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FEBRUARY 27, 1892.



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THE New York *Evening Post* publishes an article on hotels in the metropolis, which is anything but comfortable reading for people who propose to make a visit there. It will not be forgotten that something like fifty people are supposed to have suffered a sudden and frightful death by the burning of the Hotel Royal a few weeks ago, and the fatal character of the fire has been, naturally, attributed to neglect, on the part of the proprietor of the hotel, of the precautions against such catastrophes which the combined wisdom of fire-engineers and zeal of legislators have ordained. Now, however, it appears that the Hotel Royal had been furnished with fire-escapes in accordance with the directions of the proper officials, and to their approval. Moreover, it is said that the law requiring hotel-keepers to put a knotted rope in every room, which was fiercely contested by the proprietors of many hotels, and has now been decided to be unconstitutional and void, was faithfully complied with by the manager of the Hotel Royal, and that a good knotted rope was in every room. All this shows, at least, that the proprietor of the hotel tried to do his duty honestly in providing for his guests such safeguards as the authorities approved, and his conduct in this respect forms a gratifying contrast with that of the landlords of the twenty-seven other hotels, of which the *Evening Post* gives a list, who, preferring to expose their guests to the risk of being burned or suffocated in their rooms, rather than provide means of escape which they might utilize for departing surreptitiously without paying their bills, defied the knotted-rope law; but it also shows that such appliances, and even fire-escape ladders, are of very little use to panic-stricken people. The accounts say that one of the hotel guests, who, apparently, was gymnast enough to retain in his mind a connection between ropes and climbing which even panic could not disturb, dressed himself completely, put on his overcoat and silk hat, and descended at his leisure to the sidewalk, while the people all about him, with the same facilities that he had for escaping safely, were plunging head-foremost out of the windows, or writhing, with broken limbs, on the pavement below. The fact is that about one person in every fifty is safe enough in a room from which he can escape by a rope or an iron ladder. For the other forty-nine no fire-escape is of any use that does not consist of comfortable stairs, like those which they ordinarily use, and

provided with hand-rails. These may be outside, but they should also be inside. The Hotel Royal had the main stairs of wood, winding around a wooden elevator enclosure. If they had been of iron or stone, enclosed in brick walls, the result of the conflagration would probably have been very different. Every one understands this, and no hotel could be built in New York in that way now; but the officers of the law say that they have no power to compel the change of fire-traps already existing. If this be so, there is obviously nothing for us to do but to stand by, and witness at intervals the extermination of half a hundred hotel guests at a time, until all the buildings designed on the old system have been burned up; but there is no reason why it should be so. The new building-law proposed by the city of Glasgow provides that within seven years every existing building must be changed to comply with the law. We need not be quite so strict as that, but it would surely not be tyrannical or unreasonable to ordain that after a certain date, say A. D. 1900, no building which is not provided with incombustible stairs should be used as a hotel; and such a statute would cause the immediate remodelling of scores, perhaps hundreds, of buildings in which a person cannot now spend a night except at the risk of his life.

AN important decision was rendered the other day by the General Term of the New York Court of Common Pleas, which is to be taken to the Court of Appeals for a final revision. An action was brought by the New York Board of Health against the Corporation of Trinity Church to recover a penalty incurred for an alleged breach of the requirements of the Consolidation Act, which provides that every tenement-house shall have Croton or other water furnished at one or more places in each floor intended to be occupied by one or more families, and that all tenements shall be furnished with water in conformity with this provision whenever directions to that effect shall have been given by the Board of Health. The statute ordains that every owner or other person violating any of these provisions shall be deemed to be guilty of a misdemeanor, punishable by fine and imprisonment, and shall be also liable to a penalty of ten dollars a day for each day that the offence shall continue. Under this law, the Board of Health issued an order that water appliances should be placed in several tenement-houses owned by Trinity Church. The order was not complied with to the satisfaction of the Board, and an action was brought against the church authorities to recover the penalty fixed by the statute, amounting to about two hundred dollars. The jury, at the first trial, gave a verdict against the church, but this verdict has now been set aside by the Court of Common Pleas. The decision of the court, as delivered by Judge Prior, held, substantially, that the sections of the Consolidation Act under which the Board of Health issued the orders in question are unconstitutional. The Constitution of the United States provides that no person "shall be deprived of life, liberty or property without due process of law, nor shall private property be taken for public use without just compensation." To put such appliances for water-supply as the Board of Health rules prescribe in the Trinity tenements would cost about one hundred dollars for each floor, so that compliance with the order would to that extent take property from the church. In issuing the order, the Board of Health gave no previous notice to the church, nor was any opportunity afforded the church authorities to appear and be heard. So, also, the penalty was claimed, and an action begun for its collection, without notice, and without the granting of any hearing to the defendants. The judge said that "opportunity of defence is an essential element in the conception of 'due process of law,'" and, as this was not afforded, it follows that the proceedings violated this portion of the Constitution. Whether they could be justified under the provision for taking private property for public use was the next question; but even this cannot be done without "just compensation" to the owner of the property, and no compensation was ever offered to the church for what it was ordered to do. It was argued, on behalf of the Board of Health, that its requirements were imposed in the legitimate exercise of police power; but the judge said that, even supposing, for the sake of argument, that the police power extended to the taking of private

property without compensation for the advantage of the public health, its exercise must be justified by showing some connection with that object, and some tendency to promote it. In the present case nothing of the sort was shown. It was not pretended that the buildings were a nuisance, or that, in their existing condition, they in any way or to any degree impaired the health of the public or of their occupants. It was proved, without controversy, that the lack of water on all the floors was "not bad for the health of the tenants," and the court could find no evidence that the presence and distribution of water on the several floors would conduce to the health of the occupants. It was proved that there was a sufficient and easily accessible supply of water in each house, or in the yard, and the judge asked at what would the police power pause if it was competent to impose an expense on landlords in order that tenants might be furnished with water in their rooms, instead of in the yard or basement. It must be acknowledged that this reasoning is very forcible, and it will be interesting to see whether the Court of Appeals will be able to find any flaw in it. If not, the consequences of the decision will be of great importance to landlords, and in a measure to architects; and, as the Federal Constitution reigns over the whole country, the courts of other States will have to confirm the same doctrine, or invent some new logic to oppose it. Practically, we are very much inclined to think that hygiene, as well as sound law, will be none the worse for the establishment of this view of the powers of Boards of Health. While such Boards, in their capacity as investigators and advisers, undoubtedly do an immense amount of good, their success as administrators of "police power" has not been so conspicuous. In the larger cities, they are usually composed of men of great intelligence and special training; but in the smaller towns it is quite common for architects and sanitary engineers to come into collision with codes of regulations drawn up by two or three doctors and the local tinner, which are based on the sanitary ideas of twenty-five years ago, and are fatally defective in the light of our present knowledge. Notwithstanding their defects, the authors of them cling to them with a tenacity which puts all the arguments and expostulations of the modern expert at defiance; and the best drainage-work, for example, in such places is probably worse done than it would be if no Board existed.

THE accounts of the great collection of casts now being formed for the Metropolitan Museum of Art in New York grow more and more interesting. Lists have been made with great care, and revised by the best authorities in Europe, of the objects which it is desirable to copy in this way; and when the collection is completed according to the lists, it will be by far the finest in the world. To bring it to this point, it will be necessary to raise about one hundred and twenty-five thousand dollars, nearly half of which has already been subscribed by seventy-two people, who have given sums ranging from five dollars to twelve thousand. It is hardly necessary to say that the subscriber of the latter sum is Mr. Henry G. Marquand, the most constant and generous friend of art that this country has ever seen; and with him are associated, as subscribers of sums ranging from one to five thousand dollars, Mr. Edward D. Adams, Mr. C. L. Tiffany, Mr. George F. Baker, Mr. Harris C. Fahnestock, Mr. John Taylor Johnston, Mr. Stanford White, and others of the faithful supporters of the Metropolitan Museum. Mr. Augustus St. Gaudens also contributes generously in money, as well as in the time which he devotes, as a member of the committee, to arranging the choice of subjects. Besides these, Mr. St. Gaudens has just presented the Museum with a cast of what we are told is the statue of "King Arthur, by Peter Fisher." We imagine that this must be the King Arthur statue from the convent church at Innsbrück. If so, it is well worth being represented by a cast in the Museum, but we never heard before that it was the work of "Peter Fisher," who, we suppose, must be the person otherwise known as Peter Vischer, of Nuremberg. It would be curious to know the evidence on which, if it is this sculptor and this statue that are meant, they are connected together. However, this is wandering from our theme, which is intended to be simply a mention of the remarkable interest of the collection, with the information that, if any of our readers would like to help in the work, they may send contributions of any sum to Mr. Edward D. Adams, 120 Broadway, by whom they will be gratefully received.

THE idea of providing public baths has spread to Boston, and it is much to be hoped that it will prove fruitful there, as it has in New York. Boston is tolerably well provided with public floating-baths for summer use, and these are highly appreciated by a large part of the population; but winter bathing is a luxury indulged in by few except those whose income enables them to have a bath-room in their houses or apartments, and hygiene calls loudly for facilities by means of which the usual six-months' unwashed interval may be shortened. As in New York, the work in Boston will be done by private enterprise, and subscriptions are invited. There is no reason why the amounts subscribed should be considered as given in charity. By economy, warm baths can be given at five cents apiece, and give a good return on the capital invested. In the German cities, a bath, with hot and cold water, towel and soap, can be had for three cents, in private establishments which pay a tolerable interest on their cost, besides all expenses of maintenance; and with our superior skill in handling steam and water-supply, and in devising labor-saving appliances for washing towels, scrubbing out the baths, and so on, it is likely that the same thing could be done here. It is agreed on all hands that it is better to charge a small price for a bath than to give it for nothing, and the example of a charity which is self-supporting is much more likely to be extensively followed than that of one which is a dead weight on its supporters. The principal danger is that the scheme may grow to be too ambitious. What poor people need first, and most, is a little place, well lighted and warmed, and kept in order, where they can have plenty of hot water and soap, and wash themselves as clean as they like, for the price of a newspaper, or of a glass of beer. They do not need, in their winter bath-houses, tepidariums, or swimming-tanks, or porticos, or exercise-halls; and the less magnificence is put into the new buildings, the more comfortable they will be for the people who use them, and the more profitable for those who own them.

AN interesting plan has been worked out by the General Electric Company, of Berlin, for a system of underground railways in that city. The construction resembles in some respects that of the London electric road, but there are important differences. As a matter of course, each line possesses a double track; but the outward and return tracks, instead of running side by side in a large tunnel, occupy separate tunnels, communicating by a loop at each end, so that trains run around continuously, always in the same direction. Except at the looped ends, the tunnels run parallel with each other, some twenty feet apart; and the stations are placed in the space between the tunnels, so that inward trains are constantly passing one side of the station, while outward trains pass on the other. This is obviously an admirable idea, as such stations would be much cheaper, and more convenient, both for the public and the railroad company, than separate stations on each line. There are, however, other excellent details. The *Schweizerische Bauzeitung* says, truly enough, that the separation of the tracks into different tunnels will make the meeting of trains impossible; but the real reason for adopting this system is probably to make it practicable to build the tunnels of iron. It is intended to use for this purpose cast-iron rings, which are made in segments, and bolted together, and pushed forward into the earth, the material being afterwards excavated from the inside of the ring, on what is known here and in England as the Greathead system. The iron sections are to have flanged joints, packed water-tight, and as the subsoil of Berlin is sand, it is thought that there will be no difficulty in the construction, although most of the tunnels will be below the water-line, and it is proposed to cross and recross in various places below the bed of the river Spree. To make the stations, three or four short pieces of similar tunnel will be driven, side by side, between the main tunnels, but the side plates will be replaced by columns and girders. As with the Greathead tunnels, the iron will be cased inside and outside with concrete. It is proposed to run trains of three cars, drawn by an electric locomotive. The scheme has already been laid before the city authorities, and, if permission is granted, two sections, one running from north to south, under the Friedrichstrasse, and the other from east to west, between Schöneberg and the new Cattle Market, will probably be first built, followed later by two concentric belt lines. The cost is estimated at less than a million marks per kilometre, or about four hundred thousand dollars a mile.

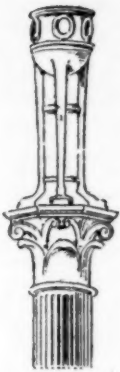
CAPITALS.¹—I.

Fig. 1.

a vase or a statue (Fig. 1), but it preserves the same character even in the construction of an edifice, where it bears indifferently an architrave or a summer. As to the question whether the isolated column is borrowed from the edifice, or whether the edifice has used the isolated column to support its upper portions, we should rather incline toward the latter hypothesis.

However, before entering upon the study of the capital in its essential features, and endeavoring to trace its probable genesis, it would be well for us, if only to get a clear idea of terms, to glance at its various forms as seen to-day; these forms are, in fact, those which it has assumed from ancient Greek times, and our architects have, moreover, found them perfect enough to determine the decoration of their monumental structures.

Roman architectural tradition runs back to the Greek, and it was perpetuated in the West down to a comparatively recent date, or until toward the tenth century, though more or less altered and corrupted; it was superseded, after an intermediate period of groping, by that magnificent and original manifestation of art which occupies the Middle Ages between the twelfth and fifteenth centuries; toward the close of the fifteenth century it forced its way into favor on a new score, and it survives yet. We shall not discuss the question here of whether this was a real progress; in any case, it was the revival of an ancient style which commended itself rather by its decorative aspect than for the part it might play in the construction of new edifices. Forms created for other needs, other customs, other countries, have replaced those which were so happily suited to the manners and customs and especially to the building materials of this part of the world, merely because of the charm which they exercised over the senses of the artists who revived the study of them after so many centuries of almost total forgetfulness.

The artists of the Renaissance labored under different conditions from those in which the artists of early mediæval times worked, that is to say, the period of decadence. The latter, caring nothing for new researches, perpetuated an ancient and traditional art; the former, turning back to that art, after a long period of abandonment, succeeded in classifying the various types, and, being able to compare the different monuments inspired by each, they were able to trace the way back through the centuries to the supreme style which, in their eyes, best merited revival. They did not go back to the Hellenic period; monuments of that time were not only much rarer, but no one could hope to find examples of them in regions that had been devastated by oriental invasions; they were therefore unknown, and destined to remain so down to the end of the eighteenth century. Roman monuments, on the contrary, existed in large numbers; their ruins bestrewed the very cities where the architects dwelt. These furnished then, the only possible subjects for their study. An enthusiastic interest in archæology developed, which led to a competition among artists as to which should best redeem and most carefully and zealously commit to drawings or writing the noblest specimens as determined by a systematic comparison of the old monuments. Barozzio da Vignola (1507-1573) was at one time the most widely known of these, through his drawings; he has had a powerful influence on the architecture of France.

Although a certain longing for independence, and a spirit of rebellion against despotic authority—strengthened by a growing acquaintance with more perfect types—may have been manifested by our modern architects, care should be taken not to be unjust toward those whose teachings it was so long

thought necessary to follow, and whose aim it was to aid and not to hamper by the rules which they laid down. Art lives by freedom, and a too rigid adherence to the doctrines of a master cannot justly be imputed to Vignola. Moreover, these are merely prefatory remarks, and we have thought best to cite an average though well-known example.

In accordance with their proportions and their relative richness the number of architectural orders has been fixed at three.

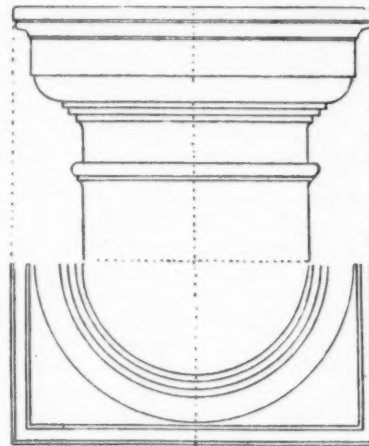


Fig. 2. From the Theatre of Marcellus, at Rome.

The first two have received or retained the names of two great regions, the land of the Dorians and the land of the Ionians. The order of the former has been termed Doric, that of the latter Ionic. As to the third, it has, singularly enough, taken its name from the town of Corinth which, whatever its importance may have been, doubtless could not have properly aspired to such an honor. Farther on we shall attempt to determine what led to the adoption of this appellation, but will accept it here without discussion.

So far as the shafts of the columns of the three orders are concerned, they present scarcely any differences except in the proportions; differences in form are very slight. The characteristic features, in every case, are to be sought in the capitals. It is even quite probable that the proportions and details of the Corinthian shaft were borrowed from the Ionic. The Corinthian column seems to have been the last to be invented.

