

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XXXIX.

Copyright, 1893, by TICKNOR & COMPANY, Boston, Mass.

No. 899.

Entered at the Post-Office at Boston as second-class matter.

MARCH 18, 1893.



SUMMARY:—

The Lincoln Street Fire, Boston.—Revising the Brooklyn Building Laws.—The City-hall Matter in New York.—The Effect of Cold on Iron and Steel Construction.—Professor Sedgwick on the Cause and Prevention of Asiatic Cholera.	161
ARCHITECTURE OF THE LOW COUNTRIES.—II.	163
LETTER FROM LONDON.	166
COMPARATIVE MUNICIPAL BUILDING LAWS.—XXIII.	168
LETTER FROM AUSTRALIA.	169
LETTER FROM CANADA.	169
LATRINES OF THE EAST.	170
THE STEVENS BICYCLE TOUR.	174
SOCIETIES.	174

ILLUSTRATIONS:—

Wissahickon Inn, Wissahickon Heights, Germantown, Pa.—Sketches made during the Stevens Bicycle Tour by Mr. Elmer Grey: Three Sheets.—Theological Seminary, Lancaster, Pa.—House at Hartford, Conn.—Design for a City House.—Bachelor Apartments, Boston, Mass.—Designs for a Cottage, a Toll-house, a Public Library and a Country Church.	174
Additional: Fontaine d'Amboise, Clermont-Ferrand, France.—Fragment from the Columbia Fountain for the World's Fair, Chicago, Ill.—"Rosecourt," Romford, Eng.—St. Frideswide's Mission-house, Poplar, Eng.—Roman Pillar at Igel.	174

COMMUNICATION:—

Brick-veneered Buildings.	175
NOTES AND CLIPPINGS.	175
TRADE SURVEYS.	176

A TERRIBLE fire occurred last week in Boston, which illustrates more forcibly than ever the absolute necessity for the speedy adoption of the rules for building which fire-engineers, such insurance men as Mr. F. C. Moore, and a few architects who have interested themselves in the subject, have been advocating for years, but without finding willing listeners. As in other recent cases, in Boston, one of the buildings destroyed was believed to be built on the "slow-burning" principle, with heavy girders and thick plank floors, but, under the intense heat developed by the combustion of many hundred cords of pine packing-boxes, boots and shoes, laces, ribbons, hats, fireworks, clothing and similar articles in and around them, they melted away, seeming to burn, if possible, more fiercely than buildings of ordinary construction. It is worthy of notice that an old and experienced architect, Mr. Tinsley, has written several articles to the *Spectator* severely condemning the present fashion of ascribing great powers of resisting fire to the "mill-construction," and predicting that, for city building, such construction will soon be pronounced unsuitable, and will be replaced by the only really fire-resisting materials in use, iron and brick or terra-cotta; and it certainly seems as if his prediction would be fulfilled. However valuable the construction of heavy girders and plank floors may be for factories, where the combustible material present—although the material itself may be very inflammable—is generally small in amount, and where the buildings are usually low, comparatively isolated and inclosed by brick walls, with few openings, it is not considered complete even for factories, without the addition of plastering on wire-lath, and is entirely insufficient for high warehouses, filled from cellar to roof with light goods in wooden cases; and the sooner that fact is recognized the better. We think it is Captain Shaw, of the London Fire Brigade, who is chiefly responsible for the adoption of this fashion of building here. Our mill-engineers, although satisfied, and with good reason, of its value for factories under suitable conditions, have been much less disposed than Captain Shaw to prefer it to iron and brick construction for city buildings, and have, indeed, repeatedly warned architects against putting too much faith in the use of heavy floor-timbers, without corresponding precautions in the other details of construction. Now, we imagine that owners will give up Captain Shaw, and return to iron and masonry, used as American architects know how to use them. That heavy timbers are at least as good as naked cast-iron columns and wrought-iron girders is no longer doubted by any architect; but exposed iron construction is almost obsolete, and that

twelve-by-twelve timbers are as fire-resisting as iron columns and girders protected by terra-cotta no architect probably now believes, while in nearly every other respect the unshrinkable, undecaying iron construction is infinitely preferable. The main objection is the cost, but, with iron beams at two cents a pound, the additional expense, for a store of ordinary dimensions, is not very serious; and it must always be remembered that, in mercantile buildings, the value of the structure and its contents should be reckoned together in considering questions of economy in construction. As we have often before observed, the willingness of insurance companies to write policies on combustible stores and their contents for less than the risk is worth has been the chief obstacle to the general adoption of more solid mercantile construction. There are many signs that this willingness on the part of the underwriters to trust to luck to save them from the natural consequences of their business methods is disappearing, and in Boston, at least, a movement to promote incombustible construction by limiting the undivided floor-area in buildings with wood floors of any kind to the maximum of five thousand square feet, which has long been advocated by experts, but rejected by the unanimous voice of the mercantile community, would probably now be zealously assisted by the insurance companies.

THE City of Brooklyn is revising its building laws, under the direction of a committee, of which Mr. F. C. Moore, the president of the Continental Fire Insurance Company, is the efficient chairman. So far, only a few of the proposed changes have been made public, but these seem judicious. One is that party-walls in frame buildings shall be of brick, carried through the roof, and two courses above, and tinned over; while another limits the height of frame buildings to three stories. It seems likely, also, that the area of undivided floor-space in buildings not fireproof will be restricted at least to the New York limit of ten thousand square feet, and perhaps to a smaller limit. It is perfectly well understood by experts that the greatest danger from fire in cities lies in the accumulation of inflammable goods in buildings which have large undivided floor-spaces. Even where the floor-space is restricted by law to ten thousand square feet, as is now the case in New York, it is evident that a mass, say of boots and shoes, packed in pine boxes, a quarter of an acre in area, and six or eight feet high, will produce a conflagration, if it once gets well on fire, which no ordinary building-materials can withstand. We have plenty of materials which will resist any blaze which can occur in a room of two or three thousand square feet area, but to quadruple the mass of combustible matter is to increase many-fold the energy of the fire.

THE three experts, Messrs. Hunt, Le Brun and Ware, selected to advise with the Municipal Building Commission in regard to the proposed New York City-Hall, have advised that, instead of trying to retain the old building, it should be removed, so that the ground which it occupies can be used for the new structure. We suppose that these gentlemen are quite as capable of appreciating the undoubted beauty of the old building as most people, but it seemed from the first utterly impracticable to incorporate it with the new one, and the wisest course is certainly in such cases to avoid sacrificing both buildings to unreflecting sentiment. If the old City-Hall could be utilized somewhere else, perhaps in the annexed district, every one would be pleased to see it reerected; and it seems possible that this may be the case. Meanwhile, with it out of the Park, and the ground cleared, there will be nothing to hamper architects in their efforts to design for the city the noblest municipal building that American architecture can produce,—and that it can do great things in the art of designing buildings no one can now deny. To our mind, the great commercial buildings of New York, Chicago, Boston and other cities, on which our best architects spend most of their time, far surpass, in originality, interest and artistic feeling, any other commercial buildings in the world, and, what is more, they are rapidly improving in these qualities. Hitherto, the architects who can do such splendid work have had little inducement to exert their powers for the public benefit, but, whenever it suits city and State authorities to treat them as

fairly, and pay them as well, as they are treated and paid by their private clients, they will be found ready to undertake public work, and they will certainly succeed.

THE *Spectator* makes the assertion that "Chicago architects are studying with some misgivings the effect of protracted cold weather on the lofty steel buildings in that city," and says that the walls and ceilings of several of them are cracked. It goes on to mention that "some of the beams" in buildings in process of construction "have shortened half-an-inch during the long cold spell," snapping off bolts and doing other damage. Of course, it is not impossible that an iron beam might be so fastened into a building that some bolts would "snap" in very cold weather, but we cannot imagine such an effect from any ordinary mode of construction. The "protraction" of the "cold spell" would be of no consequence, as steel and iron conduct heat so rapidly that they would contract as much in the first five minutes of exposure to a low temperature as they would if the temperature remained at the same point for a month. Moreover, in a building of mixed metal and masonry, a "protracted" cold spell, in which the masonry, which is a slow conductor, would have time to cool off and contract in concert with the iron, is much less injurious than alternations of warm and cold weather, in which the sensitive iron may expand and contract several times before the temperature of the masonry is materially modified. Probably the real reason for such cracks as may have been noticed is to be found, not in such contractions as would take place in a building in process of construction, but in the difference of contraction between the metal in the outer walls, exposed to a very low temperature, and that in the interior structure of buildings completed and occupied, in which the thermometer is, in the rooms, rarely allowed to fall below 60°, while the air outside may be at twenty or thirty degrees below zero. Obviously, the difference of temperature must shorten the exterior verticals, the inner ones remaining unchanged, and even a slight variation would distort the angles formed by the inner and outer verticals with the horizontal members connecting them in a way very likely to produce cracks in rigid masonry, particularly in the upper stories, which would show through the plastering. With the ordinary method of connecting the vertical and horizontal members, no further harm would probably be done, and the cracks in the walls would be likely to close partially on the return of warm weather; but a frame with diagonal bracing, or with gusset-plates in the angles, might possibly be seriously strained.

EVERY one who is interested in the sensible treatment of the invasion of cholera, to which we are almost certain to be subjected this summer, should read Prof. William T. Sedgwick's paper, delivered before the Society of Arts in Boston, on the "Cause and Prevention of Asiatic Cholera." Persons sensitive to grammar will have to brace their nerves a little to ask for the *Technology Quarterly* in which the paper is to be found reported, but, whatever may be thought of the English of the title of this periodical, there is usually no question about that of the articles which it contains, and Professor Sedgwick's paper, particularly, is a model of clear and unaffected writing. Like all modern scientific men, Professor Sedgwick regards it as settled beyond controversy that Asiatic cholera is a violent fermentation of the contents of the intestines, attended with the production of substances which act as poisons upon the nervous system, causing vomiting, cramps and collapse, and often death. This fermentation is produced by a living ferment, the cholera bacillus, as the similar fermentation of typhoid fever is produced by the typhoid-fever bacillus, but the fermentation of cholera is more active and virulent than that attending any other intestinal disease, and is consequently more fatal.

IN order that this fermentation of the intestinal contents may be produced, the cholera bacillus must be introduced into the intestines of the patient; just as, to produce any other sort of fermentation, the specific germ proper for that fermentation must be brought in contact with the material to be fermented. The only way in which the cholera bacillus can practically reach the human intestines is through the mouth, or, possibly, in some cases, through the nose. The communication of the ferment through the skin is impossible; so that

contact with a cholera patient is not dangerous if care is taken that germs from the infected intestines are not conveyed to the mouths of healthy persons. This is really the only precaution to be taken, but it must be strictly observed. In changing and washing the clothes of the patient, it is difficult to avoid soiling the fingers, and, where attendants or servants are careless, the same fingers, before being thoroughly washed, are often brought in contact with articles of food, leaving on them particles which, when swallowed by healthy persons, are ready to set up their specific fermentation in their new subjects; and it is obviously very difficult to be sure of the necessary cleanliness, even among people accustomed to the use of soap and water. How strict a watch must be kept, and how unsuspected may be the sources through which the fatal germ is introduced into the system, is strikingly illustrated by the history of an epidemic of typhoid fever, which Professor Sedgwick investigated. In this case, the fever broke out in several families in one of the best and most carefully drained and sewered portions of a city in Massachusetts. The manner of living of the families attacked was unexceptionable, the water-supply was good, and was the same for the region attacked as for the uninfected portions of the town, and, for a time, no rational theory was proposed to explain the trouble. The State Board of Health, however, coöperating with the local board, made a careful inquiry, and found that the families in which fever had appeared were supplied with milk by a certain farmer, in whose household there had been cases of typhoid fever. The excreta of the patients had been thrown into a vault, the contents of which were used, later, to fertilize a tobacco-field. On the farm was a well, which served as a part of the water-supply for the establishment. The well was covered with planks, laid, however, with cracks between them. As is common in the country, the cans of milk, before being taken to the city for sale, were lowered into the well, to keep them cool. The cans were not entirely filled with milk, and although they were closed with wooden plugs, the plugs were not tight, for milk ran out when the cans were inverted, and there was evidence that water got in during their sojourn in the well. If the water, therefore, contained fever germs, some of the germs might get into the milk, and the presence of particles of manure on the plank cover of the well showed that the men, in passing between the tobacco-field and the well, had brought on their boots some of the former contents of the vault, with, presumably, a proportion of fever germs, and had left them where they were sure to fall into the well, or to be washed in by the drippings from the buckets and cans. In another typhoid-fever epidemic, investigated by Professor Sedgwick, in which about a thousand persons were attacked, and about one hundred died, the infection was found to have come from a house situated on a brook which flowed into the stream furnishing the water-supply for the cities of Lowell and Lawrence, about two miles above the place at which the supply was taken. In this house there were cases of typhoid fever, and the germs from the patients, thrown on the ground, or passing with washing water into the brook, and thence into the river, it reached the city intake-pipes, and were distributed with fatal effect. With such infinite facilities for dissemination, it is not surprising that the active cholera germs soon produce an immense effect in a filthy and ignorant community, but it does not follow that a more intelligent one may not guard itself against them with tolerable success. "Avoid the contamination of food and fingers," Professor Sedgwick says; and he adds that "It is probably safe to say that if the bowel-discharges of the patients, and the fingers of those who have to deal with cholera patients, are properly disinfected, all danger can be avoided, and the disease confined strictly to its original appearance." The greatest danger for us lies in the contamination of the water-supply of cities. This water-supply must be taken from a large collecting-area, which it is not easy to guard, and, in some cases, there is evidence that it is already contaminated. Philadelphia, Chicago, Lowell, Lawrence and Albany, Professor Sedgwick says, show by their very large annual death-rates from typhoid fever, which, in the case of Philadelphia and Chicago, are more than twice as great as the rate of Hamburg, that their supply of drinking-water is contaminated by intestinal discharges, and if the same sources which now contribute typhoid germs to their water-supply should be placed in a condition to furnish cholera germs instead, as might happen very soon after the introduction of cholera into the country, there would be in those cities, as Professor Sedgwick says, "just cause for alarm."

ARCHITECTURE OF THE LOW COUNTRIES.¹—II.

Fig. 4. Hotel de Ville at Oudenaarde.

THE power possessed by the communes, from the thirteenth century, led to the erection all over the Low Countries, and especially in Belgium, of a large number of civil edifices: these include belfries, symbolizing the liberty of the communes, town-halls, emblematic of public rights and municipal dignity, exchanges, representing industry, the chief source of the grandeur and wealth of the commune, and lastly buildings for the accommodation of corporations and trade-guilds, and which bear witness to the spirit of fraternity, association and mutual defence of all the members of the commune. The belfries were sometimes isolated, like that of Tournai, built in the thirteenth century, that of Ghent, erected at the beginning of the fourteenth and that of Furnes. Usually they were connected with the town-halls, as at Brussels (see "Civil and Domestic Architecture," Fig. 13, *American Architect* for Feb. 1, 1890), at Oudenaarde (Fig. 4), at Alost (Fig. 5), at Middelburg (Fig. 6), and at Kampen (Fig. 7), where the bell is housed in a very original fashion. In default of a belfry rising above the town-hall, the bell of the commune was suspended in the tower of the Halles, as at Ypres (Fig. 8), at Bruges (Fig. 9), at Lierre, at Termonde and at Nieupoort. Sometimes also the tower of the principal church was made to serve as a belfry; in such cases, the commune had a large share in the construction of this appendage to the religious edifice. This was true of the cathedrals of Antwerp and Mechlin and of the churches of Utrecht and Breda.

It was Baldwin of Constantinople, Count of Flanders, and the Countess Marie, his wife, who, in 1200, laid the cornerstone of the Halles of Ypres, the largest and most imposing thirteenth-century structure on the continent (Fig. 8). The Halles of Bruges (Fig. 9) was erected in 1284 and the belfry in 1291; the wooden spire which once capped it was demolished in 1740. It is 352 feet in height. We may also cite the Halles of Mechlin, of Louvain, Nieupoort, Diest, Termonde, Lierre and Ghent. These were all cloth-halls; some cities had also important meat-markets, among which those of Antwerp and Ypres are remarkable. In addition to the town-halls of Alost, Oudenaarde, Louvain (Fig. 10) and Middelburg, of which we give reproductions, there are in Belgium, those of Ghent, Furnes, Mons, Bruges, Brussels, Courtrai, Damme, Léau and Hoogstraeten; in Holland, those of Alkmaar, Gouda, Veere, Kampen and Huisden. The most im-

portant guild-houses erected during the Pointed period are the Skipper House at Ghent (Fig. 11) and that of the Guild of



Fig. 5. Town-hall of Alost.

Fishers, on the Quai-au-Sel at Mechlin. Bruges still possesses the picturesque guild-house of the Arquebusiers of St. Sebastian. In this opulent town, one of the greatest marts of the



Fig. 6. Town-hall of Middelburg.

