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REMARKS ON THE COMPLETE GOTHIC AND AFTER-GOTHIC STYLES IN GERMANY.

BY W. WHEWELL, D.D.

To determine the succession of the architectural styles which have prevailed in any country, is a problem which can be solved only by an extensive and careful examination of the historical and documentary proofs of the dates of buildings, as well as by a survey of the edifices themselves. The *external* evidence, as we may call it, of architectural chronology must be compared with the *internal* evidence of style. Such a task cannot be performed in the course of a rapid tour, nor superseded by any views, however ingenious and persuasive, of the effects which, as we conceive, must have been produced by necessities of construction, or principles of harmony, or tendencies and ideas which have governed and moulded the fabrics of different ages. Such theoretical and imaginative views always require to be substantiated and confirmed by actual history. But though such general speculations are not of themselves sufficient, they may still be not without their value. The architecture with pointed arches, commonly called Gothic, which succeeded the architecture of round arches, called Romanesque, may be supposed to have grown out of its predecessor by certain needs of construction, and to have been unfolded to its complete form by the tendencies and connexions thus brought into view. Such a *theory of Gothic architecture*, as it may be called, I formerly put forward as illustrated by the churches of Germany, especially those of the neighbourhood of the Rhine; and the doctrine thus proposed has been regarded with favour by eminent architectural authorities. M. Boisseree has spoken of this

theory as remarkably confirmed by the results which he had obtained by an historical and artistical line of investigation ; and M. Viollet-Leduc, of Paris, in an admirable series of articles in M. Didron's *Annales Archéologiques*, has maintained the same doctrine, (the derivation of the leading features of Gothic architecture from the necessities of vaulting), and has supported it with an intimate knowledge of the actual architectural construction of Gothic buildings. (See *Ann. Arch.*, vol. ii., p. 81, 1845.) The countenance thus given to the theoretical or ideal view of architecture justifies us, I think, in attempting to apply it in other cases also, at least in the way of trial. Such modes of treating the subject may serve to give to the features of architectural styles a connexion which otherwise is not seen, and which is nevertheless interesting and instructive, and even real ; it being understood that we conceive the necessities of structure to have operated rather in producing the general features of a style, than in determining the form of a special building ; and that we suppose the ideas which run through any mode of construction or decoration not to have been so much consciously contemplated, as unconsciously directive.

Premising this understanding, I will offer a few remarks tending to carry the ideal view of German Gothic architecture a little onwards in point of time, from the point to which the theory of its formation conducts us. Having before proposed a theory of the *formation* of the Gothic style, I wish now to suggest the theory of its *dissolution*.

From the Romanesque was produced, by certain influences, the Gothic style ; from the Gothic again was produced, by these influences, exaggerated or perverted, or by others succeeding them, a style which we may, with Mr. Willis, call the *After-Gothic*, and which, in its turn, gave place to the revived Italian. It is the later tendencies which converted the Complete Gothic into the After-Gothic, of which I now wish to speak.

I would very willingly have availed myself of any classification or analysis of the later German styles by German writers. But though I have not been able to find any such work, there have been published collections of engravings and descriptions of buildings belonging to those styles, of course illustrating the principles which prevail in the styles ; these principles have been discerned, and, to a certain

extent, expressed by German archaeologists. This is especially the case in the work of M. Kallenbach, "The German Architecture of the Middle Ages" (Deutsch-mittelalterliche Baukunst), in which a large collection of buildings is drawn and described. I shall avail myself of M. Kallenbach's assistance in illustrating the principles which I point out, and their gradual development; but I shall state in my own manner the principles which, as I conceive, show themselves in the progress and completion, and subsequently in the decline and disintegration, of the Gothic style.

I. *Principle of Frame-work*.—It is impossible, in looking at a tolerably complete Gothic building (as Cologne Cathedral, St. Ouen, King's College Chapel), not to allow that the work is governed and constituted by a leading idea of frame-work. The structure does not consist, or strike the eye as consisting, of masses of wall and roof, lying merely as inert masses, upon vertical columns and walls, which is the idea of Greek architecture, and of Roman and Romanesque as thence derived. In Gothic work, on the contrary, the vertical pillars which support are continued into the arches which are supported, and into the ribs which are the main lines of the roof; and thus an internal frame-work is produced, which is kept together and supported externally by a collection of buttresses, another outward frame-work. This frame-work not only supports, but almost entirely constitutes, the edifice. The blank spaces, such as the spandrels of the pier arches, and the panels of the roof, are comparatively unimportant and subordinate, and even these are often further reduced by subordinate paneling. The frame-work, again, is constituted of several parallel members; parallel, at least at first, as, for instance, the several shafts of a clustered pier; but in their continuation some forming the ribs of vaults, some the heads of pier arches or windows. These frames, parallel in their origin, and subordinate in succession to one another, form the principal part of a Gothic edifice; and to trace the steps by which this idea of a building superseded the older notion of inert masses resting on props, is always a matter of interest to the architectural speculator. M. Kallenbach has noticed in many of his examples the steps of this change. He has marked its successive development at Gelnhausen (xxiii.¹), Ratisbon (xxxii.), Naumburg (xxxiii.),

