark green tapestry in oak framework.

In carrying out the style of the room the ceiling is composed of very deep and very thin beams only a few inches apart, these beams being decorated in gold. The effect of this room is exceedingly beautiful and is strengthened by the large columniated mantel, richly carved, which runs to the ceiling, and is flanked on the opposite side by a hanging balcony with carved balustrade. Spanish tapestries from Salamanca drape this room, and the high studio-windows send down a flood of light from the top, and show another balcony with pierced railing which discloses the dining-room. Aside from the actual beauty of this small studio, its fittings are so arranged that backgrounds of the different periods may be properly set.

A hallway leads back through the entrance-hall, and we ascend the oak staircase and enter the dining-room from the second-story hallway. The room is strikingly beautiful, for it has a groined ceiling in dull gold which smacks almost of the feudal period, and the same spirit is carried out in the Gothic mantel with its pointed arched canopy. We look out from this room into the studio below, and passing along the balcony of that room approach the Grand Studio, which occupies the entire centre of the roof of the building, and from a promenade along the front of which we can look down upon the quiet green foliage of Bryant Park. This studio is 50' x 50' and 30 feet high. Its wall-surface is simply a quiet tone, as befits a studio, but its enrichments in the way of form and embellishment, while equally quiet, are rich in the extreme, and have been the sole study of Mr. Anderson. A large organ occupies one corner, under which is seen

a glimpse of Damascus in all its Oriental splendor. A beautiful old entrance which once graced an Italian palace gives entrance from the other corner to a charming palm-garden, for which the rich golden doorway forms a framework setting off the soft greens of the shrubbery. Between these two features is a noble arch running to the ceiling, with balcony, draped with a gorgeous Beauvais tapestry, while a draped entrance beneath gives access to the private elevator.

But while the above seems to indicate mere luxury of surroundings, the perfection of the studio planning is apparent, for the entire north side, while admitting a flood of light, is controlled by a skilful arrangement of sliding-screens which will give any gradation of light, from the full clear light of a northern sky to total darkness. The entrance to this large studio has been made from a balcony off in one corner, so as to afford the best *coup d'œil* to one entering.

Mr. Anderson's pictures and portraits are everywhere about the room furthermore, and are evidence of his diligent work. While a most beautiful place, this studio of his is still a workshop where the study of years is made permanent by the hands of a man who loves his art and whose whole life has been given up to its study. L.

MODERN METHODS OF SEWAGE-TREATMENT.¹

SEWAGE can be defined as the water-supply of a city after it has been used. It contains solid and liquid excreta, household waste, street-washings and the refuse of industry. The total amount of refuse varies, but on the average city sewage is pure water containing one-tenth of one per cent of waste; 7 pounds in 1,000 gallons. In addition sewage contains approximately 150 millions to the liquid ounce of those microscopic organisms called bacteria. Only very few are harmful to man, but in the perfect treatment of sewage bacteria as well as refuse must be removed. Perfect treatment of sewage, i. e., changing sewage back again into a water-supply, is possible, but at present not practicable on account of cost. All that so far has been attempted has been to remove the polluting substances, so that when emptied into a stream the sewage can cause no offence.

The earliest method of treatment, which was merely disposal, was to carry the sewage into the ocean or the nearest stream. This dilution is allowable for cities situated on the sea, or on rivers whose flow is as compared to the sewage 100 to 1, and the unfiltered water of which is not used as a water-supply. Very few cities are so fortunately situated as to make use of this method. For most cities the treatment or purification of sewage is as imperative as the obtaining of pure water. How this can be accomplished is one of the great sanitary problems of the day. The six principal processes in historical order are, sewage-farming, chemical precipitation, intermittent filtration, contact-bed treatment, septic-tank treatment, continuous filtration. Sewage-farming is applying the sewage to cultivated land. Chemical precipitation is adding certain chemicals to throw down the polluting substances. The four remaining methods, the so-called modern methods, are all based on the fact that the micro-organisms or bacteria always present in sewage will, under proper conditions, destroy all the obnoxious substances contained in sewage.

Sewage-farming; based on the idea that plant-life was capable of decomposing organic matters in sewage almost without limit, with resulting perfect purification and immense profit from making use of the polluting substances for plant-food, resulted in failure, except in those few cases where the land was of an exceptional character and of very large area.

Chemical precipitation, consisting of adding lime and iron sulphate to crude sewage and leaving the supernatant liquid clear of suspended matter, but containing practically all the soluble putrefying substances, is costly, and removes only about 55 per cent of the total organic matter in the sewage. The effluent will putrefy, and consequently cannot be emptied into a small stream, while the precipitate is difficult to treat, and is valueless. Sewage-farming and chemical treatment are now considered as methods of the past, and all the modern methods of disposal are the so-called bacterial methods.

The first of these methods was intermittent filtration. As early as 1865 Dr. Alexander Miller, of Berlin, showed that by passing sewage intermittently through sand, the obnoxious substances were removed, but the explanation is of much later date. It is now known that fresh sewage contains bacteria which live on dead organic matter and which cause its decomposition. These bacteria are roughly divided into two great groups, the anaërobic and the aerobic groups. The anaërobic group live, grow and multiply best out of contact with air and light; the aerobic live, grow and multiply only in contact with air. Each group plays its own special part in the destruction of the effete matter in sewage. The anaërobic bacteria act first. They disintegrate the solids, and bring them into solution. The aerobic bacteria act upon the disintegrated and liquefied compounds and, by oxidation, change them into harmless gases or minerals. Both groups of bacteria are necessary. By passing sewage intermittently through a suitable material, conditions favorable to the bacteria are brought about and the obnoxious substances are destroyed by the aid of these microscopic organisms. A suitable material was sand, and by applying the sewage only six hours out of the twenty-four, the conditions favorable to the action of both anaërobic and aerobic is maintained. By this process from 50,000 to 75,000 gallons of domestic sewage, not containing manufacturing waste, can be purified each day on one acre. Intermittent filtration is undoubtedly the best method known

¹ Portions of a paper by Dr. Leonard P. Kinnicutt, of Worcester, Mass., read before the American Association for the Advancement of Science.

for cities and towns which have in their neighborhood comparatively large areas of sandy soil.

It is not practicable for those which would be obliged to construct beds with sand brought from any distance. Investigations started by their problem seem to show that, by allotting distinct abodes to the anaërobic and aërobic bacteria, purification can be more rapidly carried on. The abode allotted to the anaërobic bacteria is called the septic-tank, that allotted to the aërobic bacteria, contact-beds or continuous filters. The septic-tank is only a modified cesspool, an open or closed tank through which the sewage is run continuously, but very slowly. The sewage itself contains anaërobic bacteria, which in the tank, out of contact of air, increase immensely, and bring about putrefaction, or fermentation, giving a product which is no longer crude sewage, but a sewage in which a large amount of the solid matter has been liquefied or changed into gas. The change which sewage undergoes in this fermentation process is very marked. The carbohydrates, like starch, sugar, wood, fibre, paper, are broken down and partially liquefied; the nitrogenous substances are liquefied, and the fats are partially decomposed. In this process, as in all processes of fermentation, gases are evolved and may be conducted off, and used as a fuel or an illuminant. This self-purification removes about 50 per cent of the putrescible substances in sewage, and its great practical value is that it reduces the amount of sand-area required for purification of sewage, increasing the capacity of an acre of sand-bed per day from 50,000 to 75,000 gallons to about five times as much.

Further, the septic-tank has made the English method of contact-beds possible. This method differs from intermittent filtration in that the sewage, instead of being applied slowly and allowed to drain through a bed of sand, is run rapidly into a water-tight bed filled with a coarse-grained material, as cinders, coke or broken stone, and retained in the bed for a given number of hours, after which the liquid is quickly run out of the bed. The action of a contact-bed depends on the presence of aërobic bacteria, which coats every individual piece of filling-material with a slimy growth. If, however, the bacteria slime increases beyond a certain point, the void spaces fill up, and the bed becomes spongy and will not allow the water to drain away. Can this growth of organisms be regulated, and is serious trouble to be apprehended from the deposition of the non-putrescible part or ash? These are the two points about which there is a great difference of opinion among English sanitary engineers.

My own opinion is that crude sewage cannot be successfully treated and should never be attempted, but that sewage, clarified by chemicals or by fermentation in the septic-tank, can be successfully purified. With such sewage the contact method offers to towns or cities where large areas of sand do not occur a process which, to be successful, requires merely the personal oversight of a well-trained sanitary chemist or engineer.

With the diversity of opinion regarding the practical success of the contact-bed, there has arisen a growing interest in the so-called continuous-filtration method. Continuous filtration is an attempt to still further increase the amount of sewage that can be treated on a given area, to treat 2,000,000 to 3,000,000 gallons in place of 500,000 gallons per acre per day. This method is based on the idea that if air is supplied to the filter at the same time that the sewage is being run upon the filter, and the filter is of such a construction and so drained that fresh air continuously remains in the filter, there is no necessity for periods of rest as required by the intermittent and contact-bed methods, as the only object of periods of rest in these methods is to supply sufficient air to the bacteria. Undoubtedly continuous filtration has certain merits, especially that of being able to treat larger quantities of clarified sewage on a given area than any other bacterial process; but even if it accomplishes all that is claimed, it is a process that requires a great deal of oversight and attention.

In conclusion, I would say regarding the various methods I have mentioned, that sewage-farming as a general method of sewage-treatment is not practicable; that chemical treatment only removes a part of the polluting substances in the sewage, and is advisable only in cases where sewage contains germicidal substances, thus preventing the use of the septic-tank; that intermittent filtration is the best of all methods for the treatment of sewage of cities where sand can be easily and cheaply obtained; that the septic-tank process is a most valuable adjunct and almost an essential part of all bacterial methods of sewage treatment; that the contact method is not adapted and should not be used for the treatment of crude sewage, but can be considered a very satisfactory method for the treatment of sewage after it has undergone putrefaction in the septic-tank; and that continuous filtration, though capable of treating much greater quantities of sewage per acre than can be done by any other method, is still in the experimental stage.

THE NEW TARIFF-RULINGS ON AMERICAN ART.