Hanseatic cities, companies of merchants from seventeen different kingdoms had their warehouses and residences. The

¹ From the French of J. van Ysendyck, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 898, page 143.

most celebrated were those of the Castilians, the Florentines and the Genoese, which were veritable palaces. Bruges was still, in the fourteenth century, the commercial centre of the continent. Merchants of all nationalities met there in the spacious

palace of the Van den Buerse family, whose arms, bearing three purses, were carved above the entrance. Similar establishments were hence termed "*Bourses*." The only Bourse of this period remaining in Belgium is that of Antwerp, which was carried up a story (Vol. II, p. 396) after the fire of 1858, and thus partially lost its primitive characteristics.

The restricted limits of our work make it impossible for us even to enumerate all the remarkable constructions that may be seen in the Low Countries, or to pass in review the private dwellings, notably



Fig. 7. Town-hall of Kampen.

typical examples of which occur at Bruges (Fig. 12, and Fig. 14, Vol. V, p. 561), or to refer to the city-gates, of which Haarlem and Amsterdam preserve such quaint specimens, or, lastly, to call attention to the châteaux and military constructions. The predominant feature in the manifold architectural combinations of the period under discussion is picturesqueness as appears from certain quarters of Bruges (Fig. 13). A fact to be noted, in closing this survey of the

Brussels is almost the only structure in which their coöperation appears, and this perhaps accounts for the individual stamp borne by the works of this glorious period, works in which Keldermans, Van Peede, Layens, Du Hamel, Van Ruysbrœck



Fig. 9. Halles of Bruges.

and the entire colony of famous artists, their contemporaries, found a field for the exercise of their originality.

THE RENAISSANCE.

The Renaissance style made its appearance in the Low



Fig. 8. Halles of Ypres.

works of the Pointed period, is that but slight influence was exerted by the lodges or corporations of masons on the development of art from the thirteenth century to the sixteenth, in the provinces of Belgium and Holland. The Cathedral of

Countries at the same time as in France; it originated there in the same manner, but was slower in making its way. It was foreign artists that erected at Bruges, in 1495, the consular building of the Biscayans, the first Belgian structure to bear

the stamp of the Renaissance. Soon after, Lancelot Blondeel, a painter and architect of Bruges, author of the great triptych painted for the Guild of Barber-Surgeons, designed the famous chimney-piece of the old town-hall of the Franc de Bruges [see "Fireplaces," Fig. 10, *American Architect* for May 28, 1892]; Guyot de Beaumont executed the five beautiful statues with which it is adorned, at the same time that he sculptured those on the tomb of Ferry le Gros, in the church of Saint-Jacques, at Bruges, and the small figures on the rich rood-loft of Tesselroo. The magnificent decoration, which gives this chimney-piece a place among artistic productions of the first order, is the work of Royer de Smet, Herman Glosencamp, Jacques Crepeu and Adrien Rasch. It was probably intended to be in polychrome and gilded. In the centre of the composition is a statue representing Charles V; he stands before a throne, wearing his crown and clad in armor, with the imperial mantle thrown over his shoulders, the collar of the Order of the Golden Fleece about his neck, a sword in his right hand and a globe in his left; above the throne is the escutcheon of the Empire; five armorial bearings of the countries ruled by the sceptre of Charles V are borne on either side by powerful columns and

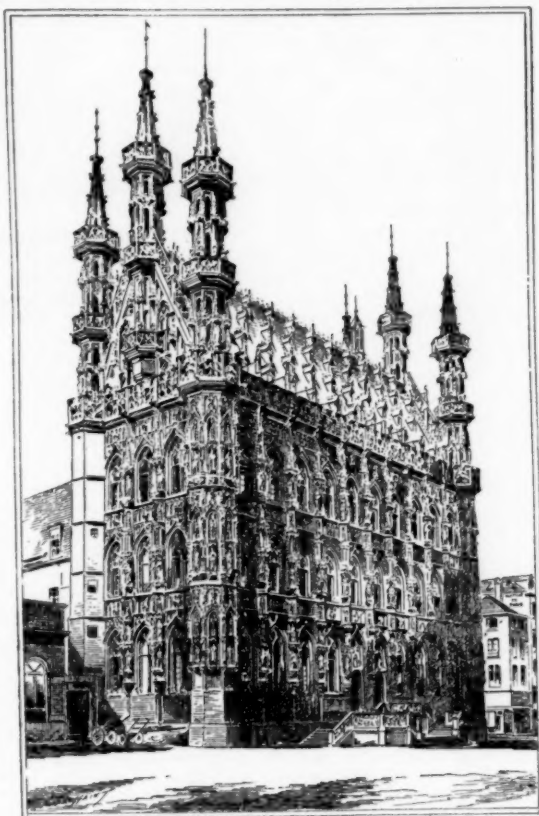


Fig. 10. Town-Hall at Louvain.

held up by genii; along the edge are the sixteen escutcheons of the paternal and maternal ancestors of the emperor; at the angles, above the mantel and bearing the supports of the ceiling are genii holding aloft sculptured medallions; the bust of Francis I and of Eleanor of Austria and the portraits of Philippe le Bel and Jeanne la Folle are reproduced above the throne; on the back are those of Charles de Launoy and Margaret of Austria. The two figures in the panel on the right represent Ferdinand of Aragon and Isabella of Castile; on the left are the statues of Maximilian and Marie de Bourgogne. This masterly work was executed between 1529 and 1531.

East of the present town-hall, and on a line with it, is the old municipal record-office, erected in 1534, after the plans of Jean Wallot. It is a noteworthy construction, richly sculptured on the exterior; of the three gables of the façade, the central and most important bears the statue of Justice; that on the left is adorned with figures representing Moses, Fidelity and Prudence; on the right, is Aaron, with Force and Temperance. Aside from purely decorative medallions, we find also the armorial bearings of Charles V, of the countship of Flanders, of the city of Bruges and of the principal guilds of the commune. Bruges, as numerous private edifices still bear witness, was the first Netherlandish city to adopt the Renaissance

style; it was from this art-centre that the new style made its way into other towns, and the movement was propagated there, quite naturally, by reason of their size, their wealth and

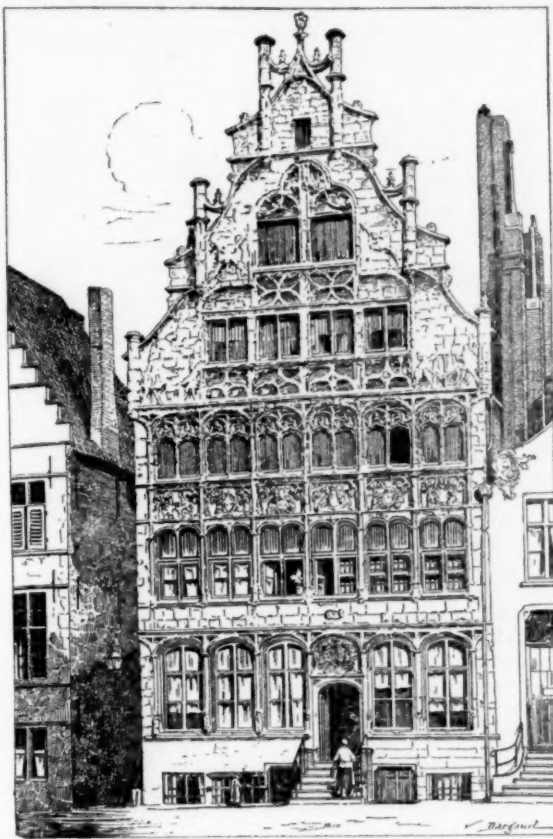


Fig. 11. Skipper House at Ghent.

their artistic aspirations. Nevertheless the impetus acquired during the Middle Ages, under which the territory of the Low

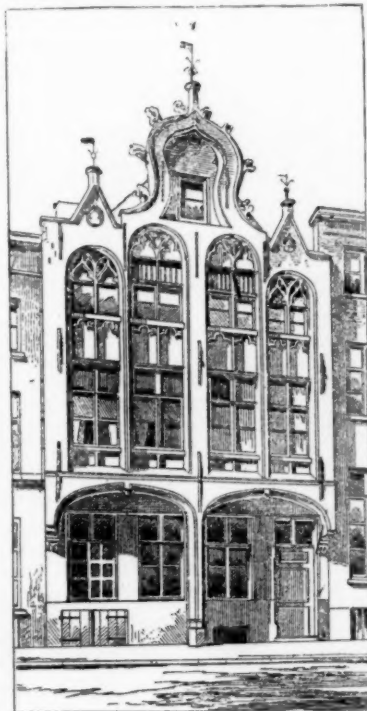


Fig. 12. House at Bruges.

Countries was bestrewn with important and remarkable structures, diminished in force in the sixteenth century, during years of civil disturbances, and with a terrible religious war in progress which extended its ravages even to the remotest parts of the country. The iconoclasts carried their mania for destruction into the whole realm of architecture, but it was especially active against houses of worship. Then art gradually made its reappearance in the building world, but only until the close of the seventeenth century, when the wars of Louis XIV again interfered with the progress of the movement.

Antwerp, in the sixteenth century, came so completely under the sway of the Italian Renaissance that it soon

became the centre of a great school, whose principal artists were trained in Italy. It is interesting, however, to see, in examining their works, that the masters of the sixteenth and seventeenth centuries, were not only able to assimilate most completely the artistic principles of the Italian school, but that, at

the same time, they could draw from these foreign sources and still preserve to their constructions the characteristics peculiar to Flemish architecture — amplex of form and perfection in the management of light and shade. To obtain the picturesque effect for which their compositions are generally distinguished,



Fig. 13. Picturesque View of Bruges.

they took advantage especially of the color of their materials, at the same time that they gave heed to climatic and utilitarian demands. The Netherlandish masters of the sixteenth and seventeenth centuries being for the most part painters, architects and sculptors, were the impersonation of the art of the time, and that so many original Renaissance productions have been left here is due to their preëminently complete training.

Peter Cœcke, of Alost, painter and architect to Charles V, was one of the first to visit Rome; on his return he immediately published a Flemish translation of Vitruvius and of the architectural works of Serlio. These had a wide circulation and a powerful influence in the Low Countries. This time, Italian art popularized was destined to form a basis for all the new combinations. Peter Cœcke hastened to put the latter in practice on the entrance of the *infante* Philip into Antwerp in 1549. He designed in the new style the numerous triumphal arches erected for the occasion and the decorations which he was charged to execute. So successful was he that he was invited to take the direction of a great many edifices, among which

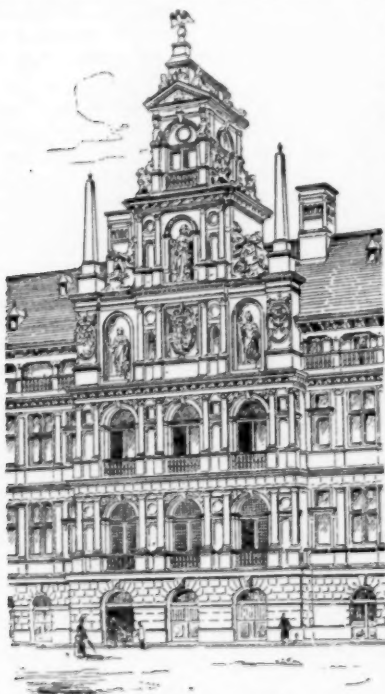


Fig. 14. Town-hall at Antwerp.

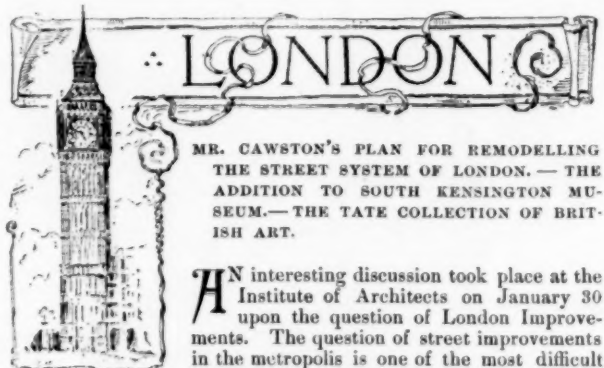
was the sumptuous residence of Thierry de Mœlener at Antwerp. Its beautiful decorations are still preserved; one of the monumental fire-places has been reconstructed in an apartment of the town-hall at Antwerp.

Cornelis de Vriendt, called Floris, comes next in the long list of artists whom a sojourn in Italy initiated into the mysteries of Renaissance principles. In the erection of the town-hall at Antwerp in 1564 (Fig. 14), which work he directed, he showed clearly that, notwithstanding his rare powers of assimilation, he could maintain his originality and his nationality.

Architect and sculptor at once, he himself executed most of its magnificent carvings; it is an isolated, imposing monument, with four façades of the same disposition forming the sides of a vast parallelogram; the basement is of red marble, as well as the

columns of the projecting portion. The beautiful chimney-piece in the Salle des Mariages is one of the most successful of the master's sculptural achievements. Cornelis de Vriendt was also the architect and sculptor of the rood-loft separating the choir and nave in the Cathedral of Tournai; it was erected in 1566, and is a sort of triumphal arch resting on Doric columns of red marble with alabaster capitals; this order supports a small attic of ten Corinthian pilasters, framing in fine alabaster bas-reliefs. This splendid work marks the first stage in the introduction of Renaissance furniture into the edifices of the Middle Ages. To the same master is due the tabernacle in the northern transept of the Church of St. Leonhard at Léau, one of the most remarkable productions of the Belgian Renaissance. It is fifty-two feet high, and has a large number of statuettes borne on brackets of the most delicate workmanship. This profusion of ornamentation is distributed over several stories of colonnettes; the whole is surrounded by a brass balustrade embellished with small figures; it was executed in 1552. The renown of this eminent artist extended to foreign countries, for which he furnished numerous objects of art. In Norway, the tombs of several sovereigns are from his chisel.

[To be continued.]



MR. CAWSTON'S PLAN FOR REMODELLING THE STREET SYSTEM OF LONDON. — THE ADDITION TO SOUTH KENSINGTON MUSEUM. — THE TATE COLLECTION OF BRITISH ART.

AN interesting discussion took place at the Institute of Architects on January 30 upon the question of London Improvements. The question of street improvements in the metropolis is one of the most difficult problems with which Londoners have to deal, and so many questions of a financial and social character are involved that a thorough discussion of the question is by no means an easy task. The condition of London streets is probably as well known to the American as to the Englishman himself. It is a vast uncontrolled growth of Mediaevalism. The streets are for the most part narrow and tortuous. They are laid out on no settled plan and are very bewildering to the stranger. When, however, we consider the history of London and the promiscuous nature of its growth, it is difficult to see how it could very well have been otherwise. To-day, however, we are being confronted with the necessities of nineteenth-century rapidity of living. The sedan-chair has given place to the omnibus, and both vehicular and pedestrian traffic have increased to a very considerable extent, so much so that our main thoroughfares are becoming insufferably narrow, with the result that frequent blocks ensue, entailing the sacrifice of much valuable time. On the other hand, while our streets, as a general rule, go on from century to century of the same width, the buildings fronting them are continually being demolished and being replaced by blocks of offices and stores many stories higher than those previously existing. This is a state of affairs that would be annoying in any town of importance, but in a place of the political and commercial status of London the need for amendment is generally admitted, and the only question is as to how it is to be carried out. Therefore it is not to be wondered at that a considerable number of architects assembled at the Institute when it was announced that Mr. Arthur Cawston proposed to read a paper upon the advantages of adopting a general scheme in making improvements to the London streets. The idea of a comprehensive plan has been floating in men's minds for years, but the practical difficulties have been felt to be insurmountable. If the present generation were inclined to spend vast sums of money for improvements that would only be seen and enjoyed by their children and grandchildren something might perhaps be done, but that is not a characteristic of the London rate-payer of to-day. Suppose, for example, a general plan could be set out which met with universal approval, — a difficult matter, to start with, — and all the houses in the line of the proposed new streets condemned, the state of London during the period of change would be not far removed from chaos. A plan, to be of any good at all, must not only take account of the needs of to-day, which are great enough, but must endeavor to grasp the probable condition of London two hundred years hence and make allowance for it. If it did not, the improvements, after all, would not be a complete solution of the problem. It seems to me, moreover, that Mr. Cawston argued on a wrong basis. He began, for example, by quoting a powerful description by Mr. Albert Shaw of the recent improvements of Paris. "In the work,"

writes Mr. Shaw, "of transforming the labyrinthine tangle of narrow, dark and foul Mediæval alleys into broad modern thoroughfares, and of providing those appointments and conveniences that distinguish the well-ordered city of our day from the old-time cities, which had grown up formless and organless by centuries of accretion—in this brilliant nineteenth-century task of reconstructing cities in their physical characters, dealing with them as organic entities, and endeavoring to give such form to the visible body as will accommodate the expanding life within, Paris has been the unrivalled leader. Berlin and Vienna have accomplished magnificent results in city-making, and great British towns—Glasgow, Birmingham, Manchester and others—have, in a less ambitious way, wrought no less useful reforms, but Paris was the pioneer. French public authorities, architects and engineers were the first to conceive effectually the ideas of symmetry and spaciousness, of order and convenience, of wholesomeness and cleanliness in the urban arrangements."

