SPECTACULAR VISUAL GUIDES

A Medieval Cathedral

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Cathedral architecture

Cathedrals were founded throughout Europe in the Middle Ages, and, in later centuries, have been built all over the world following the spread of the Christian religion. All cathedrals, wherever they are, have the same religious function, which has not changed over the years. As one 5th-century writer put it: 'Let there be a throne towards the east, and places for priests to the right and left…the altar ought also to be there…'

Key elements – the bishop's throne, places for clergy (later known as the 'choir') and an altar, where the bishops and priests could celebrate Mass – were found in all cathedrals. In time, extra elements – a nave, where ordinary people stood, chapels to house the relics of saints or an altar dedicated to the Virgin Mary, and towers and spires where bells were hung – were added to cathedrals to meet the needs of the priests and people who worshipped there. Monasteries were attached to many European cathedrals, and the bishop's palace was built nearby.

Medieval cathedrals were built in a wide variety of architectural styles, according to the inventiveness of the cathedral's architect, the fashion of the time, and the tastes of the people who paid for them. This book contains many different examples of cathedral architecture.

Key

1. Aisle A sideways extension of the nave. ('Aisle' comes from the old French word for 'wing'.)

2. Arcade A row of arches supported by columns or pillars.

3. Buttress A prop of stone to stop the walls collapsing outwards under the weight of the roof.

4. Bell tower A tower where bells were hung, almost always at the west end of the cathedral. Bells were rung to call worshippers to services.

5. Clerestory A row of windows high up, designed to let extra light into the church or cathedral.

6. Choir The most holy end of the cathedral, nearest the altar. Cathedral clergy stood in the choir during services.

7. Flying Buttress A narrow, graceful buttress shaped like half an arch.

8. Foundation A strong platform several metres below ground.

9. Nave The 'body' of the cathedral, where worshippers stood or knelt during services.

10. Porch Provided shelter for worshippers and clergy.

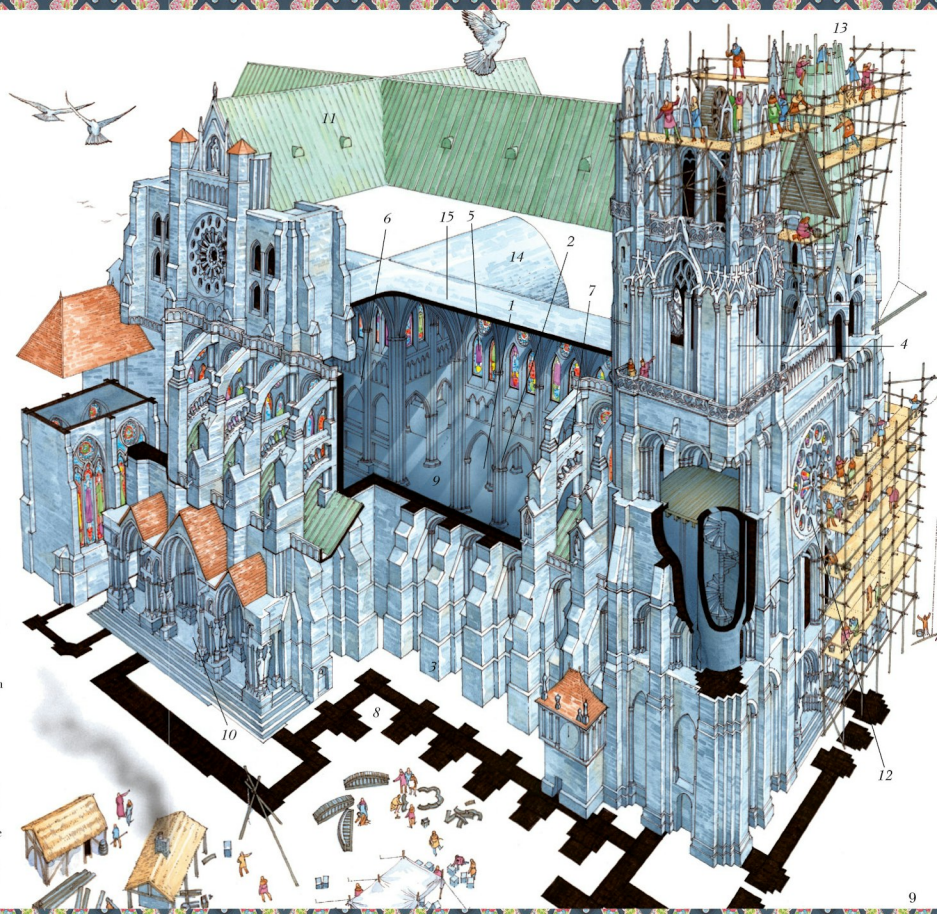
11. Roof Covered with lead or sometimes slates or tiles, resting on a framework of wooden rafters.

