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Architectural Notes on German Churches

A tutor of mathematics at Cambridge, William Whewell (1794–1866) mostly published on mechanics. He became professor of mineralogy in 1828, Knightbridge professor of moral philosophy in 1838, and master of Trinity College in 1841. This work is unusual among his writings for its focus on architecture, yet the emphasis placed on terminology is consistent with his other publications, such as *An Essay on Mineralogical Classification and Nomenclature* (1828). *Architectural Notes* is significant for offering a detailed theoretical analysis of the origins of Gothic architecture, especially of the mechanical principles underlying it, notably the pointed arch. The discussion of German churches, despite the book's title, is of secondary concern, although guidance is given for recording Gothic buildings. This first edition was published anonymously in 1830. The second (1835) and third (1842) editions bore Whewell's name and were partially revised to reflect recent research on the origin of the pointed arch.

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*With Remarks on the Origin
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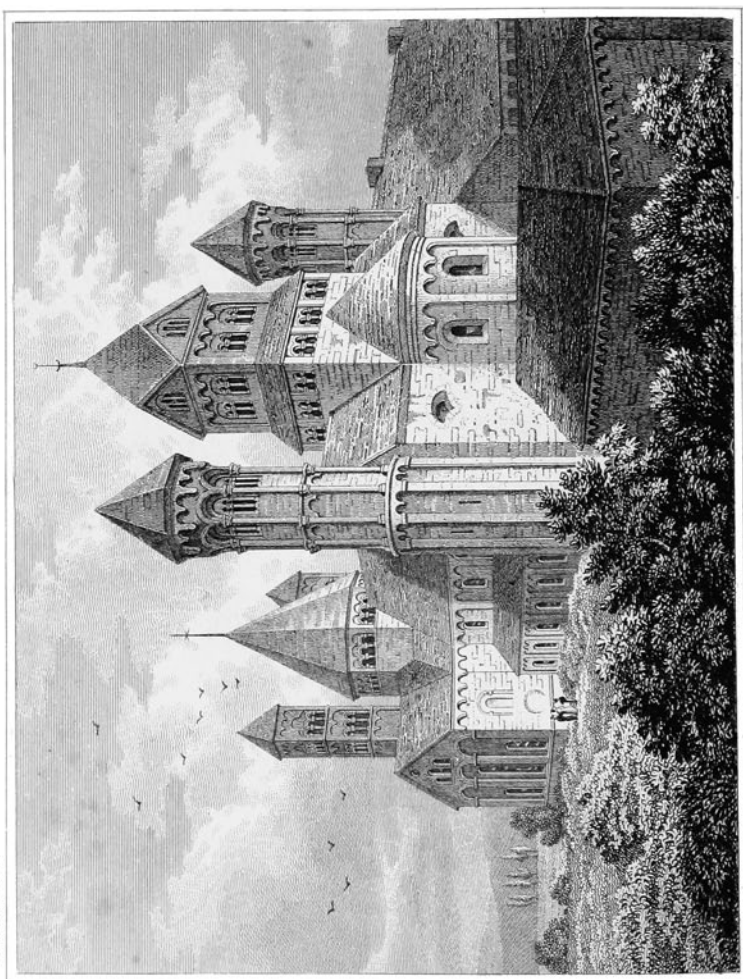


Plate III.

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DESCRIPTION OF THE PLATES.



PLATE I. Represents the steps which form the transition from circular to pointed vaulting. Fig. 1. is Roman vaulting (see p. 6.), the vault-arches in both directions being semi-circular. Fig. 2. represents the kind of vaulting called Welch vaulting, which was necessary when the length and breadth of the vaulted space were different, and both were covered with semi-circular vaults. Fig. 3. shews the way in which this form was avoided (p. 7; and p. 23, No. 6.) the vault-arch in one direction being still semi-circular, and this vault being crossed by another pointed one, of the same height but smaller width. Fig. 4. (p. 7; and p. 23, No. 6.) has pointed vault-arches both ways. Fig. 5. (p. 25, No. 8.) represents sex-partite vaulting; all the vaults being pointed. Fig. 7. is octopartite vaulting on a square base, and Fig. 8. octopartite vaulting on an octagonal base (p. 26. and 27. Nos 9. and 10.). For Fig. 6. see Plate 4.

Under the figures in this plate are placed the symbols which would represent the vaulting according to the system explained page 75.