Renaissance authors, and Vignola especially, have recognized and admitted in their classifications five orders of architecture. To the three already mentioned they add a kind of simplified Doric, under the name of Tuscan, and another beyond the Corinthian, richer or, at least, more loaded down than the latter, and bearing the title Composite. Are these two orders in the Hellenic tradition? The last name points to a mixture of forms, and the first has an analogy to the terms Doric and Ionic, in that it is derived from a wide region, Tuscany, the land of the Etruscans (Tusci, Etrusci). We shall see, in fact,

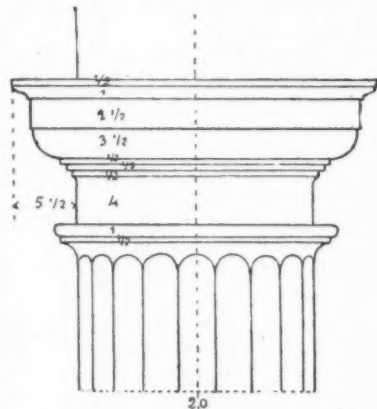


Fig. 3. Doric Capital by Vignola.

¹ From the French of Adrien Joigny, in Planat's *Encyclopédie de l'Architecture et de la Construction*.

that prior to the Hellenic invasion into Middle Italy, Greek forms had already found their way thither, by other means, and had acquired a sort of originality that warranted the adoption of a special designation for an order which the Romans,

who were disciples of the Etruscans, often made use of, even at the most brilliant period of their artistic development.

The Doric capital of the Theatre of Marcellus, at Rome, apparently inspired the composition of the capital proposed by Vignola in Figure 2. The abacus is square without other ornament than the ogee and fillet reinforcing the upper edges; this fillet is proportionally thicker in the Roman capital, a form justified by its position. Below the abacus the rounded

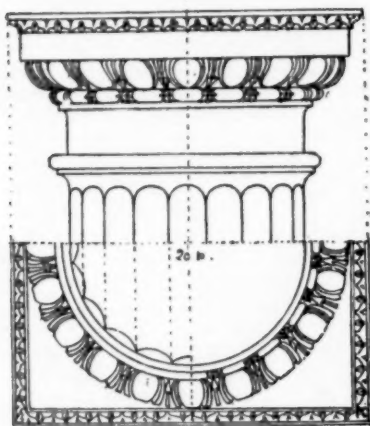


Fig. 4. Second Doric Capital by Vignola.

portion of the capital begins, an ovolo of circular profile, with an upper diameter hardly less than the breadth of the abacus, and connected with the collarino, or neck, by three small circular fillets of rectangular profile, a survival of the annulets of the Greek capital. The collarino is merely the prolongation of the shaft above the astragal encircling it. Vignola thought to give more elegance to the capital by making the collarino broader than that of the Roman capital (Fig. 3). He also made the annulets more delicate and the ovolo of greater height — the height of the abacus without the ogee. As has been said, this capital is simple, its beauty depending upon the contrast of circular and plane forms, as in the Greek capital; but it is not as delicate as the latter; notwithstanding its name it is more Roman than Greek.

Under the principal corona of the entablature of the Roman Doric is a second, carved in dentils. Vignola also added a cornice corona supported by mutules, the motive of which had been furnished by many an Etruscan temple, and for this second model he proposed another capital of richer aspect. The ogee of the corona is cut *en rais de cœur* (Fig. 4); the round fillets or annulets are replaced by an astragal, the small torus of which is carved in beads; the ovolo with egg-and-dart sculptures rests directly on this new astragal. This last type, in varying degrees of simplicity, is more frequently followed to-day than the first.

As for the Tuscan capital, it has been generally considered as a simplified and impoverished Doric capital, and with a show of reason. We do not know what signification Renaissance artists attached to the term Tuscan, possibly merely a sense of rusticity, which they thought could be satisfactorily expressed by the Doric capital denuded as far as possible (Fig. 5). The ogee decorating the Doric abacus becomes a mere fillet in

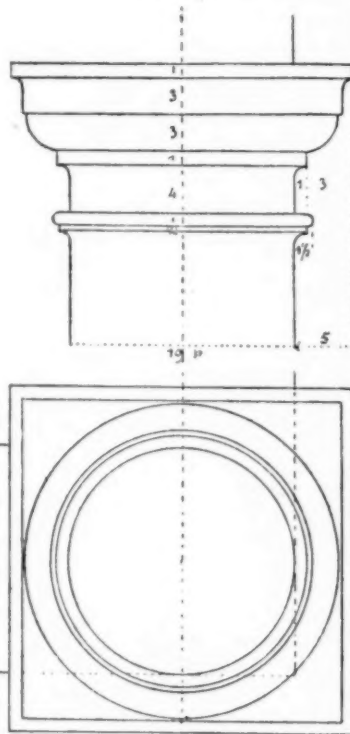


Fig. 5. Tuscan Capital by Vignola.

the Tuscan, and even this often disappears. Again a single simple fillet replaces the three fillets between the ovolo and the collarino, but the collarino is retained, though that, too, might have been suppressed, as in Vignola's Ionic capital.

The creation of the Tuscan capital would certainly be less easily accounted for on the supposition that it is the reproduction of some genuinely Etruscan capital, that is, of a type



Fig. 6. Etruscan Capital from Tarquinii.

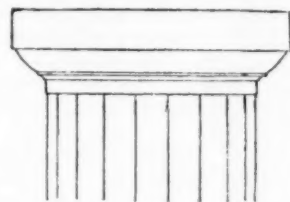


Fig. 7. Capital from the Soldiers' Camp at Pompeii.

belonging to a period anterior to the adoption of the term Roman. Vitruvius, in describing temples in the Tuscan style, after having spoken of the base and plinth, which should always be circular — a form which, as has been remarked elsewhere, makes this base resemble the bases of Iona or Asiatic Greece — says of the capital: "The height must be half the thickness of the column, and the width of the abacus must equal its entire thickness." It will be remarked that he says nothing of the ogee or the simple fillet with which the abacus might be adorned; from this omission we may infer that he supposes the latter to be wholly without decoration as in the Greek Doric. "The height of the capital being divided into three parts, one part must be given to the plinth, serving as an abacus, another to the ovolo, and the third to the gorge and apophyge (TERTIA HYPOTRACHELIO ET APOPHYGI)." It is from Vitruvius that Vignola borrowed his Tuscan capital, for beneath the ovolo are a fillet and a conge, the latter answering to the expression *apophyge*. The gorge below is a continuation of the apophyge. There are hardly any known Etruscan capitals that tally with this description. The one given here and occurring at Tarquinii exhibits, however, the different parts of the capital arranged in the order set forth by Vitruvius (Fig. 6). Beginning at the top, we find an abacus, square and without decoration, an ovolo which is in section a quarter-circle, and the fillet and conge which together would be the apophyge and the lower part of which above the astragal would form the gorge. This astragal must therefore belong to the shaft. In the capitals of Pompeii (Fig. 7) the apophyge takes the form of what we term the cavetto.

Embarrassed annotators have imagined that the text had been mutilated by some ancient copyist, and have proposed to read for *tertia et hypotrachelio*, *tertia hypotrachelio et apophygi*. This would give the Tuscan capital the exact proportions and curves of the second Doric capital of Vignola, in which the ovolo in fact rests upon a complete astragal (for it cannot be a question of the upper astragal of the shaft); but what then becomes of Vignola's Tuscan capital? It is, however, well to note that the Tuscan capital of Trajan's Column was thus constructed (Fig. 8) except that the astragal is that of the shaft. Thus also is constructed the capital of the column of the Museum of the Capitol, in which may be seen, it is thought, a reproduction of the rostral column erected in commemoration of the naval victory won by the Consul C. Duilius over the Carthaginians, 260 B. C. There is much that is contradictory and hypothetical in all this, and it is clear that Vignola could not have reached better results with the text of the manuscripts as his only guide. The unfortunate thing is that Vitruvius

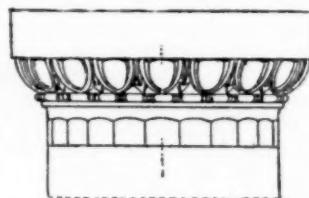
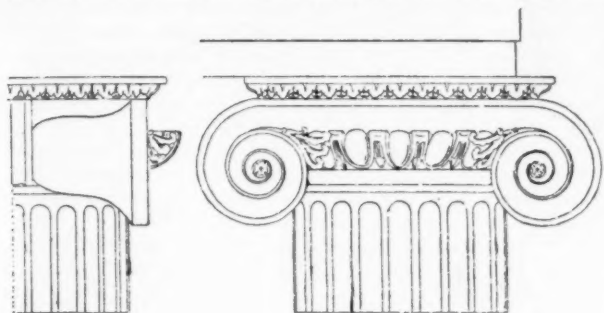


Fig. 8. Capital from Trajan's Column, Rome.

says nothing of the astragal of the shaft and so leaves us in doubt whether the *hypotrachelion* corresponds to the cylindrical portion having the same diameter as the upper part of the shaft and appearing to be a prolongation of it above its astragal. In the Doric capital of the Theatre of Marcellus this portion slopes slightly and makes the section of the gorge narrower than the shaft at the beginning of the conge.

We can see how much doubt exists as to the real nature of the true Tuscan capital, and also that there has been good reason for connecting it, in the shape in which it has been adopted, with the Roman Doric. This last has a well defined character which prevents it from being confounded with the Greek Doric.

We come next to the so-called Ionic capital. It is readily distinguished from the capitals already discussed by the spirally rolled volutes which are to be seen on the two main faces, and



Figs. 9 and 10. Ionic Capital by Vignola.

which are united on the other faces by coussinets, raised and attached to the centre of the secondary faces and having the appearance of being of flexible material (Figs. 9, 10).

In analyzing the decorative *ensemble* of the Ionic capital, we distinguish an ovolo exactly like that of the Doric capital with egg-and-dart decorations, and bearing as in the latter, on an astragal composed of a torus, a fillet and a conge — which is really the astragal of the top of the shaft — and in the place of the Doric abacus, a sort of abacus with the extremities rolled over in the direction of the architrave, being hardly broader than the latter and supporting a thin plinth. The ovolo naturally projects somewhat beyond this pseudo-abacus on the two principal faces, and palmettos are employed to fill in the space between the ovolo and the volutes. If the volutes and coussinets were removed, we should have a Doric capital without an abacus; it would also be destitute of a collarino, but this element is frequently restored to the Ionic capital, and then the astragal supporting the ovolo is not confounded with that of the shaft.

This capital, originating in Asia, was already familiar to the Etruscans, and a later acquaintance with Greek architecture or the introduction of Greek artists into Italy enabled the Romans

in showing the complete development of the egg-and-dart pattern on the ovolo, and that the desire to avoid the complicated work of carving this pattern counted for much in the modifications made in their position.

At times, a regard for symmetry tempted architects to revolve the principal faces on the secondary, and, consequently, suppress the coussinets; this disposition forced them to place the volutes on the diagonals of the square of the abacus in such manner as to back them against each other, two by two, as seen farther on in Figure 48. Greco-Etruscan architecture already offered numerous examples of this arrangement. The regular Ionic capital was comparatively but little employed at Rome, and the richer Corinthian capital was early substituted for it.

The so-called Corinthian capital, the enrichment of which is borrowed out and out from plant life, is a Greek creation, but it reached its full development only among the Romans. It was, perhaps, Greek artists who carried it to its highest perfection in Italy, and it was copied by Renaissance architects from Roman monuments. Vignola seems to have selected the one adopted for the exterior portico of the Pantheon of Agrippa; other artists have slightly amended this by reducing somewhat the projection of the large leaves.

The abacus, the faces of which are a trifle concave, and the angles or horns of which are rounded off a little, rests on a kind of vase, which is supported on the astragal of the column. The decoration consists of carved leaves, stems and vegetable volutes. Although the details and proportions will be discussed elsewhere, a few words must be said here on the fashion in which the various decorative elements are employed (Figure 11). The distance from the astragal of the shaft to the abacus is the diameter of the column taken above the conge of the base, and is divided into three sections. Eight leaves, so arranged that each quadrant contains two, occupy the first section above the astragal of the shaft; eight larger leaves extend upward through the two lower sections, starting

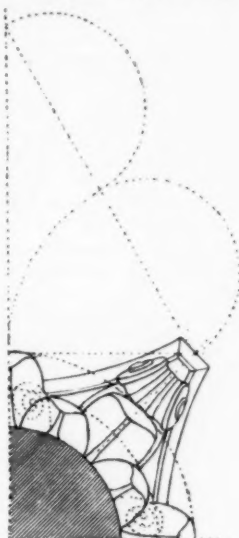


Fig. 12.

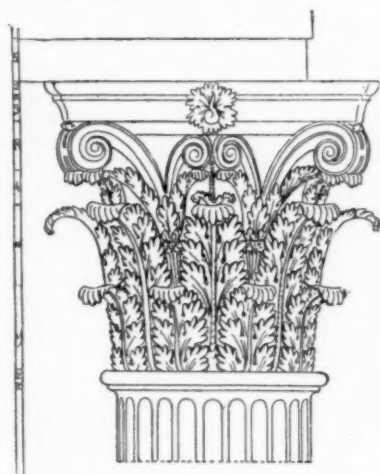


Fig. 11. Corinthian Capital by Vignola.

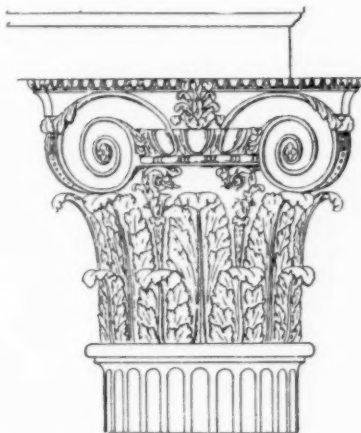


Fig. 13. Composite Capital by Vignola.



Fig. 14. Capital from the Arch of Titus, Rome.

to carry its forms to the highest perfection possible. We shall return to this subject in the historical sketch of this capital.

The Ionic capital, therefore, unlike the Doric, exhibits very dissimilar faces. On the principal faces the volutes stand out sharply and the ovolo is visible; the coussinets appear on the lateral faces and the ovolo almost wholly disappears. Vignola displays enough of it so that the eye retains a trace of it, but the coussinets are often lowered sufficiently to conceal everything but the torus of the astragal. We shall see that notwithstanding the dropping of the coussinets the Greeks succeeded

from the astragal, behind the first set of leaves, and alternating with them, so that four have their axes on the four axes of the capital and four on the diagonals of a square described about the circumference of a horizontal section of the shaft. These sixteen leaves are attached to the vase, and curl over at the extremities as though bent under their own weight. Back of the small leaves and between the large ones are eight twisted husks, called cauliculi; out of their cornet of foliage spring sixteen open volutes, eight under the horns of the abacus, eight slightly smaller and less prominent just beneath

the roses adorning the centres of the faces of the abacus. The foliage issuing from the cauliculi curves over under the helices. The trace presented herewith shows how the abacus is determined and how the concavities of its faces are traced (Figure 12).

This harmonious and well rounded-out composition, its symmetry and sumptuousness, the aspect of solidity imparted to it by the volutes, although they are so executed as to have the appearance of bending rather than giving support, the graceful curves of the abacus, the richness of the roses in full bloom, which seem to grow out from small foliated stems behind the four large leaves of the principal faces, and fill-in the recess under the small volutes — all this, set off by delicate carvings, which in no way destroy their general form, makes of the Corinthian capital one of the most finished works of art ever conceived. A few details have been modified, some have been added, but, in attempting to complete this *ensemble*, little has been accomplished except to overweight it.

We shall return to this subject in the history of the Corinthian capital, which appears to have found its final expression only in the productions of the first part of the present era, for Vitruvius, in describing it almost as it was employed after him, gives the height of the capital with its abacus as the diameter of the column at the base, while, later, the same measure was adopted for the space between the abacus and the upper astragal of the shaft.

This capital had, however, the appearance of being inadequate to the safe support of the heavy entablatures of large edifices; this led to the creation of another which, though not less rich than its predecessor, seemed less slender and less cut up; unfortunately, the departure was made at the expense of elegance. The new capital received the title of Composite, but it was frequently, and more properly, in view of its origin, termed the Italic capital. Fine Roman structures still existed at the time of the Renaissance in which this capital figured, and its peculiar character led artists to reproduce it under the title Composite (Fig. 13). It possessed a certain advantage: in structures of several stories, each admitting of the employment of an entire order, above a first order with the Corinthian capital the Composite could be made to figure in the upper order, as is seen, for example, on the façades of the court of the Louvre.

