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WE note that the New York *Evening Post* somewhat bitingly recommends us to consult "some elementary work of reference" because we credited to a work of Michael Angelo's the remark that was really applied to a painting by Correggio. Perhaps casual anecdotes are "elements of art criticism"—to some people. The *Evening Post* administers its gentle castigation because of our remarks on the nude in public places, and because of this we will say that our position may be reduced simply to this: the absence of nudity is never shocking to anybody, while its presence in public places is a shock to a great many worthy people, many of whom know quite as much about art as those who defend the misuse of the undraped figure. These objectors, who doubtless pay as much into the public purse as do those who seek to outrage their feelings, and have at least an equal right to influence the use of public money for public purposes, hold morally the better position, since they are the offended party, and it was in their behalf that we insisted that their side of the matter should be fairly presented, since the partisans of "journalism" as the *Evening Post* is fond of styling it, seemed to devote their energies to coming as close as they could to immoral suggestiveness in deriding their opponents.

AN engineer writes to the *Engineering Record*, to "protest," as he says, against the requirement usually included in architects' specifications for steam or hot-water heating, that "the building shall be heated to a temperature of seventy degrees in zero weather." He thinks that this, which, as he says, is the "standard requirement," often causes "bitter experience" to the contractor for heating. This "bitter experience" is, fortunately, in the cases which he mentions, nothing worse than having to wait for their money until it pleases the thermometer to drop to zero, so as to show whether the agreement is performed; but, as in Philadelphia, the place from which he writes, the thermometer did not fall so low for eleven years, previous to the winter of 1892-3, it may be imagined that contractors, in that city, at least, are sometimes put to considerable inconvenience. The *Record* correspondent thinks that heating contractors ought to refuse to sign contracts containing such condition, but thinks that a satisfactory clause might be substituted, to the effect that the heating system should be "capable of maintaining a temperature of seventy degrees on a basis of zero weather," and that no reputable heating contractor would refuse to sign this.

THE trouble about the substitute is that it substitutes some one's judgment for evident facts. If the thermometer outside stands at zero, and inside at seventy degrees, there can be no further controversy as to what the heating apparatus

will do; but to decide, with the outside temperature at perhaps twenty degrees, whether the warming would be satisfactory in colder weather, is a very different matter. A good architect, or an expert engineer, by studying the boiler, the piping and the radiating surface, could infer what the probable result would be, but owners want facts, not inferences, and, even if one of them were willing to leave the acceptance of the apparatus to the architect's judgment, the latter, to make sure that the owner's requirements would be fulfilled, would probably allow a margin for contingencies, in the way of radiating surface and boiler capacity, which the contractor would object to. For cold climates, therefore, where there is no lack of zero weather every winter for trying the apparatus, we still think that the ordinary test is the fairest and best for both parties. It protects the owner, who, if his rooms are sure to be at seventy degrees in such weather, knows that his most important requirement is met; and it protects also the ingenious and scientific engineer, who, if he can obtain this result in an economical way, by skilful piping, and effective application of radiating surface, is not obliged to convince a sceptical architect of the value of his arrangement before he can get his pay. Where zero weather is of rare occurrence, and the owner wishes for a tangible fact as a guarantee, it might perhaps be possible to require that the building should be warmed to seventy degrees, with the outside temperature at, say ten degrees, and a boiler pressure, or back pressure, in the case of heating by exhaust steam, of not more than a given amount, and that the system should also be tested to a much higher pressure to make sure of its capacity for withstanding it if necessary.

HABIT which has grown up among heating contractors, and is, we are sorry to observe, spreading to other kinds of contractors, is to insist on furnishing their own specifications. Probably the laziness or incapacity of architects has something to do with this practice, but if an architect is fit to be entrusted with important work, he knows how to write heating specifications, and if he knows enough to write such specifications, he probably has some definite notions as to how he wishes the steam or hot-water to circulate, what sort of boiler he thinks best to use, and where it will be most convenient for the pipes to run; to say nothing of the preferences that he is likely to have for certain sorts of valves, particularly of air-valves; but the chances are now that, if he writes a specification covering these points, and submits it for estimates, he will not, in return, receive a single proposal based on it, but will, instead, be furnished with an assortment of printed specifications, touching lightly, if at all, on some points which seem to him of great importance, and, in regard to others, mentioning, instead of the appliances that he wants, others, of which he knows nothing, except that the contractor furnishing the specification is interested in the patents on them. If he says that he would rather base the contract on his own specification than the printed form, which is evidently prepared with skill to promote the interests of the party who offers it, he is probably told that it is an immutable law of the bidder's establishment that no contract shall be signed except on the printed form, and, in the end, he submits, perhaps, with a good deal of persuasion, procuring the insertion of a saving clause, that the work shall be done to his satisfaction. Even with this addition, however, troubles often arise in the execution of the contract, from the feeling of the contractor and his men that they are doing the work on their own terms, without being subject to any one's dictation or interference, and the architect has hard work to secure that respect of such contractors for the rights of others which is essential to the successful completion of a building in which several contractors are engaged, and which, in his own specifications, he had carefully provided for. It would be too much to say that architects ought to refuse to consider any bids not based on their own specifications, but it is certainly very advisable for them to insist upon the addition of such provisions as they think necessary for securing the coöperation of the different contractors, and their submission to the architect's authority, to the printed forms, before they advise their clients to sign them. If any bidder should refuse to agree to these additions, his proposal ought not, in the interest of the owner, to be considered at all.

EVERY one who takes any pleasure in literature, to say nothing of the beautiful English domestic architecture of the Elizabethan period, will be interested to learn that the mansion and property of Charlecote, comprising about five thousand acres of land, are to be sold by the Lucy family, in whose possession they have remained since Robert Shallow, Esquire, justice of the peace and Custalorum, boasted there of his three hundred years of gentle ancestry. As is well known, the present mansion was built by Sir Thomas Lucy, the original of Shakespeare's "Justice Shallow," just before Shakespeare's birth. Queen Elizabeth was entertained in the house in 1572, when it was probably just finished, and it has remained practically unchanged since. There is hardly in England, and, if not in England, certainly nowhere else in the world, a private estate with which so many memories are associated. Justice Shallow, according to Shakespeare, underrated the antiquity of his family. It is not six hundred, but eight hundred years since Walter de Cherlecote, who was known as the patron and founder of the monastic establishment of Thelesford, near Charlecote, assumed the name of Lucy, which he transmitted, with his great estates, to the descendants who still hold them. Outside of the royal families, there are very few people in Europe who can trace their descent in an unbroken line to the twelfth century, and fewer still who live on the spot which their ancestors have occupied for eight centuries, so that, even without their connection with Shakespeare, the exile of the Lucy family from Charlecote would excite interest and sympathy.

A CURIOUS tomb has been found at Alexandria, dating from the early Christian period, but belonging to the sect of the Gnostics, or rather, to that small division of the Gnostic heretics known, from their reverence for the serpent emblem, as Ophites. The Ophites, like many other people who pride themselves on their superior spirituality, were very lax in their observance of the rules of morality applicable to more ordinary persons, and they frequently attracted, in consequence, the unfavorable attention of the secular authorities. For this reason, probably, the Alexandrian Ophites, like the Roman Christians before them, were accustomed to hold their devotional meeting in subterranean galleries, which served also as places of burial, and it is one of these galleries, rather than a tomb, which has been discovered, in what is now the Park Antoniadis. The opening of the gallery is in the face of a rocky ledge, and is well concealed by the bushes with which the rock is now, and probably always has been, overgrown. From the entrance, a flight of forty-six steps leads downward to a room, about twenty feet square, into which open five other rooms. The large room was evidently intended as a place of meeting, and a well still exists in it, sunk in the floor near the foot of the staircase. Whether the well was intended to furnish water simply for the refreshment of the congregation, or for baptism, which was a ceremony of great importance among certain of the Gnostic sects, does not appear, but it was probably for the latter purpose. The smaller rooms, although only open doorways, or even rows of piers separate them from the central hall, were devoted to sepulture, the walls being pierced with deep *loculi*, in which a coffin could be thrust endwise. There is a great difference in richness of decoration between the various sepulchral chambers, and it is possible that they were the private property of individuals or families. One, however, the richest of all, seems to have been devoted to the priests, or rather teachers, of the congregation, for it contains, in the middle of the most conspicuous wall, a representation, in high relief, of an immense serpent. In this wall, grouped around the serpent, are three *loculi*, one below the figure, and one at each side, which seems to have belonged to the highest ecclesiastical officials of the community. Apart from the serpent sculpture, the room is decorated with a dentilled cornice, and *antæ* at the angles, while a representation of an altar, with engaged columns and mouldings, formed a frame for the serpent, and pilasters and engaged columns, with a sort of pediment, and rows of round shields, ornament other portions of the enclosure. Three of the other rooms show pilasters and moulded cornices, but are otherwise plain, and the walls are filled with *loculi*, one room having thirty, and another twenty-seven. Traces are, however, found of painted inscriptions and decorations, in bright colors, on the walls around the openings of the *loculi*. The fifth room, situated at the foot of the staircase, close to the wall, is decorated with pilasters, and a dentilled cornice. There are no *loculi* in the walls, but a stone

bench runs around three sides. The proximity of this room to the well, with what is known of the Gnostic ceremonies, seems to indicate that it was a waiting-room for the neophytes, who were obliged to remain there, as in a sort of narthex, until baptism with the water of the well had prepared them to participate in the sacred ceremonies. What these ceremonies were, we can only infer from the exaggerated accounts of the orthodox enemies of the sect. According to them, the principal service was a sort of mass, in which bread was placed on the altar, and the congregation, surrounding it, sang a series of hymns, ending with a prolonged *diminuendo*. As the voices died away, leaving the participants in a state of exalted anticipation, a rustling was heard and a monstrous serpent, trained for the purpose, glided out of the darkness, climbed the steps of the altar, and coiled himself around the bread. This formed the consecration of the sacrament, and the worshippers, after prostrating themselves before the reptile symbol of the Good Spirit, took the bread and divided it among themselves, singing hymns to the glory of the Eternal. It may be imagined that the atmosphere of a subterranean temple of this sort would be none of the most wholesome, and, in order to give some sort of ventilation, holes were pierced at intervals in the vaulted ceilings of the rooms, which were carried to the surface. The ceiling of the main room has fallen in, but the traces of these shafts are visible on the fragments, and the ventilators in some of the smaller rooms are still intact. *L'Architecture*, from which we borrow the account, written by M. Hippolyte Boussac, of this most interesting discovery, says that the place is constantly wet, by infiltration from the Mahmoudieh Canal, which passes near, and the stonework is rapidly decaying.

