introduction to history of

architecture

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IKONOS preparatory course

History of Architecture

Preface

COURSE DESCRIPTION

This course of lectures aims to,

- introduce the chronological development of architecture,
- indicate the tools that make a critical appreciation of architecture possible.

It will therefore, be divided in two complimentary sections.

The first group of lectures will present the meaning of the term *architecture*. The philosophical concepts of *significanc*e and why buildings become *monuments*; what determines *value* and *merit* in architecture; and how these definitions and processes vary according to culture, religion, tradition and technological developments, will be discussed.

The second part of the lectures will introduce the historical periods of architecture in a chronological order, and in particular as developed, understood and established in the Western world. The various traditions, orders, styles and movements will be presented.

A brief introduction

Value and Meaning

SOME DEFINITIONS

- **architecture**
  Noun. art of science of building; thing built, structure; style of building; construction; hence *architectura*l *adjective*. [French, or from classical Latin *architectura...*]
- **building**
  Noun. In verbal senses; permanent fixed thing built for occupation (house, school, factory, stable, etc);... [from BUILD + ING] [1]

> *There is, though, a difference – a very important one – between building and architecture. Animals can build. ... Humans though developed architecture. This is to be blunt, the science of the art of building, or to be more poetic, the moment that a building is imbued with a knowing magic that transforms it from mere shelter into that of a self-conscious work of art. This art might offend and baffle as well as delight.*
>
> [2]

You employ stone, wood and concrete and with these materials you build houses and palaces. That is construction, ingenuity at its work. ...
But suddenly you touch my heart, you do me good, I am happy and I say 'This is beautiful', that is architecture. Art enters in. My house is practical. I thank you as I might thank railway engineers of the telephone services. You have not touched my heart. ...
But suppose that walls rise toward heaven in such a way that I am moved. I perceive your intentions. Your mood has been gentle, brutal, charming or noble. The stones you have erected tell me so. You fix me to the place and my eyes regard it. They behold something which expresses a thought. A thought which reveals itself without word or sound, but solely by means of shapes which stand in a certain relationship to one another. ...
They are a mathematical creation of your mind. They are the language of Architecture. By the use of raw materials and starting from conditions more or less utilitarian, you have established certain relationships which have aroused my emotions. This is Architecture.[3]

[1] *The Concise Oxford Dictionary*, Oxford University press, New York, 1982
[2] J. Glancey, *The Story of Architect*ure, Dorling Kindersley, London, 2000, p. 9
[3] Le Corbusier

HOME AND LIVING AWAY FROM IT

- Home is meaning.
  It is the basis of what we know and part of the personal aspects of our life.
- Shelter - protect secure surroundings with familiar characteristics.
- It contributes to our idea of how things should be – our idea of being at home.
- Familiarity ingrained in our head.
- The nomadic tribe carries home around.
- The solid building is only part or it. Neighbours, sounds or lack of them make up the rest.
- Travelling and the difference in behaviour expected in a shopping mall and a market

The thing that matters most about my home is that I know it, and do not think about that most of the time, only really noticing it when something changes, such as when I move house, or when I have unfamiliar visitors and cannot behave with my usual levels of freedom.

Business hotels, ships – minimum disruption. Today's hotels are a home-away-from-home. Moving house – the need to form new set of habits. I then become a slightly different person. Activities physical and mental that influence how we feel about that particular place.

> *Architecture involves this cultural aspect of buildings, which can range from something very personal and idiosyncratic to something that everyone seems to agree upon. We are shaped by the culture that we grow up in, and by the culture in which we participate, whether we think about it or not – and most of the time we don't think about it at all. In fact we are least aware of this at home.*

In architecture as in any other culture, our sense of 'how things should be' develops from our experience. Each gesture that we make means something, but the meaning depends on the culture in which the gesture is understood. Architecture is a gesture made with buildings.

DIFFERENT CULTURES AND ADDED VALUES

Culture needs not involve a great many people, just a few who have something in common We don't really think about it but we are daily accustomed to behave in various ways and in different circumstances. Familiar vs. unfamiliar circumstances – depending whether friends or strangers. We speak differently to family and friends – Decorum and sitting down – sofa at home and on a bus. A doctor's waiting room, a nightclub, monastery, the President's Office, on the beach…

A private house is not a high street shop that invites people in. But it is not enough for a shop to encourage people to come in. Merely putting a door is not enough.