Now this may be all very well for cities which mainly consist of "labyrinthine tangles of narrow, dark and foul Mediæval alleys," but London, at all events in its central districts, consists of nothing of the sort. We have some slums in the central districts, it is true, but they are not of great extent and are mostly in such situations as would render it difficult to use their sites more advantageously, and where they do exist there are any number of large manufactories scattered about amongst them which would render any serious removal a matter of enormous expense. Take, for example, the proposed new "Council Broadway," which stretches from the Strand to Holborn through a district which might be justly cited as one of the lowest of the central London districts. The cost of its construction is estimated at nearly three million dollars.

With these difficulties in our minds, let us consider briefly Mr. Cawston's proposal. The reasons he adduced for having a complete comprehensive plan were five in number:

1. For discovering the causes of our present inconveniences.
2. For producing the best improvements that can be produced.
3. For forwarding them as rapidly as possible.
4. For making them as economically as possible.
5. For æsthetic reasons.

Directly he began his consideration of the first head, he was confronted with the great barrier running transversely across central London from Theobald's Road to the Thames embankment, in the shape of the lawyers' properties. These, known as Gray's Inn, Lincoln's Inn, Furnival's Inn and the Outer, Inner and Middle Temples, are sacred properties. They have belonged for hundreds of years to certain societies of barristers, and possess certain royal charters which are most jealously preserved and whose inviolability would be defended to the uttermost by perhaps the most influential body of men in England. Mr. Cawston was driven, as any one else in his position would have been, to propose cutting through these estates, though how it was to be done he did not suggest. Other impediments he discovered in railway viaducts and embankments, in public parks and gardens and in the river.

The next question he touched upon was the rehousing of the displaced working population. He admitted the necessity of placing these close to their work, but deemed it scarcely consistent with the general welfare to give up the very central square mile of London for the purpose. The solution he proposed for this difficulty was to remove certain institutions, as the Foundling Hospital, the Military School at Chelsea, Bethlehem and St. Luke's Lunatic Asylums and many gas-works and water-filtering beds, into the country, and to occupy their sites with laborers' dwellings. There were fifteen sites which he proposed should be gradually devoted to this purpose, and if this were done he estimated that 127,000 of the working-class could be accommodated within one mile of the centre of the metropolis. He then explained the principle upon which he felt that a new plan should be based. The streets should be continuous arteries, sufficiently wide for the future as well as for to-day, and judiciously placed so as to connect the most important centres of business and habitation and the railway termini. Immediately a comprehensive plan was studied the small number of our main streets and the shortness of our other streets became at once manifest, and their length and uniformity were only to be obtained by planning streets to a small scale for the whole county.

Mr. Cawston then passed to the methods he proposed to adopt in order to carry out his proposals. He did not explicitly define the mode of procedure he considered the best, but left us to infer it from the nature of his remarks. "If a comprehensive plan were authoritatively adopted in London," he said, "no single building in the whole county could be rebuilt without reference to the revised lines of frontage as laid down on that plan, or without becoming an integral part of the grand city that it would be the ultimate object of the plan to produce." The annual average of buildings built or rebuilt in London during the past three years has been 21,932. Of these he felt that one-fourth would be affected by proposed improvements, and therefore he considered that there would be 5,000 annual "opportunities for improvement."

"Automatic opportunities," he preferred to term them, because he felt that every opportunity would come without legal expenses or delay connected with compensation for disturbance. This is rather a remarkable argument. It occurs to me that if an owner were aware that his house or warehouse came within the lines of an improvement he would hesitate to demolish it, if by so doing he gave the local

authority power to acquire it at the value of the land. Surely the ordinary owner would prefer to maintain it in its existing condition, and so compel the local authority to purchase it at or above its market-value. This being the case, it is hard to see where the benefits of an "automatic" improvement come in. It is apparently no advance upon the ordinary system of compensation under what is known as the "Lands Clauses Act," which is known to be a terribly expensive method, so much so that any comprehensive scheme would at once be placed out of court on the score of expense alone. Mr. Cawston instanced other ways in which he thought economy would be served by a comprehensive scheme, but his arguments appeared to me fallacious, and he finally concluded his paper without any really practical proposal for carrying out his scheme. Indeed, much as I regret to have to say it, I do not think there is any method by which London could be effectually improved on a comprehensive basis so long as the existing law remains. The cases of the foreign cities referred to by Mr. Cawston are not by any means of a parallel character. Paris and Vienna had sources of income denied to London and the initial circumstances were altogether different. All we can hope to do is to carry out isolated improvements here and there as circumstances seem to warrant, and to carry out each improvement as well as we can. The constantly increasing traffic is a source of continual trouble, and the attention of the governing authority of London is incessantly being drawn towards certain narrow necks in existing main streets which cannot very well be neglected. I do not think the street from Holborn to the Strand would have had much chance of being constructed were it not for the fact that the block of houses between the two Strand churches rendered a widening of that thoroughfare an absolute necessity and so the whole matter was dealt with at one time. Even this improvement is as yet only in its earliest stages and some changes in the law of considerable importance will have to take place before the Council can undertake it.

The completion of South Kensington Museum appears to be approaching the state of muddle which seems inseparable from all Government undertakings in this country. It will be remembered that in the limited competition that was held, Mr. Aston Webb was the successful competitor, and it was generally understood that the work would be put in hand at once. Official delays, however, began to take place and before anything was done the general election was held, with the result that Mr. Plunket was replaced at the Office of Works by Mr. Shaw Lefevre, a gentleman of original views on architecture. A rumor appeared in the *Times* that the Government did not intend to proceed with the permanent buildings for the Museum. This the *Builder* contradicts, being "informed on good authority that there is not the slightest ground for the fear that the new buildings will be abandoned." We accept this, of course, but rumor will not be silent, and there are now advocates springing up who assert that, after all, Mr. Aston Webb will not be the architect but that Major Scott's original design will be carried out. Probably before much is done there will be another change of government. (Since I wrote this the Government have announced that there is every intention of employing Mr. Aston Webb as architect, but that the buildings will not be proceeded with this year.)

The Liberal Government, however, may be credited with having secured Mr. Tate's collection of British Art for the nation. You will probably remember my references from time to time on this subject. The original difficulty arose about a site. The Government of the day could not and would not place at Mr. Tate's disposal a site which he deemed adequate for the erection of his proposed gallery and so after considerable wrangling Mr. Tate withdrew his offer. When Sir William Harcourt came into office he attempted to renew the negotiation offering to Mr. Tate for his gallery the frontage to the river now occupied by Millbank Prison. The site did not seem an altogether desirable one. It is situated on an unfrequented part of the Thames embankment, and there are no important buildings in the immediate locality. The County Council are, however, proposing to rebuild Vauxhall Bridge which is in the immediate locality of the prison, and perhaps the two works may reach on each other and alter the character of that particular district. The demolition of Millbank is proceeding apace. It has been divided into sections, which are being let to house-breakers at intervals of about a month for the purpose of giving work to the unemployed. It will not be long before the whole prison is demolished, and the Government will then have to consider what is to be done with the remainder of the site. There is some talk of erecting barracks in lieu of those behind the National Gallery and so permitting its much-needed extension; and I hear that a further portion is to be offered to the London County Council for the erection of laborer's dwellings.

CONCERNING water-backs of kitchen and laundry ranges, it would seem to be reasonable, in view of their liability to being frozen solid in winter, either owing to exposure or when the dwelling is vacant, that some mechanism be introduced in connection therewith. We suggest the following: Cast a boss on the bottom of the water-back and top it for three-quarter-inch pipe and brass coupling, and from it continue a three-quarter-inch brass or iron pipe and join it to the nearest waste-pipe. Place a stop-cock or globe valve on this pipe as close to the range as possible, and easy of access. Manufacturers of kitchen and laundry ranges ought to make this improvement. — *Fire and Water.*

COMPARATIVE MUNICIPAL BUILDING LAWS.—XXIII.

[Note:—In these tables bracketed letters invariably refer to preceding passages in the same column.]

Fireproof Shutters.

Boston:—*a.* First and Second Class Buildings: Openings or doorways in party or partition walls required by this act shall not exceed two on each floor, nor combined area on each floor exceed 100 square feet. Each opening to be provided with two sets of metal-covered doors, separated by thickness of wall, hung to rabbetted iron frames, or to iron hinges in brick or iron rabbets, provided this section does not apply to theatres.

b. First and Second Class Buildings more than one story high, containing above first story any room of over 600 square feet area, used for any purpose except domestic cooking, of greater fire-risk than offices, counting-rooms and dwelling-rooms, shall have outside openings protected by shutters. Such shutters covered on both sides with tin, or made of other substantial fire-resisting material; hung on outside if practicable, otherwise on inside either upon independent iron frame or upon iron hinges rabbetted to masonry and made to be handled from outside. These requirements apply only to openings in such buildings when openings are above and within 30° of openings in wall opposite, or the outside face of which diverges at an angle of less than 135° from outside face of wall containing opening and leaves open space between openings and outside of wall.

Baltimore:—*c.* Stores, storehouses, warehouses more than two stories high, or more than 25' high, shall have doors or shutters made of fireproof material on every window and entrance when same do not open on street, subject to approval of fire underwriters.

d. When such doors or shutters cannot be put on outside of opening they shall be put on the inside and hung independent of woodwork of window.

Brooklyn:—*e.* Every storehouse over 20' in height to highest part above sidewalk shall have shutters and doors on every window and entrance on rear above first story made of copper, iron or other fireproof material *f.* approved by Commissioner.

Churches and such other public buildings not required to have metal shutters.

Charleston:—

g. Stores, storehouses, mills, manufactories more than two stories high shall have doors, blinds or shutters of fireproof metal on every window and entrance where same do not open upon street, or are within 50' of an opposite building.

h. When such cannot be put on outside they shall be put on inside and hung upon iron eyes or frames independent of woodwork.

i. Shutters above first story arranged to be from outside.

j. Prismatic lights in iron frames regarded equivalent to iron shutters.

Cincinnati:—*k.* Buildings of warehouse class more than two stories high, and located opposite any other buildings having openings, and not more than 30' distant, shall have openings in walls provided with doors, blinds or shutters made of or covered with fireproof material.

l. These doors or shutters hung on cast-iron eyes or frames. (*j*).

m. Every opening in party-wall closed by two such fireproof doors as described, hung to cast-iron eyes or frames on opposite sides of jambs of opening.

Cleveland:—(*k*); (*l*); (*j*); (*m*).

Detroit:—

n. Every opening through party-wall of brick building shall have top, bottom and sides of brick, stone or iron; shall be closed by two sets of wrought-iron or metal-covered doors (separated by thickness of wall) hung to rabbetted iron frame or wooden frame entirely covered with metal, or to iron hinges in brick or stone rabbets; shall not exceed 10' high or 8' wide; and any opening other than doorway shall be protected in manner satisfactory to Inspector.

District of Columbia:—All buildings, except churches and dwellings, in close proximity to other buildings, shall, when ordered by Inspector, be provided on rear side or sides with iron or other fireproof shutters to all openings, of such construction as may be stipulated, which shutters shall be closed at termination of each day's business.

Kansas City:—Brick buildings to be used as warehouses, stores, storehouses or manufactories more than 45' in height shall have doors or shutters made of or covered with fireproof material on every window or entrance which does not open upon street, alley or court more than 20' wide.

o. When such shutters cannot be put on outside they shall be put on inside, and be hung upon an iron frame independent of woodwork, or to iron hinges in rabbets of masonry.

p. Every such shutter or door to be closed at completion of business each day by occupant having use or control of same.

q. Openings for doors in party-walls shall have top, bottom and sides of stone, brick or iron; shall be closed by two sets of wrought-iron or metal-covered doors (separated by thickness of wall) hung to rabbetted iron frames entirely covered with metal, or to wooden frames or two iron hinges in brick or stone rabbets. Openings other than doors protected in manner satisfactory to Superintendent.

Louisville:—(*g*); (*h*); (*i*).

Memphis:—

Milwaukee:—

Minneapolis:—

Nashville:—Business houses more than two stories high whose rear extends to alley or centre of block where numerous buildings are brought into close proximity shall have blinds or shutters of fireproof material on all openings above first story; such blinds made of tongued and grooved lumber, covered on both sides with iron.

Newark:—

r. Buildings having iron shutters on front of same shall have one or more of them provided with such arrangement for opening same from outside as shall be approved by Chief of Fire Department and City Engineer.

New York:—Buildings of more than two stories, or above 25' in height above curb-level, except dwellings, schools and churches, shall have blinds, doors or shutters of iron or other fire-resisting material approved by Superintendent on every opening above first story, except on front, when the street is more than 30' wide.

All shutters on front windows above first story arranged to be readily opened from outside by firemen.

Rolling or steel shutters on first floor shall be counterbalanced so that they may be readily opened by firemen.

No building other than dwelling or fireproof building shall have inside iron shutters above first story.

Windows and openings above first story may be exempted from having shutters by Board of Examiners.

Duty of occupants to close shutters at close of business.

Omaha:—Brick buildings more than two stories high, or above 25' in height above curb-level, except dwellings, schools and churches, shall have doors, blinds or shutters made of iron or other fire-resisting material approved by Superintendent on every window or entrance on side or rear walls.

(*m*); (*n*); (*o*); (*p*). All shutters arranged to readily open from outside by firemen.

Philadelphia:—

Pittsburgh:—

Providence:—

St. Louis:—Brick buildings more than two stories or 30' in height above curb-level, except dwellings and churches, shall have doors, blinds or shutters of fireproof metal on every window or opening above first story, except where they look upon streets.

When such shutters, blinds or doors cannot be put outside they shall be put on inside.

(*l*). Duty of occupants to close them at close of day.

San Francisco:—Iron shutters above first story must be left open, and fitted so that firemen can readily close them.

Doors and shutters on first story must be hung on hinges, locks arranged to be easily broken by Fire Department.

All iron doors or shutters on front, sides or rear of building shall be hung to iron frame or securely fastened to wall, and in no case shall all windows and shutters be fastened from inside, but at least one on front, side and rear be fastened with lock as prescribed.

(See "Openings in Party-walls.") Such openings to have wrought-iron doors on each side of wall.

Rain-Water Conductors.

Boston:—*a.* Buildings over 45' high shall have suitable water-tight metallic leaders, and all buildings shall have leaders sufficient to carry all water to street, gutter, or sewer, and in such manner as not to flow upon sidewalk, or to cause dampness in any wall, yard or area.

b. Rain-water leaders, when connected with soil or drain pipe, shall be properly trapped.

Baltimore:—*c.* Inspector is directed to compel owner or his agent to put proper metallic spouting and gutters on buildings, and keep same in repair, so that gutters shall not leak nor overflow to pavement, and carry water from roof to ground, sewer or gutter, protecting walls and foundations.

d. Awnings not extending over curbstone shall be provided with gutters and down-spouts to carry water to street-gutters.

Brooklyn:—*e.* Wooden gutters of stone or brick buildings shall be lined or covered on upper surface with copper or other fireproof material to be approved by Commissioner. (See "Cornices.")

Charleston:—

f. Buildings shall be kept provided with proper metallic leaders for conducting water from roof to ground, sewer or street-gutter in such manner as shall protect walls and foundations from damage.

g. In no case shall water be allowed to flow upon sidewalk.

h. But shall be conducted by drain-pipe to street-gutter or sewer.

i. Rain-water leaders must never be used as soil, waste or vent pipes, nor shall any soil, waste or vent pipe be used as a leader.

j. Water-leader within house must be of cast-iron with leaded joints, or of copper with soldered joints. When outside house and connected with house-drain, it must, if of sheet-metal with slip-joints, be trapped beneath ground or just inside wall, the trap being arranged to prevent freezing. When leader opens near window or light-shaft, it must be properly trapped at its base. The joint between a cast-iron leader and roof must be gas and water tight by means of brass ferrule and lead or proper pipe properly connected.

Cincinnati:—*k.* Buildings shall be provided with proper fall-pipes connected with sewer, or to catch-basin connecting with sewer when building abuts on street or alley containing public sewer; otherwise water shall be carried to street-gutter in manner approved by Inspector. (*h*).

Cleveland:—(*k*).

Denver:—*l.* Rain-water shall be so conveyed from roof as not to flow upon adjoining property, nor against any wall so as to endanger it or cause dampness therefrom, and all water conducted from building to street gutter or sewer. (*g*).

Detroit:—All gutters shall be of metal.

District of Columbia:—Buildings shall be kept provided with metallic down-spouts and eave and cornice gutters for conducting water without damage to walls or foundations, so as not to drain upon or damage adjoining property, and by drain-pipe to sewer or to gutter under sidewalk where no sewer exists. (*g*).