In our opinion, it is an exaggeration to characterize this capital as being nothing more than a mixture of Doric, Ionic and Corinthian forms. There is some show of reason for such a description, and certain artists have been roused to an attempt to carry it out in detail; but a close examination will lead to the conclusion that the Composite capital is conceived after regular types that had already become antiquated and had been forgotten. Why see Ionic volutes in those which offer such substantial support to the Composite abacus? Do they not rather recall the powerful volutes of certain Etruscan capitals, clearly derived from plant-growths, and which rise out of a sort of basket or vase, while the Ionic volutes are always connected by a horizontal band of which they constitute the rolled extremities? The Composite volutes are flat, thick leaves, like the Corinthian, and not the curling horns of the Ionic capital, seemingly penetrated by the abacus; they are frequently even accompanied with foliage. Between the volutes rises the bouquet of foliage replacing the rose of the Corinthian capital. The horizontal mouldings carved in eggs and pearls constitute the essential part of the body of the capital, crowning the collarino; the latter is very broad and is adorned by a double row of curved leaves like the basket of the Corinthian capital. It is indeed an Italic capital, and it has been styled Composite from its appearance. The Arch of Titus doubtless furnished the model for it (Fig. 14), and though less elegant, less simple, and less symmetrical than the Corinthian, it has, on the other hand, greater strength.

Such are the different forms of capitals fixed upon by the artists of the Renaissance as the result of their study of Roman monuments; they have been adopted by succeeding centuries from that time down to the present. The more or less successful attempts at emancipation made by modern architects — a few examples of which will be given later in this sketch — have made no material alterations in these forms; but an acquaintance with the monuments of Ionia, of Continental Greece, of Magna Græcia, and of Pompeii and Herculaneum, has certainly aided architects in escaping from that decay of style which is sure to result from long devotion to types regu-

lated by too rigid rules. Absolute formulas cannot be applied to the forms of art; they can properly be employed only to guide and support the artist in his work. Individuality must appear in every man's style.

Where an architrave rested at one extremity on a column and at the other on a wall, the Greeks were satisfied to employ *antæ*, that is, a mere swelling out of the wall so as to give it the breadth that the architrave required; but the Romans transformed the *antæ* into pilasters, that is, they made them of uniform depth on the different visible faces and converted them into square columns of the same thickness as the corresponding circular columns. The Renaissance naturally followed the example set by the Romans. The capital of the pilaster resembles as nearly as possible that of the column, even in the Ionic order, although here it necessarily lacks the most striking charm of the capital of the Ionic column, namely, the contrast between the plane surfaces of the volutes and the circular surface of the column; the echinus necessarily becomes rectilinear like the astragal. The other orders did not encounter the same difficulties in this transformation. A few examples of these pilaster-capitals will be given in the course of the present sketch.

Between the period when the ancient forms, having relapsed into commonplaceness and decadence, were necessarily abandoned, and the period when artists of great merit undertook their revival, with all the earnestness bred by devout and passionate study of the noblest models, a period of several centuries intervened which witnessed the flowering-out of an almost wholly new art, which was as fruitful as it was original, and found its highest expression in the West, especially in those regions where the traces of Roman art had earliest disappeared. Though full of life and movement, this style, upon which false theories have saddled the term Gothic, nevertheless died out in the fifteenth century; not because it had been touched by the hand of decay, but because it had reached the point of abusing its own principles. We will make a special study of these principles in another part of this article.

(To be continued.)



THE PROPOSED HIGH-BUILDING ORDINANCE. — NEW BUILDING CODE TO BE PREPARED. — EXTENDING THE LAKE SHORE DRIVE. — LOCOMOTION BY ELECTRICITY. — THE ELEVATED RAILROADS. — WORLD'S FAIR NOTES. — THE PUBLIC LIBRARY PLANS.

EITHER Chicago is growing to be too large a creation for rapid motion, or she is losing that old quickness in action which gave her a just claim to the reputation for rapid and decisive executive ability. However it may be, there have been several questions relative to building affairs within the limits of our city which have been discussed and re-discussed within the last three or four months, and have been handled first by this "Board" and then by that, seeming after each fresh discussion to be nearing their final settlement till seen in the hands of another committee, later on.

One of these serials which has appeared in these letters has for its subject the high-building ordinance. It has been "boarded" to an extent which might entirely fill the bill of a foreigner's idea of an American ideal State, till finally there has been presented to the Council by the Building Committee the following ordinance:

"Section 1. The height of buildings to be hereafter erected in the city of Chicago shall be limited as follows: That no building shall be hereafter erected in the city of Chicago of a height exceeding one hundred and fifty feet. That upon any street or lot of ground abutting upon any street, the width of which street is not more than eighty feet, no building shall be erected of a height exceeding one hundred and twenty-five feet. That no building exceeding in height one hundred feet shall be erected upon or abutting any lot abutting any street, the width of which is not more than forty feet.

"Provided, however, that where any building is erected with frontages upon two or more streets of different widths, the height of such building shall not exceed the average of the maximum heights which are hereinbefore permitted or not forbidden for buildings erected upon streets of the widths of those upon or abutting which said building is to be erected. For instance, where a building is to be erected having frontage upon two streets, the width of which is, respectively, forty feet and eighty feet, the height of such building shall not exceed 112½ feet.

"Provided that, if any building to be hereinafter erected in the

"city of Chicago shall be set back in whole or in part from the street-line in such manner as to increase the width of the street in front of the same, or in front of any part, not less than one-third of such building, then an increase in the height of such building, shall be permitted directly in proportion to the aggregate increase in the width of the street so made; but no building exceeding one hundred and fifty feet in height shall be so increased in height, nor shall the height of any building be so increased as to exceed one hundred and fifty feet.

"Provided, further, that parts of buildings may be carried to greater heights than those above limited, back of and within a line drawn from a point in the opposite side of the street at the established grade through the highest point of the wall of said building next to said street, as hereinbefore fixed.

"And provided, further, that nothing hereinbefore contained shall forbid or prevent the erection to a greater height than hereinbefore limited of spires, towers, domes and cupolas, the area of which shall not be more than fifteen per cent of the ground area of the proposed building.

"Sec. 2. The provision of Sec. 1 of this ordinance shall not apply to buildings constructed or to be constructed under building-permits heretofore issued, provided that the actual work in the construction of such buildings is or shall be commenced within six months from and after the date of such permits. All permits heretofore granted or issued for the construction of buildings exceeding in height the height limited by Sec. 1 of this ordinance shall become void and of no effect upon the expiration of six months from and after the date thereof respectively.

"Sec. 3. This ordinance shall be in force from and after its passage and publication."

Although, as above mentioned, this ordinance has been presented to the Council, no decisive action has been taken upon it by that body. The only step towards a desirable conclusion seems to be the ordering of the publication of the ordinance. [The order was adopted February 15.—Eds.]

More seriously affecting high buildings than any stand which the city authorities may take in regard to them is the attitude of insurance men relative to the rates of insurance for such structures. Rates have been fixed this month on eight of the high buildings, mercantile and otherwise. Of the former class, the rates published are as follows: on the Field Building, \$1.35; on the new portion of the Fair Building, \$1.50; on the structure just completed, known as the Leiter Building, to be occupied by a retail firm, \$1.75. The policy, it is understood, in raising the rates is not so much to actually raise them as to forward the use of safety-appliances. It is reported that the committee have placed all office and mercantile buildings on a forty-per-cent basis, the final rate being established according to the exposure to which the building is subjected. If the risk of fire is decreased and the ways for fighting it increased, the rates are naturally lower. There is some talk of a mutual insurance company for such high buildings, but the idea is not considered practical by insurance men. There are, comparatively, such a small number of such buildings that the premiums, it is thought, would not be sufficient to pay the running expenses of an office. Of course, if such high rates of insurance are necessary the high building will cease to yield a good percentage as an investment and its day of usefulness is nearly over. We may all talk of how unwilling we should be to bring into the city any kind of building detrimental to the most first-class sanitary condition, or one not conducive to the most pleasant state of its streets, but let that especial kind of building become a drain on our purse, and it will not spring up over our city with anything like a mushroom growth.

Another ordinance recently presented to the Council is one relating to a committee to review the building regulations. This ordinance, a very wise one, was referred to the judiciary committee. The old building ordinance has become quite inadequate for the needs of our rapidly growing city, and it has become apparent not only to the Council, but those interested in building matters, that certain changes should be made. To bring about such changes, it has, therefore, been "ordained that a new building ordinance be prepared and laid before this Council by a board of five experts, to be appointed as follows, to wit: One member of said Board to be hereby expressly appointed to be chairman of said Board, and one member to be appointed each by Commissioner of Buildings of the city, the President of the Chicago Fire Underwriters' Association, the President of the Real Estate Board and the President of the Illinois Chapter of the American Institute of Architects, said Board to proceed to work at once after approval of this ordinance, and have the new building ordinance completed within three months from the date thereof, the corporation counsel being herewith instructed to render the said Board any and all appropriate assistance in the premises. Each member of the Board shall receive from the city, as compensation for services, a sum of \$ — for each and every hour actually expended on the work, to be paid by the Treasurer."

The conclusion to another long-continued tale has at last been reached in a decision concerning the Lake Shore Drive. For about a mile north from the river, in driving from the south to the north side, there has been no road which skirts the Lake. Arrangements have now been made which will make it possible to lay out such a drive, making a continuous road stretching southward to the river. The means of accomplishing the enterprise is in this wise. The

entire expense of the improvement is to be borne by the owners of the present Lake Shore property. They agree to pay one hundred dollars a running foot for the Lake Shore Drive improvement, and expect to grant to the city, for the widening of Pine Street, fifty feet east of that thoroughfare. Besides this, the property owners are to bear all expenses of filling-in the submerged lands. The entire amount that this improvement will cost will be about two millions of dollars. The property owners have their reward, however, in acquiring a title to something like twelve million dollars' worth of, at present, partially or wholly submerged lands. The new shore line will be something like twenty-one thousand feet from the present one, skirted by a fine boulevard, thus putting a stop to the appropriation of the shore for dock purposes, or in any way giving it over to railroad interests. The boulevard is to have much the same character as that extending along the shore farther north, with a granite-paved beach fifty feet wide to the water's edge, similar to the one on the northern part of the present drive. In this way, a locality resembling the Back Bay district of Boston will be obtained, which will without doubt be the site for many of the finest residences in the northern portion of the city, so that a few years hence Chicago letters will be full of glowing descriptions of the gorgeousness of these mansions, while the local daily papers are teeming with harrowing details of the ravages of the malaria, and, mayhap, the classic flea, that attack their inhabitants.

With all these improvements on the northern shore, one is naturally interested in the report which comes from the Illinois Central, one of the corporations which monopolize the southern shore. It is reported that there is strong probability, that the motive power of this road for trains in and adjacent to the city will be electricity. If such means of bringing the trains into the down-town district should be used, a vast and attractive portion of the city now most discouragingly given over to a smoke-laden atmosphere would be reclaimed to brighter sky. It is as yet but a vague plan, but it is one step in the right direction that such a question is being agitated, and in its street railway system within the city limits, Chicago seems to be awakening to the fact that there is an electrical possibility for her in the future. One of the branches of the North Side Cable-road is about to test an underground conduit system. The steam motor spoken of in the last month's letter has been given its trial, and as far as a trial goes has been pronounced satisfactory and some of the cars are now in process of construction. The managers of this much reviled North Side cable system are at present attempting a little missionary work in a way of preaching a reform of manners to their patrons. This would seem to indicate a general polishing up of present conditions that would lead one to infer that the fundamental principles of the road were all that could be desired. The manner of this missionary work is in the shape of little placards, hung in the cars, containing a short but logical argument relative to the habits of swine and the habits of the man who chews tobacco. There was a time when the "larger growth and culture of the East" when compared with the "crudeness" of the West was, to us, most painfully evident from the signs hung in public places as a guide to manners. Gentlemen in the Eastern cities were "requested to remove their hats while in this apartment," while in the Western places "Gentlemen" were abruptly told "not to spit on the floor." Now there has come a new era in these mottos, which by degrees have taken their place in street-cars and such public conveyances, and which by their infinite variety are a constant source of entertainment to the travelling public. One pregnant with cutting sarcasm reads as follows: "Pigs do not chew tobacco. Consequently is a man who does, and then spits on the floor, neater than a pig?" What can the East produce equal to that on the pernicious habit of keeping on one's hat in places where it ought to be doffed. This one system may have done its utmost in providing the actual necessary comforts for transportation, but Chicago is hoping great things from its elevated roads. The Alley Elevated of the South Side is fast nearing completion as far as 39th Street, and promises to be in running order by the first of May. Not only does the company make this promise, but also that the service will be such that there will be a possibility of a train every minute and a half, with a rate of speed of twenty-five miles an hour. It is the intention of the management of the road, it is reported, to have everything connected with the building and running of the system, as perfect and well managed as possible. The entire construction has been planned with a view to make a solid, and comparatively noiseless road. The foundations for the pillars are about ten feet below the surface and rest on hard clay with a pressure of not over eighteen hundred to two thousand pounds a square foot. On this clay is laid a concrete bed seven feet square and a foot thick. On this concrete is placed masonry six feet square and two and a half feet thick. Two stone blocks on this foundation hold the heads of anchor bolts which extend up through brick masonry four feet thick. This brickwork is five feet square at the base and four feet square at the top. It is capped with blue-stone block three and a half feet square and one foot thick, which carries the cast-iron base for the column. This base weighs a ton and is held down by the four anchor bolts. The columns themselves are composed of two fifteen-inch channel-irons, fastened together with a lattice bracing and sunk into the cast-iron column base. The same substantial construction is carried out through the superstructure. There are four lines of longitudinal girders connected by angle-iron bracing. The girders of each track are placed five feet apart with a seven-foot space left between the

two inner girders. These girders are connected by angle-irons with vertical cross-braces. The structure was designed for locomotives weighing forty-five tons, though the ones now being constructed weigh only twenty-eight. Particularly interesting to architects will be the arrangement of stations, which will be on a different system from any previously adopted on elevated railroads. The buildings are placed on the street-level underneath the railway proper. They are supplied with electric gongs which warn the passengers of the approaching train when it is five hundred feet from the station. The little buildings are in themselves quite attractive.

The West Side, it is reported, is to have equal facilities in the way of elevated roads. Its Lake Street system though completed to a certain extent, has come to a standstill because of financial reasons. The stock of this road is being bought up by the Alley enterprise, and everything now looks as if it would be pushed to rapid completion. The plan is not to have the road stop at the river, but crossing that, to have the same down-town loop serve for that as well as the Alley road. The down-town terminus to this latter, it is candidly admitted, is only temporary until the right-of-way through certain districts can be obtained, and the final arrangements will be such as to bring both roads together. The mayor has appointed a committee of citizens to investigate the matter of facilities for something approaching rapid transit in our very much over-crowded down-town streets. It is felt to be a necessity, that something should be accomplished before the still greater over-crowding which will occur during the Exposition time of 1893. The committee has given the matter thought, and now sends into the Council some suggestions which may possibly be acted upon.

A small convenience in our city is to be the numbering of street-lamps, so that the benighted stranger may have some idea of his locality without creeping up the steps of private residences to find his clue, with sensations partly those of a depressed book-peddler, partly those of a family burglar of the deepest dye. The street-lamp in the centre of blocks is to have painted upon it the number of the house opposite which it stands. In this way with the ordinary sized lot the numbers can be easily calculated each way.

While on the subject of what the municipality is doing for the city, it might be noticed that the public has just had revealed to it the startling fact that the Court-house is about to have two additional stories. The possibilities that lie in this simple announcement can only be imagined by the genuine Chicagoan who is intimate with the present structure. The style is supposed to be Classic as the building now stands, and it is fondly to be hoped that as it rises higher a new ideal will not take possession of it. At present it has the reputation of being the worst-looking building in Chicago, and what it will be with two additional stories, which can scarcely have any unity with the design below, must be left to the imagination.

Work at the Exposition grounds is being carried on, notwithstanding the fact that though we have not had a severe winter, still the weather has had a suggestion of briskness, not noticeable for the last few seasons. During the month of January there was so much stormy weather that there were only two weeks in which the men were able to work. Since then the chances for labor such as is required on the buildings have been better. There were, however, during this inclement month 5,867,360 feet of lumber put into position and 1,636,962 pounds of iron. Besides this, there has been accomplished much work in lathing, plastering, painting, glazing and staff-setting. Putty froze in the hands of the glaziers before it could be used, and the plasterers were unable to work except where, as in the Woman's Building, salamanders were used. Excavation for the annex for Machinery Hall has been impossible as the ground was found to be frozen nearly two feet. Dynamite was tried but the result was not satisfactory. Roofers, sky-light men, lathers, plasterers, painters, glaziers and staff-setters are all constantly busy whenever the conditions are such that they can work; the men working on the large iron domes of the buildings being the most resolute not to be worsted by the weather. During the month the dome of the Administration Building has mounted considerably higher, while that of the Horticultural Building has been finished. Exterior coverings of canvas have been placed over a number of the buildings, and the space thus inclosed being heated, the staff work has been placed on the outside of the Woman's, Horticultural, Transportation, Mines, Administration and Fishery Buildings. In this way 10,236 pieces of staff have been placed during the month, while in all 18,270 pieces are now in place. During the month there have been cast 22,072 pieces, and the total number of pieces ready for placing is 50,622. As 109,402 pieces are the total number required, about half the work for the exterior covering has been accomplished. In the Woman's Building lathing, plastering and painting are in progress, while the glazing and skylight are nearly finished. The wall of the Art Building has reached the second story, while the walls of the Transportation Building are finished. The gallery floor is completed and the stairs are being laid. The Electrical Building is not progressing as rapidly. Three hundred carpenters are busy on the Manufacturers' Building. In the large aquaria of the Fishery Building the ironwork is completed, while in the same building the window-frames and sashes are in. Frames and sashes are also being placed in four pavilions of the Administration Building and twelve flag-poles have already been put in place. The Forestry Building is ready for the interior plasterers. The carpenters are now working on the second story of the Agricultural Building, and the skylight contractors are preparing to commence work.