IT seems reasonably certain that the difficulties of the American artist over the admission into this country of work done while abroad are now at an end. On June 21 last the Treasury Department issued a document received at the New York Customhouse last Thursday, and defining the present position of Secretary Shaw on the puzzling question at issue. The substance of this document, which is based largely on recent decisions, is as follows:

Paragraph 703 of the Act of July 24, 1897, provides for the free entry of "works of art, the production of American artists residing

temporarily abroad," and the following rulings under said paragraphs are published for the information and guidance of all concerned, viz:—

1. The privilege accorded by paragraph 703 extends without limitation as to duration of residence abroad, provided, however, that the artists have not renounced or intended to renounce their American citizenship, but avow, in the manner prescribed by the regulations of the Secretary of the Treasury, their intentions of returning to the United States at some later period; and it is accordingly held that long periods of residence abroad, in one case of 27 years, of American artists are "temporary" within the meaning of said paragraph 703. Domicile consists of residence at a particular place, accompanied by an intention, either positive or presumptive, to remain there permanently or for an indefinite length of time. It embraces not only the fact of residence at a place, but the *animus manendi*, or intent to regard and make it the home. It is therefore held that the privilege of the free admission accorded by said provision of law to works of art of American artists residing temporarily abroad is extended to American artists without limitation as to duration of residence abroad upon the filing of the appended declaration:—

2. Children born abroad of citizens of the United States who have not renounced such citizenship are citizens of the United States by virtue of section 1993, Revised Statutes, and therefore entitled to the privileges accorded by paragraph 703.

3. A wife's political status follows that of her husband, and it is accordingly held that a woman by birth a citizen of the United States who has married a Canadian expatriates herself by the act of marriage; that she cannot be considered as residing temporarily abroad within the meaning of paragraph 703, Tariff Act of 1897, providing for the exemption from duty of "works of art, the production of American artists residing temporarily abroad"; and that the privilege accorded by such provision cannot be extended to works of art produced by her.

4. In the case of the importation of works of art of an American artist residing temporarily abroad, it is required that the work shall be positively identified as such production by the declaration of the artist, or of witnesses of such production, and such other evidence as may be required to establish the facts to the satisfaction of the Collector of Customs at the port of importation, and a consular certificate of identification or bond therefor is not necessary in such cases.

5. Works of art of an American artist are free of duty, notwithstanding the death of the artist and transfer of ownership of the works.



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

PLANS AND ELEVATION: UNITED STATES POST-OFFICE AND COURT-HOUSE, SAN FRANCISCO, CAL. MR. JAMES KNOX TAYLOR, SUPERVISING ARCHITECT, WASHINGTON, D. C.

DETAILS OF INTERIOR FINISH OF ONE OF THE COURT-ROOMS OF THE SAME.

GROTESQUES;—ARCADE TO PROMENADE: UNIVERSITY OF PENNSYLVANIA DORMITORIES, PHILADELPHIA, PA. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

ENTRY DOORS: UNIVERSITY OF PENNSYLVANIA DORMITORIES, PHILADELPHIA, PA. MESSRS. COPE & STEWARDSON, ARCHITECTS, PHILADELPHIA, PA.

[The following named illustration may be found by reference to our advertising pages.]

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"COLLAPSE OF THE STEEL-CONCRETE ELEVATOR AT DULUTH."

PHILADELPHIA, PA., July 2, 1902.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,— We would like to call your attention to an error in your editorial of June 7th on the "Collapse of the Steel-Concrete Elevator of the Peavey Grain Company, Duluth."

The statement is made by you that—"Assuming a pressure of 50 pounds per square inch near the bottom of the bin, there would be a lateral pressure of about 72 tons upon a ring 8 inches in height." This is true to the extent that the total pressure upon the ring normal to its inner surface would be about 72 tons, but it is not true that the whole of this pressure would be exerted to rupture the ring. Only the component of these forces, acting perpendicular to a diameter passed through any point where rupture may be supposed to occur, has to be considered, and the ring would, therefore, have to be strong enough to resist a tensile-stress of about 12 tons. A bar 4" x ½" would seem to be ample, even allowing for the material removed at the joints.

We are not undertaking to defend in any way the design of the structure in question, but we do not want you to make the case out any worse than it is, as we are interested in "steel-concrete" construction in general, although we have no connection whatever with the Peavey Company or with the concern who did the work for them.

Yours truly,
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STORAGE BATTERIES.— The storage battery is coming more and more into evidence, as its value in certain situations and the proper methods of handling it get to be better understood. It has suffered in the past more from external ignorance than from internal defects. Applied in many instances to meet conditions to which it was not adapted, usually overworked, nearly always uncared for, it has been the ugly duckling of the electrical art. Engineers generally know but little about it and its limitations. They frankly admit the fact, and seem to care little that it is so. Electro-chemistry is out of their sphere, they say, and battery mathematics are not intricate enough to attract the learned. The truth remains, however, that the storage battery is a good friend, and an ever-present help in the time of trouble, if it be properly laid out and installed, and does not suffer from persistent neglect. Altogether, there seems to be a growing demand for power batteries, and as their limitations and operation become better understood their performance will become more satisfactory and their dividend paying possibilities greatly increased. The storage battery has an important place in industry, and with the exercise of proper care in its handling it will undoubtedly justify the claims of its exponents.— *N. Y. Evening Post.*

THE STRAIT OF CANSO BRIDGE.— The bridging of the Strait of Canso between Cape Breton and the mainland of Nova Scotia will be undertaken at once. The task involves great engineering difficulties, and an outlay of about \$5,000,000. J. A. L. Waddell, of Kansas City, has been engaged to oversee the work. The bridge will be a cantilever, with a span of 1,800 feet, and will have a height of 58 feet clear above high-water.— *Exchange.*

THE WESTMINSTER PRESBYTERIAN CHURCH, BALTIMORE, MD.— One of the most historic spots of this city is the site of the old Westminster Presbyterian Church, which will celebrate its fiftieth anniversary, beginning next Sunday, with elaborate and appropriate exercises. This church was built in 1852 in the old Westminster graveyard at the corner of Fayette and Greene Streets, that site being selected in order

that the church might protect the yard, in a way, and keep it in better condition, although the ground is held by the trustees of the First Presbyterian Church, corner of Madison Street and Park Avenue. The founders of Westminster Presbyterian Church were members of First Presbyterian, Franklin Street. The position and mechanical construction of the church are quite out of the ordinary. As the yard was well filled with graves and vaults, before the construction, pillars 7 feet high were erected between the mounds, and upon these pillars is the foundation of the church, leaving an open space beneath the church of ample height for visitors to stroll between the graves. For about fifty years John Spence, the gravedigger, and also sexton of the church, had a unique apartment in the corner of this lower space, where he lived alone with his large dog—a great Dane—which he called "Poe." The furniture of this room consisted largely of tombstones. His table was a vault about 4 feet high, while smaller stones served as chairs. In addition to these articles he had a couch on which he slept each night. Mr. Spence died a short time ago.— *Baltimore American.*

TRADE UNIONS IN GERMANY.— The fourth German Gewerkschaft (German Socialist Trade Union) congress, which met this week in Stuttgart, for several reasons is of interest. In the first place, for the first time in the history of Germany the German Government sent representatives to attend a Socialist labor congress. Legien, the able manager of the Gewerkschaften, in his greeting to the Government officials, said that they would realize that they were as well off at a labor congress as at a meeting of employers. He was glad that the Government had come so far as to extend recognition to the representatives of organized labor. It also deserves to be noted that, for the first time, English trade unionists were in attendance at a German trade-union congress, James O'Grady and Peter Curran having come from London to Germany for this purpose. The business report submitted to this year's meeting is also worthy of note, for it shows that the Gewerkschaften, in spite of the very serious economic conditions prevailing in Germany, have grown—in fact, since 1892 have tripled their membership, now having 481,798 members. The organizations last year had a total income of 294,189 marks, while their expenditures were 208,344 marks, exclusive of strike-funds, which amounted to 241,450 marks raised by special collection. The Gewerkschaften of Germany have had a slow, but sure, growth. While Lassalle and other early Socialist leaders were opposed to the trade-union idea, it is now admitted by the German Socialist party that trade unions are of great benefit to the laboring people. Strange to say, however, while Germany has over 6,000,000 workmen, only 700,000 belong to trade unions. This condition, therefore, was due to the fact that up to a recent date the coalition of workmen was prohibited by the State, so that trade unionism had but little chance to develop. Since the Government has become more liberal trade unions have grown.— *Boston Herald.*

CONDITION OF NEW YORK UNION MEN IN 1902.— John McMackin, New York State Commissioner of Labor, has issued the following review of the conditions of labor in this State in the first quarter of 1902: The amount of idleness among the members of New York labor organizations was far smaller than it has been in the months of January, February and March in any recent year. Heretofore at least 10 per cent of trade unionists have been idle during those months, but this year the proportion has fallen to 6.2 per cent. The average number of days worked by the men increased from 58 in 1897 to a little less than 67 in 1901, and 67.3 in 1902. Average earnings of organized workmen increased in about the same ratio, having been \$155 in the first quarter of 1897, a little less than \$183 in 1901, and a little over \$184 in 1902. Building-operations in the first three months of the year, before the interruption occasioned by the usual spring disputes, were very active in all the large cities. The number of labor organizations in this State at the end of March was 1,930, which is an increase of 59 over the number existing last September. The number of new unions recorded was 152; of old unions dissolved, 93. The aggregate membership is now 279,930, an increase since September of only 3,809. The number of immigrants at the port of New York in January, February and March, 1902, was 104,937, which was 35,134 more than a year ago, and 76,829 more than in 1895. The Bureau of Mediation and Arbitration recorded 22 industrial disputes in the first quarter of this year, involving 75 firms of associations of employers. The number of employers directly affected by these disputes was 1,788, and the number indirectly affected, 744, while the duration of the disputes in working-days (time lost by the 2,532 workpeople) was 84,425. Four of the disputes that ended in the period began in 1901, while two of the eighteen disputes that began in the quarter are still unsettled. More than one-half the disputes turned upon the question of wages.