¹ The references are to the plates of M. Kallenbach's *Deutsch mittelalterliche Baukunst*, and to the text at the bottom of each. M. K., however, does not appear to think that the formation of the Gothic style was so soon completed. He says that

Halberstadt (xxv.), where flying buttresses were intended ; the nave of Cologne (xxxvi.), where the principle appears fully developed ; and the choir of that edifice (xli.), which shows the external frame-work of composite and flying buttresses carried still further. St. Sebaldus, at Nuremburg (lvii.)—in the choir—shows this principle of frame-work well carried through in three aisles of equal height ; as Halberstadt (xlvi.) does for the more ordinary form, with clerestory and side aisles. The Church of St. Catharine, at Oppenheim (of which a description has been published by M. Müller), is a fine example of a structure thus reduced to frame-work, the walls being thin and paneled, the windows large, with no triforium, the buttresses deep, and the space between them, in their lower parts, being formed into chapels, opening into the church on the inside, and having large windows outwards (like King's College Chapel), so that there is very little wall. Mr. K. observes also (xx.), with reference to Heisterbach, that the introduction of the polygonal apse, instead of the earlier semi-circular apse, made it possible to have an organic connexion of the apse vaulting with the vaulting of the choir ; and thus there was a coherent frame-work running through the whole. He conceives also (xxxii.), with reference to the Dominican Church at Ratisbon, that the Dominicans and Franciscans, who had great influence at the time to which he refers (1230—1240), aimed at simplicity even in building ; and thus, all useless ornament being avoided, and the essential elements of the structure developed under the guidance of the pointed arch, the new art of building was formed.²

II. *Principle of Tracery.*—The tracery which fills the openings of windows in the Complete Gothic style may be considered as growing out of the idea of frame-work. Tracery,

the more the blank wall disappears, the more satisfactory is the effect (xlvi.) ; and (lxix.), with reference to Frankfort Cathedral, that in Germany the development of the idea did not proceed to its completion,—which, he says, would have led builders to reduce the roof to a skeleton of tracery, filled with stained glass.

² The prevalence of the principle of frame-work in Gothic architecture is the circumstance which gives a sort of apparent plausibility to Sir James Hall's theory of the derivation of the Gothic style from structures composed of flexible

branches ; or rather, which makes his plates, illustrating this supposed derivation, exhibit analogies which are really interesting. Yet we see in these plates that the principle of frame-work cannot absorb the whole of the edifice. In his hypothetical wicker-work archetypes of Gothic work, the solid parts of wall, or the spandrels of arches, for instance, are composed of close basket-work ; a mode of construction which suggests the notion of an organisation to which a solid wall in no way conforms.

however, differs from frame-work in this, that it includes no conception of support, and that its elements (the staves, mullions, or *tracery bars*, as Mr. Willis calls them) are exhibited as undergoing flexures which have no relation to mechanical structure.

M. Kallenbach remarks, justly, as appears to me, that the trefoils, quatrefoils, &c. which occur in the Gothic style are not forms arising from the development of that style, but independent elements primarily existing in the Romanesque style. Now, these elements materially influenced the forms which tracery assumes. They determined, almost entirely, the forms of "geometrical tracery;" and added, as it would seem, the "feathering," or "foliation," to the other kinds of tracery.

The gradual formation of tracery by grouping together several windows in one large panel, and perforating with circles, trefoils, quatrefoils, &c., the blank space, may be shown as an historical process by examples both in England and in Germany. Mr. K. gives examples, taken from Seligenstadt (xxix.), St. Geréon at Cologne (xxx.), Maulbron (xxx.), Ratisbon (xxxii.), where we see the process beginning; while in the choir at Ratisbon, and in the church at Naumburg (xxxiii.), we see it carried further. Finally, as at Magdeburg (xxxvii.), the mullions, with their ramifications, occupy the whole window, leaving no blank surfaces. The feathering of the heads of lights, as well as the trefoils and quatrefoils, are separated from the head, and glazed in the intervening opening.³

Though the invention of tracery thus would seem to have been gradual both in Germany and in England, and also in France, its general adoption appears to have gone on much more rapidly abroad than in our country. Cologne, Amiens, and Salisbury, may be considered as nearly contemporary.

³ Professor Willis (Remarks on Archit. of Middle Ages, 1835, p. 49) has, with more distinctness, shown that *foliation* arises from placing arches of different forms (as trefoil, quatrefoil, &c.) under the same compound archway; and that *tracery* is the result of placing multiple arches behind single ones, it may be, in repeated succession.

