THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLIII

No. 942.

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

JANUARY 13, 1894.

CONTENTS.

WHERE is a common superstition, which probably retains its hold upon builders solely through the profit that they find in maintaining it, but which sometimes really imposes upon laymen, to the effect that cement mortar is improved, in cold weather, by the addition of lime to it. As the mason ingenuously explains to his employer, the heat developed by the lime, in slaking, keeps the cement warm, and thus prevents it from freezing; and, on this theory, the advent of a frosty day is utilized by multitudes of sharp builders to load the mortar, which they have agreed to make of sand and cement only, with a quantity of lime, which saves cement, and makes the mortar easy to work, but destroys its waterproof qualities, and injures its strength and hardness more or less, according to the quantity used. It is hardly necessary to say that the influence of the lime in "warming" the mortar is purely mythical. Lime mortar, without cement, is not much injured by freezing, while cement mortar is totally ruined, so that a mortar containing a large proportion of lime would be harder, after freezing and thawing, than one containing cement only; but it would gain the qualities of lime mortar only as it lost those of cement mortar.

THE fact is, that the only time when it is desirable to add lime to mortar, which the contract requires to be made with cement, is in the summer. In very hot weather, cement, particularly of the quick-setting sorts, will sometimes harden in the mortar-tubs before it can be used. The average workman chops up the lumps, and re-tempers them, with more water, but this proceeding destroys half the value of the cement, and it is preferable, under such circumstances, to add a small quantity of lime to the cement, at the first mixing. A very small dose of lime will retard the setting of the cement long enough to make it manageable, without materially injuring its properties, and circumstances sometimes render it absolutely necessary to resort to such an addition, in order to be able to work the cement at all. In winter, on the contrary, the object to be aimed at is to accelerate the setting of the cement as much as possible, so as to place it beyond the reach of injury from frost, which, if kept out for twenty-four hours, has little effect upon good cement. In order to secure this rapid setting, however, all trace of lime, which is a powerful retardant, must be carefully kept out of the mortar, and the bricks or stones which are to be set with the mortar must be thoroughly warmed before they are laid. To warm the mortar alone is perfectly useless. A bed of mortar, spread on one cold stone, and with another cold stone lowered into it, will freeze completely through in a few seconds, even though it may have been boiling hot when it was spread; and we have seen, in a warm day, with the temperature well above the freezing-point, stonework in cement mortar freeze almost as fast as it was laid, simply because the stones had been cooled down during the cold day and night previous, and had not had time to get warm. It is obvious that, roughly speaking, it would require four tons of mortar, at a temperature of forty degrees Fahrenheit, to raise a single stone, weighing one ton, from zero to thirty-two degrees, so that the whole mass would be just on the verge of freezing; yet the masons would have us believe that, by adding a little lime to the mortar, they enable a hod-full of it, not only to raise above the freezing-point the temperature of a large mass of masonry from a point in the neighborhood of zero, but to hold it there, notwithstanding the temperature of the surrounding air, until the cement has had time to set. By warming the stones, or bricks, the conditions are reversed. A heated stone will keep the mortar in which it is laid above the freezing-point as long as it remains itself above that point, and, as either stones or bricks lose heat very slowly, it is easy to build, in the coldest weather, a wall which will retain, in the interior, a temperature above the freezing-point long enough to make the cement in which it is laid secure against frost, except in the superficial portions; and, with suitable coverings, these may also be protected. Mr. O. W. Norcross, one of the most ingenious and careful of builders, warms foundation-stones with a jet of steam, before laying them in cement in cold weather, but this is an expensive process, if thoroughly carried out, as the heat penetrates very slowly into the mass of the stone; and a better way is to pile the stone or brick over a furnace of some sort, in which a moderate fire can be kept, night and day. We have once or twice made use of the low, flat furnaces used by the workmen for heating pebbles who lay coal-tar concrete. Three or four thousand bricks can, with care, be piled over one of these furnaces, the chimney coming up through them, and, by renewing them as fast as the hod-carriers take them from the pile, the masons can be constantly supplied with hot bricks, which will make excellent work with cement mortar, in the coldest weather; and, as the furnace is tight, there is no danger of spoiling the appearance of the bricks by smoke.

THE New York *Evening Post* quotes some sensible remarks made by Mr. Brady, the head of the New York Department of Buildings, on the new iron construction. It will be remembered that several of the engineering journals have recently criticised the new buildings of protected iron which are being erected in New York, and, probably without intending it, have given to their readers an unfavorable idea of the system. Superintendent Brady points out that the criticisms really apply to the details of execution, rather than to the system, and would be equally applicable to structures of brick and stone, were it not that the trivial oversights which hardly affect appreciably the stability of a building of masonry may be fatal to a structure so highly organized as a modern protected-iron office-building. Many already know that one of these buildings, in process of construction, of which the iron skeleton had nearly reached the roof level, was blown some ten inches out of plumb the other day by a high wind. On examination, it proved that the uprights, which were of cast-iron, instead of having top and bottom plates planed and bolted together, were left rough, and simply superposed, the vacancies occasioned by the irregularities of the cast surfaces being "shimmed" up with bits of sheet-iron. It is hardly necessary to say that any architect would look with horror on such ironwork, but it is impossible for an architect, or, as Mr. Brady says, for the deputy inspectors, to supervise the making of all the joints, a defect in any one of which may cause the ruin of the building. Mr. Brady says that, in such buildings, the plans for the ironwork, made by the architects, and approved by his Department, are often varied from by the contractor, for his own profit. The number of bolts and rivets is reduced from that shown on the detail-drawings, and, where bolt or rivet holes have been carelessly punched, so that they do not correspond, one is often lengthened, until the rivet will go through, with the result, perhaps, of utterly destroying the rigidity of the joint. There are few architects who have not had trouble with iron-contractors, even for the simplest work, and it may be imagined how great is the opportunity for "skinning" a large structure, if the contractor is so disposed. Mr. Brady,

who is good authority, thinks that dangerous malpractice on the part of the contractors for such structures can be prevented only by having a deputy-inspector from the Department of Buildings assigned to watch each building. It has always been the praiseworthy practice of the New York Building Department to revise very carefully the architect's drawings, to recalculate the weights on the piers and girders, and examine the details of riveting and bracing, and, with copies of the approved drawings in his hands, and an inspector constantly on the ground to see that the work was executed in conformity with them, it would be possible to secure reliable iron construction, but it is hardly possible to secure it otherwise.

A GOOD many people are interested in the competition for the New York City-hall, and may like to hear that the report of the expert jury has been presented to the New Municipal Building Commission. According to this report, the jury consider No. 13 to be the best, so far as exterior design is concerned, but find the interior arrangement unsatisfactory. Next to this they prefer Nos. 23, 28, 35, 107 and 113. Those competitors who know what was the number assigned to their plans may thus see whether they are among the fortunate ones. No plan was, however, found by the jury to be quite satisfactory in regard to the arrangement and lighting of the interior rooms and corridors, and they thought that whichever was adopted would have to be more or less modified. In answer to a question of the Mayor, the jury replied that they considered it entirely practicable to draw a plan which should combine the best features of the six selected designs, but nothing was said as to whether the person employed to make and carry out the combined plan should be the author of the design placed first, or some other person, and this point may be of some interest later. A little controversy arose as to the exact number of plans submitted, the report of the jury stating that one hundred and thirty-three designs had been examined, while it was understood that one hundred and thirty-four had been submitted. The Comptroller, Mr. Myers, remarked, with rather justifiable asperity, on the carelessness displayed in an official report which made it appear that one of the competing designs had not been considered by the jury at all; and the plans were referred back to the jury for an official count. In about ten minutes the jury reported that the correct number was one hundred and thirty-four. It was voted that the report be printed in full in the minutes of the meeting; but further action on it was postponed for a week.

THE profession has lost, within the last few weeks, two of its most distinguished German members, Baron von Hasenauer, of Vienna, and Professor Bauschinger, of Munich. Of these, Baron von Hasenauer was perhaps the most distinguished, but he was an old man, whose professional career was practically completed years ago, while Professor Bauschinger was in the height of his noble career, with the prospect of many years of still more extended usefulness before him; and, while the world will mourn with affectionate regret the last of the illustrious group of artists who have made the name of Vienna so conspicuous in the history of modern architecture, it will deplore as irreparable the loss of the brilliant experimenter who has added so much to our knowledge of the materials of construction.

THE prospect of a tunnel connection between New York and Brooklyn appears to have become very remote as the result of an explosion of dynamite which occurred at the works a year ago, by which five persons were killed, and many injured. The tunnel construction had already begun when the explosion occurred, and a shaft had been carried down to a depth of ninety feet, but the work was immediately abandoned, and nothing has been done since. A few days ago, by order of the New York Supreme Court, the ninety-foot shaft, with the lot of land containing it, was seized by the sheriff, to satisfy a judgment for fifteen thousand dollars, awarded as damages to one of the persons injured by the explosion. As the aggregate of the claims against the company for damages on account of the explosion is said to be more than five hundred thousand dollars, and as a small tract of cheap land with a hole in it, will not go far toward satisfying all the claims, the natural inference seems to be that the project will not be revived, unless some fresh company takes up the matter again from the beginning.

SOME curious trade-union performances seem to be going on just now. A few days ago a public meeting of the unemployed was called in New York to consider methods by which the distress among working-people, which is very great there, might be alleviated. If such a meeting could be managed by the quiet and sensible men who form the vast majority of mechanics, it might be of great use, but it was taken into complete possession by what the New York *Sun* irreverently calls the "jawsmiths." These worthies improved the occasion in their usual style. After proposing to form vast processions of the unemployed, and march them to the Mayor's office, to demand work, a motion was put, and carried by an immense majority, that all work furnished should be paid for at the rate of wages fixed by the several Unions. This seemed to be the principal point which the "jawsmiths" intended to make, for the meeting soon afterward broke up, after a dose of absurd rant about Capital and Labor from well-known Anarchists.

WHOSE who are unacquainted with the arts of the jawsmith may not at once perceive the object of this resolution, which is simply a warning, and a terrible one, too, for the starving workmen to whom it is addressed, that they can receive the charity that their generous fellow-citizens so freely offer, only on such terms as are dictated by their cruel oppressors, who are determined that, even in the last stages of want and misery, their victims shall not escape them. To most people, the idea that a carpenter, who has a wife and children hungry at home, and finds a neighbor, a little less poor than himself, who can afford to keep the starving family supplied with shelter, food and fuel, but no more, in return for something that he has thought of that the mechanic can do for him, should be compelled by his tyrants to refuse the offer, and, in preference, to degrade himself and his children by begging at the public soup-kitchen, seems preposterous; yet this idea is just what the "jawsmiths" propose to carry out into practice, and the resolution passed at the "unemployed" meeting was a notice that the resources of Union terrorism will be employed to enforce it. The more intelligent and prudent Union mechanics have understood this before, and the extraordinary emigration of the past season, which has carried thousands of them out of the reach of the New York walking-delegates, shows their opinion on the subject; but there are many thousands left, who, compelled to choose between disobeying the Unions and beggary, will choose the latter, simply because they dare not do otherwise.

