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THE
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AND BUILDING NEWS

VOL. LXXXIII

* REGULAR EDITION *

NO. 1470

ARCHITECTURE

ENGINEERING

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CONSTRUCTION

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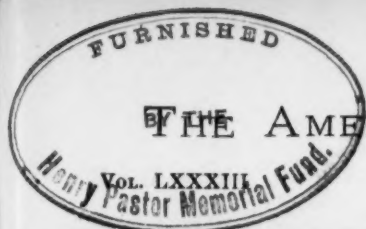
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THE AMERICAN ARCHITECT AND BUILDING NEWS

SATURDAY, FEBRUARY 27, 1904



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A SUGGESTION has been made as to the cause of the loss of life in the Iroquois Theatre disaster which, while well meant, is founded on a very imperfect appreciation of the conditions, and is calculated to relieve the persons guilty of the criminal negligence, to which the death of six hundred persons was due, of proper responsibility for their conduct. One of the investigators employed by the city officials discovered a ventilating fan in a shaft over the back of the auditorium, the blades of which appeared to him to be "melted," and from this observation he drew the conclusion that this fan was probably in motion at the time of the fire, and drew the "flames and superheated air" from the stage across the auditorium with a force which carried them at once into all parts of the house. It seems to be expected that the public will infer from this that the destruction of life was caused by the ventilating system, without fault on the part of any one, and it is, perhaps, worth while to examine this theory. The idea that the fan was "melted" by the fire might as well be dismissed at once. Presumably, the fan was of steel, and steel does not melt in anything less than the highest temperatures of a regenerating furnace, while all the testimony shows that the fire did little more than scorch the paint in the auditorium, even the furniture and decorations not being very seriously injured, much less consumed. Again, it is incredible that any outlet fan should be powerful enough to draw a blast of air in a moment from the stage across the auditorium. There was, of course, some provision for the supply of air to the auditorium, presumably a fan, driving in fresh air over indirect radiators, and the ventilating system must have been very strangely designed if the inlet fan was not much larger than the outlet fan, the principle in such installations always being to force air in much faster than it is drawn out, in order to allow for the natural escape around the windows and doors, and counteract the tendency to cold draughts at these places which would exist if the exhaust fan were superior in power to the inlet fan, or even equal to it.

IF, however, the air was forced into the auditorium through the fresh air registers with greater force than it was drawn out by the exhaust fan above, the pressure of air at the proscenium-opening would not be from the stage to the auditorium, but in the contrary direction, and this is actually and intentionally the case in all properly ventilated theatres, as currents from the stage to the auditorium, if allowed to exist, bring with them among the audience unpleasant smells of paint and gas, gunpowder and red-fire smoke, and other annoyances. With two fans in motion at once for ventilating the auditorium, the plenum fan being considerably more powerful

than the exhaust fan, it is obvious that the "sucking" of "superheated air" or any other air, from the stage to the auditorium is impossible; and, even supposing that the plenum fan was stopped, and only the exhaust fan was running, such "sucking" of the fire across the auditorium as is spoken of would be out of the question. Theatre ventilation is rarely, if ever, calculated for a supply of more than one thousand cubic feet per hour for each person in the audience, independent of the leakage through the walls and around openings; and this would apply only to the quantity delivered by the plenum fan, the exhaust fan being calculated, as a rule, to remove less than half the amount delivered by the plenum fan. Supposing, then, that the plenum fan had stopped working, and that all the fresh-air registers were closed, and all cracks around doors and windows in the auditorium sealed up, so that air could reach the auditorium only from the stage, the exhaust fan continuing to work at full speed, it would require, roughly, two hours for the fan to exhaust all the air from the auditorium, so as to begin to draw upon that over the stage. It is true that the exhaust fan, taking up first the air nearest to it, would gradually rarefy the air in the neighborhood, so that air under the normal pressure would flow in to restore the balance, but this operation would go on progressively and slowly, with results utterly different from the lightning-like flash which actually occurred.

A GAIN, even if the theory of the exhaust fan were plausible, this explanation would not diminish in the least the criminal responsibility of the officials of the theatre. If the asbestos curtain had been lowered, a hundred exhaust fans, each as powerful as the one actually in use, could not have drawn "superheated air" from the stage, even supposing that there were no fresh air inlets in the auditorium and that all doors and windows were hermetically sealed. If, again, the ventilating skylight over the stage had not been nailed up, the "superheated air" would have gone through it, and no ordinary exhaust fan in the auditorium could have diverted it from its path. All the circumstances show that the rush of the fire through the open proscenium arch across the auditorium was due to the confinement of the smoke and air on the stage, through the closing of the automatic skylight. The air, violently and suddenly expanded by the heat, forced its way out in the direction in which it found escape easiest, which, on account of the neglect to lower the asbestos curtain, was through the proscenium-arch. The effect of an exhaust fan in the auditorium, under any conditions, would be infinitesimal in comparison with the force of perhaps a million cubic feet of air, expanded in a moment to twice its former volume by the spread of the flames through it, and, in the interest of the public, the discussion should not be allowed to be confused by such fancies.

THERE have been various rumors lately about buildings of great height, to be built in New York. One of these rumors says that an office-building is to be erected in the neighborhood of the City Hall, which will be six hundred and forty feet high; while another informs us that a building forty stories in height is to be built for one of the daily newspapers on a lot on Eighth Avenue. The latter story does not seem very improbable, the advantages of a conspicuous building in advertising the newspaper whose name is connected with it having been recognized since the days of Horace Greeley, while forty stories of offices would not alarm any New York architect, thirty-three, if we are not mistaken, having been already carried out with success. As for the six hundred and forty foot building, we are content to await further information. There is, of course, nothing impracticable about such a structure. The Eiffel Tower, which is a thousand feet high, has stood for fifteen years without accident, and a casing of masonry, with floors every ten feet in height, would only add to its security. Whether an office-building sixty-four stories high would pay is another matter. There is a point in all office-buildings where the loss of rentable space in the lower stories, through the multiplication of elevators required for reaching the stories above, counterbalances the advantage of the additional rentable floors above; and those who like simple

problems in calculus might, with advantage, work out the most profitable number of stories for office-buildings and apartment-houses, under given conditions, which could be easily ascertained, of first-floor rents and upper floor rents in various localities, with added cost of construction for each story, value of ground, and the relation of required elevator-space to the number of stories, and of offices or apartments.

MR. HORNBOSTEL'S designs for the towers and anchorages of the new Manhattan and Blackwell's Island bridges, as well as for the great Terminal Building for city offices, at the New York end of the Brooklyn Bridge, have been abandoned, the new Commissioner of Bridges, Mr. Best, having prepared new plans, which he thinks better suited for the purpose. While architects will regret that Mr. Hornbostel's clever and monumental effects are not to be put in execution, they will be curious to see what will be offered in place of them; and it is a satisfaction to reflect that even the abandoned plans have, so to speak, set the pace for such constructions for all future time, and that, hereafter, nothing is likely to be acceptable to the public of New York that falls very far short of them.

THE Annual Report of the Metropolitan Museum of Art gives some interesting information, and suggests inferences perhaps still more interesting. The increase in the number of visitors is particularly remarkable, eight hundred and three thousand people having been registered as passing through the turnstiles during the year 1903. This is an increase of about one hundred and forty thousand over the preceding year, and must bring the Metropolitan Museum nearly to an equality with the Louvre in the number of visitors. The National Gallery, in London, which has the same number of "pay days" in each week as the Metropolitan Museum, has a much smaller number of visitors. The Report tells us that a very large proportion of the people who came to the Metropolitan Museum are foreigners, apparently immigrants of recent arrival. This observation speaks well for the intelligence and cultivation of the new citizens, and affords, besides, a happy augury for the future. It is a matter of history that a mixture of races tends to develop the artistic instinct, and it may be hoped that our cosmopolitan America has already begun to turn in that direction. The Report mentions, with some surprise, that very little serious work seems to be done in the Museum, only two hundred and eleven copying permits having been issued during the year for the galleries of painting, and one hundred and seventy-four for the other departments. Whether this is altogether to be regretted is not, perhaps, certain. That the great galleries of Paris and London are, on the students' days, encumbered with easels and high stools is unquestionable, but our own observation of the work that goes on with the aid of these appliances has not always led us to think that they were doing very much for art, especially in the case of many female students, whose ambition seems to lie much more in the direction of gathering a circle of male acquaintances around the high stool on which they are perched than in that of rivalling, or even imitating with success, the masterpieces which they are supposed to be copying. The question whether students gain much in artistic power by copying in galleries has been discussed for many years; and, while it cannot be said that it has been decided in the negative, we are inclined to think that the methods of our schools of art, public and private, which have maintained the tradition of the days when there were no great galleries here, in studying mainly from nature, are the best and most wholesome for us.

A GREAT deal is said in the newspapers about Venice, which, while intended to be sentimental and æsthetic, is really very unjust. We are told, for example, in one of the most popular monthly magazines, that the "indolent, happy-go-lucky inhabitants of the town which so invites to day-dreams and 'dolce far niente' were rudely awakened by the fall of the Campanile," and now that "the whole city of Venice, the loveliest city of the world, is threatened," the inhabitants are beginning to do something to preserve it. Whether the people of Venice are "indolent" or not, we would not undertake to say, but the appearance of the lace and mosaic factories, or of the markets, or the streets, suggests anything but indolence; and it is an unwarranted exaggeration, which may do great injury to the people of "the loveliest city of the world"

to say that "the whole city is threatened" with anything like the fate of the Campanile. The tower of San Stefano is being strengthened, but this has been known for years to be in need of repairs. The Palace of the Doges, although the corner next the Ponte della Paglia has been slowly settling, and is now being strengthened, is very far from being, as we are told, "in a tottering condition"; and Santa Maria della Salute, in the roof of which a leak has been discovered, is no worse off than thousands of other buildings. The fact, which architects are interested to defend, is that the construction of the Venetian buildings is quite as wonderful as their design. The Campanile itself, after standing for eleven hundred years, would probably be still intact if modern masons had not cut ruthlessly into its walls; the Doges' Palace is still one of the most perfect buildings of its period in existence, and Santa Maria della Salute is, according to the accounts, in much better condition than most of the domed churches of the period; yet all the Venetian buildings stand on wooden piles, driven into soft mud. Amsterdam presents, perhaps, the closest analogy to Venice in situation and circumstances, yet nothing is more curious than the contrast between the maudlin leaning of the houses in the old streets of Amsterdam and the stately fronts of the Venetian palaces which had been standing for two hundred years before the piles for the Amsterdam houses were driven. Even in Boston, where pile foundations are used throughout the newer part of the city, it is a rare thing to find a building ten years old, on such foundations, without a crack in it, and several important structures, not more than fifteen or twenty years old, exhibit symptoms which, if discovered in a Venetian building, would attract the attention of the world. So, also, St. Paul's, in London, an infant in age in comparison with the great monuments of Venice, threatens, we are told, imminent ruin, and even St. Peter's, at Rome, has long given evidence of settlements which may, sooner or later, prove fatal; yet we do not, for this reason, hold up Wren or Michael Angelo to public commiseration, or denounce the "indolence" of the Londoners or the Romans, or announce the approaching collapse of the entire city in which these structures are situated. On the contrary, we have reason for supposing that intelligence and skill will save these buildings for future generations, and there is quite as much reason to believe that the Italian genius for construction, which was never more conspicuous than in these very Venetian buildings, will be competent to preserve them to delight us and our children for many years to come.

THE Report of the Bureau of Forestry shows that, while not very much has been actually accomplished in the way of forest planting or conservation during the past year, public interest has been aroused to a greater extent than ever, and it is hoped that this interest will take a practical form in a sufficient number of localities to produce, before long, an appreciable effect. As this journal is neutral, or rather, indifferent, in matters of politics, we shall not be accused of having any political end in view in making the suggestion that the most effective means which could be adopted for preserving the forests of the United States would be to repeal the duty on Canadian lumber. This duty, imposed to protect American lumbermen, has been the chief cause of the ruthless destruction of American forests, the owners of these forests straining every nerve to get their timber cut off and marketed at the earliest possible moment, in order to take advantage of the high prices which the tariff enabled them to extort from their customers. The natural result of this has been the destruction of the young trees which, under free competition with Canadian lumber, would have been left to grow, and millions of acres of desert, where should be productive forests, bear silent witness to the folly of stimulating the waste of Nature's bounties. Meanwhile, the prices of timber are steadily rising, and the supply is rapidly diminishing. Whitewood, or poplar, which is produced only in a limited region, shows signs of becoming exhausted, like black walnut, cherry and butternut, from the same region. The North Carolina pine, although still tolerably abundant, is now in such demand as a substitute for whitewood that it is easy to foresee its disappearance from the market; and hemlock, cottonwood and other timbers, once considered worthless for building, are, apparently, to be brought into use. Under these circumstances, the use of iron for framing is becoming every day more necessary, as a matter of economy, and the steel mills, with judicious management of prices, need never, in this country, lack a market which will afford them a reasonable profit.