It may be remarked that tracery necessarily implies that the attention is fixed upon the tracery bars as the positive elements of the structure; and that

when the window space is either so constructed or so seen that the blank spaces (trefoils, quatrefoils, &c.) strike the eye, the intermediate bars being blotted into unorganic spaces of variable breadth (as the cusps project and retire) produces the effect of genuine tracery no longer. This holds whether the quatrefoils, &c., be seen from within, as lights in a dark space, or from without, as dark figures on a light space. Much of the filling of Italian windows appears to be this spurious kind of tracery.

In the two former cathedrals, tracery occupies all the windows, and appears as an universal element of the style. Salisbury is as complete Gothic as Amiens or Cologne in other respects, but has no tracery whatever in the windows. This and some other distinctions quite justify us, I conceive, in regarding the style of which Salisbury is a type (*Early English*) as different from the complete Gothic of Cologne and Amiens. The English style which is first distinguished by tracery is that which Mr. Rickman has termed the *Decorated*; and the propriety of this term consists principally in its denoting the introduction of this new element of decorative tracery, in addition to those which the earlier style contained.

The Decorated style has doubtless some other peculiarities; but before I say anything of these, let us further consider the subject of tracery.

The subordination of one part to another, of smaller parts to larger, which we may trace in the frame-work of a Gothic building, appears also very carefully marked in windows. Professor Willis has very fully explained this principle by resolving the tracery of a window into its successive orders.⁴ Mr. K. has remarked the same thing in a certain way. Thus, he says (xxxviii.) of the tracery of St. Catharine's, Brunswick, that it is formed of staves of single, double, and triple size, the more slender always determining the smaller spaces. This, in another place, is what he appears to call the law of the *membering* (*gliederung*); the shafts and hollows being carried out on a greater scale in the larger members, and more and more delicately in the smaller ones. We may remark, that some of the great German and French works, as Cologne and Amiens, are to an English eye defective as to this subordination. Others, on the contrary, as Strasburg, and much of the later French work, are conspicuous for the careful attention to the rule.

But we must say a word of the modifications which tracery underwent in the progress of time. From the causes already mentioned, the first forms were "geometrical tracery:" to this succeeded, in England, "flowing tracery," in which the

⁴ Professor Willis says (Remarks, p. 57), "The merit of first pointing out the regular subordination of mouldings in tracery belongs to Sir James Hall, whose essay on Gothic architecture contains an elaborate dissertation on this subject, unfortunately shorn of its utility

by the accompanying hypothesis of its derivation from basket-work, which I doubt has deterred many from giving it the attention it deserves. Mr. Rickman has also noticed it, with his usual concise clearness, but I do not think it is so generally attended to as it ought to be."

forms were no longer trefoils, quatrefoils, trifoliate and quatrefoliate circles, and the like, but flowing or inflected curves, in which the lines pass from convex to concave. Such lines also enter copiously into German and French tracery, after its first period; but there are material differences in the progress of tracery in the two countries. In France, the tracery becomes, almost universally, "flamboyant," the compartments being of a flame-like form, and the design of the window, generally, unsymmetrical with regard to a vertical line. The flame-shaped compartment is defined by Professor Willis (*Archit. of M. A.*, p. 60) as "included between two wavy lines, and divided unsymmetrically by one or more wavy lines." This element thus described as "flame-shaped" appears to be what M. Kallenbach calls the "fish-bladder form," (lvii.) — a designation which, besides other objections to it, has the inconvenience of reminding us of the "vesica piscis," a name by which we designate a form quite different, bounded by two equal segments of circles, and therefore neither bounded by wavy lines nor unsymmetrical.

The Flamboyant tracery of France is carried out with a most prodigal display of variety and caprice in the After-Gothic of that country. Tracery of this kind exists in the After-Gothic of Germany; but the love of intricacy which shows itself in that style assumes a more especially German form in the *stump tracery*, of which I shall speak hereafter.

III. *Principle of Lateral Continuity.*—I introduce this principle, in order to point out that the principles of which I have already spoken did not operate without something to interfere with them. If we have, in the structure of a building, several frames, mainly parallel, and one subordinated to another; if we have, in the tracery of a window, bundles of flexible staves or bars, which form the larger and smaller lights by their windings, triple, double, or single; the structure will still be too loose to be satisfactory, except there be something to bind together the parallel supports of the frame, the staves of the bundle. The feeling of this necessity (as a matter of idea) shows itself in various ways in the progress of Gothic architecture. In the Early English style, there were large clusters of slender shafts, each really detached; but these were bound to each other or the wall by horizontal rings in the middle of their height. The arch

mouldings, which accompanied these shafts, were equal rolls, separated by a deep hollow ; but there were never really a different set of arch staves for each roll moulding. And it soon became usual not to make each upright shaft a separate piece, but to cut these shafts upon the stones of a central pier or a wall ; and then the hollows between the mouldings became less deep, the forms of the shafts and of the mouldings were no longer circular, but were marked with a fillet, or a *quirk*, and became also of different breadths. This practice of combining mouldings of different breadths, and of accompanying strong mouldings with fine ones, and thus producing shadows of various breadth and sharpness, alternating with each other, is one of the main and most universal characters of the English Decorated style, as distinguished from the Early English, and it is one of its great and peculiar beauties.