M. ANDRÉOLI, in the *Revue Industrielle*, describes a simple method of obtaining chlorine and caustic soda, by electrolysis from common salt, which is not only interesting as a piece of industrial chemistry, but is of great value to paper-makers, who consume immense quantities of caustic soda and bleaching powders, and could, by this process, make them for themselves, on their own premises, for half the money that they have to pay for them in the market. M. Andréoli gives a photographic view of his little electrolytic plant, which consists of a slate tank, with a slate cover, divided by partitions of porous porcelain, made with asbestos, and slowly baked at a high temperature, — 1,500° Centigrade. This substance is not attacked either by caustic soda, or nascent chlorine, and, while very porous, so that it has little electrical resistance, it prevents entirely the diffusion of the soda and chlorine between the positive and negative compartments. The anodes are of retort-carbon, set in the slate cover of the tank, so that nothing but the carbon is exposed to the chlorine vapors, the metallic connections, which would otherwise soon be destroyed, being above the cover. The cathodes are of metal. In order to reduce the electrical resistance as much as possible, the pairs of anodes and cathodes are set close to the porous partitions. In this way, with a pressure in the tank of less than four volts, decomposition of the salt water contained in the tank goes on very rapidly. Glazed earthenware pipes are set in the slate cover, so as to receive the chlorine gas from the positive compartments, and an ebonite pump forces it into wooden casks, where it is automatically shaken up with milk of lime. The chlorinated liquid from the positive compartments, by another pump, is made to circulate through a series of pipes, and return again to the tanks, simply to keep it cool; and the alkaline liquid from the negative compartments circulates in the same way through an iron reservoir, returning again to the electrolytic tank. As the separation of the chlorine went on, the liquid would soon be exhausted, and decomposition of the water would begin, if the supply of salt were not renewed, and this is done very simply by means of a cylinder, standing in the liquid, and containing salt, which gradually dissolves, and keeps the solution saturated. Of course, as the chlorine is disengaged from the positive compartments, the liquid in the negative compartments becomes richer in soda, and it is finally drawn off, and the soda solution concentrated for use, while the process is recommenced with fresh solution. The power to drive the dynamo and pumps is small, and M. Andréoli estimates that, with coal at twenty francs a metric ton, and counting in the cost of salt and lime, the expense of concentrating the soda solution, and of labor, the cost of his chloride of lime and alkali is less than half the market price.



THE FRENCH RENAISSANCE.<sup>1</sup>—III.

LET us glance first at the characteristics common to the two above-mentioned periods, that is at the essential characteristics of the Renaissance itself. The most prominent, and until recently, the most misunderstood of these is nationalness. Our architects of the sixteenth century were never for a moment plagiarists, nor for a moment did they allow the action of the Italian architects to be substituted for their own.

The Renaissance, from the reign of François I, rapidly severed its material connections with the Gothic; but, though the letter was effaced, the spirit still lingered, the spirit that had animated the Pointed style and, previous to that, the Romanesque, the spirit that had presided at the transition from the one to the other.

Therefore, in the sixteenth century we sometimes find not only tastes and preferences belonging to the Pointed period perpetuated, as has been sufficiently shown for the transitional period of the reign of Louis XII, but also, what is much

of revised, corrected, and finished edition of Romanesque art. Although in France, Renaissance art, like the Romanesque, was an intermediary period between antique and Pointed art, the transition was accomplished this time in an opposite direction and the positions of the two styles with reference to each other, under the last Valois, was not what it had been under the first ten Capetian princes. Architects had matured with the experience of four centuries, they had been practised in the Pointed style, the training of the hand was no longer a thing to be accomplished, and they found themselves, with regard to ancient art, in a systematically conciliatory attitude. They were no longer, as in the twelfth century, in despair at the thought of bending Classic traditions to the necessities of an uncompromising liturgy; they disturbed themselves little about that; the concessions that seemed to be requisite for bringing about this happy and fruitful union, which seemed possible and even easy, were to be made in the field of civil architecture, which was then in the ascendancy and which had less to do with technical difficulties. Far from appearing as

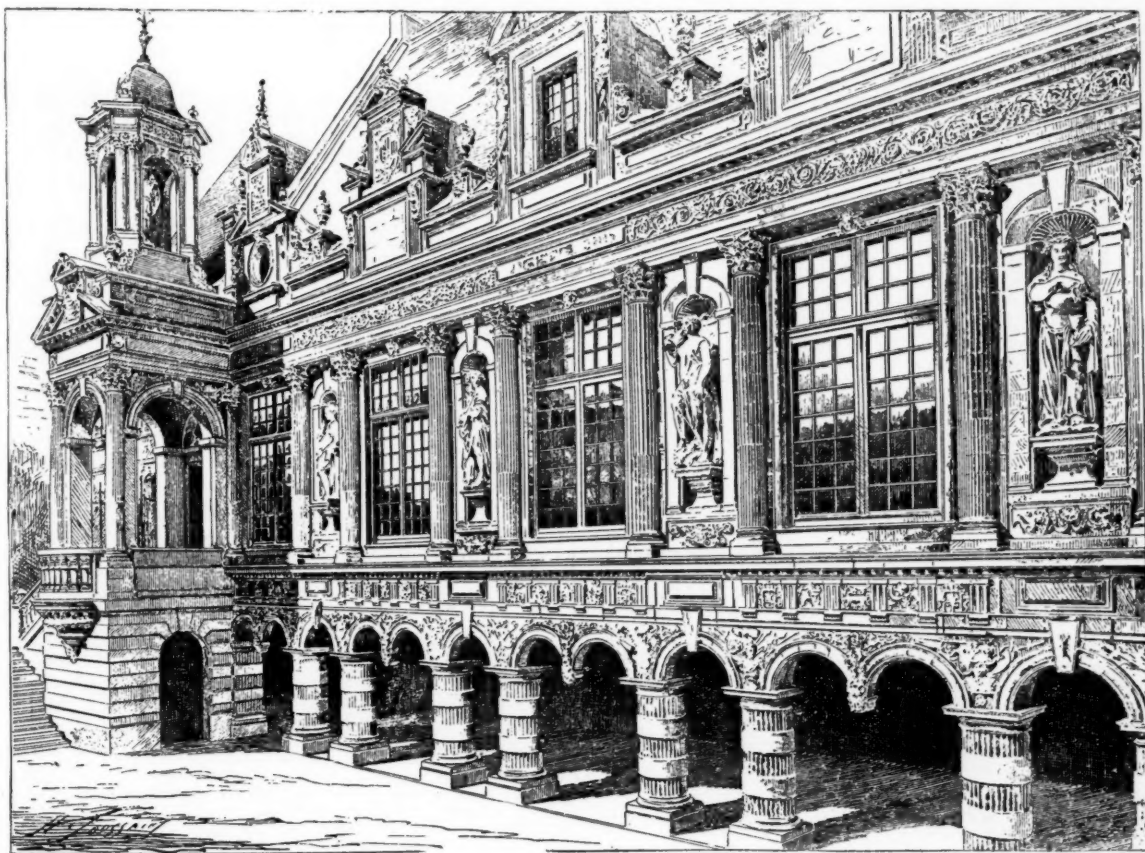


Fig. 6. Hôtel de Ville at La Rochelle.

stranger, unquestionable survivals of the Romanesque art. The logic which, in the eleventh and twelfth centuries, had forced Greco-Roman architecture to submit to compromises, naturally led now to compromises and, consequently, to analogous forms. Surely, we must not seek in any sentiment whatever of archaeological imitation for these but slightly marked coincidences: these colonettes in the splays, these covings with trail and various other decorations, these Corinthian capitals handsomely chiselled or loaded down with fantastic motives, these bases with claws, these gemel-windows, which, in the cloister of Fontevault or in that of Saint-Sauveur de Melun, for example, in the bell-towers built in Anjou by Jean de Lespine, in certain portals of the Burgundian school with semicircular arches, force one to an effort to convince himself that he is not looking at a monument of the time of Louis le Gros.

But this is only one of the piquant sides of the French Renaissance; in its ensemble it could not be converted into a sort

of an enemy and an obstacle, ancient art was looked upon as a valuable auxiliary which only needed to be subjected to a humanizing and disciplining process; the prestige of youth, which it owed to its long sleep and to the successes of Italian architects, soon converted it from an auxiliary and associate, into a master; but, when this transformation was effected, the Renaissance had ended.

The French spirit had contracted in the practice of Gothic art a disdain, almost a disgust, for symmetry; though in a softened form, this same disdain appears again during the Renaissance. The Classic module, profiles and ornaments, were adopted; the semicircular arch supplanted the broken arch, which was confined to a few vaults or church windows, and also the flat arch, which nevertheless did not disappear altogether but took on new features. This Classic order did not, however, extend above the first story and as it did not have the supremacy in the general disposition, whenever the slightest conflict occurred with the programmes, it was obliged to compromise, yield and distribute itself irregularly, except in the case of a few edifices that were conceived with an exceptional

<sup>1</sup> From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 946, page 64.

effort toward the "grand style." Bullant, that he might have an opportunity to introduce at Écouen, in all its majesty, the column of the temple of Jupiter Stator, drawn by him at Rome, made use of the colossal order (Fig. 5); but this combination is almost unique and is seen in full vigor only

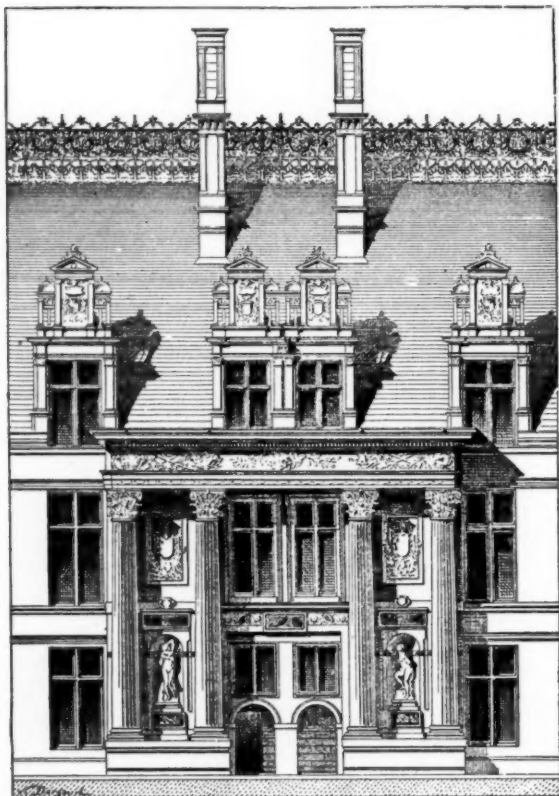


Fig. 5. Door of the Château of Écouen.

under Louis XIV. Strangely enough, in compensation for this, at the very moment when Bullant took this premature step toward modern art, his *confrère*, Philibert Delorme, was composing a "French order"; owing to the difficulty of quarrying and transporting monolithic shafts, for the sake of economy, it became necessary sometimes to resort to the use



Fig. 7. Fireplace in the Hôtel du Vieux-Raisin, Toulouse.