The architectural problem is at a cultural level; the building would be making the wrong sort of gesture for a house.

Appropriate shape and the design of Buildings - practical utility, and functional value.

Appropriateness: surroundings, method of construction (timber vs. concrete shape and use of materials), role. What is right in the suburbs may look strange in the city. It must not be misleading. A table for an insurance clerk (fit, happy, feel right) vs. a table for an emperor (extravagant, impress, intimidate). Consider say, the chairman of a multinational company and his desire to own an antique desk that belonged to someone important.

THE GESTURES MADE BY BUILDINGS

The gestural qualities that denote status in buildings need not necessarily be extravagance. On the contrary, an ascetic philosopher demands high mindedness vs. low status. The democratic president alternates between the trappings of imperial grandeur (when entertaining visiting heads of state) and absolute ordinariness (showing a rapport with voters)

The meaning of buildings is not fixed in them.[4]

Cottages - built by agricultural workers, but were not intended as an artistic expression.
In the past, there was a sentimental interpretation of agriculture that developed because there was a class in society that was not daily involved in tilling the land, but could see it from a distance and think of it as enviable, picturesque, and nostalgic.

In touch with nature and surroundings, and feelings – the innocence, naivety and sauciness: *Hamlet* of Marie-Antoinette, Versailles France, *Blaise Hamlet* by John Nash, Bristol

> 'Architecture' has often been taken to be impressive buildings such as these. In that way of thinking, buildings that impress us are to be called 'architecture', while those that don't impress remain as mere 'buildings'. In fact we might not need to call them anything at all, because they probably just fall out of the picture.
>
> [5]

... 'architecture' is not the same as 'good buildings' but is the cultural aspect of any building at all, good or bad. The putting together of materials belongs to the realm of building, but the building's gestures - the extravagance, exoticism and exuberance - belong to the realm of architecture, as would simplicity and ruggedness, if those were the building's particular qualities. The point is best explained by thinking about 'vernacular architecture', which is a term used to refer to the ordinary buildings put up by ordinary people, traditionally agricultural workers building for themselves or their neighbours.[6]

[4] A. Ballantyne, *Architecture A very Short Introduction*, OUP, New York, 2002, p.
[5] *Ibid*, p.
[6] *Ibid*, p.

> *... 'hovels', places to live that had few comforts - though for the people who lived in them they would have all the complicated connotations of 'home'. (We see them as) 'vernacular architecture' and a charming part of the scenery, protected by legislation. Even when the actual fabric of the building has not changed much, there has been a change in sensibility, which can be traced back to the influence of the Romantic poets,…*[7]

What links the... buildings is that they are far from ordinary, and have little connection with the daily lives of the ordinary people in either society. Neither of them ever helped directly

These buildings were not built to be *architecture* but eventually became so. The stones have not moved. It is the culture that has shifted. Architecture is not an attribute of a building in itself, but of a building that is experienced in culture. Every building has a cultural aspect (so that every house has character), and if we chose to notice it then we can consider that building as architecture.

LOCAL LANDMARKS AND NATIONAL MONUMENTS

Familiarity, landmarks, accustomed to problems, habits, bonded, symbol and status of the city. Principal significance is local, unique and identifiable, therefore it is something not imitated by architects?

> *It is possible for a building with no artistic accomplishment to become meaningful and significant for large numbers of people, simply by having been there all their lives.*[8]

A monument is not any building that could be anywhere and just happens to be here. It is invariably a symbolic point around which part or more of the city grows. On the other hand, the buildings that are meant to represent a nation to itself and others, are grand and more generally recognised. They are meant to represent the country to the international stage and have the duty to reflect the status of the nation.

> *These monuments are in the capital cities of various nations, but their role is to act as a symbol for people who live beyond the city.*
>
> *It is not inevitable that a building with a national role would have to appeal to the country's sense of its ancient identity.*
>
> *It does not always happen that the symbolism designed into a building is the symbolism that is understood by the observer who sees the building in the modern age, and the more distant the culture the more likely it is.*[9]

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The beginning of civilisation

Prehistory

5000 – 3000BC

Paradoxically, Neolithic Architecture served (as most architecture would thorough history) to define emotional and spiritual needs, the realm of symbolism, ritual and religion. The most extraordinary thing is how it rose above the utilitarian level and how readily human imagination and effort were channelled into monumental architecture, when day-to-day survival was so arduous and uncertain.