A RECENT instance, which comes to our knowledge, will serve to show how complete is the grip of the Unions on the fortunes of the unhappy workingman. A certain heating-contractor has a large shop, in which are employed a considerable number of men. These men have steady employment, are well treated, and are paid at least the Union wages, while they are allowed, if they choose, to do work out of regular hours, for which there is, in the heating business, always a great demand, and for which the men have extra pay. For some reason, connected with "the interests of labor," all the tinners in this shop were ordered to strike. After the strike had been in progress for some weeks, one of the tinners thrown out of employment applied to a friend of his, for whom he had formerly worked, for a job. The friend had nothing for him to do, but questioned him as to his circumstances. It appeared from the inquiry that the man, who was a good workman, and was allowed to do all the extra work he wished, had been receiving wages amounting, on an average, to thirty-five dollars a week, with the prospect of an equal, and probably increasing, income, as long as he chose to stay in the shop. His friend then inquired how much he was receiving as "strike pay," and, on being told, three dollars a week, frankly informed him that he was a fool, and that he had better go back to the shop, get down on his knees and ask his employers to take him back. The poor man replied, without the least resentment, "Yes, I know I am a fool, and I am glad to have you tell me so, but if I should go back, they would call me a scab;" and thus, out of pure terror of what would be done to him if he should get the ill-will of the Union, this unfortunate, who represents myriads of the best citizens that our Republic can boast, threw away, at the bidding of some alien schemer, a sure income of more than eighteen hundred dollars a year.

THE ENGLISH RENAISSANCE.[1]

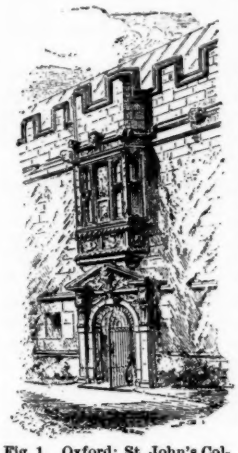

Fig. 1. Oxford: St. John's College, Garden Front.

WHILE the so-called Transitional or early Renaissance style of architecture — an Italian decoration engrafted npon a Gothic construction — was introduced into France from the first Italian expeditions, disappearing with François I, to be superseded by the finished Renaissance of Lescot, Bullant and Jean Goujon, in England the Tudor style termed the Perpendicular made its appearance with the fifteenth century and remained intact until the middle of the sixteenth, the period assigned for the beginning of the movement of foreign importation. The origin of this artistic revolution has been fixed at the date of the arrival in England, of the German painter-decorator Holbein [See "English Architecture," *American Architect* for February 21, 1891, *et seq.*], and thus has been explained the apparent resemblance between the English Renaissance and the German Renaissance.

The master from Bâle did, in fact, draw not only religious scenes, designs for windows and portraits, framing his subjects with motives borrowed from the architecture of the Renaissance, which became German under his pencil, but out of his fertile imagination he also supplied original designs and decorative adaptations to the art industries: chased-work, jewelry, gold-work, iron-work, arms, tapestry, etc. If we compare the numerous designs, outlines or sketches in the collections of the museums of Bâle and Berlin, and also of the British Museum, with certain of the objects of art executed in Germany, between 1520 and 1530, and in England, from 1530 to 1550, we can easily see how much influence the taste and imagination of Hans Holbein, the younger, must have had upon the development of the sumptuary arts.

And of special interest in considering the question of the introduction of the artistic Renaissance into England, is a design by Hans Holbein in the Berlin Museum, presenting a plan for a triumphal arch crowned by an allegorical group representing Apollo and the Muses. This festival decoration was executed in 1533, upon an order from the German merchants of the Steelyard in London, on the occasion of the marriage of Henry VIII with Anne Boleyn. In the absence of more definite information one might fix upon this circumstance as the début here of the boldest and most ingenious of the instigators of the German Renaissance; and it is comprehensible that as a result, the artist thus presented to the people

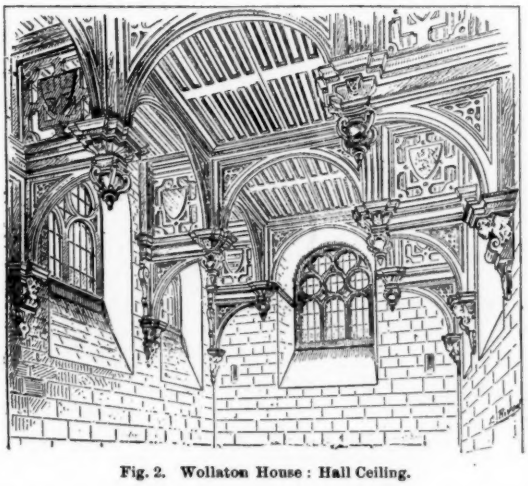

Fig. 2. Wollaton House: Hall Ceiling.

of England by his fellow countrymen, whether in person or merely represented by this important specimen of the new art, should become at once the fashion and should find himself patronized by influential persons, a Thomas More or a Colet, desirous of introducing into their insular country the artistic movement of the Renaissance, preceded, however, by the religious reformation.

Whether the portrait of the king of England [See "English Architecture," *American Architect* for February 28, 1891], was the pretext or the bait which took Holbein to London; whether an artistic revolution, premeditated or not, resulted from this acclimatization of the German Renaissance in England, and that as much in the costumes and their embellishments as in the decoration of objects of luxury, of arms and furniture, there is nothing inconsistent in all this, for it is well-known that Holbein left in London as well as at Bâle designs for costumes, for the chasing of sword handles and scabbards, for jewels and drinking-vessels, besides compositions for the decoration of books, etc. At this time, another German, Hans Mielich, designed the ornamentation of the armor made for François I, king of France.

But the distance between this and a direct influence on the monumental Renaissance is still too great for us to accredit to Holbein any large part in the transformation movement in architecture which, at the most, had but just dawned in England in 1550, some years after the death of this artist (1543). We might as well attribute the indisputable influence of Italian importations on the French architecture of the time of François I to the goldsmith-sculptor, Benvenuto Cellini.

Moreover, as we have already said [See "German Architecture," *American Architect* for August 15, 1891], the *architecture* of the German painters of Nuremburg, Augsburg, Ulm and Bâle was quite Platonic — even at home — and was confined to the decorative accessories of their painted compositions or of the plans that they furnished the industrial arts. These "*pourtraicteurs*" did not, as we know, move stones.

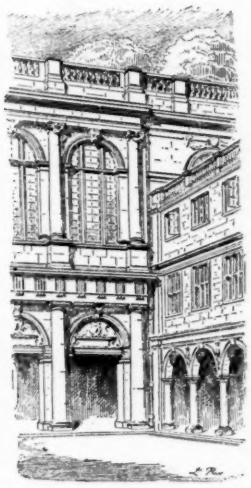

Fig. 3. Cambridge: Trinity College, Neville's Court.

It is to the Italian, John of Padua, architect of King Henry VIII, during the last years of his reign [died in 1546], that the honor is due of having extended to English architecture the Renaissance already realized in the other arts by the influence of the German artist.

The earliest examples of English Renaissance architecture, are then, at Somerset House (Strand), and Sion House (Middlesex), a direct importation from an Italian source, an application of the teachings of Vitruvius, or of the ancient monuments, to the forms and proportions of the various parts of a façade, the plan of which, nevertheless, meets wholly local requirements.

The princes and lords across the channel would not consent to modifications in their habits to suit forms of external decorations. But like the artists who had been warmed by the sun of Italy, the young English noblemen, on returning from the court of Florence — in the time of Elizabeth — brought back with them visions of the monumental splendors amid which they had passed the time accorded to the perfecting of their education, and also a desire to copy them. The "Tudor" and its "Perpendicularism," exaggerated and monotonous, had ceased to be pleasing to those of the English aristocracy in whom travel in France and Italy had engendered a love of the brilliant or picturesque, and a desire to alter and rejuvenate the aspect of their dwellings. The rest of the privileged class, continuing faithful to the traditions of their country, maintained for the melancholy, rectilineal niceties of the Tudor period, a preference which nothing was ever able to stifle wholly, and which at the close of the last century was so far revived as to constitute at the beginning of the present century, a complete return toward this entirely national type of mediæval English architecture.

Is not the garden façade of St. John's College at Oxford (Fig. 1), one of the oldest specimens of the Renaissance in England? It is said to date back to about 1555, that is to the early part of Elizabeth's reign. The general structure of

[1] From the French of E. Rivoalen, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

the bay and the dispositions of the bow-window, loaded with ornamentation after the Italian manner, are still Tudor, decorated in the new style. As for the door, it is almost absolutely Italian — with a touch of Flemish — in the framing

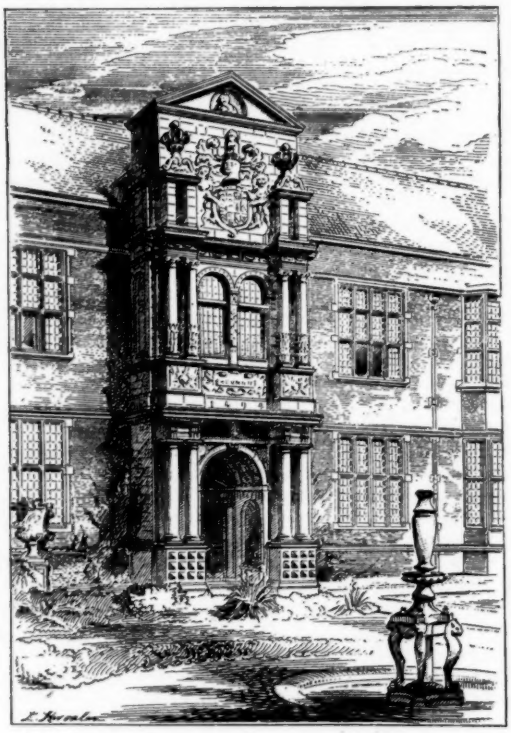

Fig. 4. Gravesend (Kent): Cobham Hall, Portal on the Court.

with strong and prominent projections; it is a souvenir of Milan or Venice; there is a complete surrender of this decorative "bit" to the art of the Italian sculptor-architects of the sixteenth century, who were the immediate precursors of decadence. Following the course temporarily adopted in France, at the beginning of the sixteenth century and down to the reign of Henri II, the local plan, the construction, and even the disposition of details, were kept intact, so far as they concerned the private life of an English family. To the foreign artist, called in as was the fashion, to the Italian, the Frenchman, or the Fleming, to the importer in a word, was entrusted the decoration and embellishment, but not the architectural system, not the general form of the monument. He received "bits" to treat in his own manner and according to his own understanding: express reservations being made in advance, under the indispensable guidance of the native master-workman, familiar with the national and local traditions which must be persistently maintained. It is for these reasons that we find battlements of the Tudor style and the Norman bow-window surmounting, at Oxford, a doorway which in France would belong to the latter part of the Renaissance.

John Thorpe, who is the best known of the architects of Queen Elizabeth's reign, and who crossed the channel to study the new architecture in Italy and France, erected a great many structures in England. About 1607 he built: Holland House (Middlesex), Bramshill (Hampshire), Summer-Hill (Kent), Charlton House (Wiltshire); and about 1611, Hatfield House (Hertfordshire). Lastly one of the most curious of English Renaissance edifices due to the capricious genius and picturesque fancy of this architect — the equal of our French masters of the castles of the Loire in the time of Francis I — is Wollaton House (1580–1616), which might properly be termed the English Chambord [See "English Architecture," Figure 38, *American Architect* for February 28, 1891].

The timber-work (Fig. 2), in the great hall at Wollaton, is quite typical of the so-called Elizabethan style: it is Tudor timber-work accommodated, in its curves and in the details of the superficial ornamentation, to the forms and taste of the Renaissance. The corbels, the pendants, the cornices with consoles and architrave, the filling-in of the spaces between the heavy parts, the very profiles of these parts — all is Renaissance, original and fantastic. But the main body of the architecture remains English.