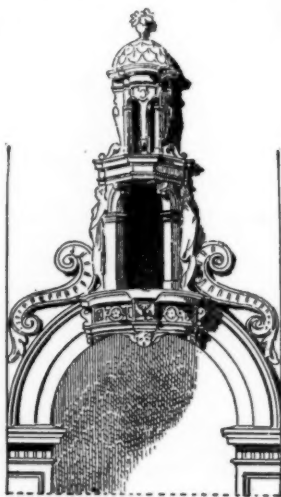


Fig. 8. Dais at Saint-Maclou, Pontoise.

of tambours; Delorme considered it illogical to seek to conceal these; he thought it was better, on the contrary, to accuse them sharply by alternations in the diameters, or by the ornamentation, a process which was later extended to the courses of the pilasters and walls. (Fig. 6.)

From the handling of Pointed architecture came also a tendency to verticality—a tendency of which the persistent steepness of the roof is not the sole reminder. The doors with the windows, and the windows themselves, are grouped in a way to add to the appearance of height rather than breadth, forming, especially in the pavilions, towers and turrets, elaborate decorations which are still further elongated by being made to correspond to rich dormer-windows. Special thought is, likewise, from habit, given to the crownings, particularly when they stand out directly against the sky; their lines had to be varied harmoniously; and the balustrades, pinnacles, dormer-windows, crests and finials were treated in this respect with scrupulous care. Through an exaggeration of brutal logic, which might be set down as a protest against Italian methods of treatment, if its germs were not to be detected in the dwellings of the Middle Ages, the external chimneys were abnormally developed, thus admitting of wonderful varieties of composition and ornamentation and raising these minor members to the rank of principal elements. While in Italy, with the exception of the huge domes, the cornice is the terminal feature; in France, it merely indicates an edge of an edifice, and sometimes it serves as a base, or point of departure, as well as a finishing. At Chambord, the zone of the roofs was so captivating to the architect that the rest of the castle gives one the impression of having been



Fig. 9. Well at Kerjean (Finistère).



Fig. 11. Trill and Arabesque Patterns.

built for it. Lastly, the binary disposition, so out of harmony with Greco-Roman ideas, which admit of neither pier, nor column, nor *piedroit* in the axis of a structure, was maintained down to the complete triumph, under Louis XIV, of academic ideas.

Between these principles on the one hand, and, on the other, the great pediment and the great dome, which enjoyed such wide-spread popularity in Italy, our architects of the sixteenth century thought to discern signs of incompatibility; toward these two important elements they assumed an attitude of distrustful reserve, which was not overcome until some time during the seventeenth century. They utilized the pediment and dome only for details, reducing greatly their dimensions and minifying their rôles. The antique pediment itself was out of the question, owing to the slope of the roofs, for no one had yet thought of introducing an obtuse pediment in front of a steep roof; it figures only at a comparatively late date in dormer-windows very near the sky; but above windows and doors, and, strange to say, over fireplaces even (Fig. 7), framed with columns, pilasters and arches, or under cornices, the disposition was promptly enough tolerated, and tolerance very soon became fashion.

Bell-towers were capped by a cupola, which did not, however, occupy the entire breadth, if this seemed at all excessive.



The upper story was sometimes narrowed by means of a truncated cupola, and the terminal dome rested on a circular or polygonal drum. The towers of the Cathedral of Tours realized the perfection of the style. In turrets, buttress projections, pinnacles, canopies (Fig. 8), fountains or wells (Fig. 9), loggia-like watch-towers (Fig. 10), and altar-screens, where small dimensions were rigorously necessary and where the cupola no longer formed a constructional element, it was lavishly introduced and almost always in the happiest fashion.

In view of this powerful, rational and earnest personality, did our architects need the stimulus of assiduous and constant competition on the part of foreigners? We are forced to acknowledge that there would have been no French Renaissance, or, at least, that Renaissance would have been wholly unlike what it was, if there had been no Italian Renaissance; it is also true that Italian architects visited France, that they made themselves very useful there and that French architects were compelled in their course of training to study Italian productions; but the initial impulse once received, these artists were very soon perfectly capable of choosing their own course and following it without continual guidance; more than this, they even carried their masters along with them. In the

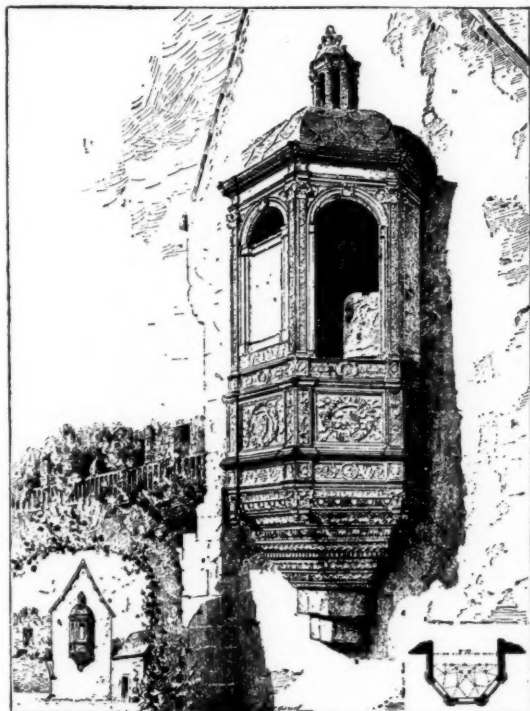


Fig. 10. Loggia of the Château de Vitré.

latter part of the reign of Charles VIII, and early in Louis XII's, Italy transmitted directly to France many details which had not yet been rejected by the Florentine, Venetian and Milanese Schools and which had great success with us: arabesque and trail ornamentations (Fig. 11), pilasters with lozenge decorations, colonnettes of varying entasis, figure medallions, shells and small pediments with openwork finish; but, later on in the sixteenth century, when the Roman School of San Gallo, Bramante and Michael Angelo had been established, what could Italy have bestowed upon France except that Classic art, which, in fact, did not gain free admittance here until a hundred years later?

France indeed possesses a few purely Italian works of the sixteenth-century style at its height; for example, the doorway of the Hôtel de Ferrare at Fontainebleau, designed by Serlio, and two singular edifices, a manor and a sepulchral chapel, built in Brittany in imitation of the Cancelleria at Rome, by a prelate desirous of perpetuating the memory of some high functions which he had discharged in the Eternal City; but these constructions are so out of harmony with everything around them that one is at once convinced that the exception proves the rule.

We may also note that of all the Italian architects who came to France, none ranked among the first at home — San

Gallo passed through Provence merely to get some sketches of ancient monuments —, none had sufficient prestige or influence to force his views, his methods, or his plans upon this country. Nothing can convince one of this more conclusively than an impartial examination of the importance of the rôle played by the Palace of Fontainebleau — a rôle too readily exaggerated. The artistic movement of which this royal residence became the theatre in the sixteenth century was doubtless a considerable, even an exceptional, one; but it came a quarter of a century too late to alter in any notable fashion the course of French sculpture and architecture; at the very most, it seriously affected only the destinies of painting. And, above all, notwithstanding the share which foreign masters seem to have had in the movement, it remained in its general lines preëminently national.

[To be continued.]

## PUBLIC SQUARES.<sup>1</sup>—IV.

### MONUMENT SQUARES.

WHEN the monument constitutes the principal object, the square becomes a "monument square." We have already seen, in many of the



Fig. 60. Piazza Carlo Emanuele, Turin, Italy.



Fig. 61. Piazza Savoia, Turin, Italy.

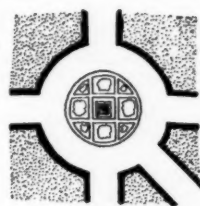


Fig. 62. Karolinenplatz, Munich, Bavaria.

examples cited, monuments suitably placed on traffic, garden, market and architectural squares; but some of these are not adapted for monuments while others adapt themselves particularly well.

It is not permissible to place a monument in the centre of one or more lines of view, without considering whether the traffic and the line of sight are disturbed thereby and whether the street stands in correct relation to it. Figures 60 and 61 are not suitable for monument sites on account of the inconvenience imposed on the traffic. In this respect, however, the Obelisk of Munich (Fig. 62) is better placed, while the Thiers Monument, at Nancy (Fig. 63), disturbs the traffic but little.

The positions of the monuments in Figures 14 and 64 are very effective, the passage around the monument in Figure 64 being only for pedestrians. In the place where stands the monument to Buodognatus at Antwerp, the traffic from the Avenue Charlotte to the Rue des Nerviens is certainly much hindered by the garden, and the same hindrance is felt in Figure 65, but not at all in Figure 66. In all the last-mentioned examples the effectiveness of the monument is undoubtedly heightened by plantations. A most prominent monument square is the Piazza dello Statuto at Turin (Fig. 67), surrounded by monumental buildings with colonnades. At one end in the axis of the Via di Dora Grossa stands the high and effective rock pyramid, enlivened by fountains and marble figures, and crowned with an allegorical angel figure commemorating the completion of the Mt. Cenis Tunnel.

The Place de la Concorde, Paris (Fig. 57), in size and arrangement is the richest monument square in Europe. It is enclosed by a monumental stone breastwork, the eight corners of which contain colossal figures representing eight French cities in a manner guarding the entrances, which are also emphasized by magnificent

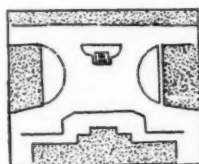


Fig. 63. Square Thiers, Nancy, France.

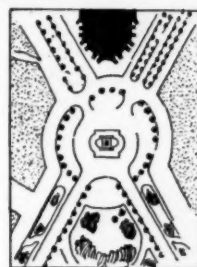


Fig. 64. Loos Monument, Antwerp, Belgium.

candelabra. In the centre stands the celebrated Obelisk of Luxor and on either side in the longer axis, two beautiful several-storied fountains. From the centre through four magnificent streets a view is obtained of the Madeleine, the Palais de la Chambre des Députés, the Louvre and the Arc de Triomphe de l'Étoile, each of which forms the terminal point of the line of sight. The effectiveness

<sup>1</sup> A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 946, page 67.

of the square would be heightened if the surroundings on the Seine side were of a more enclosing character. The Place is 390 yards in length by 235 yards in width and is bounded on the south by the Seine, on the west by the Champs-Élysées, on the north by the Rue de Rivoli and on the east by the Garden of the Tuileries.

Trafalgar Square, London (Fig. 68), has the advantage of being better enclosed and, although of small size (within the breast walls

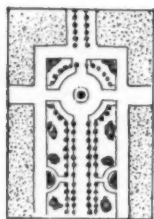


Fig. 65. The Maximilian Monument, Munich, Bavaria.

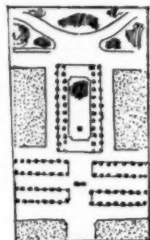


Fig. 66. The Leys Statue, Antwerp, Belgium.