Something of the same kind appears to prevail in German architecture ; although there is not, in that country, any style which exactly represents either the Early English or the Decorated. At a certain stage of German architecture, the shafts and mouldings lose their cylindrical form, and become what Mr. K. calls "pear-shaped,"—meaning, I conceive, that the *transverse* section of the moulding resembles the *longitudinal* section of a pear, the outline being drawn out to an edge and inflected. (See Halberstadt, xlvi.) At a later period, the pier loses its separation into upright parts altogether, and is a cylindrical or polygonal column, out of which the vaulting ribs spring abruptly, forming what Mr. Willis calls "a discontinuous impost." The principle of lateral continuity thus shows itself, by giving a continuity to the mass below which does not extend to the vaulting frame above ; and in this manner the principle of frame-work is interfered with and destroyed, which is, as I have said, one step in the decline of the Gothic style.

This principle of lateral continuity may be called, also, the *principle of wall-work*. The members which are designed, and to a certain extent conceived, as vertical or as curved members, according to the principle of frame-work and the principle of tracery, are really parts of walls, and are modified by this condition, as I have said. And this condition, that the structure consists of wall-work, not merely of frame-work and bent staves, not only does actually operate as being the real construction,

but is always conceived to operate, and thus materially affects the decorative construction. This principle prohibits the structure from being mere frame-work, as a structure of timber and wicker, or a structure of cast-iron, might be. It requires that large portions should be, and should be conceived to be, solid wall, though there may be upon the wall a superinduced decorative structure. This principle of wall-work, again, seems to require that free tracery should be symmetrical, for otherwise the eye is disturbed by the want of apparent balance in the two sides of the pattern; and this I conceive to be a cause of the repugnance, which, I think, most architectural eyes, at first, feel to the French flamboyant tracery. There is a like reason against German stump tracery, arising from its apparent inconsistency with stone walling; and, perhaps, we may attribute to the influence of this principle (the obvious consistency of the structure with good mason-work) the acceptableness of good *Perpendicular* tracery to the eye; for, however such tracery may be condemned by some, as harsh in its lines and having no similarity to any beautiful natural object, it will not be doubted by those who have carefully looked at fine specimens of it, where the design is full and the parts and tracery bars in due and graduated subordination, that this kind of tracery has more truly the aspect of good architecture than the later tracery either of Germany or of France.

This third principle, the principle of wall-work, to a certain extent, operates to balance and oppose our first principle, that of frame-work. For though the principle of frame-work, carried to a certain extent, is a source of beauty in architecture, it ceases to be so if it be carried so far that the whole work becomes frame-work.⁵ Though the masses of solid wall are much reduced in bulk in the most elaborate

⁵ The principle of wall-work modifies the principle of frame-work long before it injuriously affects it. It does this, indeed, as I have said, very conspicuously in the Decorated style in England, giving to the vertical mouldings different forms and values from those of mere frame-work, making some members broad, some narrow, and so on. We are not, therefore, to consider buildings as showing the evidence of corruption of style, merely because there are vertical moulded vaulting shafts too slight to support vaulting; as in King's College Chapel, the architecture of

which has been condemned on this account. Even considered as frame-work, we must take the whole bundle of mouldings, and not one alone; but, in fact, the principle of wall-work operates theoretically as well as practically in all such cases, and prevents us from regarding the shafts as separate supports. The two ideas, that of frame-work and that of wall-work, are both present to the mind; and it is their combined concords and discords which produce the kind of harmony in which architecture peculiarly rejoices.

examples of Gothic buildings, those masses nowhere disappear, nor is it consistent with the idea of a *building* that they should do so. Even in very ornamented buildings, these masses of wall continue to be of considerable extent ; as, for instance, in the lower part of the tower of Freiburg ; and in less ornate work they form a large part of the whole, the ornaments being confined to special portions. These blank and inorganic portions of the mass into which the principle of frame-work does not penetrate, may be considered as maintaining a sort of struggle with the ostensible structural organization to which the most complete examples of Gothic architecture tend. And in the decline of the style the principle of frame-work becomes feebler and less pervading in its influence, while the ambitious desire of loftiness in edifices continues in full force. In consequence of such influences, the upper parts of the building are organically detached from the lower, being connected with them only by wall-work ; and thus the principle of wall-work overmasters and suppresses the principle of frame-work.

And thus, as the ancient structural arrangement of a building, derived from Greek architecture, was, in the transition from the Romanesque, broken up, and the elements thrown into a new arrangement, by the introduction of vertical compartments and continuous upward lines of ostensible vertical support ; so, again, in the decline of Gothic architecture, the notion of continuous lines of support was allowed to slip away. The ornamentation, though derived from the Gothic style, was, in its application, distributed into detached parts, and not connected by the principles of the style ; and thus, the life of the style was fled, while the form was still retained.