After a lapse of sixty years, the English architect is seen following the course indicated in France, in the composite and picturesque works of the architects of Louis XII, or of François I, old French masters decking out, at command, their thoughts in the Italian mode.

Smithson had a part in the construction of Wollaton House, which was not completed until 1616.

About this time Inigo Jones, who was at first a landscape painter and then had become, during his travels in Italy, an enthusiastic advocate of the teachings of Palladio, returned to his country where he was received with favor by King James I and Queen Anne; he attempted, by putting into practice the precepts of the Italian master, to purify English taste; he copied the Italian Renaissance in England, allowing no regard for climatic conditions or for the usages of his country to interfere with the application of Classical theories. If he was not, in this way, always rational in his conceptions, he showed himself severe, a connoisseur in form and proportions, and skilled in the handling of orders imitated from the antique. In 1619, he began the Banqueting-house at Whitehall, London, a small part of a palace designed to be 1,152 feet long and 874 feet broad. At the centre of one side of the palace he planned an imitation of the superb disposition of the circular court in the palace of Caprarola (by Vignola); it was to have been 210 feet in diameter.

Inigo Jones, as is well-known, is considered a great master in England: he, moreover, founded a school. The cloister of Trinity College, at Cambridge (Fig. 3), has a gallery façade composed of orders with superimposed arcades, the architecture of which is Classical and of a most subdued style. François Mansart was not more correct in the so-called Gaston d'Orléans part of the Château de Blois, or in the door of the Hôtel de la Vrillère at Paris. Solomon Debrosses was not a more exact and judicious observer of the laws of proportion in the superimposed orders of the portal of Saint-Gervais at Paris. It is understood, of course, that in our comparison of the work of the English artist with these French productions no account is taken of the half-Tudor, half-Renaissance wing of the cloister.

We find, besides English, imitation of the French Renaissance in bits of architecture dating from the close of the sixteenth century. Does not the portal (Fig. 4) of Cobham Hall (Kent) constructed about 1594, and which seems to be brought here to occupy a bay seized from the austere façade of a Tudor

Fig. 5. Northamptonshire: Rushton Hall, Part of the Court.

manor, does it not recall, although remotely, that of Anet, now at the Paris École des Beaux-Arts? This imitation, or nearly that, of a masterpiece of Philibert Delorme and Jean Goujon supplies, however, the characteristic note of the English style

of all times: a prominent display of gorgeous armorial bearings; their weight here crushes the proportion of the bay and portal which are nevertheless rustic.

To the pompousness of the pseudo-classic work we may be permitted to prefer the artlessness and tranquil unity of character, the more honestly rural style of Rushton Hall (Fig. 5), in Northamptonshire. Although dating from 1595, and notwithstanding the very questionable adaptation of balustrades that mask the gutter of the roofs, but suit well the gables of the great dormer-windows, it is in the Tudor style; it is *English*, merely disguised by its Italian ornamentation, the disguise seeming not to interfere in any way with the general structure or with the characteristic dispositions — great painted windows and bow-windows — answering climatic and national demands.

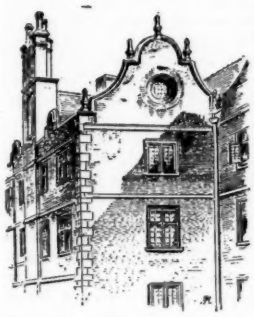

Fig. 6. Saint John's College (Cambridge): Flemish Gable (Tudor).

Elsewhere, moreover, and almost at the same period, a Tudor style is maintained, a style national but pure, at least in its silhouette. And if we except its profiles and numberless details it may be said that the architecture remains, at the close of the sixteenth century, what it was at the beginning. Only the merlons of the front walls and the crow-steps of the crest of the gables are transformed, as seen in St. John's College at Cambridge (Fig. 6), and show silhouette of the Dutch Renaissance type, — or possibly German. Rectilinear forms become curvilinear. Posts or finishing balusters, with four faces, recall the influence of an importation from a source far removed from the primitive home of the Renaissance. Italy counts for nothing in the exaggerated suppleness of these outlines, which remind one, though nearly always in a too commonplace way, of the picturesque architecture of the Low Countries [See *American Architect* for March 11, 1893, *et seq.*].

The works of the Frieslander Vredreman de Vries would

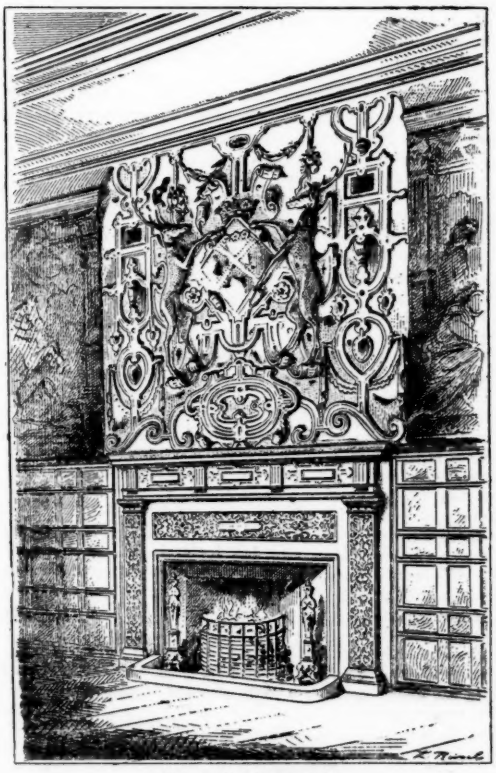

Fig. 7. Hardwicke Hall.

seem to have had much more influence on the English Renaissance as metamorphosed toward the close of the sixteenth century, than the decorative compositions of Holbein of Bâle could have had, in the middle of the same century. The commercial relations between London and the rich Hanseatic cities readily account for these influences.

However this may be, the English Renaissance cannot, as was the case in the corresponding transformation of monumental art in other European countries, be considered as an interesting period of national architecture.

In the interior decoration of English dwellings, Flemish or Dutch art appears without any question, as a single specimen of vertical decoration (Fig. 7) above a fireplace in Hardwicke Hall suffices to show; however, a purely English tone is given to the composition by the proud expansiveness of the cumbersome heraldic motive. It is very characteristic, but this frank display of family pride has its greatness and its peculiar nobility; it is not commonplace. All the rest is from a Flemish master of the latter part of the sixteenth century. This typical example perfectly illustrates the decorative manner adopted from mediæval times for the grand fireplaces of the halls or galleries in the manors of old England.

From the ceiling of a gallery (Fig. 8) of St. John's College, Cambridge (1589), one can likewise get an adequate idea of the general plan followed at the time in question, in the lattice-work decoration of the ceilings or vaults over the large rooms of private houses [See "English Architecture," Figure 37, *American Architect* for February 28, 1891]. It is, as it

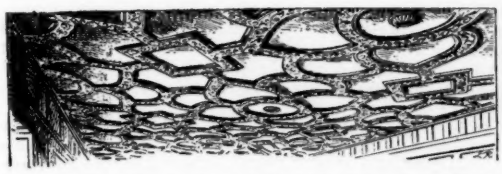

Fig. 8. Ceiling of the Gallery at Saint John's College (Cambridge).

were, an indirect copy of the ceilings of Serlio, whose writings and compositions were first introduced into Flanders through the translation of the painter, Van Aelst (1545), and formed a school, helping on the Flemish Renaissance, the very original works of which were, later, to find an imitative echo in Germany and even in England. E. RIVOALEN.

THE NINTH LEAGUE EXHIBITION. — I.

THE Ninth League Exhibition differs from its predecessors mainly, at first view, in having a more colored effect. Undoubtedly, this is due, for the most part, to the great number of decorative paintings, designs for stained-glass and mosaic, and other things of the kind, which form a very large portion of the exhibition, and to the richly decorated room, with its three great banners of red silk, in which the architectural drawings proper are hung; but, making allowance for all this, it seems to us that the proportion of colored drawings is, this year, greater than it has ever been before. Whether we are to see in this a change in the practice of architects with regard to their competition, or other show-drawings, or the result of the closer intimacy between the arts of painting and architecture which the Fine Art Society has cultivated, we will not undertake to say, but the fact is worthy of notice. Moreover, it seems to us that not only are the colored drawings more numerous, constituting more than half of those hung in the more strictly architectural part of the exhibition, but that they are better than ever before. What may be called the commercial colored perspectives, about which there is a similarity from year to year, are at least as good as usual, but there are fewer unsuccessful attempts at large colored drawings by inexperienced hands; and the sketches from nature are, as a rule, larger, and better and more carefully done than in any previous exhibition.

On examining the catalogue, as a preliminary to beginning our tour around the rooms, we find that the exhibition differs also in another respect from the previous ones, in containing fewer works from contributors outside of New York. The fine perspective drawings from Chicago, which once formed an important part of the show, are wholly wanting, and the pretty water-colors which we had been in the habit of expecting from Mr. Emerson, Mr. Peabody and Mr. Rotch, of Boston, and the fine Philadelphia work in black-and-white, are all conspicuous by their absence. However, the New York people manage to fill their walls very agreeably without them, and, except for the advantage of having the exhibition more representative of the work of the whole country, the League might exclude all contributors outside their own membership, without fearing that their annual show would be unattractive.

Beginning, as we usually do, at the beginning, we find the first twenty-two numbers represented by as many magnificent carbon enlargements, three feet by four, contributed by Mr. Frank Hegger, and offered for sale, at thirty dollars each, which certainly does not

seem dear. The subjects are all architectural, including a variety varying from the façade of Amiens Cathedral to the interior of St. Mark's at Venice, and are, presumably, selected from a much larger number.

No. 23, the first of the architectural drawings properly so-called, shows the new building of the Manhattan Life Insurance Company, on Broadway, by Messrs. Kimball & Thompson, in a well-colored drawing by Mr. Hughson Hawley, which is supplemented by a model, something like eight feet high, in the middle of the room. The design is probably familiar to our readers, and is shown to great advantage, both in the model and the colored perspective. Next to this come some sketches in water-color, by Mr. Herts, and Mr. Brunner, whose work is always pleasing, and Mr. Everett K. Taylor, who exhibited a few small sketches last year, but is this year one of the most important contributors in this line, showing some very charming work.

In No. 27, we are introduced to the first example of a class of design which has attained in this year's exhibition a marvellous development — that of brick and half-timber work. Whether the New York public has gone mad over brick and half-timber, or the hanging-committee only has been seized with the mania, we cannot say, but nearly every dwelling-house design shown is in this style, and it appears in designs for many structures of other sorts. It is needless to remark that the evidence, in so important an exhibition as this, of such unanimity in the choice of a style hitherto not much employed, gives rise to grave thoughts in the mind of the visiting architect. Can it be that the Colonial clapboard is about to vanish before the fifteenth and sixteenth century brick and plaster? If so, every architect who values his business prospects should make early preparations for the change; for the fate of the dressmaker who is not on the alert to notice when gigots give place to bretelles is not more dreadful than that of the designer of houses who fails to know everything about the very latest style in "mansions" and "cottages."