100m. x 100m.), it is very impressive. The very high Nelson Column, the statues of Napier and Havelock, and the two fountain bowls constitute the decoration and, by contrast, diminish in effectiveness the equestrian statue of Charles the First at Charing Cross, which is directly in front. Both the Place de la Concorde and Trafalgar Square, as they have no garden decoration, serve admirably for public festivities.

**Double, or Twin, Squares.**—In the laying-out of a city and in city-enlargement, the designer, after carefully considering the requirements, often finds it necessary to create an open square serving several purposes at once, as a market and architectural, or monument and garden square. As the traffic square least of all adapts itself to other purposes, it frequently becomes necessary to place a second square along side of it, which gives rise to the double square.

A twin arrangement of unusually large dimensions and great effectiveness is shown in Figure 14. The streets lead up from the Via di Porta Venezia, with a slope of 1:20, to the traffic square directly in front of the railway-station.

Equally good is Figure 69, the Piazza Acquaverde at Genoa, the lower half of which is used for the traffic while the upper half, covered with beautiful plantations and enclosed by the ascending streets from the Via Balbi, makes a suitable site for the monument to Christopher Columbus.

The Piazza Grande, at Trieste (Fig. 70), shows a combination frequently made of a garden with an architectural square. The open place is the fore-square to the city-hall and is decorated with fountains and monumental candelabra.

The combination of the traffic square with the architectural fore-square is exemplified in Figure 71: the church of St. Vincent de Paul rises on the decorated garden terrace beyond the Place de Lafayette and forms the terminal point of the Rue d'Hauteville. The gentle concave ascent of this street adds much to the already effective position of the church.

#### THE ARTISTIC CONSIDERATION OF THE PUBLIC SQUARE.

The most important relation of the public square to the city is its artistic relation. The shape and decoration of the square are, therefore of the greatest importance in giving a pleasing aspect to the city, which, once built up, is exceedingly difficult and expensive to alter and rearrange.

We will now discuss the enclosure, the arrangement of the buildings, the size, the position of monumental buildings, the grouping of squares, and the furnishing and subdivision of the square.

(a) **The Enclosure.**—It is the architectural frame that makes the free and open place a square. A mere line on the

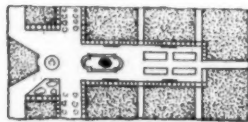


Fig. 67. Piazza dello Statuto, Turin, Italy.

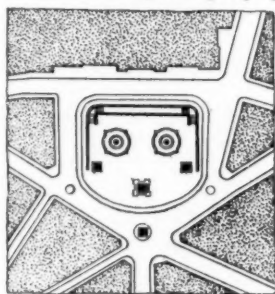


Fig. 68. Trafalgar Square, London, England.

plan, or an enclosing wall or plantation is not sufficient. Street-crossings and enlargements are not, artistically speaking, city squares and even the traffic square, which on account of its purpose is open on many sides, only exceptionally possesses the character of the architectural square when the intersections of the traffic streets with it are concealed or subordinated by an arcade or colonnade carried over the mouths of the streets.

The traffic squares, shown in Figure 20 by the enclosing railway-station wall on the one long side, Figure 21 by the gate and buildings on one side and the ramps on two of the other sides, Figure 18, and particularly Figure 19 by the arcades surrounding the open space, show in part the necessary characteristics of the architectural square. In general, the traffic square, open on many sides and crossed by wagons and pedestrians, is somewhat disturbing and unrestful, and artistically unsatisfactory.

It is evident that the enclosure cannot be complete, as streets of approach are necessary, but their entrances, as already shown in Figures 19, 21, 29 and 69, can be partially hidden and so arranged that the enclosure is cut up as little as possible.

The colonnade either supports the façade, is built out from it as a portico, or is an independent structure as at St. Peter's, Rome. In all three cases it serves as a covered walk and gives to the square a decorative frame.

The wrought-iron grilles of the Stanislas Place in Nancy (Fig. 11), the breastwork balustrade of the Place de la Concorde (Fig. 57), and the breastworks on the short sides and the terraces on the upper long sides of Trafalgar Square, London (Fig. 68), are peculiar kinds of enclosing framework. As a substitute for closing the mouth of the street, such an arrangement may be adopted that the opening will appear of little importance, so that the spectator on entering the square sees in front of him an enclosing architectural wall and not a distant perspective through the continuation of the street. In many old cities these considerations were regarded and the streets were made to enter the square in the direction of the openings of a turbine wheel, as in Cologne, Stralsund, Düren, Brunswick, Ravenna (Fig. 72), and Mantua (Fig. 73). Two streets should not enter a square directly at their intersection, as they would make too large an opening in the frame. It is, therefore, desirable, if the conditions of traffic permit, to have them intersect well out of the square, letting but one enter.

(b) **The Symmetrical and Picturesque Arrangement of Buildings.**—The buildings surrounding a square require a certain harmony in composition which is obtained in many instances by similarity or a symmetrical arrangement, as in the Place Vendôme, the Piazza of St.

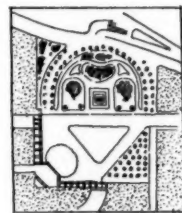


Fig. 69. Piazza Acquaverde, Genoa, Italy.

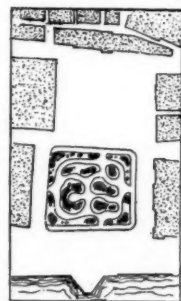


Fig. 70. Piazza Grande, Trieste, Austria.

Mark's, the Campidoglio and others; but it is obtained as well by a picturesque arrangement of buildings of different kinds so often seen in the Market Places of the Middle Ages, as at Lübeck, Bremen, Stralsund, Breslau, Cracow, Brussels, Vienne and others. Generally, in these squares, the city-hall, a court building or a church constitutes the main picture in the framework, and other buildings such as jails, guard-houses, inns, etc., are picturesquely grouped around it.

Two main buildings can be placed on opposite sides of the square without difficulty, as the eye is not confused by seeing both at once; but it is questionable to place two such buildings together on the same side, even if they are symmetrically disposed with respect to the axis of the square. This arrangement which gives to the buildings a coupled appearance is often employed in modern cities, but the necessity of two similar and equally important buildings does not often occur; when it does, however, the coupled arrangement should not be forced by the city plan. In spite of the changed conditions of business and traffic, the carefully-studied and artistic surroundings of a square are indispensable if we wish to raise the standard of our cities to the high level of those of antiquity or of the Renaissance.

(c) **Shape and Size.**—If the city square is to have an enclosed effect, its plan must be such that the entire composition has unity.

Enclosing lines that are too much cut up, as in Figure 4, with many corner projections, destroy the effect of unity. Concave lines should be striven for and the convex avoided in the plan.

This does not require that the building-lines shall conform to a curve, but that the designer should arrange the buildings on somewhat the same principle that the photographer employs when he places the individuals of the group with an artistic freedom in a generally concave line, giving to a few only of the more distinguished a prominent position.

The effectiveness of such squares as the Leipzigerplatz, Berlin, the Place Vendôme, Paris, the oval fore-square of St. Peter's, Rome, and others, depends largely on these considerations. Indeed many traffic squares, intersected by streets on all sides, are successful by virtue of their concave building-lines.



The public square does not require a strict geometrical shape, nor any strict symmetry, but an æsthetic balance is necessary. The accentuation of misshapen forms should be avoided. The mediæval squares, apparently arbitrary in shape, but in reality the growth of centuries, must not be imitated in spite of their great beauty; for, however well they satisfied the requirements of their period, they would not those of to-day, and that much of their beauty due to the picturesque effects of time would be lacking in a modern reproduction. But, in spite of the difference between modern and mediæval times, we learn from the irregularity of the old squares that we can make ourselves independent of conscientious regularity and symmetry in the details when the entire composition is to be adapted to our own times.

From this it follows that we need not be hampered by a straight-edge and compasses, although these are the instruments which we must make use of.

The Piazza Erbe, at Verona, is very pleasing, although the two sides are not symmetrical, nor are the details regularly disposed. By such irregularities, projections and recessions, squares like the three-cornered, not in themselves beautiful, may be made enduring and even picturesque, whereas, in the strictly symmetrical triangular square so usual in modern cities, the building-lines join each other harshly.

*The Size.*—The size of the square should be regulated by the purposes for which it is intended and by the size of the buildings to be erected upon or around it. The valuable work by H. Maertens "*Der Optische Massstab, etc.*," and the comparative study of known squares furnish data from which the size of a square can be artistically regulated. Maertens gives the four following rules:

1. A distance equal to the height of the building, giving an angle of sight to the top of  $45^\circ$ , is particularly suitable for viewing the details.
2. A distance of twice the height, giving an angle of sight of  $27^\circ$ , can be considered as normal for viewing the building as a whole.
3. A distance of three times the height, giving an angle of sight

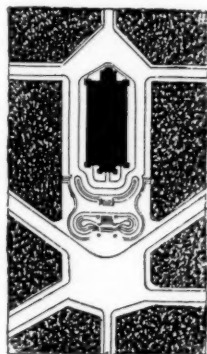


Fig. 71. Place de Lafayette and the Fore-square of St. Vincent de Paul, Paris, France.

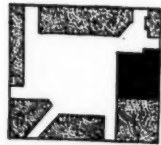


Fig. 72. Piazza del Duomo, Ravenna, Italy.



Fig. 73. Piazza San Pietro, Mantua, Italy.

of about  $18^\circ$ , obliterates the detail and combines the building and its surroundings in a composition.

4. A distance of four or five times the height furnishes merely a picturesque ensemble, in which the building is effective only by means of its outline.

Towers and the like and unusually high roofs should be included in the height of a building. The greatest angle of elevation that still permits a distinct view of the building is about  $70^\circ$ .

According to the above rules, the width of a street or square on which a building is to be erected should be, at least, equal to the height of the structure. Most city regulations permit a height greater than the width of the street; on the other hand, a too great width of street is undesirable.

Hence, it follows that the greater number of mediæval squares are too small and many modern squares excessively large.

From these rules of Maertens's, we conclude that the square which is more than twice or three times the height is unfavorable to the effectiveness of the building. This, however, does not exclude a dimension even as great as four times the height in order to view the building in connection with its surroundings, for such a square is as permissible as the street on which the building forms the terminal point of view. But even in the streets the proportions must be considered, for, if the distance be increased to more than six times the height, the importance of the structure in appearance is much diminished, unless an immediate comparison with smaller buildings is possible. Maertens's rules hold good in the beautiful Piazza of St. Mark's (Fig. 6), from the centre of which the old Council building has an elevation of  $29^\circ$ , the new one less than  $33^\circ$  and the church less than  $28^\circ$ , whereas looking from the sides of the square across its length, the first two angles become respectively  $16^\circ$  and  $18^\circ$ .

