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THE Massachusetts Board of State-house Commissioners has repeated this year, with even stronger emphasis, its recommendation of last year, to the effect that, the rear addition to the Boston State-house being now nearly completed, the front portion should be pulled down, and a new structure erected, in harmony with the rear part; and a lively discussion is going on in the newspapers in regard to the matter. It will be remembered that, when the subject of securing better accommodations for the Massachusetts State Government was first agitated, two schemes presented themselves. One was, to pull down the present building, which occupies the back portion of a large lot, finely situated at the top of Beacon Hill, and arrange for the needs of the State in a new building, which could probably have been included within the limits of the present lot, and might, with such opportunities for effect as the lot afforded, have been made one of the most splendid buildings in the world. This idea was, however, strenuously opposed by a large number of people, who declared that the present State-house, which is certainly a beautiful specimen of the architecture of the early part of the century, ought by no means to be disturbed, and that the new accommodation required by the State ought to be obtained by building an extension, on the slope of the hill behind and below the present house, where its connection with the existing structure would be inconspicuous; and, in the end, this scheme was adopted, and carried out at a very great expense, as land already occupied had to be taken for the Extension.

IT was our opinion at the time, that the clamor which resulted in saddling the State, at an enormous cost, with the architectural absurdity of a vast tail-piece, five times the size of the present building, if we recollect rightly, tucked in behind it so as to be as much out of sight as possible, was in part due to sentimentalism, which was entitled to questionable consideration; and the correctness of this opinion is, we think, sufficiently shown by the fact that, even before the completion of the tail-piece, which was determined upon, to the sacrifice of all other interests, for the sole purpose of avoiding any interference with the present building, the representatives of the State began to urge the necessity of tearing down the very structure which the entire proceeding had been intended to preserve. The Commissioners said last year, and say again this year, that the old building is perishable, and is already decaying [the deterioration, though, is slight and of such a

nature that the expenditure of a very modest sum would secure the preservation of the building for another half century at least]; but everybody knew this before the Extension was planned; and, as the Legislature decided then that it was better to keep this perishing structure intact, there is tenfold more reason now for preserving it, in preference to allowing it to be superseded by a mere addition to the tail-piece just approaching completion. Nevertheless, as we said when the whole matter was first brought up for consideration, the fact that the old building, in its present condition, could not resist decay for many years longer, and might vanish in a night if fire should start in it, is one that must be considered, and the Boston Society of Architects, which rarely interferes in public questions, has done the State a service in suggesting the only reasonable solution of the problem as it stands at present: that, instead of tearing down the old building; it should be made permanent, by rebuilding the floors and roofs with iron, in place of wood. This could be done, as appears from the report of a committee appointed by the Society to inquire into the matter, without altering the walls, except to substitute marble for painted wood, or changing the appearance of the structure in the least; and the Society proposes, in reconstructing the interior, to restore Bulfinch's arrangement of the rooms, which have been subdivided, and otherwise modified, greatly to their detriment. This sensible plan, the only one, as it seems to us, now compatible with the attainment of the objects to gain which the State has already expended millions of dollars, has received, apparently, the unanimous support of the architects of the city, seconded by a large number of artists and other citizens; and it is likely to go before the Legislature backed by immense influence.

THE New York Chapter of the American Institute of Architects in its wisdom has seen fit to adopt and lay before the public a resolution which we esteem to be one of the most remarkable documents that ever found its way into print. It is, we feel sure, generally supposed in New York that the leading organization of architects in that city is a body of earnest men whose aims and efforts are serious and not trivial. It is on this basis that the New York Chapter is officially recognized in municipal matters and we cannot conceive why it should have been willing to imperil its standing with the authorities, by declaring in the preamble to the resolution in question that "there is nothing now before the profession more important than the speedy production of a history of the A. I. A."

WE have before noted some of the woes of the architects of the New York militia armories. The Seventy-first Regiment armory seems to be just now most conspicuous. A few days ago, a meeting of the Armory Board was held, at which Captain Wilson, of the Second Battery, complained that the only way to get the ashes from the boiler-room out of this building was by hauling them in carts over the armory floor. This process did not improve the appearance of the room, and after the ash-carts had been emptied, it was necessary to store them in the armory among the gun-carriages, which, as he mildly observed, had a very unmilitary effect. Mr. Thomas, the architect, thought that the ash-carts did not hurt the floor any more than the gun-carriages, but the Board appeared to agree with Captain Wilson, as will also, we imagine, most of our readers. The fact is that, in many places besides New York, armories seem to have been designed with little conception of their proper purpose. For example, nearly all the new armories which are being erected in the Eastern States are of brick, a most unsuitable material. It will be remembered that some years ago, the State of Massachusetts built a costly new prison, which, by a similar oversight, was of brick, instead of stone. The prisoners were transferred to it, and in less than a day the most dangerous one of the lot had worked his way out of his cell, by the simple process of digging out the bricks, one by one, with a small iron bar; and he was soon followed by others. After going to a heavy expense in lining some of the brick cells with steel plates, the Massachusetts authorities finally abandoned their new prison, as unsuitable for its purposes, and moved the prisoners back to the old granite structure which had held them safely for nearly fifty years.

FOR armory-building, the conditions are nearly the same as for the construction of prisons. Sooner or later, the great city armories will be the objects of attack, probably by mobs, bent on getting possession of the arms that they contain; and they ought to be designed expressly to resist such attacks. There are few of our readers who are not old enough to recollect the riots of 1863, when many armories were plundered in this way, and others would have been, if they had been built after the modern style. When a building can be entered only by the door, a dozen men can defend it for a long time, as was the case in Boston, where a cannon, loaded with bullets, and fired just as the door was broken in, put to flight a great mob, and saved the arms in the building, and, probably, many lives; but a brick building, which can be entered by men armed with "pinch-bars" in fifty places within a few minutes, gives very poor protection to anything inside it; and, in case of a sudden assault, the field-pieces, Gatling-guns and rifles, with which the new armories are stored, would be at the mercy of a riotous mob.

THE artistic world has met with a great loss in the death of Mr. John Wolfe, of New York, one of the most accomplished collectors and connoisseurs in painting of his time. Mr. Wolfe was educated in France, and began there, while hardly more than a boy, collecting on a modest scale things that pleased him. He came to New York just before the Civil War, and took up mercantile pursuits, but the war destroyed his business, and after meeting with heavy losses, he retired altogether. While his affairs were involved, he sold the collection of pictures which he had then formed, and which contained, among others, Couture's picture of the "Day Dream." After parting with these treasures, he was able, by degrees, to acquire others, and in 1882 he sold a second collection, the principal picture in which was Bouguereau's celebrated "Nymphs and Satyrs." This beautiful work was bought by Mr. Stokes, and has ever since adorned the bar-room of the Hoffman House. Mr. Wolfe was a cousin of Miss Catherine L. Wolfe, the generous benefactress of the Metropolitan Art Museum. No doubt his knowledge and discrimination served her in making the splendid collection which is known by her name, and which, in accordance, it is said, with his earnest wish, she bequeathed to the Museum. Mr. Wolfe was a life member of the Architectural League, and of the American Art Association, and was one of the founders of the National Academy of Design.

MR. GEORGE CHAMPLIN MASON, whom our older readers only will recollect as an architect, died in Philadelphia last week, at the house of his son, Mr. George C. Mason, Jr., who was at one time Secretary of the American Institute of Architects, and is well known in the profession. Mr. Mason the elder was born in Newport, R. I., in 1820, and has always been identified with that city. He was educated as an architect, and built many fine houses and other buildings in and about Newport. He was always of a literary turn of mind, and, while in the active practice of his profession, found time to edit the Newport *Mercury*, and to write several books, treating particularly of Newport and its history. Later, after his son had become associated with him in his business, and he had more leisure to devote to other matters, he became widely known, under the name of "Champlin," as a contributor to the magazines and newspapers of articles on topics of local archaeological and literary interest, not a few of which were published in the *American Architect*. Since the removal of his son to Philadelphia, we believe that he had not practised his profession at all, but he continued his literary work until within a few months. He will be greatly missed in Newport, where he was well known and popular, both among the residents and the summer cottagers, many of whom had been his clients.

THE Municipal Art Society of New York proposes to make its influence felt in affairs within its province in the metropolis. At the meeting of the Executive Committee of the Society, held the other day, at the office of McKim, Mead & White, terms were drawn up for a public competition for the decoration of the Court of General Sessions, in the new Criminal Court Building, on Centre Street. The competition is open to all artists of either sex, and the first prize will be the commission to execute the work, money prizes being awarded to the second and third in merit. The jury, in all competitions held by the Society, will consist of fifteen

members, of whom three are to be architects, seven painters or sculptors and five laymen, all the members being appointed by the Society. A decorated court-room will be rather a novelty in this country, but if such a room is to be painted at all, it should be well painted, and nothing is more likely to encourage the study of decoration among artists than competitions of this sort. In the present case, the Society will bear all the expense of the decoration, but it may be hoped that, the example once set, municipal art will not long need to depend upon the charity of private citizens.

NEXT year an extraordinary exhibition is to be held in Japan, where the resources of that wonderful country are to be displayed as they have never yet been. The exhibition is to be made in Kioto, and is to commemorate the eleven-hundredth anniversary of the establishment of that city as the capital of Japan. The buildings are to reproduce, as nearly as possible, the great palace built for the Mikado when he first took up his residence there, with such additions as may be found necessary. It is hardly necessary to say that porcelains, carvings, metal-work and embroideries will be shown in profusion, and the modern manufactures of Japan will also be represented, together with mining products and processes. The most curious exhibit, however, is one which nobody else seems to have thought of, but to which the Japanese Government intends to give an extensive development. This is a religious exhibit, comprising, so to speak, processes as well as apparatus. On the grounds there are to be temples of the various sects represented in Japan, including Christian churches, if the communities of Christians choose to furnish them, and in each temple or church will be stationed priests, who will not only perform the appropriate services, but will expound the doctrines of their sect to all who wish to listen to them, interpreters being provided, who will translate the discourses for the benefit of foreigners. Whether this exhibit is competitive, we are not informed, but there is something interesting in the seriousness with which the Mikado, the consecrated ruler of the Empire, proposes to spread all religions clearly and impartially before his subjects, for them to choose as they would between different systems of electric-lighting. The police regulations will be strict, so that no extortion will be practised upon strangers, and interpreters will be furnished by the reception-committee to those who wish for them. Nearly all the members of the committee in charge of the exhibition are well known in this country. The President is Prince Komatsei. M. Saito, the Director-general, is Secretary of Legation to the Japanese Embassy; the Chief Judge, Mr. Kuki, was formerly Minister to the United States, and the other directors, Messrs. Ashiware, Yamataka, Niwa, Yanagiwa, Ariga and Yoshimura, have either resided or visited in this country. This indicates that Americans will be particularly welcomed at the Exhibition, and they could hardly go to any place where they would see more curious and interesting things.