Neolithic man imagined the world in terms of his own body, the processes of birth, growth, fruition, death and rebirth. The world was governed by supernatural causes, inaccessible and inappeasable through ordinary means, and his attempts to master them were based on the same fantasy and magical ritual, where monumental architecture reigned supreme.

The earliest dwellings were the humble nomadic multi-chambered caves and rock shelters and fragile tent-like structures of our Western and Southern European Stone Age ancestors.

The turning point is the Neolithic Period (New Stone Age, starting 9000 BC). The Paleolithic (Early Stone Age) man had been a migratory hunter, living in small groups. But as he learned to farm, domesticate animals (as well as hunt them), and weave cloth, village communities that marked the beginning of civilisation, flourished.

By *circa* 6000 BC, sufficient population pressures, territorial ambitions and technological progress achieved the dubious advance in full-scale interurban warfare.

THE PALEOLITHIC PERIOD

The houses and dwellings of the Palaeolithic period are generally classified as,

- **Huts** (*Terra Amata*, Nice)

  are the earliest known structures. In this case they were built by nomadic hunters who returned to the same sandy beaches, each spring. The construction consists of walls made of a palisade of timber stakes, arranged in an oval plan, with a bracing ring of stoners on the outside. The interior had a central hearth and the floor was made of a beaten layer of ash and organic material. There is no evidence that suggests the shape of the roof.

- **Lean-to** (*Le Lazaret*, Nice)

  was erected against one wall of a cave. The assembly probably consisted of a timber frame with post supports and a skin covering, pinned to the ground by a circle of stones.

- **Tents**

  Tepee-like tents were a common feature of glacial Europe (Czechoslovakia, Germany and France). The structure consisted of a timber framework covered with animal (mammoth?) skins. The skirts were invariably weighed down with stones and the interior paved.

THE NEOLITHIC PERIOD

The *dwellings* of the Neolithic period were generally small timber-framed, uni-cellular, single-family houses, or large longhouses for extended and multiple families. Dry-stone multi-cellular houses were also built.

Between 4500 – 1500BC, there originated a widespread practice of burial in Megalithic *collective tombs*, particularly in Western Europe, as far as Scandinavia and the Mediterranean. These are of two types, *passage* and *gallery* graves. They differed from region to another in their purpose, plans, and methods of construction.

Temples from this period (*Ggantija* and *Hal Tarxien*, Malta) represent some of the earliest European buildings with a specific function. They were formally planned with trilithion entrance passages. The structure consisted of megalithic stone-faced earthen walls.

MEGALITHIC CONSTRUCTION

As in real life the prime necessity was shelter, it was natural to imagine the spirits of the dead were in need of it as well. The tomb was both a monument to remember the deceased. It is a dwelling that had a twofold purpose. It appeased the (possibly dangerous) spirit, and incarcerated it. Having first lived and buried his dead in caves, man now built artificial caves in artificial mountains. The first monumental architecture (like most others that will follow) imitates nature and provides for social, psychological and symbolic needs.

The principal form of construction is known as megalithic (*megas-lithos*, Gk. great stone). Huge stone blocks were assembled without mortar in basic structural configurations that are still used today. Sometimes blocks were set-up merely to rest against each other. More important is the post-and-lintel (or trabeated construction) in which a horizontal beam rests on vertical uprights. This is the single most important structural device used in architecture. Sub-megalithic blockwork was developed as a device for corbelling. Successive courses of masonry project from the wall plane to eventually bridge a gap. This device could be used to bridge over a rectangular plan between two parallel walls or in the case of centralised plans, to provide a solid domelike structure. Megalithic structures may be of two categories,

- **Tombs**

  Apart from the *hypogea*, or rock-cut caves, they are of three basic arrangements;

- *Chamber tomb* (a single stone roof supported by two or more uprights)
- *Passage grave* (a rectangular or polygonal chamber with an entrance passage, generally used for collective burials)
- *Gallery grave* (an elongated, rectangular grave that was sometimes sub-divided further, without an entrance passage). All varieties were covered by a circular or oval mound of earth, often fortified with retaining walls of stone.