Among the rules for exhibitors, the following is one concerning certain building material: "Building stones must be shown in cubes one foot square, and one side must be finished. Slabs of marble and onyx and similar exhibits must not exceed four feet square."

A Turkish mosque is to be erected on the grounds by the Turkish Government for the use of Turkish exhibitors, but, as it is only to be at a cost of three thousand dollars, architecturally, it is to be feared, it will not be a very interesting structure.

Although the last month's letter to the *American Architect* provoked in the city papers some very lively discussions on the Public Library question, and fully substantiated the fact, as there stated, that the plans, as made by the Board, were, without exception, thoroughly disapproved by all disinterested parties, both architects and librarians, yet this Board, at their regular meeting on the 13th inst., formally adopted these plans, as it was presumed they would; also, they approved of the design submitted by Messrs. Shepley, Rutan & Coolidge, of Boston, and appointed them architects for the proposed structure.

The old Chicago Exposition Building, which for twenty years has stood on the Lake Front, is at last being torn down. Viewed from the Lake and from the southern shore, looking northward, it has been really a picturesque feature. The building has, of course, been entirely emptied, with the exception of the Lincoln log cabin, which, although located here for some time, seems not to have been very widely known. The plan now is to remove this relic intact to Jackson Park, where it is to be hoped that, under the enthusiasm of sight-seeing, some one will be inclined to stop and look at it. It is intended to place it on rollers, conveying it in this way to a flat-boat, on which it will accomplish its journey.

In the place of the old Exposition Building, the Art Institute will be erected. The present Art Institute building has been so extremely inconvenient, that the thought of leaving it must be a pleasant one to the management. The comparatively new galleries at the top of the building have been extremely commodious, but the arrangement of most of the other rooms has been in the highest degree inconvenient. The public lecture-room, built after the plan of a sleeping-car, with the exception of ventilators, has been one of the most annoying features; while the dependence of one room on another, each of necessity serving as a passageway for the more distant apartments, has been anything but satisfactory. In the plan for the new building, a lecture-room is shown capable of seating one thousand people; while the library, where the reference books are kept, will be a room worthy such a purpose, and not a makeshift whose first and real office is a passageway. Of course, this new building is to be planned as an entirety, though only a part of it is to be erected at first, whereas the other, be it said in its defence, was not planned in any such way, though, even were the two later additions afterthoughts, it would seem—if there were any thought of any kind connected with them—that they might have been brought more into harmony with the original building. The new structure is to be rather Renaissance in style, the façade on Michigan Avenue, when entirely finished, extending three hundred and twenty feet. The plans are from the office of a Boston firm of architects.

CONSTRUCTION.—III.

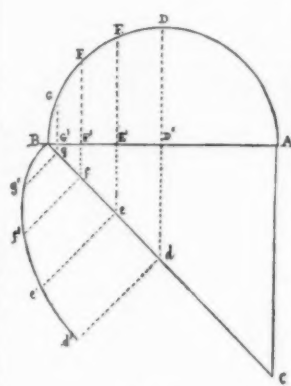


Fig. 4.

WHEN we know the means employed to construct a groined vault, we easily comprehend the reason for that modification of the Roman groined vault. To make a vault, it requires wooden centres upon which to place the courses. Now to make a Roman groined vault, it is necessary to make four semi-circular centres and two diagonal centres, whose curve is given by the meeting of the half-cylinders; the curve of the diagonal centres is not a semicircle, but an ellipse that is obtained by means of ordinates, as shown in Figure 4.

Let AB represent the diameter of the cylinders, and BC the horizontal trace of the plane in which the two cylinders AB and AC meet. Working upon a quarter-section, and dividing the revolved semicircle into a certain number of equal parts— DE , EF , FG , GB —we let fall perpendiculars from these dividing points, D , E , F , G , upon the diameter AB , prolonging them to meet the diagonal BC . We thus obtain upon that diagonal the dividing points, d , e , f , g ; from these points, erecting perpendiculars upon the diagonal BC , and taking upon these perpendiculars the distances dd' , equal to DD' , ee' , equal to EE' , etc., we determine the points d' , e' , f' , g' , through which the curve of the intersection of the two half-cylinders must pass. This curve, having a versed sine (*flèche*), dd' ,

¹ From the "Dictionnaire raisonné de l'Architecture Française," by M. Viollet-le-Duc, Government Architect, Inspector-General of Diocesan Edifices, translated by George Martin Russ, Architect. Continued from No. 843, page 119.

equal to the radius DD' , and a diameter BC , greater than the diameter AB , cannot be a semicircle. Although very simple, this geometrical drawing appeared too complicated to the Romanesque builders. Accordingly, having described a semicircle upon the diameter AB , in order to cut out the timber centres of the four arches generating the vault, they described a second semicircle upon the diameter BC , in order to cut out the two diagonal centres. Thus the keystones d of meeting of these two diagonal centres were found to be situated on a higher level than the keystones D of the generating arches; and the vault, instead of resulting from the meeting of two half-cylinders, was a nameless compound of curved surfaces, but resembling a dome. This elementary demonstration is necessary, for it is the key to the whole system of vaults in the Middle Ages.

Fig. 5.

This first result, due rather to ignorance than to design, was, nevertheless, one of the most fertile principles in the history of construction. Moreover, it indicates something different from dense ignorance; it denotes a certain liberty of thought in the use of the means of building, the importance of which is considerable, and, in fact, once freed from Roman traditions, the builders of the Middle Ages were more and more consistent with their principles. They soon comprehended the full extent of these, and gave themselves up freely to them; nevertheless, let us follow them step by step.

The problem was, then, the principle once admitted of the Roman groined vault modified in this way, to apply these vaults to oblong plans, for the builders recognized the danger of wide barrel or cradle vaults; that is, barrel-vaults having a wide span.

Let A, B, C, D , then (Fig. 5), be the plan of a compartment of a nave which is to be covered by a groined vault.

Let A, E, B be the semicircular extrados of the transverse arches in plan, and A, F, C , the semicircular extrados of the wall-arches likewise in plan.

It is clear that the radius HF , will be shorter than the radius GE ; therefore, the keystone E will be higher than the keystone F .

If we describe a semicircle upon the diagonal AD , as being the curve on which the vaults generated by the semicircles A, E, B , and A, F, C , must meet, it will result that the groins A, I, B, I , D, I and C, I , instead of projecting throughout all their development, will be, on the contrary, hollow for almost two-thirds of their length, and chiefly so in approaching the keystone I .

Thus, let Figure 6 be the transverse section of the vault through HO .

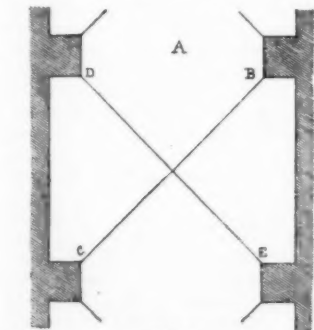
Let HF' be the section of the wall-arch, $H'I'O$ the vertical projection of the diagonal AD or BC .

The straight line drawn from the keystone F' to the keystone I' leaves a segment of a circle, K, L, I' , above that line, whence it would result that this portion of the vault must be convex on the intrados, instead of being concave, and that, consequently, it would not be constructible.

Placing, then, wall-arches and transverse arches upon the diagonal arches and courses of planks to close the triangles of the vaults in masonry, the builders covered these courses with a thick mass of earth, following a curve given by three points, F', I', F'' ; that is to say, given by the summits of the diagonal and wall arches; hence the diagonal groins once more projected, and upon this mass they placed rows of stones parallel with the section $F'I'$, to close the vault.

The result of these blind efforts was that the groined vaults were no longer the intersections of cylinders or cones, but ellipsoidal. The first difficulty being cleared, improvements were not slow to develop. But first, how, by what mechanical processes were these vaults constructed? The Roman groined vault, built in compartments, had no transverse arches; it rested upon piers or projecting columns, as represented in Figure 7,—that is to say (see the horizontal plan A of one of these vaults), the diagonals BC and DE , formed by the intersection of two half-cylinders of equal

Fig. 7.



diameter and forming projecting groins, rested upon the projecting corners of the piers.

But the Romanesque architects having at first reinforced the large cradle-vaults by transverse arches, as shown in Figure 8, and having come to replace these semicylindrical vaults by oblong groined

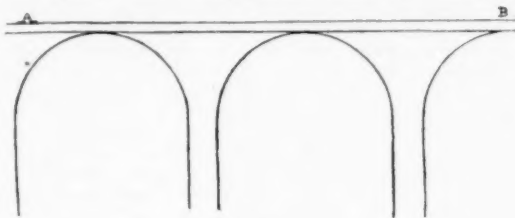


Fig. 8.

vaults, kept the transverse arches; they could not do otherwise, since the diagonals of these vaults were semicircular, and their summit rose above the summit of the arches, whose diameter was given by the distance between the piers.

In order to make ourselves clear, let Figure 8 be the longitudinal section of a Roman groined vault composed of compartments; the line AB is horizontal and is the section of the longitudinal semicylinder.

Let Figure 8b be the longitudinal section of a Romanesque groined vault in oblong form; then the line AB is a succession of curves, or at least of broken lines uniting the points C and D , the summits of the transverse arches, to the point of meeting, E , of the diagonal semicircles. They are obliged, necessarily, to preserve under the points C and D of the projecting arches, transverse arches which, as

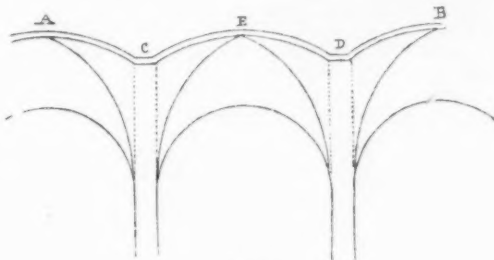


Fig. 8b.

we said before, were only permanent centres. From that time the diagonal groins had to take their point of departure in the rear of the projection of the piers or columns; these being destined only to carry the transverse arches; that is to say (Fig. 9), the groins had to start from points F instead of from G , while the abutments of the transverse arches rested upon the imposts F, H, G, I . When it was necessary then to close the vaults, the builders placed the planks bearing the masonry or earthen forms upon the extrados of these transverse arches and upon the two diagonal centres of timber.

In the architecture of all building nations, logical deductions follow one another with fatal severity. One step forward can never be the last, one must always go on; from the moment that a principle is the result of reasoning, it at once becomes its slave. Such is the spirit of the Western nations; it comes out as soon as the society of

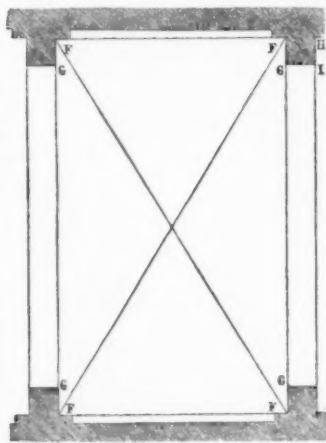


Fig. 9.

the Middle Ages begins to be conscious and to organize itself; it could not be checked, for the first man who founds a principle upon a course of reasoning cannot say to the reason, "Thou shalt go no farther." The builders, in the shadow of the cloisters, recognized this principle from the time of the eleventh century.

One hundred years later they were no longer the masters of it. Bishops, monks, nobles, commoners, had they wished, could not have prevented the Romanesque architects from producing the architecture termed Gothic; the latter was only the predestined consequence of the former.

Those who pretend to see the emancipation of a nation of artists and artisans, who, having been taught to reason, reason better than their masters, and with the forces put into their hands, carry them in spite of themselves very far from the goal that at first they wished to reach; those who

believed that Gothic architecture is an exception, a caprice of the human mind, have certainly not studied its principle, which is but the rigorous application of the system inaugurated by the Romanesque constructors. It will be easy for us to demonstrate it. Let us go on.

We see already, at the end of the eleventh century, the principle of the Roman groined vault laid aside.¹

The transverse arches are definitely admitted as a vital force, elastic and free, a framework on which rests the vault proper. If the builders admitted that these permanent centres were useful transversely, they must likewise admit their usefulness longitudinally. No longer considering the vaults as a homogeneous, concrete crust, but as a series of *panels* with curved surfaces, free, and resting upon flexible arches, the rigidity of the lateral walls contrasted with the new system. It was necessary that these *panels* should be

free in every direction; otherwise, the breaks and fractures would have been so much the more dangerous when these vaults were fixed upon flexible arches in one direction and upon rigid walls in the other. They stretched wall-arches from one pier to another, over the walls, longitudinally. These wall-arches are only transverse semi-arches,

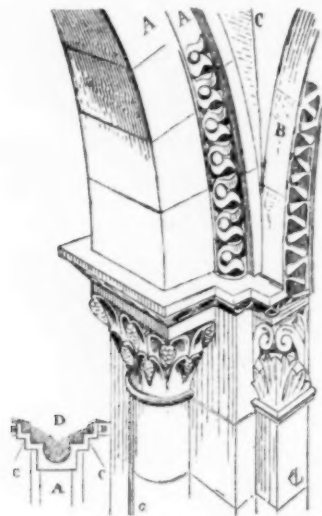


Fig. 10.

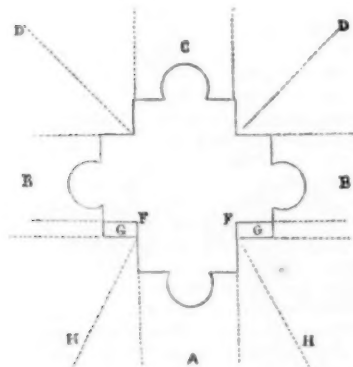


Fig. 10b.

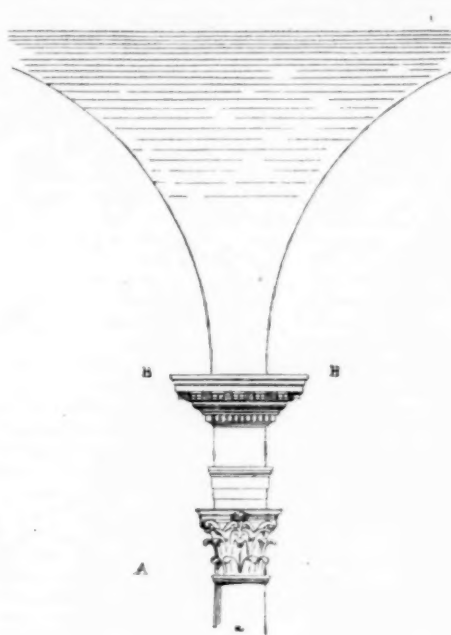


Fig. 13.

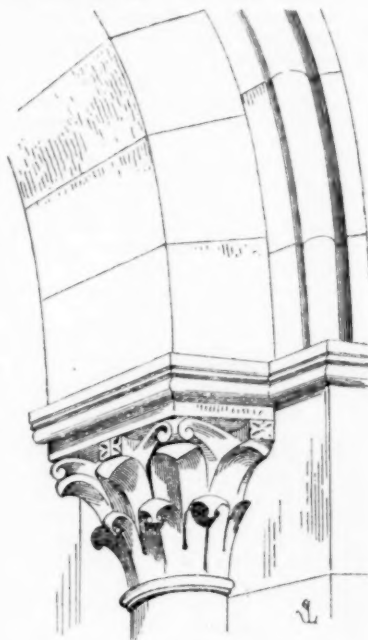


Fig. 14.

sunk partly in the walls, but not depending upon its construction. By this means the vaults rested solely upon the piers, and the walls became only enclosures, which, at need, could be built afterward or omitted. It required an impost for these wall-arches, a particular point of support, so the Romanesque builders added for

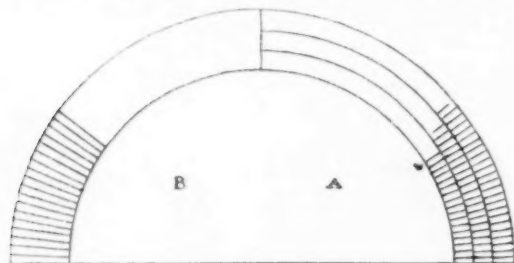


Fig. 11.

this purpose a new member to their piers, and the groined vault took its start in the re-entering angle formed by the abutment of the transverse arch and that of the wall-arch, as indicated in Figure 10.