In the Piazza Colonna, in Rome (Fig. 9), one sees from the Corso

the Palace on the opposite side of the square, at a distance two and one-half or three times its height, and also the Column of Marcus Aurelius, 29m. high, at a distance of 40m. Hence a good view of both the palace and the column is obtained. The Cathedral Square of Milan (Fig. 40) has the proportion of depth to height of 3:1 (169m. to 56m.) but does not give a true impression of its size



Fig. 74. Domplatz, Regensburg.

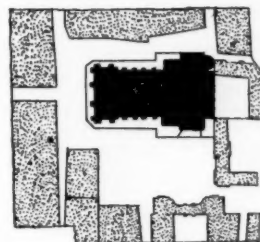


Fig. 75. Munsterplatz, Strasburg.

because here is lacking some intermediate feature to give scale, and the façade of the church is not sufficiently prominent with respect to the other high buildings. In the square of the Cathedral of Palermo (Fig. 41) one sees the building from the opposite side of the square at a distance which is somewhat less than twice the height, hence the impression is so much the more imposing.

St. Peter's, Rome (Fig. 7), when seen from the Piazza Rusticucci does not give the expected impression of immensity, for although the dome is 143m. high it is 420m. distant—about three and one-half times the height—while the façade is 340m. distant, almost two and one-half times the height; hence, the impression of the dome is picturesque in character, appearing as a part of the magnificent surroundings.

The Campidoglio, Rome (Fig. 10), and the Piazza dell' Annunziata, Florence (Fig. 8), illustrate the beauty of the proportion of height to length of one to two or two and one-half. The proportion of the Kaiserplatz at Strasburg being 1:4, it is not surprising that the palace does not produce from most points-of-view the desired majestic impression.

The Königsplatz and Friedrichsplatz, at Cassel, the Rathausplatz at Vienna and the Szechenyiplatz, at Szegedin, show proportions of 1:8 or more. The reverse, a proportion of less than one to one of height of building to the distance across the square is found in the city-hall squares of Brussels and Cologne, as well as on the long side of the Cathedrals of Regensburg (Fig. 74) and Strasburg (Fig. 75).

It is evident that high tower-fronts, domes and cupolas, require a form of square that permits a greater distance from which they can be viewed. Long buildings, that are not very high, such as city-halls, museums and the sides of churches should be placed on the long sides of the square.

The St. Mark's Square (Fig. 6) is shaped with regard to the height of the Church at the wide end and the long and low civic buildings on the other sides. It would be a useless task to deduce standard rules for the proportions between the length and breadth of the

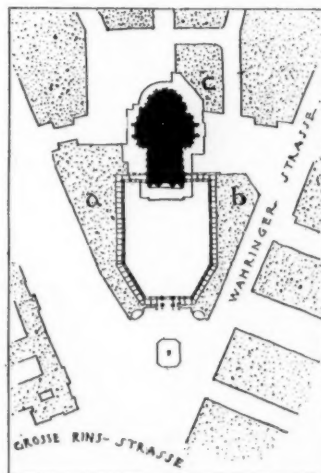


Fig. 76. Maximilianplatz, Vienna, Austria.

square. Those which approach the square form, as in Figures 3, 8, 10, 11, 54, can be aesthetically as satisfactory as those which are rectangular or oblong (Figs. 22, 23). We have to consider solely the perspective impression which depends upon the point-of-view of the beholder, the building surrounding the square, and its adornment or decoration.

The more a square is elongated, the more it resembles a street—the limit of the elongation being probably marked by the Piazza Navona, Rome (Fig. 22), which has a proportion of 1:4, breadth to length. The so-called Friedrich Wil-

helmplatz, at Aix-la-Chapelle (1:6), and the so-called Stäudelplatz, at Cassel (1:7), appears principally as streets.

The praiseworthy attempts to enlarge too narrow or restricted streets, to remove buildings that are too near or built against monumental structures, are at present found in Italy, France and Germany. But the opposite also occurs, the restriction of squares that

are too large, in order to surround the monumental buildings with a closer frame.

The propositions of Sitte for restricting the surroundings of the Justice Buildings, Burg Theater, the City-hall and Votive Church, Vienna, by minor groups of buildings contain many artistic truths and for the development of the city plan, in the future, may prove to have fruitful results. Figure 76 shows a sketch by Sitte for the improvement of the Votive Church at Vienna. The large open place between the Ring Strasse and the Church and the smaller squares behind the choir, would, according to this scheme, be partly built upon by the blocks *a*, *b* and *c*, thus giving to the tower-front a monumental enclosure of proper size. There is a monument in front of this atrium, its entrance being flanked by fountains. At the back of the church there will remain an open place sufficiently large for viewing the choir and the intersection of the nave and transept, and at the side, a small square which permits a view of the church from the Währinger Strasse.

(To be continued.)

#### THE OWNERSHIP OF DRAWINGS MADE FOR AND BY AN ARCHITECT.<sup>1</sup>



House of W. H. Walker, Esq., Vancouver, B. C. R. Mackay Fripp, Architect.

**A** LETTER is a document which, by means of words, attempts to supply to the reader some information from the writer; even after signature this, until delivery to the Post-office, or until delivery by some other means (the difficulties respecting a letter *in transitu* need not here be discussed), is held to be the absolute property of the writer, unless by agreement he has previously parted with that property. After delivery (if there has been no such agreement), either party may by injunction prevent the publication of the document; but before proceeding to that step, in cases where the Post-office is not the medium of transmission, the delivery to the reader or to an agent specially appointed by him to receive the document must be proved by the recipient. An architect's drawing has the nature of a written document, and is invested with all the qualities of a letter, as soon as it has received his signature, or the formula, "To be returned to the office of A. B.," etc., or even "From the office of A. B.," etc. A drawing is any combination of two or more lines which expresses form more clearly than any amount of description could do. In exception to this definition, some persons might produce copies of photographic pictures, and inquire where the lines are to be seen; others might bring forward shadowed representations of buildings in which no lines appear. The reply is, that no man could have made such copy or such shadowed drawings without first drawing the lines, which have subsequently been erased.

Architectural drawings are technically known as "*Sketches*" of plans, or sections, or elevations, or perspective views; *Draughts* (this term is nearly obsolete, because the words "rough plan," etc., are too generally used in an office for "rough draught of plan," etc.), and sometimes scaled to a *modulus*; General Drawings, always scaled to a foot; Detail Drawings, either at full-size or at an aliquot part of that size; Show Drawings, for exhibition to the client, to the architect's friends and to the public; a drawing in any one of these classes may be either "rough" or "finished," but is not necessarily an original design—the words "design" and "drawing" are so frequently used with indifference as to their separate meanings, that it may be useful here to insist that a design means a project, an idea, which may be very good although expressed in a bad drawing, just as, on the contrary, good drawing may be wasted upon a bad design;

<sup>1</sup> During the period when the important subject of the ownership of drawings was under consideration—a question raised by the demand made by the Office of H. M. Works, etc., on the late Edward Barry, for the drawings made by his father in carrying out the designs for the House of Parliament—my brother, the late John W. Papworth, undertook to collect the views generally held by members of the profession, and wrote them out with comments. His notes, which were found, at his death, among numerous other papers in his desk, are given in the above posthumous article. See for other articles on this subject Vol. VIII, N. S., (Journal of the R. I. B. A.), pp. 169, 188, 231, 254, 404.—WYATT PAPWORTH.

and copies or repetitions, which may be either counter-drawn by transfer, or duplicates by tracing or by using the rule and compasses, or enlarged or diminished copies produced by hand or by machinery. The term "Working-drawings" once meant the general drawings drawn so large as to show construction, or to admit of minute dimensions to save mistakes by workmen unused to scales; but now all detail drawings may be included. As to Original Drawings, all from which copies are made are original: however, since an assistant's work has been allowed to pass under the master's name, an original drawing by the master is one which he has himself made. Competition Drawings are finished general (and sometimes detail) drawings submitted in competition with other architects; in a few exceptional cases drawings of the design to a small scale have been at first required, and a selection has been sealed, for verification by the advertising body, from which the larger drawings have been made, and again submitted in final competition. Prize Drawings are the successful Competition drawings, although the present day speaks of "premiated prize-drawings" when the competition has been made as a scholastic exercise for a small sum of money, or for a medal, or for books, etc., commonly called a "prize."

When the conditions of competition include a provision that the prize-drawings shall become the property of the donor of the premium, without the addition of words to the effect of "on delivery of the premium," the architect enters into a speculation of making drawings for approval, purchase and payment. The drawings on approval become the property of the donor of the premium, who in the present state of the law of artistic copyright has the power to sell, or lend, or publish them forthwith, without fear of any interference on the part of the architect, who must formally sue the donor for the premium as a debt, unless the architect by some indirection has deprived himself even of that remedy.

It is clear that a body corporate having a common seal may advertise for competition designs, receive them, approve two or more sets of drawings, and refuse to proceed to the adjudication of the premiums (on the ground that the advertisement was not a copy of a contract made under seal) until a more satisfactory opportunity; yet the architects cannot compel the body corporate to return the approved drawings; and it is doubtful whether they could compel them to proceed forthwith to adjudication and payment; yet the drawings would be legally in possession of the corporation, if not legally its absolute property.

The drawings made by an architect's assistant in the architect's office absolutely belong to the architect until he parts with his property in them, and this whether the assistant be paid (even if there be a debt due to him in respect thereof) or otherwise. This property depends on the fact that the drawings are made on paper, or vellum, etc., provided by the architect. Hence the clause in Articles of Pupilage that the pupil is to provide all instruments and materials except paper.

The drawings made by an architect's assistant out of the office, for the architect, absolutely belong to the architect until he parts with his property in them, even before he has paid to the assistant the price of the work. This property may arise in one of two ways: either the drawings are made on paper or vellum, etc., provided by the architect, in the same manner as a solicitor supplies to his surveyor the parchments on which the surveyor is to make duplicate drawings; or else the drawings have been made on paper or vellum, etc., provided by the assistant, and the architect, by agreeing to have them, acquires the property in them; but, in both cases, the assistant has a lien upon the drawings, or any part of them, for the whole price, unless he has agreed to receive the price at a future day, or takes security for the debt.

Not to omit what may at first sight seem to be an almost extinct branch of the subject, it may be observed that a century or more since, when vellum was more used, paper much dearer, and assistance perhaps worse remunerated than at present, agreements as to the usefulness of an assistant's work were settled by destroying the material, a habit said to have been preserved to his later years by Sir John Soane, who did not hesitate to ask the assistant or pupil for his penknife, with which Soane reduced, at two diagonal cuts, the drawing into four triangles. Even now, the destruction of a pupil's drawing is taken as the strongest mark of the architect's disapproval. But, of late years, the principle *caveat emptor* has been so triumphant that if the architect does not take care to see satisfactory samples of his proposed assistant's skill, he had better not refuse an unsatisfactory drawing, but, (after pointing out the defects and getting them rectified as much as possible) accept, without manifesting displeasure, the finished work which is tendered to him. And if the architect, during the progress of work done out of the office, should see evidence of carelessness, incapacity, or ignorance, he had better say that the drawing at that stage will suit his purpose, as if it were completed; and, upon payment even of the price originally fixed, withdraw it. To leave a drawing under a continuous lien is not satisfactory.

