

GOTHIC ARCHITECTURE.

By JOHN J. STEVENSON.

THE influence of the Gothic style has been so marked on our architecture generally that it may not be out of place to devote a few pages of *Harper's Monthly* to an explanation of its development. This will turn out to be the shortest way of explaining its principles, and enabling us to judge how far it is suited for modern domestic requirements.

Although England and France developed each its own forms of Gothic architecture, similar advances being made independently in both countries about the same time, as is the case at present in astronomy and other sciences, the style was imported into England already somewhat advanced. Its first appearance was in France, and there, from the more logical character of the people, less tolerant of compromise than we are, its development can best be traced. It sprang from an imitation of the buildings which the Romans, during several centuries of occupation, with their faculty of giving their conquered provinces not only their language, but their manners, had left every where throughout Gaul, in their own round-arched style, palaces, baths, aqueducts, bridges, basilicas, and villas or country-houses like villages, consisting of straggling agglomerations of buildings one story high, connected by covered colonnades, for country residence and the cultivation of the soil. After a century or two of pillaging excursions the German barbarians settled in the land. About the middle of the sixth century the Franks had occupied the whole country except part of Languedoc, held by the Visigoths; the east, held by the Burgundians; and Brittany, which was not conquered. By these conquests they lost the social organization they had brought with them. Ceasing to be a conquering army under a single head, the habit which Cesar and Tacitus had observed in their ancestors arose again among them, each tribe dwelling apart, isolated from its neighbors by tracts of waste land. Military chiefs became landed proprietors, heads of little independent sovereignties uncontrolled by the central power, their companions in arms, almost their equals before, being now their dependents. With their love of plunder and fighting, when there were no more villages and towns to pillage, they took to fighting among themselves, and it was some centuries before even the rude national unity of feudalism became a fact as well as an idea.

In this anarchy the monasteries were the only refuge of civilization, preserving some traditions of Roman art and order, organizing needful trades into guilds—a system afterward adopted in the towns when, in the

beginning of the tenth century, they began to recover their freedom.

When with rising civilization churches or monasteries and towns began to be built, architecture had to begin at the beginning again. Roman buildings remained every where, but no one knew how they had been constructed. These in their new buildings the people copied as well as they could, making up for miserable construction by lining them inside with marble and gaudy painting.

When they began to build churches, they attempted a reproduction of the old basilicas, or halls for the administration of justice (as had been already done in Italy), the form of which churches still retain, a large central nave or vessel, with an aisle or passage along each side, half the width and height of the nave, opening into it through a range of pillars supporting round arches, above which was a range of windows called a clear-story, lighting the central nave. At first, as they were unable, from poverty and want of skill, to reproduce the Roman vaulting, the roofs were wooden. But churches in those days, like theatres now, were always being burned, and attempts were made to make the roofs as well as walls of incombustible material. In the south of France this was attempted—without the use of wood—by a plain wagon vault, as it is called, from being like the cover of a long wagon stretched on half hoops. This vault they covered with solid masonry in the ordinary form of a roof (Fig. 1). But for this a round arch was very unsuitable; a pointed one



Fig. 1.

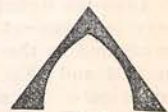


Fig. 2.

saved weight on the apex, and had less thrust (Fig. 2). And wherever they got the idea, whether out of their own heads, which is not impossible, or through Venice from the East, where the pointed arch seems to have been used continually since the time of the Pyramids and Nineveh, it was for vaulting almost immediately adopted. But the arches opening between nave and aisles and those of the windows were still round.

In another way the pointed arch was found advantageous in construction. Attempts, again from a desire for fire-proof construction, were made to build domes. Gothic had once a chance of becoming a domical style of architecture. If a square is supported on four arches, and carries a dome (Fig. 3, plan), the bottom of the dome

being quite inside the angle pillars, must be supported from them by four spherical triangles (*a a*, Figs. 3, 4, and 5) whose points rest each on one of the pillars, and whose bases, turned uppermost, form together the lowest ring of the dome. These triangles resting on their points, their tops a quarter of a circle, their sides each half of one of the supporting arches, are called pendentives, from their hanging, as it were, in the air. Now if the arches whose curves their sides follow are pointed (Fig. 5), the pendentive will be longer than if the arches were round, and, the projection being the same, will not slope so steeply forward; while, if the arches are round, the top part of these pendentives must project actually level, and thin away to nothing, and consequently a dome is more easily placed on pointed arches than on round.