ARE THE PROFESSIONS COMMERCIALIZED?— The truth is, we hear too much about the commercialization of the professions. There are men who vulgarize them all—no doubt—and who sell their craft-right for a mess of millions, for there have always been such men. But there is another tendency of our time that is far stronger than the tendency to get wealth: it is the tendency to establish, to build, and to maintain institutions of any useful and honorable kind. Men give themselves in the most unselfish way to build up colleges and universities, hospitals, museums, clubs, associations, for the advancement of trades and professions, libraries—there is no end of the list. Men labor to turn their business into institutions. Many founders of great commercial houses work for their honorable perpetuity. Many manufacturers plan their factories so as to give them an institutional character and value. The naturally constructive tendency of an active people is towards institution-building. Strong men in almost every department of work show such a tendency, often as a dominant trait of character; and this is a stronger motive than the mere wish to be rich. The rich man who stands alone, who has not established something, who is not identified with some great institution, commercial or public, is not envied. He is more likely to be pitied.— *The World's Work.*

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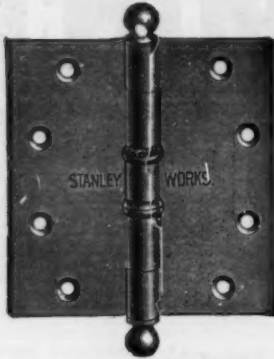
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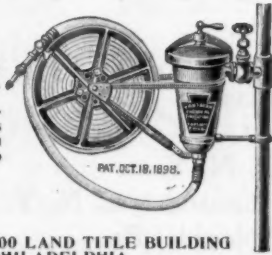
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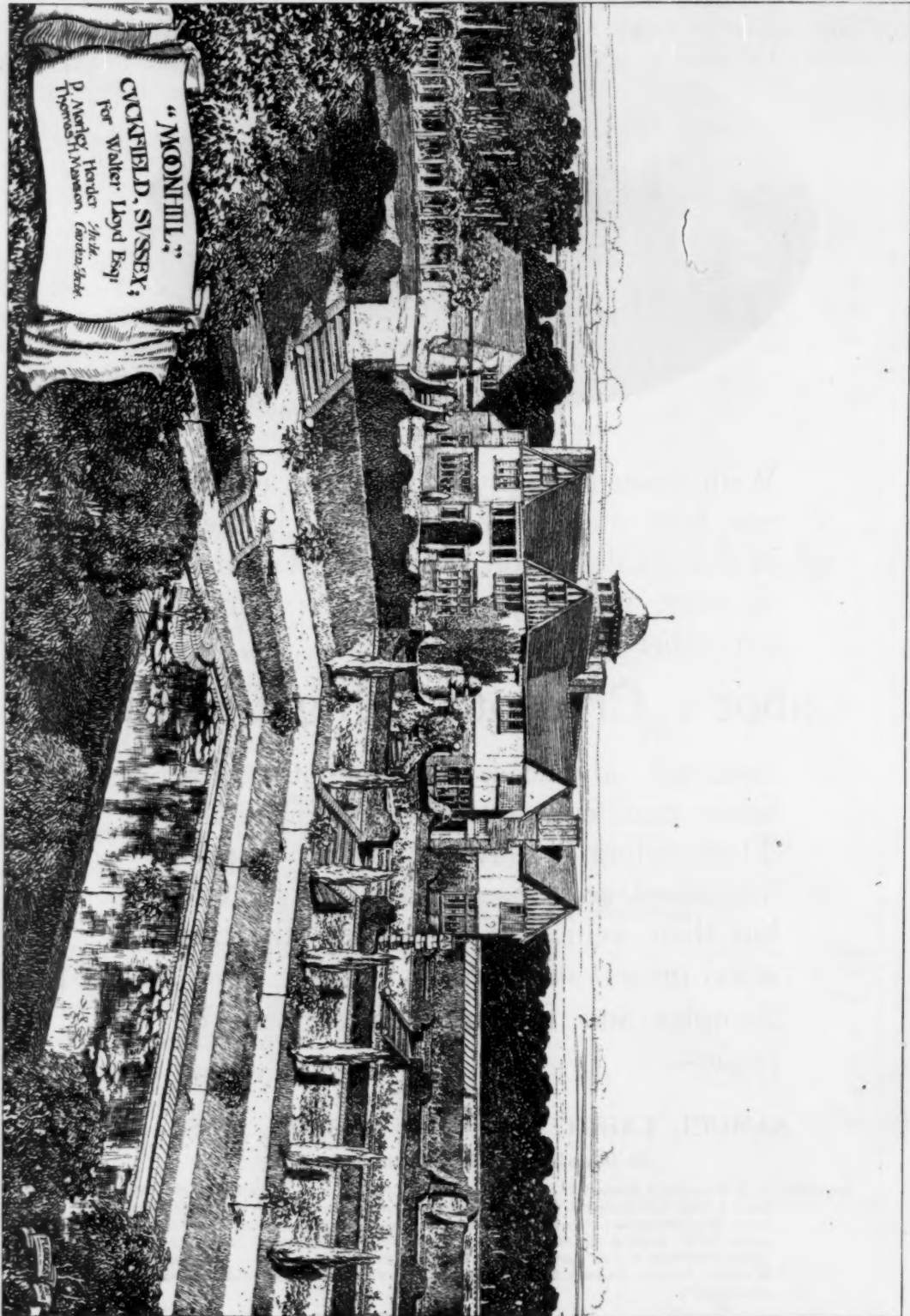
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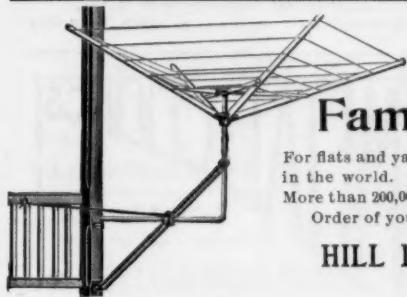
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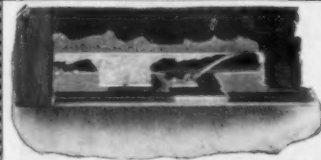
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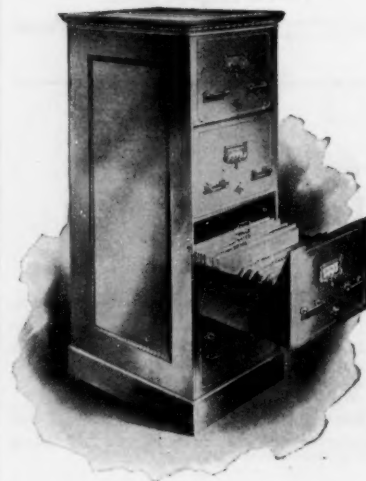
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Important Litigation Relating to Magnesia Covering Patents

THE KEASBEY & MATTISON CO., the owners of the patents for magnesia covering, have commenced a suit in the United States Circuit Court for the Southern District of New York against the Philip Carey Mfg. Co., George D. Crabbs, J. E. Breese, Schoellkopf, Hartford & Hanna Co., J. F. Schoellkopf, Jr., James Hartford, W. W. Hanna, C. P. Hugo Schoellkopf and Jesse W. Starr, to restrain the defendants from making and selling magnesia covering for boilers and steam pipes containing more than 50 per cent of magnesia, and especially coverings containing 85 per cent magnesia.

The Bill prays for a preliminary writ of injunction, to be continued during the pendency of the suit, and upon the final determination thereof to be made perpetual, and also demands an accounting and damages.

☞ All persons are respectfully requested to refrain from purchasing covering infringing these patents, as such purchasing must of necessity lead to suit. ☞

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See last or next issue for the following advertisements:—

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ARCHITECTS' REMOVALS, Etc.

July 1st, 1902.

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BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

ADVANCE RUMORS.

Algonac, Mich.—M. L. Smith & Son, Home Bank Building, Detroit, have prepared plans for a hotel for the Algonac Hotel Co., to cost \$30,000.

Amesbury, Mass.—The government has appropriated \$45,000 for the purchase of a site and erection of a Post-office building here.

Amherst, Mass.—Amherst College is reported to have received a gift of \$65,000 to erect an observatory for the astronomical department.

Ann Arbor, Mich.—The Phi Delta Theta Fraternity has purchased a site on S. University and Wash-tenaw Aves. and will erect on same a \$25,000 building.

Ballard, Wash.—A plant for the construction of locomotives and cars will be established here by Seattle capitalists; cost, \$300,000.

Belleville, Pa.—Edward Hazlehurst, of Philadelphia, has been commissioned by the trustees of the State College to design the new buildings to be erected for that institution near this place.

Bloomington, Ind.—John D. Rockefeller has presented to the Indiana University \$30,000 for the erection of a building for social and religious purposes.

Boston, Mass.—The Governor has signed the bill providing for the construction of a tunnel and additional subways.

Braddock, Pa.—E. J. Carlisle & Co., 700 Lewis Block, have prepared plans for an \$85,000 school.

Bridgeport, Conn.—The American Graphophone Co. has awarded a contract for a two-story factory, 50' x 200'. It will be occupied by the Burt Mfg. Co., which is about to move from Milburn, N. J.

Brooklyn, N. Y.—The Board of Aldermen has authorized the issue of \$150,000 corporate stock of the City of New York, to defray the expenses of installing a steam heating and lighting plant in the Kings County Hospital and Almshouse.

Plans have been filed for a three-story brick parish building to be erected on Driggs Ave. and N. 6th St. for St. Vincent de Paul's Church, to cost \$25,000. Architect, F. J. Berlenbaeh, 260 Graham Ave.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Calumet, Mich.—The miners of the Trimountain mine have formed a cooperative company with a capital of \$25,000 and will erect a store.

Cambridge, Mass.—Plans by Architect J. A. Schweinfurth, 53 State St., will soon be ready to figure for a one-story brick block to contain 5 stores to be erected at the corner of Massachusetts and Putnam Aves., for Dr. G. R. Southwick, 31 Massachusetts Ave., Boston. Architect in charge.

Camden, N. J.—The City Council has passed an ordinance authorizing the issue of \$50,000 bonds for the purpose of erecting one school and repairing other school-buildings.

The plans of Walter Smedley, Stephen Girard Building, Philadelphia, have been accepted for the Nurses' Home, to be erected at the Cooper Hospital, to cost about \$20,000.

Cleveland, O.—The National Woolen Co. has been incorporated to manufacture cotton and woolen goods. The capital is \$730,000.

Colorado City, Col.—The United States Smelting Co. will build a smelter at a cost of \$1,000,000.

Concord, N. H.—Several citizens had endeavored to prevent the erection of a new city building but the recent decision of the Supreme Court dissolves the temporary injunction and allows the city government to proceed at once with the erection of the building.

Council Bluffs, Ia.—\$28,000 will be used for the erection of temporary buildings for the school for the deaf.

Courtenay, N. D.—A \$40,000 hotel may be erected here.

Darien, Conn.—Howells & Stokes, 100 William St., have completed plans for a new country home for Anson Phelps Stokes, of New York City, to be erected on Colander's Point. The estimated cost of the mansion and various buildings to be erected on the place will be \$250,000.

Davenport, Ia.—Chapel and gymnasium buildings will be erected at St. Katherine's Hall.

Des Moines, Ia.—The contract for the army post buildings has been let to Hamilton Bros. for \$55,000.

Plans for the Brown-Hurley Hardware Co.'s six-story building are completed. The building will cost \$60,000.

The State Capitol will be repaired and improved at a cost of \$250,000.

Dr. W. O. Coffee, eye and ear specialist, will soon commence the construction of a \$60,000 stone mansion on W. Grand Ave. The edifice will be four stories, and will have 21 rooms. It will be heated with hot water and every room will be provided with fixtures for both gas and electric lights.

Hallett & Rawson are to prepare plans at once for the new warehouse of the Rumley Mfg. Co., La Porte, Ind. The building is to be erected at once and will occupy the entire quarter block at 4th and Vine Sts. The dimensions will be 132' x 132'. The building will be constructed of vitrified brick and will be massive in construction. Cost, \$50,000.

Detroit, Mich.—A three-story brick store, 32' x 110', stone trimmings, is to be built on W. Miami Ave. for J. F. Hartz; cost, \$20,000.