GARDEN CITIES.¹

THIS paper deals with the objects of the directors of the First Garden City, Limited, the name and idea for which were due to Mr. Ebenezer Howard, the author of a recent book on the subject. The scheme simply aims at stimulating and organizing the movement towards the decentralization of manufacturing industry which is observable in various quarters. The endeavor was to facilitate the distribution of the industrial population upon the land, and the action of the Association was prompted by the belief that physical degeneration among the population of our great towns must be recognized as an existing and pressing evil. He thought that this degeneration was so generally recognized that he might fairly proceed on the assumption that it exists, and he thought that there was a consensus of opinion that the progress of physical degeneration was identified with the increase of the population of the towns and the decrease of the population of the country, but as to the determining causes, which made town life unhealthy and country life healthy, there seemed to be, strangely enough, a divergence of opinion. Medical opinion was tardily beginning to lay hold of this vital fact that, no matter how satisfactory the conditions of life might be in other respects, it was absolutely impossible to rear and maintain a healthy race without an abundance of fresh air. It was not pretended that when we have provided a sufficiency of fresh air we have done all that is necessary. Some day we shall recognize the truth, which the Germans, in search of an object quite different, stumbled upon, i.e., the effect upon national physique of sound physical training at the critical period of the lives of their young men. He did not despair of seeing a similar opportunity extended to our own boys.

Now if physical degeneration exists, and we were agreed that steps should be taken to arrest it, what was, precisely, the problem we have to solve? He assumed at the outset a consensus of opinion identifying the growth of the towns and the depopulation of the country with the advance of deterioration. He had endeavored to lead to the conclusion that the determining cause (or at all events that which transcends all others) was the insufficiency of fresh air in overcrowded towns. If this be conceded, it followed that either the towns must be so modified as to provide a sufficiency of air for the working class inhabiting them, or some means must be found of withdrawing part of the population to the country.

And first, with regard to the practicability of converting our great towns into places suitable for the rearing and maintenance of a healthy race. He would summarize the more important difficulties in the way. First, the cost was almost prohibitive; then, if that be overcome, the necessity arose of either heaping the working-class in tenement buildings or scattering them far from their work. Mr. Scoble, in a paper recently read before the Institution, had done well in calling attention to the mischief flowing from the adoption of the tenement system. A very large proportion of the tenements must inevitably be deficient in light and air, and in many of them artificial light was in constant use; but their chief defect lay in the tendency to keep the children within four walls and out of the open air. The tenements were very inaccessible from the street, or perhaps it would be better to say the street was very inaccessible from the tenements. Now we speak, partly sympathetically and partly reproachfully, of "gutter children"; but it was a mistake to suppose that their connection with the gutter was the chief ground for commiserating their lot. On the contrary, when seen in the gutter, these children, sad as it was to say so, were enjoying the principal opportunity they possess for securing healthy development. The board school playgrounds should perhaps be mentioned, but he doubted if hygienically they were any better. With regard to the other alternative, distribution in suburbs, inasmuch as it was difficult to make factory work healthy, particularly in towns, what should be aimed at was, by securing healthy conditions of life during leisure hours, to counteract any deteriorating effects which might prove inseparable from work in the factory and workshop. Long journeys to and from work were not only exhausting, but were almost invariably performed under conditions quite as unfavorable to health as those which obtain in the ordinary workshop. What a man wanted to enable him to make the most of his life was to be close to his work and close to his opportunities for play or relaxation. Every possible inducement should be held out to the working man to spend the hours which were not devoted to indoor labor in some pursuit which takes him into the open air. Another point to be borne in mind was this. Large aggregations of inhabited dwellings undoubtedly affect the atmosphere in a manner prejudicial to health. If we took a man from the centre of London and put him upon the Surrey Hills or Sussex Downs, he was immediately sensible of an alteration in his physical condition. Now, the more we clear the centre of our great towns, and distribute the population in suburbs, the farther and farther off we drive the country, and the wider and wider becomes the thickly inhabited area. It therefore by no means necessarily followed that by spreading it out over a wider area we improved the hygienic conditions of the town as a whole. So far, therefore, Mr. Scoble and the promoters of the Garden City project travelled along the same lines, and arrived at the same conclusion, namely, that the distribution of industries in the country was the true solution of the problem of overcrowding and physical deterioration. When we came, however, to the question of what, if anything, should be done for the purpose of promoting such distribution they parted company.

The author then referred in some detail to the Garden City project, mentioning that the total amount of money found up to the present time was some £85,000. To Mr. Howard belonged the merit of directing public attention to the desirability and possibility of making provision for the increase and overflow of the industrial population by: (1) Acquiring sites for industrial settlements at agricultural prices; (2) Scientific planning of the sites by experts; (3) Concerted migration of population; (4) Limiting the area and population of these settlements; (5) Maintaining a belt of agricultural land around them; (6) Applying the increment in the value of the land for the benefit of the population. Here began and ended the connection between Mr. Howard's book and the undertaking of the First Garden City, Limited. Mr. Howard provided his central idea with an attractive setting; with this the Company had no concern. Some of this might prove capable of realization, some of it was very possibly fanciful, but the whole of it was expressly stated by him to be suggestive merely, and in his book he expressly said the final and actual scheme would be the outcome of many minds. The purpose of the Company was to proceed with the development of the estate in accordance with the best expert advice they could obtain, having regard only to the objects enumerated above. This was the attitude of the directors to-day. This has been the attitude of those engaged in the movement ever since he (the author) had been connected with it, and, to the best of his belief, it was the same from the very inception of the movement. Some of the advantages which might be expected to accrue from industrial settlements so organized were:—

1. Conditions of life for the artisan and townsman consistent with sound health for himself, his wife and his children.
2. Cheapness, efficiency and sightliness resulting from the scientific laying out of the town as a whole from the outset. In connection with this head may be grouped: (a) The supply of light, water, power and heat; (b) Facility of transit and communication; (c) Disposal of sewage.
3. The reduction of rates, by the application of the increment in the value of the lands, so far as it can be secured for the benefit of the inhabitants.
4. Bringing a market to the farmers of the agricultural land, and incidentally; (a) Increasing the amount of labor employed upon the land by the extension of small culture; (b) Affording the agricultural laborer the advantages of town life.

If this scheme of industrial distribution were progressively acted upon, it seemed to him that the location of the population upon the land would have been started on the right lines. It would increase the value of land over a wide area, would maintain a greater number, probably double the number, of agricultural laborers, and would afford conditions of healthy existence to the industrial workmen. We speak of the over-population of England: the land would bear in health and comfort a far larger population than it holds to-day if the population were distributed in this fashion. The progressive depopulation of the country had long been bewailed. Numerous expedients had been suggested to check it, varying from the provision of travelling circuses to the imposition of protective duties; but in his judgment any attempt to force back the people from industry to agriculture by artificial means was foredoomed to failure. The tide of civilization flowed in the same direction in all advanced countries.

The author then criticized at some length some of Mr. Scoble's conclusions. He agreed in the view that certain trades would be more and more drawn into the country, but he could not think the sporadic settlement of manufacturers was the true solution of the industrial question. There was no business in which coöperation offered so fair a field as it did in land settlement and the formation of towns. In this case there arose an advantage from the collective conduct of business, apart from that due to the conduct of the several businesses themselves. The mere resort of people to the same place, whether it be for the purpose of residence or of business, whether it be by individual selection or collective design, added a value to the land beyond its intrinsic worth. This increment had hitherto been uniformly presented to the landowner. By foresight and concerted action, it could be secured in great part, if not altogether, for the benefit of the people who create it. Moreover, in existing towns the inhabitants were in several ways exploited by private monopolists. Assuming management to be efficient in a town designed and managed in the interests of manufacture, where the return on capital was limited, as in the present case to five per cent, there must be an opportunity for a reduction of cost which would place the manufacturer in a favorable position, not only in comparison with his rivals in great towns, but with those who had selected isolated sites for themselves in the country or near small towns. With regard to labor, too, and accommodation for labor, the advantages of coöperation and concerted action were distinct. The manufacturers to whom expenditure outside their business was immaterial were comparatively few. Certainly many of those who would be glad to move into the country were not prepared to build model villages or even themselves to provide accommodation for their work-people. Now, it was not easy to get builders to build cottages, the occupation of which depended exclusively upon the prosperity of a particular factory; whereas, where even a few manufacturers start together with the probability of an increase in their numbers, he did not think any very great difficulty would be found in procuring the

¹ A paper by Mr. Ralph Neville, K. C., read before the Surveyors' Institution.

erection of cottages, particularly where the landowner undertakes the capital expenditure with regard to sewerage and road-making. Again, there was, he believed, always a difficulty about labor where local industries provide employment for men only. In the creation of Barrow-in-Furness it was found necessary, he had been told, to provide supplemental industries for the employment of women. On the whole, it was to be observed that the history of industry under the factory system indicated that towns were *prima facie* advantageous. It was only since the overcrowding of towns that the disadvantage had begun to predominate. The Garden City believed that they could offer land to the manufacturer upon terms which, having regard to the advantages offered, would be better than any which he could obtain from a private owner.

The history of industrial development in its effect upon the distribution of the population upon the land, did not teach the desirability, in the case of a new departure, of leaving matters to self-interest and individual effort alone without foresight, coöperation, or organization. If the development of the movement of decentralization was left to chance, as the prime movement of centralization under the factory system was left, we might anticipate with some confidence the growth of evils not less serious than those which the short-sighted indifference of our predecessors compelled us to cope with to-day. To the advantage of individualist effort he was quite alive, but the idea that this excluded the necessity for reasonable coöperation and organization, he ventured to call individualism gone mad.

In regard to the site itself and its development, it was an estate of 3,800 acres, near Hitchin, on the Great Northern Railway. With regard to the area of the site, experience must show what was the right proportion which agricultural should bear to town land. In this regard it must be remembered that if the completed idea of a group of towns built on the like principle were carried into effect, the width of the agricultural belt surrounding each would be doubled. Personally, he should have preferred 6,000 acres, as originally suggested, but there is an old proverb that you must cut your coat according to your cloth. It was, of course, impossible that one site should afford equal facilities for all kinds of manufactures, but the company were advised that for general purposes the site was an admirable one. The preliminary work had been proved by experience to be much greater than one would have anticipated, but they have now every reason to believe that in a very short time they would be in a position to make a substantial start in the business of development. In regard to the question of the density of the population, it seemed to him that this might very fairly exceed what was to be found in a model village. The retention of two-thirds to three-quarters of the surrounding land unbuilt upon, would justify the erection of a fairly compact town, and compactness had of course its advantages, although everything must give way to sound hygienic conditions. There might be some temptation to create a straggling village, rather than a town; and by aiming to provide as much space round each dwelling as in a model village, and as many open spaces as in a model town, in addition to the open belt surrounding the town, they might provide several times over for the same thing. He thought, however, that the architects and others engaged upon the plans were fully alive to this danger, and he doubted not they would escape the Scylla of extravagant extension without falling into the Charybdis of overcrowding. With regard to land tenure, it was desired to part as little as might be from conventional terms, the directors' duty to their shareholders and the inhabitants alike being to dispose of the building sites to the best advantage.

There was a point in connection with the Garden City which should not be overlooked, and it was this: All that the company could in the first instance attempt was to provide for the laying out and creation of a town in accordance with the best conditions known to modern science; but there was ample scope for subsidiary effort to ameliorate the conditions of civic life. For such effort an exceptional opportunity was presented. From the very nature of the endeavor, a very much larger proportion of the inhabitants would consist of persons sincerely interested in municipal progress than could be found in other societies. He was fully aware that this was not without its dangerous side, but he trusted he should not be thought too sanguine when he said that the constitution of the board afforded a substantial guaranty against the undue influence of fads and fancies. The promoters of all reasonable schemes of social welfare, be they for model dwellings, workmen's clubs, coöperative enterprises, or what not, might be sure of sympathy and assistance from the company. The enthusiasm worked by a forward movement like the present was a great motive power, the effect of which could not, of course, be measured beforehand; but he should be much disappointed if the Garden City movement did not exert a great moral force and lead to considerable social improvement above and beyond hygienic questions, important and essential though they be.

MR. HOWARD MARTIN, in proposing a vote of thanks to the author of the paper, said there could be no two opinions about the importance of the subject. From a London point-of-view, it was extremely important, that we should diminish the constantly increasing pressure of immigration into London by inducing workers to carry on their occupations in the country, not only in order to stop the physical deterioration of the people, but in order to get land on

which to build proper houses and factories at a cost which would not be prohibitive. He thought the ideal state of affairs was for London to become a distributing centre, and for most of the manufactories to be carried on in the country. One result of that would be that more people would be willing to employ themselves on the land. It was said that one reason why people came to the towns was the dullness of the country life; houses were bad and were distant from work, and the workers were willing to put up with the overcrowding, etc., of the towns in order to escape from the dullness of the country. If rural centres of work could be established, town workers would be brought under conditions which they preferred, but which were more healthy in every way. It was desirable to get more people to work out of doors, for it was that sort of life that made a healthy and vigorous race. He thought Mr. Neville's paper would convince them as to the desirability of the scheme, but if there were doubts they would be as to the mode of carrying it out. He thought there would not be much difficulty as to the mode of disposing of sewage and as to lighting; such matters could be settled far more easily in a new town than in an old town, where there were all sorts of conflicting interests to consider. The great difficulty the promoters of this admirable scheme would have to contend with was in inducing individual manufacturers to move their capital and works, and transfer their labor soon enough to make the movement a success.