12. Rose window A large, circular window filled with brilliantly patterned glass. Rose windows symbolised eternity.

13. Spire A tall, pointed structure built on top of one or more towers. Spires were built of wood, and covered with sheets of lead or with wooden tiles, known as shingles. Spires were often topped with a golden weather vane or a cross.

14. Transept A crosswise extension to the cathedral, usually located where the nave joins the choir. Transepts housed robing rooms for clergy and chapels dedicated to saints.

15. Vault The arched underside of the roof; the area that worshippers inside the building saw when they looked upwards.



Building the walls

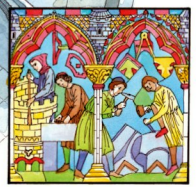
Cathedral walls and pillars were massive structures, often enclosing an area hundreds of metres square. Although they were built of stone, they were not quite as solid as they looked. Usually, walls and pillars were constructed of two separate layers: an outer layer of neatly squared stone blocks, known as 'ashlar', carefully fitted together, and an inner core, or filling, of rough stone, rubble and mortar. Journeymen and labourers prepared the core, while skilled master masons chiselled the ashlar facing blocks. They often 'signed' these by carving their own 'mason's mark' into the finished piece of stone.

Designs and decorations used in cathedral building changed quite considerably over the centuries, although the basic plan of most cathedrals remained the same. The earliest surviving cathedrals, dating from the 10th to the 12th centuries, are built in a style known as 'Romanesque', with squat, solid pillars and heavy rounded arches. The elaborate doorway at the bottom of page 17 is in Romanesque style. Later medieval cathedrals dating from the 13th to the 15th centuries are built in a lighter style, usually known as Gothic. They have pointed arches, slender colums and soaring roofs, like the elegant section of Chartres Cathedral in France, shown here.

A 13th-century manuscript drawing shows masons and other craftsmen at work (opposite page, top left). The man on the left of the picture is using a level with an adjustable plumbline; below him, a man is hauling a basket of stones with a windlass. In the centre of the picture, a mason is checking the level of a newly positioned block of stone with a plumbline – there is a bowl of mortar by his feet – while below him, a skilled craftsman carves decorations for the top of a pillar. At the far right of the picture, a scaffolder perched halfway up a ladder bores a hole in a wooden post; below him, a carpenter shapes a beam with an axe.

Scaffolding was so important to the building work that it was often designed at the same time as the cathedral.

Flying buttress



A scene portrayed in a 13th-century stained-glass window (far right) shows master masons at work. The man on the right of the picture is wearing a glove to protect his chisel-holding hand. The masons' templates (shapes used to help them cut complicated patterns) and compasses hang overhead. Their set squares (used to measure right angles) lie on the ground.

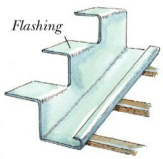
Gutters, gargoyles and roofs

Once each section of the cathedral walls was completed, it had to be roofed over and made weatherproof. The earliest cathedral roofs were made of timber, but, whenever possible, these were replaced with stone, to lessen the risk of fire. But stone roofs were expensive, extremely heavy, and took a long time to build. Cathedral walls began to bulge outwards under the extra weight, and often had to be supported by rows of stone buttresses. Building these involved extra expense in materials and workmanship.

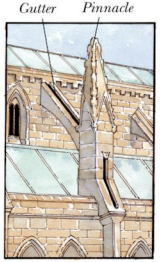
Nonetheless, the risk of fire – from stray sparks from nearby houses, from unattended candles, or occasionally from lightning – was so great that stone roofs were still preferred, despite the problems they brought. Medieval architects were also worried by the difficulties of carrying up the large quantities of water needed to put out fires. For this reason, they designed special stairs and passageways within the cathedral walls to allow firefighters quick and easy access to the roof.

Whatever they were made of, cathedral roofs still had to be covered with something to keep out the rain. Thin sheets of lead, which could be welded together to make a completely waterproof 'skin', were the first choice, but lead was expensive. Sometimes clay tiles or slates were used instead.

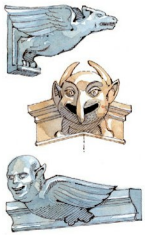
Long strips of lead, known as flashing, were used to cover gaps between roofs and walls. The edge of the flashing was curved back to stop water seeping in.