THE real-estate editor of *La Semaine des Constructeurs*, M. Léon Mauruc, relates the experience of one of his clients, who had amassed a considerable sum of money, and, being afraid to entrust it to banks, or invest it in stock companies, hid it in an old bureau, and, for six years, hunted all over France for a real-estate investment to his liking. He attended nearly all the auction sales, and employed M. Mauruc to examine more than two hundred estates, none of which suited his ideas. At last, he heard of a property which offered attractions for a thrifty man. The house was old, certainly, but the total rental amounted to fifteen per cent on the investment, and the temptation was too great to be resisted. The money was extracted from the secret recesses of the bureau, and exchanged for the title to the old house. When rent-day came around, the purchaser set out to collect the first instalment of his revenue, but was unpleasantly surprised to find, that most of the tenants, quite unmindful of the obligations contained in the leases which had been shown him, not only refused unanimously to pay any rent at all, but, arming themselves with such weapons as lay nearest at hand, drove their new landlord incontinently from the premises. On next rent-day the same performance was repeated, and, so far as appears from the story, the unfortunate investor is still seeking for some one with courage enough to extract his rents from his unruly tenants.

THE FRENCH RENAISSANCE.¹—II.

Fig. 2. Château of Fontaine-Henri (Calvados).

FRANCIS I had, in fact, in arts as in letters, a direct and individual part in the intellectual movement of his epoch, much more than any king of France had had before him. In spite of his profligacy and his political blunderings, he possessed all the most generous, most enthusiastic, and most elevated qualities of the Valois family, and he was not the only one of his race to render most eminent service to architecture. Charles V and his brother, Jean de Berg, whom we have mentioned, were builders as intelligent as they were lavish; their nephew, Louis d'Orléans, and his son Charles, the father of Louis XII, deserve to be associated with them; the brilliant dukes of Burgundy were likewise of the Valois family. The Valois were thus for France, but in a less degree, what the Medicis had been for Italy.

Louis XI, whose aspirations were vulgar enough, trenched too much, by far, on the dominant spirit of his race; Louis XII had more taste, but it did not run in the direction of novelties. The reparative reign of the "Father of the People" would, perhaps, have been lost on the Renaissance, if it had not already germinated and appeared above the soil, and if the minister of Louis XII, Cardinal Georges d'Amboise, had not resolutely taken upon himself the duties naturally devolving upon his sovereign. While the latter, in the wing of the castle of Blois which bears his name, timidly entrenched himself in Gothic traditions, the former, in the Château de Gaillon, allowed himself full reign and bequeathed to his country the greatest and noblest construction which had been reared in the new style during the first fifteen years of the sixteenth century.

In justice, it must, however, be said that the severe Anne de Bretagne—to whose ascendancy one might be attempted to attribute the indifference or lack of enthusiasm for what was going on in France, displayed by so many high lay and ecclesiastical barons—was able, on the contrary, to discern better than any one else the marvellous talent of Michel Colombe, who was in a peculiar sense her subject, since he was a Breton. It was in his atelier that the new ideas were warmly welcomed and from which the Italian artists were not excluded: it was in this true home of the Renaissance that she sought a plan and workmen for the execution of the mausoleum of her father, duke Francis II, and of her mother. The tomb of the sons whom she had borne to Charles VIII, was of the same origin. Louis XII himself, when he wished to erect to his grandfather, Louis d'Orléans, and to Valentine, his grandmother, a monument out of the ordinary style and worthy of such ancestors, turned to Milanese and Florentine artists—it was sculptured at Genoa: this tomb, stranded, after the Revolution at Saint-Denis, from the wreck of the Celestins at Paris, is naturally a stranger to all Gothic traditions, and even the epitaph is of the kind dear to the Latinists of the peninsula.

The Château de Gaillon is the most complete and the most characteristic specimen of what has been termed, for want of other historic designation, the Louis XII style; this style may be considered as extending four or five years beyond the reign from which its name is taken; and this period, as may well be supposed, is, even at Gaillon, a transitional period.

Architects allowed the old national methods to be encroached

upon but imperceptibly; they by no means surrendered the supremacy at once to ultramontane methods. Gothic processes continued to hold sway in the structure, the general dispositions and the proportions; the vault was ribbed; the arch was either flat or broken, and, when framed with a Classic order, the latter had only pilasters and, consequently projecting but slightly, did not attract undue attention. The roofs, instead of being lowered, instead of approaching toward the obtuse angle of the Greco-Roman pediment, tended, on the contrary, to become excessively pointed (Fig. 2). The mouldings penetrated the arches, the bays, and the bases of the pillars. The decoration of the bays was cut deep in the embrasures: this was the relief system inaugurated in the Romanesque period. The frames of the bays, and the ribs of the vaulting preserved the angular sections of the fifteenth century, the windows kept their mullions and intricate networks or their stone crosses (Fig. 3), which disappeared only after the time of Louis XIII; the Corinthian capital was always preferred, because it is in a way akin to the Gothic; it is often so treated as to be quite like it, and sometimes we see it, in the same column, associated with a cordiform base (Fig. 4). The niche with a canopy, the pinnacle, the balustrade with openwork notches and corbelling, all flourished as in their palmy days. Few important edifices were completely rebuilt, few were undertaken on new sites. At Gaillon, the former external perimeter was almost exactly followed, when, by skilful expedients, the interior court was successfully reduced to a rectangular plan. Bury, near Blois, and Le Verger, are exceptions; but the feudal prerogatives assert themselves there in great angle towers, symbols of power, which no one was inclined to abandon.

A comparison of the style of Louis XII, with the early Pointed style will indicate more clearly than anything else the difference, or contrast existing between an architectural style created for material or moral needs and one adopted under the pressure of aesthetic requirements. In the twelfth century, new principles were triumphant, and the forms resulting therefrom at first hardly changed anything except the interior, and there the alterations were mainly in things which strike the casual observer least; at the same time these principles played the most prominent part in the construction. The vault became ribbed, the framing arches supporting it terminated in a point, while no visible change in the profiles, capitals, decoration, secondary arches, or disposition of the towers, bore unmistakable evidence of the revolution accomplished; so true was this that a church of the French school built about 1160, entirely Gothic in essence and framework, appears externally to be purely Romanesque. Altars, altar-screens and tombs



Fig. 3. Hôtel de Ville, Beaugency.

continued to be in the Romanesque style for more than a quarter of a century after the consecration of the Church of Saint-Denis. But as programmes called for the progress which was being realized in the structure, this progress became

¹From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 945, page 52.

more and more marked and, spreading rapidly over regions where it was necessary, it quickly had the mastery over all the routines which, moreover, had not had the time to entrench themselves. In the sixteenth century, on the contrary, the forms of art being adopted because they were

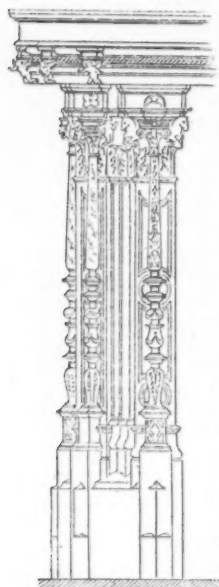


Fig. 4. Details of the Château of Arnay-le-Duc.

pleasing, they were at once conspicuously displayed; and, from the points most exposed to view, but of secondary importance, they passed slowly to the organic elements; these they did not definitely supplant until after their nature or their aspect had rendered them irreconcilable with the invading tendencies of the Greco-Roman orders. Besides, since one was to choose according to his individual humor, the man who preferred tradition to novelties, safe and well-tested practice to experiments and ventures, in which the efforts and risks might not be counterbalanced by the final result, clung to what he had learned or what he had already seen done; for this reason, until the Renaissance had half run its race, and even later than that, Gothic edifices were numerous, churches at least, in the regions first won over to the great architectonic revolution of the sixteenth century. There are sections like Beauvais, Valois, Vermandois, Amiénois and, for better reasons still, Artois, Flanders and Franche-Comté, then foreign provinces, which the Louis XII transition did not touch, as it were, and in which the following evolutions respected the greater part of the religious monuments. In Valois, the Gothic bell-tower, with its lace-work spire and other details, was familiar to master-masons down to about 1600. In the transept of the Cathedral of Beauvais, which was crowned, about 1550, with a wonderfully bold tower, nothing with the exception of two doors bears the stamp of the prevailing taste of the time. In the very centre of Paris, a few steps from the Louvre, the Church of Saint-Merri was erected, from 1520 to 1612, in a but slightly altered Gothic style; a similar remark might be made as to the Church of Saint-Gervais, if its date were better established. It was, however, at Paris that in 1532, the church was begun in which the Renaissance, in the field of religious architecture, engaged in the supreme and victorious struggle against Pointed art: we refer to the celebrated Church of Saint-Eustache.

In 1515, François I ascended the throne, and with him the Renaissance; and it was only at the death of the last prince of the Valois (1589) that it made way for Classic art, represented by the Bourbons. But this change of styles was not accomplished with the abruptness and haste which characterized the political changes. To mark correctly the duration of the French Renaissance, without running the risk of giving rise to false notions, we should consider the reigns as only approximate guiding-points, and the dates should be expressed in round numbers capable of a certain elasticity. With these reservations, the years 1520 and 1590 may be reasonably fixed upon as the two extremes of the existence of our Renaissance. They were preceded, as we have said, by a transition which imperceptibly stripped the Renaissance of Gothic characteristics; they were followed by a second transition, corresponding nearly enough to the reign of Henry IV, which paved the way for the advent of modern architecture.

We must also make allowances for such sections as were belated or that clung heroically to glorious traditions. There were provinces where the local genius manifested itself with special vigor and vitality. The Orleanist school was maintained down to the middle of the reign of Henry IV, or until about 1600; the schools of Troyes and Toulouse until toward the end of the reign of Louis XIII; the Breton school until at least the middle of the reign of Louis XIV, the same as the Flemish school; on the banks of the Loire, at Montoire and Le Lude, we have seen houses of the latter part of the eighteenth century, which, but for the dates they bear, we should have been tempted to refer to the reigns of François I and Henri II.

There is nothing surprising in this, if we remember that Gothic churches continued to be built down to the Revolution of 1789: for example, the abbey-churches of Saint-Maixent and Corbie, the bell-tower of Fontenay-le-Comté, and the Cathedrals of Blois and Orléans.

Let us add that the Renaissance, which came upon the stage in decorative work and details, likewise quitted it in decorative work and details. It appeared in fireplaces, tombs, baptisteries, holy-water basins, altar-screens, and stalls during the entire reign of Henri IV and that of Louis XIII. In addition, certain constructional processes which are thought not to be always advantageously replaced by Greco-Roman processes remained in vogue during the seventeenth century and a part of the eighteenth; the ribbed vault, the stilted arch, the flying-buttress (often reduced to such a scale as to serve as a decorative motive in bell-towers, domes and dormer-windows), the staircase turret and corbelling; this last has never been abandoned and one sees it still marvellously employed under Louis XV and Louis XVI.