No. 28 is a very pretty design for a school-house in Brookline, by Mr. William Atkinson, quiet and elegant, and shown in a sepia drawing, so finished and skilful that we mistook it at a distance for a large brown-toned photograph of a real building. Next to this comes another house, with brick in the first story, and half-timber above, by Mr. J. G. Thorp, which is particularly pretty. Notwithstanding our New England affection for the old-time elegance of wooden pilasters and dentilled cornices, we are by no means incapable of appreciating the beauties of half-timber gables and carved barge-boards; and Mr. Thorp's design, taken in connection with its numerous relatives to be seen upon the walls, gives promise of a revival of the picturesque in American domestic architecture, which may lead to great things. Next come some designs for banks, by Messrs. Le Brun & Son, and Mr. Warren R. Briggs, which do not appeal very strongly to our sensibilities, and probably were not intended to do so; and a design for a Museum of Art for the City of Providence, which might, so far as the subject is concerned, have been appropriately made much more beautiful than it is. Two large designs for the Brooklyn Institute of Arts and Sciences follow, one by Messrs. Brockway & Benson, showing a good design, well rendered in India ink wash; and the other, the accepted one, by Messrs. McKim, Mead & White, indicating, so far as can be seen by the perspective, a clear, symmetrical plan, carried out in a massive, colonnaded design, coarsely rendered in color, and having a chalky, disagreeable look. This drawing, which is by Mr. Hoppin, and has the air of having been colored in about four hours, hangs next to a pretty water-color sketch of a Venetian palace, by the same clever artist; and next to this, again is another colored sketch of another Venetian house by Mr. J. Watrous Case. It was an unfortunate idea to hang Mr. Hoppin's and Mr. Case's drawings together, for Mr. Case's impression of Venice seems to combine that of Diaz and Turner, and his rich, sunshiny coloring makes that of Mr. Hoppin, who probably had rainy weather during his stay in Venice, look rather cold; and the same mistake is repeated a little further on, where a good and careful drawing of the Casa d'Oro, by Mr. Hoppin, is hung next to a beautiful little picture of Santa Maria della Salute, by Mr. Case, as pretty and warm in color as it is artistic in its treatment of the subject.

At this point we bid farewell for a while to Venice and the artistic and poetic, and have presented to us some designs for boarding-schools, of no extraordinary interest, and an iron rood-screen, by Messrs. McKim, Mead & White, which suggests a garden fence as much as anything, but has some stylish-looking tops to the pickets, which undoubtedly raise it well into the realm of high art. Next, after another brick and half-timber house, by Messrs. Stephenson & Greene, comes a pencil-sketch for an Episcopal church, in San Francisco, by Messrs. Coxhead, which comes near being very successful; and we then reach one of the best things in the exhibition. — a colored elevation, by Messrs. Romeyn & Stever, for the exhibition building of the American Institute. As a drawing, a colored elevation is never of great interest, but, as a design, the present subject is one of the cleverest adaptations of Dutch brick and stone architecture we have ever seen. Few people know how beautiful the brick and stone work of the best period in the old Dutch cities is, but Messrs. Romeyn & Stever have not only caught the spirit of the best examples, but have adapted the style most artistically to difficult conditions. There is another Dutch gabled design, in brick and stone, farther on, but it is less carefully studied, and has the fatal mistake of being rendered in yellow brick, so that it loses the warm, comfortable color, and the contrast of the brick and stone, which are essential parts of the impression peculiar to the style.

Hereabout, we come to some photographs of Mr. Kimball's theatres, which, notwithstanding the interest of their subjects, count as dark, unpleasant spots among the bright drawings. It would be a pity to discourage contributors from showing photographs of their works, and some things can only be properly shown in that way; but it would be very much for the advantage of the exhibitors to have the photographs collected in a room by themselves, where they would neither injure the effect of the drawings, nor be injured by them.

The east side of the Vanderbilt room is, to a considerable extent, taken up by a set of large drawings, mostly in pencil, with a little color on the cut surfaces, of the enormous house which Mr. Post is building for Mr. Cornelius Vanderbilt. The "lay-out" of the house, if we can apply so familiar a term to anything so fine, is magnificent. Nothing of the kind, we think, has ever been attempted in New York, and one would have to turn to Bridgewater House, or some other London palace, for an adequate comparison. The interior decoration, as indicated on Mr. Post's sections, is, perhaps, more elaborate than in the London houses, and there is a certain picturesqueness in the arrangement, and changes of height in the ceilings, which promises a charming effect in execution.

[To be continued.]

ELECTRICAL SCIENCE FOR ARCHITECTS. — I.

ONE hears very often that this is an age of specialists. We are told time and again that all one's thought and endeavor must be given to one branch of work, if there is to be any advancement. Yet it seems quite as true that there has never been a time when one must have so broad a knowledge. The development on all lines has been so great, and, in all branches of engineering, at least, these lines have become so interwoven that one must greatly broaden interests and knowledge if the most is to be made of the special work. We may know only one thing, but we have to *know about* a great many.

Electrical engineering and architecture are certainly distinct, yet electrical matters are every year brought more to the architect's attention. Electric-lighting, the increasing application of the motor to elevators, pumps, ventilating-fans, etc., and the innumerable bells, burglar-alarms, gas-lighting arrangements and similar conveniences, have a rather important place in the fittings of buildings, and the electrical item is one of too much consequence to be turned over *carte blanche* to contractors or arranged for without due consideration. It is becoming important that the architect should know a little about the nature of electricity — the uses it can be put to, and what safe, economical, and durable electrical work is. Electrical power can be so cheaply and conveniently brought into buildings of any size that there is no limit to its possible use. Already it is being seriously considered in connection with heating and cooking and if the hopes of inventors are realized, the need for providing for the use of electricity and for looking most carefully into all electrical arrangements will grow into a necessity.

There seems to be an inclination to look upon all electrical matters as quite out of the range of ordinary work and interests, perhaps as something too mysterious to comprehend without that thorough study for which there is not time. But every architect knows something about plumbing, steam-heating and gas, and the necessary knowledge about electrical matters is scarcely more occult. It would be a much simpler matter if we but had an "electrical sense." Most of the actions take place without giving any evidence that can be appreciated by our five senses. When a wire is tapped here and there and a part of the electrical energy is translated into some other form that we recognize, such as light and heat, it seems an unreasonable and miraculous thing, for with our limited perceptions we cannot follow from cause to effect. A little familiarity with the phenomena is acquired, and we are apt to forget the miraculous part just as we do on seeing an object drop toward the earth. We become content to simply give a name to the force. It seems to bring electricity nearer when it is thought how little we should know about heat if there were no sense of feeling. A good deal could be learned about it of course in a slow way, but its actions would be very mysterious. We would, perhaps, see a piece of wood suddenly blaze up, a kettle of water a foot above it would begin to dance about and boil, and yet we might pass our hands between them with no appreciation of anything happening there. Steam might be carried from a closed kettle through a pipe to a small engine. The pipe might be of glass and nothing would be seen, so if we had no sense of feeling we would see only a piece of wood blazing and a machine, with no apparent connection, doing work. It would surely not be less mysterious than the working of an electric motor.

Electricity is not an erratic, uncertain thing. The laws which govern its actions are well known, it can be controlled without great trouble, electrical forces can be measured with the greatest accuracy, and the way in which it will act under given conditions can be foretold with definiteness. Whatever it really is and whatever may ultimately be found true as regards its nature, it is known that it acts very much as a fluid does, and all the actions of water flowing in a pipe are closely analogous to electricity "flowing" in a wire. We cannot go very far wrong if we look upon it in this way, and as

water flowing in a pipe is such a familiar phenomenon, a great number of useful analogies are at hand, and an easy way is open of understanding many of the actions of effective currents.

In the earlier days of electricity, when trained workmen were scarce and the needs not so well understood, and when, it might be added, the underwriters were not so hard upon the heels of the contractors, there was a great deal of exceedingly poor and slipshod work done. Electricity was fast getting the reputation of being a most untrustworthy servant, if not one actually dangerous to property. This idea is being dispelled under the improved conditions, and while much bad work is still done, and most of the wiring is far from perfect, it still has been proved that even in the most difficult places electricity can be employed with the greatest surety of action and freedom from danger. The underwriters have done much to bring about the improved state of affairs, for surety of action and freedom from fire causation are very closely related.

Faulty circuits are not always easily discovered, for there is often no sensible evidence of defects until they are looked for with great painstaking or until they suddenly become worse and give sensational notice of fault. It is consequently of great importance that the work be done thoroughly to begin with. It is not a difficult matter to confine electricity to its proper conductor, but to do so it is absolutely necessary that every care be taken with the insulation. With all metals such good conductors, and with brickwork, plaster and damp wood partial conductors, there is a great temptation for the current to go astray.

There is this difference between electricity and water. Water flows freely in space and to conduct it we surround a certain amount of space with metal — we use a pipe. The metal is the insulator through which the water cannot pass unless the metal be punctured. Electricity does not flow freely in space but does through metals. Space is the impassable and the metal is the "hole." When wires are strung, it may be considered as punching holes for the electricity to flow in, and if these "holes" are not surrounded by some non-conductor, it is of course impossible to keep the electricity in the path intended for it. Pipes are strengthened and joints are looked after with regard to the pressure upon them. Electrical insulation should also be looked after with regard to the pressure which it is to withstand, for there is an electro-motive force that is analogous to water-pressure. In insulating wires the difficulty comes from the fact that all electric insulators can be either punctured or permeated by conductors. Sometimes they even become themselves partial conductors through the action of heat or other deteriorating agents, and it is necessary to provide against all of these conditions in one way or another. If a nail pierces the insulation, if dampness permeates it, or if it becomes charred by heat there may be a leakage. It is as if a water-system were tapped by a small pipe through which the water constantly leaked away, only it is a far more subtle waste and attracts no attention unless there be on account of it a lack of power in the circuit. And it is by no means the waste alone that makes leaks undesirable. There is a very small margin often between a small leak and a great one, and if it is large it carries off practically all of the electricity, leaving nothing for useful purposes, and in doing so is very apt to cause a part of the circuit to heat to a dangerously high temperature.

But even in damp cellars, tunnels and mines, electric circuits are in successful operation. A few principles must be kept in mind, a few rules carefully followed, but if proper attention is given to insulation, leaks will be impossible under normal conditions.

RUSSELL ROBB.

(To be continued.)

ARCHITECTURE AND ADVERTISEMENTS.[1]

IF we transport ourselves — calling historic imagination to our aid — to the time when an earlier race of members of your Corporation entered into possession of this beautiful fabric, we can realize that in those days, happier in some respects, less happy in others, the problem was wholly to enlarge the supply of what was beautiful or comely. The ordinary architecture of the last century possibly left much to be desired. And as we know to our cost there was a sad want of sensibility to the charms of the older work, and a stalwart contempt for what, in these days, we should consider picturesque effect in domestic buildings. Comfort was studied to the neglect of grace. Speaking as I do in a district which commemorates by its very name the fame of the two brothers who played so prominent a part in reconciling beauty of form with rigid regard for homely utility, I ought perhaps to hesitate about accusing their age of any conscious tolerance of ungainliness. Many of the public edifices of the time attest a striving after the fanciful, although to our eyes the result did not always respond to the excellence of the intention. But if we confess, as I fear we must, that there were periods in which grace was little sought and seldom found, there was a redeeming absence of deliberate disfigurement. A street might consist of long rows of uniform brick houses, in which the only thought of the designer was to arrange for windows that would admit the light, and doors that would allow free exit and entry. . . .