- **Non-sepulchral single uprights**

  Usually standing alone (*menhirs*) or in composite, circular groups (*cromlechs* or *henge* monuments)

BRONZE AGE NON-SEPULCHRAL ARCHITECTURE

- ***Stonehenge***, England *circa* 2600-1800BC

  Best preserved and unique rather than typical. Later refinements suggest a well-established architectural tradition. The first (Early Bronze Age, c. 2600 BC) phase consisted of earthworks and a low ditch and a number of standing stones and timber structures.

  The second (Bronze Age, c. 2100 BC) phase involved the erection of two concentric stone rings, including blue stone blocks obtained from elsewhere (Pembrokeshire). The last (Mid to Late Bronze Age) phase involved the clearing of the central area and the erection of completely new stones.

  Lintel stones were dovetailed into each other, and morticed and tenoned into the uprights to prevent slippage. The uprights were shaped to an upward tapering convexity to counteract the effects of perspective. Inner and outer faces of the lintels were curved to create a quasi-complete perfect circle.

- ***Hal-Tarxien***, Malta *circa* 2000 BC
  Unique culture, popularly believed (though open to speculation) to have descended from seafarers of Asia Minor that settled in the Western Mediterranean. A highly evolved phase of Megalithic temple architecture, built however, during the Bronze Age.

  Enormous post-and-lintel portals decorated with patterns of hammered holes. Altars are carved in bas-relief and are set in apses formed by corbelled roofs. Carefully dressed limestone slabs line passages.

Life and the Afterlife

Ancient Egypt

2900 – 700BC

The existence of Ancient Egypt depended on the Nile, the annual flooding of which left fertile mud on the river banks. Water meant life, beyond which, on either side was the desert, hence death. The world view was a perpetual cycle of life and death, and therefore renewal. Death seen as a passage to another life, made possible only if the body remained intact. Preservation through mummification was reserved mainly for the greatest members of society, hence the pharaoh.

Even more than Neolithic man, the ancient Egyptian was obsessed with the cult of the dead. His complex religion revolved from elaborate rituals of life and the afterlife. Life was but a brief transient passage and the other side of death was the eternal extension of the joys of his worldly existence.
A successful afterlife depended on the delicate balance between a good moral conduct and on careful provisions for the physical remains of the dead. Means of preservation for the deceased ensured immortality.
Man had a dual being, the material body and a spirit-soul called Ba (or Ka, its double). The latter survived death but needed the trappings of life (and a body in particular) to survive.

Mummification provided reasonable permanent habitation for the soul and through mutilation, made the dead harmless. As an added security, the form of the body was duplicated in several shells of the mummy case, sculptural effigies and wall reliefs.

SACRED NON-SEPULCHRAL ARCHITECTURE

- ***Temples of Amon***, Luxor and Karnak

  The procession temples of the Nile valley were cut in the rock, West of Thebes. They indicate a religious design philosophy based on the surrounding natural landscape. In fact, by the 3rd century BC, the simple square piers of the structures of the Old Kingdom were supplanted by columns, decorated with capitals and bases, inspired by nature (lotus, palm and papyrus).

  All temple plans denote a strong sense of axiality, therefore of procession (and processional grandeur). The entrance was flanked by two sloping pylons (or towers) that represented the sloping rock faces of the Nile. A forecourt leads to an enormous and monumental *hypostyle* (pillared hall with many columns supporting the roof), reminiscent of a forest of trees. As the New kingdom increased its prosperity, more pylons and larger forecourts were added in front of the existing structures. The temple complex invariably ends with a narrow *sacred* room, reserved for the image of the god.

GENERIC TOMB ARCHITECTURE

Places of burial were of three main types,

- ***Mastabas***, or bench tombs

  By the 4th Dynasty, they developed into a tomb consisting of a superstructure meant to house an offering chapel, and a deeply sunk burial chamber approached first through a long vertical shaft, then a short horizontal passage.