MR. WHEELER, K. C., seconded the vote of thanks, and referred to the question of physical degeneration of large masses of the people, which was the most pressing question of the time. In Lancashire, the greatest manufacturing county in England, forty-nine per cent of the class from which our soldiers were drawn were useless as soldiers. He did not agree with the author as to the unhealthiness of town life, except in crowded areas. The population of London for the whole area was actually sparse, *i. e.*, fifteen to the acre, and the death rate for the whole area was twelve or thirteen per thousand. That would compare favorably with any village in England. But these conditions varied greatly. The death rate of his own particular district was under ten per thousand, but within two miles of that area was an area where the death rate was over fifty per thousand. In his opinion this was due to the habits of the people. The housing question was only one phase of the matter. It was not merely a question of insanitation, it was also a question of the unwholesome habits of the people. The tenement system, on the whole, had been admirable, and the death rate, generally speaking, was a favorable one, distinctly good, when compared with the streets immediately contiguous. There were considerable drawbacks to tenements, but on the whole they were healthy, and so he was not altogether able to agree with Mr. Neville. He did agree with the author, however, in what he said about the undesirability of working people travelling long distances to their work; that did not conduce to physical improvement. In the garden cities factories would be close at hand, and that would be an advantage. As to sewage disposal, that would depend to a large extent on the local authorities, and they might insist on conditions which might add enormously to the cost of erecting the buildings in Garden City.

MR. EBENEZER HOWARD said that in considering the health of a people they ought not merely to look at death rates. Were they not delusive? Might there not be a very low death rate accompanied by a very low standard of life? Was there not a great deal in what had been said about the survival of the unfit? In comparing town life with country life we had to remember that country life itself was often not nearly so healthy as it might be, because there were often not sufficient people in a particular district to make it feasible or possible to provide better sanitary conditions. Mr. Howard then described in some detail the Garden City project at Hitchin. The subsoil, he said, is chalk, and the upper soil is sandy loam. There is a good deal of sand on the estate; there is gravel, and in some parts a considerable amount of clay, and they had made some very good bricks, and hoped to make more. The estate was within the area of a profitable motor-car service. As to a water-supply, their engineer had advised them that they would have a plentiful supply, as was proved by the bore-holes that been made. As to sewage disposal, no system had been settled on, but it was quite possible that at first some system of earth-closets would be adopted; there was no difficulty under the Hitchin by-laws as to that. They had decided to have a system of gas-lighting, and a small gas-works would be started on the estate. They were very sanguine about getting manufacturers to bring their factories to the estate; several manufacturers were greatly interested in the scheme, and there was not the least doubt that a great many would take part in it.

EFFECT OF CLAY ON THE STRENGTH OF CONCRETE.

ALTHOUGH the effect of clay on the strength of concrete is not definitely known, its presence is presumed by most engineers to be an element of weakness. While the sand and gravel used in concrete work often contains as much as 5 or 10 per cent clay, yet many specifications require a minimum of 2 per cent. Such specifications make it necessary to clean the sand and as the expense of cleaning is great, it is a question of whether it might not be more economical to use more concrete with a high per cent of clay, than to remove the clay in order to save concrete. The lack of reliable

data along this line suggested the value of some systematic experiments to determine the effect of clay in sand and gravel upon the strength of concrete and mortar. After a preliminary test had been made to determine the proper range and rate of variation of the amount of clay used in the concrete, it was decided that the experiments should consist in moulding and crushing three series of cubes containing respectively 0, 6 and 12 per cent of clay. Each of these series was in turn divided into three groups to season for three periods of time, one, four and twelve weeks respectively. Each of these groups consisted of three cubes, thus making twenty-seven cubes in all. The forms used in moulding had a capacity of three 6-inch cubes each. They were made of heavy 1½-inch oak, and were so bolted that no springing resulted from tamping the concrete into place. In order to minimize the errors of experiment, every precaution was used to obtain uniformity throughout the work. As nearly as possible the different mixtures were given the same degree of plasticity. The concrete was put into forms in layers about 2 inches thick, and each layer was well and uniformly tamped. The cubes were crushed in an Olsen testing-machine, running with slow speed. The load was applied in a direction normal to the layers of the cubes. In order to secure even bedding, the top and bottom faces of each cube were given a thin coat of plaster of Paris, which was allowed to set under a pressure of about 1,000 pounds. The experiments with mortar were undertaken principally for the purpose of furnishing a check on the results of the concrete tests, and consisted in moulding and breaking five series of standard briquettes containing respectively 0, 3, 6, 9 and 12 per cent of clay. These briquettes were hand-tamped in layers, care being taken as in the experiments on concrete, to secure uniformity of tamping and of plasticity. In order to obtain comparable results for a Portland and a natural cement, the whole series of experiments were carried out by each of two observers, one using Portland, and the other using natural cement. The results of the preliminary tests to determine the percentage of clay to be used in the experiments, the age of the cubes when broken being four weeks, were:—(1.) Per cent of clay, *nil*. Average crushing strength in pounds, 55,100. Crushing strength in pounds per square inch, 1,530. Relative strength, 100. (2.) Percentage of clay, 6. Average crushing strength, 50,100. Crushing strength per square inch, 1,390. Relative strength, 91. (3.) Percentage of clay, 12. Average crushing strength, 38,000. Crushing strength per square inch, 1,055. Relative strength, 69. In the experiments with Portland cement the proportions were 1, 2 and 6, for the concrete, and one to three for the mortar. The consistency of both concrete and mortar throughout the experiments may be characterized as dry, no water flushing to the surface after thorough tamping. The results of the tests for the comparative strength of Portland-cement concrete containing various portions of clay, were:—

Per cent of clay.	Average crushing strength.	Crushing strength per square inch.	Relative strength.
AGE: ONE WEEK.			
<i>Nil</i> .	37,000	1,030	100
6	36,300	1,001	97
12	24,900	692	67
AGE: FOUR WEEKS.			
<i>Nil</i> .	50,300	1,398	100
6	55,000	1,525	109
12	46,400	1,287	92
AGE: TWELVE WEEKS.			
<i>Nil</i> .	76,000	2,110	100
6	99,500	2,760	131
12	67,300	1,865	89

Comparative strength of Portland-cement mortar containing various proportions of clay:—

Per cent of clay.	Breaking strength in pounds per square inch.			Relative strength.
	Maximum.	Minimum.	Mean of five.	
AGE: TWO WEEKS.				
<i>Nil</i> .	225	185	202	100
3	229	250	267	132
6	310	245	280	138
9	340	295	318	157
12	365	305	333	165
AGE: FOUR WEEKS.				
<i>Nil</i> .	415	340	362	100
3	325	285	301	83
6	385	310	334	92
9	395	350	381	105
12	395	320	353	97
AGE: TWELVE WEEKS.				
<i>Nil</i> .	485	395	451	100
3	560	470	506	112
6	545	490	521	115
9	565	475	522	115
12	560	520	547	121

In the experiments with natural cement, the concrete was proportioned by weight in the ratio of one part cement, two parts sand and

four parts gravel. The mortar consisted of one part cement and two parts sand. The consistency of the mixtures was such that after the cubes and briquettes had been well tamped, fresh water was just on the point of flushing to the surface. The results of the tests for the comparative strength of natural-cement concrete containing various proportions of clay, were:—

Per cent of clay.	Average crushing strength.	Crushing strength per square inch.	Relative strength.
AGE: ONE WEEK.			
<i>Nil</i> .	7,500	208	100
6	4,700	131	63
12	2,900	81	39
AGE: FOUR WEEKS.			
<i>Nil</i> .	15,400	428	100
6	14,100	364	85
12	10,200	283	66
AGE: TWELVE WEEKS.			
<i>Nil</i> .	28,300	786	100
6	26,000	722	92
12	17,300	480	61

The results of the tests for the comparative strength of natural-cement mortar containing various proportions of clay:—

Per cent of clay.	Breaking strength in pounds per square inch.			Relative strength.
	Maximum.	Minimum.	Mean of five.	
AGE: ONE WEEK.				
<i>Nil</i> .	71	65	68	100
3	120	114	117	172
6	111	89	101	149
9	111	91	99	146
12	72	60	65	96
AGE: FOUR WEEKS.				
<i>Nil</i> .	160	147	152	100
3	211	175	199	131
6	232	210	219	144
9	175	164	170	112
12	151	140	146	96
AGE: TWELVE WEEKS.				
<i>Nil</i> .	195	153	170	100
3	222	200	214	126
6	261	240	252	148
9	245	205	230	135
12	225	206	211	124

In general, the results of the tests indicate that up to 5 or 6 per cent, the weakening influence of clay is not great. Beyond 5 or 6 per cent the injurious effect increases more rapidly than the amount of clay. The tests on mortar agree more closely than those on concrete, and indicate that clay up to 5 or 6 per cent is not only not injurious, but is even beneficial to the strength of the mortar. The tamping of concrete has much to do with its strength, and in considering the effect of clay in the mixture, it may be well to note the differences in the action of different mixtures under the tamping-iron. The ease of tamping is greater for 4 or 6 per cent clay mixtures than for either the clean, or 10 or 12 per cent. Tamping the clean material more nearly approaches the ease of tamping marbles, not because the voids are filled, but because the adjacent surfaces are clean, and the friction is thus reduced so that it becomes difficult to compact the mass. In the 10 or 12 per cent mixtures clay is present in excess of the amount required to prevent the slipping of the aggregate under the tamper, and as a result some of the clay is forced toward the surface and clings to the tamper, so that tamping becomes a difficult task, as well as a disagreeable one. From these experiments it may be concluded that since the strength of concrete is not much impaired by even 6 per cent clay, and since the cost of cleaning sand and gravel to contain only a small per cent is very great, it is probably more economical to use a little more concrete in the work for the sake of avoiding the trouble and expense of removing all the clay contained in the materials available. In other words, these tests indicate that it is unwise to specify for any concrete work a minimum of less than 4 or possibly 5 per cent clay in the sand and gravel used, when any considerable expense would be incurred to obtain cleaner material.— *The Stone Trades Journal*.

LEAD ARCHITECTURE.¹

THE author first gave some details of the lead-mining industry in Britain since the earliest times, and referred to the use made of the metal in architecture by the Greeks in the Mycenaean period. The metal has specially valuable properties that distinguish it from all other metals. Capable of producing the most delicate and lace-like effects, or of covering with an impervious sheath the most extensive buildings, it equally defies the ravages of time and the

¹ A paper by Mr. J. Starkie Gardner, F. S. A., read before the Royal Institute of British Architects.

corroding influences of air or of water. It succumbs to the attacks of fire alone. Under the murky pall of our great cities its hue deepens to a sombre black, but if weather-beaten in purer air it oxidizes to a silvery white, producing contrasts of light and shade which are exquisitely beautiful. Formerly richer effects were obtained by gilding and painting in chevrons of color or powdered devices, or by varying the surface with inlays of tin, or incising patterns and filling them with minium, white oxide, or black asphaltum. It quickly tarnishes, but freshly melted or cleaned its surface is lustrous as silver; and this might, perhaps, be preserved by coating it with vitreous glaze dissolved in fluoric acid.

The Greeks first applied lead decoratively in architecture. An Ionic capital from the Temple of Ephesus, in the British Museum, has its volutes inlaid with a fillet of lead. The idea of inlaying lead into stone may have reached the Anglo-Briton, the most expert metal-worker of that time, from the East. William of Malmesbury describes an ancient pavement in Glastonbury Abbey as formed of "stones designedly inlaid with triangles and squares and figured with lead." The finest existing example of fourteenth century work is that now in the Cathedral of Rheims (illustrated in the *Building News* for October 4, 1874). A sparing use of lead was made in ceilings and vaultings, where the gilded stars are of lead. The pomegranate pendants and leaves at the intersections of the geometric ceiling to Cardinal Woolsey's cabinet at Hampton Court are of lead, like the enrichments to the ceiling of the Chapel Royal, St. James's. Windows, like those in Salisbury Cathedral, often depended for the decorative effect entirely on the grace and intricacy of their leaded lines. Beautiful plaques of perforated lead, usually lozenge-shaped, but sometimes square or round, replaced one or more of the quarries of a window for ventilation; they are met with in considerable variety in the offices and corridors of Tudor buildings, such as Hampton Court and Haddon.

The simplest and most natural method of using lead decoratively is to cast it in moulds. The Romans first employed a method of decoration used later by Sussex and other mediaeval iron-founders. Small objects in relief, such as scallop shells, beaded rods, plain rings, etc., were impressed as decoration into the beds of sand upon which the sheets were cast. Some richly decorated lead coffins were found under the pavement of the Temple Church.

