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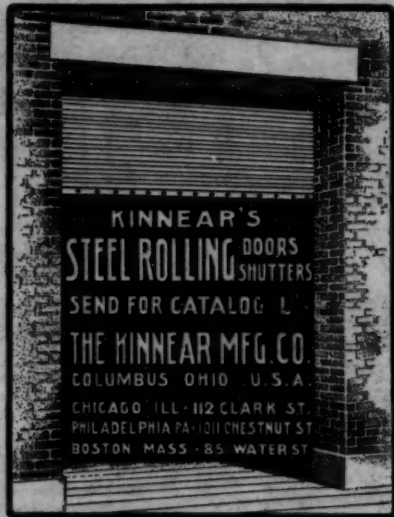
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NOTES AND CLIPPINGS.

A COMMITTEE of the New York Chamber of Commerce has been investigating the matter of the obstruction of sidewalks by the merchandise of the owners of the abutting stores and warehouses in the down-town portion of that city. The phase of the matter which interests them in the highest degree, one for which they seem to find no real solution ready to their hand, is different from that kind of obstruction which is occasioned by the intentional intrusion upon the public's right to free passage over the sidewalk by the presence of show-cases and stacks of displayed merchandise about doors and along the stoop-line which are maintained throughout the daylight hours avowedly for advertising purposes only. This persistent wrongful appropriation of the sidewalk can be prevented by the police and the Bureau of Encumbrances, if they choose to do their duty; but the obstruction of the sidewalk and the congestion of sidewalk traffic through and because of legitimate mercantile operations, while quite another matter in the eye of the law, are none the less a grievance to the public and a nuisance that calls for abating. The greater the business activity in one of these narrow down-town streets, the greater the congestion of teams in this street due to the number of vehicles each striving to discharge at the same point at one and the same time, and the greater, consequently, the obstruction of the sidewalk by goods discharged thereon from such teams. No one package or case, perhaps, remains on the sidewalk so long as to give the police a right to order its removal to the corporation yard, but the constant succession of packages of merchandise certainly does result in a permanent expropriation of public property by private individuals during working hours. With the passage of time, this congestion becomes greater owing to the erection of higher buildings, the increased number of tenants in which all having to do business across the same narrow frontage of sidewalk.

A POSSIBLE alleviation of this evil, one which might grow to be a complete remedy, is to be found in a change of plan and structure, easily carried out in all new mercantile buildings, and perhaps not too expensively in many old ones, accompanied by certain changes in the time-hallowed methods of doing business. A little observation will show that most of the trouble is caused by the time consumed in discharging or loading over the tail-board of teams backed up to the curb on both sides of the street, thus narrowing the passage-way in the middle of the street and occasioning blockages as drivers try to get their teams into or out of the current of traffic. Add to this the time lost by the present clumsy method of lifting by hand heavy cases from the sidewalk to the truck, by parbuckling casks down into basements or by shoving crates and bales up inclined planes into wagons or stores and the ultimate cause of the trouble seems to be found. At any rate here is one of the chief evils, and its cure is to be found in providing a more effective and rapid way of loading and unloading teams. A law, easily enacted, providing that, after a given date, all merchandise exceeding in weight a certain limit, or in bulk surpassing certain fixed dimensions, must be discharged into and from a warehouse floor not less than twelve feet above the sidewalk level would provide instant palliation,

perhaps complete cure. A variety of useful improvements would at once follow on the enforcement of this simple law which, so far as goods-shipping is concerned, would at once transform what is now known as the second floor into the *piano nobile*. In new buildings the necessary changes in plan and structure could of course be provided for, while in old buildings, short of complete remodelling of the lower floors, a runway from the front to the elevator at the rear could easily be arranged without an overgreat sacrifice of office room, and goods delivered on the second floor could be sent by elevator up or down for storage as easily as they now are. The first great change in methods would come with the introduction at each building of a small but powerful crane, operated by electricity, and so set at the second-story level that it could swing goods rapidly between building and wagon without interfering with foot passengers, and to the immediate alleviating of street traffic, since it would no longer be necessary to back a truck up to the curb and load over the tail-board. But, as the ordinary man, unfamiliar with the virtues of slings, barrel-hooks, stone-setters' tongs and such like contrivances, would have the same objection to walking under a series of loaded cranes that he now has to passing beneath a suspended safe, it would be necessary to conceal the cranes from the view of the passers beneath. This would entail the building of a ceiling, or floor, extending from the second-story level out to the curb-line, supported by light steel beams and columns on the curb-line, all of sufficient strength to stand any strain or shock that might come on them in handling goods. As the natural place for the crane would be on the outer edge of the structure and as it would have to be stayed back to the building, designers of ornamental ironwork would find in these stays and in the treatment of the sidewalk colonnade a new and interesting problem for study.

THE suggestion seems to have obvious advantages. Passage along the sidewalk would no longer be obstructed and the roof or ceiling above would give shelter from sun and weather, so that all the advantages of a colonnade, so often urged, would be had without encountering the objections which owners of real estate have always urged in their desire to avoid being deprived of a portion of their floor-space through the colonnading of the lower stories of existing buildings—the form that the recommendation has most often taken. If it should be argued that the roof of this sidewalk structure or elongated marquise would necessarily darken the present lower floors, it may be pointed out that by the use of some shape of sidewalk-prism, — which must, of course, be strong enough to stand shock — possibly even a greater amount of light might be thrown into the lower story than now actually reaches it. Besides, even if this should not be the case, it should be remembered that henceforward business must in New York be conducted more and more by the aid of artificial light, so far as the lower stories are concerned, partly owing to the increase in height of surrounding buildings and partly because of the increasing use of soft coal, which is sure, at certain seasons of the year, to produce atmospheric conditions which cannot be outdone by the densest of London fogs.

ALL who have had a chance to examine the ruins of a wrecked building have probably felt that it was almost an impossibility to determine, on the evidence afforded by the inanimate material, just what caused the disaster. In the case of the Buddeniseck disaster, the offence of the builder was so rank that the heap of mortarless brick declared the truth at a glance. In the case of the Ireland collapse, the best that could be done was to decide that probably an old cesspool, undiscovered beneath a pier footing, was the cause; but in the case of the "Hotel Darlington" it will seemingly be more difficult to settle upon a cause with anything greater than plausible probability; but this only because there seem to be in sight so many possibilities. We are at present disposed to consider this latest horror one of the most inexcusable of accidents. With timber construction there is always the doubt as to the real strength of the timber itself; with masonry, whether stonework or brick, the static problem is always involved with chemical doubts and the matter of frictional resistance; and with structures

into which cast-iron enters there is always the chance of concealed flaws. But the science of erecting a steel-skeleton framework is to other building operations very like what modern surgery — nearly an exact science — is to medicine, still confessedly an empirical art. The proper and safe designing of a steel skeleton is a comparatively simple engineering problem; the modern steel shape, properly mill-inspected, is an absolutely trustworthy material, and the erection of a steel frame is an operation peculiarly open to easy inspection, and though the task of the housesmith is arduous and dangerous at times it is not particularly difficult, and the men are, as a rule, sufficiently intelligent to know whether they are doing properly the work they are set to do, and to realize that their own safety depends upon their own care and thoroughness. Real accidents, due to mishandling of material on the job through the misjudging of human strength or the snapping of rope or guy under a too great strain temporarily applied, of course will happen; but as there seems to be no evidence of any such mishap at the "Darlington" we incline to feel the collapse inexcusable.

THE sinister aspect of the affair, which has attracted every one's attention, is that the Building Department — which in this case, happily, has a better defense for itself than in some previous instances — had filed numerous "violations" against the building. Naturally every one feels that more than this should have been done and that the operation ought to have been ordered stopped by the inspector, and there is a general feeling of surprise that the Building Department has no power of summarily stopping a dangerous piece of building construction, but can only proceed by procuring an injunction from a court. Hereupon the public clamors that such summary powers must at once be given to the Building Department; but this is merely an impulsive and hysterical demand and it may really be unwise to greatly enlarge the Department's present powers. But there is one step that could be taken and taken quickly, one, too, which would ensure the correction of an error in the shortest time possible. Filing a "violation" against a building turns out to be merely the filing of proof for the Department's own later self-defense, at need. It seems to us that all that is needed to make the present "violation" system a very efficient weapon in the hands of an inspector is an ordinance making it compulsory on an inspector, who finds cause for filing a violation, to notify every workman on the job that he is about to file such a violation and its nature. As it is the workmen's lives which first are brought into jeopardy, it is only fair-play that they should have warning of a new danger in their occupation which they did not anticipate when they undertook the work. Contractors and owners, who found their workmen refusing to go on with their work until the official "violation" had been repealed, would set about making the matter right with as much celerity as if impelled by the mandatory injunction of the highest court in the land. In this device the public can find a cure for the evil it now perceives, and the matter of extending the power of the Building Department in any direction can await cooler and more deliberate action.

THE business community was of course prepared to learn that the Baltimore conflagration had had a serious effect on insurance interests, and that one of the secondary results must inevitably take the form of a more or less general advance in insurance rates in all cities, and particularly in such portions of them as seemed most subject to conflagration hazards. The National Board of Underwriters has already sent to its members a circular recommending an advance in rates and the matter will be discussed and settled at the annual meeting in May. The manner in which the underwriters have been able to endure the shock of the Baltimore losses is such gratifying evidence of their better understanding of the problem with which they have to deal, that the general public is likely to accept their decisions as wise and founded in justice. For just as it is certain that the cost of insurance is finally borne by the general public, so it is equally sure that it is for the interest of the general public that the underwriters should be allowed to make themselves strong enough to cope with the burden of the losses which the carelessness, indifference or depravity of the general public thrust upon them.

PERHAPS it is not fair to speak of the depravity of the general public, since most men really are not firebugs and incendiaries; but there certainly are too many men who insure for gain and not for mere indemnity, that is, there are a large num-

ber of men who regularly practise over-insurance on the chance of making a profit out of a possible misfortune, caused either by their own carelessness or by that of some neighbor. The vulgar insurance frauds practised by Polish Hebrews in New York are well understood and can be fairly guarded against by the underwriters, and their large corps of detectives finds ample occupation in running down and convicting men of that class who, without a thought of the risk they inflict on a whole neighborhood, deliberately set afire their own premises on which they have wrongfully effected insurance in excess of value. But the more subtle temptation thrown in the way of the little scrupulous, but hardly to be called criminal, class by the opportunities provided in certain States by the "valued policy" law is not so well understood, and we are glad to aid the insurance companies in their campaign of enlightenment by calling attention to extracts from the report of the Commissioner of Insurance for the State of Missouri which can be found in another column.

THE present stage of the discussion seems to indicate that there is a very strong probability that New York will shortly undertake to install some sort of salt-water supply for fire-service, and possibly for other municipal uses, in spite of the failure that has attended such attempts at Hastings and other places in England. Amongst the various disadvantages charged against a salt-water system, we have seen no mention of one evil of which our boyhood days had proof. Living in a town where the streets were sprinkled with water drawn partly direct from a tidal river and partly from sumps in the marshes, where the water was brackish and stagnant, we recall distinctly that with the advent of the summer watering-cart appeared the first pestilential swarms of mosquitoes. How far this phenomenon conforms with what is now known of the propagation of the mosquito, whether larvæ in the final stages of development sprinkled on the street surface can complete their growth before the surface dries, we do not know. But if the synchronous appearance of water-cart and mosquito was something more than accidental, it should count as an argument in favor of those who oppose the use of salt-water for anything other than for fire service. Of course mosquitoes do not breed in the river water that surrounds Manhattan Island, but it is full of impurities which it is just as undesirable to have spread over the surface of the city streets as would be the larvæ of mosquitoes just ready to enter on their blood-thirsty career. One of the most sensible suggestions we have seen, one which Colonel Waring is said to have approved, is that the water for this salt-water fire-service should be pumped from wells driven near the water's edge, so that the water, though still essentially salt-water and hence cheap, should nevertheless be purified to a large degree by filtering through the soil existing between the well bore and the river itself.

THERE has been so much public discussion as to whether Mr. Carnegie's proffered gift of a society building, costing a million and a half of dollars and to be occupied by them as tenants in common, to four engineering societies would be actually accepted by the selected beneficiaries, that it can hardly be a surprise to any one to learn that the most important of the four bodies, the American Society of Civil Engineers, has at length decided to decline to profit in the prescribed manner. It would be rather interesting to know in what degree the votes of the members were affected by the matter of mere accessibility and consequent actual personal availability of usufruct, that is, whether the two-thirds vote against acceptance was thrown, in the main, by members of the Society who would rarely have the opportunity of using a building situated in New York but who nevertheless must bear their share of the cost of maintenance, growth of sinking-fund and so on. The phase of the matter, however, which seems to us of most interest is the characteristic thoroughness with which the entire situation was canvassed and the arguments pro and con brought to the attention of the members in the parallel columns of an exhaustive report. Architects, we fancy, in determining such a question would have been swayed by sentiment, and would have yielded to the temptation to bring about the erection of one more fine building, even if they never expected to set foot within its walls; but the engineers, with true professional phlegm, concerned themselves largely with considering whether acceptance of the gift would satisfy their needs in the most "economical" manner.