The period of seventy years, which we have assigned to the French Renaissance, was not an era of rest; between the two transitions, at either extremity, art did not remain stationary, and the time can even be divided into three distinct secondary periods; these have been named the François I, Henri II and Charles IX styles. We will confine our discussion to the first two, that of François I, extending from 1520 to 1550, and that of Henri II, including the reigns of this monarch and of his sons. If archaeologists were more inclined to be gallant, nowhere could this quality be exercised to better advantage than here: to be just, the style of Henri II should be termed that of Catherine; it would be a much more accurate designation, not only as regards its duration, for Catherine de' Medici lived nearly to the close of the period, but also as to personal aid and influence, in which the queen, who was a friend of the arts, participated to a far greater extent than did her husband and her three sons. One of these four sovereigns, Charles IX, if he had lived longer and in less troubled times, might have won the right to substitute his name for that of Catherine. The term which we suggest would have, besides, the merit of paying implied or indirect homage to the part which such other women as Diane de Poitiers (tomb of Pierre de Brézé, at Rouen, Château d'Anet), Anne de Polignac (La Rochefoucauld and Onzain), Gabrielle de Bourbon (Thouars), Hélène de Hangest (Oiron), Jeanne de Vivonne (Dampierre-sur-Boutonne), and Blanche d'Aumont (Javarzay), to say nothing more of Anne de Bretagne, played, in the sixteenth century, in the development and applications of architecture — a part which M. Palustre has ably set forth.

(To be continued.)

PUBLIC SQUARES.¹ — II. THE TRAFFIC SQUARE.

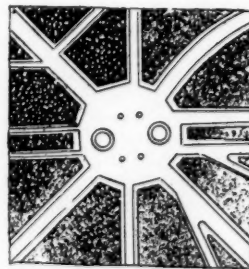


Fig. 15. Place Pereire, Paris, France.

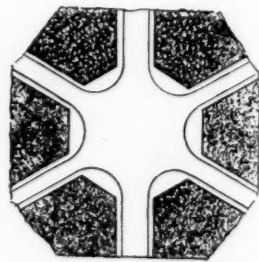


Fig. 16. Place de Strasbourg, Lille, France.

THIS form of square is really a street enlargement on an extensive scale.

The form of the traffic square is usually a circle (Figs. 15, 12 and 13), or a regular polygon (Figs. 16, 17); and less seldom a true square (Fig. 18) or a rectangular one (Fig. 19). The circular plan with a small diameter is not suited for being built around, nor is it agreeable for the pedestrian who is obliged to take either a circuitous route on the sidewalk or a long street-crossing. The semicircular or polygonal plan distributes the flow of traffic in a fan-like

¹A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 945, page 54.

manner and is particularly well-adapted for railroad-stations (Figs. 17 and 20).

The use of refuges is shown in Figures 15, 17 and 20. They are very common in London and Paris and when carefully located they direct the traffic and prevent confusion. If put in the neutral space between two adjacent intersecting streets, they offer but little obstruction to the traffic. The larger the square the more necessary are refuges and garden beds on which are placed candelabra, bill-posters, urinals, booths and small waiting-stations for the street-railways.

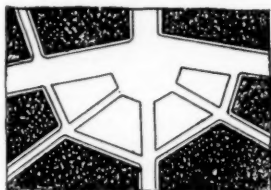


Fig. 17. Weissthurmplatz, Strasbourg.

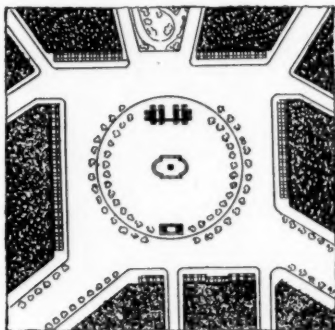


Fig. 18. Piazza Cavour, Florence, Italy.

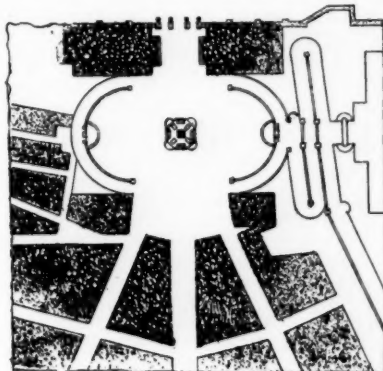


Fig. 21. Piazza del Popolo, Rome, Italy.

Rows of trees, fountains and (very seldom) monuments are found only in large traffic squares. The Piazza del Popolo (Fig. 21) is peculiar and of great beauty and a particularly fine example of this kind of square.

The name "star square" is given to such squares as the Place de l'Etoile (Fig. 13), Place des Nations, Place d'Italie and the Place d'Eylau, Paris (Fig. 12). These are celebrated for the panorama-like views along the radiating streets. Such views are seen in Antwerp, Brussels, Berlin, Dresden, Rome and Florence, but they are particularly remarkable in Paris where the vistas of effective street architecture are heightened by carefully-arranged plantations and artistic end-views. The star square is effective and pleasing

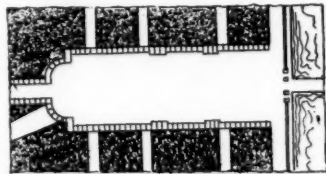


Fig. 19. Piazza Vittorio Emanuele, Turin, Italy.



Fig. 20. Ernst-August Platz, Hanover, Germany.

only in large cities, full of life and animation, where the radiating avenues are well built-up, as in Paris, Rome and Florence.

The traffic square in general and the star variety in particular should be used in small and medium-sized cities only when necessary, as the simple street-crossings and the pleasingly-arranged street-connections, in most cases, satisfy the requirements without the disadvantage of confusion.

The Market Square.—This is the name given to the open square which serves as a market and which, when necessary, it should be possible to use for exhibitions and public festivities.

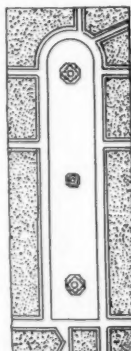


Fig. 22. Piazza Navona, Rome, Italy.

The necessity of open places for the sale of vegetables, fruit, flowers and for exhibition-buildings has not disappeared and a city should so provide for its squares that if in the future it becomes necessary they can be altered into children's playgrounds, garden-squares or sites for a public building.

It is best to place the market-square as near as possible to the centre of traffic, keeping in mind, however, that it is in its nature the opposite of the traffic square, as regards the city flow, which must pass at least on one side but never through it. The market-place is more suitable than the traffic square for decoration by plantations, as the rows of trees are useful in marking-off the space for the booths and in giving shade to the buyers and sellers. This kind of square is suited, but not very well, for public festivities and carnivals, which should be provided for in all large cities by separate squares. These should be sunk and surrounded by terraces. When a square

serves the double purpose of a market and a place for public festivity, its subdivision by trees and beds of plants should be avoided and the ornamentation restricted to gates, sculptures, obelisks, masts and fountains.

The Piazza Navonna, Rome (Fig. 22), and the Königsplatz at Cologne (Fig. 23) are particularly suitable for markets and public carnivals; the latter being also used for military drills and parades. In London, the concavity of the circus square is successfully used

as a cab-stand, but other and better arrangements are shown in Figure 24.

The Garden Square.—This species of square serves particularly the needs of the public health, comfort and recreation, and is at the same time one of the best means of city decoration. The more crowded the city quarter, the more necessary becomes the garden square for the public health.

London and Edinburgh are justly celebrated for the number and arrangement of these squares. The West End city quarter of London

(Fig. 25), comprising the Russell, Torrington, Woburn, Gordon, Tavistock and Euston Squares, and the new city quarter of Edinburgh from Princes

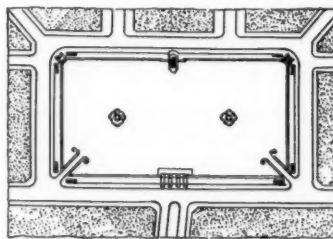


Fig. 23. Königsplatz, Cologne, Prussia.

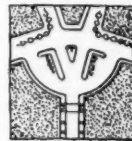


Fig. 24. Carlsplatz, Munich, Bavaria.

Street to St. Stephen's Church (Fig. 26) are most pleasing examples of connected garden squares. Two beautiful examples of this kind of square are shown in Figures 27 and 28; the latter is particularly to be remarked.

The natural attractions of the garden square are enhanced by fountains, aviaries and the like.

The French incline more to outward grandeur than to rural beauty, so that, in France, the garden square frequently serves as a mere street decoration. A beautiful example of the open garden square is given in Figure 29. It is decorated with fountains and works of art and is surrounded by a colonnade and welcomes the stranger entering the city from the railway-station.

In the last decade it has become the custom in Europe to surround public buildings with grass and foliage and make provision for garden squares in the city enlargements. The best examples of this movement are to be found in Berlin, as Figure 30. They are certainly efforts worthy of a large city. The Königsplatz would perhaps be

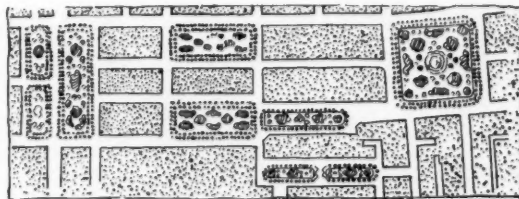


Fig. 25. Garden Squares at the West End, London, England.

more effective if it were not unnecessarily cut up by the street that curves through it. The Schlossplatz at Stuttgart (Fig. 31), decorated with columns and two fountains, is one of the most beautiful palace fore-squares in the world.

Figure 32 shows a square that is not cut through by any foot-path

or street. It serves as a decoration and, together with the sidewalk islands at its wider end, helps to direct the traffic. In opposition to traffic and market squares, the garden square should be removed from the course of traffic which at most should touch it on one side only. An example of a square unhappily placed and too much cut up is shown in Figure 33. The Albertplatz at Dresden (Fig. 34), which serves both as a traffic and garden square, is cut up as little as possible.

The crossing of the garden square by one or more streets of traffic

pose where the square is small and sunk below the surrounding streets. In Europe the garden square is frequently designed to serve as a play-ground for the young, without lessening its ornamental value as a square.

Several garden squares are more to the purpose than a single large one, as there is a

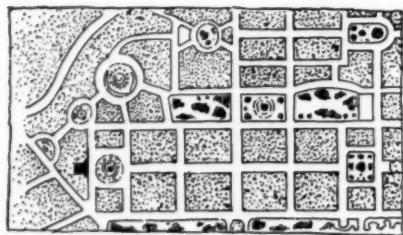


Fig. 26. Connected Squares, Edinburgh, Scotland.

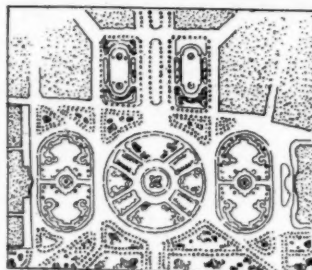


Fig. 30. Königsplatz, Berlin, Prussia.