- **Rock-hewn tombs.**

  Tombs consisted of items such as food and sacrificial offerings that were meant to offer the same levels of comfort the dead person enjoyed in his former life. Lest the supplies ran out, decoration and reliefs of harvests and similar scenes were meant to appease the soul of the deceased. Entire rooms were replicated around the burial chamber, cut deep in the rock. Sacrificial chambers were invariably built on the high West bank of the Nile.

- **The *Royal Pyramids***

  The pharaohs regarded as sons of the sun-god *Re* and sun worship became official religion in the 3rd century BC. By now, pyramids such as those at *Giza*, acquired a square plan with smooth external walls of limestone and a shimmering capping of gold leaf. They were meant to symbolise the sun beams on which the sun-king was transported to *Re*.

OLD KINGDOM TOMB ARCHITECTURE

- ***Stepped Pyramid of Zoser***, Sakkara, 2778 BC

  Conceived as a replica of the pharaoh's palace in Memphis. The prominent structure was most probably meant to defeat tomb robbers. The structure was finished in stepped limestone blocks and brick walls.

  Built by Imhotep, the pyramid shows no less than five changes in plan. It began as a mastaba, then extended twice and later used as a basis for a four-stepped pyramid. This was made of layers inclined against a steep-sided core, and was enlarged further. Usually underground chambers were finished prior to the superstructure. A pit was approached by a tunnel that emerged in an open ramp. It was later deepened and a granite tomb inserted at the bottom. Above, was a limestone chamber containing a granite plug to seal off the hole when the burial was complete. The approach tunnel was also widened and converted into a ramp. Four corridors emerge from the bottom of the pit and connect to galleries running parallel to the side of the pyramid. Separate pits, meant as tombs for members of the royal family were sealed off during the third phase.

  Religious symbolism - the stepped form represented a staircase that climbed to heaven, the visual form denoted a monument that was visible from afar.
- ***Bent (****or South Pyramid)* ***of Seneferu***, Dahshûr, 2723 BC
  Peculiar in that the angle of inclination changes from 54°15' to 43° indicating a hasty completion and that it has two independent burial chambers. The change in slope was deemed necessary for structural reasons, as the chamber passages show fissures. Materials are local stone and facings. Tomb chambers have corbelled roofs with gradually stepping corbelling on all sides. Around pyramid was a double-walled enclosure, an offering chapel, mortuary temple, and a causeway that lead to the Valley Building.

- ***Great Pyramid of Khufu*** (Greek, *Cheops*), Gizeh
  The largest pyramid of all three. The four sides face the cardinal points and are equilateral triangles of 51°52'. There are three separate, internal chambers due to changes of plan. The subterranean and the *Queen's* chambers are discarded projects. The original entrance was a descending corridor that was modified when an ascending one was cut in its ceiling. When the *Queen's* chamber was discarded, it was extended to what is called the Grand Gallery. This is covered by ramped corbelled vault of seven great courses. At the top is the *King's* chamber, where the granite sarcophagus was located, and which like the vestibule is lined in granite. In the latter originally were three massive granite slabs, let down in slots in the sidewalls, to seal the chamber after burial.

  There are five tiers, each consisting of nine great stone beams and ranged with a void in between the layers, above one another. Above is an embryonic vault of pairs of great stones inclined against each other. This device occurs in the *Queen's* Chamber and over the entrance. Two shafts for ventilation (or to allow Ka free passage) lead from the *King's* Chamber. Similar incomplete shafts occur in the *Queen's* Chamber. The pyramid was built in local stone and originally dressed in limestone. The apex was perhaps gilded. Only a few casing stones survive and are bedded in a thin lime-mortar that was used as a lubricant rather than as an adhesive. Little traces of the enclosure wall and of the attendant buildings survive. The queens were buried the pyramid, at a little distance in three subsidiary pyramids with chapels

MIDDLE KINGDOM TOMB ARCHITECTURE

- ***Tombs of the Kings***, Thebes

  A complete abandonment of the Royal Pyramid tomb occurred during the New Kingdom, in favour of the corridor type with stairs, passages and chambers that extend as much as 200m into the mountains and 95m underground. The sarcophagus was laid in a concluding rock-cut hall that was elaborately painted with sacred texts and ceremonial and funerary scenes. The tombs served only for the sarcophagus and the funerary deposits. The mortuary temples stood completely detached.