PLATE II. Three Ground Plans with their vaulting, (see p. 37). Fig. 9, the Cathedral at Mentz, represents a Romanesque Cathedral, with both east and west apses, two transepts, towers at each crossing, and a pair of towers at each end (p. 39). The vaulting of the east apse is a semi-dome (p. 13.), of the west apse, polygonal with acute cells (p. 27). The vaulting of the center aisle is groined, with only the transverse ribs pointed (p. 24); the next lateral aisles are Roman vaulting; the exterior aisles are of more modern work, and are pointed both ways.

Fig. 10, St. Aposteln at Cologne. A transverse-triapsal church, with a large western tower; two smaller towers at the east, and an octagonal pyramid at the eastern crossing. (See p. 39). It has also a western transept. The apses are vaulted

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with semi-domes: the old vaulting of the center aisle is sex-partite on the double compartments, and cylindrical on the single ones; the modern vaulting (represented by dotted lines) has acute transverse vaults over each single compartment, the longitudinal vault being semi-circular. (See p. 26, 54, and 76).

Fig. 11, Abbey Church of Laach. A parallel-triapsal church, (see p. 54.), with a semi-circular apse at each end, a pair of square towers at the east, and of round towers at the west, two transepts and towers at the two crossings. (See p. 39). The three aisles have each Roman vaulting in single compartments. There are three apses towards the east, each with a semi-dome. A portal-cloister, (see p. 61.) occurs at the west end.

These Plans were drawn by the eye without any measurement, and have no pretensions to exactness of proportions or details.

PLATE III. Perspective view of Laach, exhibiting the six towers just mentioned, with their galleries, windows, panneling, corbel-tables, gables and roofing. (See p. 39). The semi-circular *west* end also is shewn, and part of the portal-cloister.

PLATE IV. Fig. 6. Part of a Romanesque Cathedral, with Roman vaulting in double compartments; shewing the origin of the triforium-space, clerestory, alternate piers, and clerestory windows in pairs. (See p. 19).

Fig. 12. A compartment of the church at Sinzig, drawn in memorandum lines only, (see p. 78.), exhibiting the principal and intermediate piers, vaulting pillars, triforium, and fan-shaped clerestory windows. (See p. 51).

Fig. 13. Ground Plan of a pier of engaged shafts and pier edges. (See p. 45).

Fig. 14. Ground Plan of pillar, with square abacuses set obliquely. (See p. 52).

Fig. 15. Cornice which occurs over the apsidal gallery. (See p. 58).

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P R E F A C E.



THE following pages contain the substance of some notes on churches, made during a rapid tour through a part of Germany, with a few remarks suggested by what I there observed. The matter contained in them appears to me to add something to our published information on this subject; and I am persuaded, that by extending and arranging similar observations, we should be led to some interesting and satisfactory views on the progress of ecclesiastical architecture in Germany.

As I see no prospect of my having leisure to pursue the point myself, I place these materials in the hands of the public; with the hope that they may stimulate or assist others, who may take up the subject with better opportunities of doing it justice.

It might perhaps be worth while to publish these memoranda, even if I had no other object than to guide and assist, in some measure, those who may visit Germany with a wish to study

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the ecclesiastical architecture of the country. I have myself felt how welcome to a traveller so employed, are the smallest and most imperfect hints of what he is to see. A single phrase, especially from any one whose studies have been architectural, may direct him to objects which will give him the greatest pleasure, or may save him from a tedious journey, ending in the unprofitable magnificence of some Italianizing church. It will, I think, appear from the following pages, that there are abundant sources of interest to the English antiquary in the country through which I travelled, and that the German churches, both from their resemblances and from their differences as compared with our own, may eminently illustrate the subject of church architecture, which has so long been in our country a favorite topic of speculation.

I cannot, however, pretend to deny, that I have mixed up with these indications and statements something of theory and system. This has taken place almost without my having intended it. It so happened, that the churches which came under my notice in the neighbourhood of the Rhine, illustrated very remarkably an opinion which had long appeared to me almost certain, with regard to the introduction of the pointed arch. Some of the modes of building assumed in this theory, which had been only hypothetical suppositions when it was applied to

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English churches, were found existing as common architectural practices in Germany. It seemed worth while to explain to others this curious coincidence of the theoretical and actual progress of things: and I was thus led to arrange my observations on German churches in subordination to this view. The consequence has been, that this Essay has partly assumed the shape of a disquisition on the origin of Gothic Architecture, instead of that of a collection of architectural notes, which was the form originally contemplated.