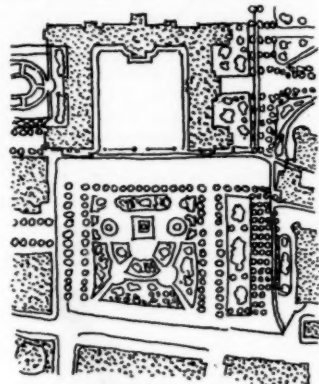


Fig. 31. Schlossplatz, Stuttgart, Wurtemberg, 180m x 210m.

is not to be tolerated and is allowable only when each resulting division makes an independent field.

Garden squares, like all other garden arrangements, are best placed in valleys, partly on account of the protected and favorable position



Fig. 27. Red Lion Square, London, England.



Fig. 28. Finsburg Square, London, England.



Fig. 29. Piazza Carlo Felice, Turin, Italy.

for plant growth and partly because a bird's-eye view is so much more effective. The valley location is exemplified by the Botanical Garden near the Rue Royale, Brussels, the park at Laeken and the new People's Garden at Cologne; in a less degree the Karls-Aue at

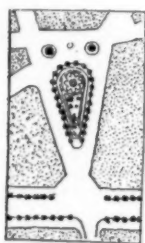


Fig. 32. Friesen-platz, Cologne, Prussia.

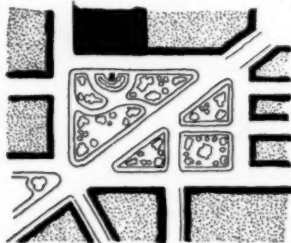


Fig. 33. Georgs-platz, Hanover, Prussia.

Cassel, the park construction at Frankfort-on-the-Main and the Public Garden of Milan, the view of which from the neighboring high streets is particularly picturesque. The plant growth of a garden square should not be forest-like nor disturbing to the architecture. In general, it should be low and subordinate and especially

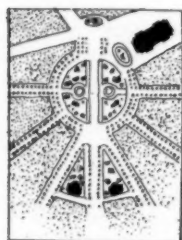


Fig. 34. Albert-platz, Dresden, Saxony.

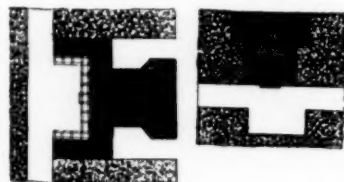


Fig. 35.

Fig. 36. San Giovanni, Brescia, Italy.

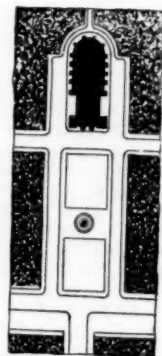


Fig. 39. Luisen-platz, Weissenbaden, Prussia.

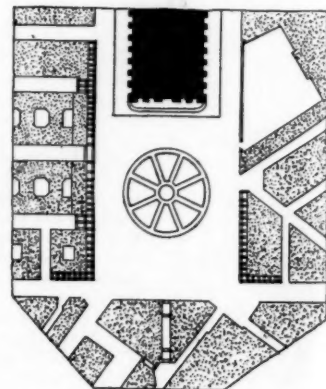


Fig. 40. Piazza del Duomo, Milan, Italy.

so when serving as the foreground for a building. Single high groups of trees are not to be excluded as they are frequently necessary to hide an unattractive view, surround an artistic object or to give scale. A geometrical arrangement of the plants is to the pur-

more equal distribution of the advantages to be gained from them.

The Architectural Square.—Under this heading we discuss the square upon or around which the buildings are erected. A square upon which a public building stands we designate as the "built upon square," and that around which the buildings are erected, as a "built around square." We shall separately consider the fore-square that is placed in front of a building and the monument square, the shape and arrangement of which is greatly conditioned by the erection of a statue, column or other monument.

The Fore-square.—The site of a monumental building should be so selected that it may be seen without difficulty from both near and

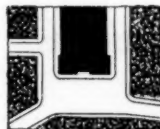


Fig. 37. St. Maurice, Lille, France.

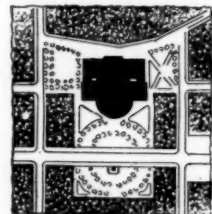


Fig. 38. Stadt Theater, Mainz, Hesse.

far. The distant view should show it in good perspective, inviting to closer inspection, but in satisfying both these requirements the traffic must not be inconvenienced. The location of a monumental structure on a broad street is not satisfactory for the building or for the city, but if it is so placed, the custom is to emphasize it by setting the main part of the building back from the building-line, covering up the sides of the neighboring houses with its wings (Fig. 35). It is common in France to enclose the recession, thus making a court.

Figure 36 shows a fore-square placed on the opposite side of the

street from the church. The appearance of a building, however, is much heightened if it is placed in becoming relation to the head of the street, on an open square of sufficient size. Only in such a position can the spectator be sure of a good view from both near and far.

The fore-square, intended to emphasize only the main façade, should have a depth equal to the height of the building or, better, one and a half times the height. The arrangement of a railway fore-place, worthy of study, is given in Figure 20.

Figure 37 shows buildings on a square entirely too contracted.

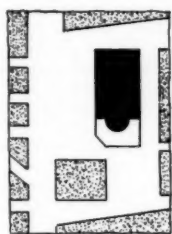


Fig. 41. Piazza del Duomo, Palermo, Sicily.

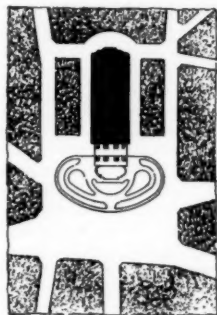


Fig. 42. Eglise de la Trinite, Paris, France.

Of more generous proportions is the Piazza Colonna (Fig. 9) with the column of Marcus Aurelius, Rome.

The fore-square of the Stadt Theatre at Mainz (Fig. 38) with the Gutenberg monument, shows how, on an unfavorably located square, the traffic can be regulated.

The Luisen-platz at Wiesbaden (Fig. 39) would be large enough for the church were it not divided by the Waterloo monument and the foliage.

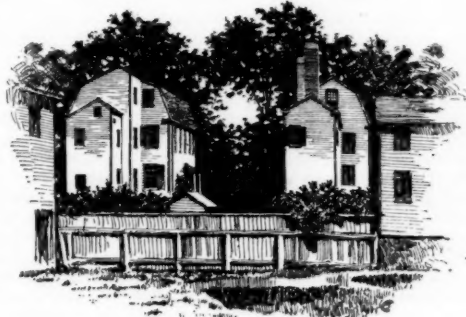
The large empty square before the Cathedral of Milan (Fig. 40) gives an impression of vastness, but it is exaggerated in size and suffers in comparison with the beautiful and smaller cathedral fore-square at Palermo (Fig. 41).

A most beautiful fore-square is that before the Church of the Trinity at Paris (Fig. 42). An ascending ramp, with a rise of a few metres, leads up from the square level to that of the church which rises proudly in height and forms the terminal point of view of the Chaussée d'Antin.

The most monumental fore-square is undeniably that of St. Peter's, Rome (Fig. 7). The dimensions are immense though not here excessive. The square consists of three parts, the Piazza Rusticucci surrounded by stores, the large oval inclosed on the sides by the Bernini colonnade, and the church square proper which is trapezoidal in shape, enlarging towards the church and flanked by colonnades. The ground of the oval slopes towards the centre where the celebrated obelisk stands on a stepped base, diagonally around which are arranged four candelabra. The fountains are placed at the intersections of the longitudinal axis of the oval with the chords of the encircling arcs. The rise from the centre of the oval continues on the axis up to the monumental steps which first lead to a terrace and then to the porch of the church. The cornice of the colonnade having the same rise as the ground, assists in conducting the sight of the spectator up to the gates of the first temple in Christendom. Both the Trinity Church at Paris and St. Peter's at Rome are instructive examples of that æsthetic requirement which demands that the site of a monumental building be raised above the surrounding ground. The Acropolis at Athens, the Villa d'Este at Tivoli, the Church of Santa Maria Maggiore at Rome, the Votive Church upon Montmatre and the Trocadéro Palace at Paris, the Palace of Justice at Brussels, the Federal Palace at Bern, Switzerland, and the Court Palace at Offen, are monumental examples of this principle.

(To be continued.)

THE MODERN RAIN-BATH.



Old Houses, Salem, Mass.

SINCE the first introduction of the so-called "rain-baths" in Germany I have followed with keen interest and attention the gradual development and rapid spread of this new system of baths, and as it has been my good fortune to have been connected

with the planning and construction of the majority of rain-baths installed up to date in this country, it occurred to me that a brief description of the new system would be of interest to the readers of the *American Architect*.

The form of shower or douche used in the rain-bath is not, in itself, new, for it has long been used in connection with the common bath-tub, and it has also been used separately in isolated cases: for instance, as an adjunct to swimming and Turkish baths, or in gymnasiums and athletic-club houses. In the modern "rain-bath" system, however, as recently advocated and applied, *tubs are entirely abolished*, simple douche or shower baths being substituted for the same and being installed as a distinct and independent form of bath. This does not, of course, apply to bath-rooms in private houses, but only to public baths, and to baths for institutions, for manufacturing establishments, for schools, etc.

One feature of construction is novel and of much importance, *i. e.*, the inclined angle at which the *douche* is placed in the rain-bath, the object being to avoid a vertical stream from the douche striking the head of the bather, which to many persons is quite disagreeable. In the new form of rain-bath the bather stands erect under the douche, which is inclined in such a way that the luke-warm water strikes the body only from the neck downwards, and the head is not wetted except when the bather purposely places the same under the descending shower of water.