But other principles also operated in thus destroying the organization and connection of Gothic structure ; or rather they operated first in forming and developing the style, and then, when they lost their vitality, they gave the direction to its decline.

IV. *Principle of Spire Growth.*—In the Gothic style, the tendency upwards is manifested not only in the lines of support, but also in the forms assumed by elements which tend upwards, free, supporting nothing, and being themselves the terminal portions of vertical masses ; such are pinnacles, canopies, spires, and the like. And there is a kind of

activity and vitality given to these elements, by forming and framing them, not as merely continuations of the parts below, with a smaller breadth and finer details, but as parts tending upwards upon a plan of their own, which separates them from the masses out of which they spring. Thus we have (in the Decorated style especially) buttresses terminated upwards by pinnacles set diagonally upon the rectangular plan of the buttress, either at its summit or on the set-offs, or by octagonal pinnacles; and the crockets, and finials of such pinnacles, and even of the hood mouldings of windows, doors, and other arches, may be considered as a manifestation of the same principle; for these ornaments are quite extraneous to the notion of frame-work; and yet, how blank and bare would an ogee canopy or a triangular canopy to a door or window appear, without crockets or finials!

This principle is exhibited on a larger scale where we have an octagonal spire growing out of a square tower; especially if the transition from the square to the octagonal form be made by means of vertical growths, as is the case in many of the principal edifices of Germany, though rarely in England. The Romanesque forms, especially as they appear in the neighbourhood of the Rhine, naturally led to such a mode of composition, when the Gothic style came into full play; for there were introduced abundantly in the Rhenish Romanesque churches, four-sided spires set diagonally on squares, and towers which, in their upper part, were octagonal with a triangular head to each face of the octagon, and with a spire, accommodated in various ways to this form. Such a tower was treated with great skill by the German *Gothic* architects. The square, reduced to an octagon by cutting off the corners, left, at the corners, masses which shot upwards in detached groups of niches and pinnacles; and the gradual preparations in the lower parts, for thus detaching these masses, and in the upper part, for grouping and connecting them with the central mass, are the subject of a vast variety of ingenious contrivances. These appear in such towers as Freiburg, Cologne, Ulm, Vienna, Strasburg; which are examples of a style of composition, altogether different from anything which exists in this country, where octagonal spires commonly either stand on a square tower, within a battlement, the mode of connection not being exhibited to the eye; or are (as in the churches of Northamptonshire) connected with

the square, by certain sloping surfaces variously disposed ; the pinnacles and dormer windows which break and animate the outline not being made to spring out of any obvious construction.

In many of the churches of Normandy, (we may take St. Stephen's, at Caen, as a conspicuous instance,) groups of canopies on shafts, of exceedingly light and open structure, decorate the transition from the square tower to the octagonal spire, and break the rectilinear outline of the spire itself ; but they do not suggest to the mind, as the German spires, of which I speak, do, the conception of the octagonal structure existing in the mass of the square tower, as a kind of formative *nisus*, which at last burst out freely in the upper part of the tower, and shoots upwards in the spire, still retaining an organic connection with the square tower, out of which it springs ; this tower, also, is not an inert mass, but has itself a tendency to upward growth, shown in turrets, pinnacles, and other portions of a like character.⁶

Perhaps this co-existence of the tendency to the growth of a square tower and an octagonal spire in the same space, was at first not distinctly conceived or consciously contemplated, but was produced by the attempt to give to the forms of the lower and upper parts of the towers, which, as I have said, were *data* supplied by the previous modes of church building, that appearance of organic connection which the spirit of Gothic architecture demands ; and which I have attempted in some measure to mark, by speaking of the Principle of Frame-work. We see the co-existence of the two tendencies in various degrees of development in the great structures to which I have referred. At Freiburg the square lower part of the tower is comparatively blank. The preparation for the transition to the octagonal part begins, however, under the first open gallery which runs round the tower ; and in this gallery, the impression of the square form is further diluted by making the sides into faces, and making the four angles acute. Above this gallery we have an open octagonal lanthorn, having eight fine tracery windows, and triangular canopies ; while the detached angles of the square, shooting up into niches and pinnacles, are still

⁶ Mr. Willis, in his *Architecture of the Middle Ages*, p. 148, has noticed the skill with which the German architects manage

the transition from the square tower to the octagonal spire.

connected with the central mass, and combine with it in forming a crown of pinnacles, out of which the open work spire rises.