Dorchester, Mass.—Architects Maginnis, Walsh & Sullivan, 100 Boylston St., Boston, have completed the plans for the proposed new 12-room primary school-house to be erected on Westville St. Will be built of brick and limestone, of fireproof construction throughout. Everything will be let in one contract.

Duluth, Minn.—C. A. Congden will erect a residence which will cost \$100,000. It will be of stone. C. H. Johnson, Minneapolis, architect.

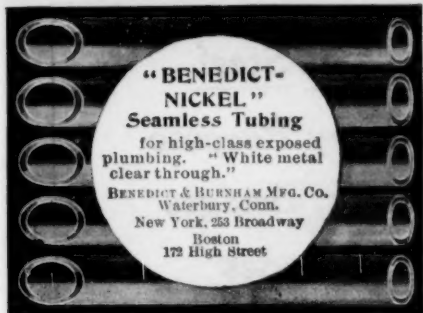
Forest City, Ia.—A canning factory, costing \$30,000, will be built.

Hartford, Conn.—A building permit has been issued to the Pratt & Whitney Co. for a foundry addition to the plant on Capitol Ave. The structure is to be of brick, one story, 87' x 68'.

Holyoke, Mass.—Plans have been drawn by City Engineer Tighe for an 8-room brick addition to be erected to Sargeant St. School. Cost, \$20,000.

The French Building Association has accepted the plans of Arthur Perreault for a building to be erected on Appleton and Race Sts. to cost between \$50,000 and \$70,000.

Kansas City, Mo.—Report states that the largest cotton-mill in the world is to be built within 20 miles of this city. Ten million dollars is to be invested. It is stated that a church to cost about \$60,000 has



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For Wash-Bowls, Sinks, Bath and Wash-Tub.
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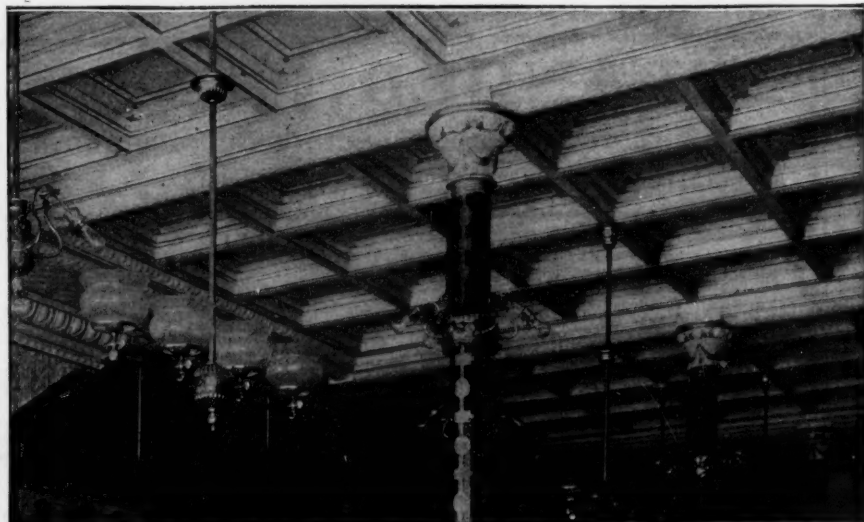
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BOSTON OFFICE
ROOM 74, EQUITABLE BUILDING
F. A. NORTHROP, Mgr.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

been planned by the congregation of the Westminster Church.

Lansing, Mich.—Spier & Rohms, Chamber of Commerce Building, have prepared plans for a depot for the Grand Trunk R. R. to cost \$30,000.

Lawrence, Mass.—Architect John Ashton, Blakeley Building, is preparing plans for a six-story brick block to contain stores and offices, to be erected at the corner of Franklin and Essex Sts., for Franklin Butler of 431 Lowell St. It will be 62' x 78', and will have steam heating, electric lighting and tar and gravel roof. All the work is in charge of the architect and the plans will be ready to figure August 1.

Lynn, Mass.—At the annual meeting of the Board of Trustees of the Y. M. C. A. it was decided to sell the present property of the Association. A fine new building is now in view.

An apartment-building is to be erected by E. A. Putnam, at the corner of Union and W. Green Sts., opposite St. Joseph's Church. Holman K. Wheeler is the architect.

Marshalltown, Ia.—A St. Thomas Hospital costing \$25,000 will be erected.

Middleboro, Mass.—The Globe Realty Co. has sold for Mrs. S. Kimball Harrison her elegant country home. The purchaser is a well known Boston lawyer, who buys for a summer home, and will make extensive alterations and improvements.

Milton, Mass.—It is reported that Mr. Milliken has begun the foundation for a house on Brush Hill Road, to cost about \$200,000; contract for construction not yet let. W. H. Besarick, of Boston, architect.

Milwaukee, Wis.—Local press reports state that the Wisconsin Telephone Co. is preparing plans for the erection of 2 branch exchange buildings here, besides making other improvements to the system in the city proper, and also putting in 1,000 miles of additional circuits throughout the State

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

during the present year, at an outlay of about \$500,000.

Minneapolis, Minn.—Pike & Cook, 220 S. 4th St., have secured the general contract to put up the buildings for the Minneapolis Steel & Machinery Co., near 29th St. and Milwaukee railway tracks; also to make the improvements in the old buildings. The machine-shop will be brick with steel roof, 124' x 203', two stories. The foundry will be 110' x 202'; the warehouse, 25' x 125'; the office 44' x 77', two stories and basement; engine and boiler room, 60' x 90'; the steel construction shop, 136' x 258'; all of solid brick. Cost, complete, \$100,000.

Montreal, Que.—Mann & Strachan will erect a hotel on Guy St., to cost about \$150,000.

Naugatuck, Conn.—The White & Wells Co., manufacturer of paper boxes, is about to erect a new factory. It will be a three-story brick structure, 60' x 88'.

Newark, N. J.—The contract for Newark's new City-hall has been awarded to E. M. Waldron for \$1,068,177. The building is to be completed in 30 months. It will be constructed of Webb granite from the quarries of the Webb Granite Construction Co., Fitzwilliam, N. H.

New Brunswick, N. J.—The contract has been awarded for building factory for the National Boiler Tube Co., 75' x 225', to cost \$30,000.

New York, N. Y.—Architect Horace Trumbauer, Philadelphia, has drawn plans for the reconstruction of the handsome residence of O. H. P. Belmont located at 5th Ave. and 47th St. It will be one of the finest mansions in the metropolis.

Plans have been drawn for a factory for the National Blenit Co. to be erected on 10th Ave., between 15th and 16th Sts.

Plans have been filed at the Bureau of Buildings, Manhattan, for an eighteen-story brick hotel for the corner of 5th Ave. and 55th St., 100' 5" x 125'. The

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Fifty-fifth Street Co. is the owner. Estimated cost, \$2,250,000.

Plans have been completed by Architects Sars & Smallheiser, 23 Park Row, for a seven-story brick and stone business building, 25' x 50' x 125', to be erected at 79 81 Reade St. at an estimated cost of \$40,000. Plans provide for granite and limestone face and common brick, structural iron work, composition roof, steam heat, electric light, electric elevators, etc. Work will be started soon.

Omaha, Neb.—The Storx Brewing Co. will erect a large bottling house adjoining its present plant on Sherman Ave.; cost, \$40,000.

The Masons propose to erect a temple on Farnam St. at a cost of \$250,000.

\$30,000 will be used in the erection of school-buildings at South Omaha.

The Catholics of Omaha diocese will erect a large cathedral.

Peabody, Mass.—The Peabody School Committee has not as yet decided upon the site for the location of the new \$95,000 school-building, but is considering two locations—the Franklin Osborne lot opposite the Bowditch School-house and the Coburn lot at the junction of Lowell and Endicott Sts. The building to be erected is expected to fill the needs of the high school for the next 15 years. The decision will probably be made within a week or two.

Philadelphia, Pa.—Geo. Hessler has been granted a permit to build Robert H. Foerderer's new warehouse, at the corner of Trenton and Frankford Aves. It will be a four-story brick structure, 71' x 151', and will cost \$30,000.

The Angus S. Wade Co. is estimating on 3 one-story stone buildings, 16' x 50', to be built for the Kansas City Beef Co. at Germantown and Indiana Aves., and on the proposed interior alterations to the Medico-Chirurgical Hospital.

Arthur H. Williams has been awarded the contract for remodeling the recently-burned Church

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

of the Saviour, at 38th and Ludlow Sts. C. M. Burns is the architect.
 Estimates will be filed at the office of Amos W. Barnes, architect, 901 Walnut St., for a six-story apartment-house at 22d and Ludlow Sts. It will be a six-story building, of fireproof construction and cost about \$250,000. Machin & Brown and Doyle & Doak are among those figuring.
 Several prominent architects of this city have been asked to prepare competitive plans for a new club-house at Broad and Spring Garden Sts. for the order of the Nobles of the Mystic Shrine. It is to be a two or three-story structure of brick and stone to cost \$75,000 to \$100,000. For details, address Wm. Ross, 307 Walnut St.
Rugby, N. D.—The following will rebuild their buildings which were recently burned: R. R. Widemeyer, barber shop; F. McBride, drug store; T. J. O'Neil, pool-room and bowling alley; E. Nelson, jewelry and confectionery; H. H. Kern, general store; A. Lafavre, restaurant; E. Gunderson, general store. The total cost will be \$50,000.
Sault Ste. Marie, Mich.—Harry C. LaFlamboy, of Detroit, contemplates forming a company with a capital of \$500,000 for the purpose of establishing a match factory here.
 Blumrosen Bros. will build a stone and brick block at a cost of \$25,000. Edw. Demar, architect.
Sheboygan, Wis.—It is stated that an opera house to cost \$28,000 will be erected in the near future.
Sioux City, Ia.—A company has been formed by William Gordon and others, for the purpose of building a beet sugar factory here to cost \$350,000.
 G. W. Burkhead has drawn plans for a four-story brick and stone hotel building, 80' x 100', to be erected by Robert E. Parslow at a cost of \$40,000.
Spokane, Wash.—Funk Bros. will build a \$20,000 block. C. H. Smith, architect.
 McGowan Bros. will build a large brick warehouse; cost, \$20,000.
Springfield, Mass.—The French Building Association has accepted the plans of Arthur Perreault for their new building to be erected at the corner of Appleton and Race Sts. The cost will be between \$50,000 and \$70,000.
Tempico, Ill.—Fisher & Gaul, Teutonic Building, Chicago, have drawn plans for a \$15,000 church for Rev. F. Weber, pastor of St. Mary's Roman Catholic Church.
Toledo, O.—The Euclid Ave. Methodist Episcopal congregation contemplates the erection of a stone edifice, 70' x 90', at Euclid and Starr Aves., to cost \$30,000.