The advocates of this novel method of bath-construction claim the following chief advantages for it as against bath-houses fitted up with the usual form of bath-tubs:

1. The first outlay for construction is considerably reduced, because the douches are cheaper than bath-tubs. Likewise are the running expenses for maintenance and repairs reduced, because the apparatus is simple and not liable to get out of order, because douches last longer than copper or enamelled-iron bath-tubs, and because repairs, if needed for such baths, are not considerable in extent.
2. In public bathing-establishments the douche or rain-bath system is much more economical in management than the tub system, for the douche or shower-bath is always ready for use and requires but very little attendance. No time is lost as in the filling of the ordinary bath-tubs, and in the subsequent emptying, cleansing and scrubbing of the sides of the tub after each bath.
3. The douche or rain-bath, while more efficient, consumes less time in application, consequently a larger number of people can take baths in a given time than where bathing is carried on in tubs.
4. The rain-bath requires less space in the planning of a bath-house as compared with the same building when fitted up with bath-tubs. In other words, more bathers can be accommodated in a given space.
5. The body of a person using a rain-bath does not come at all in contact with soiled-water, as is the case in bathing in the ordinary bath-tub, for in the rain-bath the water from the douche passes away as waste-water through an outlet in the floor almost as fast as it is delivered. This is one of the leading arguments in favor of the new method, and it is of particular importance in the case of baths for workmen or factory employés, of baths for school-children and of people's baths in tenement-districts.
6. The mechanical and tonic effect of the descending stream in the rain-bath is superior to the tub-bath, both in thoroughly cleansing the body and producing a stimulating effect and good hygienic results, whereas a bath taken in a common bath-tub instead of refreshing the body often has a debilitating effect.
7. The rain-bath requires somewhat less water than a tub-bath, which consideration is of importance where water is given to consumers by meter-measurement, which is generally the case in public baths and public institutions. The exact proportion between amount used in a tub-bath and amount needed for a rain-bath differs according to the construction, the number and the size of the perforations of the douche, the available water-pressure and the length of time during which the douche is kept running. The saving of water as quoted by Dr. Lassar and others appears to me to be somewhat exaggerated. Experiments by actual meter-measurement, carried out by the writer at the Demilt Dispensary, showed that whereas the tub-bath (a short French-shaped enamelled-iron tub) requires about 45 gallons, the rain-bath with an ordinary douche kept running for three minutes, requires about 22½ gallons (7½ gallons per minute), or in other words about one-half the amount required for a tub-bath. Three minutes for each bather is the time allowed in the case of military barracks in Germany: a workman or mechanic would in all probability, require the douche to run somewhat longer to effect a thorough cleansing of the body, hands and face after his work.¹
8. Compared with swimming-baths the rain-bath affords a greater degree of privacy, and it can be used both in summer and in winter, whereas the free swimming-baths of many cities are only available during the summer-season.
9. Finally, the danger of communicating disease is somewhat reduced, because no impure, infectious or contagious matter is left in the bath, as might easily happen where the bath-attendant is either hasty or careless in the cleansing of the tub.

¹ Since writing the above, I have received some douches from Germany, such as are largely used there in rain-baths, and I find these douches considerably smaller in diameter and with holes less in number and less in diameter than used here. These douches run on an average from 2½ to 3 gallons of water, with a water-pressure of from 25 to 40 pounds per square inch.

What appears to have been the first rain-bath was constructed as early as 1857 by Dr. Duval in a military barrack at Marseilles.

Dr. Alexander Bresgen, surgeon in the Prussian Army, in a pamphlet on baths published in Germany in 1871, was the first to advocate the general introduction of rain-baths instead of tub-baths for all public institutions, enumerating in particular military barracks, prisons, hospitals and factories. Attached to his pamphlet is a plan of an octagonal bath-house with sixteen bathing-apartments with overhead inclined douches, and he figures that 120 soldiers can bathe in one hour.

The celebrated French engineer and architect, Tollet, in a pamphlet published in 1877, and entitled "*La Reforme du Casernement et les Bains-douches*," Paris, 1877, submitted plans for three types of rain-baths suitable for military needs.

In the *Revue d'Hygiène* for 1879, Monsieur Vallin describes a primitive form of rain-bath used in an asylum for homeless women and children in Paris.

The first progress toward the general use of rain-baths was made in the case of military barracks and of prisons. At the suggestion of Dr. Munnich, surgeon-in-chief of the regiment, rain-baths were installed in 1879 in the armory of the Emperor Franz Joseph Regiment of the Guards in Berlin, his aim being to bathe quickly a large number of soldiers. Similar baths were fitted-up in the armory of the Infantry Regiment Prince George in Dresden, where twenty-four soldiers can bathe at one time in a large bath-room, also for a cavalry regiment of the Imperial Guards at Potsdam. In 1881, the military barracks of the First Bavarian Infantry Regiment at Munich, were furnished with rain-baths. The well-known military school at St. Cyr, France, was also equipped with these baths.

In Pettenkofer's "*Hand-book of Hygiene*," published in 1882, Prof. Dr. Schuster writing about military barracks, states that experiments with tub-baths for soldiers did not prove successful, first because the tubs are expensive, second because of the large quantity of warm water required, and third, because the time occupied in bathing is too great, and his conclusion is that the douche or rain-bath is much more adapted to the needs of the military service.

Again, for bathing in prisons, jails, workhouses and houses of correction, Dr. A. Baer, of Berlin, recommended in 1882, in the same hand-book, the douche or rain-bath in preference to tub-baths. He describes a prison or jail in the City of Munster which has eight bathing-compartments fitted-up with douches, enabling the bathing of nearly 300 prisoners in four hours.

In the prison of Rouen, Dr. Merry-Delabost installed a large rain-bath capable of bathing 900 to 1,200 prisoners in two days.

The credit of having first advocated the use of the rain-bath for people's or public baths belongs to Dr. Oscar Lassar, who exhibited at the Hygienic Exhibition at Berlin, in 1883, the first people's rain-bath, the construction and equipment of which was carried out by the well-known firm of David Grove & Co.

The Berlin Health Exhibition in 1883, therefore, may be said to have given the first impulse to a more general introduction of this new form of bath, and Dr. Lassar since then became the champion advocate of public rain-baths in Germany. The matter received renewed vigor and impetus by the Berlin Exhibition for the Prevention of Accidents, in 1889, when a special committee arranged for a competition and drew up a programme for the proper construction and installation of workmen's baths on the "rain-bath" principle.

Such people's rain-baths were built and constructed in Vienna in 1887, in Berlin, Frankfurt, Magdeburg in 1888, in Munich and Hanover in 1889, in Altona, Breslau, Braunschweig, Mannheim and Mainz in 1890, in Würzburg in 1891, in Cologne, Düren and Mühlheim in 1892, in Leipzig in 1893 and, and are at present constantly and rapidly multiplying throughout Germany, whereas we hear little or nothing of their use in England or other European countries.

To Professor Flüge and Mayor Merkel of the university town of Göttingen belongs the credit of having advocated and introduced the first rain-baths into the public schools of that city. In public schools, where cleanliness of the body is so intimately connected with the problem of school-room ventilation, such rain-baths for the children have proven very successful, and the example of Göttingen was soon followed in other cities, notably Weimar, Sachsenhausen, Magdeburg, Karlsruhe, Mainz, Breslau, Frankfurt, and others too numerous to mention.

Rain-baths were likewise soon erected or fitted-up in a great many factories and manufacturing establishments, of which I will only mention the large steel-works of Herr Friedrich Krupp in Essen.

Even on board of steam-ships the rain-bath has been found useful, and I learn that some of the ships of the German Navy, and likewise some of the fast, passenger ocean-steamers of the North German Lloyd are fitted-up with rain-baths.

Quite recently, rain-baths have been introduced into the United States, largely at the suggestion of a hydropathic physician, Dr. S. Baruch, of New York City, who had an opportunity to visit and inspect some of the European baths built on this principle.

The first American rain-bath was installed at the New York City Juvenile Asylum. Then followed the people's baths in Centre Market Place, the public baths at the Demilt Dispensary, in the Hebrew Institute, and those erected by the trustees of the Baron de Hirsch Fund at the corner of Henry and Market Streets in New York City. The plans and the construction of the three last-named baths were devised and superintended by the writer, associated with

Messrs. Brunner & Tryon as architects. The writer also acted as consulting engineer for the rain-baths erected in the Young Men's Christian Association Building, at Cedar Rapids, Iowa, designed by Josselyn & Taylor, architects.

In Scranton, Pa., the Pennsylvania Oral High School Building is being provided with rain-baths from plans of Mr. Theophilus P. Chandler, Jr., of Philadelphia. The factory of J. H. Williams & Co., manufacturers of drop-forgings, in South Brooklyn, near Hamilton Ferry, has recently been fitted-up by its owner with rain-baths (although with vertical douches) for the employés.

At this writing a large bath-house is in course of construction, from plans prepared by the writer and under his superintendence, at the State Hospital for Insane at Utica, N. Y.

In this country the "rain-bath" is as yet comparatively little known, but its advantages are so obvious that the writer feels confident in predicting a rapid and successful development of the new form of baths. Since the opening of the Baron de Hirsch Fund Baths the writer has had numerous inquiries about rain-baths from Philadelphia, Chicago, Boston, Cleveland, and also from Southern cities, and he has learned that in Philadelphia the erection of a people's large rain-bath is now being contemplated.

It is sometimes argued that people's rain-baths cannot become popular in the United States because in all large cities and even in the smaller towns, dwelling-houses are rapidly built without the convenience of a bath-room. This can hardly be considered a fair statement of the existing conditions. The actual facts in the case would appear to me to be as follows: It is true that the wealthy and the well-to-do classes have in their houses one or several bath-rooms, fitted-up with more or less luxury, and the rich have, moreover, the many bathing-establishments charging a high price of admission, which only people in comfortable circumstances can afford to pay. On the other hand, it must not be overlooked that even in the houses of the well-to-do people proper provision is rarely made for servants' baths. Again, the middle classes who in New York City, for instance, are largely compelled to live in flats or apartment-houses (the higher-sounding name for improved tenement-houses), have, with rare exceptions, only a narrow, dark and generally uninviting bath-room, and the mistake is, moreover, usually made by architects or builders of locating the water-closet almost invariably in the same room. But the poorer classes of our population, including mechanics, salesmen, clerks, etc., have rarely any bathing facilities whatever, and there are thousands of tenement-houses, especially in the densely-populated districts of our large cities, which do not afford the convenience of a bath.

People's baths, therefore, would seem to me to be just as much needed here for health and cleanliness of the people as they are in Europe.

Rain-baths, however, are not merely suitable for public or people's bath-houses in populous districts. As their success in Europe has fully demonstrated, they are eminently adapted for many other classes of buildings, among which I will mention the following:

1. Institutions, such as general hospitals, hospitals for the insane, hospitals for infectious diseases, orphan asylums, prisons, institutions for feeble-minded children, for the blind, etc.
2. Gymnasiums, college buildings and club-houses.
3. Public schools.
4. Factories and manufacturing establishments, breweries, central slaughter-houses or abattoirs, etc.
5. Military barracks and armories.
6. Hotels.
7. Railroad stations, for railroad employés, in particular for the engineers and firemen, and the clerks of the railway mail-service.
8. Quarantine establishments.
9. On board of merchant steamships, ocean steamers and men-of-war.

The general arrangement of rain-baths as well as the details of construction vary, each case being a problem in itself. For whatever purpose they may be constructed, the baths should be tidy and neat, kept scrupulously clean and inviting in appearance, and well ventilated, heated and lighted. It will suffice to mention briefly a few of the more important features.

The main bath-room is sometimes divided into a dressing-room, and a separate room containing the douches, or else the dressing-rooms are arranged in a row on one side of the room, whereas the apartments containing the douches are placed on the opposite side. Such arrangement is preferred for schools, hospitals and military barracks. In the case of people's baths it is preferred to combine the dressing-room and the bath proper, separating the two only by means of a waterproof curtain. Each bath is generally four feet wide and four feet deep, whereas the dressing-room is four feet wide, and from three to five feet deep. The floor of the bath may consist of concrete covered with a final coat of pure Portland cement, or else some artificial stone floor, such as is used for sidewalks, is laid. The floor may also consist of marble mosaic or vitrified tiling, or else of asphalt, which is more impervious to water than cement, and is more agreeable to the feet than a cement floor. The cement floor is often covered in the dressing-room with a removable sectional wooden lattice, or gridiron-floor to keep the feet dry, but such wood soon rots and requires frequent renewal. In all cases the floor of the dressing-room should be graded toward the bath-apartment.