A STUDENT IN JAPAN AND INDIA.

It is so unusual for a holder of the Rotch Travelling-Scholarship to do otherwise than proceed by the most direct course to either Paris or Rome, that we have thought our readers would be interested in the following reports to the committee, made by a Travelling-Scholar who set his face toward the West, so that he might track the architectural movements of the past from the Orient to the Occident.

NIPPON YUSEN KAISHA, SS. "*Hiroshima Maru*,"
OFF COAST OF CHINA, Oct. 1, 1903.

TO THE COMMITTEE OF THE ROTCH TRAVELLING-SCHOLARSHIP:—

GENTLEMEN,—It affords me great pleasure to write you this my first monthly report as holder of the Rotch Travelling-Scholarship, as I feel that my first month spent abroad has been exceedingly profitable along architectural lines, as well as intensely interesting from a general point-of-view.

Sailing from Vancouver, B. C., on August 17, our steamer anchored at Yokohama, September 1. As the passage across was an uneventful one, my time was spent mainly in reading guide-books and histories relating to Japan, having for a nucleus the valuable data of architectural interest which Mr. Ralph Cram, of Boston, so kindly gave me.

From Yokohama I took a short trip to Hamakura to see the Daibutsu or colossal bronze statue of Buddha. The figure is 49 feet high and formed of sheets of bronze, cast separately, brazed together and finished off on the surface with the chisel. The image is quite impressive, sitting in its calm repose amid the beautiful surrounding foliage. Apart from this, one cannot say much of it as a work of art. During my stay in Japan I saw many of these colossal Buddha images, but this one at Hamakura is by far the best.

My next stop was at Tokio, where I spent some time at the temples of Shiba Park and also at Ueno Park. While at Tokio I met the professors of architecture at the Imperial University and from them I learned much as to how they conduct their architectural courses and what they consider the best periods of the temple architecture of Japan, besides much pertaining to their art in general. From them I received permits which enabled me, later on, to measure, draw, and even see interiors of temples not usually open to the public.

At Nikko I found an interesting group of Buddhist and Shinto temples. Here they have the most elaborate carvings, worked into their buildings, beautifully executed and with a color scheme that is most harmonious. These temples may be criticised on the ground that they are too minutely done and were, in fact, built during the decline of the period of architecture. In Japan it is a common saying, "You cannot say 'beautiful' till you have seen Nikko," and surely it was a beautiful sight to see these temples, under a clear sky and amid the grandeur of their natural surroundings.

It was customary at the time these temples were built (seventeenth century) for the feudal lords to pay tribute to their rulers for the building and maintenance of these temples; if too poor to give money they often did a certain amount of work upon the surroundings. One of these lords built a road and lined it on either side with trees which lead up to the temples, twenty miles distant. One of the most impressive experiences I had in Japan was the jinrikisha ride along this road between the lofty cryptomeria trees till finally we reached these most charming temples.

From Nikko I returned to make a second study of the work at Tokio and then proceeded to Nagoya, where is situated the finest existing example of Japanese castle architecture. Aside from its great originality, the castle does not excite any great amount of interest. All the other castles I saw were along the same general lines as this one at Nagoya. Enormous stones were used in the construction of the lower walls; some measuring 40 feet in length. From there (Nagoya) I visited Kyoto, Uji, Nara and Horyuji in turn, finding temples in all these places on a much grander scale than I had seen heretofore, with more consideration apparently given to mass and general proportions, and in which the constructive principles were most beautifully carried out. These three temples were left mainly in the natural wood, but if lacquered were in monochrome, usually red.

All throughout Japan I noticed the excellent effects reached by the treatment of wood with metal fastenings, trimmings, etc. The ends of rafters and overhanging beams, etc., are tipped with copper alloy having some delicate surface-pattern wrought upon it. Likewise, uninteresting wood surfaces are broken up and nail-heads covered with rosettes of charming design. The architects seem to object to straight lines in their work and we find the gables, eaves, rafters, etc., all having a gentle curve, and this accounts to a great extent for the pleasing character of these buildings.

The lacquerwork of Japan was new and quite interesting to me. Some of the temples, pagodas and entrance-gates are completely covered with a lacquer which is put on in nine or ten coats, rubbed down with pumice after each coat. Between the last few coats a fibrous material is inserted to give clinch to the finish, which is always of an ivory black or a red color. When complete the entire building is found to be covered with a lacquer at least $\frac{1}{4}$ inch thick.

My trip to Japan seems to have been at a most opportune time, as the Japanese Government is at the present time repairing many of the best temples and I found them in all stages of improvement and some enclosed in a most complete system of bamboo staging

which enabled me to measure and sketch under the most favorable circumstances. Besides this advantage I met members of the Japanese Restoring Committee who, when they found I was interested in their architecture, gave me information concerning the temples as they originally existed.

Aside from the temple architecture, the Japanese have little of interest to offer the student. Their castles are not worth spending much time over and their domestic architecture is beautiful only in its extreme simplicity and suitability to their climate. Their gardens, excepting in few cases where trees, rocks and lakes were happily combined, were a disappointment to me.

I do not expect to find more interesting wooden architecture anywhere in my travels than in Japan and look upon the Japanese as the masters of this construction, just as we look upon the Greeks and Romans as masters in stonework.

Aside from the larger interests I have seen the most beautiful screens, lacquerwork, antique figures (some most charming draperies), bronzes of every description, tapestries and hangings of all sorts.

The large cities of Japan, Tokio, Kyoto, Osaka, have many new large public and semi-public buildings all done in a modern European style, generally not over three stories, on account of the frequent violent earthquakes, and constructed in brick and stone. Steel is being introduced now for the first time as a building material and Japan boasts of one steel-frame building.

My trip has been made exceedingly pleasant by the courtesies extended me by the people I have met in Japan. Especially do I refer to the professors of architecture of the Imperial University, to the several members of the Japanese Temple Restoring Committee and to the Buddhist priests in charge of the temples at Nikko.

I am exceedingly glad of the opportunity to make my trip by way of Japan and hope in the drawings and sketches which I shall forward to be able to express somewhat, at least, of the character of the Japanese architecture which has pleased me so greatly.

Respectfully submitted,

EDWARD T. FOULKES.

BENARES, INDIA, Oct. 31, 1903.

My report for the month of October will have to be of a general nature, as much time has been spent on board ship, travelling from Japan to India, making stops of from two to four days at Shanghai, Hong Kong, Singapore and Colombo.

While in China I inquired of European architects at Shanghai and Hong Kong about the architecture of China, but, so far as they knew, nothing of any importance was to be seen in China. This only bore out my own idea, so I was not at all disappointed. At Canton I saw a few Buddhist temples and pagodas, but not at all comparable to those I saw in Japan.

The two ports of China which I visited are extremely busy commercial cities with a vast amount of building now in course of construction. The architects of these buildings are mainly Englishmen, who in my estimation are not making the most of the opportunities offered them.

The sights in China aroused my deepest curiosity; and in the shops I found some of the rarest silks, beautiful carvings in ivory and engravings of all sorts. The Chinese, in their narrow, crowded alleys where all the disagreeable odors seem to be condensed, did not appeal to me at all and I was glad when the steamer started on her course for the next port.

Singapore by its geographical situation commands an extensive shipping industry. All the European liners stop here, as well as a host of coasting steamers: as many as forty to fifty steamers pass Singapore in a single day. It is likewise a most excellent place to study the different races of the world, as nearly all are represented in the commercial town. The botanical gardens with all the tropical trees, fruits, etc., and the zoological park interested me during the two days' stop here.

Arriving at Colombo, October 20, I took a train the same day to Kandy, Ceylon, where are some Buddhist temples. Ceylon is not particularly interesting architecturally, so I sailed across the channel to India.

At the time of this report I have studied the Brahman architecture, or that type peculiar to South India, and have been most wonderfully impressed by the immense temples at Madura, Trichinopoly, Tanjour and Chidambaram. No description of mine could convey an adequate idea of the grandeur of these temples, which are said to have no equal, unless it possibly be the pyramids of Egypt. The enormous scale, the repetition of parts, and the wonderful play of light and shade, combined with a detail that excels in delicacy, all go to make these southern temples an architectural revelation to one.

If for no other purpose than to stimulate the imagination are these temples worthy of study, as they contain forms and combinations of horizontal and vertical lines that are original to the style and which do most certainly please the eye. The Ecole des Beaux-Arts is alive to this vast field of architectural investigation and many of the designs for which I had given credit to that school, I am finding here in the South Indian temples.

The designs were surely studied to be seen from different points-of-view. From one distance the mass counts wonderfully well; a little closer the subdivisions come into the composition and finally the detail which draws one almost down to the microscope.

All the architectural refinements are met in these temples. The stylobated colonnade, 1,000 feet long, has a perceptible rise towards the centre, so likewise with the other long architectural lines.

Nearly all of these temples have in connection with them halls of one thousand pillars. The effect here at night when you chance to see single lights in the distance, or possibly a religious procession of elephants, festival carts and gaily dressed natives winding their way amid these pillars all goes to make the halls most impressive.

From the south of India I travelled overland, seeing Puri temples, the best example of pure Indo-Aryan architecture, Madras and Calcutta, with some interesting modern work, and finally on to Benares. To-morrow I start for the northern district, with the Taj Mahal included.

I want to add a line or two of personal interest to accompany my report.

India is the most wonderful country and the many interests aside from architecture keep one constantly on the move. The people with their gay-colored clothes, their shawls of most beautiful design and color, their religion affecting as it does almost every move, and their singular manners and customs all make up a picture of intense interest.

Europeans are not allowed to enter even the outer enclosure of some of the Brahman or high-caste Hindu temples. But by paying a small fee one can generally get admission to a house-top, — after the proprietor has carefully concealed his little god that you may not defile it in passing, — and thence get the *ensemble*. It is not such a loss as one might imagine, as the real beauty of these temples lies in the exterior, the interiors generally being very disagreeable, the columns smeared with oil by the worshippers and covered with flowers in all stages of decomposition, together with rotten fruit, rice, bread, etc. These old Brahmans, for fear of Europeans, whom they consider of low caste, defiling them, will cover their mouths when you pass them or walk several feet away so your shadow even may not touch them. I generally give them a bow and pass on.

In the centre, generally, of their temples are immense tanks in which the people bathe and get their water-supply. This water generally is the filthiest I ever saw even an animal drink. But it is a great sight early in the morning at one of these tanks, with hundreds of people washing themselves, and girls of the most beautiful proportions carrying water in brass vases on their heads.

Travelling in India is rather difficult, especially in the district I have just completed, as the temples are in out of the way places where the natives are ignorant of European ways. The Government has established bungalows in these places, but for the convenience of all travellers one can only remain twenty-four hours and then is compelled to move on. The bullock carts are anything but comfortable; but I am enjoying this sort of "western" life and am getting a great deal of information that the average tourist never gets. You should see me in my huge cork hat and tropical clothes, with my sketching outfit packed on behind.

When I visit a temple I generally make several rough pencil-sketches of what detail interests me, photograph some and end up with a water-color sketch of some portion. The blasted natives, who are nearly all beggars at the temples, swarm around one. Three or four lepers will hold out their fingerless hands and all sorts of deformed and sore people will molest you to death. I have found it necessary to take a guide always, if for no other object than to beat off the beggars. At one temple alone 20,000 native priests exist on what the pilgrims and tourists give them. You can't imagine how materially the religion of these people affects them.

I am making my way to Agra and the Taj Mahal by way of Lucknow and Cawnpore to-day and my bullocks are now ready, so shall sign

Respectfully yours,

EDWARD T. FOULKES.

THERMIT.¹

BEFORE I come to my subject proper, which relates to a material which depends for its peculiar and valuable properties upon the unique characteristics of aluminium, which, however, in some respects, it shares with magnesium, it may be worth while to draw your attention to a number of curious properties of this peculiar metal, in which again magnesium is found to behave similarly to aluminium, either in greater or less degree.

The obvious characteristic of aluminium with which we are all familiar, is its lightness; not only is it light in the gross, but chemically it is light also, its atomic weight being only twenty-seven. The low atomic weight carries with it, as is well known, a high specific heat, and this, together with its large latent heat, give rise to the peculiarity that it takes a long time to melt aluminium, even though the melting-point is only a little above that of zinc, namely, quite a dull red heat.