Neither of these styles of Gothic was ever

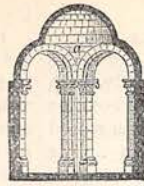


Fig. 4.

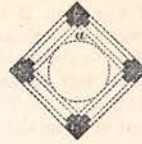


Fig. 3, plan.

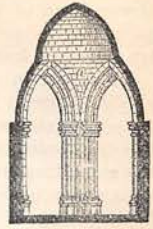


Fig. 5.

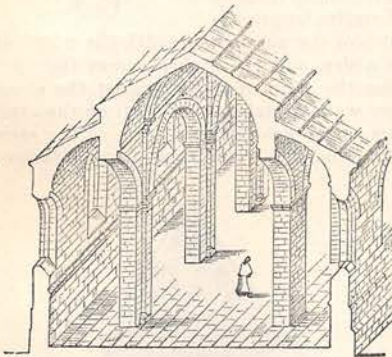


Fig. 6.

developed. In them the windows and openings always remained round. The domical style, with the means at the command of the builders, was suited only for small churches, and could not serve the needs of the great towns of the North. The style with wagon vaults was suited only for the South, for churches so constructed were difficult to light. To form an abutment for the massive central vault the lower side aisles had to be carried up to its springing, thus abolishing the clear-story, and preventing any light getting into the central nave except from the side aisles, leaving the central vaults dark caverns (Fig. 6). Then the roofs all stone did not do. Water got through their upper surface, as will happen, and filtered through the solid roof in devious courses, the place where it appeared on the inside being no indication of the position of the leak outside, so that it was found necessary, especially when the vaulting became more intricate in form, to make it merely an inner ceiling, protected outside by a simple wooden framed roof.

Gothic, as we know it, developed in the

north of France, in what was called the Royal Domain, comprising Paris, Rheims, Amiens, etc.* At first, their churches being large, the builders confined their fire-proof constructions to the side aisles, for they were unable to vault over the wider central portion; nor could they afford to lose the range of windows, or clear-story, as it is called, which lighted this central part, by raising the side aisles so as to make them abutments to a wagon vault. For this difficulty they found in Roman work a solution which enabled them to vault the central nave and yet preserve the clear-story. By dividing the continuous wagon vault of the nave into square compartments, and running another vault across each compartment, so that the two vaults intersected, as the Romans had done, they concentrated the thrust on the four angles of the compartment, where it was abutted, at first ineffectually by tall buttresses, but with larger experience completely, being carried down to the ground by half an arch above the aisle roofs, to which is given the name of flying buttress. At the same time an arched space was left clear in each compartment of the nave above the aisle roof, in which windows could be opened. These improvements are shown in Fig. 7. This form of

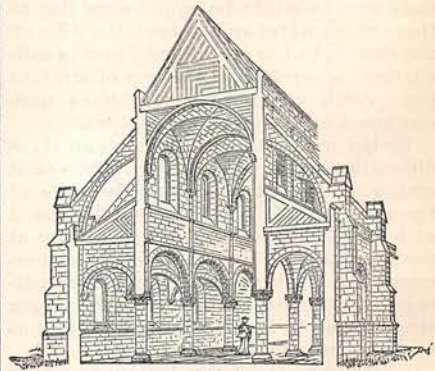


Fig. 7.

vaulting is called groining, in contradistinction to the continuous wagon vault, as

* Viollet-le-Duc, *Dictionnaire de l'Architecture Française du XIe au XVIe Siècle*, Paris, 1854, which gives an admirable account of the history and meaning of Gothic architecture.

the masses of the vault are divided and joined at a point, like the limbs to the trunk in the human groin.