An architect is paid for his services either by salary, by fee, by commission, or by time. The term "salary" applies to all payment (generally as an annual one) for continuous professional services necessary to the satisfactory discharge of the duties of the position held by the salaried architect, whether such services be rendered daily or only occasionally, and whether the hours of work be fixed or left to his discretion. There may still occur a case in which an amateur gives to an architect just free from pupilage a moderate salary



to look after an estate generally, and to assist in improving it and the mansion. In such a case, all finished drawings absolutely belong to the employer, whoever provided the materials, but they pass to the architect by verbal or written consent, being, in fact, a part of the patronage which supplies him with a portfolio of (not academical) drawings of work that has been, or has been likely to be, executed. All unfinished (in rough) works, such as dimensions in a note-book, measuring-book, or field-book, with calculations therefrom and abstracts thereof, belong to the salaried architect; he has always had it in his power to throw them aside (replacing, if necessary, the material) if he suspected them, and so preferred to take reproach of indolence rather than of carelessness, ignorance, or incapacity.

There is, next, the case of the amateur who takes into residence, or pays by salary, or both, a clever, but yet unsuccessful, architect to draw out what the amateur designs, or thinks he designs, or wishes to see designed and drawn. The patron will (perhaps jealously, certainly legally) insist upon securing every scrap of paper used by the architect in setting forth an idea, and every alteration suggested until the completion of the finished drawings, even if these run into complicated details at full size, or highly-finished perspective views. This patron naturally holds that it is not honorable in his salaried architect to make tracings of the finished drawings, either in or out of office-hours. This arrangement is sure to fail unless an office-room and fixed hours are part of the bargain.

The last phase of salaried business to which attention need be given here is that of the architect attached to a public building or institution. If he acts as steward, which in some places is part of the business, his ledgers belong to the office; and if his work includes building, his contracts and bills examined, or ready for examination, belong to the office. But at the death or departure of the architect, all rough work excepted in the positions above mentioned, ought not to be asked for by the client, who should be satisfied to think himself fortunate in getting any finished drawings made in explanation of the contract drawings for new works in progress. As to designs for new works proposed, the successor should prepare his own design for his own work, and not lazily avail himself of the labor (which he may misunderstand) of his predecessor, who, if alive, is not to be damaged in reputation by having his work spoilt, or if it be unsuccessfully executed, to be made responsible for the liabilities that may occur.

When an architect takes a salary for the guardianship of a building, the drawings which he may make of defects in the existing structures, for the purpose of pointing out them and the remedies, ought to remain in the office for his successors. But all drawings made outside the usual hours of work where daily service is required, or even (by open or tacit agreement for an equivalent) during those hours, or in the intervals of occasional service, for any object apparently connected with the salaried situation, but really foreign thereto, belong entirely to the architect until he parts with them for a fee or other consideration.

The term "fee" applies to payment for a report, whatever be the nature of the document, and whether illustrated or not by drawings. The property in finished work done for a fee is generally supposed to pass so entirely to the client when he accepts the work as to prevent publication by the reporter without the consent of the client, while any attempt on the part of the reporter to prevent publication by the client would be reprobated by his professional brethren. The plan, as of an estate, made by a surveyor is, in fact, a report of the shape, extent and nature of the estate, and the drawing is itself his report; but all wrongly-plotted plans or rough draughts belong to the surveyor, and would not be yielded to the client by any man of respectable position in business. If they were demanded by a troublesome client, the surveyor would probably destroy them, and communicate the fact of their non-existence as his reply to the demand. So, also, if an architect is required to report on the condition of a building, or part of a building, his rough draught of his report might be demanded by a troublesome client; and, inasmuch as the architect's first impressions might have been modified by subsequent surveys, the destruction of the rough draughts of reports would be prudent. Indeed, destruction seems to be the only way by which to promptly meet a demand for papers upon which statements apparently incriminating the architect or surveyor might be founded. It is for the *finished work*, not for the preliminary studies, that the amount of the fee is fixed; otherwise the architect or surveyor might tender the rough work, or studies, and require in exchange the fee; and the order of the client to stop and deliver the unfinished work on part payment of the proposed fee would be as futile in an action against him for the entire profit of the transaction as if he refused to accept the finished work without the rough work.

An architect's contract with his employer, where the former works on commission, is that the architect will make the usual professional charges, and will be liable to the client for any responsibility incurred by himself or assistants. But the client and his friends understand the matter very differently. They say: "Architect A contracted with friend B to build B a house for £900; yet it has cost £1,200 and ruined B." The architect says that there was not any contract in that case; that the original order was for a £900 house, that his original sketches were for a £900 house; that B, with his family, made additions in size and quality to match what they saw at their neighbor's; that the lowest tender was £1,200, and that B said, "Cut it down as much as possible, but I shall have some-

thing more like what I want than you at first designed"; and that, in process of construction, the builder gets orders from B to an amount that fills up the cutting down. Furthermore, our lawyers fall into the verbal trap, and insist on supposing that the architect's contract drawings bind him to the client; on the contrary, the client is bound by them to the builder, and the builder to the client, no variations being usually allowed unless ordered by the architect, or architect and client, in writing. When an architect takes a commission for the erection (I omit the words "the alteration") of a building, he undertakes the production of such a building to the best of his ability, which may improve as the work proceeds. He may write what directions he likes, and so describe his plan as to make a drawing unnecessary (remembering Michael Angelo's celebrated letter to Vasari about the stairs to the Florentine Library); or he may illustrate his letter with diagrams, or his diagrams may be so full as to leave little occasion for writing to it at all. Still his signature constitutes it a letter, for which he is responsible, and which, according to all the text-books on property, belong to the sender, not to the receiver; and, by the way, if a perspective view, highly-colored, be stolen, the value is that of the paper on which it is made.

These diagrams may be a plan, an elevation, a section, a perspective view in freehand or geometrical work; the size of the paper does not affect the fact that they are protected as letters so far that if a piratical publisher sought to print them he would be open to an injunction to leave out all the accompanying explanatory writing. Moreover, the illustrative details in other diagrams, drawn by another person not in the employment of the architect, become the property of the architect as soon as his signature thereto makes him responsible for the directions given thereon.

If the architect be represented as the owner, and the drawings in question have been appended in fact or in schedule to a contract, the thief may say that they are the client's property (it will be impossible to deny that a contract is the client's property), and so escape conviction; on the other hand, if the client be represented as the owner, and the drawings in question never have been appended in fact or in schedule to a contract, the thief may say that they never were the client's property, or at least, that they are the joint property of the architect and client, and so escape conviction. In both these cases it must be observed that the indictment will be framed for stealing the papers (say value 40s.), and not for stealing the drawing (say value £4 or £40), by which the property in the papers is proved. Under peculiar circumstances (if known to the thief) a third line of defence might be taken; for he may say that the drawings, having been sent by the architect to the client for transmission to the builder, had become the joint property of the architect and client and so escape conviction.

The subject of the joint property of the architect and client in a drawing is one of the highest importance. An architect's drawings for a work executed upon commission, say of five per cent, appended in fact or in schedule to a contract, have the nature of a written document, and are liable to be stamped accordingly: it will be impossible to deny that the contract is the client's property; the property in the drawings passes, with the implied consent of the architect, entirely to the client, who in the present state of the law of artistic copyright, evidently has the power to sell or lend or publish them, as well as to use them again for another locality. The practice is, of course, reprobated by the profession, which herein cannot help itself.

An architect's drawing for such a work not so appended to the contract, whether made before the contract is signed or at any time subsequently, is an explanation of the subject of the contract, and is as entirely his property, to deal with as he likes, as if it were blank paper, until the moment that it leaves his office with his signature authorizing the execution of the work in the way there shown, at which time it becomes invested with the character of a letter. If any number of copies of such a drawing may have been made in the office, they still remain the property of the architect, even when he has selected the best executed among them for signature for transmission, and he may put them as patterns before his pupils for further copies, or he may publish them. The client has no power to interfere.

Moreover, if the architect chooses to tear up, not only his sketches, but his finished drawings, one after the other, as soon as the works which they show are executed, it might not be prudent, but is clearly within his power to do so. If Sir C. Barry neglected, before his decease, to destroy his papers, that neglect did not transfer his right to burn them to the Government. If a member of the Government had chosen to order Sir C. Barry to deliver up, from time to time, his sketches and drawings, so that they might be officially destroyed, the matter would have been so ludicrous that it could not have been sustained. Official destruction is not so far from official preservation as might be supposed. The Government itself cannot produce all the drawings made by its salaried officials from the Fire of London to the Reform Bill.

From the first sketch of the ideas of an architect working on a payment by commission, to the picture representing the extent or intended result made by an artist for the architect, the paper on which those drawings are made remains the property of the architect, not of the client, and can be transferred by the former to any one; and further, the client has no right to select such as he would like to possess, even if he tender the value of the materials and workmanship.—A paper by the late John W. Papworth, published in the *Journal of the Royal Institute of British Architects*.



## ENGINEERS' CLUB OF PHILADELPHIA.

AT the regular meeting, February 17, 1894, Mr. John C. Trautwine, Jr., called the attention of the meeting to an interesting problem which occurred in supplying the village of Frackville with water from the Mud Run Reservoir in Schuylkill County. The water was fed through a 10-inch pipe, for a distance of 8,000 feet, to locomotives and fire-plugs in the village. The fall in the pipe was 40 feet, and the head in the reservoir 20 feet. At the village, this pipe separated into two branches of 6 inches in diameter, one, 3,200 feet long, running to the village of Mahanoy Plain, with a fall of 340 feet, and the other, about 1,500 feet long, running to the head-house of the plain, and in this distance first rising 2 feet, then falling about 10 feet to the upper story of the head-house, and fifteen feet further to the cellar.

The difficulty experienced was, that owing to the much greater head in the long pipe, the valley at its end got all the water, leaving practically none for the head-house at the top of the plain.

Mr. H. K. Nichols, Chief Engineer of the Philadelphia and Reading railroad, remedied the trouble by the simple expedient of introducing in the long pipe, just below the branch, a siphon about 18½ feet high, provided at the top with a blow-off cock, by which the air is allowed to escape when it accumulates in too great quantities.

Mr. Trautwine's remarks were followed by a considerable discussion on this and other interesting instances met with in hydraulic practice.



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

HOUSE OF DR. H. M. JERNEGAN, COMMONWEALTH AVE., BOSTON, MASS. MR. GEORGE A. AVERY, ARCHITECT, BOSTON, MASS.