The author touched on the uses of lead in relation to the plumbers' craft, which was first mastered on a grand scale by the Romans. In England lead pipes have been found in Roman foundations, and at Bath is a massive water channel of lead an inch thick. Water was brought into London houses by lead pipes for the first time in 1582 by Peter Morris, a Dutchman. Leaden spouts for relieving the gutters formed at times a picturesque feature in mediaeval buildings. Of greater interest were the conduits or central distributing fountains which generally occupied some accessible place in one of the courts of every princely dwelling. Most of these were under canopies, and lead entered very largely into their construction. The decorated tank or cistern for storing rain-water may be of great antiquity; the earliest preserved, of the sixteenth century bearing "E. R." and the royal arms was figured in the *Builder* for 1862 (p. 602). The author referred to several specimens of sixteenth century elaborately-decorated heads to rain-water pipes. In the old artistic days even the pump was made a vehicle for decoration, like that formerly in Leather-Sellers' Yard, which was surmounted by a mermaid pressing her breasts, out of which wine ran on State occasions.

In the seventeenth and eighteenth centuries much of the purely decorative statuary produced in England was of lead, especially the massive equestrian statues, the first of which, that of Charles I, by Hubert Le Sueur, was cast near Covent Garden in 1633 and erected by Charles II at Charing Cross in 1674. The statue, horse and man is still the finest we possess. [This particular statue is, however, of bronze.—Eds.] For the garden lead reigns supreme. Softer and grayer in tone, more yielding, less costly, and less pretensions than bronze or marble, lead seems, above all other materials, to lend itself to the garden. An instance was referred to of four or five score of leaden statues dispersed over a gentleman's extensive grounds. They consisted of reproductions from the antique of eighteenth-century renderings of gods and goddesses, and of more modern subjects, such as musicians, dancers, mummies, skaters, shepherds and shepherdesses, gardeners, etc., in contemporary costume, the latter group by far the most interesting.

As regards lead architecture, Eusebius speaks of lead roofs in the third century; and the domes of the Holy Sepulchre and St. Sophia are still so covered. The roofing in the seventh century of the Church of York with lead, by Wilfrid, and the sheathing of that of Lindisfarne, by Eadbert, both walls and roof, must have been new and unusual occurrences to have been chronicled by Bede. The development of Pointed church architecture in the thirteenth century afforded much scope for a display of leadwork. The roofs rising to a great height, and becoming increasingly rich, with turrets, fleches, creatings, finials, buttresses, parapets, crockets, gargoyles, and, above all, the lofty steeples, often clustered in threes, as at Lincoln, Ripon and Canterbury, absorbed more lead, and afforded greater areas for display than ever. In France the lead roofs appeared to form almost half, and by no means the least picturesque half, of many of the great sacred buildings. The laying of the lead in strips, vertically or diagonally, formed with their rolled overlaps fretted lines of shadow on the bleached white surfaces. Stowe describes the bell-tower of the Priory Church of St. John as "graven, gilt and enam-

elled, to the great beautifying of the city, and passing all other that I have seen."

The Palace of Sheen, rebuilt by Henry VII, seems to have been the earliest revival of great displays of lead in domestic architecture in England, since the roofing with lead of a building earlier in the century had resulted in its being distinguished as Leadenhall. The roof of Richmond Palace was a forest of turrets, octagons, pinnacles and finials, gold and azure, with the King's arms, and vanes surmounting them. Special ornaments to the building were the turreted lanthorns over the great hall, the clock-case at the west end, the lanthorn leaved and embattled with fourteen turrets over the privy lodgings, a round structure four stories high, called the Canted Tower, embattled and all covered with lead; besides the Chapel, Queen's and Prince's closets, Hall, Middlegate, and kitchen, decorated, embattled, covered with lead, and all equal "special ornaments" of the building. The Palace at Hampton Court, though not completely destroyed like Richmond, is shorn of the lead-covered cupolas, octagons, turrets and louvres, bedecked with finials and pennons, all glittering in gold and armorial bearings, which rendered it the most attractive sight in all England.

But it was only where timber framing entered largely into the construction that the lead was carried down below the roofs and a truly lead architecture could be revived. The rural retreat of Nonsuch, a veritable palace of lead, dazzled the imagination and baffled description. The stanchions and outposts of the Banqueting Hall, three stories high, and its lanthorn, were "all covered with lead, as were the whole of the wooden battlements, perhaps, like those at Windsor, the great grace and special ornament to the whole building." The upper stories, at least, were "buted round with frames of wood, covered with lead," and these, with the turrets, water-tower, clock-case, etc., "are the chiefe ornament of the whole house of Nonsuch." But for the intrinsic value of its materials, especially the lead, the palace might not have perished.

In 1491, Thomas Wood, a goldsmith and sheriff of London, built a row of shops and dwellings in Cheapside, fronted with lead, which every chronicler speaks of as beauteous and glorious to behold. The front was gilded, and it was known as Goldsmiths'-row. Stowe describes it as the most beautiful frame and front of fair houses and shops in London or elsewhere in England. It contained ten dwelling-houses and fourteen shops, all in one frame, uniformly built four stories high, beautified towards the street with the Goldsmiths' arms; and the likeness of Woodmen, in memory of the founder's name, riding on monstrous beasts. All which was cast in lead, richly painted over, and gilt. It was regilt in 1594 by Sir Richard Martin, Lord Mayor, and was destroyed in the great fire of 1666.

The author concluded by referring to some modern examples of ornamental leadwork, mentioning particularly the bridge across Northumberland Street, connecting the Grand Hotel with its annex. Some ideas were given for the newly fronting of old houses with ornamental leadwork, and for the treatment of water-towers with lead ornament.

THE CHAIRMAN said they had heard an exceedingly interesting paper, not only from the historical point-of-view, but from the practical point-of-view, in the way they might adopt lead to modern requirements.

MR. R. PHENE SPIERS, F. S. A., said he had had a sort of vague suspicion that the Palace of Nonsuch was one of the views Mr. Gardner would put upon the screen, and he would like to hear a little more about it because in that room they had a paper read by Mr. Robinson many years ago, at which a view of Nonsuch was given, and he claimed that the decorative work of the palace was made in a plaster of a new kind brought over here. He would be quite willing to agree with Mr. Gardner that those panels which decorated that palace would be infinitely better in lead than in plaster, because at the time he wondered how the plaster could have been protected, for in many parts it would not have been protected by those gable-roofs found in many of the houses where plaster decoration was employed. Throughout France they had the most beautiful roofs, gable-ends and finials in lead, and in fact they seemed to employ it in decoration to a much greater extent than they did in England. He also remembered seeing at Rouen in the Museum three or four finials which were made in lead. The finials were 6 feet or 8 feet high, and massive, and he should think when raised aloft on a gable they would have been very important features. He had also seen lead coffins made by the Romans, and he believed there were two or three of them in the Louvre with precisely the same decoration and method of casting as described by Mr. Gardner. There were three or four in the Louvre brought by M. Ernest Renan from Syria. He had, of course, seen the bridge across the street joining up the Grand Hotel, but did not know that it had ever occurred to him that it was anything else but stone, but it was a very graceful little structure and well decorated, and it was extremely interesting to know that such a feature could be produced in lead. If the result of Mr. Gardner's paper was to induce some architects to employ lead to a greater extent than it had been, and to revive an old manufacture, then Mr. Gardner could not regret the time and labor he had given to the preparation of his paper.

MR. MAURICE B. ADAMS asked how large Mr. Gardner thought the sheets of cast lead could properly be made supposing they were to erect such buildings as had been suggested? He did not think

the suggestion with regard to commercial buildings was at all a bad one, because it was becoming a matter of some difficulty with increasing voids as to how the façade could be adequately treated. In the application of lead, however, the size of the sheets of lead had always been a matter of some difficulty. What was generally done was to nail it up by the top edge, and welt or roll it together, one sheet over the other, and when the sheet was very long fix some sort of iron holdfast to help hold it up, leaving the sheet of metal free, of course, for the purpose of expansion and contraction. It occurred to him that it might be useful if Mr. Gardner could tell them whether he had had any experience — possibly he might have had something to do with the bridge at the Grand Hotel — as to how large these sheets should be. Assuming that they were enriched with ornamentation, some parts would be rather heavy, and would require some special fixing, and although they could, as the illustrations had shown, have pilasters to cover the joints of two sheets, one would like to know how large these metal casings could be reasonably made, and which was the best way to fix them. He could not quite follow how that was to be done, and it was a practical question one would like to have answered, as it was probable that others present would have realized the same difficulty. Then Mr. Gardner had not told them how it was that they got the black color in the lead manufactured of late years. Although silver had gone down in value very much, yet the manufacturers seemed to take out all the silver and arsenic from the lead, so that it did not assume that white and silvery color which made the old spires of Long Sutton and other places look so charming. The lead thus desilverized had a horrible black color which appeared to him to be contrary to all artistic sense. He was rather interested to hear that the old statues, which they so much admired for their silvery color, were originally picked out in color and painted over, and he could not help feeling that they must look much better as they were now. It would be difficult to imagine anything more incongruous than old statues thus dressed out with barbaric splendor. He would like to know whether we could get instead of the ordinary lead of commerce pure lead with the silver left in it; whether there was any manufactory where lead in its genuine form could be purchased, and whether it was much dearer than the ordinary lead? As to the artistic treatment of lead, that must vary with people's taste, but he felt they should try to get out of the mechanical way in which they applied all materials. If they looked at the old spires and the old roofings, they would see how irregularly they were spaced, and, instead of having a ridge to give a uniform line, the rolls were carried out right up to the ridge and allowed to break the ridge line. He was aware that the wind-pressure was a very great difficulty with these sheets of lead, and he understood that Lord Grimthorpe got rather into a difficulty with lead with regard to St. Albans Abbey because of the creeping of the lead, and, as a matter of fact, it all had to be done over again. It must have been a very great difficulty when the old builders built those immense spires like the one over St. Paul's Cathedral which was burned down long before the Great Fire, which went up, he believed, 520 feet above the ground, and was covered entirely with lead. The wind-pressure on these old spires must have been something tremendous, and the way in which the lead was fixed down was a matter of extreme interest.

MR. W. H. SETH-SMITH said they had listened with much pleasure to such an eminent authority on the subject of metal-work, and it was extremely interesting to have his experience and his taste to guide them, and they hoped the suggestions Mr. Gardner had made might be made use of by at least the younger architects. As to what Mr. Adams had said as to the color of lead, he had noticed it himself, and he sympathized with Mr. Adams thoroughly. The result of a lead-covered fascia was most unsatisfactory, owing to the way in which the lead appeared to be prepared now. He was lately in Frankfort, and was noticing in old buildings there what the effect of the lead lacework on the gables was. Nothing could be more beautiful than the fine line given by that leadwork, with all its rich details. He also passed a building in London the other day — he believed it was a Sailors' Institute in the East India Dock-road, or just by there — in which lead appeared to have been freely made use of, and it was very charming indeed. It was introduced in panels in front over the main entrance. There were other points which Mr. Gardner did not mention, but which he undoubtedly had in his mind, — that was the great use made of lead in sundials and in the balustrades of the staircases, which were so very charming in London, and which they would have liked to have had some views of.

MR. E. W. HUDSON said that if they used lead for a fountain in a public place they would run the risk of losing the decorated part by the juveniles, if not by thieves, and, therefore, the application of lead to a high building like a water-tower would be of particular interest. He was interested to hear Mr. Gardner bring in the instance of the Tower of St. John's Priory, Clerkenwell. He had often wondered what Stowe's description actually referred to when he spoke of the "graven, gilt and enamelled panel." He did not know whether there was any authority for actually claiming it in metal, but it would be interesting to know whether or not it was so. They all remembered the application of lead to statuary, and would remember the negro boy which used to stand in St. Clement's inn. He did not know whether it was there now. They also knew that in

the Middle Ages lead was considerably used for images and saints, and so on.

THE CHAIRMAN said he was sure that some of the illustrations must have made them regret very much that they had not now in London anything so charming and picturesque as the view they had been given of Goldsmith's Row, Cheapside. With regard to what Mr. Adams said as to the color of lead, he thought there was no possible doubt that the lead they got now and what they used for their roofs was a very different material from that used 200 years ago. As to Mr. Gardner's remarks on putting up erections of perishable material and covering them with imperishable material such as lead, he was not quite sure whether the effect of that covering would be quite so permanent as some people would think, because it had been his experience, sometimes, in treating old houses where there had been a timber turret which had been covered with lead, that the lead had cracked in several places and had not been looked after, and this had let the water in, which caused the timber behind to rot in the most terrible manner. The treatment which Mr. Gardner alluded to of covering concrete and metal material with lead undoubtedly would prevent that, and seemed to be quite a feasible method. As to what Mr. Adams said as to the size of the sheets, it appeared to him that in any treatment of lead for surface decoration they must keep the panels rather small. They had all known for a long time that Mr. Gardner was one of their best artists in ironwork, and it was apparent that he had not restricted his researches to that material.