This system of vaulting it was easy to apply either to the nave, leaving the aisles with wooden roofs, or to the aisles only, with wooden-roofed nave; but to vault both at the same time, using only the Roman round arch, was a problem of some difficulty. For if the width of the nave was taken as the size of the square of vaulting, the vault of the narrower aisles, springing from the piers of the wider nave, became oblong in plan, the arches across the aisles only half the size of those in the nave, and the vaults rising from these lower arches to the higher ones having an awkward domical appearance.

If, again, the aisle vaults, as well as those of the nave, were made square in plan, each square of the nave corresponding with two squares of the aisles on each side (Fig. 8), the thrust of the nave

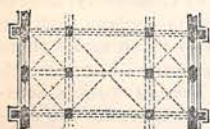


Fig. 8, plan.

vault was brought on every second pier only.

Again, if only semicircular arches are used, those across the diagonals of the square of vaulting being larger and higher than those of the sides of the square, the windows under these can not be as high as the centre of the vault. Light is thus lost, and a mass of dead-wall is needed over the clear-story windows to form a level bearing for the beams of the roof over the central vault. In other positions, also, the round arch was found awkward. Where the piers were close together, as round the apse of a church, the arches resting on them, in order that their crowns might be on the same line as those of the wider arches down the sides of the church, had to be "stilted," as it is called, that is, perched on the top of straight piers, down which their mouldings were continued to the line of the capitals.

By the use of the pointed arch all those difficulties were got over. By means of it arches of different spans could be made all the same height. By breaking the round arch into two parts, attached by a point at the top, the arch could be widened or narrowed like a pair of compasses, and, by adding to the length of the legs in the longer stretches, could be kept the same height as in the narrower stretches.

In this way the determination to render churches fire-proof by means of vaulting produced the pointed style of architecture which we call Gothic. In consequence of being so constructed, our old cathedrals have been preserved to us. Canterbury and Chartres, in our own time, Rheims in the sixteenth century, have had their wood-

en roofs which covered the vaulting destroyed by fire, without injuring the buildings under them.

For some time after the discovery of the pointed arch the width of the nave continued to be taken as the size of the square of vaulting, the aisles also being vaulted in square compartments, two to each square of the nave on each side. The defect of the thrust of the nave vault coming on each second pier only was partially obviated by springing a subsidiary rib from the intermediate pier, thus dividing the vault into six parts instead of four, whence this method is called sexpartite vaulting. Taking the width of the aisles as the size of the square of vaulting, which the use of the pointed arch rendered possible, obviated all difficulties (Fig. 9). The central nave vault became thereby oblong, its length the

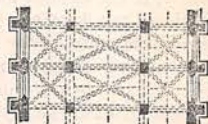


Fig. 9.

width of the nave, its breadth the width of the aisles, and the arches across the nave twice the span of those against the clear-story walls, which, springing from the same piers as the nave arcade, were of the same span (Fig. 10). The clear-story windows



Fig. 10.

were raised to the full height of the apex of the central vault, sometimes even higher, and the thrust of the vault was equal on each pier. Thus by the use of the pointed arch the problems of making both nave and aisle fire-proof by vaulting, of bringing the thrust of the vault equally on every pier, and of making the vaults as high at the side walls as in the centre, thus giving height for windows, were completely solved.

Even after the vaults became pointed, the windows under them continued round-head-

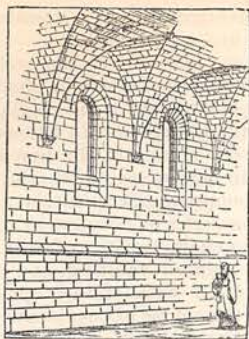


Fig. 11.

ed (Fig. 11). But a round arch under a pointed one leaves a space something like an arrow-head in shape between them, which it was soon seen could be made available as window. The shapes of the windows were therefore made the same as that of the vaults, and the same form was, from the principles of harmony, carried out every where throughout the building.

