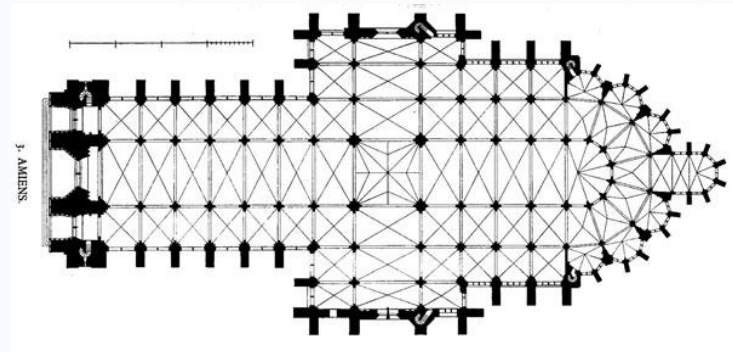


# Characteristics of Gothic churches and cathedrals

In Gothic architecture, a unique combination of existing technologies established the emergence of a new building style. Those technologies were the ogival or pointed arch, the ribbed vault, and the flying buttress.



The Gothic style, when applied to an ecclesiastical building, emphasizes verticality and light. This appearance was achieved by the development of certain architectural features, which together provided an engineering solution. The structural parts of the building ceased to be its solid walls, and became a stone skeleton comprising clustered columns, pointed ribbed vaults and flying buttresses. (See below: **Light**)



A Gothic cathedral or abbey was, prior to the 20th century, generally the landmark building in its town, rising high above all the domestic structures and often surmounted by one or more towers and pinnacles and perhaps tall spires. These cathedrals were the skyscrapers of that day and would have, by far, been the largest buildings that Europeans would have ever seen.

## Plan

Most Gothic churches, unless they are entitled chapels, are of the Latin cross (or "cruciform") plan, with a long nave making the body of the church, a transverse arm called the transept and, beyond it, an extension which may be called the choir, chancel or presbytery. There are several regional variations on this plan.

The nave is generally flanked on either side by aisles, usually singly, but sometimes double. The nave is generally considerably taller than the aisles, having clerestory windows which light the central space. Gothic churches of the Germanic tradition, like St. Stephen of Vienna, often have nave and aisles of similar height and are called *Hallenkirche*. In the South of France there is often a single wide nave and no aisles, as at Sainte-Marie in Saint-Bertrand-de-Comminges.

In some churches with double aisles, like Notre Dame, Paris, the transept does not project beyond the aisles. In English cathedrals transepts tend to project boldly and there may be two of them, as at Salisbury Cathedral, though this is not the case with lesser churches.

The eastern arm shows considerable diversity. In England it is generally long and may have two distinct sections, both choir and presbytery. It is often square ended or has a projecting *Lady Chapel*, dedicated to the Virgin Mary. In France the eastern end is often polygonal and surrounded by a walkway called an ambulatory and sometimes a ring of chapels called a "chevet". While German churches are often similar to those of France, in Italy, the eastern projection beyond the transept is usually just a shallow apsidal chapel containing the sanctuary, as at Florence Cathedral.

## Structure: the pointed arch

### Origins

One of the *defining* characteristics of Gothic architecture is the pointed or ogival arch. Arches of this type were used in the Near East in pre-Islamic as well as Islamic architecture before they were structurally employed in medieval architecture, and are thus thought to have been the inspiration for their use in France, as at Autun Cathedral, which is otherwise stylistically Romanesque.<sup>[7]</sup>

However, contrary to the diffusionist theory, it appears that there was simultaneously an ongoing structural evolution towards the pointed arch, for the purpose of vaulting spaces of irregular plan, or to bring transverse vaults to the same height as diagonal vaults. This latter occurs at Durham Cathedral in the nave aisles in 1093. Pointed arches also occur extensively in Romanesque decorative blind arcading, where semi-circular arches overlap each other in a simple decorative pattern, and the points are accidental to the design.