The western towers of Cologne have no portion of blank wall in the lower part as the tower of Freiburg has ; but immediately from the ground they are resolved into a frame-work of several orders (buttresses, shafts, window sides, &c.), which frame-work is constructed with reference to the whole tower and spire. It appears to me that, in this respect, Cologne would have gained something if the towers had somewhat more resembled Freiburg, and had had solid and plain portions in their lower parts. It appears to be a general rule with regard to the ornamentation of buildings, and especially of Gothic buildings, that the more elaborate and complicated ornaments should appear in the upper part ; the lower part appearing more in the nature of a support to the upper structure, or a bed, out of which its growths spring ; and this rule is recognised in the rest of the cathedral at Cologne, for the lower parts of the buttresses in the rest of the building are plain, and form a strong contrast with the copious paneling and tabernacling above. And another inconvenience results from thus continuing the whole of the decorative frame-work of the tower down to the ground. The parts of this frame-work are, of course, on a very great scale, having reference to the whole spire, in which each side of the octagon forms a single tracery window, as at Freiburg ; and the windows and masses of buttress which appear in the first upper story of the tower are grand from their size and connection. But the portal below this, which is inserted between the buttresses, as a sort of independent structure, with its own arch and triangular canopy, seems to be constructed on a smaller scale, and to have no organic connection with the whole : an incongruity which would disappear if the portal were an opening in a mass of masonry in which the frame-work which is to be developed in the upper part has not yet shown itself.

In the great church at Ulm, in St. Stephen's at Vienna, in the cathedral at Strasburg, and in that of Frankfort, we have the transition from the square to the octagon managed in a way somewhat similar, but with great variety in the different cases. The artists of the Middle Ages did not copy one example from another ; but having, in this idea of a

spire, a living and fertile principle, they extracted out of it in each case new and varied forms, animated by an organic connection, even to the latest times. Ulm and Frankfort were built as late as the middle of the fifteenth century, and yet have in their structure much of the true spirit of Gothic architecture; while in other parts and elements of such buildings, we see the decline, perversion, and disappearance of the principles which had prevailed in the time of the complete Gothic.

V. *Interpenetration*.⁷—One step of such perversion may be considered as probably resulting from the principle of spire growth, of which I have been speaking. The co-existing tendencies to two different forms in the same mass, (for instance, a square and an octagonal turret, or a square buttress and another square diagonally placed,) when directly and distinctly contemplated, suggested the notion of not only co-existing *tendencies*, but co-existing *forms*, occupying nearly the same space. If we suppose a square and an octagonal pillar, having the same axis and nearly the same size, and each having various mouldings and projections at different stages of its length, the mouldings and projections of the square may, in some parts, protrude beyond the faces of the octagonal mass; while in other parts the mouldings and projections of the octagonal mass protrude beyond the faces of the square mass; and if the whole compound mass exhibits these protruding projections of each of the separate forms, the two forms are presented as *interpenetrating* each other. The same would be the case with two quadrangular masses placed diagonally to each other. And if the two forms which thus co-exist and interpenetrate be complex and different, so that the parts in which each shows itself outside the other, are numerous and various, it requires clear geometrical ideas to conceive and peculiar geometrical skill to construct the interpenetrating forms. Such ideas became objects of attention among the German builders in the time of the After-Gothic; and the exhibition of interpenetrations was one of their favourite manifestations of skill. Tabernacle work, of various kinds, occurs, in which two extremely complex forms occupy the same space, and show themselves in

⁷ See a valuable paper, by Mr. Willis, *On the Characteristic Interpenetrations of the Flamboyant style*, in the *Transactions of the Institute of British Architects*.

Mr. Ruskin appears to think that Interpenetration had its origin in tracery.—*Lamp of Truth*, xxvii.

most curious alternations. And this notion of interpenetrating forms was applied to many of the elements of a building. The mouldings in the heads of doors, windows, piers, &c., which meet to form a pointed arch, do not stop when they meet, but cross each other till they are lost in the more projecting parts. The same is the case with other mouldings which meet each other at an angle in any way ; they do not stop, but cross each other, and die in the projecting masses. In the same way we have clusters of shafts, some of which having their square pedestals set diagonally, and their mouldings at a different height from the others, the mouldings of the pedestals and of the bases of the shafts appear as alternate projections. This is frequent in English After-Gothic (Perpendicular). As another case of interpenetration, we may refer to the examples in which the German architects carried two tracery bars each through the other, and then cut them off short beyond the intersection, making what has been called *stump-tracery*. At Strasburg, in the upper part of the cathedral tower, which is of After-Gothic work, the mouldings of the window heads are treated in another way. There are three or four roll mouldings in the window sides which meet in the head, but not exactly ; each roll on the one side falling into the hollow between two rolls on the other, like the fingers of two clasped hands.