In many rain-baths the floor of the bathing-apartment is sunk or depressed, being moulded in concrete in the form of a basin from four to six inches deep with rounded corners. In order to make the basin hold a few inches of water and thus answer for a foot-bath, the number of holes in the strainer over the waste is properly adjusted so that the water does not flow away as fast as delivered by the douche, or else a standing overflow with trumpet-shaped mouth is arranged.

It is not easy to decide what material is best adapted for the upright partitions or divisions between the bathing-apartments. A non-absorbent material, such as opaque and non-transparent glass, marble or slate would, of course, be best from a sanitary point-of-view, where economy is no object. The partitions may be covered with glazed tiles, and the walls may be tiled or faced with glazed or enamelled brick. Often the divisions are made of corrugated iron, galvanized and afterward painted with special bath-enamel paint. The cheapest partitions are those of wood, if well filled and oil-painted, and such I find are used in many of the people's baths in Germany, although they are undoubtedly inferior in point of cleanliness and durability to marble or slate. Sometimes marble divisions are used for the compartment and wooden divisions painted with English white enamel paint for the dressing-rooms.

The partitions should not be less than seven feet in height, and it is advisable to keep the bottom of all partitions from ten to sixteen inches from the floor to facilitate cleaning operations, and to promote the circulation of air.

The douches are made either of copper or of spun brass, and may be finished either by tinning or by nickel-plating. Copper douches are somewhat cheaper than brass, but they should be made very strong and have well soldered joints where the pressure of water is heavy, otherwise it may happen that the facing will blow out. It is preferable to have the face of the douche fastened with screws or bolts, so as to have the face removable in case the holes become stopped up by impurities in the water. The number and size of the holes should be calculated and adjusted to the available water-pressure so that the douches will deliver from 5 to 7½ gallons of water per minute. In order to be able to vary the angle of the descending stream it is best to fasten the douches to the supply-pipes by means of swivel joints. In order to enable each bather to control the douche, a strong self-closing cock with combination lever, chain and pull is inserted in the branch supplying each douche, and a hook is provided to fasten the chain to, in order to leave both hands of the bather free. Such cocks or shut-offs, may, however, be dispensed with whenever a bath-attendant controls the bathing-apparatus, as in schools, military barracks and institutions.

The water-service pipes, which are generally carried exposed along the ceiling of the apartments, may be more or less complex in arrangement. Sometimes both hot and cold water-pipes are provided and carried to each bath compartment, in which case each of the latter requires a separate mixing-valve, generally fitted with a hot-water thermometer. As a rule, however, the warm water of a temperature suitable for bathing and varying from 85° to 110° Fahrenheit, is mixed at a central apparatus, and carried and distributed to the douches by a single warm-water main. The best mean temperature of the warm water at the douche is about 100° Fahrenheit. Provision must be made by a large supply-pipe for an abundant supply of water.

Likewise should the waste-pipes from the bath be ample in size to carry off quickly all soiled water. The main drain should be laid with the greatest care, and wherever possible it is advisable to use a separate sewer for the bath-house where the same is located in a building having other plumbing work.

All plumbing should be durable and substantial, of the best of its kind and perfect from a sanitary point-of-view. A good flushing-rim water-closet with flushing-cistern, a well-flushed urinal, and a cleanly earthen or enamelled-iron slop-sink should always be provided. A hose sill-cock with rubber-lined hose, for flushing the floors and cleaning the bath-house generally, must not be forgotten.

Where a general waiting-room is provided, its floor should be tiled, and provided with a safely trapped floor-drain, with shut-off gate-valve.

The bath-house should be properly and comfortably heated and suitably ventilated. All bath-compartments should be lighted by gas, or better still by incandescent electric-lights.

The bathing-compartments should be fitted with plain and substantial furniture, as follows: In the bath proper there should be a perforated brass or galvanized-iron soap-cup and sometimes a wooden foot-stool or a galvanized-iron seat, while the dressing-room should have a well fastened hardwood seat, generally quarter-circle in shape, a number of enamelled-iron clothes-hooks, a towel-rack, a cuspadore and an iron boot-jack.

It is doubtful whether it is proper to provide comb and hair-brush in each dressing-room, because by the promiscuous use of these toilet articles diseases of the hair or scalp may be communicated from one person to another.

Mirrors in bathing-compartments generally become covered with watery vapor and are thus rendered practically useless, and it is quite sufficient to provide one large mirror in the main vestibule or hall of the bath-house.

The entrance from the waiting-room to the dressing-room should have a light wooden lattice door, cut off at bottom and at the top so as to admit of plenty of air for circulation. A door between the

dressing-room and the bath-room proper is not needed; it generally suffices to put up a rubber curtain or a curtain of coarse cheese-cloth to prevent the splashing of the douche and the wetting of the clothes of the bather. It should be mentioned that physicians are opposed to the use of any curtain as being liable to take up and retain disease germs.

A question of prime importance in the construction and fitting-up of "rain-baths" is the provision of a large quantity of warm water, and, at least in the case of public baths, their ultimate success may be said to hinge largely about this point.

In private houses an abundant supply of hot water for bathing is, as a rule, provided for by the water-back in the kitchen range in connection with the kitchen boiler or reservoir for hot water. But for all large bathing-establishments special means for warming water are required, such as hot-water heaters with coal or gas fire, or else closed boiler-iron tanks heated by steam coils. Sometimes the water is heated by the direct admixture of steam, but this, as I shall explain later on, is a method not much to be commended.

Whatever the system may be, the warm-water apparatus to be successful should be simple, efficient and reliable; there should be no unnecessary loss of heat, and the water for baths should never become over-heated and thereby expose the bather to the danger of scalding.

In nearly all cases where a larger number of rain-baths are fitted-up, whether in bathing-houses, factories, institutions, schools, hotels, breweries or other buildings, a steam-boiler plant is erected in the building for heating or power purposes, and steam is therefore available for the generation of warm water in the form of either high or low pressure steam, or else of exhaust steam. The ordinary hot-water tank, however, heated by a steam coil, is open to many objections, being unreliable and difficult to regulate, therefore wasteful in heat. The Tobey hot-water heater is constructed with a view of obviating this difficulty and is, to some extent, successful. The ordinary hot-water tank has been fitted-up with an automatic attachment regulating the supply of steam. Both devices are, however, expensive and somewhat complicated.

Quite recently a novel and ingenious form of apparatus for heating water by steam has been devised which promises to work very successfully. About this I hope to say something in the near future.

WM. PAUL GERHARD.



YOUNG MEN'S CHRISTIAN ASSOCIATION, NEW YORK.

THE Library of the Young Men's Christian Association will give its sixth annual exhibition of art and architectural books on Washington's Birthday, from 11 A. M. to 5 P. M. The exhibition is designed more especially for students and for practical designers and architects. Both ladies and gentlemen will be welcome.



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

OFFICES OF THE OAKLAND GAS AND HEAT COMPANY, OAKLAND, CAL. MESSRS. COXHEAD & COXHEAD, ARCHITECTS, SAN FRANCISCO, CAL.

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

This building cost about \$45,000.

SIMSBURY FREE LIBRARY, SIMSBURY, CONN. MESSRS. HAPGOOD & HAPGOOD, ARCHITECTS, HARTFORD, CONN.

THIS library was given by Mr. Amos K. Eno to his native town. The building is of red brick with hollow walls. The outside is painted yellow with white trimmings; the outside doors, green. The plastering of inside walls and ceilings was tinted with buff Pecora stain before being put on, and was then floated. In one room the plastering froze, but set hard before being thawed, the result being that the surface is covered with imperishable Jack-Frost patterns. The inside woodwork is painted a creamy white, while the doors and railings are of mahogany. The upper doors are of pine painted dull green.

[Note:—Owing to the displacement of a negative and to the further fact that the drawing of the elevation of the building bore no title upon it, we published a portion of this plate last week as a presentation of a dwelling-house at Hartford.—Eds.]

ST. JOSEPH'S IN THE COURTYARD, WILLING'S LANE, PHILADELPHIA, PA. SKETCHED BY MR. FRANK HAYS, PHILADELPHIA, PA.

DOOR OF THE OLD CUSTOM-HOUSE, PORTSMOUTH, N. H. MEASURED AND DRAWN BY MESSRS. C. A. FOWLER AND F. A. CAMPBELL, BOSTON, MASS.

SKELETON CONSTRUCTION AS USED IN THE NEW YORK LIFE BUILDING, CHICAGO, ILL. MESSRS. W. L. B. JENNY AND W. R. MUNDIE, ARCHITECTS.

FOR description, see elsewhere in this issue.

UNDER THE DOME OF THE ART BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Additional Illustrations in the International Edition.]

CHÂTEAU AT CLÈRES, NORMANDY, FRANCE.

[Copper-plate Photogravure.]

BECAUSE of the fortunately chosen position which the Château de Clères occupies in the midst of that pretty valley where the river slowly flows along, reflecting back the large trees upon its banks, we can judge fairly of the art and science with which our ancestors selected the sites where it was their pleasure to establish their seigniories. Here the Château de Clères, dominating four dales, and protected behind by a wide moat, was admirably placed from a strategical point-of-view. Like the Château de Longueville, which has left a very vivid fame in the annals of war, it overlooked the old road from Dieppe to Rouen, over which Joan of Arc passed, while being conducted from Beaurevoir to Arras, to Eu and to Dieppe, in order to be incarcerated in the castle at Rouen, and she must have stopped at this Château de Clères. This would only be another honor for the old Norman château, under the shadow of whose towers two kings, Charles IX and Henri IV once rested.

The ancient château appears to have existed in the immediate vicinity of the present building, behind the church. Its situation and the position of its principal tower seem to indicate that it must have overlooked a very old road descending towards the Village of Clères. Behind, it must have been protected by a moat and by the River Clères. The donjon, like many other structures of this epoch, amongst others the donjon of the Château at Gisors, was built upon an artificial mound. All the exterior of this ancient structure, which consisted chiefly of two stumpy round towers, was of *grès*. Under the tower of the neighboring church used to be a deep well. This ancient château was a contemporary of the château at Arques, and belongs to the thirteenth century. Midst its ruins, amongst burned beams, have been found fragments of a pavement bearing the fleur-de-lis and the towers of Castile. The destruction of the château must have dated from 1418, the time of the taking of Rouen by the English. George II, Sieur de Clères, who was made prisoner by the English at Harfleur, was at that time dispossessed of his property. The charter of Henry V, in fact, dated January 20, 1420, gave the lands and domains formerly belonging to Georges de Clères to John Gray of Heton, on condition of presenting himself at the camp at Rouen on St. John's Day with his following. This John Gray died at the battle of Beaugé, 1421. The estate passed to his son, Henry Gray, who owned it until 1431. This young lord, according to the notes "Sur la Prise du Château de Rouen" by Ricarville, also possessed the County of Tancarville, Beaunais, Hugleville and Gitre-Bernard, four estates which brought him in about seven hundred crowns of yearly income. The domain of Clères only returned to the possession of a French family with George III, son of John III, who also had been made prisoner by the English in 1419, and, on his father's death at the battle of Agincourt, had succeeded him.