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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Topka, Kan.—The Board of Health has purchased 10 acres of land near here, for a new detention hospital.
Trenton, N. J.—Ground for a plant will be broken by the Jordan L. Mott Iron Works within the next few weeks. Options have been obtained on about 20 acres in the lower part of the city, now occupied principally by the plants of the Roeblings, the Trenton Iron Co. and several minor iron plants. The buildings are to cost more than \$1,000,000 and 2,250 workmen are to be employed.
Washington, D. C.—It is reported that the Secretary of War has directed the preparation of a general order for the establishment in this city of an army war college for the most advanced instruction of army officers. Major General C. B. M. Young has been detailed to duty as president of the college. Until the buildings contemplated at Washington barracks for the use of the college are erected and ready for occupation, the college will occupy temporary quarters in a private building.
 A press report states that instead of building \$4,000,000 worth of barracks for Federal troops, as proposed by the Senate, the House insists that only \$3,350,000 worth shall be built. No matter; the barracks will be built, and the spectacle of soldiers camped out in tents during mid-winter will not be presented to the American people.
Waterloo, Ia.—Two gymnasiums, a library and a chemistry building will be erected at the State Normal School. Total cost, \$250,000.
Wayne Junction, Pa.—The Blaisdell Paper Pencil Co. will erect a two story factory building here. It will be 33' x 75', of brick.
Wellston, O.—Plans have been completed by A. B. Alger & Son, Portsmouth, for the \$25,000 four-story manufacturing building for the Tremper Shoe Manufacturing Co. It will be of mill construction, brick and stone, have composition roof, steam or hot blast heat.
Winnipeg, Man.—The Young Men's Liberal Club will erect a four-story brick club-house.
ALTERATIONS AND ADDITIONS.
Boston, Mass.—Brimmer St., No. 9, alterations & three-story addition, 14' x 24', comp. roof; \$15,000; o., W. F. Beal, 50 State St.; a., John Lavallo.
New York, N. Y.—Broome St., cor. Ridge St., five-story extension, 61' x 80', general alterations to four-story bk. school; \$70,000; o., City of New York; a., C. B. J. Snyder, 4th Ave. & 50th St.
APARTMENT-HOUSES.
Cleveland, O.—Ingleside and Sangamon Sts., four-bk. & st. apart., 80' x 115'; \$40,000; o., Heriz & Foster, 1352 Superior St.; a., F. C. Bate, 401 New England Building.
Hartford, Conn.—Wethersfield Ave., four-story bk. & st. apart., 72' x 96', steam; \$50,000; o., Radding Bros., Springfield, Mass.; a., W. B. Reid, Holyoke, Mass.
New York, N. Y.—One Hundred and Twelfth St., nr. Amsterdam Ave., eight-story st. front flat, 51' x 85', cement & tile roof; \$125,000; o., John Reilly, 420 E. 121st St.; a., Frank H. Quimby, 99 Nassau St.; b., Theo. Reilly, 420 E. 121st St.

BUILDING INTELLIGENCE.

(Apartment-Houses Continued.)

One Hundred and Sixth St., nr. Manhattan Ave., 3 six-story bk. & st. flats, 48' x 87', plastic slate roof; \$201,000; o., Park Construction Co., 4 & 6 Warren St.; a., Moore & Landsiedel, 148th St. & 3d Ave.
St. Louis, Mo.—Hamilton and Maple Aves., five-story bk. & st. apart., 100' x 145'; \$100,000; o., W. F. Williamson.
Waltham, Mass.—Elm St., cor. Main St., three-story bk. store & apart. block; \$40,000; o., E. F. Snell, trustee, Park Theatre Building; a., Hartwell, Richardson & Driver, 62 Devonshire St., Boston.
CHURCHES.
New York, N. Y.—W. One Hundred and Thirty-second St., Nos. 209 219, one-story bk. church, 75' x 99' 11", slate roof; \$60,000; o., Corporation of St. Aloysius Church, on premises; a., W. W. Renwick, 39 W. 27th St.
FACTORIES.
Auburn, Ind.—Four-story bk. factory, 81' x 193', tar & gravel roof, steam; \$25,000; o., Modern Buggy Co.
Brooklyn, N. Y.—Third Ave., nr. 3d St., five-story bk. factory, 81' x 104' 4", gravel roof; \$125,000; o., American Can Co., 11 Broadway, N. Y.; a., E. L. Daus, 120 Fulton St., N. Y.
 Park Ave., nr. Emerson Pl., five-story bk. factory, 56' x 80', gravel roof, steam; \$25,000; o., Rigney Co., 348 Park Ave.; a., H. E. Funk, 25 Third Ave., N. Y.; b., C. Doenecke, 216 Washington Ave.
Findlay, O.—One-story bk. factory building, 120' x 150', saw-tooth roof; \$25,000; o., Findlay Table Mfg. Co.; a., D. E. Postle, 1731 Marquette Building, Chicago, Ill.
Westfield, Mass.—Four-story bk. & st. factory building, 45' x 200', comp. roof, steam; \$50,000; o., Independent Whip Co.; a., Penn Varney, 46 Central Sq., Lynn.
HOSPITALS.
New York, N. Y.—One Hundred and Forty-second St., One Hundred and Forty-third St., St. Ann's Ave., Brook Ave., 5 four-story & base bk. & st. hospital buildings, 326' & 36' 8" x 175' & 57' & irregular, slate & t'n roof; \$500,000; o., Sisters of the Poor of St. Francis, 649 Fifth Ave.; a., Schickel & Dittmar, 111 Fifth Ave.
 W. Thirty-fourth St., Nos. 450-458, six & seven-story bk. & st. hospital, 36' 9" x 103' 7", tile & slate roof; \$160,000; o., French Benevolent Society, 320 W. 34th St.; a., Welch, Smith & Procvit, 11 E. 42d St.
HOTELS.
Maynard, Mass.—Main St., three-story fr. boarding-house, 60' x 73'; \$20,000; o., American Woollen Co.; a., P. F. Gilbert, 53 Central St., Lowell.
New York, N. Y.—E. Thirty-second St., Nos. 11-13, twelve-story bk. & st. hotel, 50' x 84', plastic slate roof; \$350,000; o., Campbell & Clement, Nagle Ave., nr. Dyckman St.; a., Neville & Bagge, 217 W. 125th St.
 Seventy-second St., nr. West End Ave., twelve-story bk. & st. hotel, 101' 3" x 24' 4", plastic slate roof; \$1,100,000; o., The Johnson-Kahn Co., 102 W. 69th St.; a., John E. Scharms, 477 W. 144th St.

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COMPETITIONS.

ARTISTS' DESIGNS INVITED

Strathcona and South African Memorial Fund

It is proposed to erect in Montreal a monument in honor of the Canadian Soldiers who fought in South Africa, and also to commemorate the patriotic act of Lord Strathcona in the equipment of a regiment of mounted troops for the same service. The Committee has at its disposal a sum of between five and six thousand pounds stg. (twenty-five to thirty thousand dollars) and invites designs for such a monument.
Terms of the competition may be had from PEERS DAVIDSON, Esq., London and Lancashire Building, Montreal, or at the Bank of Montreal, 22 Abchurch Lane, London, E. C. 1385

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., July 8, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 18th day of August, 1902, and then opened, for the construction (except heating apparatus, electric wiring and conduits) of the U. S. Court-house and Post-office at Fergus Falls, Minn., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Fergus Falls, Minn., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1386

ENGINE-HOUSES. [At Springfield, O.]
The Board of Public Affairs will receive bids until July 21 for furnishing material and erecting two fire-engine houses. 1385

LIBRARY BUILDING. [At Sparta, Wis.]
Sealed bids will be received by the Building Committee at the office of C. M. Masters, Sparta, Wis., until July 21, 1902, for the erection of a public library in Sparta, Wis., according to plans and specifications prepared by Messrs. Schick & Roth, architects, La Crosse, Wis., which are on file in the offices

PROPOSALS.

of said architects, and in those of Masters & Graves, Sparta, Wis. Separate bids for plumbing and heating. C. M. MASTERS, G. A. RICHARDSON, F. E. DOTY. 1385

SEWERS. [At Binghamton, N. Y.]
Bids are wanted July 22 for constructing sewers in portions of four streets. I. C. HULL, City Clk. 1385

PAVING. [At Napoleon, O.]
Bids will be received by Usher Fisher, Village Clk., until July 22 for furnishing material and paving Perry St. and Oakwood Ave. with a vitrified brick or asphalt block on a stone foundation, or with asphalt block on present stone or sand foundation on Perry St. and on a crushed-stone foundation on Oakwood Ave. C. N. SCHWAB, Engr. 1385

PAVING AND CURBS. [At Dayton, O.]
Bids are wanted July 23 for paving with bituminous macadam, brick or sheet asphalt, furnishing and setting curbs on Maple St. Bids will also be received

PROPOSALS.

for paving with bituminous macadam or macadam, furnishing and setting curbs on Central Ave. ROBT M. FERGUSON, City Compt. 1385

GRADING, ETC.

[At Mt. Pleasant, O.] Bids will be received by the Turnpike Comrs., care Jas. E. Finley, Mt. Pleasant, until July 23 for grading and macadamizing Mt. Pleasant Section and Leag Run Free Turnpike. 1385

ADDITION TO SCHOOL.

[At Cleveland, O.] Bids will be received by the Bd. of Educ. until July 23 for furnishing material and erecting an addition to Sibley School, work to include mason, cut stone, iron and steel, galvanized iron and tin work, fireproofing, ventilating and heating, plumbing, gas-fitting, sewerage, etc. STARR CADWALLADER, School Dir. 1385

LIBRARY.

[At Eureka, Cal.] Bids will be received by the Carnegie Free Library Com. until July 31 for furnishing material and constructing the foundations and basement for Carnegie Free Library, including drainage and sewerage, and for furnishing material and erecting the superstructure, including all brick, stone, metal, mason, iron, terra-cotta work, plumbing, etc. GEO. A. KELLOGG, Sec'y. 1385

PAVING, ETC.

[At Steubenville, O.] Bids will be received by the Co. Comrs. until July 23 for paving and curbing a road, about 5,200 feet long and 23 to 30 feet wide. C. M. BROWN, Chmn. 1385

ABUTMENTS FOR BRIDGE.

[At Cambridge, Mass.] Sealed bids for building two masonry abutments for Cambridge Bridge will be received by the Cambridge Bridge Commission at the Mayor's office, City-hall, Boston, until July 17, 1902. Notice to contractors, forms of bid, contract, specifications and bond, can be obtained, and plans can be seen at the office of the City Engineer, 50 City-hall, Boston. PATRICK A. COLLINS, JOHN H. H. MCNAMEE, E. D. LEAVITT, Cambridge Bridge Commission, Boston, July 3, 1902. 1385

COURT-HOUSE.

[At Crown Point, Ind.] Bids will be received by the Board of County Commissioners until July 21 for erecting a brick and stone court-house. 1385

STEAM HEATING.