MR. GARDNER, having replied to the vote of thanks, said that, with regard to the remarks of Mr. Spiers, he spent almost two days in looking over the accounts of the buildings of Nonsuch, and he thought the plaster used there was plaster of Paris, which had nothing to do with any external work; and he did not think from what he had read that any kind of plaster was known at the time which would have been available for it. Although there was some doubt about the meaning of the description, he did not think, by the light of the earlier building in Goldsmith's Row, there could be any doubt that the whole of the decorative work of Nonsuch was cast lead-work. The account as good as stated that all the decoration of the tower and spires was lead. He had not had very large experience in lead construction, and the largest work he had had to do was the lead bridge at the Grand Hotel; there the panels were cast in sand in an open mould, and, so far as he could recollect, the size of the panels was 4' x 3'. But there was no difficulty whatever in casting lead if they had enough hot metal and enough cauldrons to pour from. He would make a panel of 10 feet, but he would not recommend cast panels of that large size, because they would be unwieldy. Otherwise he did not think there would be any difficulty about it. There was no better way of fixing lead than by screws to iron, but of course they must be careful to give an amount of play, or otherwise it was extremely probable that with a change of temperature there would be buckling. [The Chairman: What thickness would the panels be?] They could cast $\frac{1}{4}$ -inch thick, but where there was a good deal of ornamentation it would be thicker. [Mr. E. George: May the lead be safely put to iron?] There was no action between the metals unless there was water between them. Dry junction had no effect whatever. There was no galvanic effect going on except with water, and then only when the metals were sometimes wet and sometimes dry. The oxide was a very curious thing, that white color which came to old lead. He could not consider that it was due to the silver because silver oxide was black, and he did not think the presence of silver could possibly affect the oxidation of lead. Very possibly arsenic might. That was a matter he had not thought over, but he thought it would not be beyond the bounds of science to start that white oxide if necessary by the application of an oxidizing agent. He should think that possibly a chemist would suggest a means of starting it just as he would start the green oxide on copper. He quite agreed that it was a great drawback to lead that it had assumed this black color, but he expected that it would pass off with age, and become that white which they admired. The drawback to the actual joining of the joints of lead was the change of temperature. They must give it the means of contracting and expanding, and that could be done only by some kind of loose joint that was rolled over and was water-tight. The moment they burned the joints together they were bound to have buckling and trouble. He would always advocate either strips of lead to cover the joints or lapping edges one over the other, in a way which would permit of movement. In reply to Mr. Hudson he would not suggest having a lead fountain, which could be kicked by children. One would always have a stone basement or something in front to hold the water, and the leadwork would be behind the water, where it could not be tampered with or injured. Stowe, unless he misread him, particularly stated that the Tower of St. John's was of lead. Of course it was not really enamelled, but it had the effect of enamel; it had been painted or colored in some way. There was no doubt the French in many cases tried to produce the effect of enamelled work on their leaden roofs. The negro which used to be in St. Clement's Inn was now in the Temple Gardens. It was one of the stock models, and there were many replicas dotted about the country. At the same time it was one of the most beautiful models.

ILLUSTRATIONS

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

EAST ELEVATION: CAMDEN COUNTY COURT-HOUSE, CAMDEN, N. J. MESSRS. RANKIN, KELLOGG & CRANE, ARCHITECTS, PHILADELPHIA, PA.

NORTH AND SOUTH ELEVATIONS OF THE SAME.

PLANS OF THE SAME.

DETAIL OF ENTRANCE PAVILION OF THE SAME.

DETAIL OF ROTUNDA OF THE SAME.

Additional Illustrations in the International Edition.

HOUSE IN THE RUE ROYALE-STE.-MARIE, SCHAERBEEK, BELGIUM. M. HENRI JACOBS, ARCHITECT.

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DETAILS OF DOME OF THE CAMDEN COUNTY COURT-HOUSE. MESSRS. RANKIN, KELLOGG & CRANE, ARCHITECTS, PHILADELPHIA, PA.

DETAILS OF MAIN STAIRWAY IN SAME BUILDING.

DESIGN FOR A MONUMENTAL TOWER. HERR FRITZ GOTTLÖB, ARCHITECT.

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COMMUNICATIONS

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

MORE FACTS ABOUT THE IROQUOIS THEATRE.

CHICAGO, Feb. 19, 1904.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—A study of the articles on theatre fires and the news items which you have published from time to time probably furnish sufficient evidence to draw up all the necessary rules for the safe planning of a theatre, and I have found my files of the *American Architect* very interesting in this matter, and noticing that two recent statements in regard to the Iroquois fire are incorrect I believe that they should be corrected. In one of the recent issues you state "that a wire stretched from stage to auditorium prevented the lowering of the asbestos curtain." This is not a fact; the wire was not in use at the time and the curtain was stopped by a vertical incandescent light trough reflector, about 20 feet high, hinged to the proscenium-wall so that it could be swung into a niche or recess with the back of the reflector flush with the proscenium-wall. This reflector was standing out and in use at the time and was not swung out of the plane of the curtain.

The circumstances quoted from the *Deutsche Bauzeitung* "that a door opened on the outside wall 30 feet above the street" did not happen. This statement was probably made up from the fact that many people jumped and fell from the highest stair fire-escape platform in the alley; flames pouring from doors lower down on the stairs prevented the use of these; then a ladder which was laid on the fire-escape railing and sill on the opposite side of a 20-foot alley-way fell with others; later some scaffold planks were laid across and several lives saved.

The gossip among architectural draughtsmen relates that the making of a large number of sight-line sections was considered "college nonsense," with the result that sight-lines from the sides of the gallery were so poor that it was necessary to raise both galleries nearly 20 inches, thereby adding a group of three stair-risers in one point, increasing the rise of other stairs to an exceedingly steep pitch.

No attempt appears to have been made to make any of the new fire-proof curtains fit tightly against the proscenium-wall on all sides, so as to close the opening almost gas-tight. Simple devices for this were illustrated in the *Deutsche Bauzeitung* twenty years ago, but none of the experts called in to devise ordinances or to design curtains appear to have any knowledge of such devices. Our theatres may have well-constructed fire-shields, but the passage of large quantities of deadly gas from one side of the proscenium-wall to the other will not be prevented.

The building of panels trimmed with casings and hung with portieres similar to those on the doors for symmetry in design, should never be allowed again.

A CHICAGO ARCHITECT.

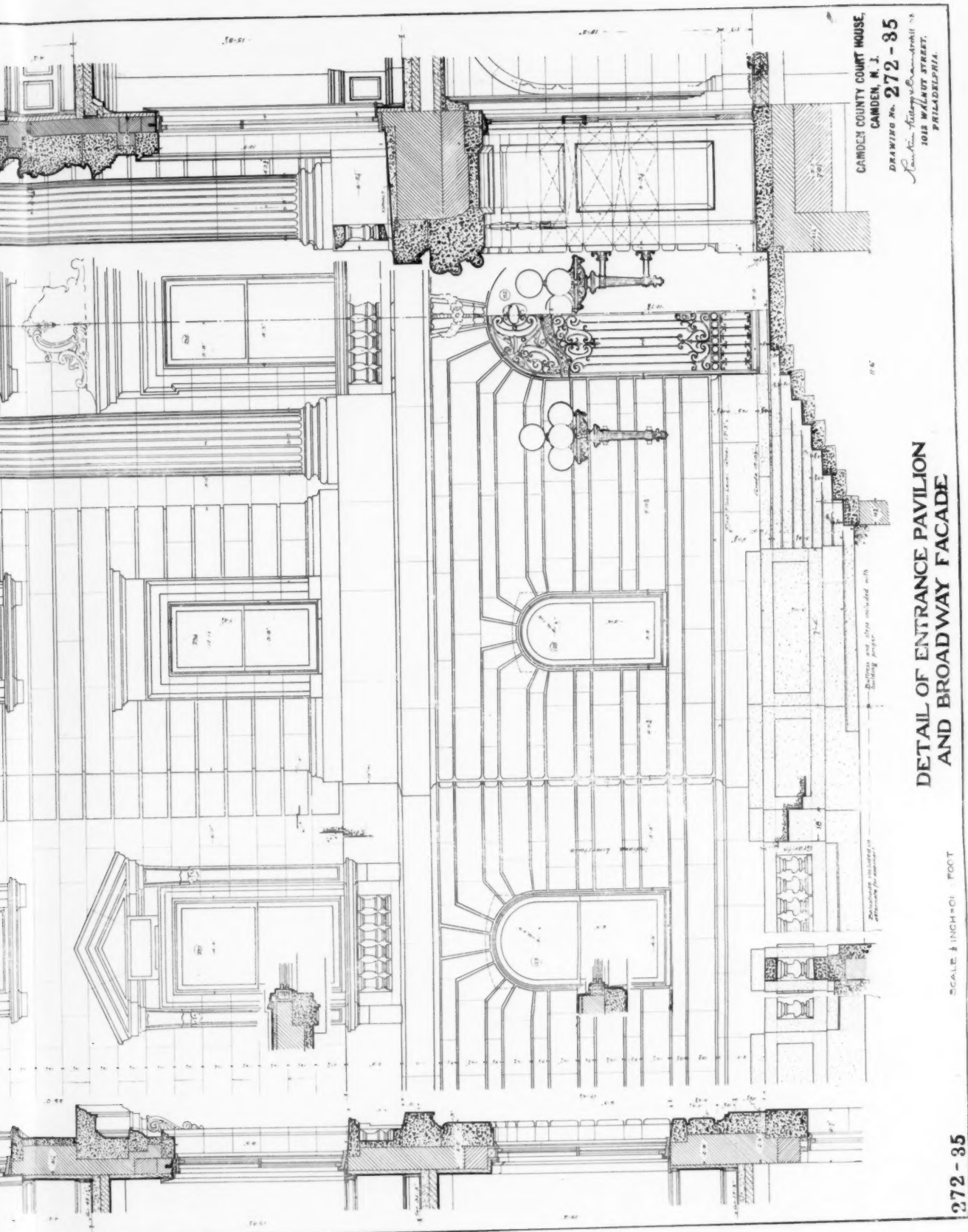
NOTES AND CLIPPINGS

THE TALLEST CATHEDRAL.—The most remarkable and striking feature of the new Liverpool Cathedral will be the height of the vaulting of the nave and choir—measured in the barrel vaulting 116 feet, and into the high transepts 140 feet—which cannot fail to produce a very magnificent effect. No cathedral in the country approaches its height. The nearest is Westminster, the nave of which has a height of 102 feet, while York measures 99 feet; then Salisbury, 84, and Lincoln, 82, Chester reaches only 78. The "whispering gallery" of St. Paul's Cathedral is 100 feet from the floor.—*St. James's Gazette*.

A JUDGE ON THE NON-INCORPORATION OF LABOR-UNIONS.—Judge Humphrey in the United States District Court at Springfield, Ill., recently, said the fact that labor-unions were not incorporated enabled them to escape any responsibility that might accrue from damages resulting from their action. The case in question was that of Eugene Linxweiler, secretary-treasurer of the Decatur Trades and Labor Assembly, who pleaded guilty to a violation of the postal law by sending through the mails postal cards threatening to boycott business firms if they continued to advertise in a Western newspaper which had differences with the Typographical Union. Linxweiler was fined \$100 and costs. Postal cards were sent to advertisers by order of the Decatur Trades and Labor Assembly.—*Exchange*.

NEW OBSERVATORY AT BERKELEY.—The new astronomical observatory buildings which have been under construction for the last few months have just been dedicated. The new buildings, which house the additional apparatus, were designed by Supervising Architect John Galen Howard. They consist of one main building, containing two large rooms, two domes, a dark-room and store-rooms, besides a separate dome in which the eight-inch Pierson reflector is placed. One of the two domes in the main building has the five-inch refractor, once the property of the late Senator Fair, and recently donated to the University by his daughter, Mrs. Herman Oelrichs. The companion dome contains the beautiful photographic telescope, which is the pride of the local department, being designed, constructed and set up entirely by the members of the Berkeley colleges, with the sole exception of the lens. Dr. Allen F. Gillihan, assistant in astronomy, as well as a practising physician, designed the instrument, and Val Arntzen, the expert instrument-maker in the civil engineering college, executed the mechanical work. In the smaller of the two rooms are an apparatus for measuring astronomical photographs and another for measuring sectograms. These latter were designed by Eastern firms. While most of the fine work has been done at Berkeley, valuable assistance has been given the astronomers by the California School of Mechanical Arts, which was entrusted with the delicate task of casting parts of the photographic telescope and the rolling gears of the domes.—*N. Y. Evening Post*.