According to Richards, it takes more heat to melt aluminium than the same weight of cast-iron, two and a half times as much as for platinum, and nearly five times as much as for gold. When melted, at once a new peculiarity is apparent; it appears in the crucible to stand up above the lip, as though it were not fluid, it is sometimes even called pasty, and it seems as if it would be difficult to pour, yet it is perfectly fluid, and is capable of making the most exquisitely

fine castings. This capacity for standing up is simply caused by its high capillary constant, as compared with its density. In the workshop, aluminium, when pure, is a disappointing metal, and, in spite of the numerous aluminium solders, it is not so easy to handle where solder is necessary, as we should like.

In connection with the difficulty of soldering aluminium, it might be worth while to refer to a further peculiar property of aluminium, namely, its power of adhesion to glass when rubbed upon it.

This property of aluminium is described by M. Margot in the "*Archives des Sciences Physiques et Naturelles de Genève*" for 1894, but a sufficient account is to be found in that most valuable book, of which the title is "*On Laboratory Arts*," by Professor Threlfall. Not only does aluminium adhere to clean glass when rubbed upon it, more especially if the glass has been lightly dusted with rouge, or with alumina, but, strange to say, the very fine aluminium deposit so made can be soldered by means of M. Margot's aluminium solder, of which the proportions are ninety-two per cent tin and 8 per cent zinc. It seems extraordinary that it should be possible to solder pieces of glass together through the intervention of a rubbed-on film of aluminium, more especially when we remember how troublesome in the ordinary way aluminium is to solder. Professor Threlfall and Dr. Watson now solder quartz fibres in instruments by means of aluminium solder.

Aluminium further possesses the unique property of enabling clean metal ingots for plates, between which is interposed a thin sheet of aluminium, to be welded simply by hot rolling. The Compound Metals Company have kindly sent a number of specimens of sheets so made, and of articles made from them — from thick copper-plated steel for ships' plates to quite thin foil, including all kinds of combinations of metals. It is impossible to see any limit to the importance or ultimate scope of this process, and I should strongly urge that a paper dealing with it exhaustively should be arranged for by this Society.

Another very curious property of aluminium is its value as a fine hone; its capacity for giving a fine edge to razors, lancets, and other tools requiring a fine and keen edge, seems to me to indicate that, in spite of all the care that may be taken in casting, the oxide which forms upon its surface to a certain extent is diffused throughout the mass. I cannot believe, myself, that a pure soft metal, such as aluminium, can itself have any abrasive action on hard steel. If, however, ultramicroscopic particles of oxide permeated the mass, then it is not difficult to realize that an excessively fine hone would be the result. Perhaps the most remarkable property of all that aluminium possesses, is that discovered by Pollak, of acting as an electrode in a phosphate of soda solution, which will allow the current to go one way, but not the other, acting, in fact, as an electric valve when inserted into an alternating-current circuit, even though the pressure is as great as 180 volts.

However peculiar the physical characteristics of aluminium may be, it possesses a chemical property, in which, together with magnesium, it surpasses all other metals, namely, the production of an enormous quantity of heat on combining with oxygen.

It may be worth while, by means of a simple experiment, to give some evidence of this and of the high temperature evolved in the combustion of aluminium. I have here a small glass jar, in which two or three leaves of aluminium are lying loosely at the bottom. The jar is filled with oxygen gas. On dropping a minute splinter of red-hot charcoal into the jar, it at once sets fire to the metal, and a flash is produced of such dazzling brightness, that those who see it will not see anything clearly for a little time. It may be interesting to state that the oxide bombards the glass with such effect, as to apparently enter its substance, so that it can never be made clean and bright again.

The enormous temperature developed by the combustion of aluminium in oxygen, or when mixed with any material containing oxygen, has been made use of recently in an explosive of which I heard for the first time about a year ago, but I am not now able to ascertain what is being done with it. The explosive consists simply of ground aluminium and nitrate of ammonia. Here we have a mechanical mixture in the same sense that gunpowder is a mechanical mixture, as distinct from an explosive compound such as nitroglycerine, yet this mixture can be fired by detonation, when it explodes with the suddenness of a true chemical explosive. This is the more remarkable, as, unlike all recognized explosives, here the product of combustion is not wholly a gas, but largely a solid, so that there are only the residual gases of the nitrate of ammonia to produce the explosive pressure, and this is only rendered operative by reason of the fearfully high temperature. . . .

HEAT OF COMBUSTION OF ALUMINIUM.

Having spoken generally of the great heat of combustion of aluminium, I should next give some figures to make our ideas more precise. Instead of comparing the heat generated by the combustion of one pound or one kilogramme of a material, it is more convenient for the purpose of comparison to choose a number of pounds or kilogrammes that combine with 16 pounds or kilogrammes of oxygen, 16 being the atomic weight of oxygen. Richards, in his great work on aluminium, gives such a table, and the same figures may be deduced from Lupton's handy little table, from which it appears that magnesium heads the list with 145,860 large calories set free by the combustion in oxygen of 24.4 kilogrammes of magnesium. This is followed by aluminium, 18 kilogrammes of which in combining with same quantity of oxygen, set free 130,500 calories. The metals of

¹ A paper by C. V. Boys, F. R. S., read before the Society of Arts and published in the *Journal* of that Society.

the alkalis and of the alkaline earths follow closely. A long way behind come ordinary metals and hydrogen, while carbon, our best fuel, is far behind. Of ordinary metals iron is of special interest to us. Thirty-seven kilogrammes in becoming Fe_2O_3 give out 63,700 calories or absorb this amount of heat in being reduced again. If the reduction is affected by the action of 18 kilogrammes of aluminium, the heat developed will be $130,500 - 63,700 = 66,800$ calories. As 71 kilogrammes of material are involved, i. e., as nearly 1,000 calories are set free per kilogramme of mixture, the temperature attained must be several thousand degrees if the mean specific heats of alumina and iron through that great range of temperature and their latent heats of fusion are at all comparable with those of ordinary materials. Another consideration—limiting temperature—is the inability of elements to combine when a certain temperature is exceeded so that a higher temperature cannot be produced by their combustion. In the case of our ordinary fuels, carbon and hydrogen, it is this rather than lack of heat units that limits the temperature of a furnace fed even with hot oxygen. In the case of aluminium, however, a much higher temperature is possible; while, therefore, the total development of heat of the reaction just described is known pretty accurately, it would be difficult to calculate with precision the temperature reached on account of our imperfect knowledge of the latent heats of alumina and of iron and of the varying specific heats of the materials at these high temperatures.

The temperature could be determined by radiation measures on the principle of the "absolutely black body," which, however, seems a strange way of speaking of such a dazzling blaze, but I am not aware that any measurements of the kind have been made as yet. Wyborgh, however, has made a measurement involving of necessity considerable extrapolation. He placed a small charge of fulminate of mercury in a magnesia tube, and having prepared a number of identical specimens, he subjected them suddenly to known temperatures by casting metals round them at these temperatures, then, when the fulminate reached a certain temperature, it exploded. The times taken between the casting of the metal and the explosion was observed to get less, of course, as the metal was hotter up to the highest measurable temperature, as follows:—

Temperature of Metal.	Time before Explosion.
300 degrees C.	180 seconds.
1,900 degrees C.	30 seconds.
2,000 degrees C.	29 seconds.
2,100 degrees C.	28 seconds.
2,250 degrees C.	27 seconds.

When the melted metal was replaced by the thermit-iron the explosion took place in 22 seconds, from which a temperature of about 3,000 degrees C. was deduced.

Of course extreme accuracy must not be looked for after so great an extrapolation, but the result cannot be seriously incorrect.

THERMIT-IRON AND METALS.

Not only iron, but other metals, as already mentioned, may for similar reasons be obtained in a state of great purity and fused by this process. I would specially point out that the iron obtained in this way, though it is fluid, and may be cast in moulds, is not "cast-iron," but pure metal wrought-iron. It may have its softness modified somewhat by the admixture with the thermit of small quantities of manganese, titanium, chromium, or other metal, or it may be carbonized to a moderate extent by adding to the mixture high carbon steel or cast-iron. The temperature is in any case so high that it is desirable to reduce it somewhat. This is most advantageously done by the addition of some ten per cent or so of sheet-iron punchings, where the thermit-iron is intended for welding, or even a larger amount where a lower temperature will suffice. This possesses the further advantage that the yield of iron per pound of material is increased. When in future, therefore, I speak of thermit-iron as being used in any welding operation, I do not mean "cast-iron," or necessarily pure iron free from carbon, but iron to which, if desired, the required degree of hardness has been given by the addition of one or another of the materials mentioned, but which is always ductile.

HISTORY AND DEVELOPMENT.

The history of thermit dates back to the year 1894, when Claude Vautin, of the city of London, made use of aluminium mixed with metallic oxides, sulphides, chlorides, etc., to effect a corresponding reduction of metals with which oxygen, sulphur, or chlorine might be combined. He found on mixing aluminium in a finely divided state with these bodies, that the mixture when heated in the crucible to a sufficient temperature, would react as already described, and that the mass would attain an intense heat, in virtue of the enormous heat developed by the oxidation of the aluminium. So great was the temperature, that metals ordinarily intractable and infusible, such as chromium, could be reduced and obtained in a compact form. Not only this, but the absence of carbon made it possible for the first time to obtain many such metals with a degree of purity hitherto unknown. One drawback, however, resulted from the very great temperature set up, namely, there was risk of losing a large proportion of the contents of the crucible, which was apt to be more or less violently projected into the air.

The next stage in the development of this subject, as shown by the records of the Patent Office, was made by Vautin a little more

than two years later. In his specification of 1896, Mr. Vautin describes his next step. Instead of heating the materials in the crucible up to the point at which reaction begins, he ignites a portion of the cold mixture by the aid, either of burning magnesium, or of a special ignition-powder, which he there describes, consisting of finely divided peroxide of barium and aluminium. This mixture is specially valuable for creating high temperatures, because the peroxide of barium is quite ready to give up its extra atom of oxygen, and the product—namely, baryta and alumina mixed—is solid, so that there is no loss of temperature owing to the latent heat of a liquid, or still more so of a gas. A little of this mixture, which is easily lighted by a match, may be placed upon the mixed oxide of chromium, manganese, or whatever the metal may be, and aluminium, and ignited. The local heat is so intense as to start the reaction in the mixture in immediate contact with it. The heat produced by this is so great as to set up the reaction in surrounding quantities, and so a combustion gradually proceeds through the mass, after which the metal is found at the bottom of the crucible, in a pure melted state, and the alumina, or oxide of aluminium, remains floating on the surface.

So far as the records go, there is no means of telling what Vautin did with his invention; judging by my experience of the way in which invention is looked upon by the majority of our English manufacturers and capitalists, it is likely that Vautin can have found nothing but discouragement wherever he turned. This, however, is pure imagination on my part; I have no direct knowledge that it was so. At any rate about six months later we find that Vautin's mixture began to be turned to account in Germany, where Robert Deissler made use of the heat of the reaction as a convenient way of heating up metal quickly.

DR. GOLDSCHMIDT'S INVENTIONS.

Nearly three years later we find Dr. Hans Goldschmidt coming upon the scene with a further invention for utilizing the heat of the reaction that I have described, for the purpose of welding iron. To Dr. Goldschmidt further, I believe, should be attributed the invention of the word "thermit," a convenient fancy name for the mixture, especially of aluminium and oxide of iron in fine grain, and in chemical proportion. Dr. Goldschmidt has been most active in the last few years in the development of a number of inventions designed to utilize either the heat of the reaction or the product of the reaction, or both. Supposing, for instance, that a butt weld is desired between two bars of iron or steel, or between two pipes or angle-irons, or channel-irons, or iron bars of any other section, two distinctive methods have been devised by Dr. Goldschmidt. From what I have already said, you will understand that a crucible of the mixture which I shall now call thermit, after ignition consists of two layers, iron below, in an amount nearly half the weight of the original thermit, alumina above, both at a temperature approaching 3,000 degrees C., so that it cannot be looked at without risk to the eyes. This double layer may be taken out of the crucible by either of two methods; it may either be poured out of the top, like castor oil over ginger wine, in which case the lighter material goes first and is followed by the heavier; or it may be run out through a small orifice at the bottom of the crucible, in which case the heavy iron will go first, and be followed by the lighter alumina.

PIPE WELDING.