Are we proving ourselves worthy of the inheritance to which we have succeeded? Are we faithful trustees of the relics that have been left to us by our ancestors, and that we are bound in honor to hand on to posterity? A journey on foot in any direction whatever from the Bank of England, or any other centre, east, or west, or central, will supply the melancholy and humiliating answer. Would Dr. Johnson, if he were with us still, dream of inviting his friends to take a walk down Fleet Street? Would Charles Lamb protest that there was no such scenery anywhere as could be had without leaving town? Would Robert Herrick, hurrying up from his pleasant Devonshire parish, vow that now at last he could live again, since he was back in London? Need I attempt here to draw a picture of what greets the eye, say, in that part of Holburn which lies between Tottenham-Court road and Holburn viaduct? or to present a verbal photograph of the panorama of placards which surround that most beautiful of churches, St. Mary-le-Strand. Have any members of the Society of Arts been lately to Tower-hill? If they have, they will not ask to be reminded of what they saw. If they have not, far be it from me to counsel them to purchase so dearly experience of what crimes can be committed in the name of trade.

I confine myself — for the sake of practical illustration — in detail to a survey of the Thames Embankment. There, the process of creeping disfigurement can be watched almost from day to day, and its effect studied by reference to what remains of the original beauty. We all of us, as rate payers, have excellent reason to know that it cost some millions of public money to create that superb avenue; for superb it is, in the majestic sweep of its spaces, and in the massive grace of the chiselled granite that forms the rampart. Yet much as we must praise the completed work, we must not refuse to confess that there was loss as well as gain. The river banks, a generation since, were unquestionably picturesque. The fleets of lazy barges moored in the stream or floating sluggishly with the tide, the motley host of minor craft, made the water thoroughfare, as seen from any of the bridges, a sight full of suggestion and beauty. At high tide there was the bright sheet of water, at low the shelving mud banks, features not lovely in themselves and undoubtedly malodorous; but as part of the scene, full of artistic merit. Then there were the bridges themselves: the spectator, let us hope being so placed as to have in the foreground that masterpiece of bridge-building which commemorates the most glorious event of English history. Forming part of the same group would be Somerset House, descending in its imposing terraces to the water's edge, while as background would be the mighty dome of St. Paul's and the countless spires and roof-ridges of the city. As to the buildings by the river's edge, I am not afraid to take up my parable in their praise. The two shot-towers were and remain — to my eyes — objects as stately and, in their way, as fine as any minaret on the Golden Horn or campanile on the Grand Canal. Then there were the wharves with their huge mills and graneries and stores, and all the miscellaneous relics of shanties, black with time, sheds that tiled roofs made gracious, decrepit old houses, edifices more modern, but not offensive, simply because they served appropriately a distinctly useful end. Add to all the infinite mutations of sky which our climate, with fickle prodigality, gives us; whether the rolling mist and brooding smoke-clouds, or the ungenial clearness of the East wind, and we need not wonder that the master-painters of Great Britain have found in the Thames, above bridge and below, constant subjects for their most successful canvases.

I am far from saying that the charm has wholly departed even now. But there has been change enough to impair, if not to destroy the grace: to mar the enjoyment of the whole, even if still much material for artistic contemplation of detail can be found by that happy class of seeker, who can tolerate the vexations that come in the way of delight.

I want, by your leave, to consider the character of these changes, and to discriminate between those that every man of sense, whatever his æsthetic sensibilities may be, must accept as unavoidable and even praiseworthy, from those which are purely wanton and gratuitous — which disgrace civilization instead of being the result of progress; and which not only call for the censure of all intelligent believers in the principle of public utility, but are susceptible of remedy.

There is, to begin with, the construction of the Embankment itself — an undertaking which made a clean sweep of what I may venture to call the picturesque higgledy-piggledy on the Middlesex side, and substituted for it an imposing regularity. If the only thing to be considered were the desirability of providing for some elegant loiterer on one of the bridges a pleasing picture for sunrise or sunset, the decision would possibly be in favor of leaving things as they were before Sir Joseph Bazalgette waved his engineering wand over the scene. But, of course, pictorial interest is not the criterion. Cities exist to satisfy the everyday needs of the average population, not to nourish the dreams of the poet nor refresh the eyes of the landscape lover. Convenience, then, in the broad and common sense of the word, is the primary point to be considered. There was urgent need of a new line for the traffic of the metropolis; something was to be said for the view that the river which flows through the greatest city of the world ought to be flanked by massive and sumptuous edifices; many, even those who thought that the stream as it was, was fair enough, were forced to acknowledge that a promenade from which people could watch the water was needed to extend the range of general enjoyment; and public order, too, demanded the reconstruction of an area in which there was much

[1] Extracts from a paper read by Mr. Richardson Evans before the Society of Arts, and published in the *Journal* of the Society.

that shocked the sanitarian and added to the anxieties of the magistrate. The construction of the Embankment, therefore, was good work, well done. . . .

I return to the platitude: Cities do not exist for the sake of being picturesque. Facilities for manufactures, for commerce, for trade, for ease of traffic, efficiency of sanitation, and police administration: these are the things that influence the plans of our municipal ædiles. But though cities do not exist for the sake of picturesque effect, picturesqueness may be, and ought to be, an incident of city life. The other utilities I have mentioned may be reconciled to this utility; and the arrangements made for securing scope for industry, safety for life and limb, and, generally speaking, physical convenience, should be consistent with, and conditioned by, arrangements for giving fair play to the tendencies which make for the comfort of the seeing eye. . . .

When the Thames Embankment was made, care should have been taken to save from unnecessary disfigurement the scene of which it is a feature. No care has been taken. Everything has been left to chance, and chance means the caprice of the individual defacer.

Presently I shall ask you to apportion responsibility. Here let me seek to portray — in sorrow rather than in anger — the result of official neglect and private competition in the senseless effort to catch the eye. Nearly a generation has passed since the roadway and the newly-created building space adjoining became an accomplished fact. Many of these places still remain areas which it would be a compliment to call a howling wilderness. It may be a matter for just complaint that those who had the letting of the sites were so long in coming to terms with those who wanted them; but that is a matter for business criticism. I may not enter into it here, and am willing to assume that all was done with a strict regard to the pecuniary interests of the public. But I do say that it showed a very grave insensibility to the principles of civilization in any rational sense, that the vacant sites have during all these years been allowed to remain, not merely as an eyesore, but as a nuisance to the neighborhood. It surely would have been possible to have enclosed them with a decent paling, to have kept that decent paling in a decent condition, and to have kept the land as a sort of field, which, pending the long-deferred signing of the leases, would have added to the health and comfort of the neighborhood. But all the intelligent enterprise of the eminent persons concerned appears to have spent itself in making a costly embankment. To spend a small sum yearly for the purpose of making the outlay remunerative, in promoting the ends which were supposed to justify it, seems never to have entered into the collective minds of these municipal worthies. Every building, as it successively rose from the waste, was allowed to add something positive to the aggressive meanness of the spectacle. The gable end of a new structure in one of the lateral streets, just because it was huge and ungainly, and by its obtrusive bulk thrust itself upon the eye of the pedestrian, was utilized by the occupant as a colossal tablet to announce to people half-a-mile away the nature of the business that was being prosecuted inside. No doubt each tenant would plead that he was only taking advantage of a temporary chance of advertising his business, but the net result is, that the Thames Valley in this region has become a permanent hoarding on a gigantic scale, without even any alleviating variety in the character of the inscriptions.

Nor was there any relief or prospect of relief, as the structures rose which were to form the permanent frontage. I am not one of those who seek to acquire a reputation for refined taste by sneering at the works of modern architects. I believe that contemporary builders are not inferior to their masters and forerunners, and I have no grievance against those who severally designed the works that the intelligent foreigner may study from Waterloo Bridge. But can any one say, surveying the series as a whole, that it is worthy of the superb situation. Uniformity is not beauty; but there is a degree of contempt for congruity that approaches deliberate unsightlessness. I do not think that it should have been left to pure chance whether a Queen Anne's pile in red brick should overtop a Palladian façade in Portland stone, yet I own I should not murmur if each item in the architectural miscellany were left such as the designer intended it to be. Irregularity and variety are, it must be considered, part and parcel of that sturdy individualism which is still associated with the type of the true Briton. But it is impossible to approve a system of *laissez faire*, which allows the manager of a great hotel, built with a robust disregard for dignity of appearance, to crown his offence and his establishment with an enormous board, which proclaims to thousands who do not care for the information the uses to which the building is applied; nor can any one who dislikes strong language trust himself to speak in adequate terms of the decision of a very learned college, which adjoins Somerset House, to destroy, by the erection of an elevated laboratory, the exquisite perfection of a façade which is a national possession and ought to be an object of national pride and reverence.

When the people who do these things are put on their defence, they generally fall back, by way of extenuating their own sins, on the colossal enormity of the Charing-cross Railway station and bridge. "What is the use," they say, "of being nice about trifles, when this monstrous iniquity is allowed?" It is the old, old story. Because things are bad it is not wrong to make them worse. Because there has been negligence once, close the door for ever on precaution. Let me not be misunderstood. It was absolutely necessary that there should be railway bridges over the Thames; and I for one do not think the one which we owe to the South-Eastern Railway at all a bad specimen of its kind. It has strength and massiveness. There is no sham about it. It is what it pretends to be: a fine piece of engineering in iron work. The Rialto is more romantic; but a Rialto is not what London needs, and there is a homely grandeur about this viaduct of girders. Wordsworth, had he lived to see it, might have found as much to quicken his poetic sense in this constant procession of trains laden with their freight of men and women, full of human emotions and anxieties, as he did in the contemplation of the sleeping city from the old bridge of Westminster. Humanity has not ceased to be pathetic because it is often packed uncomfortably in third-class compartments, and has to make undignified haste to catch a train. Turner, who lived long enough to grasp the poetry of steam, would certainly have found much to paint in that never-ceasing picture of the panting, toiling locomotive monsters. I say, then, that Charing-cross Railway bridge does not necessarily or irretrievably spoil the picturesque or jar upon the sentimental mood. Of the station itself we dare not speak with the same charity. Even had the architect tried to make it an ornament to the river-side, he would have been baffled by the intrinsic difficulties. But, as a matter-of-fact, he was not instructed to try; and it remains probably a unique sample of a mammoth shed — a thing without form and void. Something might even now be done to make the staring chasm a little less aggressive; but in any case, though the unwieldly bulk of the thing must more or less upset the balance of the prospect, there is an impressiveness about it which may almost reconcile us to the want of grace and harmony. One is sorry that it is there, but there it is; we must accept its presence.

But what we cannot and ought not to tolerate is the pretension of the directors to make profit out of the wrong they have done. It is nothing short of a public scandal that they should use the walls — such as they are — for advertising stations, and that they should plaster their staring posters on that part of their bridge which spans the Embankment. We must put up with their ironwork; it is outrageous to affront us with their bills. . . .

These, however, are, comparatively speaking, bagatelles. The main charm of the promenade would, in a healthy condition of things, be the view of the river in its devious course. But alas for the poor pilgrim who seeks the old delight. Some purveyor of advertising appliances bethought him that if colossal gridirons could be erected on the roof-ridges, huge letters could be hung on them which would show against the sky; and so trader after trader, thinking only of the chance of snatching a penny from his decent competitors, gave his orders, and lo, there was an end of the firmament, and, as it seemed, of architecture. The County Council, to their very great credit, would not stand this. But it is a proof of the want of moral courage which dooms us to the sorrows I speak of, that though the motive was, unquestionably, regard for the eye, no alderman or councillor nerved himself to recommend prohibition on this ground. By a legal fiction the things have been forbidden, on the transparent pretext that, if they fell, they might hurt some one in the street below. And, as we have saddest reasons to know, the frames that were already in possession of the sky, were allowed some years of grace — or rather some years of hideousness. By a later Act an attempt was made to bring other elevated advertisements under the ban, but concessions had to be made which, as far as my observation goes, has rather stimulated the production of Gargantuan signboards. . . .