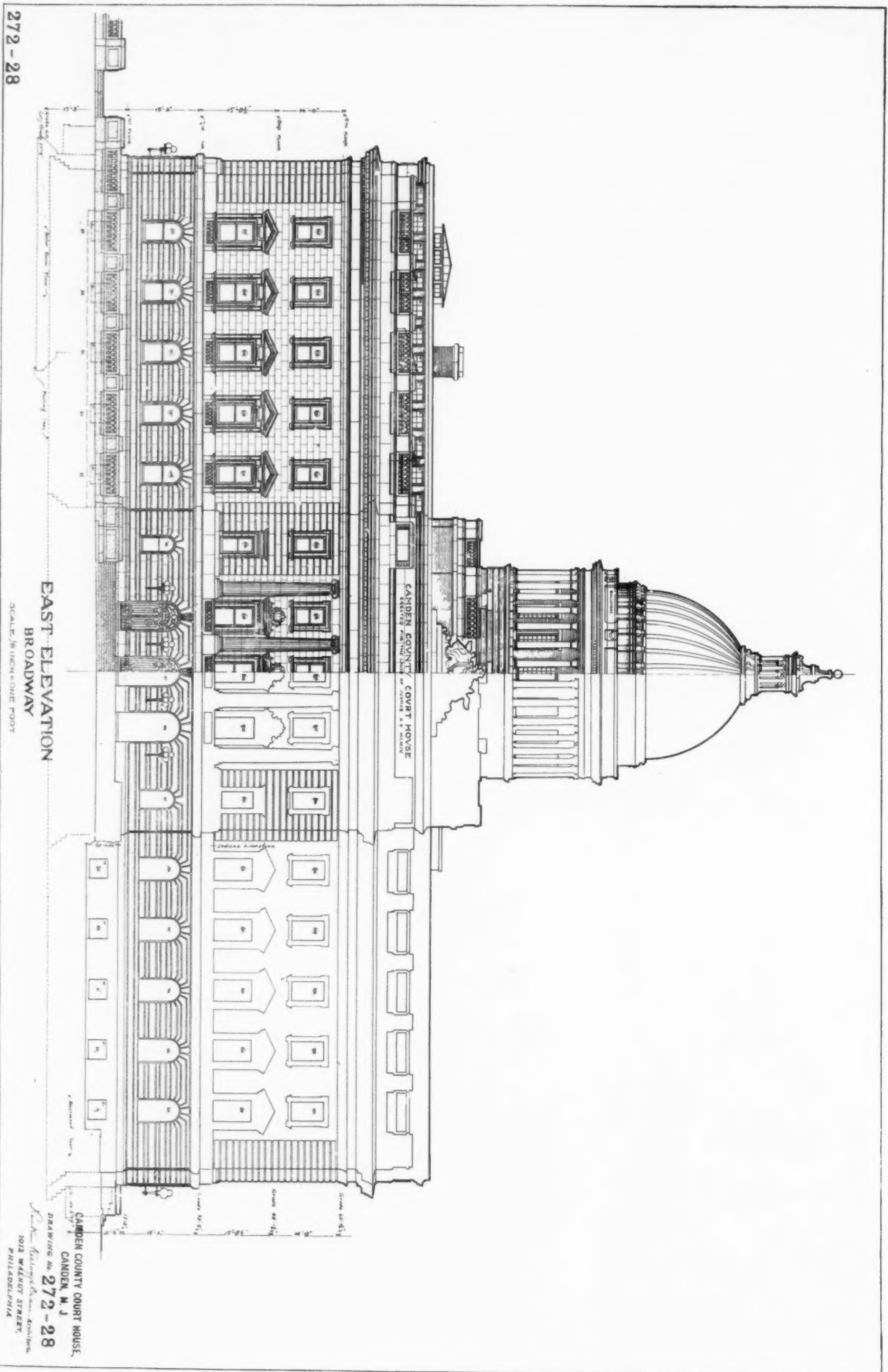
THE FIRST MODERN SHIP-CANAL.—In these days of ship-canal we hear little or nothing about the earliest enterprise of the kind during modern times, namely, the Berkeley and Gloucester Ship-canal. Although Gloucester is situated on the Severn, access to the port is really afforded by the canal. Owing to the dangerous condition of the river, an Act was obtained in 1793 for the construction of a ship-canal commencing at Berkeley, some sixteen miles lower down the Severn, and the works were completed in the year 1827. This waterway follows the Vale of Berkeley, originally commencing with a tidal-basin and lock at Sharpness Point and ending at the docks in Gloucester, where there is another lock communicating with the Severn. The original cost was about £500,000, but within the last forty years considerable outlay has been incurred in opening a new entrance half a mile lower down the river, with additional dock accommodation. These works were finally completed in 1874. Although vessels of more than 600 tons cannot pass up the canal to the port, ships of 2,500 tons can enter the outer basin, where cargo is transferred to barges. The dimensions of this ship-canal may be small compared with more recent developments, but its continuously successful operation has certainly had some useful effect in the encouragement of more ambitious schemes of the same kind.—*The Builder*.



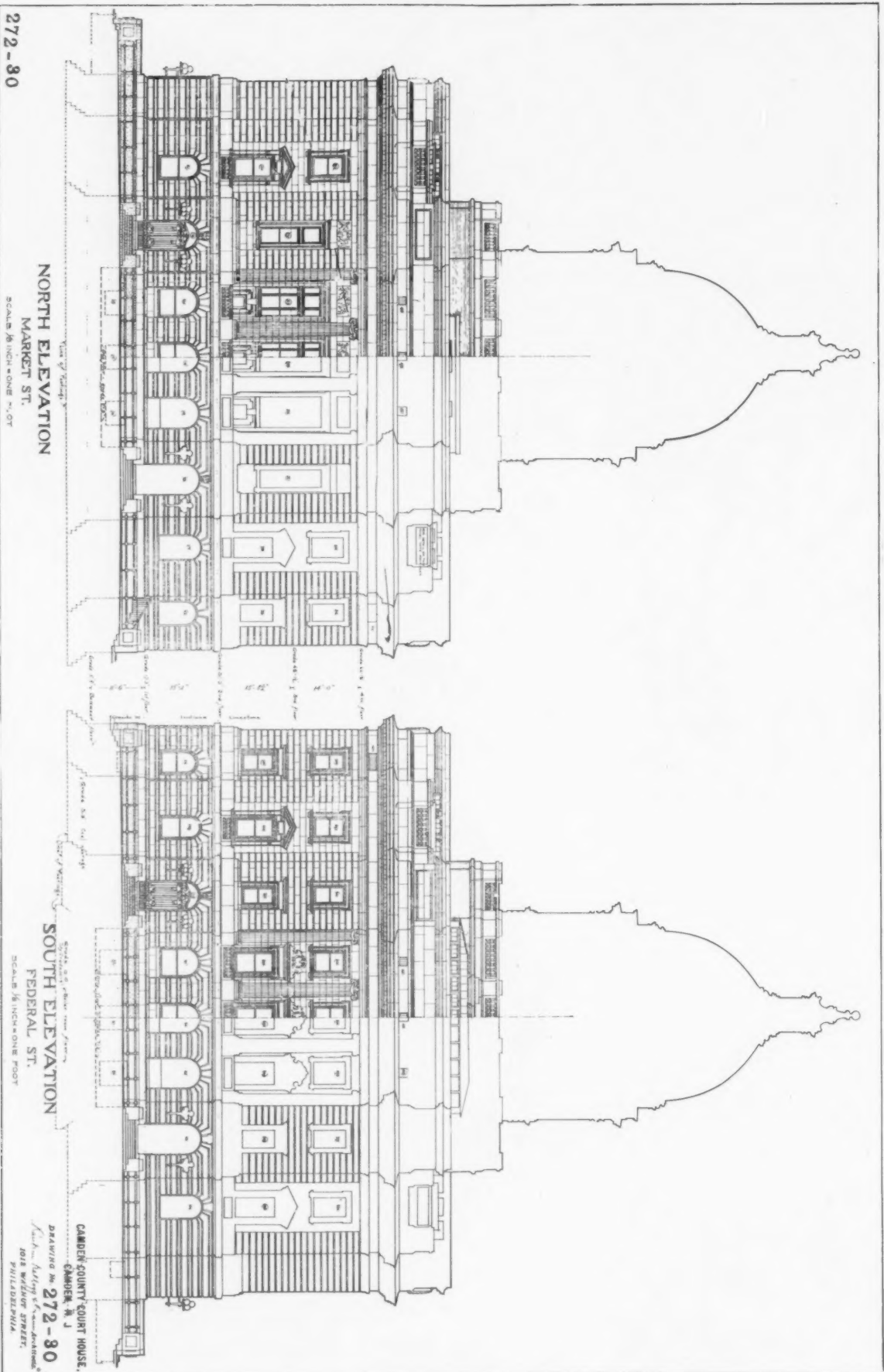
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The American Architect
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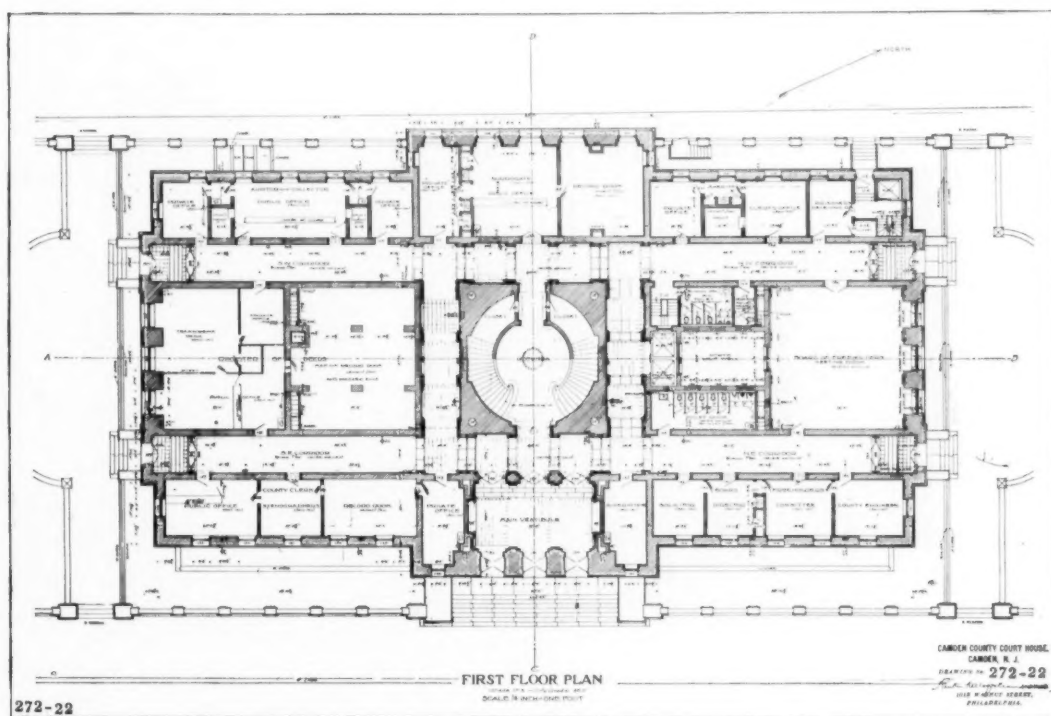
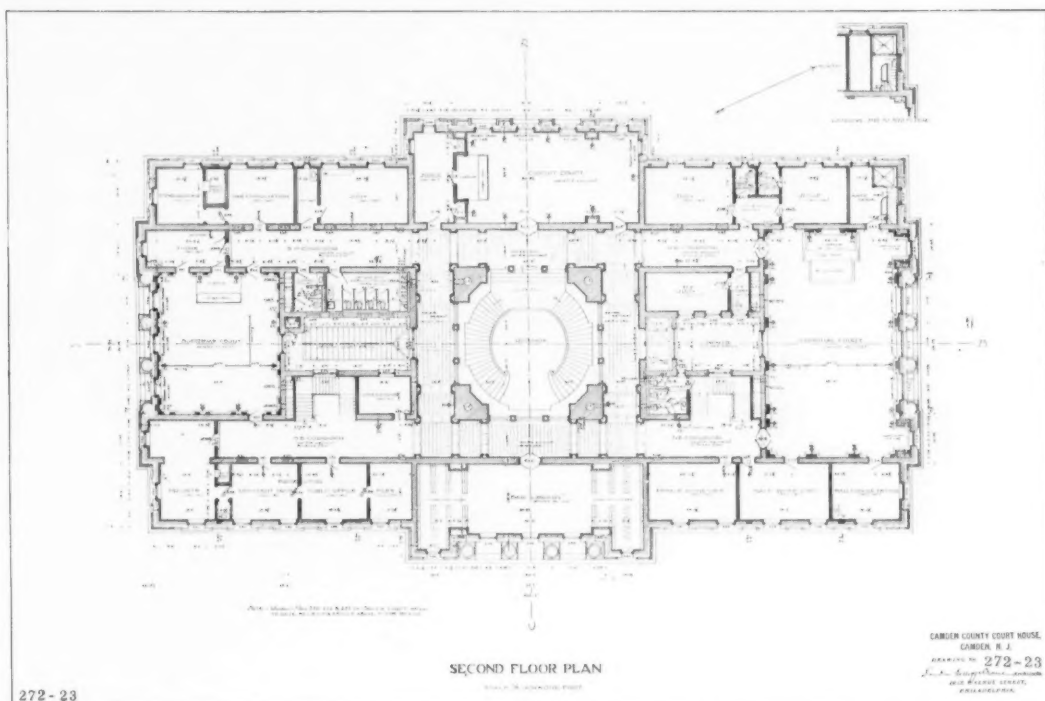
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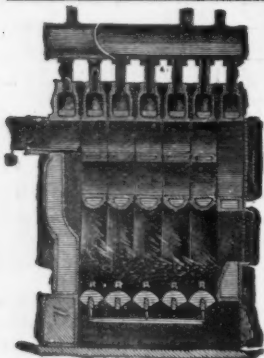
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[For pagination, see Alphabetical Index on Cover 2.]