The doctrine which seems to me so probable is, as may be seen in the following pages, that the adoption of the pointed arch in vaulted roofs arose from the requirements of vaulting, and from the necessity of having arches of equal heights with different widths: and it appears moreover that the succession of contrivances to which these circumstances gave birth, is found more completely developed, and probably more ancient, in the German edifices than in our own.

If it be allowed that this account of the origin of the pointed arch is the true one, it will perhaps be granted without much difficulty that, from its original situation in the vaulting, this form of arch was gradually diffused into every other part of the building. This opinion accordingly I am disposed to entertain, though I do not consider it to be susceptible of the same

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exactness of proof as the former tenet: and I have tried to shew that this was the manner in which the old system of architecture, derived from the classical styles, was finally converted into one of a different and opposite kind. According to this view all the other changes which are found in company with the newly-adopted pointed arch, may be considered as the natural manifestations of the new character thus impressed upon art. The features and details of the later architecture were brought out more and more completely, in proportion as the *idea*, or internal principle of unity and harmony in the newer works, became clear and single, like that which had pervaded the buildings of antiquity: the characteristic forms of the one being horizontal, reposing, definite; of the other vertical, aspiring, indefinite*.

* The contrast of character which exists between the Grecian and the Gothic styles is well marked by Mr. Rickman. But the various rules and arrangements which he has pointed out as opposite in the two systems, combine in each case to make a common impression on the mind, and flow from some fundamental principle. It is suggested to me by a friend, that this distinctive principle of construction in the Gothic architecture appears to be the admission of oblique pressures, and inclined lines of support. In Grecian architecture the whole edifice consists of horizontal masses reposing on vertical props. In Gothic buildings on the contrary, the pointed arch is always to be considered as formed by two sides leaning against each other at top, and pressing outward at their lower ends. The eye recognizes this statical condition in the leading lines of the edifice, and requires the details to conform

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It does not appear that the degree of attention which the circumstance so well deserves, has yet been given to the extraordinary uniformity of one particular style of Gothic architecture, as it is found over a large part of Europe. The style to which I refer, belongs to that which Mr. Rickman has called “The Decorated*,” in

conform to it. We have thus in the Grecian buildings nothing but rectangular forms and spaces: horizontal lines with vertical ones subordinate to them. The pediment is one mass with its horizontal cornice, and does not violate this rule. Arches, when they occur, are either subordinate parts, or mark the transition style, in which the integrity of the principle is no longer preserved. In Gothic works, on the other hand, the arch is an indispensable and governing feature: it has pillars to support its vertical, and buttresses to resist its lateral pressure: its summit may be carried upwards indefinitely by the joint thrust of its two sides. All the parts agree in this character of indefinite upward extension, with an inclination or flexure to allow of their meeting at top; and thus obviously require and depend on pressures acting obliquely.

* Mr. Rickman’s terms “Early English,” “Decorated,” “Perpendicular” architecture, have been objected to. It is a sufficient reason for continuing to employ these words, that they have been so much more accurately defined and discriminated than any other terms of classification. But I conceive that some of the objections which have been raised against these names, have arisen from not attending precisely to the views with which they were imposed. They were apparently intended to distinguish each style from the *preceding* one: and for this purpose they are significant enough. The *Decorated* differs principally from the Early English in exhibiting a greater degree of decoration: the *Perpendicular* varies from the later Decorated mainly in having certain perpendicular members,

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its earlier form, and with a prevalence of circular tracery. The cathedral of Cologne may be taken as the great type or exemplar of this style; it corresponds pretty nearly in character with such English buildings as the east end of Lincoln cathedral, the chapter-house and nave of York, the nave of Exeter. St. Ouen at Rouen, the choir at Amiens, are French examples. Germany and the Low Countries abound with them: along with Cologne we may mention Altenburg, Oppenheim, Strasburg. This mode of architecture seems, in fact, to have occupied almost the whole of Europe, at least north of the Alps, with a singular identity of spirit and character; and with a very remarkable uniformity in subordinate members, and even in minute details. In different countries it succeeded, apparently in different manners, the previous architecture which had been formed by an imperfect imitation of Roman models: and in each case, when the architects have entirely emancipated themselves from the forms of this degraded Ro-

members, mullions, which in the Decorated are not perpendicular throughout. And the term *Rectilinear*, which has been suggested, would not apparently be an advantageous substitute for Perpendicular; for the mullions, the only members to which the description applies distinctively, are rectilinear only so far as they are perpendicular. The term "Early English" has *accidentally* a peculiar propriety, inasmuch as this style is found almost exclusively in England: at least it does not occur in Germany.