In the case of a weld in a pipe, or in an angle-iron, it is probably desirable that the body of the weld shall, when finished, be identical in section with the rest of the material, so that on no account must any iron produced by the action of the thermit remain adherent. If this is the object, a simple mould is placed round the pipe or bar to be welded, leaving a space which experience has found to be suitable, the two ends are securely held in position by means of clamps, so that when desired a considerable pressure can be exercised between them. Then, when all is ready, the charge of thermit in the crucible, the amount of which for each section is known to a nicety and is tabulated, is ignited, and as soon as the fluid has become quiet, it is poured into the mould. As it is difficult to see the mould in consequence of the glare from the crucible, it is desirable just to splash a little alumina as near as can be judged, into the mould, when at once the glare from this will make the opening into the mould easily seen, and the rest of the mixture can be gently and gradually poured in. Now, in this operation, the alumina going first immediately chills in contact with the cool metal, thus forming a protecting layer, which prevents the iron that follows from damaging, or adhering to the bar. The heat of the mixture—again iron below and alumina above—quickly heats up the bar or tube to the welding point, and if the space below, where the iron is, has been properly proportioned, and a proper quantity of thermit has been taken, the temperature of the bar or tube will reach the welding point, but will not reach the melting point. After a time, varying from one minute to three or four, according to size and thickness, it is merely necessary to exert pressure by means of the clamps, and the weld is complete. Immediately—that is while still white-hot—the mould is removed, and the hot iron and alumina are knocked away, when there is nothing more to be done but to leave it to cool.

The moulds for this pipe welding, the dimensions of which have been carefully tabulated by Dr. Goldschmidt, may either be made of two casings of sheet-iron with sand between, or sand moulds of the right form, such as are used in foundries, may be employed. The

crucibles are not of the usual kind adopted to be heated in a fire, but consist of a perforated sheet-iron casing lined with an inch or more of magnesia.

RAIL WELDING.

The second method of making a weld is that which now appears to be, commercially, the more important, namely, to use, not only the heat of the reaction, but to utilize the iron formed by the thermit as well as the heat. Perhaps the most extensive use that has been made of this method of welding, at any rate in this country, has been in the welding of street tram-rails. In this case, there is no objection whatever to the thermit-iron being allowed to adhere to the rail ends, forming a shoe round the foot and web of the rail. By this means the heat of the reaction is more completely utilized, so that a smaller quantity of thermit is sufficient to raise the ends of the rail to the welding point, and even to melt, to a certain extent, the surface. . . .

Tests speak for themselves, and show (1) that the joint is far stiffer than the usual one made with fish and sole plates; (2) that the electrical conductivity is better than that of the unjointed rail; and the conclusion is that there is no more any occasion to subject the rolling stock and the nerves of the passengers to the continual hammering of imperfectly connected rail ends.

Besides Leeds some fifteen other towns, mostly in the north, have used thermit joints, but up to the present not to the same extent.

Before dismissing the question of the welding of tram-rails, whether the welding is performed by the thermit process or is made electrically, I feel that I must, in spite of having done so many times already, refer to the expansion bogey which seems to scare so many people. I will not now go into all the figures, I have already done this elsewhere, but the general results may be stated. Tram-rails that are buried in the street, as distinct from rails on our main lines that are exposed over their whole surface to the air, do not go through a large diurnal change of temperature, and even the annual range of temperature is very much less than that of the atmosphere. With a rise of temperature, the rail of course tends to expand, and with a fall, to contract, and the forces set up are, if that expansion or contraction is resisted, pretty considerable; but with the steel used for tram-rails, these forces are insignificant compared with the tensile-strength of the steel, being only about 300 pounds of tension to the square inch for every degree that it falls in temperature. Similarly, where there is a curve in the road, the lateral forces due to expansion or contraction become infinitesimal where the radius of curvature is large, and where it is small, an imperceptible movement of the rail, extending over half the year, is sufficient to relieve it of strain. The most serious conditions are those in which a sharp curve in a vertical plane, such as may be found in crossing a narrow bridge, unites two long straight lengths. Such conditions might lead to the actual lifting of the rail and, with it, of the road bed, in prolonged hot weather; but then there is no necessity to make use of a weld in the very few places which can be found, where a weld is likely to introduce trouble.

There is another point to which I should like to refer, before dismissing the welding of tram-rails: objection is often taken, that however good the joint, or however perfect the system may be, it must be a terrible undertaking to make any alteration in the rails when they are all welded into a single piece. Of course this objection, so far as it goes, applies equally to electrical and other methods of welding rails, besides that with which we are specially concerned this evening. The objection really is a purely imaginary one. Any one who has used a hack-saw only once or twice, and broken it or hurt his fingers in the attempt, cannot understand what a marvelously efficient instrument the common saw worked by hand is, in the hands of a man who has acquired the knack of using it. The tram-rail has a section of about 10 square inches, and is made of steel of moderate hardness. I was amazed, even though I believe I can use a hack-saw with some effect, to hear that both at Leeds and Liverpool they have a man who can saw through the rail in twenty minutes, and who does not think much of the proceeding. How long it would take to remove fish-plates and sole-plates, held as they are by eighteen or twenty 1-inch or $\frac{7}{8}$ -inch bolts, well rusted up or covered with pitch, I do not know, but the margin under twenty minutes cannot be so great as to make the sawing, where it really may be required, in any serious degree an objection.

MACHINE REPAIRS.

The thermit weld may be of very great value in a break-down of machinery, for a piece that is broken away from a steel forging or casting, or even from an iron casting, may be replaced by thermit-iron run into a proper-shaped mould; or if a crack has developed this may be enlarged with a chisel, and thermit-iron run in and through the space, sufficient in quantity to heat it up so as to make a complete and perfect weld. Owing to the kindness of Mr. J. H. Jurriaanse, of Rotterdam (Wynmalen and Hansmann), I am able to show you a slide of a most interesting repair of this kind. The connecting-rod of a large steam-engine, driving all the machinery in a wire, nail and rivet factory in Holland, where five hundred men were employed, broke in the fork in one end, and it was of the utmost importance that this should be repaired immediately, as work was stopped until it was done. The repair of this connecting-rod was undertaken by Mr. Jurriaanse, who, having the drawings, prepared the necessary

mould, and had it ready when the connecting-rod arrived. The photographs show the several stages of the repair, and it may be sufficient to quiet those people who never cease to be afraid of the effects of expansion and contraction, if I tell them that when the joint was cold, the connecting-pin, which had previously held one side of the fork correctly in position, simply dropped out. The whole of this repair was effected within twenty-four hours.

I should like to express at this step my admiration of the skill and ingenuity with which Mr. Jurriaanse has utilized the powers of thermit. I have seen a number of specimens of experimental joints and of runners made by him, and it is impossible to imagine how they could be improved. Mr. Jurriaanse, whose experience is very great, has told me of one or two little points of detail which are of so much importance, that I should like to refer to them. In the first place, he adopts a plan to prevent the sand which is placed at the bottom of the crucible from entering the mould, a plan which would at least surprise any one seeing a thermit joint made for the first time. Having got everything ready for a run, Mr. Jurriaanse places a piece of $\frac{1}{4}$ -inch iron plate over the opening in the mould, and then, when he taps the crucible in the usual way, the first splashing of iron and sand is scattered, but the iron plate is no bar to the entry of the thermit-iron that follows, and so the iron enters the mould, but the sand is kept out. Another point of importance—in which the beginner persists in going wrong—is to wait for a time, which in the excitement seems interminable, say half a minute or so after the reaction is complete, before tapping. This allows gas and particles of slag to get well separated from the metal, and a more clean and perfect run is to be expected, than any that can be obtained if the tapping of the crucible is effected with undue hurry. There is another point to which he attaches some importance; in order to ensure that the crystallization of the metal shall be of fine grain, he gently and continuously taps with a hammer the steel upon which a thermit weld is being made, from the time of the setting of the metal until the crystallization may be considered complete, and finally he pays great attention to a careful preliminary heating and annealing, where that is possible.

As an example of an engineering repair which I fear it would be difficult to get accepted in this country, I am able to show slides of a repair made in Austria, for the Austrian State Railways, to a locomotive driving-wheel, from which you will see that in three places, the spokes have had a break satisfactorily repaired.

A question that will very naturally be asked is: To what extent are welds made in this way? really welds, and not mere patches, and if welds, to what extent may the utility of an otherwise sound weld be destroyed by contraction strains? I think the best answer to this is found in the fact that not only have broken teeth been replaced in steel wheels, and stood up to their work, but a far more difficult operation, and one which involves the most severe stresses known in engineering, has been successfully accomplished. I refer to the casting of new steel journals on the ends of the broken rolls of a rolling-mill. This is hardly so direct an operation as any that I am describing this evening, and would take too long to describe in detail; but the method was devised by Professor Matthesius, now appointed Professor of Metallurgy in the University of Berlin, and has been successfully accomplished. If a thermit-welded roll will stand to its work, it is hardly necessary to discuss the soundness and strength of the weld. I cannot give a better example of the British (it was in Scotland) mode of being interested in the progress of the arts than the answer of one of the engineers of a great steel works, to whom I was describing this process, as I saw a number of broken rolls lying about. He showed his superiority over a mere outsider, and his just appreciation, in the following words: "The thing is ridiculous, the roll cost £300."

SHIP REPAIRS.

The success with which steel of moderate dimensions, such as has already been described, may be welded by the aid of thermit, naturally leads to the inquiry as to how far it would be applicable when the section of the metal, when a weld is desired, is very much greater, say, than 10 square inches. It is difficult, at first, to realize the possibility of heating solid steel with a sectional area of, say, 50 or 100 square inches to the welding point, without at the same time heating the metal through a considerable distance, which would inevitably be the case if the heating were performed by the use of an ordinary forge fire, which would require a greatly increased quantity of heat. The fact that thermit puts into our hands a temperature at least 1,000 degrees C. above that available in the forge, and the fact that the thermit-iron carries its heat at a rate enormously greater than that at which hot furnace gas can possibly carry it, simply on account of its far greater density and conductivity, completely alter the usual circumstances, and further, the relatively less conductivity of the solid metal for heat when dimensions are great, as compared with that where the dimensions are small, makes it by no means so prohibitive a process to weld steel of the great dimensions of the propeller shafts or the framings of ships, as at first one would be led to expect.

In the case of a repair to a ship, the stake is so great that there must have been great anxiety when the first repair of the kind was effected. This has now become almost a common operation on the Continent. The importance of the subject is such that it will be worth while to spend a short time describing, by the aid of photographs kindly furnished by Dr. Goldschmidt and Mr. Jurriaanse, some of these repairs. The first of these shows the repair in various

¹ "Proceedings of Civil Engineers," vol. cii., 1902, pp. 102-5.

stages of the tiller arm of the steamship "Assyria," 6,581 tons, which was welded fourteen months ago. The second shows the repair, in different stages, of a 13-inch crank shaft of one of the Rhine paddle steamers. This is the more interesting, as the position of the fracture is such, where the shaft and the crank web join, that the stresses, twisting and bending combined, are most severe, and the repair could not have lasted had it not been effective. In this case, the crack was found extending more than half of the thickness of the shaft. The metal was cut away by means of cross-cut chisels, so as to form a gap about $1\frac{1}{4}$ inches wide, until the bottom of the crack was reached. The process was carried out in the manner already described, but a ring of thermit-iron was left on. The ship has been running ever since, and the result is entirely satisfactory. A certain number of repairs have been made in the stern frames of steamships which have been damaged in collision. The photographs of the S. S. "Sevilla," 5,135 tons, showing the repair in various stages, are of special interest. The metal at the crack is cut away, until a space of 1 or 2 inches is left. A mould, consisting of sand with sufficient clay to make it less friable, is prepared, in two or three sheet-iron boxes, so as to allow of the entrance of the metal at the lower part of the desired cast, and of the overflow of so much metal as would ensure the passage of enough thermit-iron through the gap to bring the metal up to the welding point, and superficially melt it. In the case of the S. S. "Sebenico," in order to avoid any contraction flaws, the stern-post was forced outwards by means of a powerful screw-jack before the metal was run, and then, as the cooling began, the jack was gradually released, so as to keep the joint in a state of compression. Of these ships, the "Assyria" and the "Sevilla" belong to the Hamburg-American line, and from the time of the weld to the present, *i. e.*, about fourteen months, they have experienced the usual Atlantic weather, and no trouble has resulted. The "Sebenico" repair was carried out in the floating dock, at Trieste, and was also entirely successful.

One of Mr. Jurriaanse's repairs to a dredger is interesting in that the heel just under the rudder frame had been broken away in running aground. In this case, a new piece over 3 feet long was forged to replace the missing corner, but it was purposely made too short, so as to leave a gap at each end. This was welded at both places as described already. The photographs will make the process more intelligible.

LUNKER AND TITAN THERMIT.