¹ It is in the nave of the church at Vezelay that one must admit the abandonment of the Roman system. There the high, groined vaults, upon an oblong plan, are the intersection of ellipsoids, with projecting transverse arches and rib-arches.

A is the transverse arch, B the wall-arch, C the groin of the vault; the plan of the pier is in D, but if the pier was detached, if a nave was accompanied by aisles, it would take the form of Figure 10b. A is the transverse arch of the great vault, B the archivolt bearing upon the wall.

Above these archivolt, this wall retreats in F, so as to allow the pilasters G to carry the higher wall-arches. C is the transverse arch

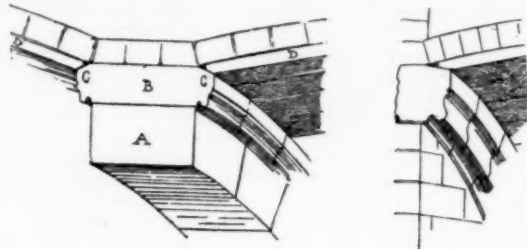


Fig. 12.

of the aisles, D the groins of the vaults of this aisle, and H those of the high vaults. The vaults of the aisles are stretched over the transverse arches C, the extrados of the archivolt B, and upon a wall-arch partly sunk in the wall of the aisle, and resembling the higher wall-arches in Figure 10. Accordingly, then, the mouldings of the vaults at once give the horizontal section of the piers, and their form is derived from these mouldings.

Nevertheless, these vaults were insufficiently buttressed, and movements could be felt in the piers; consequently, the principal sinews of the vaults, the transverse arches, were put out of shape. Not knowing how to support the pressure, the builders occupied themselves at first in rendering the effect of this less disastrous. They had observed that the greater the section presented by the stones of an arch from the intrados to the extrados, the greater would be the disorder occasioned by the movement produced in that arch.

They were not the first who had recognized that law. The Romans, before them, when they had large arches to raise, had been careful to make them of several rows of voussoirs, concentric, but independent of one another, as indicated by Figure 11 in A. The arches built in this way form, as it were, so many rings, acting separately and preserving much greater elasticity, and, therefore, greater resistance than in an arch of the same section, built after the method indicated in B.

The Romanesque builders, according to this principle, composed their transverse arches of two concentric rows of voussoirs; the one, that of the intrados, taking a longer section or portion of radius than that of the extrados, and, as the transverse arches were only permanent centres, designed to receive the ends of the planks on which they built the masonry of the vault, they allowed the second row of voussoirs to project beyond the first row sufficiently to support the ends of these planks.

Figure 12 explains this method. In A is the row of voussoirs on the intrados; in B, that of the stones of the extrados with the two projections C, designed to receive the ends of the planks D, over which they built the masonry of the vaults.

The wall-arches, having a smaller diameter, and not being subject to the effects of the pressure, are composed of a single row of voussoirs having, as Figure 12 (second) shows, the projection necessary to hold the planks.

We now see that the Romanesque builders plainly exposed their means of construction; that, far from seeking to disguise them, they determined their architecture by those very means.

Does any one wish another proof of this fact?

The Romans terminated the tops of their columns by capitals, but the projection of the abacus of these capitals supported nothing; it was only an ornament.

Accordingly, when the Romans rested a groined vault upon columns, as frequently happened, for example, in the halls of the thermæ (hot baths), the abutment of the vault was in a vertical line with the body of the column (Fig. 13). And then a singular fact, for which no one can account, the shaft of the Roman column bore not only its capital, but the complete entablature of the order; so that, in point of fact, all the parts comprehended between *A* and *B* served no purpose, and the broad projections *B* could be used only to support the wooden centres destined to close the vaults. It must be granted that this was a great luxury for an accessory object.

When the Romanesque builders place an arch upon a column, whether free or engaged, the capital is only a corbel destined to receive the abutment of the arch, a projection serving as a link between the cylindrical shaft of the column and the square impost of the abutment (Fig. 14). Then the capital is not only an ornament, but a useful member of the structure (see "*Chapiteau*").

If the Romanesque builders had to place a crowning cornice at the top of a wall on the outside, being economical of the time and of materials, they took great care not to carve out, at great expense, the different members of that cornice from a single stone; they set, for example, projecting corbels between the last row of stones, and upon these corbels they placed a stone coping to serve as a drain for the roof (see "*Corniche*").

It is useless to insist further upon these details, which will present themselves in their place in the course of this work.

(To be continued.)

WHERE TO SEE DOMESTIC WORK IN ENGLAND.¹

"Building royally
Their mansions curiously."



Romanesque Capital from the Cathedral at Autun.
From *La Construction Moderne*.

AMONG the many practical educational undertakings connected with the Architectural Association, there are few which have proved more successful or more useful than our annual excursions in August. When your secretary asked me to read a paper during the present session, it occurred to me that a retrospective glance giving the opportunity of a comparative review at least of some of the buildings we have seen, would serve to afford timely reminders to those who have joined the excursions, and possibly suggestive ideas to many more who have not before gone over exactly the same ground. I, therefore, with the generous coöperation of my friend, Mr. John L. Robinson, A. R. I. B. A., the genial and able hon. photographer of the A. A. Excursions, propose to bring before you this evening a selection of buildings, illustrated by some of his photographs, showing a few typical specimens of Domestic work seen on some of our holiday outings. It was the late Mr. G. E. Street, if I remember rightly, who described these excursions of ours as "Architectural Scrambles," an expression which I believe he subsequently saw good reason to modify, although I am not so certain but that, at any rate, on some occasions, his words were not actually justified. The founder of these yearly excursions was, as you all know, our very dear friend, the late Mr. Edmund Sharpe, who, with much foresight and zeal for the welfare of the architectural student, conceived the idea of organizing systematic trips on the coöperative principle, to different parts of the country for the study and examination of our national architecture. As a pupil of Rickman, and one of the pioneers of the Gothic Revival, he naturally desired to further the progress of that movement by turning the attention of students to some of the more typical examples of Mediæval work, which he had so carefully annotated and analyzed in his "*Architectural Parallels*," and other books. During the six annual excursions, therefore, which he conducted so wisely and so well, the buildings visited were almost exclusively

chosen for their Gothic style, and so were chiefly of an ecclesiastical character. . . .

With the change so marked in the general field of modern architecture, naturally enough has followed a change in the immediate aims of the Architectural Association excursions. Churches at first were chiefly thought of, grand minsters and crumbling monastic buildings; but now, after passing through an intermediate state, with a craving for what was called "Late and Flat," interest is mainly directed towards specimens of Domestic work — Renaissance by preference, and, if possible, with a flavor of that debased character which has been fancifully designated "twiddle." To witness almost to a man the working-bees of the A. A. excursion party, hungry for lunch, but still more eager for food of this mode, mere crumbs of more than "Free Classic," all gathered round in a swarm, sketching and measuring Jacobean monuments, as was witnessed only last August at Acton Burnell, while the ruined Edwardian house, hard by the church-yard, a unique specimen from the hand of the same architect who erected the Bishops Palace at Wells, was not seen at all by more than half the party, is surely enough to make a purist like Edmund Sharpe turn in his grave. Rightly or wrongly, fashion has changed, and while it will scarcely be denied that contemporary architecture, chiefly civic and domestic, has, speaking as a whole, largely improved in merit, it is certainly obvious that mere "twiddles" do not constitute the backbone of true architecture, any more than the dry bones of archaeological formula which the rising architects of to-day affect to so unreservedly despise. More conspicuous effort, of course, is being displayed nowadays, than ever before in furthering the education of students intended for the calling of the architect in the future; but is it so certain that in the attractive scheme of the studio forcing-house, a very great risk is not run of dissipating all remaining trace of the traditional side of an architect's work and study, such as distinguished the pupils and followers of a Pugin, a Scott, a Street and a Burges? Are we not tending to reduce our students to an average dead level? I fancy the Institute prize drawings this year were an evidence of this being so. In old times, when the finest works the world has ever seen were built, it was tradition alone which guided designers and craftsmen in their work. Now, as then, there must be some leading principles, some definite aims, some semblance at least of a unity of ideas, if good and living work is really to be secured. To waste valuable energies over the fruitless squabble so recently carried on as to whether architecture be an art or a profession seems a matter for much regret when so many practical matters need attention. Architects worthy of the name must plan and build houses structurally sound, well lighted and conveniently arranged, before ever they can deserve the credit which some seem so anxious to secure of being called high-art architects. To erect a crumbling ruin, a house without foundations, a disintegrated structure posing as an ancient building, is not even good construction, and deserves nothing but the stoutest condemnation whoever may be guilty of like things; and such as these are by no means unheard-of circumstances even nowadays, to the bad name and discredit of architects with the public be it said. During our excursions it has often been remarked that the more modern the work the less the merit discoverable in the example. This, however, is only half the truth. Bad design, bad construction and bad planning can be found, of course, in all periods; but whether the work be old or whether it be new, it is generally certain that its badness will be correspondingly found associated with pretentiousness and the marked absence of simplicity. Old, well-worn word-saw as this is, we can never realize the fact too often. Above all things, an architect has to deal with facts, and his success must be measured by the manner in which he deals with them. Looking back over many annual excursions with members of the Architectural Association, these trite remarks suggest themselves as being among the most apposite by way of introduction. With respect to the excursions themselves, as at present conducted they seem to be admirably suited for those who have for so many years constituted the bulk of the excursion party; but it is to be noted that this is so because we have grown older and more experienced, more readily able to catch the main distinguishing features or peculiarities of a building when visiting it than formerly. For the junior student and young beginner these outings are scarcely so adapted, and if some such guide as our own founder, Mr. Sharpe, could be discovered who would start a second personally-conducted excursion for the younger men, it no doubt would more nearly realize the original aim and prove a great advantage. . . .

The difficulty immediately presenting itself at the outset of such a task as that before us is the amount of material to be dealt with. To reduce this to something like order, it may be well to broadly classify the buildings under notice in the following groups, regardless of style, date and locality, viz: "Half-timbered Houses," "Stone Houses," "Brick Houses," "Plaster-fronted Houses," "Garden Walls and Details," "Interiors" and "Furniture." The most notable specimens in the half-timbered method of building will at once strike you as being Pitchford Hall, Shropshire; Mere Hall, Worcester; Somershall Herbert, Derbyshire; the Market-house, Ledbury; Salwarpe Hall, Worcestershire; Ford's Hospital, Coventry; Leicester's Hospital, Warwick; Huddington Court, Worcestershire; the Court-yard, Ightham Mote, Kent; Ewelme Almshouses, Oxfordshire; Severn End, Worcestershire; Stokesay Castle Gate-house, and several old buildings in Shrewsbury, Worcester, Tewkesbury, Stratford-on-Avon, Warwick and Kent. Only a few remain with

¹ Extracts from a paper read by Maurice B. Adams, F. R. I. B. A., before the Architectural Association on Friday, February 5, 1892.

their timbers not grimed up with black pitch or tar. In some the work, as at Mere Hall, is largely sham, with designs for timber framings colored over plaster and brick surfaces. At Stokesay and Somershall Herbert, where the oak has been left untouched, the wood has become delightful in color, for the most part a silvery gray. Where the tar has been allowed to perish or soak into the wood, as at Severn End, the effect, of course, is less startling. Many a so-called "magpie" house is quite spoiled architecturally by the absence of repose, due to the periodical coatings of pitch with which over-zealous owners bedaub the framings. The original way of filling-in these timberings probably was the "dab and wattle," with two or more sheetings of interwoven oak laths and plaster to exclude the wind and weather. Brick-filling is, of course, not uncommon, and it is eminently picturesque, giving touches of color and irregularity, though, from a constructional point-of-view, it is very heavy and difficult to render satisfactory. Where half-timber building is almost exclusively employed, as at Pitchford or Salwarpe Halls, you will notice that the effect of excessive verticality of form, due to the countless number of upright timberings, is overcome by long, low lines of roofs and general proportions, which again are made to prominently dominate by the over-sailing of the upper stages. This, also, is observable in the narrow strips of frontages which occur in contemporary street buildings. The timberings, too, in the best specimens are simple in form and massive in scale, often being allowed to follow the natural shapes of the limbs of the trees from which they were cut. In those smug and conceited spruce, high set-up, match-like and meaningless imitations which have brought half-timber house-building into contempt among people of artistic appreciation, the spirit of the style has really never been apprehended at all, and, although good taste is not realized in attempting to make a new building, erected for new requirements and modern ideas of comfort, look like an old one, it is certain that the traditional elements of the old work taken as a model must be understood as an inspiring influence in any successful work. The difficulty of obtaining nowadays sound, seasoned timber of ample scantlings, and the general requirements of large windows and tall pitches for our living-rooms, furnish good reasons for not adopting this mode of construction generally for present use, to say nothing about the enhanced risk of fire. For gables and minor portions of a house façade in country dwellings, half-timber is still used with great advantage and a charmingly homely effect. Clients have, I am told, been heard to remark, however, that draughty upper floors, windy corridors and windows perched up so high that no one may look out unless aided by a ladder are not infrequently the result of an architect's first care having been devoted to the cultivation of the picturesque in half-timber. Turning next to the stone houses under review, we naturally find our examples more numerous, much larger and of greater variety in date and style. For the practical architect, those of English Renaissance period furnish by far the greater points of interest and suggestiveness. The feudal strongholds of Rochester and Ludlow, and such like masses of masonry, consume the antiquary with delight; but to the builder of modern houses, the work of Sir Thomas Tresham in Northamptonshire, Burford Priory, Water Eaton in Oxfordshire, and Moreton Corbet in Shropshire, are much more to the point, as also are such examples as Brympton, near Yeovil, with its font, by Inigo Jones; Asthall Manor, near Witney, and Woollas Hall, in Somerset. The Edwardian work at Haddon, the Tower of Stokesay, Leeds Castle, Kent, and Penshurst, in the same county, and South Wingfield Manor in Derbyshire, all have their individual charms, particularly the latter, with its elegant and refined Late Gothic detail. So, too, the ponderously heavy style has its lessons in contrast to such as these, as exemplified at Blenheim, parts of Bolsover Castle, Burleigh-on-the-Hill, Northants; Houghton Hall, for Sir Richard Walpole, in Norfolk, by Colin Campbell; Sudbury Hall in Derbyshire, a brick house, and Ickworth, another in Suffolk. They teach us broadly what to avoid in new work, while furnishing much that is historically interesting as a reflex of the times they represent, and as records of the men who built them. The Mediæval Domestic buildings which we have seen, commencing with the Norman Hall at Oakham, in Rutland, the older part of Lacock Abbey, Meare Hall and Fish House, near Glastonbury, the Vicar's Close, and the palace at Wells and Lyddington Bede House, in Rutland, on the other hand, each, in turn, exemplify far more than is worthy of our study and attention, even though the failure of the Gothic revival has, perhaps, demonstrated beyond dispute that a rigid adaptation of the work of the Middle Ages is now an impossibility. In point of general forms, however, and in the same principal scheme of building, the style may, with advantage, still be our guide, even though we must needs considerably modify items of detail. Thus the dominating necessity of high roofs and a good sky-line, the advantage of strongly-contrasted proportions of solid and void, and the homelike quality of simple picturesqueness, are all characteristics essential to the suitable treatment of an Englishman's house, be it a cottage or a mansion.