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man, they fall into the same new style; which thus seems to afford, in each country, a goal and resting place after a period of progression and change.

In England, indeed, the case was somewhat peculiar. We possess a style, the “Early English” of Mr. Rickman, preceding that Decorated to which we have ascribed this European diffusion; and this style may be considered as retaining very few traces of the Roman or Romanesque character. It may be said that with us the Gothic system was fully established when this style had become universal*. Though fully established, however, the new character was not thus completely matured. The differences between this English architecture and the Complete Gothic of the Continent are clearly marked; and it is obvious that the additional changes introduced in the latter are such as to present a still further developement of the Gothic principles. The abundant use of window-tracery in the latter case, compared with its entire absence in the former, is a sufficiently broad distinction; and besides this difference, the modes of clustering the shafts and mouldings, and of forming the but-

* What is here said will shew in what sense I have in the following pages used the phrase “Complete Gothic.” In Germany it designates the Decorated style, because there they have no previous fully developed Gothic: but in England it includes both the Early English and the Decorated.

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tresses and windows, are limited with a sort of severity and monotony in the Early English style, which, in the continental edifices of this, and the English edifices of the next period, is exchanged for a freer, more flexible, and more fertile rule.

It seems to me a most curious fact, that the English architects should have gone by a path of their own to the consummation of Gothic architecture, and should on the road have discovered a style, full of beauty and unity, and quite finished in itself, which escaped their German brother-artists. It will, I think, be proved that this is the case, by any one who examines the German churches. Those of them which belong to the steps of the transition from the Roman manner to that of Cologne, have nowhere a character clear and independent, and distinct from either of those. They differ by gradations of more or less, by changes of one part or another, the style advancing over the interval without apparently finding any intermediate position of equilibrium. For the sake of collecting into one view the phenomena of this transition, and of noting local peculiarities, I have given an enumeration of the characters of *Early German* architecture. But by this term I designate, not a single and definite style like the *Early English* of Salisbury and Lincoln, but the collection of all the forms which occur after the great change had begun, and before it was completed; from

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the just-wavering Romanesque of Mentz or Worms, to the multiplied but not quite Gothic elements of Limburg and Gelnhausen.

I fear that some of my readers may expect to find in the following pages more information than I have given, concerning the dates of particular buildings, or the exact chronology of the different styles of architecture. I am obliged to abstain, at present, from entering directly upon this field. I am well aware that such discussions might be more interesting than description and theory can hope to be; and it is undeniable that those enquiries are very essential to complete our knowledge of architectural history. But strong reasons withhold my pen from such topics. The unavoidable length to which these antiquarian lucubrations spread, and the quantity of time and learning which they require, may excuse their absence from a small and subsidiary essay like the present one: and besides this consideration, there seems to be an advantage in studying separately the two things which we are afterwards to compare;—the differences of style, and the differences of date. If there really be any consistency and uniformity in the several buildings of the same epoch, we ought to be able to detect this agreement by examining the buildings alone: and when we are satisfied of this common character, we shall know what problem we have to solve in investigating *when*

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and *how* these epochs followed each other. We have to compare the *internal* evidence of derivation or succession with the *external* evidence of time; and what I have here contributed, is intended to illustrate the former term of this comparison.

To tell the truth, the difficulties of the historical branch of the enquiry are sufficient to deter any one from engaging himself hastily in its perplexities. The paucity and indistinctness of the notices of the erection of early buildings; the difficulty of identifying those described with those that still exist; the confusion of works protracted, suspended, built in imitation of others, or in accommodation to them; the alternation of destructions and reparations;—all the chances that can happen to edifices or to authors, combine to unsettle the faith of the architectural antiquary. And the lesson thus taught us seems to be, that though we are to examine the history of particular buildings as carefully as we possibly can, we are not to give to any one of them too great a weight in determining our architectural chronology; but to take rather the age which is collectively inferred from many resembling churches.