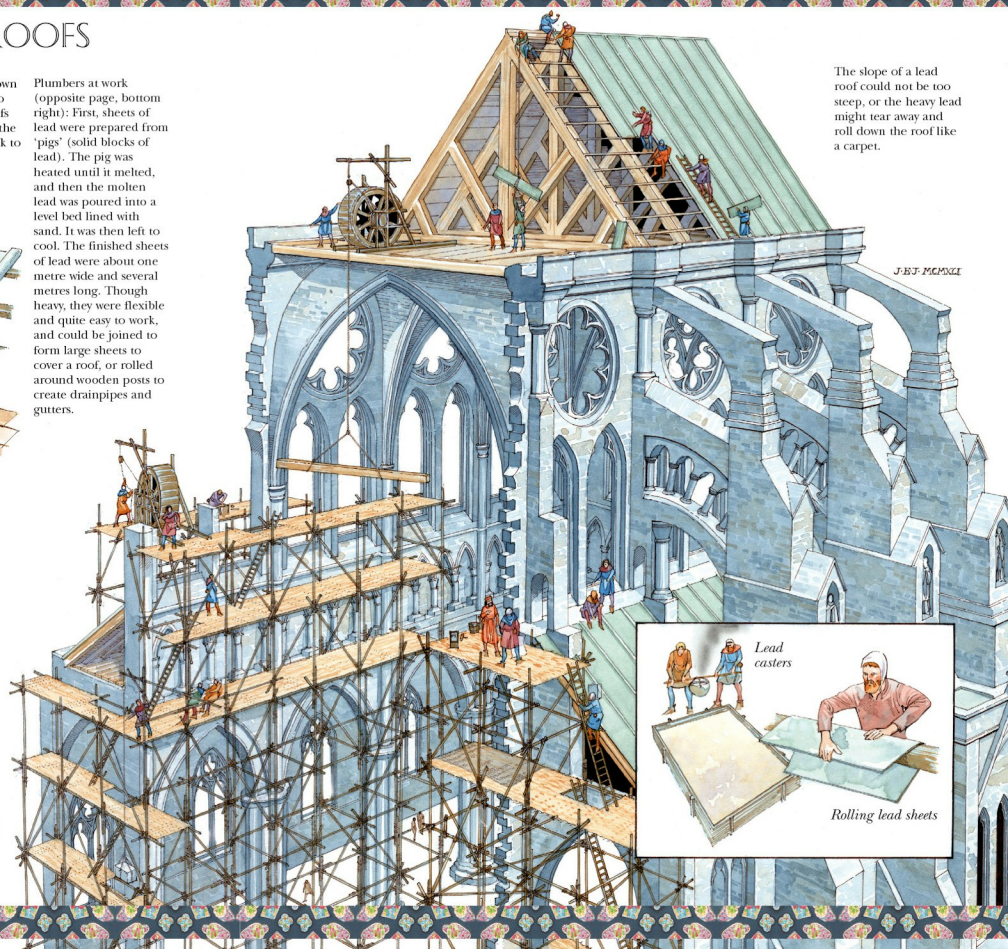
Plumbers at work (opposite page, bottom right): First, sheets of lead were prepared from 'pigs' (solid blocks of lead). The pig was heated until it melted, and then the molten lead was poured into a level bed lined with sand. It was then left to cool. The finished sheets of lead were about one metre wide and several metres long. Though heavy, they were flexible and quite easy to work, and could be joined to form large sheets to cover a roof, or rolled around wooden posts to create drainpipes and gutters.



Gutters were essential to carry rainwater down from the high cathedral roof. Often, they were hidden in buttresses or pinnacles. Gargoyles were used as water spouts, to carry streams of rainwater away from the walls. Masons usually carved them like monsters or devils. But sometimes they made mocking portraits of bishops or craftsmen instead.



The slope of a lead roof could not be too steep, or the heavy lead might tear away and roll down the roof like a carpet.



'The Bible of the poor'

Towards the end of the 15th century, the French poet François Villon wrote the following lines describing how his mother, a poor peasant woman, might feel when she walked into her beautifully decorated local village church:

> I am a woman, poor and old,
> Quite ignorant, I cannot read.
> They showed me, in my village church,
> A painted Paradise with harps,
> And Hell where the damned souls are boiled.
> One gives me joy, the other frightens me...

Until the later Middle Ages, most ordinary people could not read or understand the words of church services, which were in Latin. The only ways they had of learning about Christianity were by listening to sermons or by looking at the scenes from saints' lives and Bible stories shown in wall paintings, statues and stained glass.

The brilliantly coloured glass used in medieval cathedrals was made in special workshops established in major towns. Chemicals were mixed with the molten glass to produce glowing colours, and the designs were pieced together and held secure by thin strips of lead. In the 14th century, craftsmen discovered a way of painting on glass using a special silver stain, to add greater richness and detail to their designs.

Stained glass windows took skilled craftsmen many hours to build. First, glass was made by melting sand, lime and potash together. The glass blower then blew the molten glass into a cylindrical shape, which was cut open and flattened. The glass worker cut the glass roughly according to the window design by touching it with a hot iron and pouring cold water over the heated areas, causing the glass to break along the 'hot spots'. Workers then used a tool called a 'grozing iron' to cut the glass into smaller pieces. The glass was then painted with a special paint which, when heated, melted into the glass. The glass pieces were fitted together with lengths of lead called 'cames', and the joints fixed with drops of molten solder, a mixture of lead and tin.

Installing a great 'rose window'. These dramatic circular windows were first introduced during the 12th century in France, and became very popular. The circular designs were thought to represent the petals of a flower opening towards the sun. Rose windows gave craftsmen a chance to show their skill, and still survive at Chartres Cathedral in France, and York Minster in England.