The Renaissance, as illustrated in its earlier stages in many of the old specimens which we have seen, successfully realizes this idea, and therein we shall do well to follow their lead. They combine all the freedom of the Gothic style, coupled with a sufficient amount of the horizontal method and rectilinear forms suggested by Classical types, while, most important of all, their internal plan and arrangements are expressed externally in their elevations. I do not lay

claim to any originality in this statement; indeed, the best of our contemporary work has for some time demonstrated the principle. That its more general use and common-sense development may be rightly extended is ample reason for thus briefly drawing attention to the subject. Our old brick-built houses illustrate precisely the same notion; and while bound to admit that Compton Wyniate is, perhaps, the most delightful house I have ever seen both for color and suitability of composition as well as detail, I fancy it is to later models that we must rather turn for inspiration. This house, erected in 1525—the same year as dates Hengrave Hall, Suffolk—is more decidedly Tudor in style; a name which, in the nineteenth century, has had to answer for numberless atrocities. The houses to which I refer are represented by Woollas Hall (1611) and Norton Manor in Worcestershire; Barrington Court, Somerset; Water Eaton and Burford Priory in Oxfordshire; Weekley Hospital and Exton Hall in Northamptonshire; Charlecote in Warwickshire; Brympton, near Yeovil; Rushbrook, Kentwell and Coldham Halls in Suffolk; the brick part of Severn End, Worcester; St. Catherine's, near Bath; and Plaish Hall in Shropshire. Larger houses, such as Moreton Corbet, Montacute, Blickling, Westwood House, near Droitwich, Kirby, Corsham, Court, Rushton, and perhaps Hardwick, deserve the closest study, and for new works of corresponding consequence might possibly be taken as guides, for they are all masterpieces. The craving for the dignity of balance and grandiose effect led their designers, however, into some incongruities, such as a series of sham windows; or big windows cut up inside regardless of their exteriors; or over-fenestration, as at Hardwick, and perhaps useless ones, like the portals at Cobham. Much of their detail, too, lacks refinement, and, at least, in some the construction is radically bad. Take, for example, the masonry of Morton Corbet in the main front, and notice how clumsily the jointing of the stonework is managed, in some parts the transom stones are run through the window architraves, and in others merely joggled in most awkwardly. The members of the cornices do not mitre properly, and, in some of the breaks, fail to carry on at all. This want of refinement is illustrated by the two details which I shall show you, one of a doorway from this building, and another of a similar doorway from Kirby, which is exquisite in every way. A very similar doorway you will call to mind as having seen at Ashbourne, in Derbyshire, at the Grammar School. The masonry, too, of Burford Priory is also very poor, indeed it could hardly be worse, especially in the unique and beautiful chapel there of somewhat later date. The house itself is probably partly an older building refaced, and, strange as it may seem, some of the stone mouldings round the bay-windows are nailed on. This is worse than mason's joints in joinery so common with some fashionable architects now. St. John's College, Oxford, commenced in 1631, and the contemporary Market-house at Peterborough, seem perfect examples of the style I so much admire. In the old houses a great feature is nearly always made of the lead stack-pipes and water-heads; but you will observe that for the most part they are used in conjunction with parapets, and not eaves.

To employ large massive down-pipes and wrought-heads implies a monumental treatment, but quite lately I saw a new mansion recently erected by a well-known London architect, to which most costly lead-work of this character has been applied, taking water from the commonest half-round eaves-guttering procurable. Nothing could be more incongruous! There is a wonderful variety of lead-work at Haddon Hall, Woollas, Blickling and most of the places I have named; but at Canons' Ashby you will find, perhaps, the richest and most beautiful lead-heads and spouting to be seen in England. Before passing on to the plaster houses in our list, I should like briefly to name a point observable in some of the brick ones where terra-cotta was used, such as East Barsham Hall, Norfolk and Oxburgh Hall in the same county, or Bardwell Manor and West Stowe Hall in Suffolk. There are other specimens, of course, about the country, like the house at Canterbury, and Layer Marney, but these have not been visited on our A. A. excursions. In them all the terra-cotta is not too much in evidence, but is sparingly used in a subordinate manner; whereas, in our latest editions of this useful material, it has been very much overdone, and the buildings look "as hard as iron." The big heraldic beasts modelled in the clay at East Barsham deserve, too, to be named as specimens of terra-cotta largely treated, but you will observe how quiet the effect is because the spandrels are inclosed in brickwork. Value is given to the ornament by the contrast of adjoining plainness, for the old builders knew the advantage of concentration and size. We, on the other hand, produce our ornament by machinery, and spread it over the entire surface, thinking it looks clever. It may be fine, but it is not good. Our details also now are getting too small in their parts, and ineffective from want of scale. The plaster-fronted houses which we have seen are, for the most part, very plain ones as compared with such specimens as that in the Butter-market at Ipswich, but they are none the less suggestive. We may divide them into two kinds, viz: first, those with rough-cast or plastered stone walls flush with stone dressings, such as Witney Grammar School and the old street houses at Lacock, Corsham and Burford; secondly, those which are plastered over timber framings, such as the old Georgian inn at Bury St. Edmund's, the house in the High-street at Oxford, the cake shop at Banbury, Bardwell Manor, Suffolk and the old houses at Maidstone. Most of these we shall see to-night. For my part, I think that there is a capital opportunity open to architects and sculptors for the development of plaster-work in the external treatment of Domestic

building. Nothing could be more durable if properly used than stucco duro, say, for the frieze of a house front, or an upper stage under a well projecting eaves. If our younger sculptors would turn their attention to modelling in plaster for architectural purposes, a fine field for the lasting display of great artistic ability would be found, and instead of figure-work in plaster now being prohibitive in price, architects would be enabled to turn to a school of capable and willing artists to cooperate with them in producing work which might compare with that of any period, and reflect the skill which we know exists in a latent form among many who are struggling to become monumental sculptors, but are without patrons.

Mr. T. E. Colcutt, years ago in Fleet Street, showed how plaster-work might be treated with scratched ornament, and the late F. P. Cockerell did a house at Datchet with plaster panels. Mr. Norman Shaw, foremost in this as in many other matters, has shown us what to do, and so has Mr. T. G. Jackson, A. R. A., as in his High-School at Oxford and Military College outside that city. More, however, remains to be done, and the old houses above named have inspired others besides ourselves. In respect to the garden-craft details which we have seen at Haddon, Rockingham Castle, Drayton House, Claverton, and St. Catherine's, near Bath, Hardwick and Blickling, as well as Montacute, very much might be said did time allow. The importance of these minor matters of Domestic architecture renders them worthy of more attention than they have lately received, and they certainly should be designed by the architect, and not left to specialists and landscape-gardeners. Architects, however, must study and master this branch of their artistic work if they would render themselves worthy of being intrusted with it. My last two divisions, including interiors and furniture, for lack of time, must be even more briefly alluded to than our previous ones. The houses which are remarkable for interior plaster-work among those we have seen are South Wraxhall, in Wiltshire, the Reindeer Inn at Banbury, Blickling Hall Library, Lytes Carey in Somerset, Hardwick Hall and Haddon, and the domed drawing-room at Canons' Ashby. The ponderous vulgarity of the rococo plaster-work at Houghton Hall, Norfolk, and other like specimens, need not detain us, wonderful as it is in size and voluptuousness. Most of the houses visited have been more or less modernized inside; but I can show you some which have not, such as Plaish Hall, Broughton Castle, Haddon, Bolsover, Wollaton, Hardwick and Pitchford. The chimney-pieces from Ightham Mote, Benthall Hall and Bolsover will interest you. When Mr. Robinson's camera studies have all been seen I know you will be pleased, but I fear my task attempted too much for one evening. I must leave untouched the furniture we have seen, simply recalling, in conclusion, many a fine example, such as those at Oxburgh Hall, Charlecote, Hardwick, Cobham, Ightham (now dismantled), Brigstock Manor, Rushbrook, Coldham Hall and other places.

BOOKS PAPERS

THE announcement recently made that the concluding part of the "Dictionary of Architecture," comprising the letters T to Z, would soon be issued has no doubt been received with much satisfaction by the members of the Architectural Publication Society, whose subscriptions have enabled the Committee to carry out the work.

The Society was established in 1848 by the initiation of Mr. Wyatt Papworth, with a wide range of literary objects, which speedily became consolidated in the idea of producing a Cyclopædia of Architecture. For four years the publications of the Society were directed to this end, the separate essays and illustrations being intended to form parts of and to be ultimately incorporated in the cyclopædia. With the same object, a comprehensive "List of Terms"—of the articles which should be included in this work—was prepared with great care and labor. The list, which comprised 12,127 distinct headings, was widely circulated to form a basis for collecting information. In 1852, as the result of the preparation and issue of this "List of Terms," it was decided to undertake the production of a Dictionary of Architecture which, while comprehensive in its scope, should be more concise and less elaborate in its articles than the cyclopædia first contemplated.

At the time this idea of a dictionary was first promulgated, it was thought possible—somewhat sanguinely—that, if sufficient financial support were obtained, the work then contemplated might possibly be completed in three years.

When, however, the first sheets of A were produced, it was found that, with the utmost care in compressing the articles, the limits thought possible would be far exceeded, and it was decided to proceed on a wider basis. On this basis the work has been continued throughout under the care of Mr. Wyatt Papworth, assisted by the members of the Committee, and, in the earlier years, especially by Arthur Ashpitel, Geo. R. Burnell, Charles Charnock Nelson (for many years Hon. Secretary of the Institute) and John Woody Papworth, by the last of whom the MS. up to 1870 was prepared for press.

The successive deaths of these and many other valued collaborators, whose aid was of the greatest importance, ultimately threw the entire labor of the work of the Dictionary on its original founder,

whose professional and other engagements, however, were of such a nature as to prevent him continuing, during an interval of some years, to devote his energies to the task.

The unavoidable delays arising from these and other causes for a long period seriously retarded the progress of the work, and greatly discouraged all interested. Ultimately, on an assurance from Mr. Wyatt Papworth that he would be able soon to resume the work, a considerable sum was raised to carry it on, by subscription for the complete work at twenty guineas (£21 payable in one sum or by instalments); the pledge previously given that the work should not at any time be sold by the Committee for less than the subscription price being again renewed.

When the letter S had been completed, it was estimated that a contribution of two guineas (£2 2s. from every subscriber who had not paid £21) would suffice to complete the whole, and it is with the aid of the funds so raised that the now forthcoming volume (vol. viii.) will be produced. The sole charge of the work since the production of the letter L, has been in the hands of Mr. Wyatt Papworth, by whom the matter has been collected and edited, with the assistance (too often, it is to be feared, inadequate) of a Committee of Revisers; and that the work has now attained completion is solely due to his indefatigable devotion to his project of forty years ago.

The Dictionary will be complete in eight folio volumes (comprising matter equal to about thirty octavo volumes of 300 pp. each) with some 150 lithographic plates and some hundreds of wood-cuts as illustrations to the text.

The number of terms contained in the list issued in 1852 was 12,127; the number of articles actually comprised in the Dictionary is 18,240.

A small number of copies of the complete work is still available, which, by the liberality of the wealthier members of the profession and others, should find places in the libraries of public institutions, where this most valuable book of reference would be found of great service, especially to the student of architecture preparing for the progressive examinations of the Institute.

There are many original subscribers or their representatives who, having discontinued membership when the progress of the work was suspended, have only the earlier parts of the Dictionary (now hardly obtainable). The opportunity now exists for them to complete their sets, but this opportunity will speedily cease to be available, as the affairs of the Society will probably be finally closed as soon as possible after the issue of the concluding volume, and the parts cease to be obtainable.

Unfortunately, the recent failure of the firm which had in hand the printing will lead to some little delay, but the greater part, up to Z, has now been printed off, so that the consummation anxiously desired is close at hand, preparations having been made for the issue of the final volume without delay. — *Arthur Cates in the R. I. B. A. Journal.*

It is always a pleasure to welcome a book¹ by a sanitarian so earnest and thoroughly competent as Mr. Gerhard, and we have reason to congratulate ourselves that we have already half-a-dozen of them. The latest is a mere pamphlet, published by the Iowa State Board of Health, but it adds a little to our knowledge; and, what is of importance to architects, who are seldom able to keep in the full current of sanitary science, it shows that the solutions of sanitary problems which were reached ten or fifteen years ago by the more advanced practitioners, and have since become familiar to all intelligent architects and engineers, have not been materially modified by subsequent investigation. On the contrary, Mr. Gerhard believes now as thoroughly as ever, and with a great and constantly increasing mass of experience to confirm his belief, that for country and suburban houses, with water-supply, the best mode of sewage disposal is by sub-surface irrigation in the same form in which it has been practised for ten years past by architects and sanitary engineers, with only some slight and, to our mind, occasionally rather questionable improvements.

It is curious that years of experience have tended to diminish the distance from the surface at which engineers think it advisable to lay the absorption pipes. We all remember when fifteen inches below the sod was regarded as the correct distance; then twelve inches was found better, and was accepted as the proper thing; now Mr. Gerhard tells us that they should not be put more than "ten or twelve inches" below the surface to secure the best results. Probably this change in the standard is due less to the modification in the opinion of engineers, who have known for many years that the upper six inches of the soil is far more efficient in oxidizing organic matter than the ground below that limit, than to the gradual overcoming of the popular notion that sewage pipes near the surface must inevitably freeze in winter. The fact is that, with proper intermittent flow, the absorption pipes might probably be laid on the surface without freezing. The irrigation fields which receive the sewage from the city of Dantzic are said never to freeze in winter, although the sewage is delivered directly on the surface, and the climate is about as cold as that of any town in the United States. Nevertheless, the irregularity of the surface grades make it difficult to lay absorption tiles much nearer than ten inches, so that this will probably remain about the practical limit; but it may with advantage be remembered that, if the grades

¹ "The Disposal of Sewage for Isolated Country Houses." By Wm. Paul Gerhard, C. E. Published by the Iowa State Board of Health. 1892.

should render it more convenient to cross a low place at a less distance from the surface, there is usually no risk in doing so.

In estimating the cost of applying this method to the disposal of house sewage, we think that Mr. Gerhard sets it unnecessarily high, and that a good many of his readers will be deterred from adopting it on this account. While it is true that a thoroughly constructed system, including grease-tank, settling-tank, siphon, earthenware trough-tiles and caps, and the absorption tiles, and the royalties from different portions of the system which happen to be patented, will cost from two hundred and fifty to four or five hundred dollars for an ordinary house, it is equally true that a very efficient and wholesome system of absorption drains, including an ample brick settling-tank, and flushing apparatus of suitable proportion for a ten or twelve room house, with bath-room and water-closets, can be constructed, if the grade of the ground is tolerably favorable, and the soil not too clayey, for not much more than one hundred dollars. To do this, the absorption pipes must be sole tiles, laid without the earthenware troughs, and, instead of earthenware caps, bits of tarred roofing, felt or asbestos paper must be used; and the grease-tank must be omitted; but the system will work very well without them. No doubt, Mr. Gerhard would condemn the cheaper system for its want of permanence. Laid as he proposes, the absorption tiles will collect sediment enough to choke them only about once in three years; while, on the cheaper system, it is not prudent to let them go more than one year without washing them out or taking them up and relaying them; but the sole tiles, which do not roll, are very easily laid, and more easily taken up than pipes set in troughs, where care must be taken not to disturb the trough-tiles; so that, in our experience, four or five hundred feet of sole tile can be taken up, washed out and relaid, with tarred paper on top of the joints, for two or three dollars. The extra cost of attending to a less perfect system is thus less than the interest on the additional expense of a thoroughly constructed one, so far as the tiles are concerned, and the same may be said of some of the other details. For example, the flushing siphon, in our practice, we have generally preferred, for ordinary dwelling-houses, to replace by a tilting-tank made of galvanized iron, which has the advantage of being readily washed free of sediment with a hose without interrupting its operation, while a choked siphon is a troublesome thing to clean. Moreover, the tilting-tank usually, though not necessarily, works in a smaller vertical space, and, where the ground is nearly level, several inches of grade can be saved by using it, while there is no patent on it, and no royalty to pay, either directly or indirectly.

Where the tilting-tank is used for flushing, it is possible to dispense with the grease-tank, on which we believe that there is also a patent. Mr. Gerhard says that the grease-tank must be cleaned out about once a month, and this is the usual rule laid down by engineers.

The cleaning of the grease-tank, especially after a longer interval than this, is, to our senses, an extremely disagreeable operation, but, if the flushing siphon is not to give a great deal of trouble by choking, the tank and the cleaning are indispensable. With the tilting-tank flush, it is quite practicable, in small houses, to carry all the drainage directly into the large settling-tank, without the intervening grease-trap. The tilting-tank is filled through a pipe which dips below the constant level of the surface of the water in the settling-tank, so that the worst of the scum does not flow through it, and the grease finally makes its way into the tilting-tank, and thence into the pipes, in the form of small white lumps, rarely larger than the tip of one's finger. These lumps would clog a siphon badly, but they do not interfere in the smallest degree with the operation of a tilting-tank. This receives them, floating in the sewage, and pitches them into the outlet pipes, which they undoubtedly tend to choke; but, as was just said, the digging-up and relaying of the outlet pipes is usually a trifling matter. It is curious to read, in Mr. Gerhard's book, that in England, the anxiety felt to keep the sediment and suspended particles of grease out of the flushing siphon is so great that it is quite common to surround the siphon with wire nettings, which have to be cleared every day. Mr. Gerhard says, very justly, that if so much trouble as this had to be taken to keep the pipes and siphon clear, it would be just as well to leave out the siphon, or other automatic flushing device, entirely, and have the attendant simply open a gate to discharge the contents of the settling-tank over the irrigation field.