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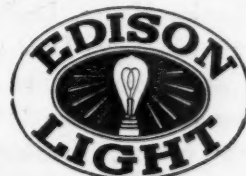
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and others.		

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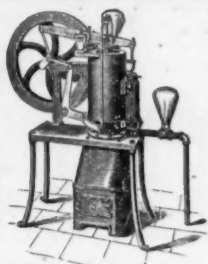
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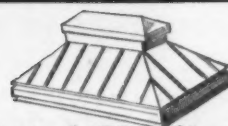
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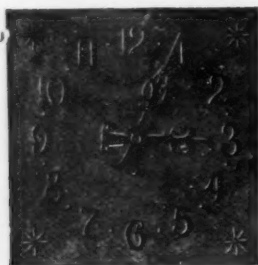
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New Advertisements.

THE LAWRENCE CEMENT CO. (New York, N. Y.), Portland Cement. Cover 4.

F. ARMINGTON PEAVY (Brooklyn, N. Y.), Money. Page ix.

LARRABEE-ROSCOE CO. (Boston, Mass.), Memorial Windows. Page ix.

BRUNO HESSLING CO. LTD. (New York, N. Y.), Books. Page ix.

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Chicago & Alton Railway.
Gadell, F. R.
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[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.

Athol, Mass.—St. Catharine Society has bought for \$8,000, the property at 24 School St., owned by Frank E. Wing and Mrs. M. A. Smith, and May 1 will break ground for a \$40,000 church edifice.

Atlanta, Ga.—It is announced that Mrs. Robert Graves, widow of the late Henry B. Plant, has given \$50,000 to St. Anthony's Chapel with which to erect a handsome new edifice. The property on which the church is to be built has already been purchased. It is located at corner of Gordon and Ashby Sts. in West End.

The members of the building committee of the First Baptist Church have raised the sum of \$60,000 recently toward the cost of erecting the new house of worship, which is to be located at the corner of Peachtree and Cain Sts. That amount added to the \$31,500, paid by the government for the present site of the church, will defray all expenses involved in the erection of the new edifice. Architect G. L. Normann is now engaged in drawing the plans for the edifice and it is expected that he will have them completed by March 1st. Bids for the erection of the structure will then be advertised for and one month will be given to the contractors to submit their offers. The work of construction will then begin immediately.

Attleboro, Mass.—The Sweet lot on N. Main St., is said to be the site for the proposed new library building.

Baltimore, Md.—The first contract awarded any architect for the rebuilding of Baltimore was given to Howells & Stokes, of New York City. They were given six days in which to complete plans for a new structure for the Stock Exchange, the price to be of no consideration. The work of actual building will be pushed rapidly.

Bangor, Me.—If the trustees of the Bangor Public Library succeed in raising \$10,000 during the next month or two, work will be commenced this spring on the erection of the \$125,000 building on the lot presented by the late N. C. Ayer. The architect is Frank A. Bourne.

Beloit, Wis.—President E. D. Eaton of Beloit College has announced that plans have been prepared and approved and the contract let for the erection of a \$50,000 library for the College, the gift of Andrew Carnegie.

Berlin, Ont.—The factory of the Berlin Felt Boot Co., the largest of the kind in Canada, destroyed by fire recently, may be rebuilt. The loss was \$150,000.

Birmingham, Ala.—The general committee of the Odd Fellows and the Knights of Pythias lodges of Birmingham met recently and decided on a plan for the erection of a joint castle in the city. The plan calls for a building not to cost more than \$40,000 nor less than \$30,000, and a committee has been instructed to look for a site.

Boston, Mass.—Plans have been drawn by Clarence H. Blackall for extensive alterations to be made in the large mercantile building at 82 Summer St. and 291 and 299 Devonshire St., for Franklin B. Fay, trustee. The plans call for the raising of the first floor and a complete change of the partitions, etc., and the lowering of the floor of the basement. McNeil Bros., of Dorchester, have the contract for the work.

Hartwell, Richardson & Driver have prepared plans, and \$30,000 will be expended upon the improvements and alterations to be made in the building at Bedford and Kingston Sts., owned by the Bedford Trust.

A press report states that \$2,000,000 will be placed at the disposal of the Episcopal diocese for the erection of a cathedral, the gift of the late Miss Mary Sophia Walker, of Waltham. The diocesan convention will meet on May 4th, and will then act

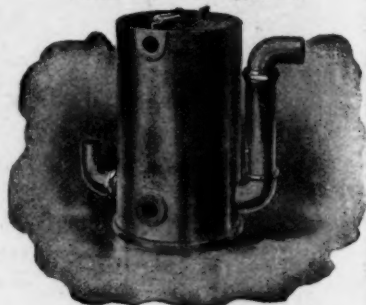
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

on the munificent bequest. Bishop Lawrence is said to favor a duplication of St. Botolph's Cathedral, in Boston, Eng., on the banks of the Charles.

Brooklyn, N. Y.—An appropriation of \$370,000 has been made for a stable and administration building here.

The fund for the Masonic Temple has reached \$127,000. It is necessary to raise but \$23,000 more before the building of the structure will begin. It is proposed to spend \$50,000 for an acceptable site.

Camden, N. J.—The Board of Education of Camden has accepted plans for a new \$35,000 grammar school-house. It will be erected at 7th and Pine Sts.

Announcement is made of the award of the contract for the new county court-house to Contractors Henderson & Co., limited, of Philadelphia, for \$586,220. It is agreed that the work shall be completed in eighteen months.

Canandaigua, N. Y.—The need for a new academy building is imperative as the present big building on N. Main St. is wholly inadequate to meet present requirements. It is proposed to raise \$80,000 for the purpose.

Cedar Rapids, Ia.—Architects Uehling & Linde, of Milwaukee, have completed plans for a five-story fireproof hotel, to be erected here at a cost of \$150,000, to be known as the Allison Hotel.

Chandler, Okla.—Miss Helen Gould is backing, financially, the erection and equipment of a modern hospital building here to be known as the Helen Gould Hospital.

Chicago, Ill.—The Northwestern University is to establish an American Institute of Germanics as a part of its college of liberal arts. A special building is contemplated which will house a library devoted to the history of German achievement in art, music, science, literature, arms and law. The plan also includes a German museum.

Plans and specifications are ready for estimates for the large new apartment-house which is to be erected for W. C. Gunn, at 21st and Calumet Ave. and designs by Architect W. C. Zimmerman, 17 Van Buren St., show an eight story building to cost about \$100,000. It will be a steel skeleton construction and have the latest improvements.

Cincinnati, O.—The memorial building that is to be erected by Mr. J. G. Schmidlapp in Eden Park, adjoining the Art Museum. It is now stated, will reach a cost of nearer \$200,000 than \$100,000, as was at first stated.

Mr. John Havlin has bought property at Vine St. and Opera Pl., on which to erect, sometime in the future, a \$300,000 hotel. He states in all probability, he will not begin actual work on the hotel building for some time, as the property as it stands brings in a good return on the capital invested.

Columbus, O.—The chemical laboratory at Ohio State University was destroyed by fire on February

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

19th. The loss is estimated at \$100,000; no insurance.

Concord, N. H.—The propriety of moving to secure from Andrew Carnegie funds for the erection of a commodious and substantial library building, has been under consideration among people of the city for some time but no general expression upon the subject has been had as yet. Meanwhile it is realized that more capacious quarters than the present building affords must be had at once, and the library trustees have, under the authority of the city government, procured plans and estimates of the expense for such an enlargement of the present structure as can be effected upon the lot. It is said the cost of same will be from \$35,000 to \$55,000, according to whether or not a fireproof plan be adopted. It is a question whether or not it is admissible to expend such an amount of money upon the present library site, restricted as it is, with the certainty that a new site and a new building will be required twenty-five years hence, when funds for a new building can be had for the asking, if a site for the same be provided.

The matter is under discussion as to whether it is advisable to remodel the Fowler Library building on School St., or to take it down and erect a new structure on the site.

Cuthbert, Ga.—Northern capitalists have made a proposition to establish a \$100,000 cotton factory here. They offer to furnish half of the capital provided local investors take the other \$50,000. Subscriptions are now being solicited from the business men by the local Board of Trade.

Dubuque, Ia.—St. Raphael's parish will erect a 12-room parochial school with auditorium and club-rooms. Cost, \$40,000.

The city will erect a brick building, 52' x 145', for a patrol and storehouse.

Duluth, Minn.—Duncan & Brewer, who own the Colson House property at the northeast corner of 1st St. and 2d Ave. West, have decided to remove the old hotel building and erect a modern four-story brick business house that will be occupied by Bayha & Co. The new structure will be thoroughly modern in every respect, and will be an important addition to the new business houses that are going up on 1st St. the coming season. The plans for the new building are understood to be in the hands of German & Lignell, architects.

Dunkirk, N. Y.—It has been decided to secure, if possible, \$30,000 from Andrew Carnegie for the purpose of erecting a public library building here. The Y. M. C. A. will provide a site and the city is willing to support the library at an expense of \$3,000 a year.

Enaley, Ala.—The Southern Street Car Manufacturing Co. has just closed a deal for the purchase of 10 acres of land near here, on which to erect a street-car manufacturing plant to cost \$100,000. The company will employ 1,000 men at first, but will later enlarge and double this number. Its capital stock, now \$50,000, will be increased to \$500,000.

Escanaba, Mich.—A handsome theatre and opera-house will be built here from designs by Architect J. B. Chubb, 112 Clark St., Chicago. The new building will cost about \$25,000 to \$30,000. Designs show a three-story structure, covering an area of 75' x 150'. It will be constructed of brick and stone.

Fort Douglass, Utah.—Authority has been given for the construction here of one bachelor officers' quarters, including eight sets of brick and one wagon-shed of frame.

Fort Greble, R. I.—Bids are soon to be called for the construction of a post exchange and gymnasium building here.

Grand Rapids, Mich.—The Board of Education has adopted the report of the special building committee, recommending the building of a new South High School, a new Central Grammar School, and additions to present buildings at an estimated cost of \$290,000.

Great Neck, N. Y.—Architect William Kraemer has prepared plans for the mansion of Frederick Russell which will cost \$20,000.

Griswold, Ia.—Plans for a \$50,000 library building for Iowa College have just been completed.

Hanover, N. H.—Dartmouth seems entirely unanimous on the proposition to rebuild Dartmouth Hall on the old lines. Colonial in style.

Harlan, Ia.—At a meeting of the Harlan Commercial exchange the matter of a public library for this place was fully discussed. The test vote showed nearly five to one in favor of the establishment of a free library.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Havre, Mont.—H. S. Cannon, of Kallispell, will erect a two-story business block, 60' x 100'. Cost, \$40,000.

Hinsdale, N. H.—Pellet Bros. have the contract for building the new hotel on the island on the Hinsdale side of the Connecticut River. The house is to be built by Fred C. Gale and is to be three stories, with 30 rooms for guests.

Indianola, Ia.—Simpson College has had plans prepared for the erection of an auditorium to cost \$20,000. Proudfoot & Bird, architects.

Jacksonville, Fla.—The plans of Architect M. H. Hubbard, of Utica, N. Y., have been accepted for the new Bethel Baptist edifice to be erected here. Cost, \$40,000.

Jewett City, Conn.—The Jewett City Textile Novelty Co. is formulating plans for an additional building. The structure will be of brick, three stories, 50' x 175'. The addition will be for the calendar, tenting, mercerizing and finishing departments.

Kansas City, Mo.—A building permit has been issued to Hollinger & Mitchell for the construction of the new Christian church at the southwest corner of Gladstone and Independence Boulevards. The church is to be finished on or before March, 1905. Cost, \$117,000.

Knoxville, Tenn.—Bauman Bros. are at work on plans for three new buildings which will be erected on Gay St. on the site of those which were burned on the night of February 2. The front of the Phoenix Building, owned by Tarwater & Wright, of Rockwood, will be used, as also will the buildings owned by M. L. Ross estate which were damaged in the fire. The buildings will be replaced on exactly the same plan as before. Bids will probably be asked for in the next thirty days.

Long Island City, N. Y.—Plans for a section of the great power-house to be erected here by the Pennsylvania Railroad Co. have been filed by Westinghouse, Church, Kerr & Co. The construction of this section will cost, it is said, \$450,000. It will be 200' x 260', two stories, and will occupy half a block at Front, 3d and 4th Sts. The entire plant will cost \$1,000,000.

Madison, S. D.—A. K. Hofas has the contract to erect the west wing of the State Normal School at \$24,100.

Marlboro, Mass.—C. E. Barnes, of South Framingham, a former resident of this city, is to draw the plans for remodeling the brick store. It is thought he will draw plans for the new city building.

Milwaukee, Wis.—John J. Ryan will erect a handsome flat building in the spring, at a cost of \$125,000.