A new impulse had been given to the art of vaulting by the invention of vaulting ribs. In the Roman groining the angle of the groin consists merely of a line formed by the intersection of the two vaults (see Figs. 7 and 11). The Gothic builders, even while still using the round-arched style, made the angles of the groin strong arch ribs, which form the skeleton of the vaulting, filling in the spaces between these ribs with light flat arching, or even, where the distance between the ribs was short, with long stones resting from one rib to another.

These ribs were made to spring each from a separate slender column, one of a cluster. As the style developed, the columns and the vaulting ribs coalesced, the capitals dividing them became absorbed, the ribs in late Gothic rising without break from the base of the building to the crown of the arch. The feeling of ascent and growth thus given, with the branching groining ribs meeting overhead, gave rise to the popular theory that Gothic architecture sprang from an imitation of a forest with its spreading branches. The history of the style proves the theory erroneous; yet it is true that it has in it something of the spirit and growth of forest life, as Greek architecture has sympathy with the higher forms of animal life.

The development of the style was doubtless influenced not only by the mechanical requirements of which we have traced the development, but by the sense of beauty in the mind of its inventors, and by the environment in which they found themselves placed. If, in the problem which they had to solve, they had been guided purely by mathematical principles, they would have found a more perfect solution not in the

pointed but in the elliptical arch. By means of it arches of different spans could have been made to intersect with perfect mathematical accuracy without recourse to the expedient which, in the light of mathematics, is a clumsier one, of vaulting ribs. But in the light of art the result would have been far less beautiful, and even if they had possessed mathematical knowledge sufficient for working out their problem by the use of the elliptical arch, their instinct as artists would have prevented them adopting it. Besides this, opportunity had made them acquainted with the pointed arch. The Crusades had carried them to the East, which was its birth-place, and where they would see it still in use.

At first the windows were small, leaving large surfaces of wall to be decorated with color and painting, and the decoration was carried out over the windows also by the use of stained glass. This latter mode of decoration, once introduced, was felt to be so brilliant and charming that henceforth it ruled the development of the style. The object of every change was to reduce the surface of masonry, and give more space for stained glass. The small windows were put closer together, and the masonry between them reduced to single upright bars of stone, called mullions, narrow on the face, but deep across the plane of the window, so as to give as much opening as possible for glass, at the same time retaining strength. Openings shaped like flowers, of three or four or more leaves, were placed above them; the corners left between were pierced; the stone between these openings was also reduced to bars bending round the foliated forms (to which the name of tracery is given); and thus at last one great window was formed, which filled the whole space under the vault (Fig. 10).

These mullioned and traceried windows are one of the most charming features of Gothic architecture, so beautiful in themselves that, like Greek porticoes, they have been used even when the causes which led to their adoption do not exist. In large windows, however—especially when these are used in the same building along with smaller ones—a division of their surface by some such means must always remain one of the simplest and most admirable means of producing architectural effect. Windows of all sizes can thus be brought into harmony with each other—an immense advantage in domestic architecture. The architecture of the walls is, as it were, carried over the windows by bars of stone, giving them greater strength and solidity and interest than if they remained mere great holes in the wall.

The form of these stone bars will naturally partake of the constructive lines of the architecture. Under vaultings they will be

curved, but when the architectural construction is altogether in perpendicular and horizontal straight lines, as in our ordinary domestic architecture, the straight form which bars of stone naturally take will be simpler and more suitable.

Gothic architecture had a magnificent opportunity of development in the construction of the great cathedrals, which, in France, were all built at the end of the twelfth and beginning of the thirteenth centuries.

These were civil as well as ecclesiastical buildings; in fact, the distinction between the two provinces was a thing unknown at the time, and is wholly a modern idea, which we never probably would have had except for the differences in religious belief which arose among us at the Reformation. The state is merely the community acting in combination for those purposes in which combined action is more convenient than individual. With us these are now almost confined to justice, police, war, and possibly education. But when religious belief was uniform, as in the Middle Ages, state action included religion. The bishops and abbots were feudal barons, with civil jurisdiction; and, on the other hand, all state action had some religious character and sanction. The cathedrals were the great meeting-places of the city, used for secular purposes, such as the administration of justice, and even for histrionic performances* (which, again, were religious in character), as well as for mass.