[At Fort Robinson, Neb.] Chief Quartermaster's Office, Omaha, Neb. Sealed proposals will be received at this office until July 23, 1902, for furnishing material and labor in installing of steam-heating plants in the commanding officer's quarters and five double sets officers' quarters at Fort Robinson, Neb. JNO. W. PULLMAN, chief quartermaster. 1385

PAVING.

[At Boston, Mass.] Sealed proposals, endorsed "Proposals for Paving and Sidewalks," will be received at the bureau of Yards and Docks, Navy Department, Washington, until July 19, 1902, for constructing vitrified brick, concrete and granolithic pavements at the navy yard, Boston, Mass. Appropriation about \$17,000. Plans and specifications can be seen at the bureau or will be furnished by the commandant of the navy yard named. MORDECAI T. ENDICOTT, chief of bureau. 1385

BUILDINGS.

[At Iowa City, Ia.] Bids will be received by William J. Haddock, secretary Board of Regents of the State University, until July 21 for erecting two buildings. Proudfoot & Bird, architects, 712 Crocker Building, Des Moines. 1385

BUILDINGS.

[At Columbus, O.] Bids will be received by E. G. Carpenter, M. D., Sec'y Bd. of Trus. of the Columbus State Hospital, until July 26 for furnishing material and erecting 2 buildings for the hospital. It is reported that the buildings will cost about \$40,000 each. 1385

Treasury Department, Office of the Supervising Architect, Washington, D. C., July 5, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 6th day of August, 1902, and then opened, for the installation of a conduit and electric wiring system for the U. S. Post-office at Freeport, Ill., in accordance with the drawings and specification, copies of which may be obtained at this office or at the office of the Superintendent of Construction at Freeport, Ill., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1386

Treasury Department, Office of the Supervising Architect, Washington, D. C., June 19th, 1902. Sealed proposals will be received at this office until 2 o'clock P. M., on the 5th day of August, 1902, and then opened, for furnishing the steam-heating apparatus complete in place, for the U. S. Custom-house and Post-office at Brunswick, Ga., in accordance with drawings and specification, copies of which may be had at this office, or at the office of the Superintendent at Brunswick, Georgia, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1386

HOSPITAL STEWARDS QUARTERS.

[At Plattsburgh Barracks, N. Y.] Quartermaster's Office, Plattsburgh Barracks, N. Y. Sealed proposals for constructing hospital stewards quarters here will be received until July 30, 1902. Information furnished on application. QUARTERMASTER, Plattsburgh Barracks, N. Y. 1386

PUBLIC BUILDING.

[At Dedham, Mass.] Sealed proposals for the construction at Dedham, in the County of Norfolk and the Commonwealth of Massachusetts, of a building for the Registries of Deeds and of Probate and for the Probate Court for said County, will be received by the County Commissioners of said County at the County Court-house in said Dedham, until the twenty-ninth day of July,

PROPOSALS.

1902. Plans and specifications may be seen by prospective bidders at the office of the Architects, on any work day, except Saturday, between the hours of 9 A. M. and 5 P. M., and on a Saturday between the hours of 9 A. M. and 1 P. M. THOMAS BLANCHARD, JAMES HEWINS, MARSHALL P. WRIGHT, County Commissioners, of Norfolk County, Massachusetts, Peabody & Stearns, architects, 919 State Street Exchange, Boston. 1386

BUILDING.

[At Pima Agency, Ariz.] Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at this office until July 31, 1902, for furnishing and delivering the materials (except stone for foundation and brick for building, which are to be furnished on ground by the government) and labor required in construction and completion at Pima Agency, Ariz., of a brick building for employe quarters and mess hall, in strict accordance with plans, specifications and instructions to bidders. For further information apply to this office or to Elwood Hadley, U. S. Indian agent, Sacaton, Ariz. W. A. JONES, commissioner. 1386

HEATING PLANT.

[At Lisbon, N. D.] Bids for a steam-heating plant will be received until July 30. 1386

ADDITION TO GUARD-HOUSE.

[At Fort Totten, Willets Point, N. Y.] Sealed proposals, in duplicate, for constructing addition to guard-house at this post, will be received here until August 1, 1902. Separate proposals may be made on construction, plumbing, heating apparatus and electric wiring. Information furnished on application. A. HASBROUCK, Q. M. 1386

FOUNDATIONS FOR BRIDGE, ETC.

[At Chicago, Ill.] U. S. Engineer Office, 1637 Indiana Ave., Chicago, Ill. Sealed proposals for constructing foundations for five locks and one aqueduct bridge, the walls for eight locks, and the piers and abutments for five aqueduct bridges and one highway bridge will be received here until July 28, 1902. Information on application here or to Assistant Engineer L. L. Wheeler, Sterling, Ill. J. H. WILLARD, Maj. Engrs. 1386

DORMITORY.

[At Cherokee, N. C.] Department of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals will be received at the Indian office until July 28, 1902, for furnishing the necessary materials and labor required to construct and complete a frame dormitory, with plumbing, steam heat and acetylene gas piping, at the Cherokee Indian School, N. C., in strict accordance with plans, specifications and instructions to bidders. For further information apply to Henry W. Spray, superintendent, Indian School, Cherokee, N. C. W. A. JONES, commissioner. 1386

BUILDING.

[At Mare Island, Cal.] Sealed proposals will be received at the bureau of yards and docks, Navy Department, Washington, D. C., until August 9, 1902, for constructing a one-story brick and steel building, 300' x 100', at the navy yard, Mare Island, Cal. Plans and specifications will be furnished by the commandant of the navy yard upon deposit of \$15 to secure their return. MORDECAI T. ENDICOTT, chief of bureau. 1387

Treasury Department, Office Supervising Architect, Washington, D. C., June 27th, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 29th day of July, 1902, and then opened for furnishing the low-pressure steam heating apparatus, etc., complete in place for the U. S. Post-office at Joliet, Illinois, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Joliet, Illinois, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1385

Treasury Department, Office of the Supervising Architect, Washington, D. C., June 27, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 13th day of August, 1902, and then opened, for furnishing the steam heating apparatus, complete in place, for the U. S. Post-office at Freeport, Illinois, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Freeport, Illinois, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1385

Treasury Department, Office of the Supervising Architect, Washington, D. C., June 30, 1902. Sealed proposals will be received at this office until 2 o'clock P. M. on the 31st day of July, 1902, and then opened, for the installation of an electric conduit and wiring system for the U. S. Post-office at Joliet, Illinois, in accordance with the drawings and specification, copies of which may be obtained at this office or at the office of the Superintendent of Construction at Joliet, Illinois, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1385

ENGINE-HOUSE.

[At Buffalo, N. Y.] Bids will be received until July 25 for the erection of a brick engine-house to be known as engine-house No. 30. FRANCIS G. WARD, commissioner of public works. 1385

PLUMBING.

[At Fort Hunt, Va.] Office of Constructing Quartermaster, Fort Washington, Md. Sealed proposals will be received at this office until July 18, 1902, for installing plumbing in guard-house at Fort Hunt, Va. Plans and specifications furnished on application. GEO. H. MC-MANUS, constructing quartermaster, U. S. Army. 1385

ROADWAY.

[At Anderson, Ind.] Bids will be received by the Directors of Maplewood Cemetery until July 27 for constructing about 1 1/2 miles of macadamized drives and 50,000 square feet of cement work. JOHN P. SEARE, Sec'y. 1386

CODE OF PRACTICE FOR SUB-ESTIMATING AND SUB-CONTRACTING

Adopted by the Master Builders' Association of the City of Boston, Aug. 2, 1894.

ARTICLE I.

Obligation of Principal Contractor to Sub-Contractor.

A principal contractor is under obligation to treat upon an equal basis all estimates which he "receives" prior to putting in his own bid. Estimates must be considered as "received" when they come into a principal contractor's possession, either by his direct solicitation or by being accepted by him. The opening of a bid, knowing it to be such, constitutes receipt of the same.

A principal contractor is under no obligation to use a bid which he has not solicited, accepted, or received, but if he does not wish to use the estimate of a sub-bidder he should decline it, if proffered personally, or should return it unopened if sent to him by mail or otherwise. The retention of a bid should be construed as a receipt of the same.

A principal contractor, when making up his estimate, is not entitled to receive bids from sub-contractors if he is at the same time making himself their competitor by figuring their portion of the contemplated work. It is legitimate for a principal contractor to figure all portions of work, depending upon no one for what are usually known as sub-estimates, but it is not legitimate for him to receive bids from others for sub-work if he is himself figuring those portions independently.

ARTICLE II.

Award of Sub-Contracts.

The principal contractor having been awarded a general contract should immediately award the sub-contracts to the lowest bidder in each branch.

ARTICLE III.

Penalty for not Awarding Contract to Lowest Sub-Bidder.

A principal contractor failing to award a sub-contract to the lowest sub-bidder to whom he is under obligation as previously provided should be liable to pay damages to the said lowest bidder, in amount not less than ten per cent of the amount of the estimate.

Payment of such damages will not relieve the principal contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE V.

Payments to Sub-Contractors.

Unless the contracts made with sub-contractors otherwise provide, payments during the progress of the work should be made by the principal contractor to the sub-contractors upon the same basis of payment, in relation to amount of work performed, as is prescribed in the contract made by the principal contractor with the owner.

Final payment to a sub-contractor should be considered as due at the expiration of thirty days after the completion of his work and its approval by the architect or owner, unless otherwise provided by the sub-contract or agreement.

ARTICLE VII.

Obligation of Sub-Contractor to Principal Contractor.

Should a sub-contractor refuse to contract at the amount of the estimate he has given to a principal contractor who has used the said estimate in good faith, he then should be liable to the said principal contractor for damages in amount not less than the difference between the amount of the estimate which was submitted by him and the amount at which the principal contractor may be obliged to contract the work.

Payment of such damages will not relieve the sub-contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE X.

Bids to Architects or Owners.

When bids for separate departments of work on a building are solicited by the architect or the owner, they should be submitted with the understanding that they are direct estimates, for which direct contracts are to be made by the owner with the lowest bidder, and no other disposition of such bids should be permitted without consent of the bidder submitting the same.

Sub-bids should be given only to the principal contractors who are estimating the work in question, and should not be left with architects or owners for the inspection and information of principal contractors. Sub-contractors must understand that bids thus left with architects or owners are in great danger of losing their confidential character, and that if they so leave them they cannot claim protection or redress under the first article of this Code.

SUGGESTIONS.

Members of this Association having sub-contracts to let, or material to buy, should, as far as may be consistent with business principles, deal only with members of the Association, or at all events give their fellow-members an opportunity to compete, and their give them the preference, other things being equal.

All bidders should take cognizance of the danger they may be subjected to through the practice, so prevalent in some architects' offices, of making change in plans or specifications, or in both, during the progress of estimating. Correction of this pernicious practice can only be obtained through refusal by contractors to estimate under such conditions.