- ***Temple of Mentuhetep***, Dêr El-Bahari, Thebes, 2065 BC

  A mortuary temple connected directly to a corridor tomb. It is terraced in two levels at the base of steep cliffs. The lower has a tree-planted forecourt with an inclined walkway that connects to the upper terrace. On the latter are double colonnades, and a small completely solid pyramid is raised on a podium and surrounded by a walled hypostyle hall with more double colonnades. An irregular passage from the forecourt connects to a dummy burial chamber, below the pyramid. To the rear is an open court and a ramp leads down to the 150m long corridor tomb. Beyond is another pillared hall, recessed in the rock face.

Order and Harmony

Classical Greece & Hellenism

800 – 30BC

The culture eventually became the basis for Hellenism, first through Alexander the Great, then *Magna Græcia* and eventually Rome. The Classical Age was almost completely dominated by Athenian history (The Periclean Age of the 5th century BC), intellect and law.

For 3000 years the Egyptians had depicted the same stylised body features. Then, the first Greek Archaic sculptors and artisans breathe life in their creations. Greek wisdom is an attitude of human mind and body. The anatomically-perfect *Olympian gods* were nevertheless, humanly frail.

- The Greeks sailed (as opposed to travelled) but were uninterested in the Egyptian and Persian barbaric culture.
- It was a patriotic and inward looking culture, unsuitable to carve large empires (unlike the Roman one). Drama replaced ritual and myth as custom replaced tyranny.
- Thought was transformed, nature and society understood, and balanced thought replaced *hubris* (intellectual pride).
- Absolute perfection was attained though within certain limits. The great builders were sculptors, never engineers, they were mathematicians but never exploited the arch (as the Romans did).
- Violence existed but was limited, and cruelty disliked, though infanticide practised though slavery remained the basis of economy. Women were unrecognised, as democracy was based on male votes.

THE MYCENEAN TRADITION

Mycenaean palaces were more formal than their Cretan counterparts in plan. They were founded on hills and in fortified citadels, and consisted of a number of religious and domestic buildings.

- **Treasuries** (of ***Atreus***, for instance)

  were royal tombs were built outside the citadel. Walled passage connects to bee-hive corbelled vault tholos (*tholoi*) burial chamber approximately 15m diameter.

- **Megaron**

  was the chieftain's palace within the citadel (not unlike the house of *Odysseus*). It was a unicellular structure, with columned portico, vestibule and hearth (a configuration similar to that of temple-house of the gods).

- **Temple**

  was a timber house that eventually became marble shrine. It was always a house, never a place of assembly (never like a *church* but always set on the highest place in the town, in *sacred enclosure* or better in its own *citadel* or *acropolis*)

THE ORDERS

Order, is the assembled unit comprising *column*, *base* (below) and *entablature* (above). Vitruvius described the vocabulary of Classical architecture, in 1st century AD. The earliest temples were timber structures.
Ashlar constructions are masonry versions of preceding originals - the *capital* is the unifying element between post and beam, the *pediment* is gable-end of roof, and the *cornice*, the eaves. The *triglyphs* are decorated beam-ends, and *guttae* are nails or dowels.

When first stone temples were built they already followed a standard prototype plan. Raised on podium to distinguish importance. Worship was done outside only. *Cella* is a plain, empty room, store for the god's statue. The back room was the *treasury*. Small temples had a *portico* only. Larger examples had a *peristyle* (all-round colonnade). Columns are Doric, Ionic and Corinthian. Most obvious difference (but not solely) is the capital, but the *base, shaft, scale, proportion,* and *entablature* (architrave, frieze, cornice) vary as well. Chronologically, Doric and Ionic are first but not necessarily follow each other. Different regions had different developments and refinements.

- **Dorians** are first inhabitants of mainland Greece. They were originally the tribes of northern shepherds who migrated as far away from the *Steppes* - sturdy and practical.
- **Ionians** are from Asia Minor (modern Turkey) and the surrounding islands. Hence, probably sophisticated, sensuous (effeminate?) colourful Orientals.

But development of order is not strictly developed thus. Ionic order was used in the mainland as well, and vice-versa. Columns were made of drum-shaped sections that were successively slimmer towards the top (tree trunk optical correction), and were held together by iron and lead dowels or connectors.