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

VANDERBILT DORMITORY FOR YALE COLLEGE, NEW HAVEN, CONN. MR. CHARLES C. HAIGHT, ARCHITECT, NEW YORK, N. Y.

THIS building, now nearly finished, has been erected by Cornelius Vanderbilt, Esq., as a memorial to his eldest son, who died a year or two ago while a student at the college. As the young man had been greatly taken with the character and arrangement of the Oxford halls, pains have been taken in this building to give heed to his predilections in the design and plan.

FIRST ENGLISH LUTHERAN CHURCH, CINCINNATI, O. MESSRS. CRAFTSEY & BROWN, ARCHITECTS, CINCINNATI, O.

THE First English Lutheran church, about to be erected, will cover the entire lot, which is eighty feet on Race Street and ninety-five feet deep. The church will be top lighted and will be in all respects a complete modern building. The front is to be of red stone and the treatment is of purest "Gothic."

PRELIMINARY SKETCH FOR HOUSES AT WASHINGTON, D. C. MR. WM. J. MARSH, ARCHITECT, WASHINGTON, D. C.

It is proposed to build the front of these houses with Indiana limestone and Harvard water-struck red bricks laid with white-lime mortar joints. Brindled roofing-tiles and white-pine interior finish, except for the staircases. Estimated cost \$19,000.

HOUSE FOR GEORGE BULLOCK, ESQ., OYSTER BAY, L. I., N. Y. MESSRS. STICKNEY & AUSTIN, ARCHITECTS, BOSTON, MASS.

AMERICAN INSTITUTE EXHIBITION BUILDINGS, NEW YORK, N. Y. MESSRS. ROMEYN & STEVER, ARCHITECTS, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

WORK-HORSE AND FARMER GROUP IN THE COURT OF HONOR, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. D. C. FRENCH & E. C. POTTER, SCULPTORS.

[Gelatin Print.]

STATUE OF AUGUSTUS, NORTH FRONT OF FINE ARTS BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatin Print.]

THIS statue is an enlargement of the marble figure of Augustus, found in 1863 in the ruins of the Villa of Livia at Porta Pia, near Rome. The original is now in the hall of the Braccio Nuovo in the

Vatican. "A noble witness to the technical excellence of sculpture in the Augustan age," the figure measures nearly seven feet in height, exclusive of the plinth, and bears distinct traces of color. Its date is set down as about 20 B. C. The only restorations which it has undergone are the sceptre, the forefinger of the left hand and part of one ear.

DRAWING-ROOM, 49 PRINCE'S GATE, LONDON, ENG. MR. R. NORMAN SHAW, ARCHITECT.

No. 49 Prince's Gate was the town-house of the late Frederick R. Leyland, a Liverpool merchant-prince, and once held his remarkably fine collection of paintings old and new, of which the special glory was the Botticelli's and Rossetti's, all since sold at Christie's.

Famed as the mansion was for these pictures, it was, perhaps, even more widely noted for its dining-room, known as the "Peacock Room."<sup>1</sup> "This description," says the *Pall Mall Budget*, "it owes

to the decoration with which Mr. Whistler has enriched the walls. The general color-scheme of the room is turquoise-blue and gold, and the only ornaments are pieces of blue and white china, displayed on shelves of carved and gilt wood. The room, as it was originally conceived, was hung with Spanish leather and it was by a mere fluke that Whistler came to decorate it. The story is as follows: Mr. Leyland, having purchased a picture by Whistler, representing a damsel in a Japanese robe, hung it over a fireplace, where it still remains. Mr. Whistler, having inspected the arrangement, complained that the red flowers scattered over the gold ground of the Spanish leather hurt the harmony of his picture, and proposed to paint them out. Mr. Leyland gave a thousand pounds for his Spanish leather, but he nevertheless allowed the impressionist leader to have his way, whereupon Whistler went on



Shutter in Dining-room.

painting and painting until the Spanish leather disappeared entirely and a new and absolutely unique decorative scheme of blue-and-gold, in which the chief motif was peacocks and their feathers, appeared in its place. Walls, woodwork and ceiling are entirely covered with these Japanese compositions. Over the buffet at the end of the room, opposite the fireplace, is an oblong panel, sixteen feet long, where Mr. Whistler has depicted two peacocks in aggressive attitudes, designed in gold on a blue ground. One peacock of unruffled elegance is supposed by some subtle interlinear readers to represent the artist, and the other peacock with disordered plumage and irate mien, standing on a pile of shekels, is identified with the artist's patron. The background is dotted with flying feathers and masses of gold, and the whole composition has reference, we are told, to a difference that arose between the artist and the late Mr. Leyland with respect to the cost of the work. This cryptic panel was the painter's vengeance, but its hidden meaning is so discreetly concealed that it would remain lost in the spirited charm of the whole had not anecdotic memories treasured up the souvenir of the artist's wrath and of its ingenious manifestation. It is a remarkable fact that besides estranging Whistler and Mr. Leyland, the "Peacock Room" had a far more tragic consequence. Mr. Jeckyll, who had designed and completely finished the room when Mr. Whistler appeared on the scene, had already suffered several disappointments owing to accident having deprived him of the credit of his work in Mr. Leyland's house. When Mr. Jeckyll saw the Spanish leather disappear and the peacock harmony in blue-and-gold become the talk of London, he went home and commenced to paint the floor of his bedroom gold, and in a few weeks he died, insane, in a private lunatic asylum."

Jeckyll is said to have been the first to introduce into England

<sup>1</sup> See also *American Architect*, March 24, 1877.



(after the Paris Exhibition of 1867) that Japanese manner of decoration which he also made use of in some of the rooms of Mr. Alexander Ionides's house in Holland Park, Kensington.

#### HALL AND STAIRCASE IN SAME.

This staircase, which is of marble with gilt bronze balustrade, came from Northumberland House, having been bought at the sale of the materials of that mansion in 1874.



[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.]

#### MR. ORD AND THE PHILADELPHIA PUBLIC BUILDING.

PHILADELPHIA, PA., February 24, 1894.

##### TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In the confusion incidental to moving my office, I regret that I overlooked the notice of what you style my "unfortunate misunderstanding" with the Philadelphia Public Buildings Commission in your issue of February 17, until my attention was called to it yesterday morning.

As you very properly state, it "seems to convey a lesson to other architects who may be employed upon public work," but as your history of the case is not quite correct I desire to furnish one that is correct, as well as concise.

The Requisition of the Commissioners upon the City Councils for funds for the year 1894—with which I was perfectly familiar, having assisted in its preparation—called for \$1,426,425, besides \$405,935.52 to cancel outstanding Certificates of Indebtedness, making a total of \$1,832,360.52 and included as part of "Item I, for Salaries" the usual provision (of 10-years' standing) of the sum of \$9,600 (not \$7,500 as you have it), for the salary of the architect, also \$3,300 for draughtsmen, and \$1,200 for a clerk for the president. The total amounts were given to the City Controller on August 15, and the Requisition itself was formally transmitted, by the President of the Commission, to City Councils on September 5, 1893.

Subsequently, as all constructional work upon the buildings was suspended for want of an appropriation, salaries were reduced, and among others, that of architect from \$9,600 to \$4,000; and I was elected to serve at that rate till the end of the year 1893 only, by which time the appropriation for 1894 was expected to be available. [The officers are usually elected in October to serve till the following October.]

When the City Councils reached the consideration of an appropriation to the Public Buildings, they found that they could not give the full amount asked for, viz, \$1,426,425 (the outstanding certificates having in the meantime been provided for by a separate appropriation of \$405,935.52), but, instead of making a formal communication to the Commissioners, the chairman of the Sub-committee of Finance called informally upon the secretary and architect, in person, to inquire as to what could be done with \$750,000, which amount he thought the Councils were able and willing to appropriate. In hastily itemizing, for him, that amount, and in view of the active resumption of work upon the buildings in 1894, which would render necessary a great deal of work in the architect's office, I sought to provide for the Commissioners, a sufficiency of money, with which to secure competent architectural service, and included a maximum amount of \$7,500 as the possible salary of the architect, and also the

sum of \$1,500 for a draughtsman, besides \$1,200 for the clerk. I had no reason to believe (and have none now) that the \$4,000 salary had been adopted as a permanent allowance, and was perfectly alive to the fact that my suggesting the appropriation of \$7,500 did not in any way bind the Commission to adopt it unless they thought proper, afterwards, to do so. And I venture to think, and to say, that I appreciate the magnitude of the work and the responsibilities of the position a great deal more than some of those more directly responsible for it.

I reported my action at once to the president and it also came informally to the knowledge of others of the Commission while there was yet abundance of time to make any desired changes; but it was deemed of no importance until, later, private politics meddled with it, and it became absurdly magnified and misrepresented.

I was not dismissed from office, as my term had already expired; and in electing my successor it was quite unnecessary to make any remarks, to say nothing of the alleged charges of the newspapers; and as a matter of fact, there is nothing on the minutes of the Commission to show that anything was said.

It may be interesting to the profession to know that the Commissioners have paid for architectural services from 1872 up to September 30, 1893, the sum of \$282,936.05 (or an average of \$13,000 per annum), which is equal to 1.82 per cent upon the net cost of construction, which has been, to January 1, 1893, about \$15,007,426.36. Even these rates are much below what the city, county and State officials pay to architects directly employed by them.

For the last ten years the architect of the Philadelphia Public Buildings has paid for all his own stationery and other office-supplies; and it now is made to appear that he has in addition to pay his draughtsmen out of the reduced allowance of \$4,000.

JOHN ORD, F. A. I. A.

[We regret that we characterized the severance of relation between Mr. Ord and the Public Building work as a "dismissal."—EDS. AMERICAN ARCHITECT.]

#### ACOUSTICS.

BOSTON, MASS., February 9, 1894.

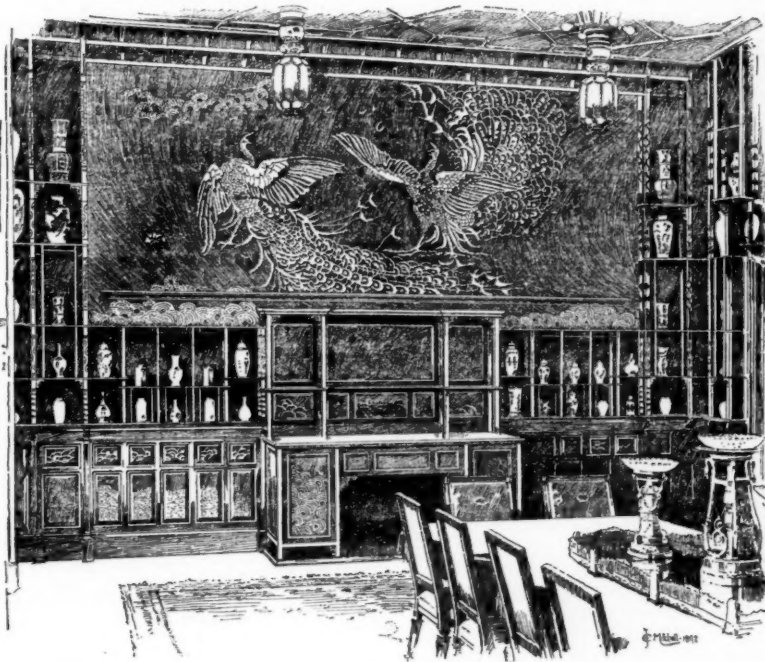
##### TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I noted in your issue of November 11 last, page 80, a clipping from the *Architect and Contract Reporter* giving the rule for

a cross-section of an auditorium—as a principle of good acoustics. The said citation assumes (its general intent, as I take it) that the said rule is of universal nature, applicable in all cases. It is not so, and it suggested to me that a few words upon the subject might not be wholly uninteresting to your readers.