We are told unceasingly that it is the spirit of competition that is the root of the evil; but this explanation — I say it with all deference to the eminent philosophers who are all agreed to give this account of the matter — is unscientific and inadequate. The population of these islands no doubt consists of about 40,000,000 of people, all more or less concerned in making things pleasant for themselves; and publicity, let me most freely grant, is, in business matters, a cause of profit. But there are two ways of securing prominence. You may advertise yourself, but if other people do the same, you have advertised in vain. Conversely, you may keep your own place in the public eye, by preventing your neighbors from usurping more than their share. Therefore, though the desire to secure prominence is the motive which leads each individual to push himself forward, it does not at all follow that society, as a whole, has any interest in the appeal to the retina. If the opportunities of display be limited all round, no one will be the loser; indeed, there will be an aggregate gain, since all the expenditure of effort that is now wasted — and worse than wasted — in manufacturing catchpenny-emblems of all sorts, will be available for purposes really useful to the community.

DANGEROUS OCCUPATIONS.

THE present Home Secretary, the Right Hon. H. H. Asquith, has turned his attention to the question of dangerous occupations, and within the past few days two reports of department committees have been issued regarding them, on "Various Lead Industries," and on "Potteries" respectively. The former is the more important of the two, as the industries in question are notoriously dangerous, particularly that dealing with the manufacture of white lead. For some time past much has, however, been done to render it less

noxious to the workpeople by the issue of rules which require the employers to provide overalls and respirators for use in certain processes, and also accommodation for washing and bathing. The employer is required to see that the workpeople wash faces and hands before each meal-time, and take a weekly bath. He has to provide all necessary appliances for these purposes, and insist on their use. By these means the constant absorption of lead through the skin is greatly reduced; the overalls prevent the clothes becoming fouled, while the cleansing prevents lead particles being carried into food, or accumulated under the nails and in the pores of the skin. To minimize the absorption of lead-dust, the plates of lead-carbonate are required to be wetted before they are removed from the "white beds," and again at the crushing mills. But in spite of these precautions much dust is created. That this is so will be understood from a description of the process of manufacture. Gratings or thin plates of metallic-lead are made into stacks within a brick cell. This is done as follows: The floor of the stack is first covered with a layer of tan; on this are arranged as closely as possible stoneware pots filled with dilute acetic acid, and on the top of these are placed four or five layers of lead-plate. The whole is covered over with boards, forming a second floor, upon which fresh layers of tan, pots and plates are arranged. This is in its turn covered in the same way, and so on until the stack is full, as many as ten or more layers going into one stack. When it is complete, it is closed and left ten to fifteen weeks; the tan heats and evolves carbonic acid, the heat volatilizing the acetic acid. Chemical action between the lead, the carbonic acid, the acetic acid, and the air takes place, leading through a series of changes not clearly understood to the ultimate production of an amorphous basic carbonate of lead, or white lead. When the process is supposed to be complete, the stack is opened and taken to pieces. The corroded lead-plates are carried in trays, generally by women, to corrugated-rollers, over which there passes a constant stream of water. In front of these rollers the corroded-lead is tipped, after being dipped in water or thoroughly wetted by a hose, otherwise much dust arises, and even this does not entirely prevent it. In passing through the rollers the white lead is separated from any remaining blue or metallic lead. The crushed material next passes into a shallow tank, having a perforated bottom, in which it is raked about, completing the separation. The blue lead is raked out, and the white lead passes with the current of water to grinding-mills, where it is ground-up and run into a series of washing tanks or becks. Here the lead settles, and the water is run off; the white lead is then removed, put into earthenware or copper pans, and placed in drying-ovens. There it remains from three to five days; the pans are taken from the ovens by hand labor, and the dry white lead is either packed directly in casks or thrown into bins for subsequent conversion into paint. The emptying of the ovens and the packing of the white lead is necessarily a very dusty operation, since the white lead, being perfectly dry and friable, rises readily as dust.

Such is the general outline of the process. The chief danger arises from the inhalation of the dust, which is carried directly into the lungs, and also by the saliva into the stomach. There is also danger from absorption through the skin, and by particles being dropped into food from the hands. These two latter are fairly provided against by the present regulations, and it is to the former that the committee directed their principal attention. They found, by inquiring of the medical officers connected with the various works, that women are more susceptible to lead-poisoning than men, and young girls than full-grown women. It is well known that lead is capricious in its action on the human constitution, and that while some can resist its effects almost perfectly, others succumb very readily. From the evidence taken it would appear that a strong organization is the best defence, and that consequently the weaker sex are the chief sufferers. As it is impossible to predict what will be the effect of the absorption of lead on a given person, the committee have taken the bold course of recommending that no female labor be permitted after January 1, 1896, in the white beds, the rollers, the wash becks, the stoves, or in packing dry white lead. Practically this covers the entire manufacture, and, if the recommendation be adopted, must have very serious consequences on the trade.

It is little less than a revolution to prohibit women working at a manufacture that has hitherto been carried on almost entirely by them. It means either that higher-priced male labor must be employed, or that machinery must be adopted as far as possible. Engineers are not likely to grumble at this latter alternative; at some of the best organized works many of the processes are conducted by automatic-mechanism, and in all machinery might be adopted to a greater extent than it is. It shows how crude processes survive when labor is cheap and ignorant when we relate that, in forming the stacks, in some works women carry on their heads plates of lead, varying from thirty pounds to fifty pounds, up ladders ten feet to fifteen feet high. At others, women cast these plates from the molten lead. Evidently the owners need some pressure brought to bear upon them in order to enable them to recognize that they live at the close of the nineteenth century, and to see that not only is it indecent to allow ignorant women to continue in such tasks, but also that it is uneconomical. The disinclination that we should otherwise feel in concurring in the recommendation to abolish female labor at two years' notice is a good deal reduced by the knowledge that it is now used, in part, for such unnecessary purposes.

From time to time processes for the manufacture of white lead in a perfectly innocuous manner have been placed before the public, and some of these are now at work, but their output is, relatively, so small that the committee pass them over in a few words. Foreign competition in white lead is so severe that regulations demanding a radical change in its method of manufacture would kill the home industry entirely. Besides white lead, there is manufactured sulphate of lead, red lead, orange lead, litharge and yellow lead. None of these latter are so poisonous as white lead, and beyond general recommendations concerning ventilation and personal cleanliness the committee have little to suggest.

The Potteries Committee of Inquiry found that the chief evil they had to deal with was the dust of clay and flint. These have a serious effect on the health of the workers, setting up inflammatory action in the lungs, and ending in gradual consolidation and abolition of the functions of the organs. Analysis of the mortality returns for males above the age of fourteen for the year 1890, of the Parish of Stoke-on-Trent, including the county borough of Hanley, the boroughs of Longton and Stoke, and the large town of Fenton, show that, of the total mortality from all causes among potters, bronchitis accounted for forty-two per cent, pneumonia and pleurisy eight per cent and pulmonary consumption twenty-one per cent. Thus seventy-one per cent of the deaths arose from chest disease. Among pressers, bronchitis was the cause of death in forty-seven per cent of the cases, and other lung diseases in seven per cent; pulmonary consumption accounted for twenty-one per cent. In this class, therefore, seventy-five per cent die from chest diseases. In males above fourteen, living in the district, but not engaged in pottery labor, diseases of the chest produced twenty-six per cent, and pulmonary consumption fourteen per cent of the deaths. The dust is not directly poisonous, in the ordinary sense of the word, but it is so deleterious that the average length of life among potters is forty-eight years, while among non-potters in the district it is fifty-three years. It is evidently impossible to abolish clay and flint in the pottery trades, or to prohibit adult male labor, and therefore the committee could only insist on improved ventilation and greater cleanliness.

Lead-poisoning also occurs in the potteries from the glazes employed, and is especially liable to attack young women and lads, especially if they are ill-fed or debilitated. The bad effects of the lead are, however, being gradually reduced, as shown by the statistics of the hospitals and the experience of medical men. This is probably due to greater personal cleanliness, to an improved standard of living, and possibly to increased intelligence among the workers. The committee suggest that in future no child under fourteen be employed in the dipping-house or the dippers' drying-room, or in any process of ware-cleaning after the dippers, glost-placing, china-scouring, ground-laying, or majolica-painting, or in any process in which lead is used. Overalls and head-coverings are to be provided for all workers exposed to lead dust; no food is to be eaten in a room in which lead is employed; efficient ventilation and daily cleansing are to be provided for; washing appliances are to be supplied; excessive temperature in the workshops is to be avoided, and no female under sixteen years of age is to be employed at treading the lathes used by turners.

These recommendations are much less drastic than those propounded by the Committee on Lead Industries, the danger to be met being less imminent. They amount to little more than common-sense suggestions that any humane employer would wish to carry out. It is evident, however, from the tone of the report, that greater opposition is to be expected from the workpeople than from the employers. Dust is preferred to draughts, overalls are found to be irksome to work in, scrupulous cleanliness involves more trouble than workpeople often care to take, and in many ways the proposed reforms will provoke opposition. The position of an employer thus becomes very unpleasant. He is urged to spend money and thought for the benefit of his workpeople, and he finds his efforts resisted by the very persons who reap the gain of it. He must console himself by the reflection that were it not for this want of thought — this preference of present ease to future well-being — he would find it difficult to obtain hands, and would have to pay greatly increased wages for those he did get. It is undoubtedly true that the office of the Inspector of Factories is as much concerned with workpeople as with employers, and that a constant and steady pressure is required to bring both parties up to the level of practice which both admit to be desirable. One great use of these inquiries will be to demonstrate to the laborers that they must bear their part in the steps taken for the preservation of their health. — *Engineering.*

SOCIETIES

THE ARCHITECTURAL LEAGUE OF NEW YORK.

AT a meeting of the City-hall Committee of the Architectural League, held January 1, 1894, the following resolutions were unanimously adopted:

Whereas, The report of the Advisory Committee to the Board of Commission on a municipal building of the City of New York, has been handed in, and certain adverse criticism has appeared in the public press, and

Whereas, Competition drawings can under no circumstances be more than elaborate sketches, the object of a competition is fully accomplished if a plan is selected which in its general features of design, both in ground plans and elevations, conforms with the instructions given, and offers a project which with careful study and without any radical departure from the original scheme of the design, may result in the construction of a thoroughly satisfactory building.

Resolved, That the undersigned Committee of the Architectural League of New York, after carefully reading the full report, believe it to be in accordance with the terms of the instructions, and hereby reaffirm their entire confidence in the judgment of the said Advisory Committee.

George B. Post, *Ex-Officio.*
Charles I. Berg.
John Du Fais.
G. L. Heins.
Bruce Price, *Chairman.*

SKETCH-CLUB OF NEW YORK.