Referring back to an early paragraph of this paper you will remember that I showed how, not only iron, but other metals may be reduced from their oxides by the aid of aluminium. In this way chromium, manganese, titanium, tungsten, and a number of metals may be obtained, free from carbon, and suitable for the purpose of making alloys, specially of copper or of steel. Specimens of several of these are upon the table. There is, however, a use for thermit containing some of these metals, to which I would refer, namely, the use of small tin boxes containing what Dr. Goldschmidt calls "lunker" thermit or "titan" thermit, which may be plunged at the end of an iron bar, into ladles of cast steel or of cast iron, where the reaction sets up such a development of heat and such a churning and mixing of the metal as to make it possible to run thin and extensive castings in steel or in iron which, in the ordinary way, would be impracticable. The British Westinghouse Company have kindly given me permission to state that they are now using lunker thermit with this object, and they have sent me some specimens of castings so made which they found impossible before, of which specimens are upon the table.

The production of heat has been ingeniously made use of to prevent the formation of cavities in steel ingots. A small box of thermit, prepared for the purpose, is pushed into the head of the ingot just as the crust is beginning to form. The heat set up there is so great that, as the metal below gradually solidifies, the cavity which ordinarily is formed, and which spoils the upper third of the ingot, is kept supplied with hot, fluid metal, so that a very much smaller proportion of the ingot is wasted. The same purpose has been served where very extensive steel castings are made, by putting small boxes of special thermit in the risers at the distant parts of the mould. Where hitherto the metal on reaching the riser has become too cool to be able to run back to supply the contracting metal during the process of feeding; the metal in the risers is made so hot, by the use of the thermit, as to get over this difficulty.

ARTIFICIAL EMERY.

Even the slag is useful. This being almost pure alumina, fused and crystalline, is nothing more than emery of unusual purity and sharpness, and emery wheels may be made of it.

THE VALUED POLICY LAW.¹

WHILE the courts have held that the legislatures of the different States have the right to enact a Valued Policy law, they have not settled the question whether such laws are of benefit to the people. I contend that they are harmful, have a tendency to increase incendiarism and certainly increase the cost of insurance.

A careful investigation of this question will show that the citizens in the States that have Valued Policy laws are paying from 50 to 150

per cent more for the same class of insurance, to the same companies, than citizens of the States where no such laws exist, and that the insurance companies are making more money in the States that have no such laws than they are making in the States that have enacted such laws. Valued Policy laws are found on the Statutes of several States, and many have been vetoed, so they are neither new nor novel. The effects have been investigated by the best authorities in the country. Governor Shaw, of Iowa, in his veto of such a law, in May, 1900, said:—

"I have sent representatives to several States where such laws were in force, and found that the cost of farm insurance had been doubled in Missouri, and had been largely increased in Wisconsin and Minnesota."

His opinion was that such a law was pernicious, costly and dangerous; that in order to reduce fire losses there should be some inducement for owners to throw water instead of oil on incipient fires. "The bill," he said, "is not rejected in behalf of insurance companies, but because I am convinced it will increase our rates out of all proportion to any advantage that might be gained thereby."

Governor Pattison, of Pennsylvania, in vetoing a Valued Policy bill, said:—

"Such laws are conducive to over-valuation and over-insurance. They breed fraud, perjury and arson; are dangerous and demoralizing. Commonwealths which, in obedience to a false public clamor, have engrafted such laws upon their statutes have reaped a whirlwind."

Governor Altgeld, of Illinois, in vetoing such a bill, said:—

"Insurance is an indemnity not a speculation. It is intended to protect a man against loss, not to give him something for nothing. Its object is to make a man whole, so that he shall be no worse off after a fire than before. The principles involved in this bill would enable a man in many cases to be twice as well off after a fire as he was before. In all cases where a dishonest man could, by conniving with agents or in any other way, secure insurance for more than the real value of his property, a fire would be a blessing. There would be a standing bribe, a perpetual inducement to allow his property to burn.—I will not say to have it burn. And when it is remembered that a fire in one building always endangers and frequently destroys property near by, which often is not insured, it would be bad policy for the State to permit a condition of affairs to exist which, to say the least, tends to increase fire. It is true that several of the States have adopted acts similar to this bill, except that they provide against fraud, which this bill does not; but in these States experience has shown that the proportion of fires has greatly increased; consequently, the insurance rates have been raised in all these States, and the general public, which pays insurance, has in this way been taxed to an extent which would otherwise not have been—and this largely for the benefit of the very few who were fortunate enough to have a fire which totally destroyed their property."

In 1899, Governor Thomas, of Colorado, vetoed a valued policy law and said:—

"The experience of other States under legislation like this is most instructive. In every one of them the proportion of fires has greatly increased, and the ratio of this increase presupposes incendiarism. The natural and necessary result has been an increase in the rates of insurance, which means an additional tax upon the insuring public. The increased burden which these laws impose upon the insured is shifted by him upon the mass of policy-holders, and the community is the ultimate sufferer. From every standpoint the measure is a vicious one; from none of them can its policy be defended. Protection against loss is the only possible basis of sound fire insurance, and any departure from it will pave the way for the perpetration of fraud and wrong."

In 1895 the Commissioner of Insurance of Ohio, in his Report, referring to the Valued Policy law, said:—

"To say that fires have steadily increased since the enactment of this obnoxious law is to put it mildly. In my judgment, no man ought to receive from the insurance companies a dollar more than his actual loss. The Legislature of Ohio ought to have repealed the law years ago. The rates have steadily increased since the enactment of this law, clearly showing that the honest people in the end are compelled to pay for the dishonest losses. The existence of this law in Ohio has, in my judgment, been the cause of the destruction of hundreds of thousands of dollars' worth of property belonging to innocent persons."

The Insurance Commissioner of Wisconsin says:—

"The very foundation principles of fire insurance are opposed to such a law. Fire insurance is indemnity; it should never be gain.

"It is intended only to make good the actual loss sustained; and to make a company liable in case of total loss for the full face of the policy, irrespective of the value of the property, has been the means of increasing the number of fires, and has compelled the payment of thousands of dollars, thus increasing the rates to the honest man."

¹ From the Thirty-third Annual Report (1902) of the Insurance Department of Missouri, Hon. Thos. H. Wagner, Supt.

In 1894, the Superintendent of Insurance in Missouri says, in relation to the Valued Policy law:—

"This is simply an incentive to perjury and arson. Neither the insurance company nor the insured should be permitted to enter into such contracts. The law should require that every person should help to insure his own property."

It has been universally conceded by all who have had experience with the law that it is bad in principle and effect. There is nothing clearer than that the insured pays all losses. Insurance rates are based on the loss ratio. If for any reason the insurance companies failed to collect from the insuring public sufficient to pay losses, taxes and expenses, they must necessarily fail. So in the end, and all the time, the insuring public pays the bill. Valued Policy laws are of no benefit to the honest insurer. He insures for indemnity, not for speculation. Not one man in fifty could be induced to over-insure his property. As long as he is but partially insured he does everything he can to prevent and to put out fires. It is the fifty-first man, the firebug, who has settled down among the fifty honest men, who speculates on misfortune and throws oil instead of water on the little blaze he has himself started. That little blaze becomes a conflagration, and the property not only of the scoundrel who makes money out of misfortune, but of his fifty honest neighbors who are not insured or but partially so, is destroyed. The friends of Valued Policy laws seem to have only in mind the interests of the fifty-first man in their advocacy of the law.

The fire waste of this State makes it imperative that all thoughtful men, and especially the law-makers, should consider ways and means of lessening the annual increasing fire-loss. Only by rigid legislation can this ever-increasing vast waste of wealth be saved to the State. A law prohibiting the collecting of more than three-fourths of the actual value of property destroyed by fire from insurance companies, and compelling the companies to return to the insured all premiums collected on valuations in excess of that amount, would, in my opinion, reduce the fire loss and cost of insurance in Missouri fully one-half.



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

A COMPETITIVE DESIGN FOR THE CATHEDRAL OF ST. JOHN IN THE WILDERNESS, DENVER, COLO. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON, MASS.

THE architects desire to point out that a proper regard for the amount of money at the command of the diocese, caused them to refrain from attempting to give their design the elaboration which one usually expects to find in a "cathedral" building.

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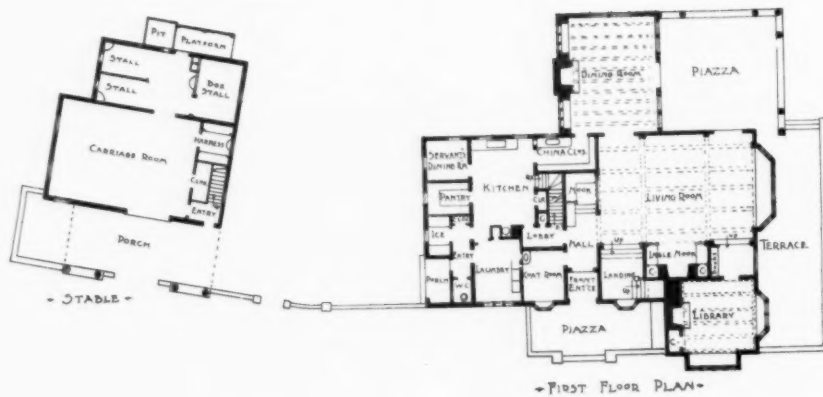
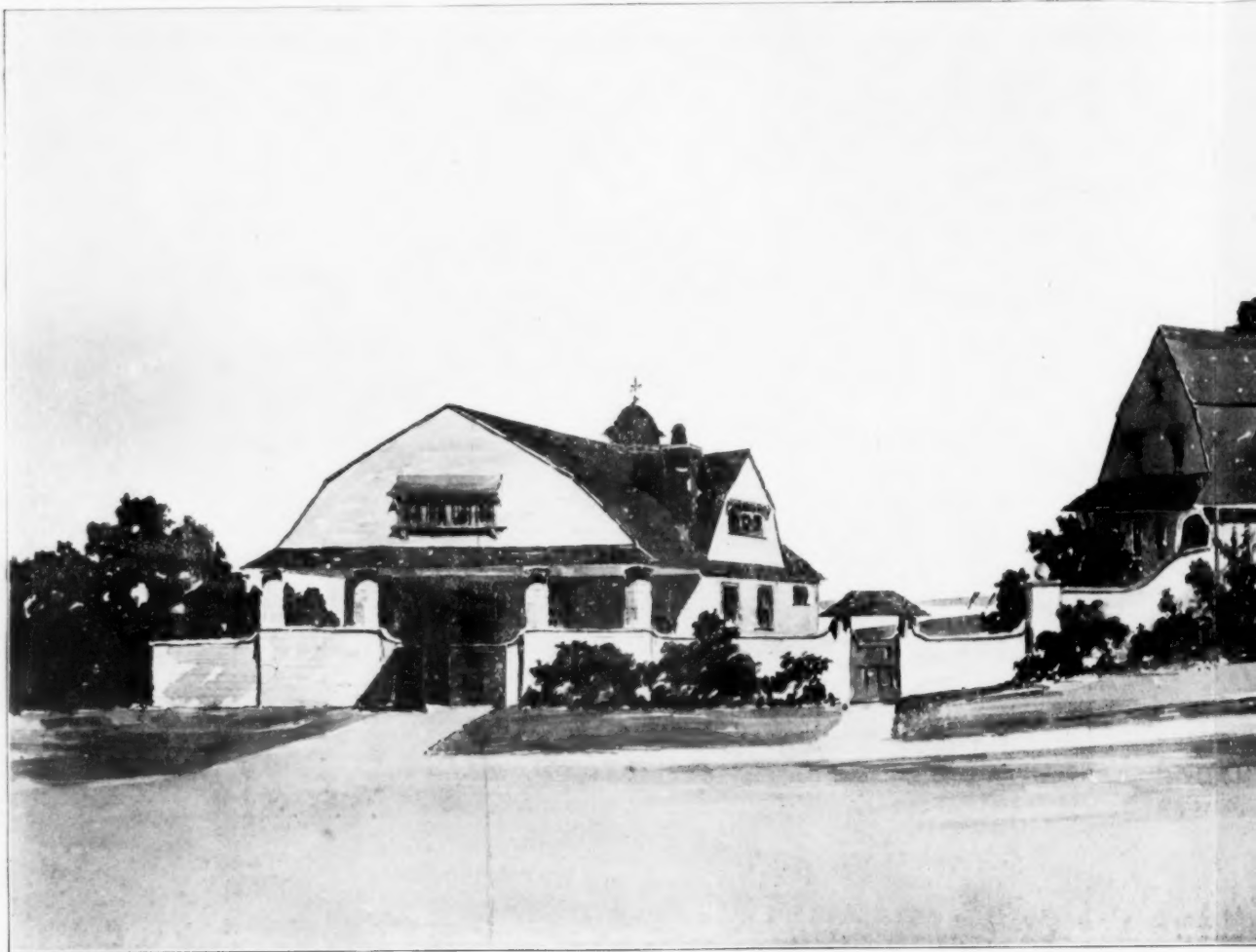
THE INVENTOR OF PORTLAND CEMENT.—Very few of the thousands who make use of Portland cement, and still fewer of the millions who benefit by its use, have ever heard of Joseph Aspdin, the inventor of a material to which we owe many of the great engineering works of the present day. Aspdin was a Leeds brick-maker who, in 1813, conceived the idea of combining chalk with clay from the river bed, drying and

calcining the mixture at a high temperature. In the year 1824 he patented the invention, and soon afterwards opened a small cement manufactory at Wakefield, and a few years later his son William Aspdin established a cement factory near Chatham. The peculiar advantages of the new material were soon recognized by engineers, and Brunel was one of the first to make use of it, employing Aspdin's patent cement in the construction of the Thames Tunnel. It is true that rival claimants have arisen to claim the honor of inventing Portland cement, but it is now recognized by competent authorities, not only in this country, but also in France, Germany and Italy, that the palm belongs by right to Joseph Aspdin. In other departments of work, there is a commendable readiness to recognize the services of those who have contributed to the advancement of science and art, but at the present moment Aspdin is literally a forgotten genius. The suggestion is now made that a public memorial should be raised in Leeds to the inventor of Portland cement, and we feel sure that this proposal will meet with the hearty support of architects, engineers and contractors in all parts of the world.—*The Builder*.