This is not intended, by any means, to be an essay on acoustics—both time and space forbid—but simply to state in as few words as possible, why the rule or principle referred to is misleading and will not answer in all problems, and to outline some of the primary laws and elements which enter into a problem of acoustics; such as I have considered and followed in my own practice, with gratifying results.

1.—As to the rule above noticed: if the same is of general application, then auditoriums, churches, theatres, music-halls and the like, would have to be of much less height than they now are; otherwise they would not be good acoustically (which some are), or the platform or stage would need to be much elevated above the average level, and the ceiling of the barrel-vault type. For, according to this rule, in an auditorium (theatre, for instance) 78 feet wide and 65 feet high—an average size—the speaker's mouth (the phonic centre) would need to be 26 feet above the floor. We know that such is not the need. On the other hand, assuming this rule to be in force, an auditorium 78 feet wide would call for a height of about 47' 8".



Dining-room, 49 Prince's Gate, London.

The fact is, that the rule referred to is one of minor importance — applicable, with good results, under certain conditions, but not at all necessary under other conditions; these other conditions affecting this special rule vastly more than it can possibly affect any given case. Acoustic results depend almost as much upon knowledge of the various materials entering into the construction and finishing of an auditorium, as upon a thorough knowledge of acoustic laws governing the propagation, reflection, or augmentation of sound.

I know of no science, in connection with our art of architecture, in which the truism of the old saying "a little knowledge is a dangerous thing" bears more directly than in this matter of acoustics, and the average practitioner will need to go but a short span over the road of research which I have travelled, to convince him of this.

2. — Assuming that the genesis of sound is of right quality, *i. e.*, as to purity and normal intensity, whether of speaking or music, oral or instrumental, there are certain fixed laws which govern its transmission and diffusion, and certain elements which affect its purity, harmony and right hearing, and briefly they are stated as follows:

- (a) Pure air and a normal temperature of 70°.
- (b) Uninterrupted transmission.
- (c) Sympathetic, *i. e.*, harmonious, vibration.
- (d) Minimizing of reflection.
- (e) Prevention of echo.
- (f) Diminution of sound, when necessary, *i. e.*, when the size of the auditorium is considerably within the limits of natural radiation.
- (g) Augmentation of sound, when necessary, *i. e.*, when the size of the auditorium is considerably in excess of the limits of natural radiation.

As to natural radiation of sound: the Greeks well understood its phenomena, and the plans of ancient theatres are laid down accordingly (as to which the reader is referred to Stuart & Revett's "Antiquities of Athens," Vignola, Sanders, and an interesting work [in Italian], "L'Acoustica," by Antonio Favaro-Torino), and may be briefly stated as follows: Inscribe an area with a circle having a radius of 60' 0"; then placing the phonic centre, *i. e.*, the speaker, 30' 0" from the periphery, the sound (*i. e.*, of normal speaking pitch), will be heard 90' 0" directly in front of the speaker, 30' 0" back, and 52' 6" directly upon either hand; in other words, a row of hearers standing in line around the periphery will hear the speaker, with equal distinctness in pure air at 70°; as the hearer recedes from — gets outside of, the periphery, so will his sense of hearing decrease, or, in other words, the sound fail to reach him.

As to (a), transmitting medium: the velocity of sound is conditioned upon the elasticity, or density (purity) of the medium — air, the greater the elasticity the greater the velocity; the greater the density (impurity), the less the velocity. Sound travels faster in warm air than in cold, and at a rate of 1,130 feet a second in pure air at 70°.

The clearness and purity of sound is conditioned upon the equality of its vibratory transmission, and this equality of vibration can only be maintained in air of equal elasticity and purity; so that uniform temperature and purity of air is one of the first essentials for the equal transmission of sound, not only in spots but throughout every portion of an auditorium.

This condition can only be obtained by a perfect system of heating and ventilation, and such a system should help, not retard, transmission. If the direction of the heating or ventilating currents is towards the stage, transmission and vibration will be retarded, and *vice versa*; the direction of such currents should be along with the direction of the sound-waves.

As to (b), uninterrupted transmission: free space should be provided for the transmission between the genesis of sound and the auditors; solid features, like columns, partitions, balcony-fronts, etc., should be rigidly avoided; balcony-fronts should be of perforated iron or wood work (wood is best), to prevent reflection and to admit of the sound-waves passing through and being absorbed by the clothing of the audience; and in the case of partitioned boxes, as in an opera-house, the partitions should be on radial lines from the phonic centre.

As to (c), sympathetic, *i. e.*, harmonious, vibration: the propagation of sound is by multitudinous waves sent out in all directions from the genesis of sound; (a simple illustration is afforded by dropping a pebble into water, though this is not an accurate illustration, inasmuch as the sound-waves do not expand in the form of rings, but rather in the form of millions of lines having wave-motion in transmission). These waves or lines, have an undulatory, or vibratory movement, of periodic extent and amplitude, and this extent and amplitude of the wave is governed by the force, intensity, pitch or initial vibration of the particular note creating its corresponding wave in the air; consequently, (1) the air must be in a condition to vibrate sympathetically with the initial vibration, and (2) as the waves are of periodic extent and amplitude, it is necessary that the dimensions or scale of the auditorium shall coincide in every direction, as far as possible, with the extent or scale of the vibratory motion or waves; for instance, the French standard pitch *C*, of 512 vibrations per second, propagates a wave whose extent is 2.207 feet; therefore, it follows, if this note *C* is taken as the "fundamental note" of the auditorium, the scale upon which such an auditorium must be designed must be of a unit of 2.207 feet, and the shape of the auditorium should conform to the extent, or

end, of the numerous radiating waves, in musical progression, *i. e.*, in a ratio of 5, 6, 7, 8, 9, etc.; and if this ratio of proportion is adhered to, the forces of impact of the waves upon the enclosing surface (or in other words, the force of reflection from such surface) will be equal in all parts, and reflection may be prevented. Further, the form of the ceiling should not be flat, but curved, but the line of this curve cannot be any curve or series of curves which the architect may think "looks well," but is determined by the height of the centre of the ceiling above the floor and its distance from the phonic centre, and this initial curve will not coincide with the plane of transverse section of the house, but must coincide with the plane of a line or wave radiating from the phonic centre to the centre of the ceiling. The acoustic faults of the Trocadero at Paris, are almost wholly due to the faulty lines or shape of the ceiling and the stage opening — being of such contour as to aggravate reflection and to concentrate reflected waves at certain places in the house.

As to (d), minimizing of reflection: this is an element which can hardly be set forth clearly in writing: (1) because even a slight variation of the lines of an auditorium will change the angles and force of reflected waves; (2) because reflection will largely depend upon the nature of the materials used in finishing and decorating the interior, a most important consideration, of which knowledge can only be gained by experience, observation and study; but the following general principles may be stated: (a) that hard or smooth surfaces reflect more and with greater force, than rough or soft ones; (b) that the angle of reflection is the same as the angle of incidence; (c) that reflection will be more powerful within limits considerably less than those stated in the seventh paragraph, and less powerful when the limits exceed those stated as aforesaid; (d) that much study needs to be given to the shaping of the plan and the elevation of walls, and other parts, to prevent reflected waves coming in contact with direct waves; (e) that balconies, if properly designed, are a great help in preventing reflection, their lines depending on the distance from and height above the phonic centre, and their projection from the walls; and utmost care should be taken that the height of wall back of and above the upper balcony be so designed that waves may not be reflected from said wall to the ceiling, and as before stated, the balcony-fronts should be in all cases open-work, not solid.

Care should also be taken that the plan, section and opening of the stage (the focus of genesis) are of such contour that direct waves will not strike the ceiling forward of the centre, *i. e.*, between the centre and the stage wall, or proscenium.

As to (e), prevention of echo: what I have observed, in the forepart of the preceding paragraph, holds good as to echo; no fixed rules can be written as to its prevention. Echo is due to reflection, and to the intensifying quality of resonant materials injudiciously placed. Possibility or probability of echo can only be determined, graphically, by laying out the direct waves, reflected waves and succeeding reflections.

As to (f), diminution of sound: it will be easily understood that there will be a preponderance of sound (of given intensity) in an auditorium, say, 60' 0" in diameter, over one of 120' 0" diameter, and that the force of reflection will be much greater; it is, therefore, necessary to so construct and finish the auditorium that resonance will be reduced and reflection prevented.

As to (g), augmentation of sound: it will be easily understood that there will be a diminution of sound (of given intensity) in an auditorium, say, of 240' 0" diameter, inferior to that in one of 120' 0" diameter, and that the force of reflection will be much less; it is, therefore, necessary to so construct and finish the auditorium that it will be of augmented resonant quality; sometimes powerful resonators are necessary, as, for instance, a sounding-bell, below the floor of the auditorium. The stage also must be planned and constructed in the form and nature of a great resonator, so as to augment the genesis, timbre or power of sound.

These elements of transmission, reflection, echo, diminution, or augmentation of sound are of vital importance in any attempt to design an auditorium, to be a success as regards acoustics, and demand of the architect not only something more than a superficial knowledge of acoustic laws, but also a knowledge of the influence of the various materials which he may be led to employ in the construction and finishing of an auditorium, and the manner in which such materials may be used to the best advantage.

JOHN LYMAN FAXON.

## NOTES & CLIPPINGS

MME. NAYA. — One of the most enterprising women of the Continent was Mme. Naya, widow of a French photographer of the name, and wife of the sculptor Dal Zotto, who died in Venice last month. About twenty-five years ago she decided to make a series of photographs of the treasures of Venice — buildings, bridges, pictures, etc. She was remarkably successful, and sold thousands of photographs. She left a fortune estimated at many millions. She married the well-known sculptor, Dal Zotto, a few years ago, and her house soon became the trysting-place of the art and literature circles of Venice. She helped hundreds in various ways and great regret is felt at her death. — *N. Y. Times*.