Among the many useful suggestions which Mr. Gerhard makes in regard to this sort of drainage, we are rather surprised that he has nothing to say about the alternative of having the lines of absorption pipes radiate directly from the flushing-chamber, instead of being laid out as branches from a long main stem. It is true that, with a siphon flush, it is rather easier to connect a main trunk pipe with the siphon, but there would be no difficulty in arranging a chamber to receive the discharge of the siphon, and radiating the outlet pipes from it; and the advantages of the radiating system are very considerable. To say nothing of the facility with which radiating pipes can be cleaned, in a rough, but effectual way, by turning water from a hose into each line, the radiating lines choke much more slowly and gradually, other things being equal, than a trunk-line and branches. The choking almost invariably takes place by the deposit of sediment at the ends of the lines of pipe, which gradually fill. With a radiating system, each line, so to speak, shortens as it fills, leaving its unobstructed length available as outlet until the whole system is filled. With a trunk-line and branches, on the contrary, the trunk

may, and often does, fill first. As the filling advances, the branches are cut off, each one cut off subtracting at once a considerable part from the absorption area, and, if the deposition of sediment is not checked, the choking of the trunk may advance until all the laterals are cut off, when absorption suddenly stops, and the remainder of the system immediately fills up and overflows, causing great annoyance. We have several times witnessed this phenomenon with the trunk-and-branch system, and have seen, when the pipes were dug up, the trunk filled above the first lateral, while the lateral lines were in tolerably good condition; capable, at least, of taking care of the sewage for several months longer. It is, perhaps, possible to avoid such mishaps, even with a trunk-and-branch system of pipes, by very accurate grading; but accurate grading is difficult to get with country workmen, and, in our own practice, we much prefer a plan under which slight inaccuracies are rendered harmless.



WORCESTER CHAPTER, A. I. A.

A MEETING of the newly-formed Worcester Chapter of the American Institute of Architects was held recently at the Board of Trade rooms on Foster Street. The principal object of the meeting was the discussion of the new By-Laws and Constitution, prepared by a committee consisting of S. C. Earle, A. P. Cutting and W. P. Delano. After a short discussion the meeting adjourned, subject to the call of the committee.



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

HOUSE OF TANGERMANN, ESQ., NO. 276 BERKELEY PLACE, BROOKLYN, N. Y. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

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

ELIZABETH HALL, STETSON UNIVERSITY, DE LAND, FLA. MR. GEORGE T. PEARSON, ARCHITECT, PHILADELPHIA, PA.

CASINO FOR BELLE-HAVEN, CONN. MESSRS. BORING, TILTON & MELLEN, ARCHITECTS, NEW YORK, N. Y.

HOUSE AT WELLESLEY HILLS, MASS. MR. WARREN A. RODMAN, ARCHITECT, BOSTON, MASS.

TWO HOUSES ON WEST FIFTY-SEVENTH STREET, NEW YORK, N. Y. MR. JAMES E. WARE, ARCHITECT, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

COMPETITIVE DESIGN FOR THE EVANGELICAL REFORMED CHURCH, OSNABRÜCK, PRUSSIA.

This plate is copied from *Deutsche Bauzeitung*.

THE NEW FRONT OF WESTMINSTER ABBEY, LONDON, ENG.

This plate is copied from *Specialties*.

GOVERNMENT BUILDING AT MÜNSTER, WESTPHALIA.

This design is copied from *Zeitschrift für Bauwesen*.

ENTRANCE HALL IN PELLER'S HOUSE, NUREMBERG, GERMANY.

This plate is copied from *Architektonische Rundschau*.

FIREPLACE IN A HOUSE IN THE AVENUE KLÉBER, PARIS, FRANCE. M. LE MAIRE, ARCHITECT.

This plate is copied from *La Semaine des Constructeurs*.

POST-OFFICE, CALCUTTA, INDIA.

THIS building, which forms the subject of an illustration in *Indian Engineering*, is one of the most imposing of the public edifices in Calcutta, contributing in no small degree to the architectural reputation of the "City of Palaces." It stands in a most prominent position in the midst of all the commercial and public offices on the

west side of Dalhousie Square, a place recognized as containing the finest group of buildings in the metropolis, and is surmounted by a dome which forms a conspicuous feature both from far and near.

The central feature in the plan of the building is at the angle formed by the meeting of Koila Ghat Street and that known as Dalhousie Square West, which has been turned to good account, by its being designed as a rotunda crowned by the dome already referred to. This room is utilized for letter-boxes, poste restante, and other postal sub-departments resorted to by the public, and is admirably suited for the purpose.

The two-storied wings or blocks facing the two roads mentioned above are occupied by the several departments under the Postmaster of Calcutta, otherwise known as the Presidency Postmaster.

Externally the building presents a simple but dignified appearance due to the fine proportions of the Corinthian colonnade and its less than usually ornate treatment, a result much enhanced by the manner in which the façades are divided up and flanked by massive staircase blocks or towers. The dome, which is well raised on a drum or lantern, is a very appropriate crowning feature, notwithstanding that the elegance of its outline is a subject of adverse criticism.

Mr. Walter B. Granville, who was architect to the Government of Bengal some years ago, designed the building, which was completed in 1868.

The length of the east or Dalhousie Square façade from "out to out" of flank towers is 188 feet, and of the south or Koila Ghat Street front 205 feet, both these wings having a depth of 78 feet, and lying at an angle of 80° with regard to each other. The colonnade with which these two wings is faced is also carried round the rotunda at the angle and a grand flight of steps forms an appropriate base. The rotunda has a diameter of 54 feet, and the verandas within the colonnades are 18 feet in width.

The Corinthian columns which form the principal architectural feature are 39 feet high, the total height of the main portions of the building, that is, from pavement to parapet, being 62 feet. The towers or staircase blocks with their massive justified appearance rising 11 feet above the parapet were not completed as the architect designed them. The central feature of the building, namely, the dome, attains a height of 145 feet, the external diameter of the lantern being 64 feet.

NO. 185 QUEEN'S GATE, LONDON, S. W., ENGLAND. MR. R. NORMAN SHAW, R. A., ARCHITECT.

STREET SCENE, GENEVA.

It is too generally supposed that Geneva has not much in the form of buildings which can captivate an artist. The drawing of the city from the river which was published last week and the street scene in the present number suggest that Prout at least saw something that was worth drawing. The preponderance of vertical lines in the street view has been turned to account as if they suggested a metrical arrangement.

NEW FOYER TO STALLS, THEATRE ROYAL, BRIGHTON, ENG. MESSRS. CLAYTON & BLACK, ARCHITECTS, BRIGHTON, ENG.

SINCE the comfortable and popular Theatre Royal at Brighton, passed into the hands of a company, various alterations have been made to bring the building in every particular "up to date." As new ideas are introduced, whether in seating, fire-appliances, lighting arrangements or what not, which prove successful in London, they are adopted at London-by-the-Sea, and, as all the new London theatres make a feature of the "foyer," the managers of the Brighton Theatre Royal have turned a stable and storeroom into a luxurious lounge and refreshment room, and at the same time have given additional exits on the ground-level from the stalls. Only a few years ago Brighton had but one theatre; now four and a permanent circus are already open, a fifth is being built, while rumor speaks of a sixth to be larger than any yet erected, although it may well be doubted whether all those already in existence can permanently flourish.

PREMISES IN CHURCH STREET, BRIGHTON, ENG. MESSRS. CLAYTON & BLACK, ARCHITECTS, BRIGHTON, ENG.

VERY few of the older buildings in Brighton have any claim to consideration on account of their beauty, while they are also, as in all other towns, mostly somewhat deficient in such matters as air-space, dryness and proper sanitary accommodation. On the extensive property of the lord of the manor, Mr. C. R. Searse-Dickins, D. L., which is largely in the centre of the town, great improvements are gradually being made both by entire rebuilding and by modernizing alterations, and our plate shows a picturesque corner block near to the New Volunteer Drill-Hall in Church Street.

DESIGN FOR A LARGE TOWN MANSION.

The illustrations show the perspective view, section, and principal floor plan of the design to which the Royal Academy Gold Medal and Travelling Studentship of 200*l.* have been awarded this year. The author of the design is Mr. A. H. Hart, Associate of the

Institute of Architects, who has given to the *Builder* the following brief notes as to the objects put before the competitors and the manner in which he has treated the problem:

"The building required was a large town house, planned with a view to the proper placing and lighting of pictures, sculpture, and other works of art. The site was 180 feet deep, with a frontage of 70 feet.

"The problem, therefore, was to secure a symmetrical plan, such as a town mansion required, without in any way sacrificing convenience, and to provide proper accommodation for the display of pictures and sculpture, with efficient light both for the works of art and the house generally. To secure all these properties upon a deep site with no light obtainable on either side made the problem a difficult one.

"The house is planned without a picture-gallery, the object being to display the pictures and sculpture in the rooms themselves, so that the inmates may enjoy them upon all occasions. An endeavor has been made to let the works of art form part of the architecture and contribute towards a harmonious whole, rather than to appear independent, as they generally do in a museum.

"The first floor is devoted to the state-apartments, in which state-likeness and freedom of circulation have been aimed at, whereas the ground-floor contains the family living-rooms, etc., where comfort is the first consideration.

"The house is designed in the François I style, and an attempt has been made to combine richness with dignity."



[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.]

THE RHODE ISLAND STATE-HOUSE COMPETITION.

PROVIDENCE, R. I.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Thank you for the copy of your paper containing the Rhode Island State-house designs.

In your editorial on the subject you say "a decision has been reached which places the designs in the following order": Will you kindly correct this statement as the order of merit of the designs was never considered by the Commission. But one vote was taken and that merely to decide which plan should be accepted.

Yours truly,

E. K. GLEZEN,

Secretary to the Commission.



DISCOVERIES IN IRRIGATION. — People who desire to know something about irrigation in the United States need to read the report of the artesian and underflow investigation and of the irrigation inquiry, which the Secretary of Agriculture has submitted to Congress and which is now being printed. When the report was submitted, Mr. Manderson (Rep.), of Nebraska, Chairman of the Senate Committee on Printing, indorsed it in the strongest terms. The investigation was authorized by the last Congress. According to the report, twelve States and Territories have been visited and over forty irrigation districts and centres inspected. Plans and maps and the testimony of about 300 persons actively interested in irrigation enterprises are among the results of the investigation. Senator Manderson says that the interest throughout the country on the subject of irrigation is fully evidenced by the unprecedented demand for the reports published on the subject by the Government. The demand has been so great that not one in fifty requests for copies of reports issued in the past two years has been complied with. Some of the requests have been from distinguished foreign engineers and experts, Government officials and librarians. In indorsing the report Senator Manderson says: "It is very generally supposed that the interest in the subject of the report is confined to the regions of the West and Southwest. This is not the case. The interest aroused in this subject in the sections of the country most largely affected by heavy precipitation and constant humidity is almost as widespread and intense. For example, the Southern States have furnished a large amount of valuable information on the subject, illustrating the fact that in such States as Louisiana, Alabama and Texas the semi-tropical heat of the summer, with its attendant evaporation, tends rapidly to produce drought in the growing season, and, as a consequence, the security of the commercial crops grown in the Gulf States is materially affected. The irrigation problem in Florida is destined to become one of utmost scientific interest, of vital importance to soil culture. Especially will this be so in the eastern part of that State, where artesian water, by means of wells, can unquestionably be utilized to make secure the orange orchards and vegetable gardens." The final results of the artesian and underflow investigation are declared to be thoroughly satisfactory. Last year two farms in South Dakota were irrigated under the direction of the chief engineer of the investigation. They are said to have proved very successful. Capital that was about to be withdrawn from the neighborhood was induced to remain, and new investments were made. It is claimed that two years ago, when

the work was begun, the counties west of the one-hundredth meridian of longitude were on the verge of being wholly abandoned for agricultural purposes. Since the fact of an underflow has become known fears caused by drought in these regions have largely disappeared. Speaking in behalf of the Printing Committee, Mr. Manderson said that he believed that when the nature of the report was thoroughly understood a large edition of it would be ordered printed. He added: "The investigation thus far made by the Government covers a large field, yet it must be apparent to any one who will read the report under consideration that there remains much to be done before the subject shall have been exhausted. The conservation and proper distribution of water may be made as serviceable in obtaining security for crops when the rainfall is excessive as it must necessarily be in making possible the reclamation of arid lands. It is remarkable how very little is known as to the extent or character of subterranean water supplies. Yet, without doubt, when recent research has given full knowledge to the world on this subject, soil culture will be advanced to a degree that, under present conditions, cannot be well understood. The report proposed to be printed traverses this entire subject in a way that will prove an incentive to further investigation, will encourage the investment of capital and lead to intelligent effort in the agricultural development of this most wonderful land." — *N. Y. Times*.

MR. TATE AND A GALLERY OF BRITISH ART. — In the *New Review* for this month, Mr. M. H. Spielmann gives a concise history of an attempt that has been made to found a gallery of British Art in London, and the difficulties that have been put in the path of the would-be founder, Mr. Tate. Eighteen months ago Mr. Tate offered a collection of pictures valued at £70,000 to the nation with certain stipulations which were not acceptable to the Government, but which were finally withdrawn on the single condition that a gallery should be provided for the collection within two years. The Government agreed to grant the eastern and western galleries at South Kensington. Mr. Tate refused the offer and proposed, anonymously, to build a gallery himself, at a cost of £80,000, if the State would give the land. He asked for a plot opposite the Colonial Institute at South Kensington, and the Government was about to accede to this when the scientists arose and claimed that the site had been promised to them. Since then the whole affair has been blocked. Mr. Spielmann proposes that the space back of the National Gallery now occupied by barracks, a guard-house and a parade, be given over to the new building, which might thus be made part of the great structure which faces on Trafalgar Square, and the British pictures already in the National collection incorporated with Mr. Tate's in the additional wing. This would leave space, moreover, in the old building for further foreign acquisitions. This is the wisest plan thus far submitted, and it is hoped that the Government will adopt it before the lapse of time will have dampened Mr. Tate's enthusiasm and lead him to revoke his benefaction. — *New York Tribune*.

THE ROYAL ACADEMY ELECTION. — The Royal Academy elections have caused some heartburnings. One of the members elected was Stanford Forbes, who is a relative of the Chairman of the London, Chatham and Dover Railway Company. Complaints are made that he is too young an artist to merit such distinction. Bates, the sculptor, another of the successful ones, is almost unknown. Jackson, an architect, who was also elected, has hardly the claims to the honors that are possessed by some of the older men. The elections indicate a leaning in the direction of the newer schools of art. The usual outside scene attending the elections, which are held in Burlington House, occurred this year. The main door was surrounded by a crowd of models, who eagerly awaited the announcement of the result. The model who was fortunate enough first to learn of an election would rush madly to the house of the lucky artist or sculptor, and inform him that he had been elected an Associate of the Royal Academy. In return for this information the model would, according to custom, receive a guinea. In some cases, where two or more models would learn at the same time of an election, they would dash off together, and there were several exciting races between the rivals in their efforts to gain the coveted guinea. — *New York Times*.

COKE-BREEZE CONCRETE. — A correspondent of the *Builder* writes "Let me caution 'Surveyor' against carrying his coke-breeze concrete into the fireplaces. It is a very perfect conductor of heat. The heat will accumulate in it sufficiently to char any wooden skirtings or other combustible work, at quite a respectable distance from the fireplace. This I know from ocular demonstration. I am not sure that coke-breeze is a safe material to place even near flues. The mere admixture of cement with it does not entirely deprive the coke of its very combustible properties. Another hint as to coke-breeze concrete. It is apt to scale off from below the flanges of any iron joists which may be embedded in it. I should, therefore, hesitate about plastering directly on to the concrete. Of course, the soffit can be battened and lathed. Possibly the same scaling-off may sometimes occur with other concretes. Possibly, too, a liberal use of cement may get over this difficulty. The concrete, whatever the 'aggregate' used, must have plenty of time to dry — not always an easy matter when a building has to be rushed. The floor-boards may be cut and laid in place, and nailed later on. Coke-breeze concrete has, of course, the advantage of being light, and of taking nails kindly. The disadvantages are, I think, those which I have cited, and also that, like all concretes made with porous material, it lets water through too freely; so the extinction of even a small fire may do a good deal of mischief."