### Functions

The Gothic vault, unlike the semi-circular vault of Roman and Romanesque buildings, can be used to roof rectangular and irregularly shaped plans such as trapezoids. The other structural advantage is that the pointed arch channels the weight onto the bearing piers or columns at a steep angle. This enabled architects to raise vaults much higher than was possible in Romanesque architecture.<sup>[7]</sup>

While, structurally, use of the pointed arch gave a greater flexibility to architectural form, it also gave Gothic architecture a very different visual character to Romanesque, the verticality suggesting an aspiration to Heaven.

In Gothic Architecture the pointed arch is used in every location where a vaulted shape is called for, both structural and decorative. Gothic openings such as doorways, windows, arcades and galleries have pointed arches. Gothic vaulting above spaces both large and small is usually supported by richly moulded ribs.

Rows of pointed arches upon delicate shafts form a typical wall decoration known as blind arcading. Niches with pointed arches and containing statuary are a major external feature. The

pointed arch lent itself to elaborate intersecting shapes which developed within window spaces into complex Gothic tracery forming the structural support of the large windows that are characteristic of the style.



Salisbury Cathedral has the tallest spire in England.

## Height

A characteristic of Gothic church architecture is its height, both absolute and in proportion to its width. A section of the main body of a Gothic church usually shows the nave as considerably taller than it is wide. In England the proportion is sometimes greater than 2:1, while the greatest proportional difference achieved is at Cologne Cathedral with a ratio of 3.6:1. The highest internal vault is at Beauvais Cathedral at 48 metres (157 ft).

Externally, towers and spires are characteristic of Gothic churches both great and small, the number and positioning being one of the greatest variables in Gothic architecture. In Italy, the tower, if present, is almost always detached from the building, as at Florence Cathedral, and is often from an earlier structure. In France and Spain, two towers on the front is the norm. In England, Germany and Scandinavia this is often the arrangement, but an English cathedral may also be surmounted by an enormous tower at the crossing. Smaller churches usually have just one tower, but this may also be the case at larger buildings, such as Salisbury Cathedral or Ulm Minster, which has the tallest spire in the world,<sup>[17]</sup> slightly exceeding that of Lincoln Cathedral, the tallest which was actually completed during the medieval period, at 160 metres (520 ft).



The Gothic east end of Cologne Cathedral represents the extreme of verticality. (nave, dating to the 19th century).

## Vertical emphasis

The pointed arch lends itself to a suggestion of height. This appearance is characteristically further enhanced by both the architectural features and the decoration of the building.

On the exterior, the verticality is emphasised in a major way by the towers and spires and in a lesser way by strongly projecting vertical buttresses, by narrow half-columns called *attached shafts* which often pass through several storeys of the building, by long narrow windows, vertical mouldings around doors and figurative sculpture which emphasises the vertical and is often attenuated. The roofline, gable ends, buttresses and other parts of the building are often terminated by small pinnacles, Milan Cathedral being an extreme example in the use of this form of decoration.

On the interior of the building attached shafts often sweep unbroken from floor to ceiling and meet the ribs of the vault, like a tall tree spreading into branches. The verticals are generally repeated in the treatment of the windows and wall surfaces. In many Gothic churches, particularly in France, and in the *Perpendicular period* of English Gothic architecture, the treatment of vertical elements in gallery and window tracery creates a strongly unifying feature that counteracts the horizontal divisions of the interior structure.



Sainte Chapelle. Paris

## Light

One of the most distinctive characteristics of Gothic architecture is the expansive area of the windows as at Sainte Chapelle and the very large size of many individual windows, as at York Minster, Gloucester Cathedral and Milan Cathedral. The increase in size between windows of the Romanesque and Gothic periods is related to the use of the ribbed vault, and in particular, the pointed ribbed vault which channeled the weight to a supporting shaft with less outward thrust than a semicircular vault. Walls did not need to be so weighty.