If we reject this maxim, we may be left in no small embarrassment; and this, in fact, seems to have befallen the architectural enquirers of modern times; as, for instance, in the case of Coutances. The cathedral of Coutances in Nor-

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mandy is, for the most part, in a style which has a great resemblance to our Early English, and appears to be not less advanced than our good buildings of that class. Its towers have tall pointed windows, divided into two lights by single or double slender shafts; they have clustered shafts at their corners, and octagonal turrets, also decorated with shafts, and finished with a pyramid of stone. The interior in like manner has throughout pointed arches, abundance of small roll mouldings, slender shafts with capitals of upright leaves, variously clustered, grouped, and supported by corbels; the profiles of piers and of mouldings, the vaulting, the triforium balustrade, the clerestory windows, are all in the same style. In short the cathedral is decidedly Early Gothic, with few or no traces of Romanesque or Norman. This Early Gothic, or, as we term it, Early English style, is by the best authorities held to have made its appearance among us about 1189; and it has been commonly believed, that the generality of churches in France agree pretty well with this English epoch. But if we receive the date which the best evidence seems to fix for Coutances, we shall have the new style fully developed in Normandy a century and a half too early for this doctrine. M. Gerville, in the first volume of the *Memoirs of the Academy of Antiquaries of Normandy*, has endeavoured to shew that the church in ques-

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tion was built and dedicated before the year 1056; and he has offered evidence better than can generally be had in such cases, to prove that the building, of which the Monkish chronicler gives us this account, was not replaced by another at a time more consistent with the received theory. This case is important, because the anomaly at Coutances is not the pointed arch only, which may probably be produced of as early a date in other instances, but the whole style of the building, which according to M. Gerville's view is an anticipation by 130 years, of our architecture.

There appears to be a case in Germany almost as rebellious as Coutances to established opinions, in the cathedral of Bamberg. This church is an instance of what I have called Early German architecture. It has pointed pier arches, and pointed vaulting; the piers have slender shafts attached, the mouldings are small rolls; there are clustered and banded shafts with capitals of upright foliage; a polygonal west apse, vaulted with very acute cells, and many similar features. The German antiquaries would agree very nearly with our English ones, in attributing this building, from the evidence of its style, to a period somewhere about the middle of the 12th century. But it seems, that so far as the external evidence goes, we must take a date considerably earlier. The foundation of the bishopric

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of Bamberg by the emperor Henry II. in 1007, is an event which occupies a prominent place in German history; and in connection with this occurrence, we find that the cathedral which had been already begun, was dedicated in 1012. Bishop Otto, who held the See from 1104 to 1130, is stated to have rebuilt the west end, which had suffered by a fire; and accordingly there are in this part the features of a style somewhat later than that of the eastern choir.

In the same manner the church of St. George at Limburg on the Lahn, which shews a still more clear approximation to the Gothic, is said to have been finished in 1058. It is exceedingly difficult to reconcile such statements with the character of buildings which are known to belong to dates approaching these.

The succession of the earlier style seems to be preserved unbroken in existing edifices. Spires, Mentz and Worms, are spoken of in the succeeding pages as three great examples of the Romanesque; and the greater part of these mighty edifices is clearly and altogether different from the succeeding style. Of these buildings the dates are said to be historically known. Spires was founded by Conrad II. in 1030, and finished in 1061. The east end of Worms is earlier still, and is of the time of Henry II. (who died 1024.). The oldest part of Mentz is said to be of the date of Archbishop Willigis, between 978 and 1009.

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These buildings, except Spires, have pointed arches in the vaulting, but all the other arches and openings are round, and the members altogether Romanesque. Other remains in Germany enable us to pursue still further back the Romanesque architecture. St. Mary Capitoline at Cologne is said to be incontestably of the ninth century: the chapel at Lorch, so eminently Roman in its character, is attributed to the same age; and if we include Italian buildings in our researches, there will probably be no difficulty in tracing the gradations of this architecture from the classical times, to the period when the rudiments of the newer style begin to prevail.

But if we descend in the order of time, it seems to be a much harder task to determine the epoch and progress of the transition from the Romanesque to the Gothic. It does not appear that the dates of the transition churches of Germany are generally known there; even buildings of considerable splendor belonging to this class, as Gelnhausen, Andernach, Boppard, are dated by writers according to internal evidence only: and the cases where we have other testimony, as Bamberg and Limburg, serve rather to make the matter more obscure. We may however hope for much light from the spirit of research and interest on this subject, which appears at present to be so extensively and actively at work in the neighbourhood of many of these edifices.