Kansas City:—*j.* Brick buildings shall be kept provided with suitable water-tight metallic leaders, and all other buildings with water-tight metallic or wooden leaders conducting water from roof to ground, and thence to street-gutter or sewer. (*g*).

k. Nor drip on ground or cause dampness in wall, yard or area.

Louisville:—

Memphis:—

Milwaukee:—

Minneapolis:—Buildings fronting on street shall be kept provided with proper leaders for conducting water from roof to ground, sewer, street-gutter or dry well in such manner as shall protect walls and foundations from damage. (*g*). No leader shall be constructed except in accordance to law.

Rain-water leaders running down outside of building shall have trap or back-pressure valve before entering sewer, drain or soil pipe.

Rain-water leader within building shall be extra heavy cast-iron soil-pipe, or standard wrought-iron pipe tinned inside and outside.

Connection of rain-water pipe with soil and drain pipes shall be on lower side of highest fixture.

A soil or vent pipe above highest fixture shall not be used as rain-water pipe.

Rain-water pipe running from low roof or low eaves shall have trap or back-pressure valve before entering drain or sewer pipe.

Nashville:—Water-spouts emptying contents on public sidewalk shall be connected with gutter by drain laid beneath surface of sidewalk.

Newark:—

New Orleans:—Gutters on buildings where fireproof roofs are required shall be made of non-combustible material, and firmly secured to building by irons.

Balcony projecting over any part of banquette shall be provided with metal gutter attached to outer edge and leading into metallic down-pipe, leading across banquette into street-gutter. But if balcony is entirely roofed, then such gutter shall be attached to roof.

Gutters shall be kept in such repair that they do not leak or drip on sidewalk.

Gutters across banquette shall be covered and approved by City Engineer, or of proper size of drain-pipe.

New York:—(*f*). (*g*). If there is sewer in street. Pipe shall be below surface of sidewalk.

Omaha:—(*f*); (*g*); (*k*).

Philadelphia:—

Pittsburgh:—

Providence:—Buildings fronting on street shall be provided with proper leaders conducting water from roof to ground, sewer, street-gutter or dry well in such manner as to protect walls and foundations from damage. (*g*).

Tenement and lodging houses, water shall not drip from roof so as to cause dampness in walls, yard or area.

St. Louis:—All buildings shall be provided with proper metallic leaders conducting water from roof to ground, river or street-gutter in such manner as to protect walls and foundations from damage.

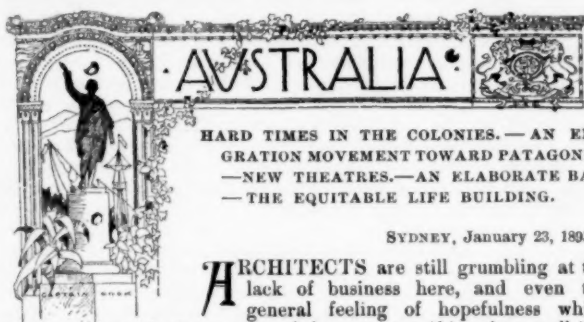
(*g*), but shall be conducted by drain-pipe to street-gutter or sewer.

San Francisco:—Gutters on brick buildings reconstructed shall be made of fireproof material.

Wilmington:—

Compiled by HENRY A. PHILLIPS.

¹ Buildings used for mercantile or manufacturing purposes, and where a sewer connection can be made, shall have in basement or cellar such a connection that may be readily opened in case building is flooded. Location of such sewer connection shall be indicated by permanent and conspicuous sign on wall near ceiling, and always kept in sight.



HARD TIMES IN THE COLONIES.—AN EMIGRATION MOVEMENT TOWARD PATAGONIA.
—NEW THEATRES.—AN ELABORATE BAR.
—THE EQUITABLE LIFE BUILDING.

SYDNEY, January 23, 1893.

ARCHITECTS are still grumbling at the lack of business here, and even the general feeling of hopefulness which usually comes with the opening of the new year, if it exists at all just now, is certainly not very pronounced.

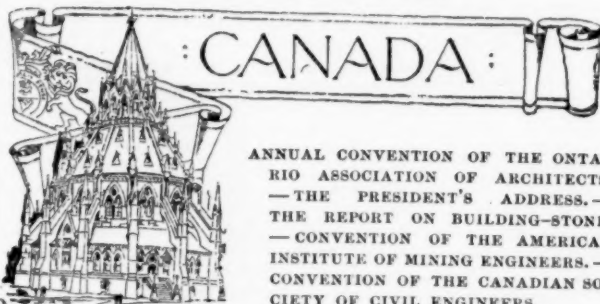
Eighteen ninety-three begins with the announcement of a large deficiency in the Treasurer's Department, and various modes of retrenchment are being devised to keep the public expenditure within reasonable bounds, and an income-tax is to be imposed for the purpose of raising revenue to meet existing liabilities. The Australian Governments are such large employers of labor that when retrenchment becomes necessary the effect is felt by all classes of the community.

Our government statistician, too, has been compiling a doleful list of the persons who during the last year brought themselves within the jurisdiction of the Insolvency Act, from which it appears that 1,500 failed, and that in the aggregate their deficiencies amounted to a million and a quarter pounds sterling. To show what three bad years have brought us to, the founding of a "New Australia" is seriously talked about, and the part of the world chosen for the establishment of this latest Utopia is Patagonia, or Argentina, as they fondly call it here. That a continent as large as Australia should be unable to support less than four-and-a-half millions of people seems too absurd for remark, and yet this mad scheme of emigration is actually about to be put into execution! If it were not for the feverish anxiety to amass wealth quickly, these visionaries would, one may be sure, find it better to face the ills they have in their colonial homes than fly to others, which they know not of, in Argentina. Yet, these troublous times notwithstanding, there would seem to be no dearth of money where amusements are concerned. As proof of this, if proof were needed, it will be sufficient to mention that two of the Sydney theatres have lately been reopened: one, the Theatre Royal, rebuilt after destruction by fire last year, and the other, the Criterion, which has been closed for some months while the building was being enlarged and re-decorated. The three other theatres of which the city boasts are kept going almost constantly, and within the last few weeks we witnessed the opening of still another, the Lyceum, in Pitt Street, which is, undoubtedly, one of the largest and most sumptuous places of amusement in the Colonies. The front of this building is an imposing design of a Queen Anne character, carried-out in red brick with cement dressings. The fatal facility with which this latter material can be made to assume decorative forms has proved a temptation to the architects (Messrs. Backhouse & Laidley) which they have, apparently, been unable to withstand. The pressed-cement-work, as a consequence, is too assertive, and there is about the whole building a lack of that restraint which lends a charm to even the most artistic work. But, taken as a whole, the building, externally, is striking and effective. Internally, it is exceedingly well arranged, and nearly every one of the two thousand people it is capable of seating can both see and hear what is taking place on the stage; and this, after all, is more than can be said of many a more pretentious playhouse. To attain this end, the usual outward curve at each end of the horseshoe in the three tiers has been done away with, and though, in appearance, the form is less graceful, still the end aimed at seems to have been successfully attained. The theatre is well ventilated, and the sliding roof allows the air to be thoroughly changed in the auditorium between the acts. This open-roof arrangement is now regarded as essential in all our theatres, and it is certainly conducive to comfort, when the thermometer is verging on 90°, to feel the cool, fresh air on one's face, and when one's eyes are aching with the glare of the lights on the stage it is pleasant to be able, without leaving one's seat, to look out on the night and the stars.

Another recently completed work which calls for notice is the new bar at Tattersall's Hotel, on which, as has been stated, over £22,000 have been expended. Everything that money could do has been done for the adornment of this bar, and yet, to say the least of it, the result is not satisfactory, for the simple reason that the thing has been overdone. The most costly marbles line the walls; the ceilings impress one as being masses of ornament overlaid with paint and gilding; the floor is laid with expensive mosaic, and the American-walnut buffets and bar-counters are rough with elaborate carving. Round the walls of the bar itself are decorative panels from the brush of Mr. J. R. Ashton, ex-president of the Art Society of New South Wales. The artist has done his work well, and these picture-panels and the stained-glass are the most satisfactory portions of the work. The glass, indeed, is the best ever made here, and the designs, also by Mr. Ashton, are models of what work of this kind should be. Everything has been well done,—some of the

workmanship is really excellent,—but the effect of all the lavish expenditure has come perilously near degenerating into vulgarity.

In curious contrast to this sumptuous gin-palace is the calm and dignified refinement of the new building in course of erection for the Equitable Life Association of New York, which is now becoming a prominent feature in George Street. Of course, no comparison can be instituted between the two, as one is only an elaborate piece of decoration and the other is a stately block of offices. But the decoration in the one is so loud and fussy that the quiet dignity of the other is emphasized, and it immediately suggests where the fault of the former lies.



ANNUAL CONVENTION OF THE ONTARIO ASSOCIATION OF ARCHITECTS.
—THE PRESIDENT'S ADDRESS.
—THE REPORT ON BUILDING-STONE.
—CONVENTION OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.
—CONVENTION OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.

THE Ontario Association of Architects held its third annual convention on the 7th and 8th of February, just too late to admit of an account of its proceedings being sent in the February monthly letter. Although the attendance was not quite so large as on former occasions, the gathering was thoroughly representative and a considerable amount of important business was carried through, while the general tone of the convention showed that the Association was a lively body of men, who fully appreciated the benefits of the Association and intended to work hard for its success and the development of the important issues it has in hand. A few quotations from the opening address of its President, Mr. S. J. Curry, will show what has been the principal work of the Council in the past year and will describe the position of the Association with regard to its objects. The address was very able and thoroughly businesslike and was couched in terms expressive of great earnestness, such as must have very favorably impressed the hearers with the efficiency of the Council, while it will have the effect of inspiring and rousing up those members who, according to the report of the Registrar, which followed, were apparently flagging in their interest, through being unable to discover any personal advantages to be gained by a continuance of their membership. The President said: "This is the third annual meeting of the Ontario Association of Architects, and I believe it will be considered in the future as having been weighted with most important issues. At this meeting many questions of vital interest must come up for discussion and settlement. The life of the Association depends upon the action the members may take during the convention. We have nearly reached the critical point of our existence, which many of us have seen coming from the beginning and which, if safely passed, will carry the Association forward to a period of great usefulness."

"This Association is working under an Act of the Provincial Legislature, which, to all intents and purposes, gives us neither benefits nor privileges, while it imposes on us the duty of educating the future members of the profession, that the public may be benefited in the future. The Act is of so little practical benefit that it was only after considerable discussion and consideration that it was determined to try to carry out its provisions. This decision was arrived at only when it was pointed out that we could not expect to obtain all we desired in our first effort and that there was reasonable hope that we should eventually succeed in having the Act changed so that it would really serve the purpose for which it was passed. As you will see by referring to the report of the Council, an effort was made at the last session of the Legislature to have the Act amended. We found the opposition from the members of the Legislature against legislation, having the slightest appearance of giving special privileges to any profession or organization, so strong that it was worse than useless to press it at that time. . . . Our Council has been pursuing a course which they think most likely to lead to eventual success, that is, to try and carry out the educational features of the Act, and thereby show that we are in earnest in our desire to improve the professional standing of our members. The public have no sympathy with us in any efforts unless it can see some direct benefit to itself. We must, therefore, take up the measures in which the public is directly interested before we attempt to improve our condition as a profession in those respects in which we are more directly interested as practising architects. The difficulties in the way of obtaining amended legislation can only be properly understood by those upon whom the duty has been imposed of getting the desired legislation. At this point, I would like to draw the attention of the members of the Association who reside outside the cities to one of our difficulties in obtaining such changes to the Act as nearly all of us believe to be necessary to its successful working, and that is, that while it is possible to convince the city members that there is danger to life and health from the incompetency of an architect, simply because they live in

large centres of population and can see the result of such incompetency, it is next to impossible to convince the average country members that any danger exists. . . . The Council interviewed the Government two weeks ago and have reason to believe that we may succeed in having the Act amended by the striking-out of the word "registered" where it occurs in the Act, if each member will do his duty in the premises. . . ."

The President went on to review the work of the examinations, and pointed out the necessity of this work being effectively carried out, both for the objects of the Association and for the benefit of the members individually, who would have the advantage of being able to obtain trained assistants ready for their work, instead of having to educate them for themselves. Some seemed to consider that it was an expense which the Association should not have to bear—that students should pay a sufficient sum to clear all the costs; but it was evident that if the student were asked to pay high fees he would not come forward, and the work of education would be blocked at the outset. The address then referred to the library of the Association, and regret was expressed that members had not made such practical use of it as they might have done. The library was small at present, but it was the intention of the Council to purchase, by degrees, such books as could not, as a rule, be bought by architects individually on account of their expense. The practice by which members living at a distance could have these books sent them by paying the postage made the library as accessible to them as to city members, and would undoubtedly prove an inestimable benefit to them. "The Council was instructed at the last convention to determine what could be done to protect an architect's design from being used by a second party without compensation." Under the present Copyright Law, the sub-committee which had dealt with the subject found that nothing could be done to remedy the evil.

The President then dealt with the various occasions upon which the Council had acted in reference to appointing members to assist the promoters of competitions in coming to fair and satisfactory conclusions, to the various subjects upon which deputations from the Association had been to Ottawa to interview ministers in connection with the objects of the Association, and dealt at large with the subject of fees to be paid by members, some feeling having been shown by members who did not really comprehend the nature of the work done and to be done by the Association that the fees were higher than necessary. In conclusion, the President referred feelingly to the death of the late president, Mr. W. G. Storm, who had worked so earnestly for the advancement of the Association, even to the sacrifice of his material interests.

The reports of the Treasurer, Registrar and Librarian were then read, followed by the report of the Council, whose work has been practically outlined by the notes given above of the President's address.

A considerable amount of discussion followed upon "business arising out of the minutes," which was, perhaps, of local rather than general interest, and need not here be entered into; and the meeting adjourned, the members being well satisfied as to the work accomplished in the first afternoon of the convention.

In the morning of the second day a paper was read on "Iron Fireproof Construction in New York," and some tests of material were made on the machines of the School of Practical Science, in which building the convention was being held. In the afternoon session Mr. Gregg brought forward a scheme for dividing the Province of Ontario into sections in which "Chapters of the Association should be formed." The matter was very thoroughly discussed, but it was decided that, while it would be well to have some such scheme carried out in the future, it was as yet somewhat too early for its inauguration.

It was decided to change the time of the annual convention to January instead of February, the date decided on being the second Tuesday in the month. Voting by letter-ballot was then taken up. Mr. Arnoldi, from Ottawa, represented that there were sixteen members in Ottawa, of whom he was the only one able to come up, and that, while they took great interest in the work of the Association, they were debarred by the existing rules from voting in the elections. The motion to have the by-laws changed to admit of voting by letter-ballot was, however, lost, it being the general opinion that if this were permitted one incentive to attendance at the convention would be lost, and that it would tend to reduce the attendance very materially.

In connection with the library, an important direction was made to the Council, which was that they were empowered to invest a sum of money out of the capital of the Association in the purchase of books. When all the business had been disposed of the elections were proceeded with, resulting in the return of Messrs. Frank Darling, David B. Dick and Edwards (of Hamilton) to fill the positions of the three retiring officers. Mr. D. B. Dick was elected president of the Council. The proceedings terminated with sundry votes of thanks. The city members gave a dinner in the evening to their *confrères* from the country.

One very important proceeding of the convention was the reading of the report on "Building-stones of the Country," prepared by the sub-committee appointed for that purpose some time ago. This is a very important document and great labor has been expended upon its production, the intention being that the results of the tests made shall be printed in book-form and circulated for the information of those interested. We could not give the matter in full, the tables

themselves would take up more space than this whole letter, but we may make a few notes. The report concludes with the clause, "Specimens of all the stones tested have been preserved and a complete set of these, together with all data connected with the tests, including, in most cases, photographs of the stones broken, will be kept at the School of Practical Science and at the offices of the Association for the benefit of those wishing further details." The tests were conducted at the School, "the stones first sawn into cubes, set in plaster-of-Paris in a steel frame made for the purpose, and brought to perfectly parallel faces by rubbing." The report describes twenty-six kinds of stone, each one from a different quarry, and four tests were made of each kind. Of the twenty-six kinds, fourteen were sandstones, eight limestones, one dolomitic limestone and three granites. With each stone a full description is given of its formation, chemical analysis, color, location of quarry and means of shipment or transportation, and in tabulated form, its dimensions, crushing-load, crushing-stress per square inch, and the average crushing-stress of the four specimens per square inch. This report is a very valuable production of the Association and should prove of great value to all interested in building operations. It is intended to continue the work of testing specimens whenever there are any to test and to have in time a complete list with full particulars of every stone in the country.

A number of local manufacturers invited the architects holding the convention to visit their establishments in a body, and provided sleighs for the purpose, an extra day being taken up by these very interesting and instructive proceedings, the country members being especially benefited by the visits.

The next events in connection with the Association will be the examinations which are to take place in the second week of March.