A further development was the flying buttress which arched externally from the springing of the vault across the roof of the aisle to a large buttress pier projecting well beyond the line of the external wall. These piers were often surmounted by a pinnacle or statue, further adding to the downward weight, and counteracting the outward thrust of the vault and buttress arch as well as stress from wind loading.

The internal columns of the arcade with their attached shafts, the ribs of the vault and the flying buttresses, with their associated vertical buttresses jutting at right-angles to the building, created a stone skeleton. Between these parts, the walls and the infill of the vaults could be of lighter construction. Between the narrow buttresses, the walls could be opened up into large windows.

Through the Gothic period, due to the versatility of the pointed arch, the structure of Gothic windows developed from simple openings to immensely rich and decorative sculptural designs. The windows were very often filled with stained glass which added a dimension of colour to the light within the building, as well as providing a medium for figurative and narrative art.



Notre Dame de Paris

## Majesty

The façade of a large church or cathedral, often referred to as the *West Front*, is generally designed to create a powerful impression on the approaching worshipper, demonstrating both the might of God, and the might of the institution that it represents. One of the best known and most typical of such façades is that of Notre Dame de Paris.

Central to the façade is the main portal, often flanked by additional doors. In the arch of the door, the tympanum, is often a significant piece of sculpture, most frequently *Christ in Majesty* and *Judgment Day*. If there is a central door jamb or a *trempeu*, then it frequently bears a statue of the *Madonna and Child*. There may be much other carving, often of figures in niches set into the mouldings around the portals, or in sculptural screens extending across the façade.

In the centre of the middle level of the façade, there is a large window, which in countries other than England and Belgium, is generally a rose window like that at Reims Cathedral. The gable above this is usually richly decorated with arcading or sculpture, or in the case of Italy, may be decorated, with the rest of the façade, with polychrome marble and mosaic, as at Orvieto Cathedral.

The West Front of a French cathedral and many English, Spanish and German cathedrals generally has two towers, which, particularly in France, express an enormous diversity of form and decoration. However, some German cathedrals have only one tower located in the middle of the façade (such as Freiburg Münster).

## Basic shapes of Gothic arches and stylistic character

The way in which the pointed arch was drafted and utilised developed throughout the Gothic period. There were fairly clear stages of development, which did not, however, progress at the same rate, or



in the same way in every country. Moreover, the names used to define various periods or styles within the Gothic differs from country to country.

### **Lancet arch**

The simplest shape is the long opening with a pointed arch known in England as the lancet. Lancet openings are often grouped, usually as a cluster of three or five. Lancet openings may be very narrow and steeply pointed.

Salisbury Cathedral is famous for the beauty and simplicity of its Lancet Gothic, known in England as the Early English Style. York Minster has a group of lancet windows each fifty feet high and still containing ancient glass. They are known as the Five Sisters. These simple undecorated grouped windows are found at Chartres and Laon Cathedrals and are used extensively in Italy.<sup>[7][9]</sup>



Windows in the Chapter House at York Minster show the equilateral arch with typical circular motifs in the tracery.

### **Equilateral arch**

Many Gothic openings are based upon the equilateral form. In other words, when the arch is drafted, the radius is exactly the width of the opening and the centre of each arch coincides with the point from which the opposite arch springs. This makes the arch higher in relation to its width than a semi-circular arch which is exactly half as high as it is wide.

The Equilateral Arch gives a wide opening of satisfying proportion useful for doorways, decorative arcades and large windows.

The structural beauty of the Gothic arch means, however, that no set proportion had to be rigidly maintained. The Equilateral Arch was employed as a useful tool, not as a Principle of Design. This meant that narrower or wider arches were introduced into a building plan wherever necessity dictated. In the architecture of some Italian cities, notably Venice, semi-circular arches are interspersed with pointed ones.