BURIED ALIVE IN THE BALTIMORE FIRE.—"In the financial district destroyed the vaults were found intact. In the Continental Trust Company Building it had been the custom to lock a watchman inside the vault Saturday night, with food enough to last him until Monday morning. When the fire occurred the time-lock prevented his rescue. He stayed there during the progress of the fire, while the building burned and other buildings fell about it, all day Monday. The debris was too hot to enable any one to reach him until Tuesday morning. When the vault was unlocked he came out smiling."—*Cincinnati Commercial Tribune*.

ANTIQUITY OF CIVILIZATION.—So far as the question of time is concerned, it deserves notice that not merely geology, but almost every form of inquiry into the past, throws farther back the limits usually assigned. Egypt, for instance, is continually furnishing fresh proofs of the antiquity of civilization. Prof. Flinders Petrie expounded at Owens College, Manchester, England, a few days ago the results of recent explorations at Abydos, in Upper Egypt, from which it appears that the ruins at that one spot tell a continuous story that carries us back to 5000 B.C. Abydos was the first capital of Egypt, and remained for forty-five centuries the religious centre, the Canterbury of the land, and there the Egyptian Exploration Fund has unearthed the remains of "ten successive temples, one over the other." From the age of the first temple a group of about two hundred objects has been found, which throw surprising light on the civilization of the First Dynasty. A part of a large glazed pottery vase of Mena, the first king of the First Dynasty, about 4700 B.C., showed "that even then they were making glaze on a considerable scale, and also inlaying it with a second color. The ivory carving was astonishingly fine, a figure of a king showing a subtlety and power of expression as good as any work of later ages." At about 4000 B.C. an ivory statuette of Cheops, the builder of the great pyramid, was found, the only portrait known of him. Making every possible allowance for the marvellous rapidity of art development, must not many thousands of years have rolled over between the pristine dwellers in the Nile Valley and the men who carved ivory statuettes and manufactured glazed work inlaid with second colors? It is a long, long march from flint implements to the solemn temple, ivory statuettes and human portraits.—*From the London Telegraph*.

SALT LAKE ONCE A PART OF THE PACIFIC.—A dispatch from Salt Lake City, Utah, states that Mrs. B. F. House, a former Cincinnati woman, has made a discovery which proves conclusively to scientists, according to the dispatch, that Salt Lake was once a part of the Pacific Ocean. For years geologists and learned scientists, including experts from the Smithsonian Institution, have made vain efforts to discover some convincing proof that the inland sea was once a part of the great Pacific. Parties of scientists have lived on and travelled the shores of the big lake, but none of their discoveries were ever accepted as positive proof. The discovery made by Mrs. House which is accepted by many as proof positive is a piece of spongelike coral, but contains salt sea periwinkles, which a number of scientists claim are only found in ocean coral. Diligent search was made for other specimens, but the big coral rock, yellow with age, was all that could be found. Professor Henshaw, geologist at the Walnut Hills School, said that while the discovery was a great one, and while it was the most convincing proof yet established, he would not accept it as positive, although he had never heard of any like specimens being found except in the ocean. O. W. Martin, Professor of Geology at Hughes High School, said: "The discovery is indeed the most important one ever made in that region, and will undoubtedly interest scientists and geologists all over the world. Many efforts have been made to establish some positive proof that Salt Lake was once part of the Pacific, but they have all failed. While the discovery, as reported, would afford the most positive proof we have ever had, I could not accept it as conclusive proof. The question of whether Salt Lake was once a part of the ocean has been agitating scientists and geologists for many years, and this recent discovery will no doubt be of great interest to all of them." Mrs. House is the wife of the chief engineer of the Western Pacific surveying corps. M. F. Guyer, the Professor of Geology at Cincinnati University, when asked his opinion of Mrs. House's discovery, said: "While it is very strong evidence and probably the most important discovery to that end that has ever been made, I do not think it will be generally accepted as positive proof that the inland sea was once a part of the Pacific Ocean." One thing is certain—it is the first piece of coral ever discovered in an inland body of water that contained periwinkles, and it is almost conclusive evidence that Great Salt Lake was once a part of the Pacific Ocean.—*Cincinnati Times-Star*.



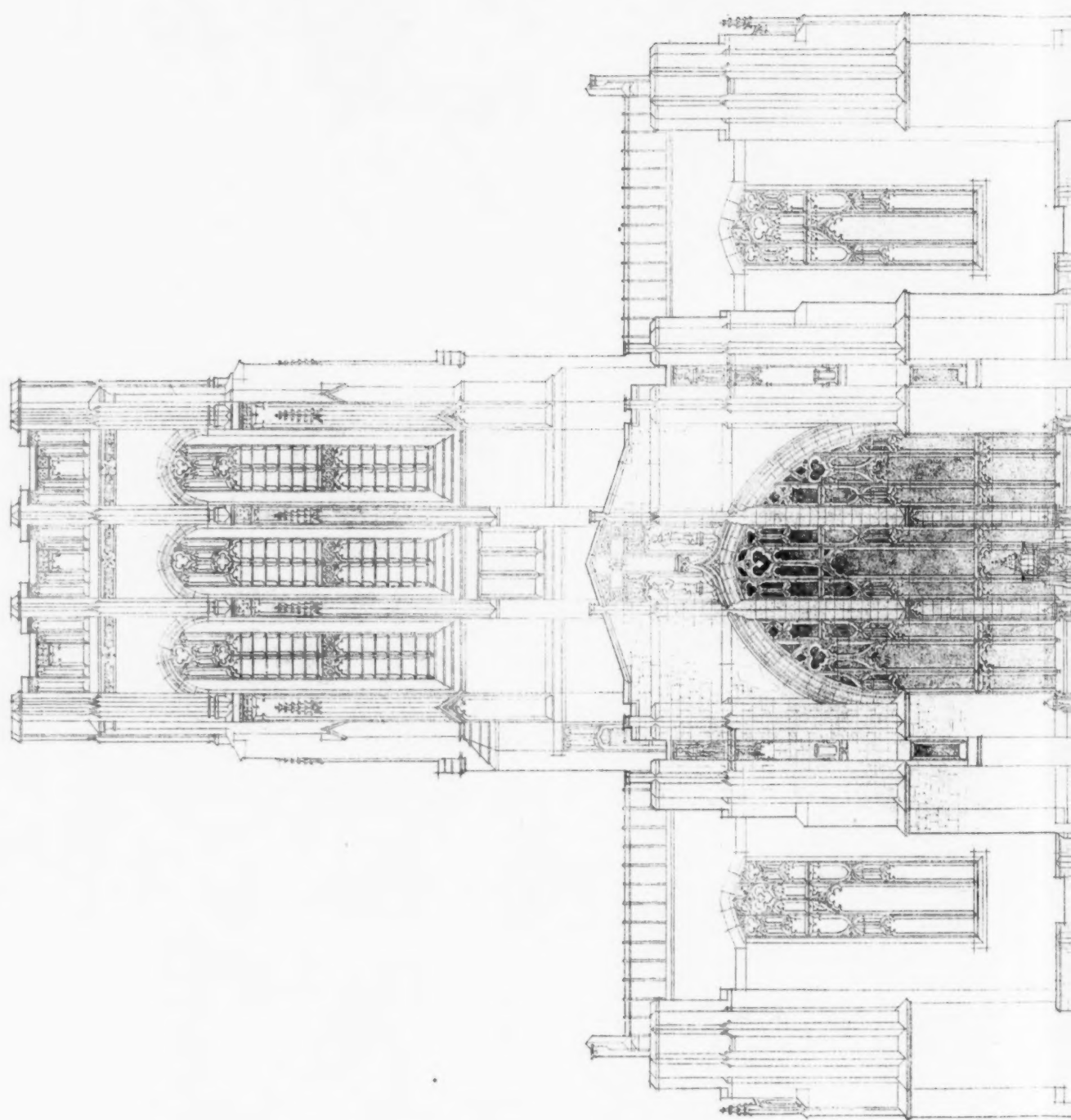
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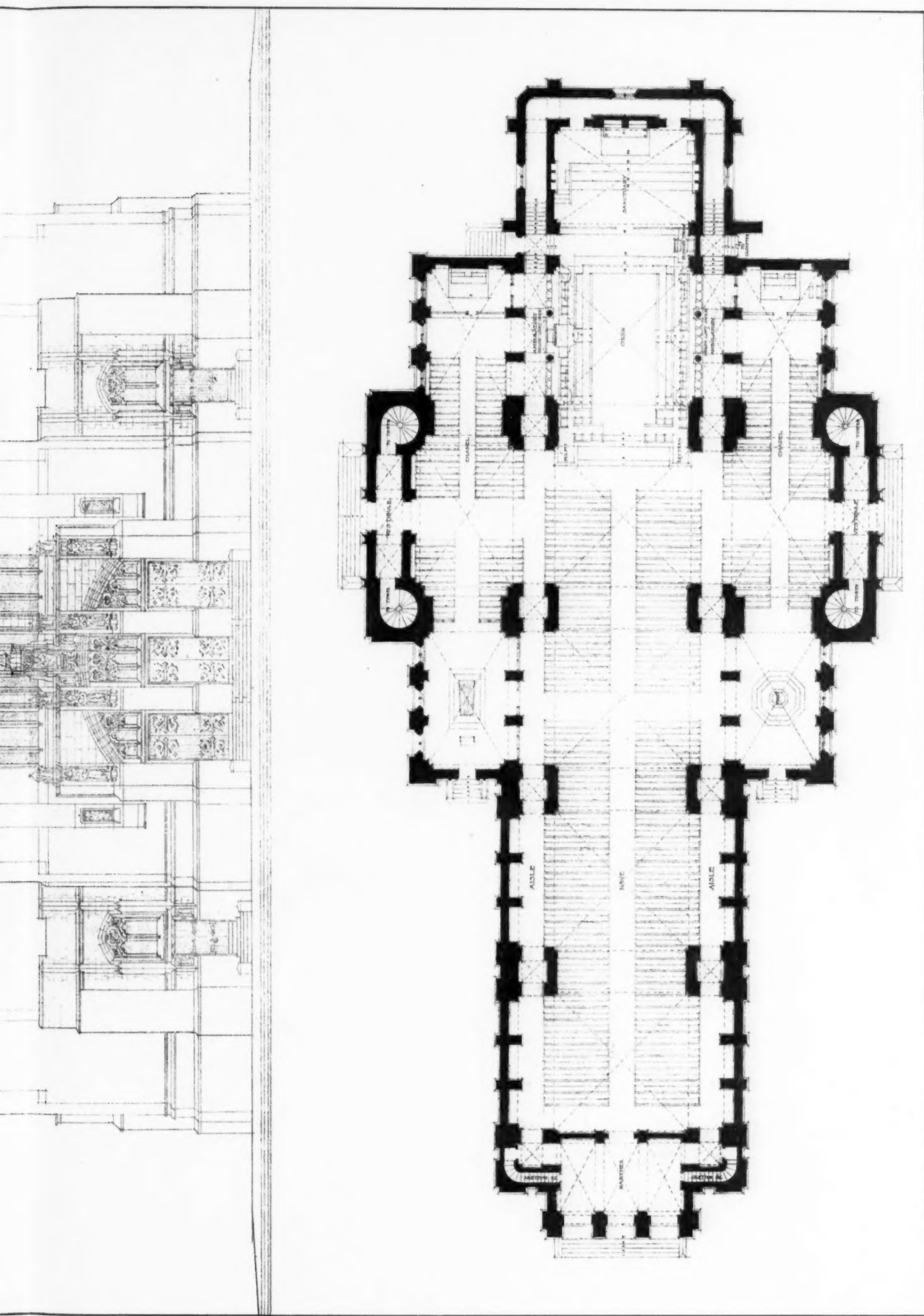