They sprung up just after the towns, along with the right to have walls, had attained freedom and privileges; in fact, as monuments of these, and as rivals to the great castles of the lay and the monasteries of the religious barons. The bishops and secular clergy went heartily with the movement, thereby asserting for themselves the power and importance which had been largely absorbed by the monasteries. All the important towns seemed seized with a mania to rebuild their cathedrals with a magnificence unknown before. The new architecture, taking nothing for granted, governed only by logical necessities of construction, is an expression of the rationalism of which Abelard sowed the seed in modern thought, though devoted, like him, to the service of the Church. Their architects were laymen, for the most part, as in several instances we know from their names and the representations which occur of some in the lay dress. In fact, the regular clergy—those living under a rule, or monks, who had hitherto been the sole depositaries of art and culture—disliked the movement: naturally so, for it meant that their use, and consequently their importance, was gone; and they continued to practice still, after

pointed architecture was invented, their own old round-arched style.

This is the reason why the architecture of the French cathedrals is in almost every instance pointed, while in England it is generally round-arched. In France the cathedrals were rebuilt in the new style; in England, in accordance with the English spirit of compromise, cathedrals were generally monasteries or minsters as well.

The main characteristics of Gothic are its system of pointed vaulting, and traceried windows filled with stained glass. The former, in the course of development, led to other peculiar features, such as the clusters of slender columns, each carrying a vaulting rib, by which the lines of the ceiling were carried down to the floor, giving the feeling of height and ascending growth; to harmonize with which, and not from any necessities of structure or of climate, the roofs were made steep and sharply pointed. The style possessed also a beautiful and vigorous style of carving, founded on natural foliage, and truthful and admirable modes of metal-work.

The change to copying natural foliage for architectural ornament, instead of the carving of wild grotesques of the earlier round-arched style, which the Benedictines of Cluny carried to its greatest excess, is due not only to the decay of barbarism and the growth of civilization and refinement, but to the denunciations of St. Bernard. Preaching at Vezelay, where we can still see them, "What business," he asked, "had these devils and monstrosities in Christian churches, taking off the attention of the monks from their prayers?" In the churches of the Cistercian order which he founded, his puritanism forbade ornament altogether, which does not, however, divest them of their art, but produces the manliest and severest type of Gothic. When the artistic genius of the people was untrammelled, it produced the exuberance of decoration inspired by the appreciation of the beauty of foliage, which usually characterizes the style.

This cathedral-building mania (which was really analogous to the railway mania of our own day) lasted in France just about eighty years, the cities then ceasing to find that their privileges and the importance of the clergy (even of the secular clergy) were identical. Strifes arose; the clergy forbade the use of the cathedral bells for town-meetings; the building impetus stopped before a single cathedral was finished, and though parts have since been built, most of them are unfinished, and not one has been completed according to the original design.

The style thus developed was, of course, used for other purposes than churches. The possibility of building in any other style than the prevalent one, or even the exist-

* Viollet-le-Duc, *Dictionnaire de l'Architecture*.

ence of any other, was inconceivable in times when Roman emperors were represented sitting under pointed arches; and the scenes of the New Testament were conceived of as transacted in mediæval cities, by people dressed in mediæval costume.*

Castles and houses were therefore built in Gothic, and the mouldings and minor ornaments were the same as in churches. Pointed windows and tracery, however, from the first it was found necessary to modify; while between vaulted floors, when height was valuable, flat arches, segments of a circle, were adopted.