A true copy.

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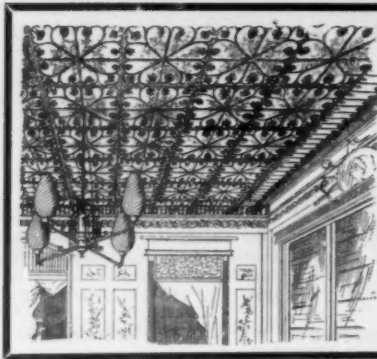
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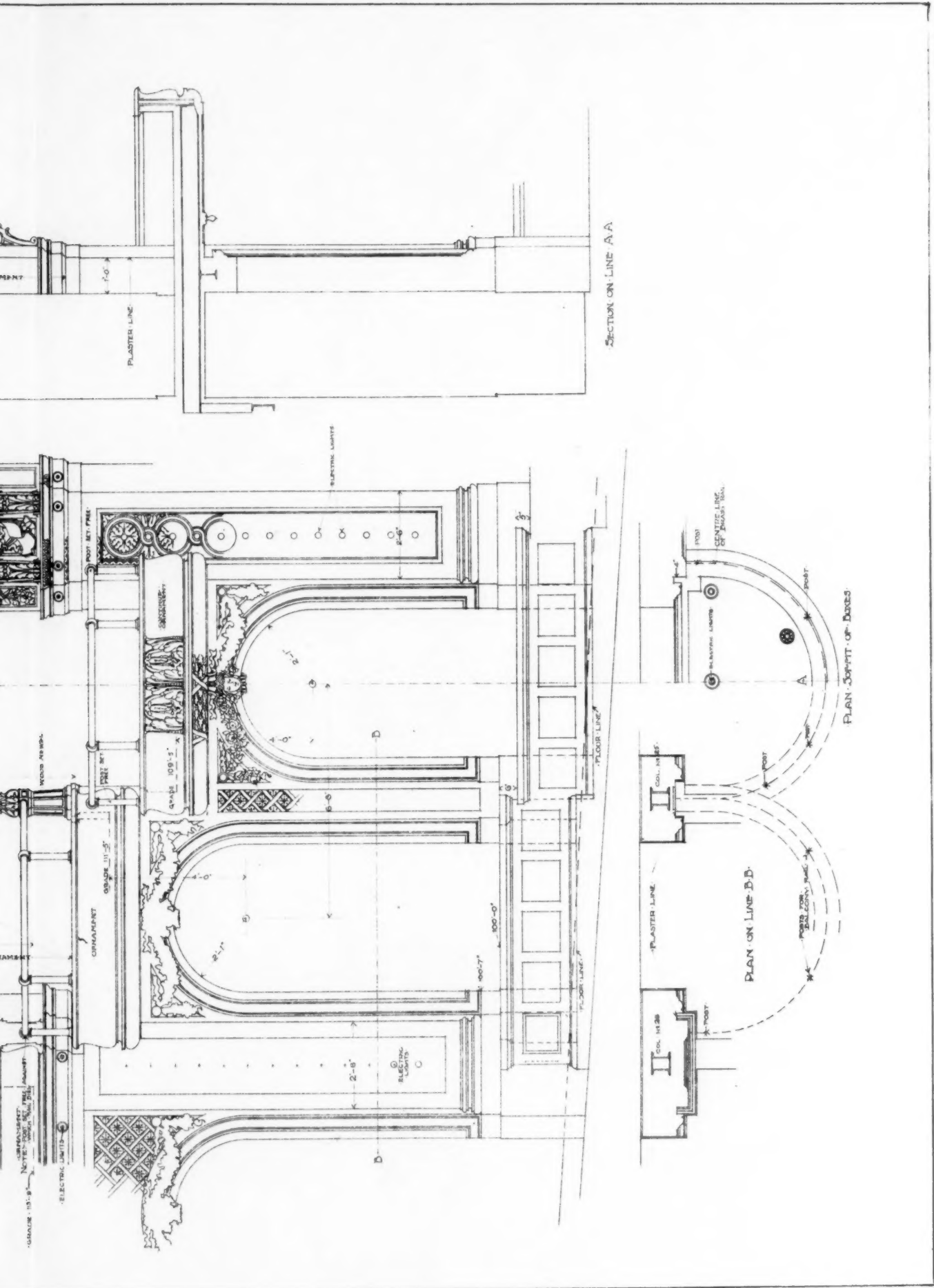
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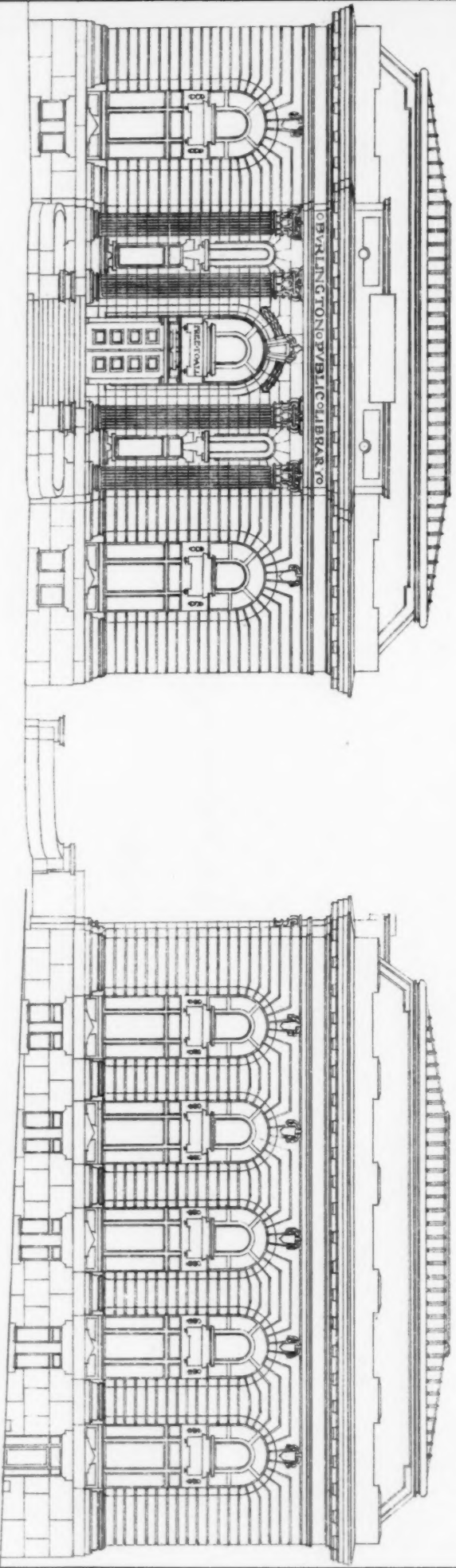
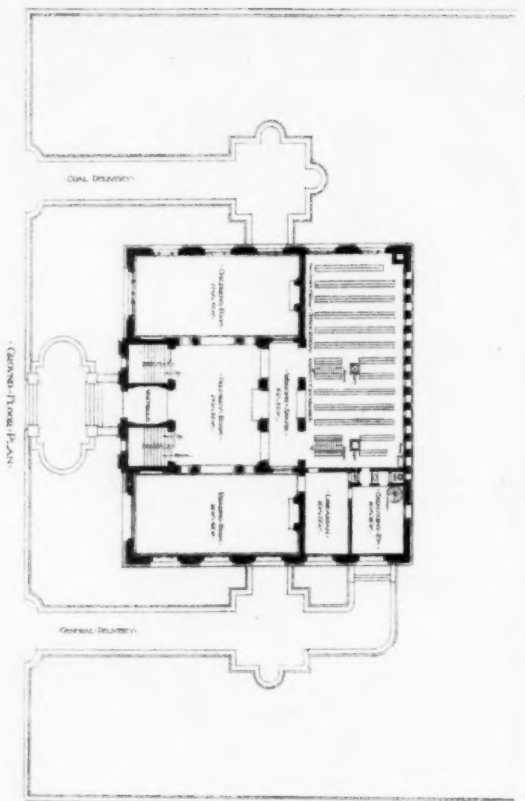
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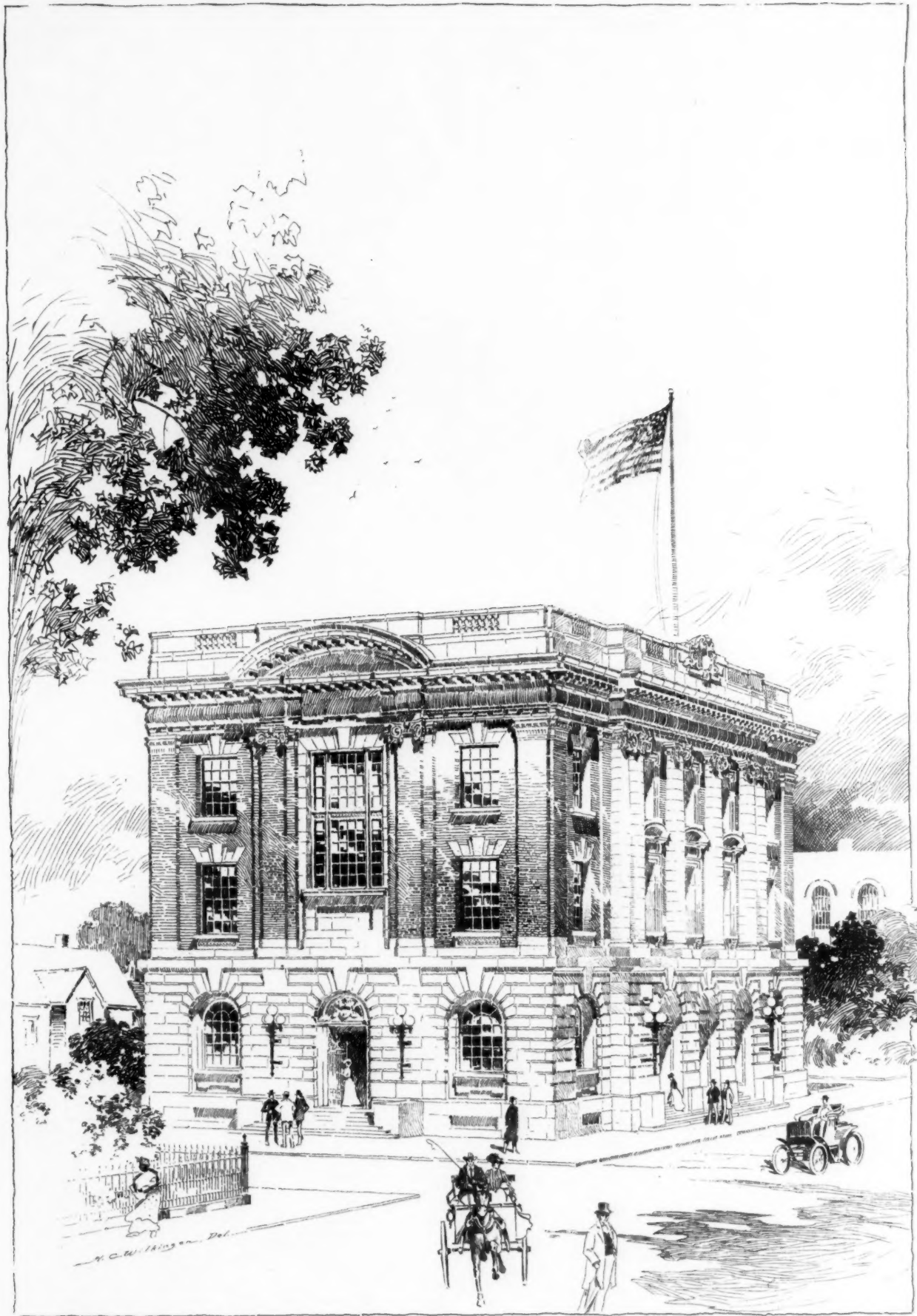
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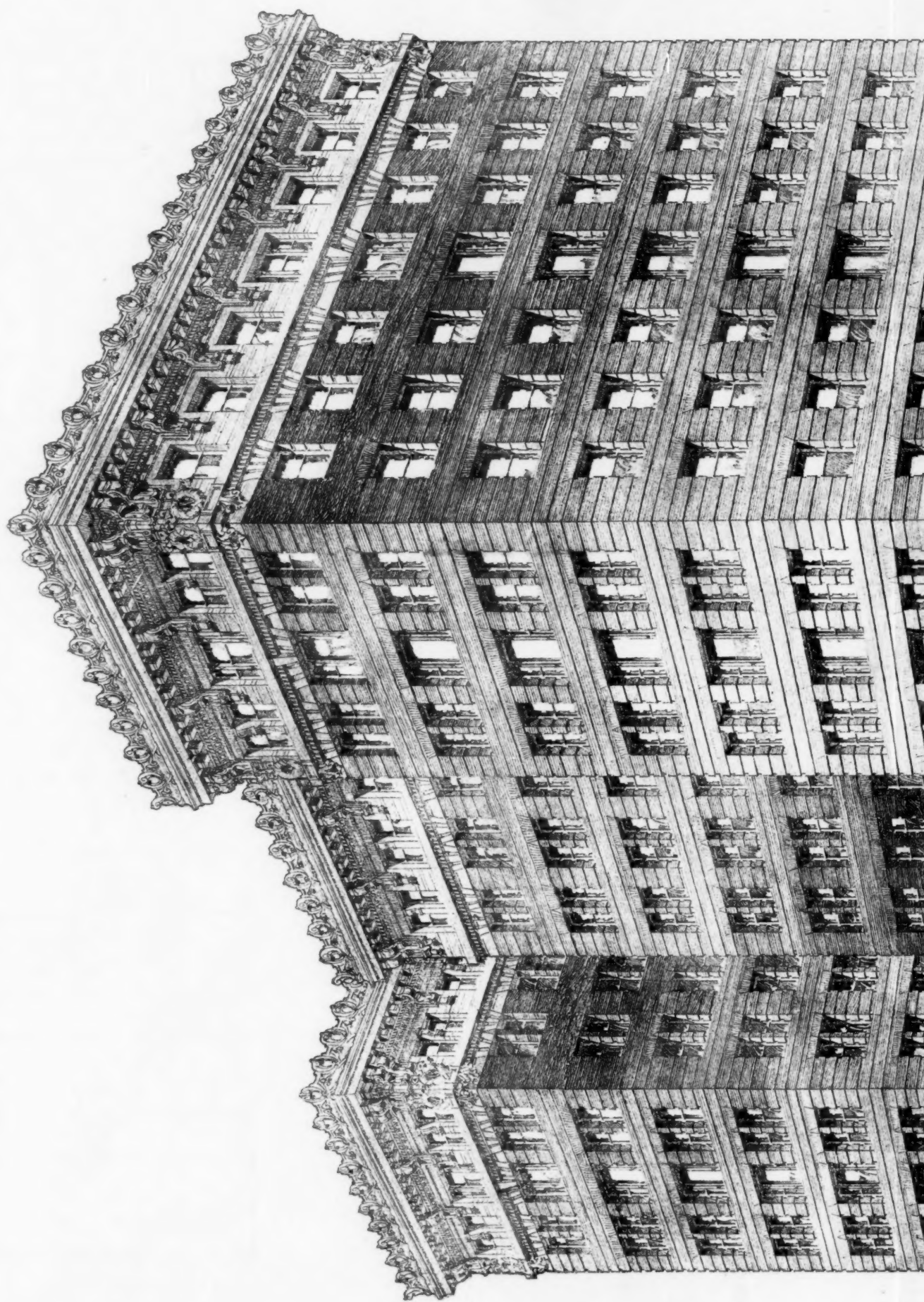