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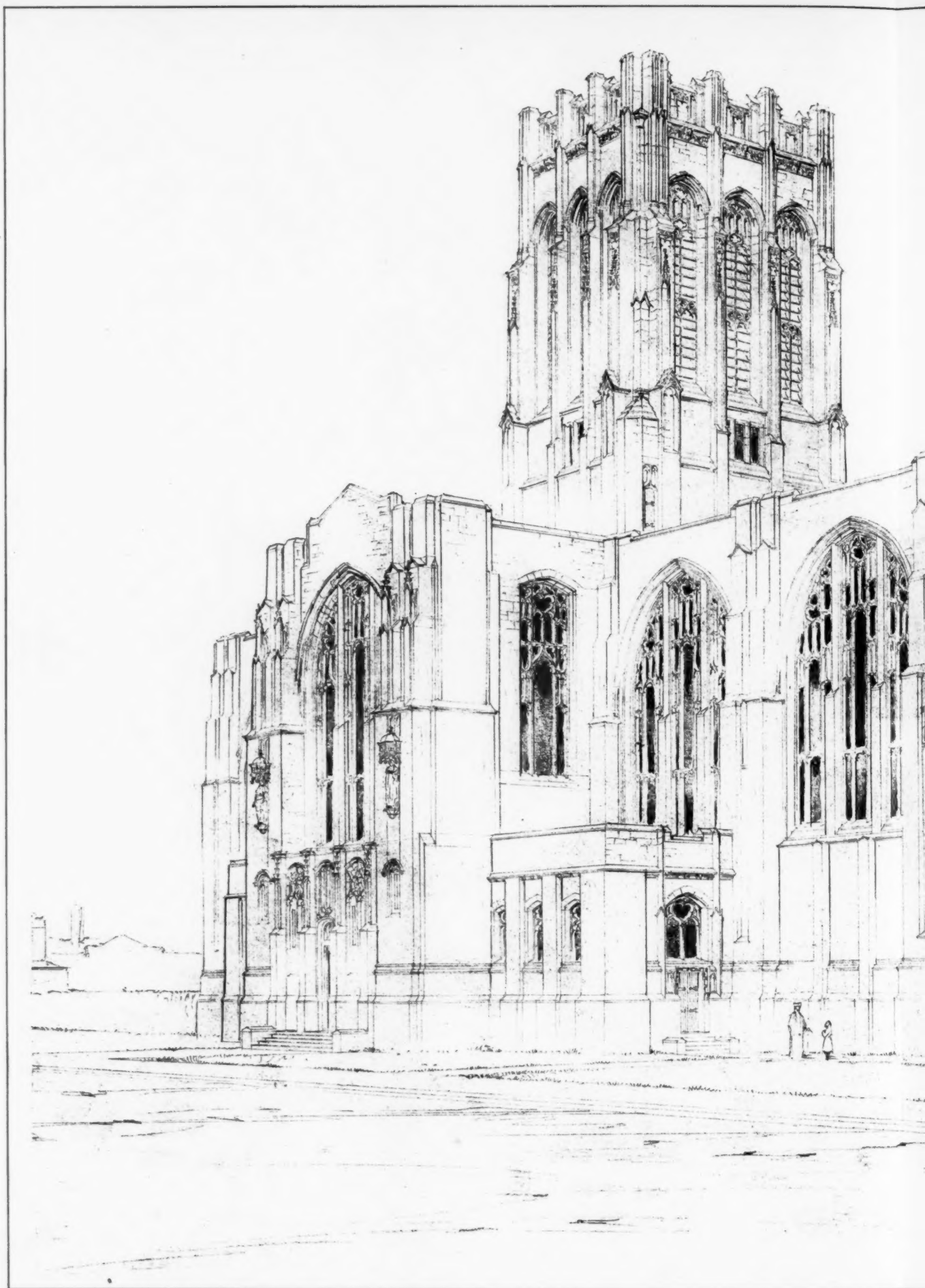
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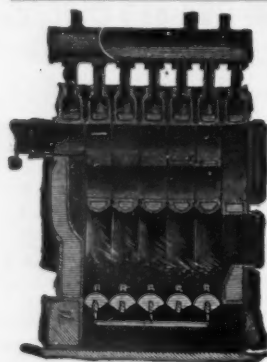
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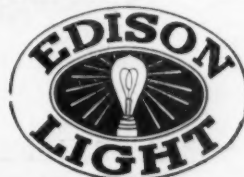
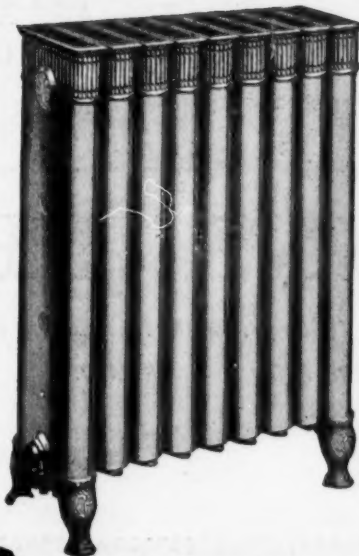
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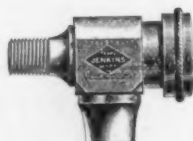
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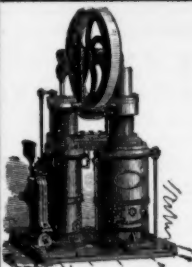
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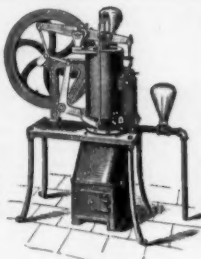
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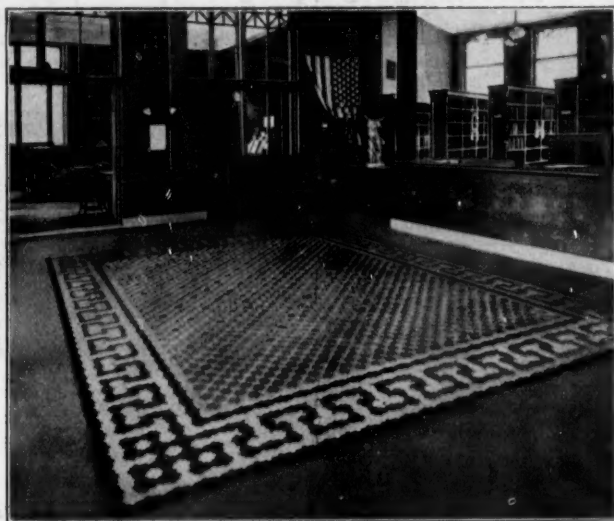
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THE new firm of Temple Burrows & McLane has opened an office in the McManis Building, Davenport, Ia. Messrs. Burrows & McLane have, for a number of years, been connected with the architectural department of the University of Illinois. The new firm requests that its name be added to the list of architects, from which material men take addresses, as it is desirous of obtaining late catalogues.

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BUILDING INTELLIGENCE.

(Reported for the American Architect and Building News.)

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

ADVANCE RUMORS.

Ann Arbor, Mich.—Plans have been prepared for a hospital for contagious diseases which is to be erected here. Estimated cost, \$30,000.

Atlanta, Ga.—Edward C. Peters, one of the owners of the Peters Building which now fronts on the Whitehall St. viaduct, recently announced that four more stories will be added to the building, and when completed it will be twelve stories high. Work will begin in a short time on the new stories. Cost will be about \$50,000.

Baltimore, Md.—Parker & Thomas, architects, of Baltimore and Boston, have been awarded the work of designing and superintending the erection of the new fourteen-story building of the National Bank of Commerce. The building is to cost \$400,000.

The plans for the new Stock Exchange building have been completed by Architects Howells & Stokes, of New York City. The new building will be of brick, stone and iron, will contain five stories, and will cost \$125,000.

A new marble building will be erected for the Hennegan-Bates Co. at 13 E. Baltimore St. The building will cost in the neighborhood of \$100,000.

Beardstown, Ill.—S. A. Bullard, 208 S. 6th St., Springfield, is preparing plans for a Carnegie Library to be erected here, at a cost of \$10,000.

Birmingham, Ala.—John G. Smith, president of the Masonic Temple Association, has stated that the association is desirous of beginning the erection of the new Masonic Temple about April 1. The temple will be six or seven stories high, and will be one of the handsomest structures in this city.

Boston, Mass.—The Dwinell-Wright Co., coffee and spice manufacturers, located on Battery March St., have recently signed an agreement with the Boston Wharf Co. to lease, for a long term of years, a new building to be especially constructed for them just across the Fort Point Channel, five minutes' walk from the South Station, on Summer St. extension, near A St. The plans show a building of seven stories, covering a lot of 9,000 feet, with frontage of 90 feet on Summer St. and 100 feet deep. A spur track is to be constructed by the N. Y., N. H. & H. R. R. alongside of the shipping floor.

Plans have been filed by Architect Chas. Park, 110 Tremont St., for a seven-story apartment-house for 60 families, to be located on Charlesgate, West, corner Newbury St., Back Bay, for Herbert C. Birtwell. The exterior walls will be brick, limestone, terra-cotta and granite, and the cost is estimated at \$30,000.

Brookline, Mass.—Architect James T. Kelly, who makes a specialty of the Georgian style of architecture, has drawn plans for the new grand stand which is to be built here for the Country Club. It will occupy the site of the former stand, and will

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

be 300 feet long and 50 feet wide. It will be built of wood and steel, giving a substantial as well as an ornamental structure.

Buffalo, N. Y.—The University Club intends erecting a gymnasium in addition to its new home at Delaware Ave. and Allen St., at a cost of \$10,000.

Camden, N. J.—Ballinger & Perrot, architects, are preparing plans for a six-story addition, 100' x 206', to be erected to the plant of the Victor Talking Machine Co. in this city.

Chicago, Ill.—It is stated that plans are being prepared for an armory for the 3d Regiment Infantry, I. N. G., at a cost of \$250,000.

Plans are being prepared for the new building which is to be erected for the theological department of the University of Chicago. Those who have charge of the work expect the Baptists of the middle West to subscribe \$100,000 for the new building. It will be erected in the central quadrangle, just north of Haskell Hall and east of Cobb Hall, and will be a complete home for the divinity school.

Henry L. Ottenheimer is preparing plans for a structure containing school, hall and rectory, to be built for St. Michael's Bohemian R. C. congregation at Wabansia Ave. and Paulina St. It will be two stories and basement high, 60' x 100', of pressed brick and stone, and will cost \$35,000.

D. W. Miller is to build a fireproof apartment-house on 39th St. and Ellis Ave. from plans drawn by George Clinton Selton. It will be four stories high, with 58' x 80' ground dimensions, and will cost \$50,000.

Henry J. Schlaacks has completed plans for St. Henry's R. C. Church, a Gothic structure of stone and brick, 50' x 100', which is to be built at Ridge Boulevard and Devon Ave., at a cost of \$75,000.

J. E. O. Pridmore has made plans for the reconstruction of the patent medicine laboratory of H. E. Bucklen & Co. on Michigan Boulevard, south of Peck Court, which was partly destroyed by fire early in the year. The work will cost about \$50,000.

Cincinnati, O.—Plans were completed by contractors and architects for the construction of one of the finest flat buildings to be erected by George H. Stapely, of O'Dell & Co. The building, located on Mitchell Ave., near the Clifton Springs Road, Avondale, will be three stories high, 200' x 200', and will contain 20 flats of five rooms each. The cost of the structure will be \$100,000.

Council Bluffs, Ia.—Patton & Miller, architects, Chicago, Ill., have completed plans and specifications for the library building and bids will be taken at once.

Darlington, Wis.—Andrew Carnegie's offer of \$10,000 for a library building has been accepted by the council.

Detroit, Mich.—The Common Council has rejected Andrew Carnegie's offer of \$750,000 for central and branch public library buildings.

(Continued on page xli.)

[PUBLISHED TODAY]

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

The Salvation Army has purchased a triangular piece of ground on the northeast corner of Michigan Ave. and 2d St., on which it will build a \$50,000 citadel for headquarters for the States of Michigan and Indiana. The property has a frontage of 30 feet on Michigan Ave., 100 feet on 2d and is 90 feet wide at the rear.

Indianapolis, Ind.—The F. W. Spacke Machine Co. has purchased the vacant ground opposite the Manual Training High School and within a short time will erect a large steel structure.