The regular monthly meeting and dinner were held in the club-room on the evening of the 6th inst., about fifty members being present. The guests of the evening were Mr. James W. Taylor and Mr. W. W. Bosworth. The former gave an address on the subject of terra-cotta, referring to the use in antiquity during the seventeenth and eighteenth centuries; the history of its introduction into New York City, and the qualification and possibilities for its use in modern buildings. He also described its manufacture and gave valuable hints in regard to its construction. Several practical questions were asked by members and answered by Mr. Taylor.

Mr. S. F. Miller, a club-member, addressed the meeting briefly on the subject of steel beams, and gave each member a small hand-book relating to steel-beam construction.

It was announced that classes in architecture, water-color, and pen-and-ink, would commence during the following week. Through an offer made by Ernest Flagg, architect, arrangements have been made to open a studio of architecture in the club-room, which will be open at all times for the use of the members, and will be visited by Mr. Flagg each Tuesday and Friday. The work to be done will be largely upon the current problem of Columbia College, in accordance with privileges recently granted by it. A small charge will be made to cover current expenses and to start a fund for a library. The class in water-color will be conducted by Mr. John Galen Howard, and that in pen-and-ink by Mr. W. W. Bosworth. These classes are free to members. Four books were presented to the club at this meeting as a nucleus of a club-library.

Within the past month a contract has been signed with the publisher of the "Sketch Book" which is to be issued in a short time, and which will contain prints of competitive sketches, and other club-work, and the committee at this meeting called for drawings, and announced prizes in connection with the cover of the book and the advertising matter.

The December competition for a "Baronial Hall" was decided by ballot, Mr. Frederick A. Parkhurst receiving first mention. Seven drawings were handed in for the pulpit competition.

Edgar A. Josselyn, *Recording Secretary.*

ILLUSTRATIONS

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

THE GUNTON-TEMPLE MEMORIAL CHURCH, WASHINGTON, D. C. MESSRS. HORNBLOWER & MARSHALL, ARCHITECTS, WASHINGTON, D. C.

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

MAIN PORCH OF THE GUNTON TEMPLE MEMORIAL CHURCH, WASHINGTON, D. C. MESSRS. HORNBLOWER & MARSHALL, ARCHITECTS, WASHINGTON, D. C.

The point of interest is the incorporation of the Memorial inscription into the ornamentation in such fashion that it is a part of the decoration and not tacked on as a sign as is too frequently the case. The exterior of the building is of green serpentine stone from Chester County, Pa., and the trimmings of Indiana limestone. The color mass effect is good and not spotty as is frequently the case. The carving was done by Mr. James F. Earley.

THE PROPOSED INN AT NAYATT, R. I. MESSRS. CLARKE & SPAULDING, ARCHITECTS, PROVIDENCE, R. I.

The scheme for the proposed Nayatt Inn secures the advantages of separated cottages without losing the convenience of a hotel. The different buildings being connected by covered piazzas or enclosed corridors, the guests may pass between their private apartments and the various parlors, public rooms and dining-halls without exposure to the weather and yet enjoy a degree of quiet and an amount of fresh air and sunlight impossible when all the departments are under a single roof. The service court and the servants' quarters are entirely secluded and the guests' apartments command an unobstructed view of the water and surrounding country. The first story will be of brick and the remainder of half-timber work.

INTERIOR OF THE CHAPEL OF THE CONVENT OF LA RABIDA, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Additional Illustrations in the International Edition.]

DETAIL OF THE CENTRAL PAVILION OF AGRICULTURE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

CHIMNEYPIECE FROM THE CHÂTEAU D'ECOUEN.

[Copper-plate Photogravure.]

DETAIL OF THE SAME.

[Copper-plate Photogravure.]

HALTON, ENG.: THE WINTER GARDEN.

ROYSTON PARK ESTATE, PINNER, ENG. MR. J. NIXON HORSFIELD, KINGSTON-ON-THAMES, ENG., ARCHITECT.

This illustration represents detached residences erected on the Royston Park Estate, which adjoins Pinner Station on the London and Northwestern main line. This undulating and finely-timbered property is being developed under most favorable auspices. It has been judiciously laid out exclusively for detached houses with large gardens.

COMMUNICATIONS

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

MODERN ENGLISH WORK.

Philadelphia, Pa., December 14, 1893.

To the Editors of the American Architect: —

Dear Sirs, — I forward by post some sketches made in England during a short visit this summer. If you find it worth your while I wish that you would select a few for publication. I made the trip for the purpose of studying the character of English domestic work, and feel that, though my sketches may not be of much value in themselves, I have been able to arrive at certain conclusions regarding house-building which have amply repaid me for the time and trouble spent. It will hardly be seriously disputed, I think, that our architects have not yet succeeded in adopting any fixed standard which a minority even of the serious-minded members of the profession are willing to accept. It is not a question of ability and talent, of course, but one of direction and impulse — or of selection and adaptation — and a study of the sort of life which we wish to image and, in a certain way, dramatize. It is probably fair to say that the only houses so far built in America which have taken a common character and deserve any credit from an æsthetic point of view, and from a point of view of suitability, are of the class such as are found at the sea-coast — unconventional and suited to their surroundings and the

life which is led in them; but a life which is only a reaction from our real life, and must be looked upon as a side issue.

I hardly think that any sort of a stand can be made for the Colonial style — so-called — which seems to me to be only an incomplete study of architecture, and is too much confined to the consideration of details. Its strong hold upon the public seems to be largely due to sentiment, but I think that if our clients had a more intimate knowledge of English history and social life, before and since the date of its adoption — if they knew what it had grown out of, and what has followed down collaterally in the progress of English Renaissance — how consistent in their better work the English have been, and how the houses of the present only differ from those of the past in the materials used and in requirements, they would see what folly it is for us to talk of more than a limited difference between our work and that of England. During the past few years there has been an enormous quantity of very meretricious work done in England, and especially in London. This is probably attributable to the fact that the architects of the present generation are not so serious-minded as those who are nearing the end of their active business-lives; also a partial reaction has set in, and cheap terra-cotta has done much mischief both in town and country. There are new buildings in London which seem to be constructed entirely of terra-cotta cubes, the effect being unsubstantial to the last degree, and uninteresting, since terra-cotta has no virtue when it is not decorated or used for decorative purposes. For purity of taste and dignity, as well as a good constructive feeling, we must, I think, go back about fifteen years, or at any rate to the work of men who have not been influenced by this later feeling.

Perhaps some of it might be accused of a sort of barrenness if it were not clearly understood what kind of life these houses represent. We have no such problem, for example, as the satisfying of the needs of a retired Viceroy of India, to whom greatness is accorded by common consent, and who should build his house in keeping with his station. I do not say that there are not men in America who might build these houses, but that such houses are not in accordance with the temper of their minds, and that they would not be satisfied. I should unhesitatingly put two architects as easily the first men of the last half of this century. They are Mr. Philip Webb and Mr. R. Norman Shaw. Mr. Shaw's work perhaps does not show the same personality as Mr. Webb's. He has a group of houses on the Chelsea Embankment which I think express the best sort of town life in the most noble manner — I speak only from the point-of-view of feeling. I cannot think of anything which can compare with them in their way. It is true that their situation is particularly happy, but he has certainly turned it to the best advantage. Mr. Webb has one house in Surrey and another near Salisbury which I would place far above any modern country work I have ever seen. The one in Surrey is a large, comfortable manor-house, while the one near Salisbury has about forty bedrooms alone. In the last-named house Mr. Webb has used absolutely no architectural details from the common stock, everything is his own and everything is wholesome and good. The house is distinctly of the Renaissance and yet it would certainly not have been what it is if the traditional experience in Gothic work were eliminated.

Before I finish I should like to say a few words about what seemed to me to be just as perfect in its way as the houses above mentioned, though of an entirely different kind. This is the interior of Daly's Theatre (London), just opened. It has the effect of having been entirely modelled by a sculptor, and one, too, who knew so much about architecture that he could afford to use it very sparingly. There is not a capital or a console in it and no striving after constructional effects, which seem to me to be the curse of such work in America.

Since the theatrical and literary world, in London are making such strides, it is not strange that the man has been found who can design a fitting place for representation, and it is to be hoped now that our education is taking such subtile and complex form, that architecture will become a thing better understood and more in tone with the beings for whose satisfaction and improvement it should exist.

Yours faithfully, WM. M. ELLICOTT.

THE VENTILATING OF OFFICES.

NEW YORK, N. Y., January 3, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Dr. F. A. Adams, in the Philadelphia *Record*, speaking of the evils arising from the intense heat in the average office, suggests that the prevalence of pneumonia among clerks and business-men may be due to this entirely. The careful work of the mason and woodworker prevents all chance of cold air entering, and with steam turned on, they spend the day in a tropic air; at night, going to their homes, they pass a considerable time in the cold air of the street or car, and the lungs being unfitted for the change, are seriously affected.

While the change of temperature has some effect, not enough importance is placed upon the fact that the majority of offices are not only very warm, but they have practically no ventilation. It is not a serious matter to have *cold* air deterred from entering a room, but it *is* necessary for good health, that some pure air should enter regularly. Hospitals, court-houses, and most good residences and public buildings have a system, more or less effective, for ventilation. This is often thought of, only as heating, as a hot-air system necessarily ventilates as well as heats.

In an office-building, however, ventilation is considered only in the halls and larger rooms, and the offices that each day hold a small army, are so tightly made that water would hardly leak out, were the room filled with this liquid. It is well-known that clear thinking depends upon the condition of the body. Is it reasonable to suppose that the brain can act to best advantage, when the close atmosphere causes indigestion and headaches? Is it a wonder that bromides are taken as regular medicine by so many business men?

Surely, the architect can impress upon the owner that the increase in cost in building flues, introducing some system of air-heating and air-circulation will be well repaid by the increase in rent.

People are wild on steam and hot-water heating, and forget that with the furnace heat their homes and offices were always filled with pure air, while with the clean and easily regulated heat from the radiator, they live in an atmosphere that will undermine the strongest constitution.

We are very truly yours, EDWIN A. JACKSON & BRO.

NOTES AND CLIPPINGS

THE PIPEAGE OF PETROLEUM. — One of the earliest problems in the commercial distribution of petroleum was that of transportation. The market for the crude product was the refineries, mostly located in large cities, especially those on the seaboard. The crude oil was put in barrels and loaded on trucks and transferred to a central point, the damage to barrels and the leakage of oil being considerable. Where water-courses were available, the barge became a popular method of transport The tank-car on the railroad followed, and, in keeping with supply and demand, has improved in plan of construction and gallon capacity. As the petroleum industry developed in magnitude and the economics of transportation became an important commercial question, the pipe-line came in logical sequence to the railway-car and the barge. This meant a considerable reduction in cost of transit, and, as a commercial consequence, the locating of immense refineries in the most available centres for distribution and a revolution in methods of manufacture as in cost. The introduction of the pipeage system met with the usual experience of all such innovations, the owners and drivers of oil-wagons, anticipating a loss of occupation, resorting to violent methods of prevention. Pipe-lines were cut, tanks set on fire, and armed patrols became necessary to furnish security to life and property. As usual, obstruction of this kind was forced to the wall, the new method gradually extending till the oil regions became a net-work of pipes, and trunk-lines conveying oil found their way as channels of supply to central points in New York, Philadelphia, Baltimore, Cleveland, Buffalo, Pittsburgh, Chicago and elsewhere. As an instance of this development, the trunk lines carrying Pennsylvania crude-oil, not including local net-works of the two-inch pipe, are placed at near 3,000 miles in length. The total pipe, according to evidence given before the State Legislature in 1891, was said to cover a line length of 25,000 miles, carrying the Pennsylvania products from local to terminal points. The amount of pipe and material used in this method was simply prodigious, and representing an equally broad employment of industries concerned in manufacture and construction. Some of these tanks have a storage-capacity of from 30,000 to 35,000 barrels, and the pumps employed in certain forms of severe service are magnificent machines. The pipes used in the trunk-lines are made of wrought-iron and are tested to stand a pressure of 2,000 pounds to the square-inch. The loading of cars by movable pipes is in line with the simplicity and efficiency of the transportation apparatus. By this method a number of cars are loaded at the same time, the economics in labor and time being carefully studied and applied. It is to such factors as these that the commercial importance of the American petroleum industry is largely due. — *The Age of Steel.*

Henry Vizitelly. — If we admit the facts are as the New York *Times* state them below, a most conscientious worker in the field of art and literature was most shabbily treated.