Minneapolis, Minn.—The United Norwegian Lutherans have purchased a lot at 4th St. and 5th Ave. In the spring the church will begin the erection of a publishing plant for the Augsburg Publishing house and permanent headquarters for the church. No plans have been prepared as far as is known, but the building will cost upwards of \$40,000. The publishing-house is now located on Cedar Ave. and Washington, but is growing rapidly and the business is greatly handicapped by lack of room.

Montevideo, Uruguay.—The architects of Baltimore will be invited to submit drawings for a new capitol building at Montevideo, the capital of the Republic of Uruguay. Consul General Prudenio de Murgulondo, of Uruguay, will receive plans and specifications in Baltimore. The cost of the capitol building will not exceed \$700,000 in Uruguayan gold. If the plans for the building show merit, they will be divided into classes one, two and three. For all plans in class one, the architects will receive \$6,000 in gold; in class two \$3,000 in gold, and in class three, \$1,500 in gold. All plans must be in by April 15.

Negaunee, Mich.—This city is in receipt of a proposition from Andrew Carnegie offering to build a handsome library under the usual conditions, that for maintenance 10 per cent of the cost of the structure be appropriated annually. The council will doubtless accept.

New Haven, Conn.—Work on the new armory of Troop A, Connecticut Cavalry, will be begun about April 1. It will be situated at the corner of Orange and Canner Sts. and will be one of the finest buildings of its kind in New England, costing \$18,000.

New York, N. Y.—Plans have been filed at the Bureau of Buildings for a three-story automobile house to be built at a cost of \$20,000 for Andrew Carnegie at No. 55 E. 90th St. It will be 25' x 30'.

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

The facade will be of marble and brick of Colonial design. Architects, Whitfield & King.

The three-story dispensary of the German Polyclinic Hospital, at Nos. 78 and 80 Seventh St., is to be enlarged by the addition of a two-story rear extension, 50 feet front and 35 feet deep, to be fitted as operating-rooms for the dispensary.

The Mercantile National Bank, at the southwest corner of Dey St. and Broadway, is to erect a new four-story office-building for itself on the site of its present building. Work on the new building will begin early in the spring. It is expected that the building will cost approximately \$250,000.

Ground is to be broken in April for the foundations for a new edifice for the Arlington Ave. Presbyterian Church to cost \$25,000. The new building will be of brick and stone and will be erected on lots owned by the church at the corner of Arlington Ave. and Elton St.

It is reported that plans have been drawn for a thirty-four or six story building to be built on the Virginian Hotel site for the "New York American."

Omaha, Neb.—It is reported that George A. Hoagland will build a large business block, 66' x 132', on the corner of 16th and Howard Sts., where his residence now stands. The building will be four stories, and occupied by Thompson, Belden & Co. It will cost \$70,000. Work will begin upon the building as soon as the residence of Mr. Hoagland can be removed and the lot graded. The new building will be on the corner, with the south side on Howard St., which still leaves 66 feet frontage on 16th St. between the location of the proposed building and the Bennett Company's store. It is said that negotiations are now pending for the erection of another building on this site. The two buildings will probably be erected at the same time.

Philadelphia, Pa.—Estimates will be received about March 1 for a brick building for the manufacture of clothing for N. Snellenburg & Co., on the site of the lumber yard at Broad and Wallace Sts. It will be six stories and basement, 100' x 150'.

Pittsfield, Mass.—Plans are being considered by officials of the New York Central R. R. Co. and American Express Co. whereby a large building to be used for baggage and express packages will probably be built in the spring on land owned by the railroad company adjacent to the depot.

Portland, Ore.—The Portland Woolen Mills at Selwood, a suburb of this city, was destroyed by fire on February 18th. Loss \$150,000; insurance \$100,000. They will doubtless be rebuilt at once.

Portsmouth, N. H.—The City Council has accepted the offer of the Hon. J. Albert Walker, of Boston, to donate a \$35,000 public library building, the



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(Advance Rumors Continued.)

opposition to changing the name from the Portsmouth Public Library to the Walker Library being overcome.

Providence, R. I.—The plans by Stone, Carpenter & Willson for the addition to the Providence Telephone Exchange building on Union St. have been decided upon, and as soon as all the specifications can be worked out the work upon the improvements will be begun. The improvements call for two additional stories to the present three-story structure.

Provincetown, Mass.—Plans for a summer cottage to be erected here for Hugh E. Ross of Lancaster St., Boston, have been drawn. The house will be built in season for the summer occupancy.

Salem, Mass.—A press report states that extensive improvements will be made in the U. S. Clark docks in the spring.

Selma, Ala.—The laying of the corner-stone of the Elks' Home took place recently. The home of Selma lodge, when completed, will cost not less than \$25,000, and will be one of the handsomest and most comfortable in the State.

St. Louis, Mo.—A large lot of vacant ground at the southeast corner of Grand and Russell Aves. has been transferred from the Tower estate to William Horan for \$61,000. The property has a frontage of 510 feet on Grand Ave. by 290 feet on Russell. Negotiations are also under way to sell the same property for a site for a new building for the St. Louis Liederkreis.

Tallahassee, Fla.—Tallahassee College is the recipient of a gift of \$15,000 by Andrew Carnegie for a new library building.

Weehawken, N. J.—A big power house of the same dimensions as the one at Long Island City will be built here for the Pennsylvania Railroad Co., and either will be capable of furnishing all of the power necessary for the entire tunnel system between Long Island City and New Jersey, and for Atlantic Ave.

Winthrop Highlands, Mass.—Edward D. Conant has sold to John H. Durnan 3,872 feet of land on Locust St. The buyer will build a residence.

PROPOSALS.

REMODELLING COURT-HOUSE.

[At Gatesville, N. C.] The Board of Commissioners for Gates County will receive sealed bids until March 7 to remodel and enlarge the present court-house, including the building and furnishing two fireproof rooms. It must be constructed according to plans and specifications on file in the office of register of deeds, Gatesville, N. C. LYCURGUS HOFER, clerk to board of county commissioners. 1470

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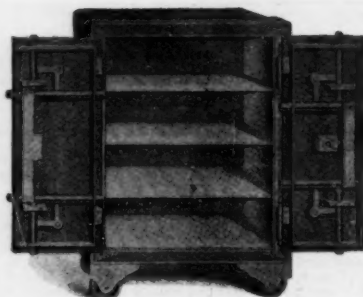
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PROPOSALS.

GRADING AND FILLING.

[At Fort Caswell, N. C.] Fort Caswell, N. C. Sealed proposals will be received here until March 9, 1904, for grading and filling at this post. Information furnished on application. PHILIP YOST, Q. M. 1470

TRAINING SCHOOL.

[At Terre Haute, Ind.] Proposals will be received until March 5 by the trustees of the Indiana State Normal School for erecting a training school. 1470

HOSPITAL.

[At Whipple Barracks, A. T.] Office Constructing Quartermaster, Whipple Barracks, Prescott, A. T. Sealed proposals will be received here until March 15, 1904, for furnishing the labor and material for the construction, plumbing, gaspiping, heating and electric-wiring of brick hospital. Plans, specifications and other information in this office, and in the offices of the chief Q. M., San Francisco, Cal., and Denver, Col., and constructing quartermaster, Fort Leavenworth, Kan. CHARLES C. WALCUTT, JR., constructing Q. M. 1471

CEMENT.

[At Ohio River.] U. S. Engineer Office, Wheeling, W. Va. Sealed proposals for furnishing and delivering about 37,000 barrels of American Portland cement for dams Nos. 13 and 18, Ohio River, will be received until March 18, 1904. Information furnished on application. GEO. A. ZINN, maj., engrs. 1471

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 23, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 23d day of March, 1904, and then opened, for the installation of two hydraulic lifts in the U. S. Post-office at Butte, Montana, in accordance with the specification, copies of which may be had at this office or at the office of the Superintendent at Butte, Montana, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1471

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 20, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 4th day of April, 1904, and then opened, for the construction of the extension to the U. S. Post-office at Burlington, Iowa, in accordance with drawings and specification, copies of which may be had at this office, or at the office of the Custodian at Burlington, Iowa, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1471

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 20, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 4th day of April, 1904, and then opened, for the construction of the extension to the U. S. Post-office at Burlington, Iowa, in accordance with drawings and specification, copies of which may be had at this office, or at the office of the Custodian at Burlington, Iowa, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1471

CELLS.

[At Stevenson, Wash.] Proposals will be received until April 4 for installing cells in county jail. A. FLEISCHHAUER. 1472

PROPOSALS.

STONE.

[At Columbia River, Oregon and Washington.] U. S. Engineer Office, Portland, Ore. Sealed proposals will be received here for 240,000 tons (more or less) stone for extension of jetty at mouth of Columbia River, Oregon and Washington, until March 11, 1904. Information on application. W. C. LANGFITT, maj., engrs. 1471

GARBAGE PLANT.

[At Atlanta, Ga.] Proposals will be received by the undersigned committee until March 25 for furnishing material and labor to construct and erect a garbage crematory plant for the city of Atlanta. Specifications and plan of ground will be furnished on application to the undersigned committee. Address all communications to C. W. Strickler, 1026-7 Empire Building, Atlanta, Ga. C. W. STRICKLER, et al., committee. 1472

COURT-HOUSE.

[At Huntington, Ind.] Bids are wanted March 10 for erecting a court-house. Probable cost, \$200,000. J. W. Gaddis, architect, Vincennes. 1470

ADDITION TO COURT-HOUSE.

[At Perry, Ga.] Bids will be received March 3 by the County Commissioners for erecting an addition to court-house. 1470

SCHOOL.

[At Winnetka, Ill.] Bids will be received March 1 by the Bd. Educ. for erecting a brick school. 1470

QUAY WALL AND CONCRETE AND STEEL PIER.

[At Portsmouth, N. H.] Bids will be received March 5 by Mordecai T. Endicott, Ch. Bureau Yards and Docks, Navy Dept., Washington, D. C., for constructing about 730 feet of quay wall and a 400-foot concrete and steel pier at the navy yard here. Funds available, \$205,000. 1470

RIPRAP.

[At Gardiner's Bay, N. Y., and N. Y. Lower Bay.] Sealed proposals will be received at the office of the Light-house Engineer, Tompkinsville, N. Y., until March 7, 1904, for furnishing riprap stone, as follows: 2,000 tons at Cedar Island light station, Gardiner's Bay, N. Y.; 600 tons at Rorer Shoal light station, New York Lower Bay, N. Y.; 400 tons at Point Comfort light station, New York Lower Bay, N. Y., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to MAJ. WM. T. ROSELL, corps of engineers, U. S. Army. 1470

CEMENT.

[At Great Gull and Plum Islands, N. Y.] U. S. Engineer Office, New London, Conn. Sealed proposals will be received here until March 5, 1904, for furnishing 10,000 barrels of American Portland cement on docks at Great Gull and Plum Islands, N. Y. Information on application. CHAS. F. POWELL, maj., engrs. 1470

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ADOPTED BY THE SOCIETY, FEBRUARY 1, . . 1895. . .

SECTION 1. No Member should enter into partnership, in any form or degree, with any builder, contractor, or manufacturer.

SECTION 2. A Member having any ownership in any building material, device or invention, proposed to be used on work for which he is architect, should inform his employer of the fact of such ownership.

SECTION 3. No Member should be a party to a building contract except as "owner."

SECTION 4. No Member should guarantee an estimate or contract by personal bond.

SECTION 5. It is unprofessional to offer drawings or other services "on approval" and without adequate pecuniary compensation.

SECTION 6. It is unprofessional to advertise in any other way than by a notice giving name, address, profession, and office hours, and special branch (if such) of practice.

SECTION 7. It is unprofessional to make alterations of a building designed by another architect, within ten years of its completion, without ascertaining that the owner refuses to employ the original designer, or, in event of the property having changed hands, without due notice to the said designer.

SECTION 8. It is unprofessional to attempt to supplant an architect after definite steps have been taken toward his employment.

SECTION 9. It is unprofessional for a Member to criticise in the public prints the professional conduct or work of another architect except over his own name or under the authority of a professional journal.

SECTION 10. It is unprofessional to furnish designs in competition for private work or for public work, unless for proper compensation, and unless a competent professional adviser is employed to draw up the "conditions" and assist in the award.

SECTION 11. No Member should submit drawings except as an original contributor in any duly instituted competition, or attempt to secure any work for which such a competition remains undecided.

SECTION 12. The American Institute of Architects' "schedule of charges" represents minimum rates for full, faithful and competent service. It is the duty of every architect to charge higher rates whenever the demand for his services will justify the increase, rather than to accept work to which he cannot give proper personal attention.

SECTION 13. No Member shall compete in amount of commission, or offer to work for less than another, in order to secure the work.

SECTION 14. It is unprofessional to enter into competition with or to consult with an architect who has been dishonorably expelled from the "Institute" or "Society."

SECTION 15. The assumption of the title of "Architect" should be held to mean that the bearer has the professional knowledge and natural ability needed for the proper invention, illustration and supervision of all building operations which he may undertake.

SECTION 16. A Member should so conduct his practice as to forward the cause of professional education and render all possible help to juniors, draughtsmen and students.

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