In all these cases of interpenetration it is evident that a play of the fancy, curiously tracing the consequences of certain geometrical assumptions, prescribes the forms, not the organic connexion which appears in the true Gothic work. It is remarkable, however, that the practice of interpenetration which was, in the After-Gothic of Germany, pursued so extensively and laboriously as to be a leading characteristic of the decline of Gothic architecture, did not make its appearance then for the first time. We find the interpenetration of mouldings both in early German and in early English work ; for instance, in the heads of piscinas. M. Kallenbach says that in Germany such intersecting mouldings occurred early, but vanished in 1250 and re-appeared in 1450, and then became in many cases the predominating ornament. In the period of the formation of Gothic architecture, many elements of ornamentation, arbitrarily invented, or suggested from various quarters, come into view. Some of these were persistent in their influence ;

as for instance, the various forms of arches and openings, pointed, trefoil, &c., which were gradually developed into tracery and feathering ; others, as this one, Interpenetration, were suppressed as ungenial, by the Gothic style while in its vigour ; but in its decline they re-appeared, and had a large share in the disorganisation and overthrow of the style.

VI. *Progress of Disorganisation.* By the disorganisation of the Gothic style, I mean the suppression and extinction of those principles, the principle of frame-work and the principle of spire-growth for example, which establish a connexion among the different parts, such that each appears to be necessary to the others, or to grow out of the others. In buildings governed by such principles, the parts are all in a necessary relation to the whole, and are thus connected with each other. In this case, the ornamentation of each part is, as it were, a blossoming of the general principle of growth. But the ornamentation of different parts takes different forms : doors are enriched with frame-work shafts and mouldings, and with spire-growth canopies ; windows with flexible tracery ; vaults with frame-work ribs ; summits of walls and buttresses with pinnacles and turrets ; towers with spires ; and the like. And each of these kinds of decoration may be applied separately to the part to which it is specially appropriate, even if the general mass of the building be destitute of organic connexion, and consist merely of blank walls. This loss of the general organic connexion of a building, while the separate parts were often richly ornamented, is one of the features of the After-Gothic ; and it is obviously connected with those perversions of the principles of ornamentation in the Gothic style of which I have already spoken. The roof was ornamented, and the windows were ornamented, but the ornamentation of each was only fanciful, not organic.

In Germany one of the traditionary aims of the architects tended to draw the ornamented parts further from each other, and thus to break up the organisation. It was a matter of ambition with the Complete Gothic architects to make their churches, and especially their choirs, lofty. It continued to be a matter of ambition with the After-Gothic architects to do the same. The Complete Gothic builders sought their object by constructing the frame-work of vaulting shafts, window shafts, and pier arch shafts in many orders,

and thus lifted into the air such vaults as those of the choirs at Cologne and Amiens. The After-Gothic builders carried their vaults to a great height, but no longer cared to give them a manifest organic connexion with the ground. In their edifices, the vaults rest upon blank walls, or are supported upon cylindrical or polygonal pillars, out of which the vaulting ribs spring abruptly with a discontinuous impost. The windows are made very long by the height of the building, but have no canopies; there are considerable spaces of blank wall; the buttresses have no pinnacles, and are stopped by a sloping top below the eaves of the roof. The roof is exceedingly high and steep, but commonly of plain slate, and, as I have said, with eaves. And thus the later churches of Germany, though conspicuous for their height, have none of that look of upward growth, which gave beauty and life to the elevation of the pure Gothic works, but seem as if they were buoyed up by some power acting on the whole bulk, like a balloon.

This idea of an elevation of internal buoyancy rather than of universal growth of the parts, appears further in the practice which became so common in the later churches of making the three aisles of the same height; as, for instance, in the choirs of St. Sebaldus' and St. Lawrence's at Nuremberg, and in St. Stephen's at Vienna. And it must be allowed that the earlier mode of giving great elevation by means of an external frame-work of flying buttresses carried over the side aisles, was not without its disadvantages. For in order to sustain the vault at so great a height as the choir of Cologne or of Amiens, the buttresses were made so massive, that instead of being subordinate to the central structure, they rather appear to be themselves the principal masses. When we look at Cologne Cathedral from the east, it offers itself to us rather as a circular range of great buttress turrets, among which the central erection is quite inconspicuous, than as a clerestory supported by stages of flying buttresses in due subordination to the central roof. In this respect, edifices in which the same extravagant elevation was not aimed at, as the nave of Strasburg Minster, and most of our English Cathedrals, contrast favourably with the more ambitious plans of such buildings as Cologne, Amiens, and Beauvais, and exhibit the organisation of the building in a far more luminous and satisfactory aspect. But the interior effect of the principle of buoyancy, as manifested in three tall aisles of

equal height, is very striking; especially where, as at St. Sebaldus' and St. Lawrence's just mentioned, we advance out of comparatively low side aisles of the nave, into the choir in which the external windows occupy the whole of the height. Such an arrangement is of course excellently adapted for the display of fine coloured glass, and it is so employed in the choirs of those churches.

Though the fine scheme of the frame-work of a great church was thus in a great measure broken up by making the ceiling independent of it, there still remained in operation the peculiar mode by which the impression of great space is given to the interior of a Gothic building, and which Mr. Willis has pointed out (*Architecture of the Middle Ages*, p. 130), namely, the impressing upon the spectator the three dimensions of height, length, and breadth, by employing a different method for each; the height being suggested by the proportions of a single compartment, whether occupied by the space between two piers with its arch, or by a window; the length being made impressive by the repetition of many such compartments, and the breadth by the succession of aisles and chapels in a transverse direction. And this impressiveness of dimensions survives the use of Gothic details, as may be seen very strikingly in St. Eustache, at Paris.