Morristown, N. J.—A new building is to be erected in the place of the Morris County Golf Club-house, which was burned to the ground November last. The new building, which is to be of brick with limestone finish, will cost in the neighborhood of \$80,000. The plans which were selected recently are now on exhibition at the Morristown Trust Co. and are drawn by George A. Freeman and Francis G. Hasselmann, of 566 Fifth Ave., New York. The contracts have not been figured upon yet, but the work will be started as soon as possible, and will be finished by September.

New Haven, Conn.—Competitive plans are being prepared by architects and engineers Ballinger & Perrot, of Philadelphia, Pa., for the proposed memorial to the discoverer of America, Christopher Columbus, to cost about \$100,000. The memorial is to be erected on Chapel St. by the Knights of Columbus. The plans will provide for a fireproof structure, four stories high, 61' x 95'.

New York, N. Y.—McKim, Mead & White, architects, have filed plans in the Building Department, for the New Lamba Club-house, to be erected at 123-130 W. 44th St. The structure is to be six stories in height and of fireproof construction throughout. There will be a four-story extension in the rear, a basement and a sub-basement. The cost is estimated at \$100,000.

Wilbur S. Knowles, 31 W. 31st St., is preparing plans for the erection of an English Gothic stone edifice, for the First Methodist Episcopal Church, to be erected at Day St. and Park Ave., Orange, N. J., at a cost of \$60,000.

The Bellevue Training School for Nurses has bought the property 423 to 431 E. 25th St., a plot 100' x 125', and will erect thereon a six or seven story building to be used as a training-school and nurses' home.

The plans for the new Madison Square Presbyterian Church, to be erected at the northeast corner of Madison Ave. and 24th St., have been filed by McKim, Mead & White, architects. Adjoining the church will be the new parish house, for which the plans have also been filed. The church is to be a one-story edifice, 69 feet high, and crowned with a great lantern-roofed dome, cupola shape. The church will have a frontage of 56.4 feet, and a depth of 89.4 feet. The parish house will be three stories

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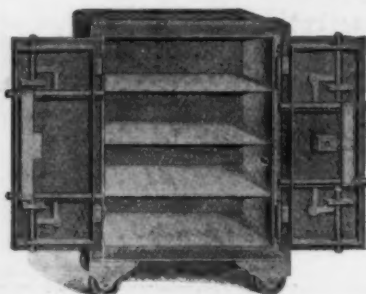
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

high, 45 feet front and 82.3 feet deep. The cost of the two structures is estimated at \$200,000.

Omaha, Neb.—Plans have been prepared for the new freight depot of the Great Western to be erected here. It will be a four-story brick and stone building. The plans contemplate unloading capacity of fifty cars, and fifteen teams can be backed to the platforms at once. The building will cost \$150,000.

Gen. Mgr. Smith, of the Omaha St. Ry. Co., states that the company will erect a new car barn at 16th and Vinton Sts., at a cost of about \$30,000.

Buechner & Orth, architects, of St. Paul, Minn., are preparing plans for a school-building to be erected by the Dominican sisters in this city. It will be two stories, 40' x 64', of pressed brick and cut stone. Plans will be ready for figures about April 1.

Orange, N. J.—Wilbur S. Knowles, of East Orange, has prepared plans for a new edifice for the Orange Methodist Church which is to be erected on Park Ave., at a cost of about \$60,000.

Penn Yan, N. Y.—At a meeting of the library trustees of the Penn Yan Public Library held recently, it was unanimously voted to appoint Albert Randolph Ross, of New York City, architect for the Carnegie public library to be erected in this village. Plans and specifications will soon be presented.

The Board of Education of the Penn Yan Union school district have chosen Otis Dockstader, of Elmira, as the architect for the enlarging of the present Penn Yan Academy building. At a special tax meeting of the school district held last September an appropriation was made for this purpose to the amount of \$20,000.

Peoria, Ill.—Plans for the new seven-story building which is to be erected for Schipper & Block on the site of the Cox Building at Adams and Fulton Sts. are now completed and preparations for the erection of the building are to begin at once. The plans are still in the hands of the architects, Holabird & Roche, of Chicago.

Philadelphia, Pa.—Architects Broocke & Hastings are working on plans for new additions and alterations to the University Hospital. It is stated that the cost will range from \$60,000 to \$100,000.

Pittsburgh, Pa.—An enormous hotel is to be erected at the intersection of Grant St., 6th Ave. and vicinity by H. C. Frick of this city.

Portland, Me.—J. J. Cunningham, 300 Congress St., is preparing plans for a three-story brick synagogue which is to be erected here, at a cost of \$25,000.

Providence, R. I.—The lot at the corner of Washington and Jackson Sts. on which the new building of the Young Women's Christian Association of this city is to be erected has been paid for by the association, the cost being \$28,000. \$65,000 more on the cost of the building remains to be obtained by subscription before the structure, which is much needed by the association, can be built. The new house will be a seven-story structure, fireproof and capable of accommodating 150 young women. The building, designed by Hoppin & Ely, architects, will contain a restaurant, hall, library, recreation-rooms and class-rooms, as well as ample bedroom space for the occupants.

Richmond, Ind.—Plans have been completed and approved for the Reid Memorial Church to be erected for the congregation of the United Presbyterian Church of this city. The foundation will be

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

of granite, the walls of dressed Bedford stone, and the entire structure as near fireproof as possible. The church is the gift of Daniel G. Reid, of New York, formerly of Richmond, as a memorial to his mother. The cost is estimated at \$100,000.

Roxbury, Mass.—At its yearly meeting in the Tremont Building recently, the treasurer of the Intercolonial Club reported that a lot on Dudley St., near the Dudley St. transfer station, had been secured for a large hall for club purposes. It is expected that work on the building will soon be begun.

Sacramento, Cal.—The Maccabee Hall Association has purchased a very fine site for the new hall on 8th St., and purpose erecting thereon a very handsome modern structure with every convenience for lodge, meeting and convention purposes, at a cost of \$50,000.

Salt Lake City, Utah.—Preliminary preparations have been made for the construction of the \$300,000 building to be erected on the Walker Bank site. Architects, Craig & Ware.

San Francisco, Cal.—The Bohemian Club at a special meeting of the members has decided to purchase the site at the northeast corner of Post and Taylor Sts. for a permanent home. Building plans will be considered in the future. According to estimate submitted to the special meeting, a suitable club-house of five stories can be constructed for \$275,000.

The Order of B'nai B'rith has decided to erect a suitable hall in this city for the use of its members. The committee submitted a report, showing that the Grand Lodge owned property interests valued at over \$200,000 and should either erect a suitable structure on the site owned by the order on Van Ness Ave. or dispose of that site and purchase a new one. A committee will be appointed at once to devise means for raising funds, select a site, and solicit plans for a structure such as will meet with the requirements of the order.

Springfield, Ky.—The location for the building of St. Catherine of Siena Academy has been definitely agreed upon. The Curry site, which was donated by the town, has been transferred to the sisters and work will begin as soon as the architects complete the plans. About \$80,000 of the insurance on the former building has been collected and will be used as a nucleus for the present building fund.

Springfield, Mass.—George P. B. Alderman & Co., architects of Holyoke, have prepared plans for a French Catholic Church to be erected here by the new parish of St. John the Baptist. The plans are for a building of the Roman type of architecture, with a seating capacity of 1,000. It will be built of brick, with brownstone trimmings, and will cost between \$30,000 and \$40,000.

Syracuse, N. Y.—The addition of \$350,000 to the endowment fund, the gift of the late James J. Belden and John D. Lyman, of this city, will be used for the construction of a new building for the engineering department of Syracuse University. Lyman C. Smith, formerly president of the Smith-Premier Typewriter Co., has announced his intention of erecting four other structures to complete a quadrangle for the engineering branches.

Terre Haute, Ind.—Plans for the new "Home Brewing Co.," which is to be erected here, are being drawn up by a Chicago architect who makes a specialty of brewery plans. It is stated that the

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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

proposed plant will cost between \$100,000 and \$150,000.
Vancouver, B. C.—The Terminal City Club proposes erecting a club-house on the lot at the northwest corner of Richards and Pender Sts., to cost in the vicinity of \$40,000.
Warsaw, Ind.—The plans of Architect R. A. Bradley for a new high-school building here have been approved and the building will be erected at a cost of \$31,000.
Waterloo, Ia.—Andrew Carnegie has given \$40,000 to this city for the erection of two library buildings to be erected at the east and west ends. So Waterloo is to have the unique distinction of being the only city in the United States to receive two libraries from Mr. Carnegie.
Winchester, Mass.—The parish of the Epiphany has been offered a \$14,000 parish house, to be erected on the church and Central St. site, provided the building fund is increased to \$25,000 by Easter. To make the offer available, the sum of \$7,000 is needed.
Woodlawn, Ill.—David Robertson, 184 La Salle St., Chicago, is architect for the new temple which is to be built for the Woodlawn Masonic lodges. The new building will be four stories high and cover an area of 60' x 100'. It will be constructed of brick and stone and cost about \$35,000 to \$40,000.

PROPOSALS.

CHURCH.

[At Yankton, S. D.]

Sealed proposals will be received until March 29, at 4 P. M., 1904, and be opened at the office of L. B. French, Chairman of the Board of Trustees, for the erection of a church building for the First Congregational Church, at Yankton, S. D. Plans and specifications can be seen on file with C. W. Lay, Yankton, S. D., or with Turnbull & Jones, architects, Elgin, Ill., also at the office of the *Builder's Exchange*, St. Paul. It is the intention to award the contracts to the lowest responsible bidder, but the right to reject any or all bids is reserved. Bids will be sealed and marked "Proposals" addressed to C. W. LAY, Secretary of the Building Committee, Yankton, S. D. 1474

Treasury Department, Office of the Supervising Architect, Washington, D. C., March 3, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 12th day of April, 1904, and then opened, for the construction (including heating apparatus, electric wiring and conduits) of the U. S. Post-office at Torrington, Connecticut, in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Postmaster at Torrington, Connecticut, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1473

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., March 2, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 19th day of April, 1904, and then opened, for the construction (except heating apparatus, electric wiring and conduits) of the U. S. Post-office at Leadville, Colorado, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Leadville, Colorado, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 24, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 30th day of March, 1904, and then opened, for furnishing miscellaneous machinery complete in place for the U. S. Post-office, Court-house, etc., building at Chicago, Illinois, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Chicago, Ill., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 24, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 6th day of April, 1904, and then opened, for the low-pressure steam-heating apparatus, complete in place, for the U. S. Custom-house, Court-house, Post-office, etc., at Memphis, Tenn., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Memphis, Tenn., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 25, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 7th day of April, 1904, and then opened, for the low pressure steam heating apparatus, complete in place, for the U. S. Court-house and Post-office building and extension, Greensboro, N. C., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Greensboro, N. C., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 25, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 11th day of April, 1904, and then opened, for the construction (including heating apparatus, electric wiring and conduits) of the U. S. Post-office at Champaign, Illinois, in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Postmaster at Champaign, Illinois, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 25, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 14th day of April, 1904, and then opened, for the construction (except elevators, heating apparatus, electric wiring and conduits) of the U. S. Court-house and Post-office building at Lincoln, Nebraska, in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Custodian at Lincoln, Nebraska, at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

Treasury Department, Office of the Supervising Architect, Washington, D. C., February 29, 1904. Sealed proposals will be received at this office until 3 o'clock P. M. on the 18th day of April, 1904, and then opened, for the construction, including plumbing, heating apparatus, electric wiring and conduits, of the U. S. Post-office and Court-house at Deadwood, South Dakota, in accordance with drawings and specifications, copies of which may be had at this office or the office of the Postmaster at Deadwood, S. D., at the discretion of the Supervising Architect. JAMES KNOX TAYLOR, Supervising Architect. 1472

SCHOOL-BUILDING.

[At Milwaukee, Wis.]

The Statutory Committee on School Sites and Plans will receive until March 15, 1904, at 10:30 o'clock A. M., competitive sketch plans and outline specifications for the construction and erection of a public school building on Cass St., between Pleasant and Brady Sts., in the First Ward of the City of Milwaukee. The right is hereby reserved to the City of Milwaukee to reject any or all plans and specifications that may be submitted. All plans and specifications must be based upon general requirements for school-houses, as determined by the Statutory Committee on School Sites and Plans, and on file in the office of the Board of School Directors. A copy of such general requirements will be furnished upon application. CORNELIUS CORCORAN, CHARLES J. POETSCH, H. O. R. SIEFERT, JEREMIAH QUIN, C. S. OTJEN, Statutory Committee on School Sites and Plans. 1472

CELLS.

[At Stevenson, Wash.]

Proposals will be received until April 4 for installing cells in county jail. A. FLEISCHHAUER. 1472

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

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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 criticize 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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