"Henry Vizitelly, whose death at Farnham, England, was announced in these columns recently, was, in the regard of many young English artists, a martyr; of many others, a great culprit; of the greater number of conservative persons, a good man who had committed a grave error, but had deserved indulgence. He was seventy-three years of age. He was imprisoned at seventy in Hollywood Jail for having translated '*L'Assommoir*,' '*Nana*,' '*Pot-Bouille*," and other works of Zola. The cable-telegraph takes pains to say that he had been in feeble health since his imprisonment. He was born in London. His father was a printer of books, and caused him to be instructed in the art of wood-engraving. These were days of enthusiasm for republicanism in England. The young man was studious, but with a restive anxiety to express startling opinions. He was one of the first artists of the *Illustrated London News*. He attained great distinction by his work for this paper for several years, but his thoughts were constantly turned to projects of nationalizing ideas which were not essentially English. He went into the business of publishing books on his own account in order that Harriet Beecher Stowe and Poe might become known in London. This, at least, is the contention of his admirers; of course he had enemies, who ever questioned his disinterestedness. At all events, he introduced the works of Poe and '*Uncle Tom's Cabin*' to the English. He published '*Evangeline*' and '*Hyperion*' with illustrations by Sir John Gilbert and Birket Foster, which have retained their charms and their artistic value. He decided that the newspaper-stamp impost was unjustifiable, and he founded a weekly newspaper for the special purpose of combating it. He bore alone the brunt of the fight, succeeded in causing the abolition of the tax, and then ceased the publication of his journal, with the remark that its mission had been accomplished. He was correspondent of the *Illustrated London News* during the Franco-Prussian war, a daring, careful, brilliantly-descriptive war-correspondent, writing from personal observation, and not, as some of his colleagues, from reminiscences of the Illiad. He was in Paris during the siege and the commune, and his letters were everywhere admired. He remained in Paris for some time after the war, becoming intimately acquainted with the literature of France, and in 1880 decided to publish it in England. Then came a series of books which were a revelation of the delicate art of the French vignettists of the eighteenth century in such works as Dorat's '*Les Baisers*,' Montesquieu's '*Temple de Guide*;' of the luxuriant art of the romanticists, in such works as Theophile Gautier's '*Mademoiselle de Maupin*'; of the admirably objective art of the realists, in such works as Gustave Flaubert's '*Salammbo*.' His translations were almost perfect. There had never been as faithful transcriptions of stories from one language into another; there had never been as truly artistic renderings of French art into English literary form, and Vizitelly was encouraged by the praise which his works commanded for its technical skill to attempt to anglicize Zola's '*Rougon Macquart*.' After the publication of '*L'Assommoir*' he was warned that he would be prosecuted if he continued, but he continued, and in July, 1889, despite the protest of influential people, was condemned, at the instigation of a society for the suppression of obscene literature, to imprisonment for three months. Pinero, Walter Besant, Lynn Lynton, Henry Irving, Edmund Yates, Archibald Forbes, and George Augustus Sala signed, in vain, a monster petition for Vizitelly's pardon. His books were confiscated, his business was ruined, and the indiscreet activity of his friends, more perilous than the attacks of his enemies, resulted in a deluge of pamphlets as detrimental to his interest as the one in which Robert Buchanan appealed to Henry Matthews, then the Tory Home Secretary, as a Roman Catholic, in the name of Roman Catholic indulgence for Lucretius, Juvenal, Catullus, and Aristophanes. Last year, while Vizitelly suffered for having translated the works of Zola, Zola himself was lionized in London, and those who deemed it necessary to explain this inconsistency to naive minds explained that Zola had a moral aim and Vizitelly no other aim than to make money. But those who appreciated Vizitelly's conscientiousness as a man of letters and an artist may not be easily persuaded that the translator of Zola's works was less deserving than their author of respectful consideration for the motive that actuated him.

The Water required for Flushing Closets and Drains. — A special committee of the Sanitary Institution have just issued a report on the quantity of water required for flushing water-closets, in which a very substantial increase in the amount now commonly used is recommended. In the course of their work the committee have carried out a series of over 800 experiments, and their recommendations are, therefore, of great weight. A number of drains were laid, consisting partly of pipes and partly of half-pipes and open channels. The gradients adopted for the four-inch drains, 50 feet long, were 1 in 30, 1 in 40, and 1 in 76, and for the 4-inch pipes, 26 feet long, 1 in 40. The 6-inch drains 50 feet long were laid at 1 in 30 and 1 in 40, and those 26 feet long at 1 in 40. At the head of each drain a simple short-hopper basin of good type was fitted, having an S-trap with a 2-inch seal leading with a bend into the drain, the top of the closet basin being 2 feet 3 inches above the drain. A good siphon waste-preventer, discharging 2 gallons in five seconds and 3 gallons in ten seconds, was placed 4 feet 3 inches above the basin with which it communicated with a 1 1-4 inch pipe. Artificial excreta, made out of soft soap, cocoa fibre, and clay, together with five pieces of newspaper, were placed in the basin and the flushing-cistern discharged, noting in each case how much material was left in the closet-traps, in the drains, and in the disconnecting traps placed at the lower end of the drains. The amount that passed through was also noted. As regards the closet-trap, it was found that a 2-gallon flush left, on the average, 5 per cent of the material in the trap, whilst a 3-gallon flush practically cleared, the retention being 1 per cent only. In the drains little difference was found between the 4-inch and the 6-inch. When fifty feet long and laid at 1 in 40, with a 2-gallon flush, 21 per cent of the material was retained, and with a 3-gallon flush 3 per cent. In disconnecting traps, 36 per cent was retained with a 2-gallon flush, and 26 per cent with a 3-gallon flush. In the case of the 26-feet drains, 3 per cent was retained in the drains, and 26 per cent in the disconnecting trap, with a 2-gallon flush, whilst with a 3-gallon flush these figures were reduced to 1 per cent and 19 per cent respectively. Taking a general view of their experiments, the committee consider that the minimum flush should be fixed at 3 gallons, and the maximum at not less than 3½ gallons. — *Engineering.*

Accidents from Thawing Dynamite. — The most fruitful source of accidents with dynamite is the thawing of the cartridges, which solidify and become inert at a comparatively high temperature, namely, about 40° F. To thaw the cartridges, tin warming-pans are, or should be, provided, and if used with ordinary care they form a safe and efficient means of carrying out this operation. They are constructed on the principle of the glue-pot, the cartridges being placed in the removable portion and covered up, the bottom part being filled with warm water. So reasonably safe is the use of this contrivance, that the author can only recall one instance of an accident occurring in its use. On the other hand, a very large number of persons have been killed, and a still larger number seriously injured, and much property destroyed, through the improper thawing of dynamite. A great deal of misapprehension and misplaced confidence has been caused by the fact that small quantities of unconfined nitro-glycerine, and explosives containing it as their chief constituent, will sometimes burn quietly away when ignited by direct contact with a flame. It has, therefore, been thought that if this was the case, no ill effects could arise from simply heating it. This idea, as the author has already observed, is a terribly mistaken one. If a cartridge of dynamite or its congeners is lighted or placed in a fire, it may burn harmlessly away. But if a similar cartridge is placed on the hob of a stove or an oven, and gradually heated up to its exploding point, which is from 350° to 400° F., a violent explosion will almost inevitably result, and before that point is reached the explosive will become extremely sensitive to the slightest shock. Nobel states that when dynamite is heated to 440° F., it is liable to explode. But Nobel is the apostle of dynamite, and is liable to look a little too favorably upon its faults. Colonel Cundill, one of Her Majesty's Inspectors of Explosives, gives 360° F., as its exploding point, and Eissler, in his work on explosives, states that when dynamite is heated to 350° F., a dime falling upon it will explode it. — *B. F. Nursey before the Society of Engineers.*

Slow Poisoning by a Patent Stove. — A most wholesome judgment, our Paris correspondent says, has been given by the Second Chamber of the Civil Tribunal there in a case brought for damages by a seamstress against a fellow-tenant. The latter bought a slow-combustion stove and set it up in a room contiguous to the one the seamstress occupied. The chimneys of both rooms opened into a common-flue. When there was a return smoke, the poisonous fumes of the stove were brought into the seamstress's abode. Poisonous fumes also made their way through chinks in the partition-wall, and the result was that the poor woman lost her health and had to go to the hospital where she was kept six weeks. When she returned home the headache, drowsiness and comatose fits returned, and she lost the use of her limbs. Her doctor then thought of asking whether there was a slow-combustion stove connected with the chimney-flue, and discovered the cause of his patient's ruined health. He advised her to bring an action against the landlord, but he pleaded that it was not he who set up the stove. The tenant who did was next sued, and the Tribunal has decided that he was responsible inasmuch as he did not first ask the landlord's leave. The latter is exonerated by the silence of the tenant, who cannot plead in his defence the article of the Code which obliges landlords to keep their chimneys in repair. When that article was framed, no means of heating other than the open fireplace with quick-combustion fires was contemplated. Damages were assessed at £250. —*London Daily News.*

Marseilles Cathedral. — France is continually offering surprises to observers, and it is not one of the least to learn that a new cathedral has been opened for service in Marseilles. It is, however, far from completion, although about fourteen millions of francs have been expended. The foundation-stone of the building was laid on September 26, 1852, in the presence of Louis Napoleon, who was at the time President of the Republic. The English contemporary journals record how "the Prince has given orders for the Cathedral of Marseilles to be rebuilt on its present site. The Minister of Public Worship has obtained a credit of 2,500,000 francs to meet the expenses, which sum is to be paid off in ten years." Ten times the amount then estimated will be required before the building is finished. The ceremony of 1852 was only a prearranged incident in the Presidential Campaign, for the works were not commenced for two years. The new cathedral has had no less than four architects, viz, MM. Vaudoyer, Esperandieu, Révoil and Erard. — *The Architect.*

Shore Property for Government Use. — A case has been on trial in the United States Court at Portland, Me., for the past week, the verdict in which, rendered last night, will have an important bearing on the shore property wanted for government uses. The Government wanted thirty acres of land on Cushing's island, south of the Ottawa House, for the purpose of erecting fortifications. Francis Cushing, the principal owner, claimed it to be worth $6,000 an acre. The Government refused to pay this price and the case was tried before a jury for the purpose of fixing the value. The jury gives to Francis Cushing $84,240 for thirty acres of land, on condition that he first extinguish all mortgages on it, so that he can convey a clear title. To John K. Robinson, of Chicago, another owner, the jury gives $19,000. The Ottawa Hotel Company is given $9,000 for damages to hotel. — *Springfield Republican.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.