The Equilateral Arch lends itself to filling with tracery of simple equilateral, circular and semi-circular forms. The type of tracery that evolved to fill these spaces is known in England as Geometric Decorated Gothic and can be seen to splendid effect at many English and French Cathedrals, notably Lincoln and Notre Dame in Paris. Windows of complex design and of three or more *lights* or vertical sections, are often designed by overlapping two or more equilateral arches.

## Flamboyant arch



Flamboyant tracery at Limoges Cathedral.

The Flamboyant Arch is one that is drafted from four points, the upper part of each main arc turning upwards into a smaller arc and meeting at a sharp, flame-like point. These arches create a rich and lively effect when used for window tracery and surface decoration. The form is structurally weak and has very rarely been used for large openings except when contained within a larger and more stable arch. It is not employed at all for vaulting.

Some of the most beautiful and famous traceried windows of Europe employ this type of tracery. It can be seen at St Stephen's Vienna, Sainte Chapelle in Paris, at the Cathedrals of Limoges and Rouen in France, and at Milan Cathedral in Italy. In England the most famous examples are the West Window of York Minster with its design based on the Sacred Heart, the extraordinarily rich seven-light East Window at Carlisle Cathedral and the exquisite East window of Selby Abbey.

Doorways surmounted by Flamboyant mouldings are very common in both ecclesiastical and domestic architecture in France. They are much rarer in England. A notable example is the doorway to the Chapter Room at Rochester Cathedral.

The style was much used in England for wall arcading and niches. Prime examples in are in the Lady Chapel at Ely, the Screen at Lincoln and externally on the façade of Exeter Cathedral. In German and Spanish Gothic architecture it often appears as openwork screens on the exterior of buildings. The style was used to rich and sometimes extraordinary effect in both these countries, notably on the famous pulpit in Vienna Cathedral.



The depressed arch supported by fan vaulting at King's College Chapel, England.

## Depressed arch

The Depressed or four-centred arch is much wider than its height and gives the visual effect of having been flattened under pressure. Its structure is achieved by drafting two arcs which rise steeply from each springing point on a small radius and then turn into two arches with a wide radius and much lower springing point.

This type of arch, when employed as a window opening, lends itself to very wide spaces, provided it is adequately supported by many narrow vertical shafts. These are often further braced by horizontal transoms. The overall effect produces a grid-like appearance of regular, delicate, rectangular forms with an emphasis on the perpendicular. It is also employed as a wall decoration in which arcade and window openings form part of the whole decorative surface.

The style, known as Perpendicular, that evolved from this treatment is specific to England, although very similar to contemporary Spanish style in particular, and was employed to great effect through the 15th century and first half of the 16th as Renaissance styles were much slower to arrive in England than in Italy and France.

## Symbolism and ornamentation



*The Royal Portal of Chartres Cathedral.*

*Main articles: Cathedral architecture of Western Europe and Poor Man's Bible*

The Gothic cathedral represented the universe in microcosm and each architectural concept, including the loftiness and huge dimensions of the structure, were intended to convey a theological message: the great glory of God. The building becomes a microcosm in two ways. Firstly, the mathematical and geometrical nature of the construction is an image of the orderly universe, in which an underlying rationality and logic can be perceived.

Secondly, the statues, sculptural decoration, stained glass and murals incorporate the essence of creation in depictions of the Labours of the Months and the Zodiac and sacred history from the Old and New Testaments and Lives of the Saints, as well as reference to the eternal in the Last Judgment and *Coronation of the Virgin*.





The Devil tempting the *Foolish Virgins* at Strasbourg.

The decorative schemes usually incorporated Biblical stories, emphasizing visual typological allegories between Old Testament prophecy and the New Testament.

Many churches were very richly decorated, both inside and out. Sculpture and architectural details were often bright with coloured paint of which traces remain at the Cathedral of Chartres. Wooden ceilings and panelling were usually brightly coloured. Sometimes the stone columns of the nave were painted, and the panels in decorative wall arcading contained narratives or figures of saints. These have rarely remained intact, but may be seen at the Chapterhouse of Westminster Abbey.