The American Institute of Mining Engineers held its annual convention in Montreal, in the new Physics Building of the McGill University, Montreal, on February 22d and 23d. Mr. John Birkenhead, of Philadelphia, was in the chair, Doctor Raymond, of New York, acting as secretary. The report of the Council was read. The Association is in a very flourishing condition, having a surplus of \$3,463 odd, an increase of \$1,750 over the surplus of last year, in addition to which there are in possession of the society certain Government bonds representing nearly \$5,000, and others having a par value of \$2,900. As regards membership, there have been one Honorary Member, 225 Ordinary Members and 30 Associates elected in the past year; 9 Associates have become Members, and 7 who were in arrears have been reinstated; 4 Foreign, 20 Ordinary Members; 3 Associates have been removed by death, while 25 Members and 4 Associates have resigned; 53 Members and one Associate have lapsed through non-payment of dues. The total membership now is 2,376. At the Chicago Exhibition the Association will have charge of the two divisions of mining and metallurgy of the International Engineering Congress, which will be held on July 31st, at which this Association will meet, and the meeting will be considered as one of the regular gatherings of the society. Several papers were read of a technical character, Major Powell, of the United States Geological Survey, reading one on "The Geological Map of the United States." The following officers were elected for the ensuing year: *President*, Henry M. Howe, Boston; *Vice-Presidents*, A. J. Bowie, Jr., San Francisco, R. G. Leckie, N. S., E. G. Spilsbury, New York; *Treasurer*, T. D. Rand, Philadelphia; *Secretary*, R. W. Raymond, New York.

The Canadian Society of Civil Engineers also held its annual convention on February 23d, under the presidency of Mr. J. Kennedy. The election of officers resulted in the return of E. P. Hannaford as *President*; Thos. Munro, P. A. Peterson, W. T. Jennings, *Vice-Presidents*; C. H. McLeod, *Secretary*; W. McNab, *Librarian*.

LATRINES OF THE EAST.



At Singapore.

THE proper disposal of human excreta is a subject of vital importance and is to-day occupying the attention of municipalities the world over. The subject has its economic and sanitary side. The question of waste and consequent impoverishment of the

land, with the masses reduced to paupers, gave little concern to the rulers, but when a connection was established between this material and infectious diseases which invaded the homes of the people, then the matter aroused interest and questions of public health enlisted the attention of thoughtful men.

Sanitation is a science of recent development. The terms sanitary-laws, sanitary-engineers, health-officers, etc., were hardly known a generation ago. The pages of advertisements, with their accompanying illustrations of porcelain bowls, syphon-traps, flushing-tanks, ventilating-pipes, call our attention to devices of recent origin. Plumbing has become a new profession—a science, in fact, since the enlightenment of the public on sanitary matters.

The latrines of a hotel, once so cold, dark and noisome, are now white marble halls, warmed and well lighted: in fact this region, once the most offensive feature of a public-house, is now, in all well-appointed hotels, not only the cleanest part of the building, but the air is purer there than in any other part of the structure. It is the only region where one does not detect the characteristic "hotel odor."

As a nation we pride ourselves on being far ahead of the world in the appointments of the latrine. This superiority, however, is confined to city populations possessing modern forms of water-supply and drainage. The common houses of the people, however, in our northern cities, at least, are usually better provided in these respects than many a fine house abroad.

Realizing the enlightened opinion concerning these matters in this country, it may be a matter of curious interest to inquire into the ways of Eastern people. While some of the Eastern nations are far in advance in the personal cleanliness associated with the disposition and utilization of sewage, using this term in its most restricted sense, other nations are offensive to the last degree. Indeed one is not compelled to leave Europe to find noisome conditions, and if one reverts to the habits of Europeans hardly more than a century ago he finds revealed a depravity only paralleled in China and certain parts of Russia to-day.

Aside from the curious interest that may attach to this subject there is a far more vital interest in the bearing the subject has upon public health. The question of a wholesome water-supply, whether pumped from the domestic well or distributed from larger sources by the commune, affects at once the life and health of the citizen. The fact that these supplies can be infected by germs of enteric disease is one that is established beyond refutation. The manner of the disposal of house-sewage is, therefore, one of vital importance, and if it can be shown that these nations whose methods are vicious in these respects are the ones that suffer from such diseases as a vitiated water-supply might induce, it will strengthen communities in their efforts to insure an uncontaminated source.

The nations of Europe stand in periodical dread of cholera from the regions lying east of them. The Orient stands as a continual menace to the nations of Europe, and the time may not be far distant when a propaganda in the interests of sanitary science shall invade these countries with their missionaries of hygiene to teach the people the gospel of cleanliness. That the masses might be ready to receive such teaching is shown by the success accompanying the efforts of medical missionaries beyond that of those who teach dogma alone.

With the threatened invasion of cholera and the undeniable fact that the dread disease comes from the East, an added reason is given for a glance at the methods in vogue for the disposal of egesta in these far-off countries.

China, from its enormous area and dense population, offers one of the most interesting fields for those interested in sanitary science. In no other part of the world, unless it be in Russia, can such depths of filthiness be found as in the cities of China. Mr. Arthur H.

city when he has inspected Foochow, he is certain of it when he visits Ningpo, and doubly sure on arriving at Tiensin, yet after all it will not be strange if he heartily recants when he reviews with candor and impartiality the claims of Pekin!

Dr. Robert Coltman, in his valuable book, "*The Chinese*," calls attention to the existence of various forms of enteric disease, and,



Fig. 2.

with other observers, notes that the Chinese are utterly ignorant of the germ-theory of disease, and, consequently, the persistent violation of all sanitary laws follows as a matter of course. The experience of centuries has taught them that water can be drunk in safety only after it has been boiled, an experience similar to that which has taught them that an emersion in the same fluid for several minutes would be equally disastrous to life. Doctor Coltman says, "they would look with horror at a foreigner drinking a glass of cold water," and he admits that after several severe sicknesses in his own family from drinking what he considered ordinarily pure water, he was forced, ever after, to drink only boiled water, tea or coffee. Despite these precautions, however, on the part of the natives, "cholera occurs as an epidemic every few years and is frightfully fatal. The ports seem to be affected the most, but in the summer of 1888 a wide-spread epidemic swept through Shantung and Chihli, from east to west, sweeping away thousands of lives."

In the *American Architect*, No. 859, an interesting extract is published from the report of Ernest Norfleet, past-assistant surgeon, U. S. A., entitled "Conservation of Filth in Chinese Cities." Speaking of Canton, he says: "The drainage is naturally bad, and what there is consists of several large canals that penetrate the city from the river and receive the filth from smaller canals and street-gutters emptying into them; but all these become greatly choked, and, notwithstanding the daily rise and fall of the tide, the city everywhere reeks with odors of the vilest sort, i. e., to Christian noses. The natives do not seem to notice them at all. Their water-supply is taken from the river and from wells and a few springs on the north side. The wells must be saturated with the filth that seeps into them from the adjoining soil, for they are fed from the rainfall for the most part; but it is always boiled, and drunk in the form of tea or consumed in soups."

The comparative freedom of the Cantonese from enteric diseases is believed to be due to the rise and fall of the tide twice a day, the heavy rainfalls which wash out the rottenness from the porous soil, the universal outdoor work of the people, the open shops and houses, and, above all, the universal habit of boiling the water before drinking. Doctor Norfleet calls attention to the scrupulous way in which ordure is saved, and, as a consequence, pollutes the soil but little. As a matter of fact, this material is put upon the rice-fields in a fluid condition and every rainfall must wash the stuff into the neighboring canals and rivers. And here we may refer to the strenuous protests made by Dr. Letheby, of England, some years ago, against sewage irrigation, showing the grave dangers which would result.

Among the teeming millions in China, there is every reason to believe that a struggle for existence has gone on for centuries, killing off those who could not stand the microbes and bacilli of certain kinds, and, as a result, the survivors are proof against conditions that would instantly depopulate one of our cities.

Enough has been said to show the extreme filth of Chinese cities, yet I must add my own brief experience, as that will enable me to present some further details. At Shanghai, as one enters the native town he encounters men bearing uncovered buckets upon the ends of a carrying-stick; these are the removers of night-soil, and they have their regular routes through the city. If one follows these scavengers he sees them going to the banks of a canal near by and emptying the buckets with a splash into a long scow, or other kind of boat, which, after being filled, is towed away to the rice-fields in the country. The stuff is often spilled in the water by careless emptying. The canal has no current, at least not enough to disturb the green ooze and sickly yellow condition of the water, which is thick with foulness; yet beside this boat people are dipping up the water for drinking and culinary purposes. Small-pox, at the time of my visit, was epidemic in the town, and I brushed past men in the narrow alleys who were covered with eruptions; everywhere the ground was slimy with filth, and the state of the town was indescribable.

I spent a few days within the city, in the care of a Chinese student, and was permitted to make many sketches of Chinese apartments. It would seem that in the better class of houses each room is provided with a large wooden bucket with close-fitting cover. These buckets are emptied every day by a man who makes the rounds for the purpose. They are scrubbed by the aid of small shells (*Arca granosa*) which have upon them numerous ribs and nodules. A small basketful is emptied into the bucket and a stiff bundle of bamboo switches is used to stir them about. Rows of these buckets may be seen airing in the back-yard—a suggestion of cleanliness that should be recognized, in spite of the revolting idea of ever having such receptacles in the house over night (Fig. 1). The men

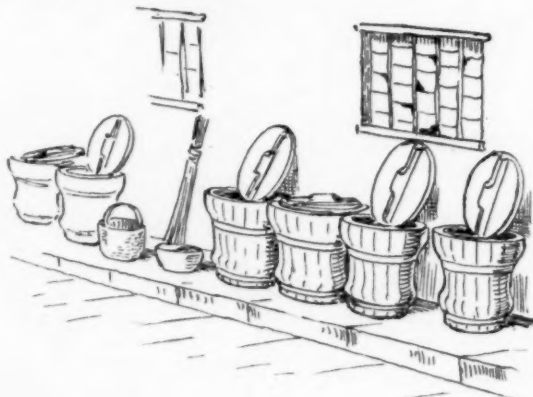


Fig. 1.

Smith, in his interesting work entitled "*Chinese Characteristics*," says that, "no matter how long one has lived in China, he remains in a condition of mental suspense, unable to decide that most interesting question, so often raised, Which is the filthiest city in the Empire? . . . The traveller thinks he has found the worst Chinese

who remove this material are often encountered in the narrow streets, and it requires some alertness and skill to avoid being brushed by them, as they move by you in the roughest way with buckets swinging. In the back-yard of a number of houses I saw large earthen jars embedded in the ground. Against the sides of these jars was a low framework of wood (Fig. 2), and, barring a shelter above, the whole affair had all the primitive simplicity of



Fig. 3.

similar conveniences all over this country. Near these places were piles of ashes from the stoves, and these were scattered over the material at times. The open character of this arrangement, while offensive to the eye, was better, in a sanitary sense, than the ordinary privy in this country, which, having its receptacle sunk in the loose soil, soon leads to the pollution of the

ground and finally of the water-supply itself. Square urinals made of stoneware are occasionally seen. These are used by old people, and I was told that they also served as pillows or head-rests (Fig. 3).

In Canton the latrines are public, comparatively few houses having private ones. Wooden buckets are used in the house by women, as is the custom farther north, but the men go to the public places. As one walks through the streets of Canton the existence of these latrines is always evident to the nostrils. Occasionally he gets glimpses of these places through an open door which leads into a narrow court, and here on each side, in the filthiest possible condition imaginable, is a long row of low stalls closed by doors. A deep, stone gutter runs the length of the place, close to the wall. Across this, in each stall, are secured two narrow planks, and just in front a narrow gutter runs to carry away the urine (Fig. 4). The whole structure was solid, durable and well-built, and, with the faintest notions of cleanliness among the people, would have been much better than similar public arrangements at home. With a supply of running water in each gutter, the plan might be adopted for public latrines in this country without the slightest modification.

Our public latrines and those connected with railroad stations, while vastly better than formerly, are in many cases far from what they ought to be. A plan of a public latrine such as the one just described, or such as one may find in Constantinople, consisting of the simplest possible arrangements and devoid of all seats, is the only true sanitary device for decent people so long as one indecent person has the privilege of access to it.

Widely distributed in the city were large earthen jars bedded in the ground, and these were the public urinals.

From what I have been able to learn from Korean friends, the

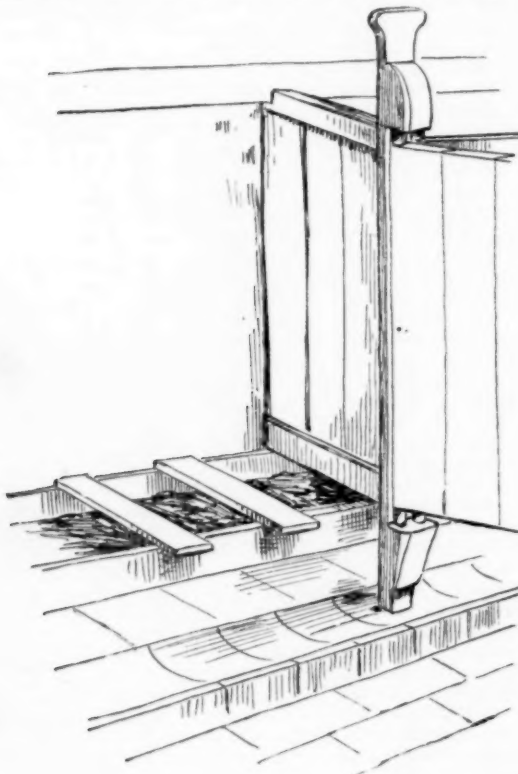
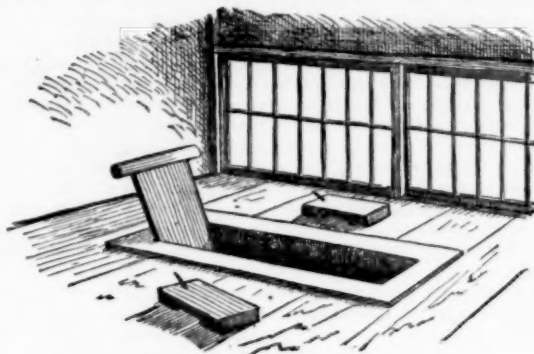


Fig. 4.

conditions in Korea are similar to those in China. Carles, in his "Life in Korea," says that near Soul he saw women washing clothes in a stream, and, "though the stream was low and its bed served as a dung heap, water was also being carried away from it for household uses, and there was evidence on every side that, according to

all rules of sanitation, the population should by right have ceased to exist."

Japan forms a most striking contrast to China and Korea in these matters; not only does every house have its privy, but there are public latrines as well. In every house, except among the poorest



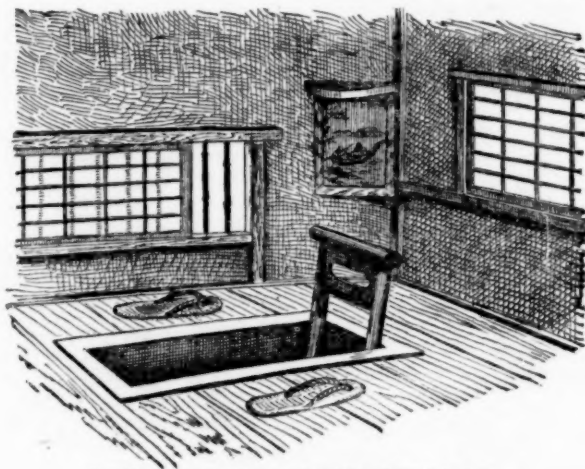
From Morse's "Japanese Homes."—Published by Harper & Brothers.—Copyright, 1885, by Edward S. Morse.

Fig. 5.

classes, one finds in the immediate vicinity of a privy a receptacle for water and a towel, which is always used for hand-washing. In the country, one often sees in the neighborhood of the poorer class of houses a covered place closed by a low door. A clever drawing of Hokusai shows that it is not beneath the dignity of a lord to avail himself of this humble convenience. Receptacles in the form of large jars or buckets are found near the rice-fields. The scrupulous care shown in the preservation of this important fertilizer is in striking contrast to the way in which we wastefully discharge it, thus polluting air and water. Frederick Charles Krepp, in his exhaustive treatise entitled "The Sewage Question," shows the calamities which have overtaken communities and nations who have permitted this material to go to waste. Lowell and Lawrence with their typhoid fever, and Chicago with its overwhelming problem before it, show how far we are yet from dealing properly with this great and perplexing question.

The Japanese, while utilizing this material, nevertheless contaminate their water-supply, for the irrigating material soon finds its way to the rivers, and though the danger of drinking water seems less in Japan than in China, experience has taught the Japanese to drink the water boiled or in the form of tea.