It should not be believed that the old château was such a thing as is now presented by the ruins of to-day, covered with ivy. These old walls were, in fact, picturesquely restored in 1815 by M. Foucher, a sculptor of Rouen, and the model used to be in the cabinet of the Count of Béarn, who brought about the whole restoration of the château. It is easy to take account of the modifications, for all the restored portions are in the white stone of Vernon, while the ruins of the ancient parts are of *grès*. Near the ancient donjon is found the ensemble of all the structures connected with the château, formed by several buildings and sleeping-apartments connected together at right angles, forming two sides of an interior court—the *cour d'armes*. The château proper consists of two structures, which have undergone real restorations, greatly altering its appearance. One of them was, indeed, entirely reconstructed in 1865, in the style of the sixteenth century. The basement alone, flanked by short buttresses, existed on this side and was prolonged the length of the moat by a low wall in *grès*, as far as the old wine-press, which has now disappeared. The *corps de logis*, like the château itself, underwent modifications. As it existed in 1865, it seemed by reason of its construction to belong to the fourteenth century. Built of two stages of *grès*, on a square plan, under a pitched roof, its openings and bays, as was the case with numerous lordly dwellings, had to be made over into the style of the sixteenth century. At that time they enlarged the narrow windows and openings, and by successful treatment they decorated with sculptures the portions of the building thus modified, so that the ancient château gained all the appearance of a structure of that date. Upon the outside, upon the south side, this square building was in communication before the restoration of 1865 by a drawbridge, dropped over the moat by suspending chains. At this date there could still be perceived the slots through which worked the arms that supported the drawbridge. This drawbridge, which to-day has disappeared, gave access under an arched doorway opening under a low gallery, and dividing the ground-floor into two portions. The two stories above, upon the

outside of the *cour d'armes*, were pierced with mullioned windows, those of the upper story terminated by a triangular crowning, surmounted by a bouquet and flanked by light pinnacles, enfaming a frieze with bas-reliefs and sculptured monograms. Upon the south side there was added a little projecting stone gallery and balcony supported by decorated machicoulis. At one of the exterior angles of this old building is also found, sheltered under a carved canopy, a statuette of the Virgin, with the inscription "*Posuerunt me custodem.*" This statue facing the road, is also a modern addition, due to M. Foucher, the sculptor. The same may be said of the two lofty brick chimney-stacks, decorated at their summits with light arcadings in stone. They enclose, with a highly-decorative air, a dormer with carved gable, which is cut in the pitch of the roof.

On the interior, as we have said, the primitive *corps de logis* is divided on the ground-floor by a vaulted gallery, which upon the exterior opens into the *cour d'armes*. On the right, over vaulted cellars, is found the kitchen with its fireplace. Upon the left is a vaulted hall, which must have been the waiting-room of the common people. Access was had to the first story by an exterior turret placed in the *cour d'armes*, which we shall have to mention later, and which enclosed the staircase of honor. The grand vestibule on the first floor gave access to three rooms, the first, called the Chamber of Henri IV because of the sojourn which the Béarnese was said to have made there, occupies the angle of the building towards the village. It contains a hooded mantlepiece made over in the style of the sixteenth century, with panels and carved woodwork coming from the château, and a kind of cathedra or throne of modern make, constructed out of the fragments of carved wood of a square wooden drum, which came from the neighboring building, the *batiment de justice*. Here also is found an old bed. In his "*Dictionnaire d'Ameublement*," M. Havard has published a drawing of this old drum, which is very curious. The second room, in the middle of this story, is occupied as a workroom, and the third is used as a dining-room. The second story, to which leads a minor staircase, situated in a little external hexagonal pavilion, contains several chambers.

To this structure joins another building, highly decorated, but entirely modern. The only piece of antiquity about it, on the *cour d'armes*, is the staircase tower, of which we have spoken, and even this was largely restored at the time of the restoration in 1862. It is built of *grès* on a hexagonal plan, and has its faces pierced with several moulded loopholes. It is crowned with a polygonal roof, slated, which is finished with a finial bearing a pennon. The doorway, formerly finished by a simple ogée arch, was at the time of the restoration richly and picturesquely ornamented. To-day it is approached by several steps leading to a platform carried on corbels, and decorated by a straight balustrade, with open flamboyant panels. The door itself, with elliptical head, the *voussoirs* of which rest on *culs-de-lampe*, in the guise of little angels, is enframed between two pinnacles, the shafts of which, twisted at their base, die away into pyramidal, crocketed pinnacles. The whole entrance, very picturesque, is sheltered by a triangular wooden canopy. In the tympanum which is sheltered by this canopy is a circular medallion consisting of a high-relief mask of a porter's head which projects from the surface of the wall which is decorated in polychrome with fleurs-de-lis and painted rinceaux. The general aspect of this entrance recalls one of the doors of the Château de Blois, which has also been reproduced in one of the houses on the Boulevard Malesherbes. Very curious and peculiar is the interior arrangement of the staircase, which is placed in this tower. This staircase *en vis de St. Gildas*, with solid newel, is built with its soffit supported on a series of arches, which form a vault. But what is peculiar in the way of construction, and especially in the way of stone-cutting, is the manner in which the lateral walls are connected with the intrados of the vault, bound together with a series of little brick triangles, admirably laid. An example of this kind of vault, which is very rare, may also be seen at the Château de St. Germain-en-Laye, as is noted by Souvageot, in his work "*Palais et Châteaux de France*." The modern portion of the château consists of a square two-story building, with gables at either end, under a pitched roof, crowned with an openwork cresting in lead.

The façade facing the *cour d'armes* rises over a basement, pierced with two openings and decorated with bullets of *grès en bossage*, as at the Château de Dieppe. An ordonnance of four decorated windows, separated by loop-holes and narrow slits, marks the stories. The windows of the ground-floor in stone are mullioned with crocketed ogée heads. Those of the second story form dormers. These are square, and flanked by two pinnacles carried in projection, and enclosing a crocketed gable, whose tympanum is decorated with the armorial bearings of the lords of Clères. Beneath the roof's gutter, over which open the triangular wooden dormers, runs along the façade a wide band of brick and stone diaper-work. It is an arrangement which we also find at the Château de St. Maurice d'Etlan. Upon the roof, which is crowned with a leaden cresting, are detached two little cylindrical stone chimneys. The gable is of a very lively and interesting design. It is flanked by three buttresses whose slopes and vigorous profiles enliven the base. The middle one, which finishes in a pinnacle, supports the two upper windows, of which the lower part is protected by openwork balustrades.

At the level of the gutter runs above the gable a crenulated balcony, decorated with shallow panels of blind arcading. This balcony at each end abuts upon two vigorous angle corbels, supported by grotesque stooping figures, flanked with projecting gargoyles and

crowned by a small pinnacle. Upon this balcony open two ogee-headed windows separated by the shaft of a very decorative chimney carried on a corbel, the stone pilasters of which enframe the brick-work which is broken by bands of stonework and a coping of open-work arcading. This chimney is very interesting, rising out of the triangular field of the gable, which is ornamented with a decoration of brick and stone diaper-work, which breaks up the monotony of the plain surface. The whole aspect of these ornamented chimneys recalls the curious chimneys of the Château de Martainville, near Rouen. The gable is finished with moulded stone corbie-steps like those in use in the old Flemish or Dutch houses. This entirely new portion of the château encloses, on the ground-floor, a large hall highly decorated, and upon the story above a series of chambers. The old portion of the château, as well as its modern addition, is connected with the different dependencies by a two-story structure of *grès*, pierced upon each face with two square mullioned windows, and on the ground-level by a wide passageway, which serves as entrance to the *cour d'armes*. This little building serves to connect the château proper with the Justice Building, and bears the name of "Passage des Hauts et Puissants Seigneurs." In this passageway used to be a flagging of varnished yellow and red tile, bearing the escutcheon of the lords of Clères, quartered with the arms of the lords Clères and de Brézé, allied to them. In this flagging, specimens of which are at the Museum of Antiquities at Rouen, was a third tile decorated in monochrome. Because of the difference of the level of the ground this "passage of the high and mighty lords" opened onto a narrow terrace, built on retaining-walls coped with stone and decorated with diaper-work of stone and brick. A narrow straight balustrade, with open-work panels, interrupted by pilasters, but against a little turret in the form of a lantern, which contains a staircase, allowing access from the *cour d'armes* to the level of the terrace. This little lantern, built in the style of the sixteenth century, on a pillared base of diapered stonework, was decorated with several open bays, and covered by a polygonal roof of the style of the little terrace of the Palais de Justice at Rouen, on the Rue St. Lo. It is here that an alarm-bell is placed. Upon this portion of the site is found the Justice Building, which consists of three stories of stone, pierced with square mullioned windows. At one of the extremities, towards the château, is found a half-turret with pepper-box roof, carried upon a crenellated semi-circular terrace, which contains the staircase leading from the first to the second story. In fact, to reach the first story of this building, it is necessary to ascend another staircase behind the Batiment des Communs and pass through a private vestibule. Upon the ground-floor this Justice Building encloses the grand hall of justice, where the lords came to give their decisions on disputes. The first story was occupied by two large tiled apartments, ornamented with wooden wainscoting. It is here that was found that wooden drum, which was utilized for the chair or throne which figures in the chamber of Henri IV. In the second story was the *chartrier*, which contained numerous abandoned rooms and the religious ornaments belonging to the oratory of the chapel. This oratory, which was independent of the seigniorial chapel attached to the church, was placed in a narrow stone building attached to the Justice Building, and was finished with a sharp-pointed gable. This oratory, situated in the first story and enclosed by a wooden barrier, was placed above a vaulted passageway upon the ground-floor, which opens onto a little drawbridge, crossing the moat, connecting the terrace with the cemetery of the parish church, which was built behind. Next to the oratory, stretching along this elevated terrace, a few steps up, is the Batiment des Communs, in half-timbered work of the sixteenth century, the panels filled with variegated brick-work.

From its roof open two projecting dormers of wood. This building is to-day occupied as a coach-house and for servants' apartments. In the rooms of the first story there used to be painted landscape decorations, whose style seemed to indicate the time of Louis XIII. At the same date there could still be discerned there armorial bearings in azure on a silver chevron with three mallets. This building is finished behind by two polygonal brick and wooden towers, near which was found the old well. Beneath the building were vaulted cellars, which were attributed to the thirteenth century. Behind this building in a semicircular tower, overlooking the moat, is a wooden neweled staircase with stone bays, giving access to the first story.