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If we descend still further, we find ourselves among buildings of which the date is somewhat more certain: and the period of the full developement of the Gothic style may perhaps be fixed with some accuracy. And it would appear, that this style in Germany belongs to a time somewhat earlier than the *resembling* style in England, though not so early as the earliest *good Gothic* in this country. The same also appears to be the case in France, so far as the investigations of Dr. Whittington and others have gone. If we take the dates of the most conspicuous examples of Early Gothic buildings, we find them as follows. The *Early English* of Salisbury and of the south transept of York belongs to about 1220. Westminster, also of good Early English work, was begun in 1245, by Henry III. The *Decorated* Architecture of Germany treads close on the heels of this. Cologne was begun in 1248: the front of Strasburg built in 1276. The resembling examples in our own country are but a little later. The presbytery of Lincoln is of 1282, retaining much of the Early English in its character. The chapter-house of York, and the nave of Exeter come in later, between 1291 and 1330: the chapter-house of Wells between 1293 and 1302. Oppenheim was built between 1262 and 1317, and is of a more advanced character than our English buildings of that date. The window-tracery is of the

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flowing kind; the walls are covered with panneling and feathering; and their remarkably small thickness (they are not more than 18 inches) is supported by rich and deep buttresses with crocketing, &c. The nave of York has flowing tracery, and is said to be after 1320. Amiens, which is generally compared with Salisbury, being nearly of the same date, is incontestably more advanced in style, having window-tracery, triangular canopies, crockets, panning, &c. Indeed it is not difficult to conceive why the English architects did not adopt, so soon as the Germans and French, all the Decorated features; for we may easily imagine that they would abandon with regret the beautiful simplicity and sobriety of the Early English, even for the rich and elegant complexity of the succeeding style.

It will be a matter of great interest to obtain hereafter, as it may be hoped we shall, a more accurate and extensive comparison of the synchronisms of Gothic architecture in different parts of Europe. Another curious enquiry which as yet has not been critically pursued, is, over what geographical extent of countries the genuine Gothic style prevailed.

It has no doubt been widely diffused, but probably has not so completely covered the face of Europe as is often imagined. So long indeed as *Gothic* was synonymous with *barbarous*, and was applied to all architecture which deviated from the

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classical rule and spirit, it was easy to find Gothic in every European country, and even in other quarters of the globe. But if we use the term Gothic in a definite sense, to designate a kind of architecture which has its principle of unity no less than the classical, and of which those only are genuine features which we find in good examples constructed upon this principle, we shall learn to restrict the local extent of this style within narrower limits. These limits I hope will hereafter be defined by those who give their attention to this branch of art. Going eastward, I know that the style extends as far as Magdeburg in the north, and Vienna in the south of Germany. On the west, it is said that there are in Spain good cathedrals of Gothic architecture. Those at Segovia, Toledo and Burgos are particularly mentioned; and I should think it likely that the last of these three for instance, is of proper Gothic character, though hardly of the pure style of the best time, since it was built by German architects, John of Cologne and his son Simon, after the year 1442. The Moorish architecture of Spain, from which some writers have endeavoured to derive the Gothic, is certainly not Gothic, and is connected with that style only by slight and superficial resemblances.

I am not so much acquainted with Italy as to be able to pronounce whether the true Gothic

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found its way over the Alps. So far as one can judge by barely passing to the Italian side of that barrier, the tramontane architecture was never fairly established in the country. The great cathedrals of the middle ages in the Italian cities, exhibit a most curious and peculiar Romanesque, but this did not, as in the more northern regions, transform itself into a new and independent style. It is indeed easy to imagine that the spirit of the classical ages never ceased to haunt the efforts of Italian art: and that whatever propensities did arise towards a set of forms different from the antique, were perpetually interrupted in their development by the surviving models and maxims of the ancient times. The tendencies opposite to the Roman system, instead of being freely and energetically pursued till the result was another system, were checked and thwarted as fast as they appeared; not eradicated indeed, but blighted in their bud. Before the Italian artists had fully seized the principles which had been so well followed out in Germany, these principles were again overturned by the revival of classical architecture along with classical literature.

The cathedral of Milan is so celebrated as a grand Gothic edifice*, that I shall perhaps be

* Madame de Stael, whose words may be taken as an expression of the popular admiration, says in her *Corinne*, that this edifice is the master-piece of Gothic art in Italy, as St. Peter's is of Roman.