The floor of the privy has simply a rectangular opening, as shown in Figures 5 and 6, which have been taken from my book on "Japanese Homes." The receptacle below consists of a large earthen jar or the half of an oil barrel. This is sunk in the ground and emptied every few days by means of a long-handled bucket from the outside. The men who are engaged in this work have their regular routes and pay for the privilege. It seems incredible that a large city like Tokio, with its million of inhabitants, has this service performed in the most thorough manner. Indeed, so valuable is this substance that in Hiroshima, I was informed, in the renting of the poorer houses, if three persons occupied a room together the value of this



From Morse's "Japanese Homes."—Published by Harper & Brothers.—Copyright, 1885, by Edward S. Morse.

Fig. 6.

product paid for the rent of one, and if five occupied the room no rent was charged.

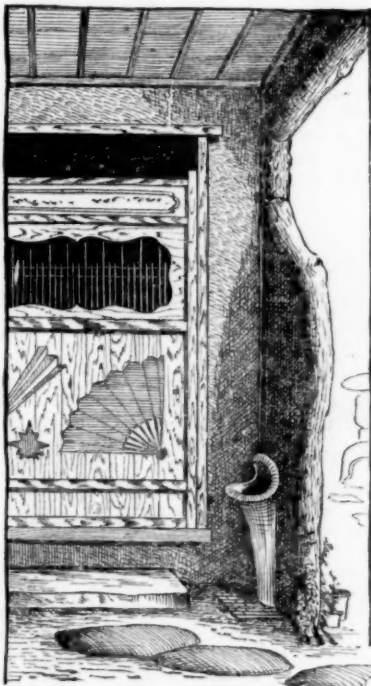
The result of the transference of this material into the country leaves the shores of a city absolutely pure. No malarious flats nor noisome odors, arising from littoral areas, curse the inhabitants, as with us.

In crowded inns much discomfort arises from the odors of the latrine, and even in the better class of houses the privy, being at the end of the veranda, is often perceptible; on the other hand, many of these places might properly be called cabinets, so exquisitely clean and beautiful is the woodwork inside and out. Figure 7, also from "*Japanese Homes*," represents the door of a privy in Tokio. This was inlaid in designs in different-colored woods, and the whole affair was a dainty bit of cabinet-work.

The urinal is usually of wood, though porcelain ones are often seen. The wooden ones are in the form of a tapering box secured against the wall of the closet. Sometimes sprays of a sweet-scented shrub are placed in these and often replaced. The refinement of the Japanese in these matters is shown by the various names applied by them to the privy, such as—*Setsu-in*, snow-hide, *Chôdzu-ba*, place to wash hands, *Ben-jo* and *Yô-ba*, place for business, *Koka*, back frame, etc.

There are certain superstitions associated with the latrine in Japan: one is in regard to the position it must be in relation to the house, the question of prevailing winds never entering into the matter. I was told that a tree called *nanten*, which bears a red berry, is often planted near the privy. Formerly it was believed that an imaginary animal called *Baku* came to eat this fruit, and also had the power of absorbing bad dreams, hence those using the closet would have their bad dreams dispelled.

On the Malay Peninsular a few closed privies are seen among the natives. By those living over the water a definite shelter supported on poles is built. This is somewhat removed from the house,



From Morse's "*Japanese Homes*."—Published by Harper & Brothers. Copyright, 1885, by Edward S. Morse.

Fig. 7.

translation of "*Kojiki, or Records of Ancient Matters*," which runs back twelve hundred years or more, shows that in this record the latrine is mentioned several times as being away from the house, and as having been placed over running water, "whence, doubtless, the name *kahaya*; that is, river-house." I may add to this the suggestion that formerly the Japanese privy was uncovered, like the Siamese type before mentioned, as the curious board that stands up at one end of the usual rectangular opening has a name in Japanese which implies this.

It would seem that in Siam and adjacent regions suffering from periodic scourges of cholera every condition for the wide dissemination of this disease was embraced. Thus, at Bangkok, not only are the latrines scattered along the river, but the bodies of those dying of cholera are denied the usual cremation, and are thrown into the river or are given to the vultures, because it is supposed that the devil has been the immediate cause of their death.

Gross negligence in disposing of egesta in these hot regions is not followed by the dire evils that would result from similar methods in colder climates. In Egypt, for example, the native resorts to the desert, where the hot sun, aided by swarms of insects, soon obliterates all traces of the substance.

The natives of Sumatra and Java resort to running water, the same water being used for drinking and all domestic purposes. The banks of these streams in Java will be occupied by women washing clothes as well. When latrines are built near the inns or larger houses in Java, a bottle of water takes the place of toilet-paper, and

the act of ablution is always performed by the left hand, consequently, the proffering of the left hand in salutation or other act is considered a gross insult.

In certain parts of India, I was informed that gardens and open lots formed the only conveniences for latrines, pigs acting as scavengers. In Ceylon, the wealthier classes have latrines near the house, but the poorer classes resort to the garden or retreat to the underbrush near by. In many of our Southern and Western States, outside the larger towns, and in Central and South America, the same custom prevails.

In Northern Russia, as I was informed by an intelligent Russian, alien nationalities are usually very filthy in their ways, having no conveniences whatever. In Southern Russia, on the contrary, little houses are constructed in basket-work fashion and of basket material—door, roof and all. Within is a circular opening, or a wide interspace between the planks forming the floor.

If anything would warrant a rigid quarantine against the Russian emigrant, the following extract from an article entitled "*Cholera and Cleanliness in Russia*" (Mr. E. B. Lanin in the *Fortnightly Review*, Vol. LII, n. s., p. 212) would certainly justify such an attitude. In speaking of inns and public-houses, the writer quotes as follows: "'The interior of these establishments,' says the semi-official journal, 'displays an inexhaustible store of disgusting foulness, eloquent signs and specimens of which cover the walls, the windows, the tables, the floors and the kitchen. The whole place is permeated with abominable smells and venomous exhalations ruinous to health. At first the atmosphere stupefies the visitor, then produces giddiness and sickness. The unpaved yards of these establishments are mere *cloacas* abounding in miasms, in the thick of which wagon-loads of fish, game and vessels containing fresh milk are left standing for considerable periods. The provisions thus conveyed in filthy vehicles and impregnated with this mephitic atmosphere cannot but sow disease-germs broadcast among the population. If to all this we add the utter absence of those elementary sanitary conveniences with which all human habitations ought to be supplied, or, what is much worse than their absence, the existence of substitutes into which it is impossible to enter, and in the vicinity of which it is dangerous to pass, we shall be better qualified to form an idea of what these nurseries of disease termed inns and public places are like.'" The writer then goes on to say: "The hygienic condition of yards, streets and public places is on a level with that of private dwellings, and the excreted refuse of houses, which, in European towns, is made to disappear as rapidly, opportunely and mysteriously as a suspected subject of the Tsar's is left as inviolate as if it were a sacrifice to the unclean gods. 'Even in our two capitals, the method of removing refuse and impurities is so antediluvian that it would be an abuse of terms to allude to it as sanitation. In the most favorable cases, the "system" consists in digging a big hole in the yard of every house and throwing into it all the garbage, offal, etc., and leaving it undisturbed for months, and for longer terms than months, until at last it is carted off in boxes and barrels to some place outside the city. It is easy to imagine to what extent the soil is permeated with filth and the atmosphere vitiated with miasms, and in what an Eldorado the microbes of infectious diseases revel. And it must be noted that even this "system," defective as it is, is followed only in favorable cases, i. e., when private houses are provided with closets. As to the "system" pursued when there are no water-pipes and water is dear, it is better not to speak of it. It is a horror."

"In Staraja Russa, Kirilloff, Tsherepovets, etc., 'cesspools are constructed under the floors of the houses'; in Samara, 'the river-banks consist of solid filth sprinkled over on the top with sand'; 'the streets of Irkutsk are made pestilential by the putrid carcasses of dogs and cats lying half-buried in mounds of ordure'; 'the city of Veronesh is saturated with filth, the excreted impurities of the barracks oozing out into the river, on the surface of which dead dogs are occasionally seen floating about'; in Elizabethpol, 'the carcasses of dogs and cats lie undisturbed on the streets in considerable numbers.' In the most widely-circulated newspaper of Kharkoff, a city of over 200,000 inhabitants, we read among the advertisements: 'House for sale: exclusively owing to the circumstance that nearly all the neighboring house-proprietors continually throw foul water and every species of filth into the streets. Address: Pesski, Ivanovsky Street, No. 25.'"

From all that I can learn, the Greeks are equally vile in these respects, though the hot climate tempers their offences somewhat. In an extraordinary work entitled "*Scatologic Rites of all Nations*," by Capt. John G. Burke, U. S. A., a work overflowing with curious ethnological material, I find a number of allusions as to the means of disposing of excreta in different parts of the world, and these are here subjoined: "Tartars do not abide long in one place. New camps are established from time to time, to avoid the accumulations that have taken place." The Tungouses of Siberia told a traveller that "they knew no greater curse than to live in one place, like a Russian or a Yakut, where filth accumulates and fills the inhabitants with stench and disease."

According to Hawkesworth's voyages, no privies existed in Madrid till 1760, and the determination of the king to introduce these conveniences, as well as sewers, and to prevent the throwing of human ordure out of windows after nightfall, as had been the custom, nearly precipitated a revolution. Edinburgh, among other cities,

was long notorious for this disgusting practice. Privies were ordered for each house in Paris in 1513. In England, privies connected with houses of the gentry appeared in the latter part of the sixteenth century. In ancient Rome there were public latrines, but no conveniences attached to the dwellings. Portable vessels began to be used in England in 1590, and in this connection I may add that the use of these vessels excite a good deal of astonishment and disgust among the Japanese. An intelligent Japanese told me that when he first saw them he was much perplexed, and, in reflecting on the reason which led to their use by a people who seemed so sensitive and were so easily shocked by certain customs in Japan, came to the conclusion that it was owing to the coldness of the climate that led to so filthy a custom.

I have wondered what his conclusions were when he saw for the first time the typical rural device in our country, a fair description of which is here quoted from the "Massachusetts State Board of Health Report" (1874, p. 235):

"As to country privies, one of our correspondents has well said that they are 'a disgrace to civilization.' A philosophical friend of the State Board says that the march of civilization is in no way more correctly marked than by perfection in water-closets. If to this rule a universal application were given, it would place our farmers, as well as the vast majority of our rural population, well back in the ranks of barbarism. We prefer to believe that this is the only respect in which they are behindhand; but that they are so in this is very certain. The common country privy, unventilated, except by the door, standing over a reeking mass of corruption, either contained in a vault or lying upon the surface of the ground, a place foul and pestilential beyond description,—this must be the daily resort of every member of the farmer's family. If it adjoins the house, its poisonous odors penetrate to the living-rooms; if standing several rods away, as it frequently does, an exposure to the weather is involved in reaching it. In either case, in winter it is frightfully cold, and its use involves a chill, which, to women and children especially, coming from the warm rooms, is a potent cause of disease. Undoubtedly the constipation which is so general among country-women is in great part due to the dread of going to this abominable place."

Captain Burke, in speaking of the introduction of latrines, is of the opinion that their origin cannot be ascribed to purely hygienic considerations, since many nations of comparatively high development manage to get along without them, while, on the other hand, tribes in low stages of culture have resorted to them. He quotes Captain Cook as recording the fact that the New Zealanders had privies to every three or four houses, while the natives of Marquesas bury their egesta.

Reference is often made to the laws of hygiene recognized by the Jews as recorded in the Mosaic scriptures, such as matters connected with food, isolation of the sick, removal from camp of effete matters, etc. The burying of fecal matter outside the camp limits is enjoined in Deuteronomy xxiii, 12, 13. This ordinance, though often quoted, does not seem to have been based on hygienic grounds, judging by the context, but solely that the Lord in walking through the camp should not have his eye offended by unclean things. The custom once established, for whatever reason, would naturally commend itself and survive, though, in the regions inhabited by the Jews at that time, the hot sun, dry air and swarms of insects would rapidly dissipate all matter of the kind.

A review of mankind throughout the world shows that only a small proportion have used even the simplest device for a latrine; an artificial device most probably arose from an agricultural and not from a hygienic necessity. The act of ingestion has been accompanied by a certain rude etiquette and with the aid of simple dishes often decorative, while the action of egestion still places the larger portion of the human race on a level with his simian relatives. In many civilized communities customs have prevailed which have resulted in grave diseases and frightful epidemics. We find at the top of another twig of mamalian descent a group of animals which has surpassed man in these matters. The cat buries its egesta. Even among nesting-birds, as the robin, the most scrupulous cleanliness prevails.

The tendency of civilization has been in the direction of better and cleaner methods. Sensitiveness to offensive conditions, like refinement in other ways, is a matter of evolution, and it can be said that the intellectual status of a community may be gauged by the advance it makes in disposing of waste-matters in a clean, wholesome and economical way.

EDWARD S. MORSE.

THE STEVENS BICYCLE TOUR.

THE

touring through France on bicycles, last summer, of the Stevens architectural party was a somewhat novel experience, and as their method of travel met with such delightful results and was in every way so thoroughly practical, an outline account of the trip, it is thought, may be of some general public interest.

Landing from one of the Royal Netherland mail-steamers at Boulogne, the party of twenty-three proceeded by rail directly to Amiens, from which point the cycle travelling began and was continued during the rest of the journey.

From Amiens the road lay in zig-zag route to Paris, from there down through the beautiful valley of the Loire, then north to Mont St. Michel and finally to Rouen, where, after having ridden nearly 1,000 miles, the company disbanded.

An itinerary for the entire trip of fifty days had been arranged before starting and only upon a few occasions was it found necessary to deviate from this prearranged programme.

Difficulties in the way of carrying sufficient luggage for a trip of such extent had been somewhat anticipated, but were easily overcome by the use of patent waterproof carriers strapped to the front of the wheel, and so arranged that the bundle could be quickly detached upon arriving at a hotel, the sketching-outfit or additional luggage being held in a flat case beneath the saddle, while those who had cameras carried them upon their backs or suspended from the shoulder. Possible inconveniences that might also have arisen through unfamiliarity with the road and strangeness of the country were amply provided against by the purchasing of department or road maps, which may be obtained in very complete and convenient form in all the principal towns.

The party was fortunate enough to have among their number, for a while, Joseph Pennell, who proved himself to be, if such a comparison could be made, as good a cyclist as he is illustrator.

An accidental meeting with the artist, Ridgeway Knight, and the accepting of a kind invitation to spend a day at his charming home near Paris, added a pleasant and interesting leaf to the history of the trip.

The meeting with congenial countrymen in a foreign land is agreeable, to say the least, and later on at Vitré, R. C. Spencer, Jr., the Rotch scholar, was met with, who also was journeying upon a bicycle.

Many a fine château in France and not a few of its choicest bits of architecture lie away off the route of the traveller by rail, and can only be reached by a road conveyance or some such method as the one here chosen.

That it is more pleasant to spin over a strange and picturesque land in this healthful, exhilarating manner than to be whirled along over miles and miles of territory with utter disregard for its beauty and surroundings almost goes without saying. Not hampered by exacting inconvenient railway time-tables and the smoky, grimy unpleasantness of their coaches, a more thoroughly delightful method of travel could hardly be imagined. In fact, it seems to have been clearly demonstrated that in choosing the wheel a means of transportation had been selected as practical and inexpensive for its purpose as it was unique in its methods.



ENGINEERS' CLUB OF PHILADELPHIA.

AT the Business Meeting, March 4, 1893, Prof. Joseph T. Rothrock made the address of the evening, on "Wood-structure in its Relation to Mechanical Purposes," with the aid of photographs and sections of wood, projected by the lantern.

He explained the effect of cellular and woody fibre upon the strength and durability of the wood, pointing out the predominance of one or the other kinds of growth in different trees, and their consequent adaptability to different purposes.

He explained that while the so-called annual rings might be used in counting the life of a tree, in most cases this was not an invariable rule, and one might be misled in following it in some cases.

He closed by showing the distribution of the timber area in the State of Pennsylvania, and called attention to the necessity for better supervision for its protection.

His remarks were discussed at considerable length by Messrs. Birkinbine, Prince, Falkeneau, Wilfred Lewis and others.

Upon motion, a unanimous vote of thanks was tendered to Professor Rothrock for his interesting address.



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

WISSAHICKON INN, WISSAHICKON HEIGHTS, GERMANTOWN, PA.
MESSRS. G. W. & W. D. HEWITT, ARCHITECTS, PHILADELPHIA, PA.

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

SKETCHES MADE DURING THE STEVENS BICYCLE TOUR BY MR.
ELMER GREY, MILWAUKEE, WIS.: THREE SHEETS.

[Issued with the International and Imperial Editions only.]

SEE article elsewhere in this issue.

THEOLOGICAL SEMINARY, LANCASTER, PA. MR. JOHN C. SMITH,
ARCHITECT, HARRISBURG, PA.

THE base-course from grade up to first-floor line will be in rock-faced ashlar, regular range-work in brownstone. The walls of first and second stories will be faced with selected common bricks laid-up in brown-colored mortar. The cut-stone dressings throughout will be of brownstone. The roofs will be covered with black slate, with hip-tiles and ridge-rolls. The roofs of bays at each side of main entrance to be covered with tiles. Over the entrance-arch a balcony is arranged, with open balustrade of stone. The main body of the building is two stories high above the basement.