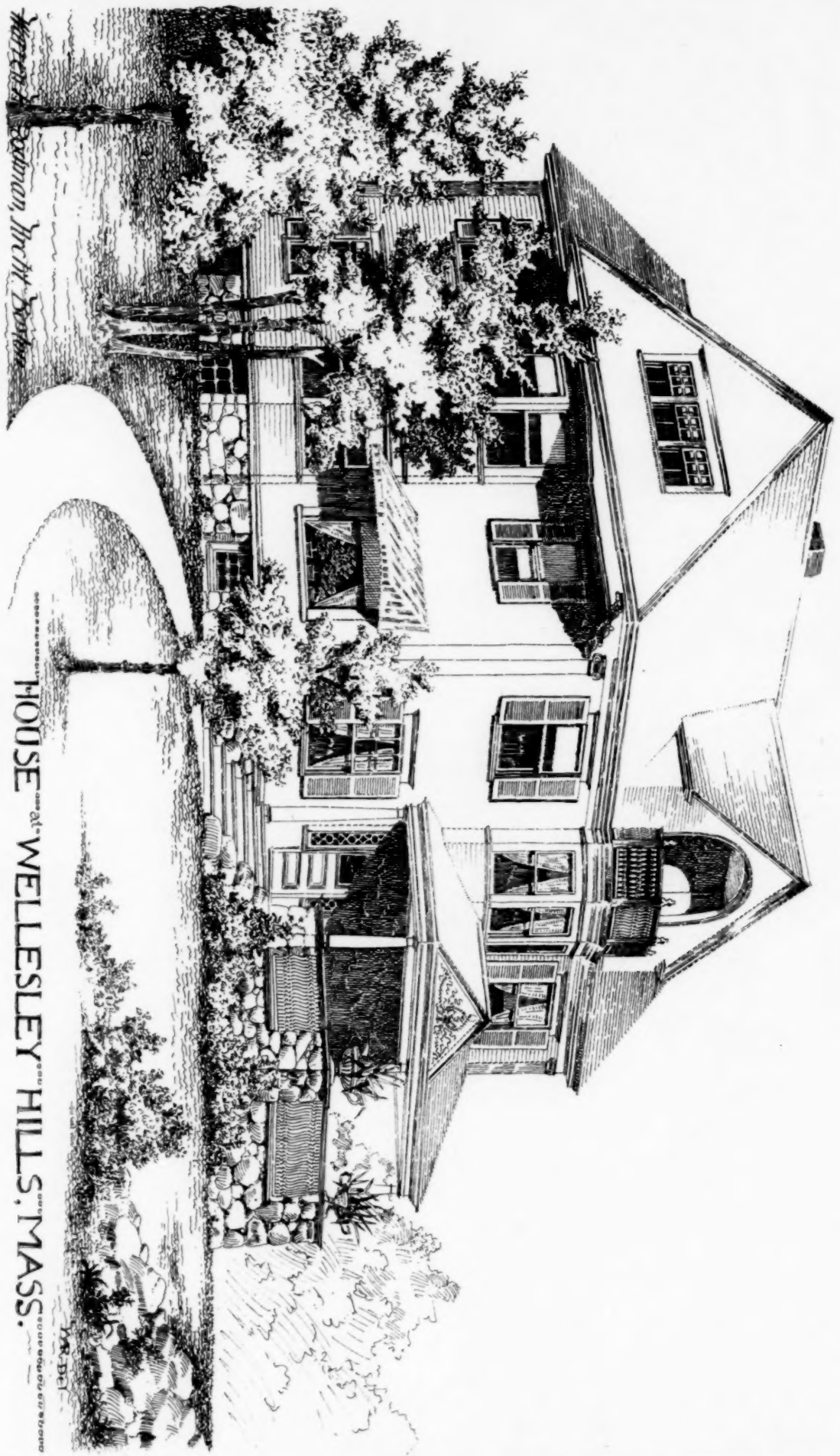
TYPHOID FEVER A MENACE TO CHICAGO. — The warning given the city of Chicago that typhoid fever was almost epidemic there, and that unless the poisonous source of the disease was removed a fearful mortality might be expected during the World's Fair, has not been given in vain. The Board of Health has boldly grappled with the danger, and

the first result of an investigation is the announcement that the water supplied to the city is impure and should not be drunk until after it has been boiled. Prof. Walter Haines has been making a microscopic examination, and his conclusion is, that the water in its raw state is unfit to drink. Health Commissioner Hoyt says the remedy is to go out farther into the lake for water, and he thinks it can only be found uncontaminated four miles from shore. The "intake" at present is at a point 5,000 feet off shore. As Alderman Cullerton says: "It would never do to take water from that intake during the period of the World's Fair. All the sewers of the World's Fair grounds and of the Hyde Park district empty into the lake not far from this intake. Cattle and horses and other animals will be on exhibition on the World's Fair grounds. Half a million people will visit there daily. The sewage output will be enormous. It is not necessary to point out the imperative duty of removing our intake from the region of pollution." Professor Haines says he will submit to the Council at its next meeting a proposal that the water tunnels be extended two miles at least farther into the lake, so as to locate the "supply crib" beyond the region of possible pollution. — *New York Evening Post*.

A HUGE ROOF FALLS. — During a gale at Lisbon, February 19, a girder supporting the roof of the customs shed, which has an area of 450 by 150 feet, fell, carrying with it the entire roof. The whole interior of the building is filled with a shapeless mass of twisted girders, heaps of glass and piles of corrugated roofing. Hundreds of workmen were at once put to work to clear away the debris. It is not known yet whether there was anybody hurt by the falling roof.

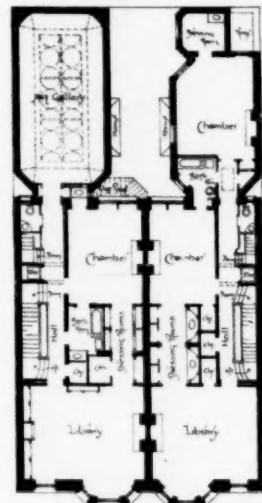
TRADE SURVEYS

THE continued dulness in most branches of trade and manufacturing is the subject of unfavorable comment in business and banking circles. The cause is not understood, and, therefore, the remedies suggested are more expressions of opinions or theories as to what might do good rather than anything else. The volume of business continues a little below the usual average. To all appearances, the supply of money in financial centres is more than sufficient to meet the demand made. It is doubtful whether the volume of money would be equal to demands in case business was up to the usual average. The abundance of money is a relative term entirely, and it does not follow by any means that there is a sufficient quantity of currency, gold, silver or paper, simply because there is more money than is called for. There is a suspiciousness and uncertainty apparent not only in manufacturing and financial circles, but in all business circles; not only in the United States, but also in Europe. Conditions are changing; new factors are coming into prominence; the old rules by which men measured their conduct are disappearing, or else need revision. Rules which answered ten or twenty years ago have very little application now. One reason is: the whole world is opening up; new communities are being established in far-off countries; new financial conditions and necessities are also arising, and theories of finance which answered very well ten or twenty years ago do not answer now. Manufacturing conditions are also changing; even in Europe, views on protection are being modified. British financiers are revising all the knowledge they ever had with a view of continuing, through the control of money, their control over trade and commerce throughout the world. It is difficult to foresee the outcome of all these changes and agitations; it is quite safe to say that nothing too good can come. If a larger volume of money is needed, the necessity will make itself apparent to those who control governments and policies indirectly. Those now in control are opposed to any change. Within the past few days a good many developments have been made in industrial channels; inquiries have been multiplying for material, stocks and merchandise of all kinds. At the same time, prices have been weakening, although no actual reduction has taken place in any direction. The cause of this cannot be given. The consumptive requirements of the world are certainly enlarging year by year; if any reason were assigned, it would be that producing-capacity has been enlarged too rapidly for demand, but this does not explain anything. It is simply stating what appears to be a truth on the surface, but it does not account for the difficulty which exists in disposing of the increased production among the producers of it. Some say too little money is the cause; others attribute it to a gorged condition of the industries, others to overproduction. No explanation accounts for the phenomenal dulness existing, and, as stated above, no prescription has yet been written by any political economist that is based upon an intelligent diagnosis of the cause. The world needs a new political-economy doctor. Adam Smith, in his time, opened the eyes of the world to a great fact and a great necessity; there is to-day as much need and room for another Smith as there was then. So far as trade production and distribution are concerned, as well as the science of finance, we are all at sea, acting without regard for scientific reasons for what we do. Congress is stumbling over questions which are not understood in or out of it, and which directly affect the interests of millions; but it is safe to say that not one single practical measure has yet been brought forward for the industrial improvement of the people that will not stand the test of a practical trial. The present dulness, to all appearances, is likely to continue for some weeks longer; early in the year it was predicted by capitalists, that by the first of March, there would be an enormous outflow of capital into new enterprises. This has not taken place; it is not lack of opportunity or lack of confidence that causes the dulness, but a lack of something else which it is not easy to define. The industries are slackening up, and only enough is made to meet requirements. Indebtedness between merchants and business men generally is not increasing, but is kept at a minimum limit. Railroad earnings continue high; margins on all manufacturing continue very low; bread-stuffs sell at good prices; cotton continues abnormally weak; exports of merchandise are heavy, and the exportation of gold has again set in. This latter fact is due to the anxiety and necessity of holders of American securities in Europe to secure gold. The struggle for gold in Europe continues, and the chief reliance is upon American supplies. The heavy return of securities will naturally depress stock markets on this side, but it will also show the fact that this country is able to endure the drain without developing weakness. In all branches of trade confidence is expressed that activity will surely come before many weeks, but the effect of the delay is to keep prices at their lowest limit, and production at the level which market demand establishes.

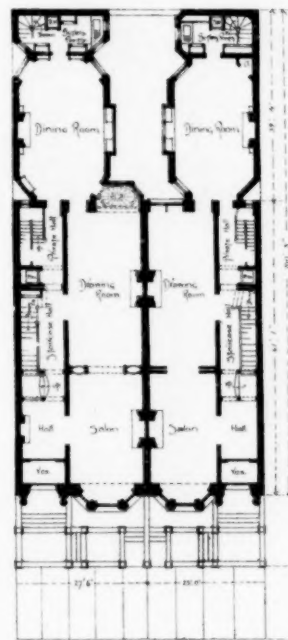


W. H. D. L.

HOUSE at WELLESLEY HILLS, MASS.



Second Floor Plan



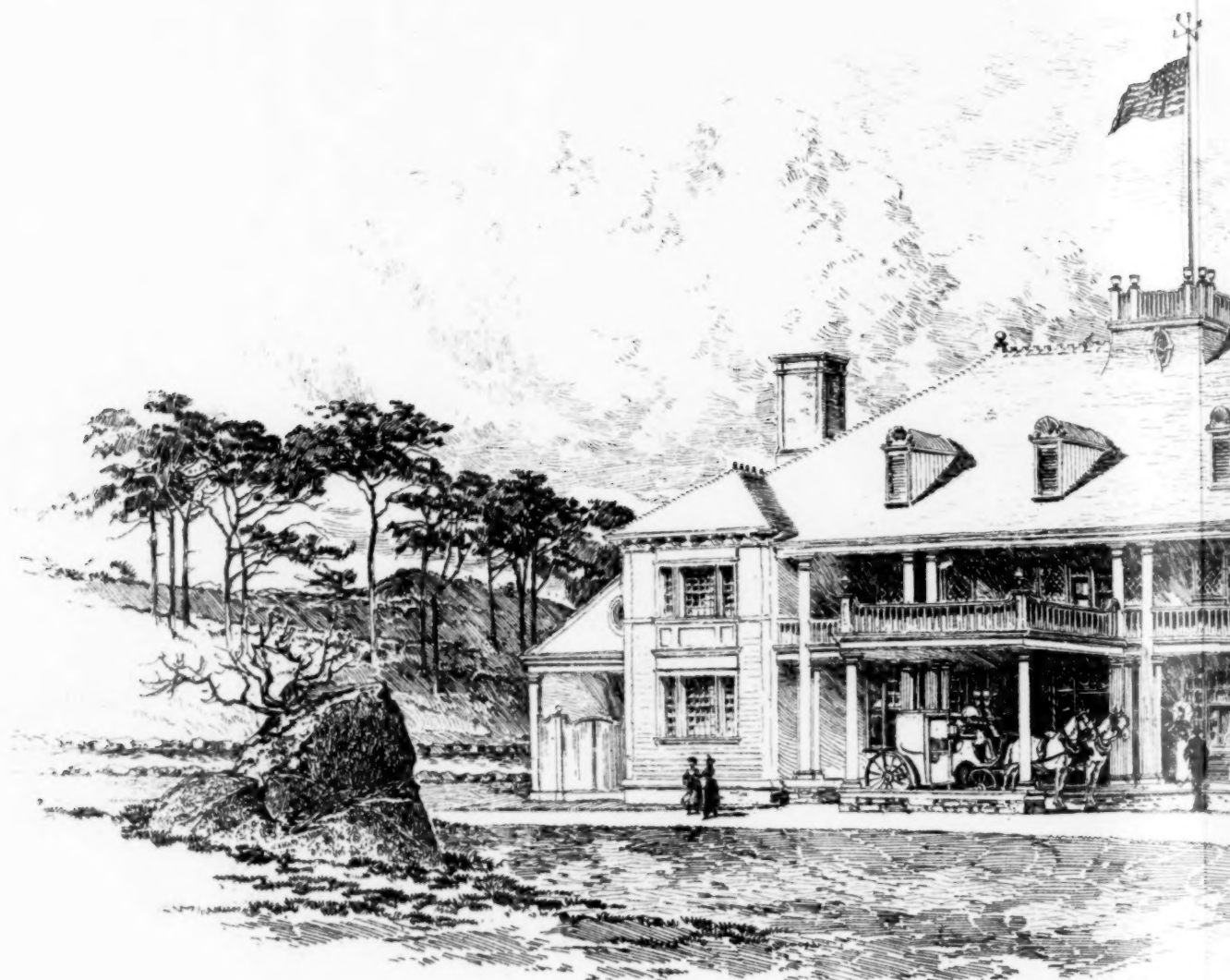
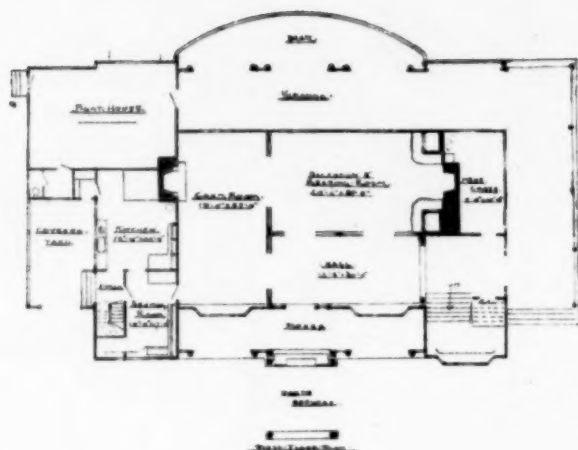
First Floor Plan

TWO PRIVATE DWELLINGS

Nos. 36 and 38 West 57th Street, N.Y.

JAMES E. WARE, ARCH'T.
487 and 489 Fifth Ave., N.Y.

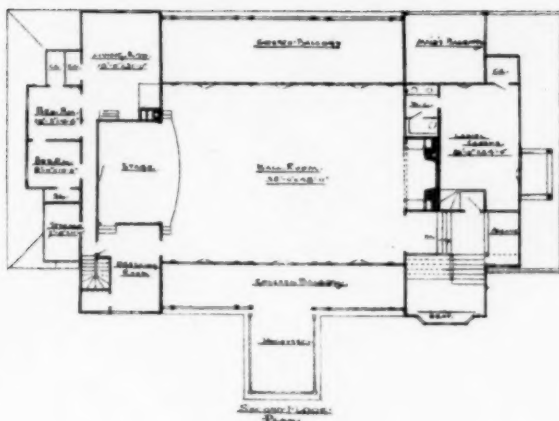
DAVID C. LYALL, OWNER.



Perspective View

Casino at Belle-Haven

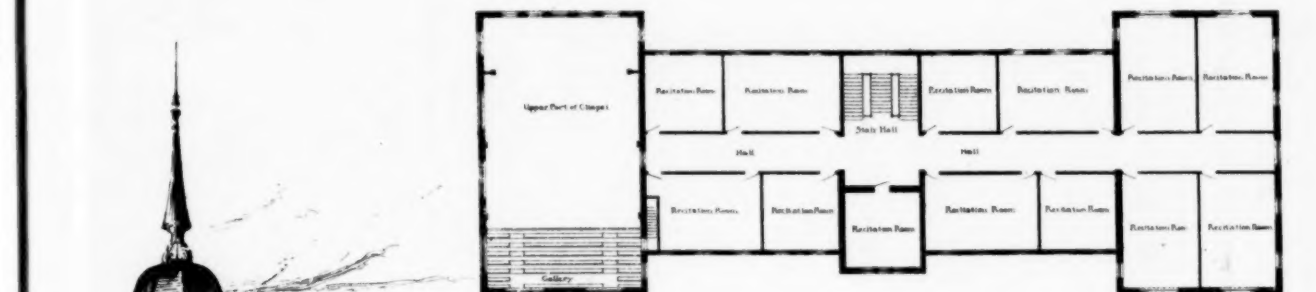
Conn.



Boring, Tilton & Vollen
Architects
125 Union Sq. N.Y.C.

HELIOTYPE PRINTING CO. BOSTON.





Second Story Plan.