It may be urged against the statement that vaulting is an essential of Gothic architecture—that Gothic churches, as well as domestic buildings, in England especially, frequently had wooden ceilings, and this not always from economy, but even, as in St. Stephen's Chapel at Westminster,† where the wealth of English art was lavished. This, however, does not disprove the fact that the pointed style arose from vaulting necessities; and, indeed, to the use of wooden roofs in England may, I think, be traced the abandonment of the pointed arch and the adoption of the flattened perpendicular form; while in France, where the use of vaulting was continued, the pointed arch also was retained to the last. The wooden ceiling left the walls divided into square-headed spaces, instead of the arched ones under the vaulting, which a pointed window could not fill (Fig. 12). The window arch formed, with the straight level cornice, awkward corner spaces, called spandrels,

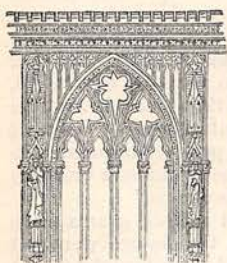


Fig. 12.

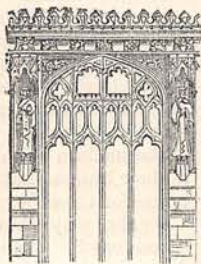


Fig. 13.

which there was always a difficulty to know what to do with. So the haunches of the arch were raised, making the window nearly square-headed, and adding the space occupied by the spandrel to the amount of stained glass (Fig. 13).

In every instance, in fact, in the history of the style in which the use of pointed

* One of the most curious instances of this dormancy of the historical faculty occurs in a picture at Antwerp of our Lord bearing His cross, in which the "stations" are marked by the usual crosses. A Calvary without the "stations" was inconceivable.

† Destroyed by Sir Charles Barry, from a regard for harmony, the style being earlier than that which he was using in the Houses of Parliament.

vaulting was given up, the abandonment of the pointed arch sooner or later followed.

An explanation of the development of Gothic architecture such as we have attempted to give, showing its principles and the purposes which it was created to serve, enables us to form an opinion as to its suitability for our domestic architecture.

It disposes at once of several invalid and absurd arguments against our using Gothic. It has been asserted that the style is gloomy and dark, and does not give sufficient light. Now one of its chief characteristics, as has been shown, is that it is all window—that the main aim in its development was to reduce the surface of the wall, and increase the space for stained glass. No doubt old Gothic castles had little window-light, and this characteristic, adopted for purposes of defense, has been sometimes foolishly copied in modern Gothic houses; but it is plain that it is no essential of the style.

Again, it is called a barbarous product of the Dark Ages, when the people were serfs, and one of the means by which a rich and powerful clergy kept them in ignorance and darkness. On the contrary, it was the product of the revived intelligence of the people, the outcome and sign of their civil freedom; and it gives evidence of a development of art, of skill and refinement and grandeur in building, such as we are incapable of furnishing.

It is said to be a style purely ecclesiastical: it was just as much civil. It was, in fact, in its origin the lay style of architecture, as distinguished from the religious or monastic.* That in England and in Scotland the monastic buildings are frequently of pointed architecture is due to the fact that the development of the monastic system took place later in those countries than in France, and after the Gothic style was formed.

Is there, however, any thing in the Gothic style which makes it (as is often asserted) more suitable than any other for our modern houses?

For this, it is not sufficient that it may appear to us more beautiful than any other. Our grandfathers thought Greek porticoes so beautiful that they were willing to block up their window-light to have them. We see now that this practice was absurd (though Mr. Ayrton, in England, has repeated it in his new Post-office); that it destroys not only the expression of truth in the houses, but the beauty of the portico, by using it where it has no meaning. No architecture can be satisfactory, even from an artistic point of view, whose forms are not founded on use.

Of the various characteristics which make

* See the evidence given by M. Viollet-le-Duc, *Dictionnaire de l'Architecture*.

up Gothic architecture, its system of vaulting does not suit our ordinary domestic requirements. For great halls, where any amount of height can be given, the height occupied by the pointed vault is no disadvantage. But in a building divided into stories, as our houses are, it is; and if in special buildings we want fire-proof construction, we can get it conveniently and cheaply by means of iron and brick or concrete, in the usual thickness of a floor, without the loss of space which would be involved between the springing of the vault and a level floor over its crown.