In proportion, however, as the obvious organisation of the edifice was broken up, and the ornamentation confined to detached portions, the Gothic style lost its meaning, and it became a matter of comparative indifference whether the decoration of each part consisted of the elements of that style, or of other elements, such, for instance, as might be found in the Roman architecture as preserved or revived in Italy. The Gothic style had been formed when the scheme of Grecian and Roman architecture had been deprived of its significance by the introduction of the arch on pillars, of vaulting on pillars, and of the subordination of the exterior to the interior. As I have elsewhere expressed it, the elements of building which had formerly been governed by horizontal arrangements were, by the influences of such practices, disbanded; and then the Gothic architecture introduced a new reign of order, by rallying their elements in a vertical line, with a corresponding frame-work. But when this frame-work disappeared, the elements of the

building again became in a great degree independent, and were no longer confined to those forms or modes of decoration to which the notion of such a frame-work had given rise.

VII. *Unconstructive Forms*.—Forms which do not indicate a possible construction, and could not stand of themselves, naturally occur in this After-Gothic style, in which the ornaments are applied to parts without regard to the whole, and are such as caprice and the love of novelty, not the conditions of construction, produce. Such unconstructive forms are vaults with pendants (as St. George's Chapel, Windsor). Such unconstructive forms in the After-Gothic of Germany, are noted by M. Kallenbach, in the cases of arches with their concavity upwards (lxxix), and by Mr. Willis in the tracery of windows (*Archit. of M. A.*, p. 61.)

The Ogee arch, so copiously used in our own Decorated Style, is an unconstructive form, if considered as an arch; and indeed with us it is scarcely ever the arch of an opening, but is commonly the canopy to such an arch, or the head of a niche. The eye appears to accept this form with pleasure in such cases, as a result of the principle of upward growth combined with the arch; and hence crockets and a finial are requisite to its good effect. On the other hand, crockets and finial upon a principal frame-work arch are inappropriate. The ill effect of crockets so applied may be seen in the restored nave of Cologne, where the pier arches are crocketed. It is said that the old work disclosed traces of such crockets having been features of the original design; but it can hardly be doubted that they greatly disfigure the building.

The free or hanging feathering so common in French porches, and which occurs also in Germany, is likewise unconstructive; but it is obviously treated as an appendage to the arch which it adorns, adhering to that, and not requiring support.

Among unconstructive forms we must place the spire of Strasburg, which, being hollow within, is made to appear as if composed of horizontal and vertical elements, and really has the joints horizontal in the external ornamental part. But in the ribs which form a pyramid within this ornamental work, and really support the structure, the joints are of course perpendicular to the length of the ribs.

VIII. *Recapitulation*.—Resuming what has been propounded with reference to the transition from the Pure Gothic

to the After-Gothic, we may say, that the Principle of a Frame-work of piers, arches, windows, vaulting ribs, and flying buttresses, is the leading idea of Gothic:—this principle may be followed out by itself, and this is in a great measure done in England, producing the Early English of Salisbury; the notion of frame-work, however, not excluding considerable masses of wall:—but to obtain the Complete Gothic, we require, further, the Principle of Tracery, and the Principle of Lateral Cohesion, which gives a new character to the mouldings; and these principles, in Germany and France, are developed at the same time with the principle of frame-work, so that the Complete Gothic in those countries is the first fully formed pointed style. The Principle of Upward Growth in the parts adds to the style other features, as pinnacles, crockets, finials, spires; thus the Complete Gothic is formed.

But the endeavour to build churches very lofty, made the frame-work too massive to be agreeable to the eye, and led at last to the plan of supporting the roof at a great height, without any decorative manifestation of the frame-work. The organic connexion of the whole being thus destroyed, the ornamentation of separate parts was pursued as an exercise of fancy and invention. The tracery became capricious and unconstructive, the structure of spires and other complex forms suggested interpenetrations, and these and the like practices mark the After-Gothic of Germany, till the Italian modes of ornamentation came into play.

In what has preceded, I have attempted to characterise the After-Gothic of Germany rather by the principles which appear to operate in its formation, than by an enumeration and description of details, such as English writers have given for the Perpendicular style. Nevertheless such an enumeration, for instance, of forms of mouldings, bases, capitals, and the like, would be very desirable, and would be a labour well worth the while of one who could spend sufficient time in examining the churches of Germany. In the course of such a labour it would probably be ascertained whether the After-Gothic of Germany can be subdivided into several well-characterised styles, and how it is distinguishable from the Flamboyant of France, as well as from the Perpendicular of England. What I have here offered can pass only for a small contribution to such a work, though collected from the best attempts which, so far as I am aware, have yet been made with such views.