The basement will be twelve feet high in clear and will contain heating-apparatus and fuel-rooms together with requisite space for foul-air ducts and rooms, fresh-air chambers, etc., lavatories and closets, storage-rooms and general purposes. The first and second stories will be fourteen feet high in clear, and will contain four lecture-rooms, hat-and-coat rooms, reading-room, recitation-room, faculty-room and six professor's studies. The tower is utilized on first floor as entrance to prayer-hall, and from second floor, by stairway, up to clock chambers above. Ample stairways are provided in each side hall at main entrance. The prayer-hall is one story high, entered on first floor from main corridor, also through tower entrance, and will have a seating-capacity of 250, and can be thrown open to one large lecture-room by the use of sliding partitions when desired: it is well lighted, and will be treated on the interior with open-timbered ceiling. The library is isolated from main building and will be fireproof, built of brick with stone dressings similar to main building; is approached from outside through porch entrance at end of building and connects with main building at first-floor level through covered passage-way. The passage at each end will be cut off from both buildings with iron doors, self-closing. The basement under library will be fitted up for alumni meetings. The library will have galleries approached by stairs in tower, and arranged in the alcove system for receiving a collection of 50,000 volumes. The buildings will be heated by steam or hot-water indirect radiation, and the interior finished in hardwood. The building, including library, will have a total frontage of about 212 feet. The probable cost, including site, will be about \$75,000.

HOUSE OF A. G. LOOMIS, ESQ., HARTFORD, CONN. MR. E. T. HAPGOOD, ARCHITECT, NEW YORK, N. Y.

DESIGN FOR A CITY HOUSE. MESSRS. MOSES & KING, ARCHITECTS, PHILADELPHIA, PA.

BACHELOR APARTMENTS, BOSTON, MASS. MR. PATRICK A. TRACY, ARCHITECT, BOSTON, MASS.

DESIGNS FOR A COTTAGE, A TOLL-HOUSE, A PUBLIC LIBRARY AND A COUNTRY CHURCH. MR. J. M. UFFINGER, ARCHITECT, BROOKLYN, N. Y.

[Additional Illustrations in the International Edition.]

FONTAINE D'AMBOISE, CLERMONT-FERRAND, FRANCE.

[Copper-plate Etching.]

A DESCRIPTION of this fountain may be found in the *American Architect* for September 26, 1891.

FRAGMENT FROM THE COLUMBIA FOUNTAIN FOR THE WORLD'S FAIR, CHICAGO, ILL. MR. FREDERICK MAC MONNIES, SCULPTOR.

[Gelatine Print.]

"ROSECOURT," ROMFORD, ENG. MESSRS. DAVIS & EMANUEL, ARCHITECTS.

ST. FRIDESWIDE'S MISSION-HOUSE, POPLAR, LONDON, ENG. MESSRS. CLARKSON, F. R. I. B. A., ARCHITECTS.

THE Mission-house and Girls' Club (illustrated this week), situated in the midst of a very poor neighborhood in the north of the East India Dock Road, have been erected and fitted up at the cost of Miss Catherine Mary Phillimore, "in memory of those at rest and in furtherance of the work of the Christ Church Mission." In 1881 the Christ Church (Oxford) Mission commenced working in this neighborhood, the first priest being the Rev. H. L. Paget, now vicar of St. Pancras. The buildings then used were cottages which stood on the site of the new Mission-house. The part of the building occupied by the Clewer Sisters is on the west portion of the site, and comprises four stories. Plans of two of the stories are given in the illustrations. On the top story are five dormitories, a work-room, a laundry and a garden. On the lowest story is a large waiting-room for applicants for assistance and advice; part of this room will be used as a soup-kitchen in the winter. Gas-coppers are provided, raised very little above the floor. This room, and the whole

of the kitchen department for the community on the ground-story, are lined with white glazed bricks.

The intention has been to provide everything required for the work of the Mission, without any excess of size in rooms or passages. "The Chapel of the Resurrection," for the use of the residents, has been placed at the southeast of the one-pair story. On the ground-floor the east portion of the site is devoted to rooms for the St. Frideswide's Club and Guild for Girls. There is communication from the interior of the Mission-house to these parts of the building, which is also reached from Duff's Fields. A small complete set of rooms for the donor and a friend, to be used when assisting in the work of the Mission, forms the west portion of the one-pair story.

The building is heated by low-pressure hot water, the boiler being placed in the basement, and there are radiators in the rooms, passages, staircases, etc.

The building was carried up to the ground-level by Mr. J. K. Coleman, builder, of 120 High Street, Poplar. Messrs. Smith & Sons, of Norwood Junction, obtained the contract for the superstructure, and have also carried out fittings specially designed for every portion of the buildings.

ROMAN PILLAR AT IGEL.



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

BRICK-VENEERED BUILDINGS.

FRANKFORD, N. Y., March 9, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—As a subscriber I beg to ask through the correspondence department of your valuable paper whether it has ever been tried, and with what result, to veneer with brick a three or four story frame building on all four sides. I am aware that there will be an unequal settlement between the brick-wall and the frame. How could the bad effects of such settlement be avoided, and what would be the best method to construct such a building? A statement of the materials used would be appreciated.

Yours respectfully,

ADOLF WEGNER.

[We trust that some architect in the Northwest, where this method of building used to be much in vogue, will give our correspondent the information he now lacks.—Eds. AMERICAN ARCHITECT.]



PAINTING BY MULE-POWER.—Walter Burridge, the artist, is painting the great volcano Kilaua, the "Inferno of the Pacific," upon a canvas 412 feet long and 54 feet high,—22,248 square feet,—which shows the wonders of the greatest crater of the globe. This painting, with the accessory spectacular effects, will form the volcano cyclorama in the Midway Plaisance, which forms part of the Hawaiian exhibit for the World's Fair. Almost directly south of the University of Chicago and east of the Cairo Street stands a polygonal building nearly 140 feet in diameter and 60 feet high. Inside the building on a circular track is a movable scaffold 55 feet in height. Well up to the top of the staging two men are at work wielding large brushes which paint in the sky on the circular canvas that lines the interior of the building, and the slapping of the brushes comes down faintly to two long-eared, loose-jointed, lazy-looking mules harnessed to the car which carries the high scaffold. These mules don't know the difference between a wash drawing and a circus-poster, but they are very large actors in painting Kilaua. A shout from above, "Hey, there, Alpher and Omega, git up!" in Burridge's voice, emphasized by a chunk of wood landing on Omega's quiescent spinal column, gives the cue, and the artist's long-eared assistants shake off the stupor of meditation and day-dreams and pull the creaking, trembling scaffold around the track until a sharp "Whoa!" sends them wool-gathering again. Painting by mule-power is one of those innovations brought out by the tremendous pressure under which all work is done in Jackson Park and the Midway Plaisance.—*Chicago News Record*.

QUERNES.—The water-mill is older than the wind-mill; but prehistoric corn—such wheat, for instance, as Pytheas, the first traveller from civilization to Great Britain, saw the natives of Kent drying in large sheds on account of the absence of sun—was ground in hand-mills, as is still done in the East. Quernes, as these mills are called, are frequently found in the cyclopean underground dwellings of Scotland. Their simplest form consists of two thin circular stones, the upper of which is pierced in the centre and revolves on a wooden or metal pin inserted in the lower one. The grinder dropped the grain into the central hole with one hand, while the other caused the upper stone to revolve by means of a stick inserted in a small hole near the edge. The laboriousness of this operation is well illustrated by a story told of Columba. He was studying under St. Finian, and every night on

which it fell to his lot to grind the corn with the querne he performed his task so quickly that his companions enviously asserted he had the assistance of an angel in turning the stone. Wilson thinks that at this time (the early part of the sixth century) the querne was the only mill in use. Large water-mills were introduced in the thirteenth century into Scotland, and legal means had to be employed to render their use compulsory. The querne is said to have lingered in the remoter districts of that country until the close of the last century, notwithstanding Alexander III's prohibition in 1284, that "Na man sall presume to grind quheit, maishlock, or rye with hands mylne, except he be compelled be storm, or be lack of mills, quick sould grind the samen." — *The Gentleman's Magazine*.

A TRUE COPPER AGE ESTABLISHED. — At a recent meeting of the Académie des Sciences, Paris, M. Berthelot read an interesting paper on the archaeological question whether there was an age of copper prior to the age of bronze. Pieces of copper have been unearthed by M. de Sarzec in Mesopotamia, which are apparently older than any found in Babylon, and more ancient than the celebrated vulture steel of Chaldea. Copper is easily reduced from its ores by carbon, but bronze requires the addition of tin, a comparatively rare metal, as it is chiefly found in Malacca and Cornwall. Its use, therefore, implied the power of making long voyages and a considerable advance in civilization. M. Berthelot has analyzed the Mesopotamian specimens, and finds them to contain no tin or zinc, and only traces of lead or arsenic. Air and water have oxidized the specimens to a mixture of protoxide and metallic copper. M. Berthelot is also analyzing a portion of a sceptre of one of the Pharaohs of Egypt who reigned about 3,500 years before Christ, and so far he has discovered no tin. Of course, a large number of specimens will require to be analyzed before the question of a pure copper age is really settled, but his researches are in favor of the supposition. We may add that Prof. Flinders Petrie has adduced much evidence from Egypt in favor of a copper age. — *London Globe*.

CURES FOR THE SMOKE-NUISANCE. — Successful application appears to have been made in some of the Pennsylvania mills of jets designed with a special view to overcoming the smoke-nuisance. In one case the difficulty is met by a jet somewhat of the Bunsen-burner type, satisfactorily operating on two batteries of flue-boilers — the jet being placed above the fire-doors and immediately below the boilers — and, though the fuel is slack, yet almost no smoke is visible, even during heavy firing. In another case, steam-jets of a different, but effective, design have been applied to puddling and heating furnaces. In these the asphit is made tight, the steam and air enter below the grates, the furnaces being also of the usual type, except that special openings are made for air above the fire and through the bridge-wall, and when the fire-doors are closed no black smoke is visible while the steam-jets are in operation; the smoke appears above the stack whenever the fire-door is opened, but disappears immediately on closing the door. Each puddling-furnace has two jets of steam and each heating-furnace five jets, all about one-tenth of an inch in diameter. With this arrangement nut-coal can be used in the heating-furnaces and slack in the puddling-furnaces, instead of, as formerly, lump in both — the quantity of fuel required being also much less. — *N. Y. Sun*.

TEST OF FIREPROOF MATERIALS AT BERLIN. — At Berlin there have been recently some very instructive experiments with fireproof materials and constructions. They were not arranged, as is mostly the case, by those peculiarly interested in the objects examined, but by the Royal Police Fire-Brigade, working hand-in-hand with the Prussian Government, the municipality and the fire-insurance offices. The series of experiments, which lasted three days, took the form of what we might term a competition for some £5,000 in premiums offered by the fire offices, and were carried out in some warehouses lent by the municipality prior to their demolition for street improvements. Every object examined had to be subjected to the most rigid, but what may be called "naturally" arranged trials. The dwelling-house, shop, warehouse, spirit-vaults, etc., each had its turn, and in most cases the simpler means of protection had to vie with the modern patented arrangements, generally much to the advantage of the former. A report is to be published by the committee of fire experts who acted as a jury on the occasion, from which we may hereafter be able to give some extracts. — *The Builder*.

LAYING BRICK IN COLD WEATHER. — "Never saw them lay hot brick in hot mortar with the thermometer 16 degrees below zero?" asked a prominent New York lawyer at Willard's. "It was a revelation to me, too. On my way home from a Western trip I stopped at Duluth. The thermometer registered the figure I have named, but building was going on just the same on a dozen brick buildings, one of which was an office-building to cost \$300,000. In the East we shut-up shop in the building-line in freezing weather, because frozen mortar loses its temper and is worthless. But out there it remains below the freezing-point. As they use it, it sets before freezing, and when set it's all right. The bricklayers on a building work as close together as possible, wearing protectors on their hands. Beside them are little furnaces and metal-lined mortar-tubs beneath which are fires. The bricks and mortar are heated hot and laid. A brick, you know, will retain heat for a long while." — *Washington Star*.

METHOD EMPLOYED IN TAKING DOWN A HIGH CHIMNEY. — The tearing down of a chimney 114 1/2 feet high, near Aachen, Germany, was effected in a peculiar manner, described in the *Thonindustrie-Zeitung*. As it was desired to utilize the bricks taken from the structure, for other building purposes, care was taken to recover them in an unbroken condition. For this purpose a cast-iron box was set up at the bottom of the interior of the chimney. The closing of its hinged door was made air-tight by a rubber strip. From the top of this box a plank chute

extended to the top of the chimney; its joints were also made air-tight with putty. Into this air-tight chute of four to six inches interior width the bricks were thrown, falling upon an elastic air-cushion, landing unbroken in the box below. As the work progressed the opening of the chute was lowered by simply sawing off a part. — *Engineering News*.

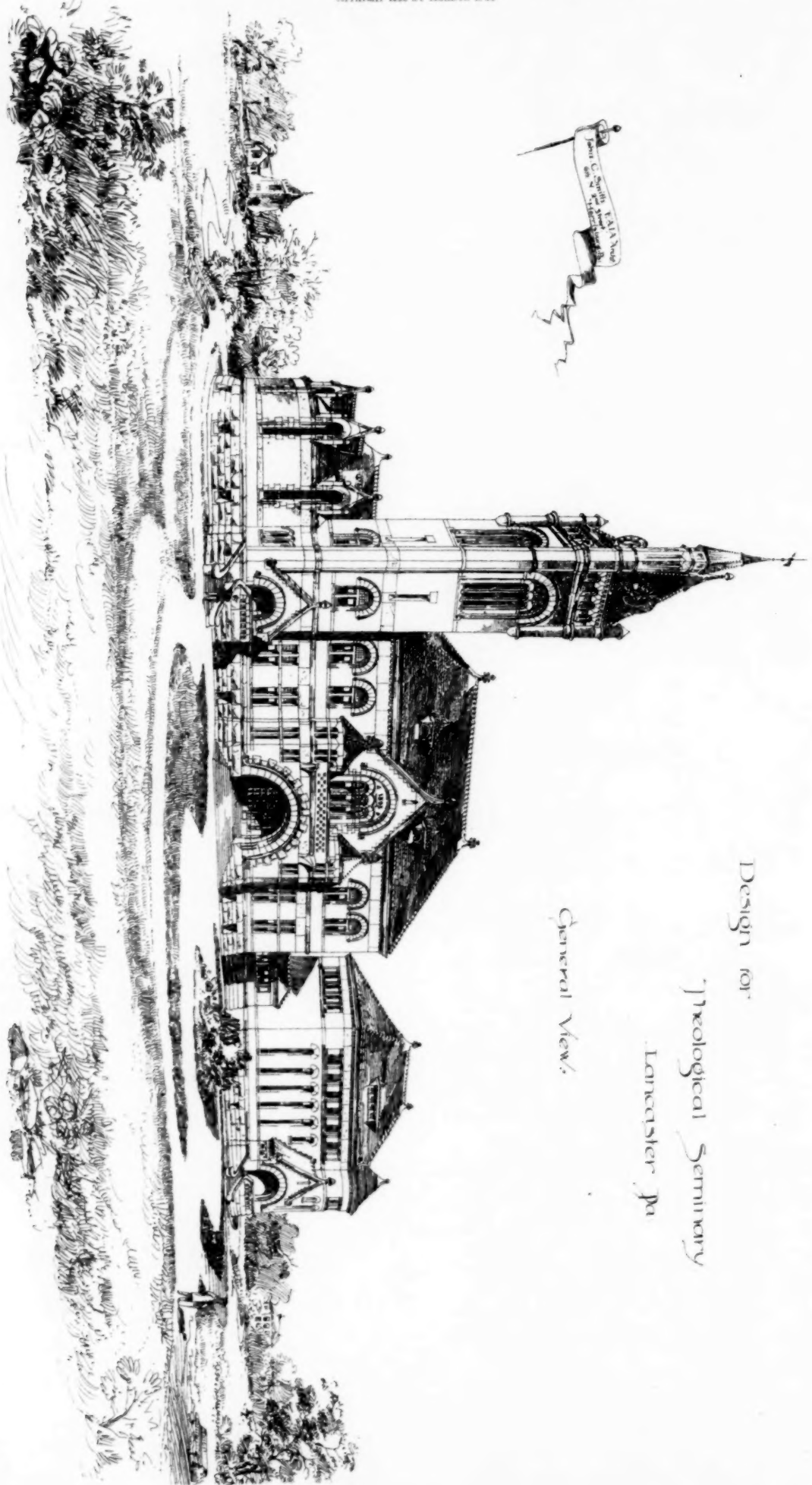
DISASTERS CAUSED BY ELECTRIC GROUND-CURRENTS. — Constant complaints, says an American contemporary, are received by water corporations, of the corrosion and consequent leakage of water-pipes, caused by ground-currents of electrical circuits; and it is even said that in connecting gas-mains arcs have formed between the ends of pipes. The West End Street Electrical Railway, of Boston, has lately been called to order on this account, much corrosion being occasioned to the water-pipes of the city by the influence of the current generated to work that line. The electrician to the railway has pointed out the desirability of metallic returns; and it has been suggested that a provision to this effect should be inserted in Acts empowering future lines to lay tracks for electric street-railways. This is a matter that deserves the attention of our County Council now that there is so much talk of opening fresh electric railways in London. — *Invention*.