In the modern revival of the style, however, in not one in a hundred of the thousands of English churches,* and in houses still seldomer, has any attempt been made to revive the vaulting. It is, therefore, hardly necessary to urge that a thing is unsuitable which is never likely to be of use. Nor would the system of vaulting by flat arches be tolerated inside our houses. It is grand, but would be thought prison-like and dismal, and, from its expense, could never come into general use.

In fact, in the application of Gothic to house-building, from the earliest period the pointed arch was dispensed with. In a house at Rheims, called the House of the Musicians, from the statues in pointed niches between the windows, which was built between the years 1240 and 1250, during the highest development of the pointed style, while the pointed arch is used for all the decorative features, such as the niches and the range supporting the cornice, it is frankly abandoned in the windows, where the form would have been unpractical. Numerous instances occur where the pointed arch is retained over the windows, but the window openings are square. The glass was set in wooden frames, so as to open like shutters; and the architects were too sensible to attempt to make these in such an awkward form for wood construction as a pointed arch. In another form of window common in old domestic Gothic, the pointed arch is purely ornamental, carved on a simple straight lintel. Even when in great halls, built for civil and domestic purposes, pointed vaults, and consequently pointed windows, were used, the lower lights of such windows, being arranged to open for air and view, were always square-headed.

From these examples of the practice of mediæval architects in domestic buildings, it is obvious that if we adopt Gothic architecture for our houses now, we ought to dispense with the use of the pointed arch.

Yet, as in all copying, it is the form and not the spirit of the original which is apt to be retained, our architects and builders think they are working in the Gothic style

when they stick a pointed arch where it is not wanted and means nothing—possibly an arch one brick thick on the face of a wall supported by a wooden lintel inside—while the whole construction and details of the house follow the ordinary classic traditions.

Old Gothic attempted honestly and fearlessly whatever use or necessity dictated. It has always the merit of truthful and apparent construction. But this also to some extent unfits the style for modern use. It involves, unless when money could be lavished in decoration, an appearance of severity which does not accord with our modern feelings, and is least appreciated by the poorer and less educated, in whose houses, did we attempt really to carry out the principles of the style, it would be thoroughly disliked. Even in houses where no expense is spared we should not like the appearance, however truthful it might be, of stone arches inside our rooms.

Moreover, truthfulness of construction can not be classed among the excellences of modern Gothic. The copiers of the style, after the manner of copyists, are very apt in their zeal for its forms to neglect its spirit. Few better illustrations of this could be given than the polished oak boxes given as wedding presents, with magnificent brass hinges meandering over them, which make it seem as if no amount of wear or ill usage could separate the lid. Unfortunately, those great hinges have no joint; the work is done by a little feeble one, which it is attempted to conceal, fastened by two minute screw nails, so that, with all its appearance of massive strength, the lid could be pried open with a penknife. Of course a hinge is stronger if the tail is well fastened to the wood, and the old architects spread the hinges all over their church doors in all sorts of playful, twisted forms; but this was always the strengthening of a real hinge. So different is the modern Gothic practice of ornamental door hinges that the workmen's ordinary name for these is "the shams."

Again, why should Gothic grates have "fire-dogs?" Before the forests were cut down, in the great old open hearths, in the days when people burned wood, they were necessary for resting the logs on, to let air under them to keep them burning; but it is sham Gothic to stick them on a grate for burning coals. And why should our gasaliers be made like the old coronas or crowns? These were great rings or hoops, suspended from the ceiling, with candles stuck round the circle. When the gasalier is very large, and the lights numerous, this may still be a convenient arrangement for gas lights; but in a four-light dining-room gasalier the brass hoop is perfectly useless, and it obstructs a deal of light. Such a design, while a revival of a Gothic form, is contrary to the spirit of the style.

* Modern French churches are often vaulted in stone.