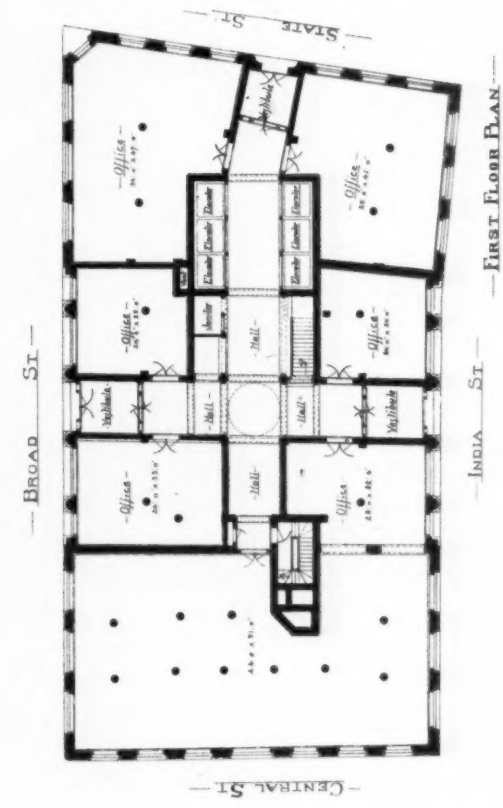
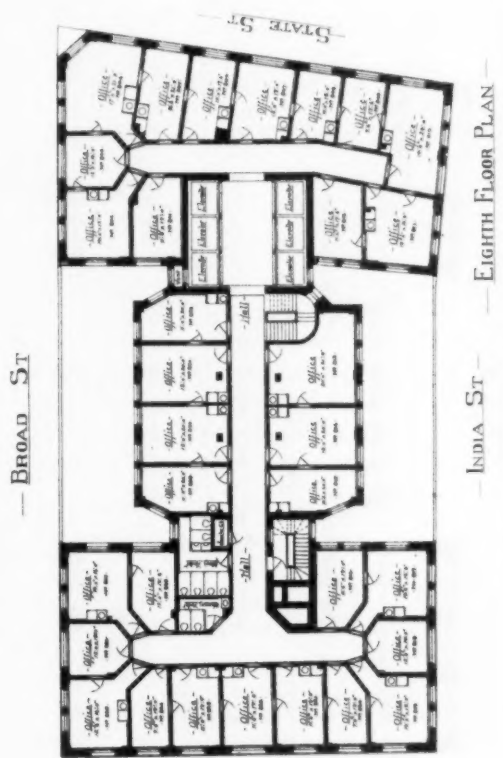
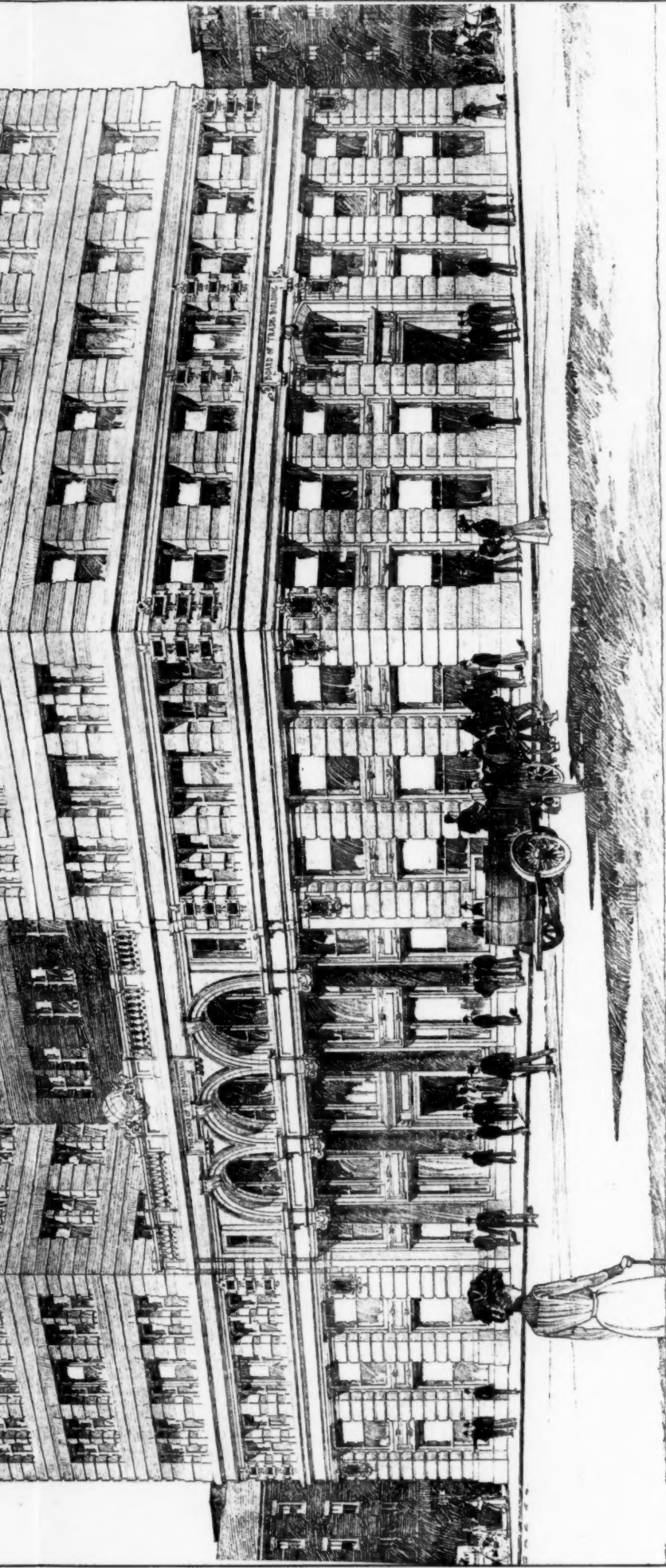
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