Such is the Château de Clères, whose sixteenth century style recalls the sumptuous elegance of the Palais de Justice at Rouen, and, with its additions, it may be held to be one of the most beautiful structures in the region.

DETAIL OF THE PAVILION OF THE AMERICAN BELL TELEPHONE COMPANY, ELECTRICITY BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. FEHMER & PAGE, ARCHITECTS, BOSTON, MASS.

[Gelatin Print.]

GROVE HOUSE, HARROGATE, ENG. MR. T. BUTLER WILSON, ARCHITECT, LEEDS, ENG.

THE new saloon is 34 feet in length and 22 feet in height, wherein on the right is a stone fireplace rising to the ceiling, consisting of an open hearth, fire-basket and ornamental dogs, over which is a moulded and enriched cornice supported by two caryatids taking the form of mer-

maids sculptured in Portland stone, from the studio of Mr. Frank Tory. The frieze is enriched by a representation of a hunting scene, while the whole is surmounted by Elizabethan pilasters and cornice. This apartment is lit by a stained-glass window, 11 feet by 7 feet, in nine panels, with subjects typical of mechanics, science and industry, conceived in a strong key of color, of bold outline; also by a panelled ceiling-light filled-in with rich glass-work from the studio of Messrs. Campbell, Smith & Co. A carved oak staircase rises to the first floor, from which level a gallery runs on two sides. The ceiling of the gallery is in enriched plaster-work, the walls have a panelled dado, and the doors are finished with moulded pediments. The whole of this work is carried out in fumed oak, the newels and other portions of the staircase and gallery being richly carved. The drawing-room is 34 feet by 20 feet, having a bay and two other windows to the south, with two fireplaces. This room is finished in dead white with polished mahogany doors, having enriched plaster frieze 2 feet in depth, which also crosses the room at the centre, and is supported by four Corinthian columns. The chintz bedroom has an angle-nook fitted with settees upholstered in silks. The dressing-rooms are fitted throughout with baths and lavatories with tiled dados, Italian marbles and polished woods. The furniture throughout has been specially designed and made to meet the requirements of each apartment. The exterior elevations have been carried out in local sandstone, and made to tone in color with the stonework of the old house, and designed in harmony with the old work as far as the requirements would allow, the roofs being covered with red tiles. The new kitchen wing has received a somewhat lighter treatment, and half-timber gables have been freely introduced, the roof being again covered with red tiles. The expenditure in connection with this work has been over \$1,000.

HALTON, HERTS: FOOT OF GRAND STAIRCASE.



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

THE CONSTRUCTIVE METHODS USED IN THE NEW YORK LIFE BUILDING, CHICAGO.

CHICAGO, December 9, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Referring to the following letter:

NEW ORLEANS, November 21, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Please ask Messrs. W. L. B. Jenney and W. B. Mundie to explain the reduction of live-loads from top to bottom, taken on columns of New York Life Insurance Building, Chicago, as described in your paper, No. 933, which I, for one, do not quite understand, and oblige,

Yours, etc.,
(Signed) JAMES FRERET.

We beg leave to submit the following:

The reduction of the live-load on the columns in the different stories of a high building is made on the general assumption that the more stories there are above a column, the less will be the probability of all being loaded to their full capacity: and from this, the less will be the actual live-load per square foot for the total floor-area that comes on this column from all the stories above it.

The general transmission of the live-load is by the tile-arches to the floor-beams; by the floor-beams to the girders and by the girders to the columns. The floor-beams are designed to carry the highest probable load that will come on any one. The girders receiving their load through floor-beams numbering from two to six for each girder, it is impossible that every one of these will be loaded to its full capacity at the same time. Hence a reduction is made for the live-load on the girder from the live-load on the floor-beams. A column bears a similar relation to the girders resting on it that the girder bears to the beams; and it seems reasonable to assume a similar relation between a column and the columns above it. And on these assumptions the reductions for live-load on the columns have been made. It may be that the table of live-loads on columns, given in a previous article, does not express this clearly, but the arrangement of loads as shown in the table has been found convenient. The increase of live-loads on the basement columns is made on the assumption that the first floor is much more liable to be loaded to its full capacity on account of the use to which it is generally put.

As the construction of the steel-skeleton buildings has attracted considerable attention, both in this country and in Europe, it may not be uninteresting to some of your readers to present an isometrical view of the columns and the connections.

Figure 1. The work is all assembled at the building with hot rivets. It is necessary in these buildings to take care of the wind-pressure, which in this instance is in part provided for by the shape of the columns and the rigid channel-connections shown in Figure 2.

Figure 3 shows the foundations of two columns where the situation was such as to force the foundations of the two columns to be united.

Chicago soil, it must be borne in mind, is a compressible clay of great depth that cannot well be loaded with more than 3,500 pounds to the square foot. The weights on the foundations must be carefully calculated throughout the entire building that the inevitable settlements of, say, about 3" shall be uniform. The centre-of-gravity of the weights must be the centre-of-gravity of the figure of the footing on the clay.

Wherever practicable each pier and column has its own independent foundations. Occasionally they will crowd in such a manner

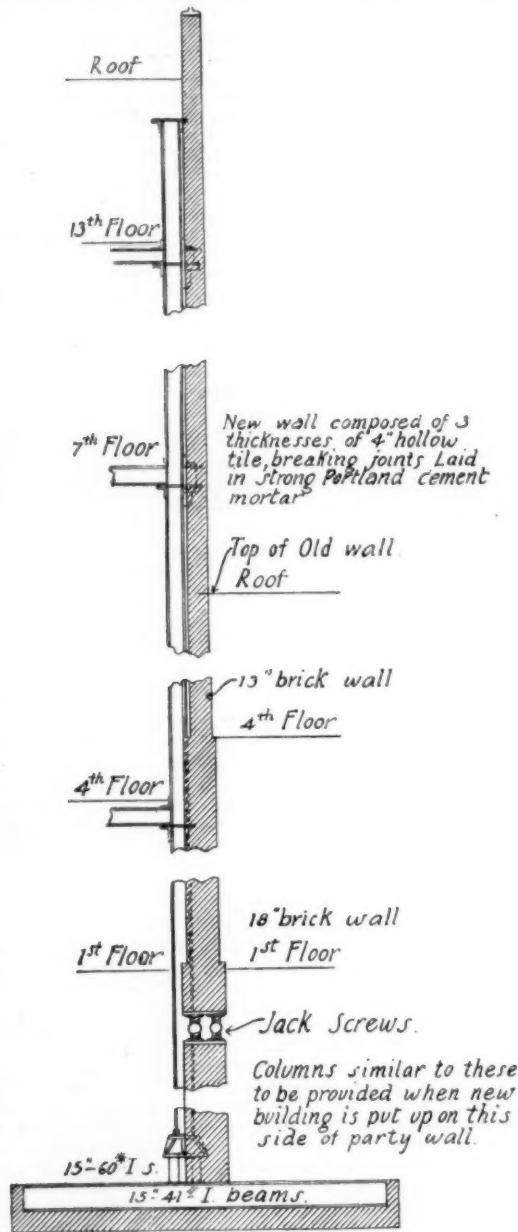


Fig. 1.

that two or more must be united, a sample of which is shown in the figure.

Party-walls.—It often arises that the new building joins another where it is impracticable to remove the old party-wall. This was the case in the New York Life Building—see Figure 1. The old wall was held up and new foundation put in to accommodate the new building and a possible future building adjacent of equal dimensions. As the supports under the old wall were taken out, jack-screws were inserted to keep the old wall in place during settlement of the new work. The floors of the new building were carried on columns, as shown.

A party-wall agreement provides "That when the party owning the property adjacent should desire to rebuild that they would carry their floors on columns and girders similar to those shown for the new building."

The "steel-skeleton" construction, now so universally used in Chicago for tall, fireproof buildings, offers great advantages in construction. The steel-work is set very rapidly, a story each twenty-five working hours. The exterior—each story being carried independently on the columns—can be put in wherever desired, and the floor-arches laid whenever a story is in place.

The view of the building from photograph taken while in process of construction shows the granite first and second stories set, but as the granite is invariably slow and the third-story granite was not at

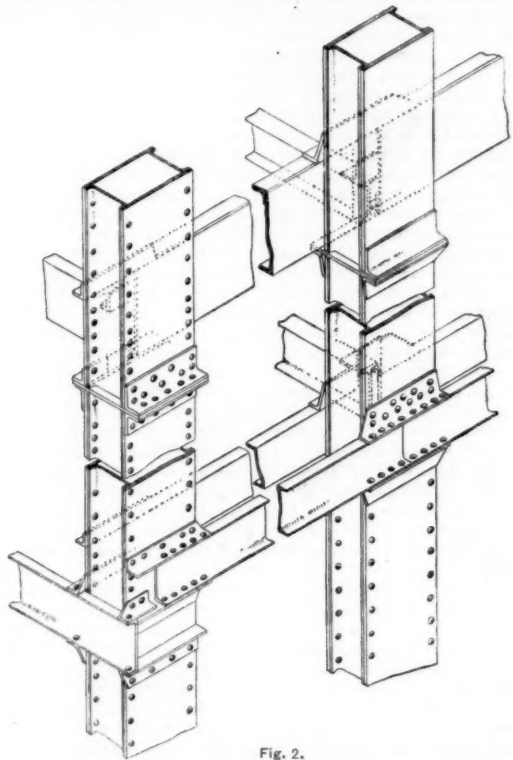


Fig. 2.

hand, the terra-cotta was set from the fifth story up, the granite of the third story and terra-cotta of the fourth to be filled-in later.

It can be readily seen, the advantages offered by this method of construction where it is so essential to complete a building ready for tenants in twelve months from the time of taking possession of the ground to the delivery of the building complete ready to receive the tenants, for it is usually the case that no move can be made to clear the site until old tenants are out on the first of May, and unless the

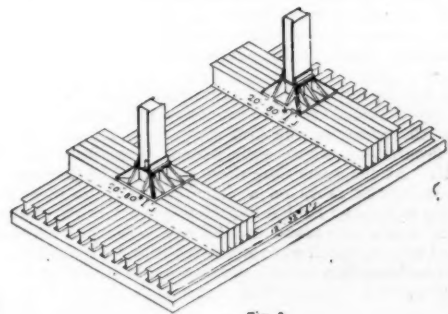


Fig. 3.

building is ready for new tenants on the first of May following, a very serious loss in interest is incurred.

It may be of interest to note the progress of the construction of the New York Life Building.

July 17, old building torn down to grade level: July 31, new footings laid out: August 17, Commenced setting basement-columns: August 31, commenced setting granite: September 5, commenced setting tile-arches: September 18, commenced setting terra-cotta: September 29, all steel-work set: November 9, finished setting tile floor: November 11, finished setting terra-cotta: November 12, commenced plastering: December 2, turned steam on in building from the entire and completed steam plant: December 4, commenced the white hard-finishing coat of the plastering.

Building is expected to be ready for tenants April 1, 1894.

JENNEY & MUNDIE, Architects.