It is seldom that architecture attaining its ideal has founded itself strictly on constructive necessities, using such ornament as could consistently be added, and no other. The human mind moves slowly, and sticks to old habits so long that for centuries after a nation has given up wood construction, we find it copying wooden forms in stone buildings. In the gateways of Hindoo Temples* enormous trouble and expense have been taken to procure posts and cross-bars of stones like long logs of wood; and of course the nail-heads, which in wooden construction fastened the logs, are carefully carved in the stone. Even in Greek architecture the triglyphs which divide the frieze into spaces are said to be the reminiscences of the notched ends of the wooden beams of the roof. As to Roman architecture, its decoration has nothing to do with its construction, but is the artistic expression of a wholly different one. In fact, the history of all arts and ornament consists very much in tracing ornamental forms back to some long-forgotten use which gave rise to them. Illustrations without end might be given of this, but the following, though slight, are as good as any. The holes arranged in waves and zigzags on the toe caps of shooting boots are the reminiscence of the old Highland brogues of untanned leather, which allowed the water to soak through them, and consequently had to be provided with little holes at the toes, where it squirted out again with the pressure of each step. Again, the bands on the backs of books have similarly now no constructive use, except in some of the best-bound books, in which they still cover the cords to which the pages are sewed. Such features in an art are not unnatural; on the contrary, they are analogous to the imperfectly developed organs of animals which in the ancestors of the species had performed functions now superseded from change of habit and development of the organism.

To the old Gothic architecture belongs the almost singular merit of perfect truthfulness. When a form ceased to have meaning, it was frankly given up; people did not, as in most other styles, weakly cling to the dead carcass. This evidence, instead of the ignorance and darkness usually attributed to the Middle Ages, a freshness and independence of thought rare in the history of humanity, and a wealth of artistic conception employed in making every new necessity beautiful which few races have possessed. If we could but do likewise, the result of working on the principles of Gothic architecture would be something very different from pointed Gothic. We should have no pointed windows, and quatre-foils, and buttresses which receive no

thrust. We should not have in stone-work chamfer stops at the angles of windows, simulating wooden framed work, and all sorts of ugly and unmeaning notchings, and roofs so steep that they endanger men's lives.* We should ruthlessly abandon forms that are unsuitable, which are not developed by our modern necessities, even though we love and admire them for their beauty. Can it be said that the Gothic revival has exhibited these signs of the true Gothic spirit? On the whole, certainly not; and we fear that such vices as appear in it are almost inseparable from the attempt to apply a thirteenth-century style to present use; that the Gothic style is, in fact, the artistic expression of an obsolete mode of construction.

Must we, then, give up hope of having a style of architecture suitable for our dwelling-houses, fitted for our use, and true and beautiful in point of art? Gothic does not answer our requirements, while the common builders' style, which is that of the houses most of us must live in, though the growth of our wants, and therefore in the main suited to them, becomes yearly more degraded and ugly.

"Why don't architects invent a new style?" say some. We might almost as reasonably ask grammarians to invent a new language. The time needed for the development of the great old styles of architecture is measured in centuries, not in years; and though in the present day our thoughts move faster, this but makes us liable to seesaw from one style to another without any real progress, instead of sticking to a single style and steadily improving it.

"But what style should we adopt?" As well ask what language must we adopt. We can not alter our history and our birth. As there is a common language which every one more or less understands, so there is a common architecture which arose with the growth of modern thought, and has been the architectural style of the country for the last three centuries, which every builder naturally follows, which every workman has been apprenticed to and more or less understands. But while our language has been kept up to a reasonable mark of artistic excellence by a high standard of criticism and the constant efforts of educated minds, our vernacular architecture is characterized by the vulgarity and commonplaceness of the men in whose hands it has been left. The interest of refined and educated minds for the last thirty years has been directed not to improving the vernacular style, but to the hopeless attempt of supplanting it by another, which appeared at first to flourish, but has not taken root in the soil of the country.

* See photographs in Fergusson's *Tree and Serpent Worship*.

* In old buildings these steep roofs had usually a parapet at the cornice, which saved any workman slipping on them from falling over the wall.