THE BIG BELL AT MOSCOW. — Russian journals are occupying themselves with the question of the restoration of the great bell of the Kremlin. This bell, which is twenty-one feet high and weighs 193 tons, fell from the tower and was broken during the conflagration of 1737. It buried itself so deep in the ground by the fall that for a long time the idea of excavating it was not seriously considered, and this was not done until the reign of Nicholas. Sixty years ago it was placed on a granite base by the French architect, Montferriat. The engineer, Somtekvitch, who has a project for its restoration, estimates the expense at 3,000 rubles. — *N. Y. Commercial Advertiser*.



UNFORTUNATELY, undue importance is attached by the business interests of the country to financial and speculative possibilities — the possibility of general and deeply-seated stringency, the possibility of lower or higher prices in the great staples and leading commodities. Politicians and the late political campaign are also responsible, in a measure, for the unsettled state of the public mind on financial matters, because so much was said by politicians, editors and others of the dire impending disasters that could only be averted by the acceptance of some panacea platform or programme. That the dangers from an unsettled financial policy have been magnified is probable. The per capita circulation, not counting Treasury deposits, is \$24, from which there has been but little variation for a long time past. It is known that certain strong financial combinations have in view the possibility of a speculative movement of wide proportions, and involving a large number of well-known securities, which possibility is related to another, viz, the solution of the legal relationship between a gold and a silver dollar, and the establishment of a fixed policy with regard to the non-coinage of silver. If these foundations could be safely laid, the highway to a grand speculative movement, these people think, would open up. They take it for granted that values, in general, are unduly depressed. They say that if the pressure is removed they will rise. They propose to remove the pressure. This is the situation in a nutshell. The question, however, is an international one, and so many things are, consequently, to be considered. The Brussels crowd are not anxious to meet again. The attitude of a new American delegation would be different from that of the last. The present professed financial policy of this country renders another conference unnecessary; yet international understandings must be established before the pressure at home can be removed. The moneyed interests desiring a speculative movement understand fully that Europe could take and retain a good many hundred million dollars' worth of American securities, to effect which is, on one hand, their objective point; on the other hand, it is to stimulate the home consumption for not only American securities, of which the future supply is unlimited, but to make it safer for capital to strike out. The lithographers have their stones cleaned and ready for the printing of a vast amount of paper in the shape of bonds, etc., but the time has not yet come. It is no wonder, therefore, that the attitude of the new man at the wheel is so watched. The contemplated speculative movement and general uplifting of values is no suddenly-conceived motive or purpose, and it would have been attempted long since but for the unsettled condition throughout the world since the Baring failure. The extended reference to it now is made as a matter of encouragement to the over-tired and discouraged heads of the industries and transporting agencies who have seen prices decline and traffic charges sag against all good and far-seeing business management. It is impossible to go farther in this direction, or to narrate the causes and agencies that are to bring in this greater activity. In fact, it would be easier to show the reason for more unfavorable conditions. Trade is not improving in mercantile circles day by day according to expectation. Trifles affect business men. In textiles of all kinds there is an exception. The distribution is large, and mills are busy both North and South. Stocks are low among retailers. The banks are obliged to strain their accommodations in many instances. Immense sums are being drawn westward. Mortgage indebtedness continues to be reduced. In some quarters banks are decreasing loans. The industries generally are prosperous, especially those depending on agriculture. Architects who express opinions say the preparations now in progress indicate full activity. Lumber manufacturers give it out that prices for Southern woods, white pine and hemlock will be, possibly, stronger than last year. The industries, so far as the saw-mills are concerned, are better managed. In industries where iron and steel are used general activity exists, as the consumption of nine million tons of pig-iron shows. The assurance of good crops and abundance of coal, ore, lumber, oils and raw material generally imparts a strong tone to the markets. There are no evidences of advances in land-values in the Western States, but quite a number of large land-purchases have been made since last autumn. It is the policy of capitalists to place money in wild lands, and at this time negotiations are well under way for some of the largest land-deals ever known.

-
r
t
e
.
s
l
e
c
d
e
t
. .
. .
. .
r
n
e
-
s
7.
e
s,
es
nd
a
il-
ee
or



Design for

Theological Seminary

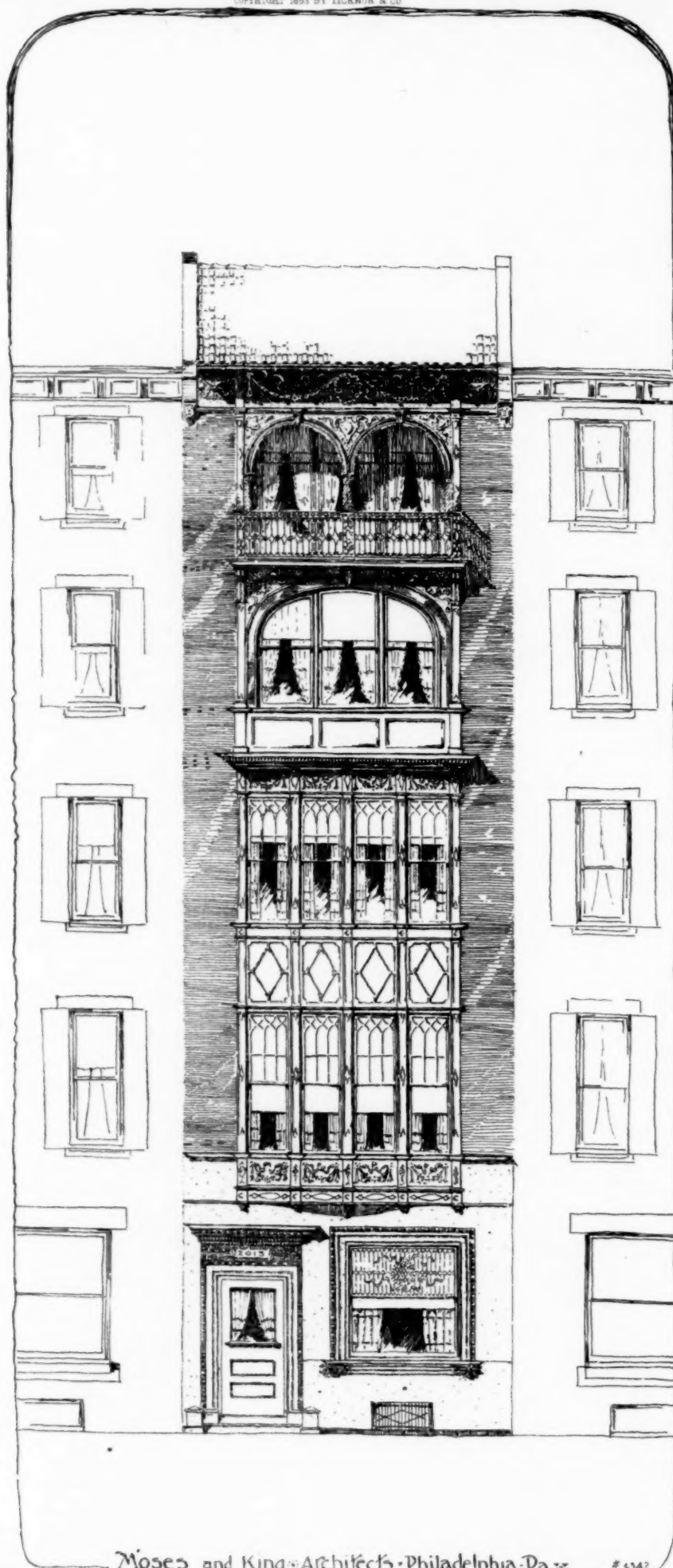
Lancaster Pa

General View.

THE CARNEGIE LIBRARY OF PITTSBURGH

PAID BY THE CARNEGIE FOUNDATION FOR THE LIBRARY



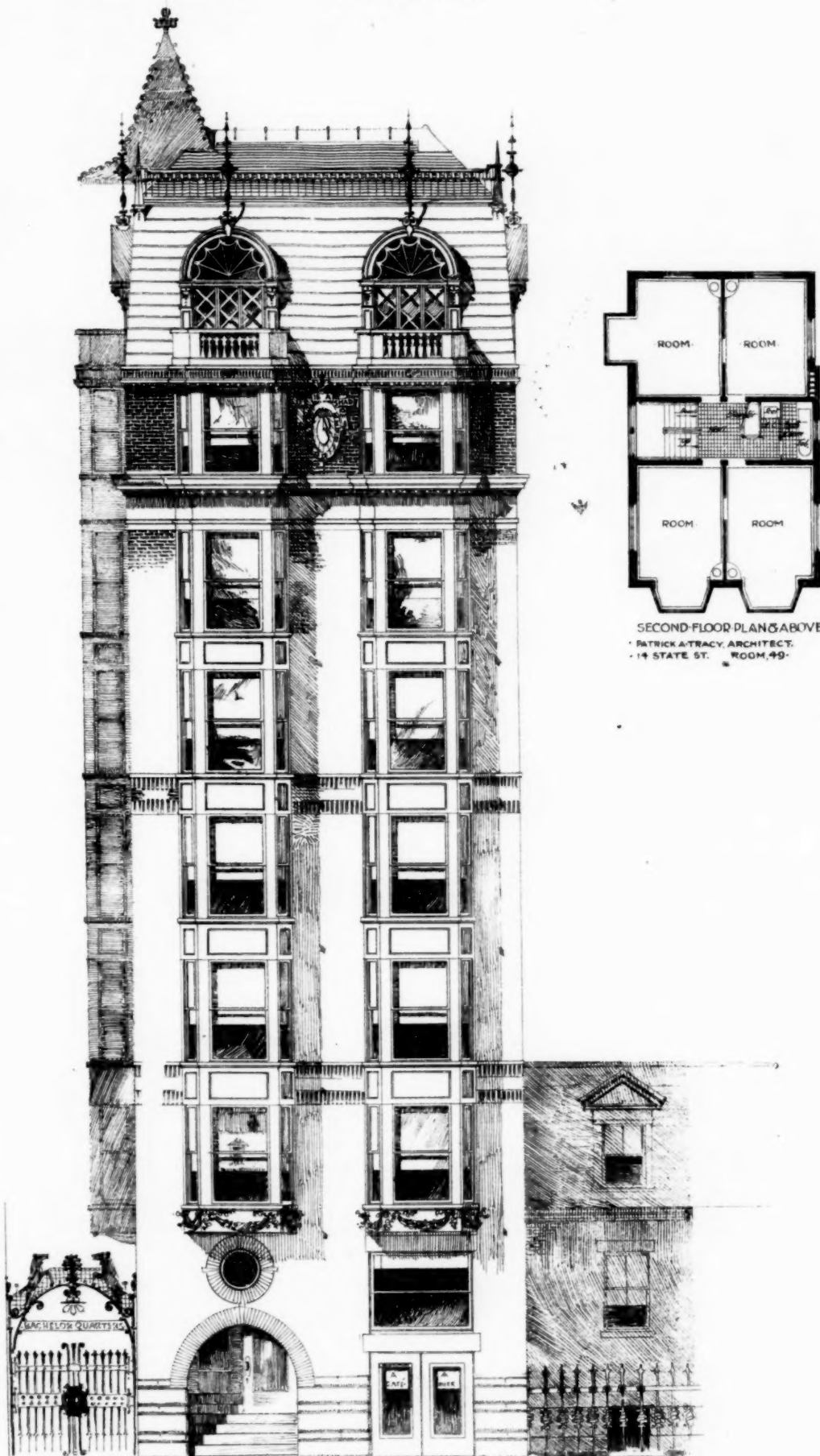


Moses and King Architects Philadelphia Pa. # 6342

RELIABLE PRINTING CO. BOSTON

COPYRIGHT 1893 BY TICKNOR & CO

• BACHELOR APARTMENTS •
• ON WILLOW ST. • BOSTON • MASS. •



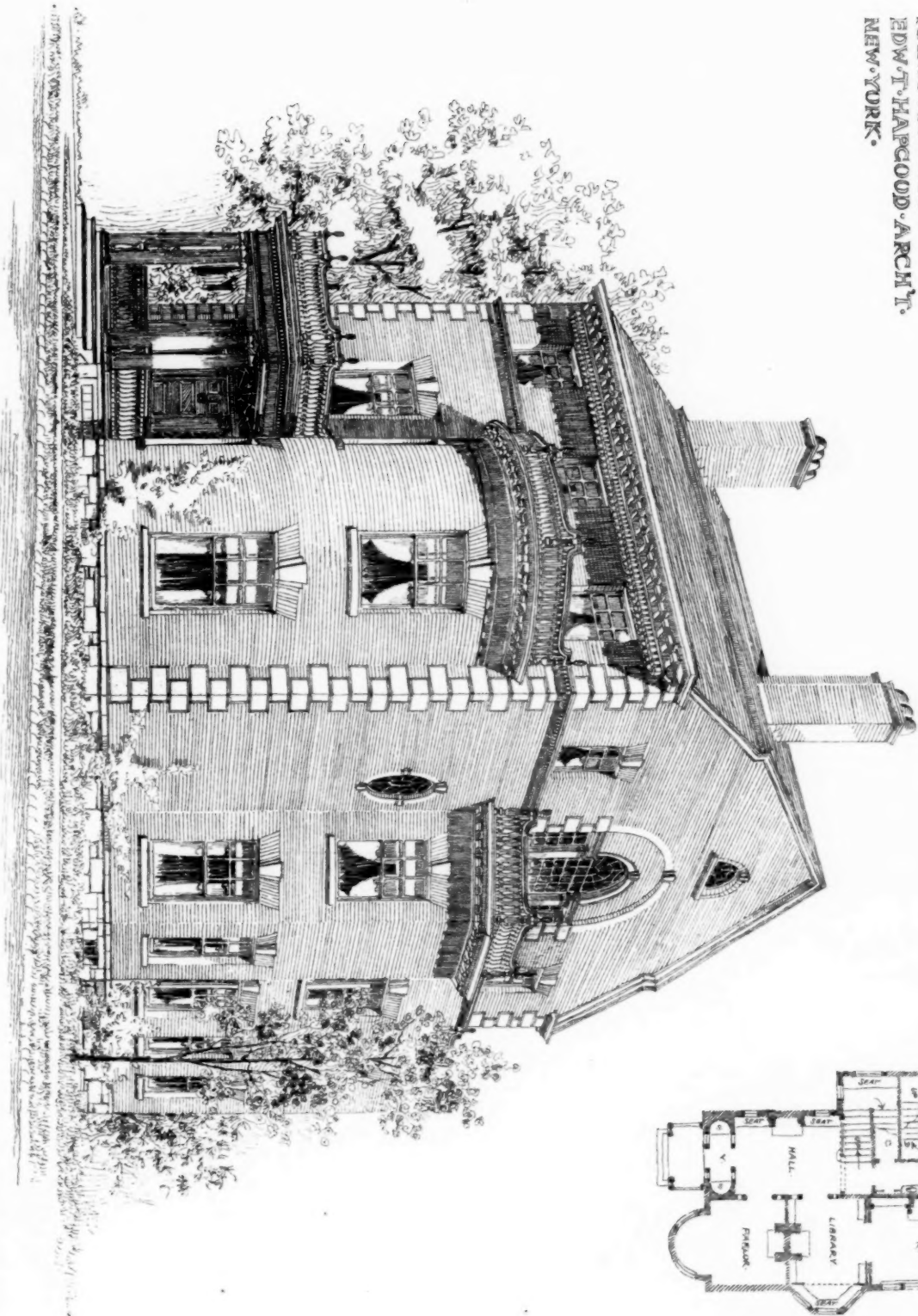
SECOND-FLOOR PLAN & ABOVE.
PATRICK A. TRACY, ARCHITECT.
14 STATE ST. ROOM 49.

• WILLOW ST. FAÇADE •

HELIOTYPE PRINTING CO. BOSTON



HOUSE FOR
A. C. LOOMIS, ESQ.
HARTFORD, CONN.
EDW. T. HAPGOOD, ARCHT.
NEW YORK.



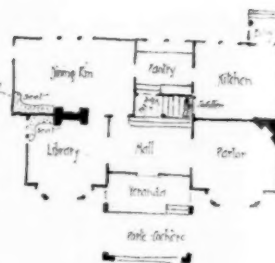
A Small Library

John H. Winger Architect
186 Remsen St. Brooklyn



Cottage costing about \$4000

John H. Winger Architect
186 Remsen St. Brooklyn





Cl County Church
J. M. Uffinger - Architect
186 Remin St. Bklyn. N.Y.