Doric is typically the simplest and squattest of all. Earliest examples had plain shaft, later ones had a fluted column with entasis (swellings in the centre that give an impression of supporting weight). This feature was eventually omitted. The order has a simple cushion-shaped capital with no base. The base was introduced later by the *Romans* who also made the shaft more slender.

Ionic is taller and slimmer (less robust, more elegant). The 2-D capital with scroll and volutes, is more sophisticated, and had shaft flutings and a base. The order is decorative but irrational. It appears already in the archaic forms at *Knossos* (Crete) and in parts of *mainland Greece*.

Corinthian is the most elegant (least robust, most feminine). A 3-D capital decoration with acanthus foliage and high base. It was not often used by the Greeks, but was developed by the Romans only later (therefore post-Vitruvius)

The triangular pediment is an excuse for sculpture. The Doric *metope* is replaced by continuous (decorated) frieze in later Ionic.

CORRECTIONS AND ADJUSTMENTS

Large scale temples. Doric temple was standardised by the 5th century BC. Refinements are barely detected except by detailed survey. *Entasis* is combined with inward-leaning and thicker columns at the podium edges.

The *stylobate* rises slightly at the centre (to assist surface water run-off?). The Doric temples had an abstract geometry, plastered with a polychrome finish. The romantic, sublime, picturesque setting was not the original intention of builders.

THE URBAN NON-URBAN SETTING

The Greeks had no formally laid-out cities (as in the *Ancient Roman* grand manner) but *geometrical*, *non-haphazard*, *small-scale, balanced* magnificence (as opposed to *imperial town planning*) in the arrangement of temples and agoræ. Typical examples are Miletus, Priene and the Acropolis.

- **The *Acropolis*, Athens** (starting mid-5th century BC)

  Only part of larger sacred precincts. It also contained shrines, treasuries and theatres, linked by processional walkways. An organic and sculptural monumentality, free from the rigid formality associated with (later) Roman planning. Other examples are centres like Delphi, Olympia, Epidaurus, Pergamon, Ephesus, and the island of Delos.

  All buildings could be seen at a distance but the unfolding drama is best appreciated on entering. Here is a mix of two poles, Athenian roots, Ionic luxury and Doric abstinence. Doric and Ionic orders. *Athena Nike* in (graceful) Ionic, and the *Parthenon* in (sturdier) Doric.

- ***Propylaea*** (Mnesicles, 437 BC)

  This is a Doric portico, porch, entrance or gateway, containing the *Pinacotheca*. It had no symmetry as seen from entering through but was balanced nevertheless. The small, complex *Erechtheum* (left) is balanced by larger, simpler *Parthenon* (right) and statue of *Athena* in between.

- ***Erechtheum*** (Mnesicles, 421 BC)

  Replaced an earlier temple. Most important temple in Acropolis for its sacred relics (*Erechtheus*'s shrine, *Athena*'s olive tree and *Poseidon*'s fountain). Use of three types of Ionic Order (different sizes). Unique in that not rectangular and surrounded by peristyle, but irregular in massing (and apparently never finished). Most remarkable feature is *Caryatid Porch* (*rostrum* really, not portico at all). Maidens replace columns in carrying an (apparently light, given their relaxed pose) *entablature*.

- ***Parthenon*** (Ictinus, Callicrates and Phidias, begun 447 BC)

  Also replaced an earlier temple but built slightly shifted. A unique example of setting and stage management. Whatever the viewpoint, the *Parthenon* is always seen against the sky. Here is an unorthodox example in unique frieze design outside the *cella* and a two-storey tier of colonnades inside. The stylobate (stepped platform) is 228x 101 ft. The peristyle is of 56 columns, and is octastyle as opposed to hexastyle. A two columns-deep portico (pteripteral) gives depth and shade. The *Parthenos* (virgin) has bronze-grille doors, and is of an Ionic (why not Doric?) Order. This was the treasure-room for the *Acropolis*. There was also room for the priestesses who cared for the temple. The kris-elephantine statue of *Athena* was 12m high.

- **Theatres**

  These were religious buildings nevertheless, but usually built outside the city walls. An auditorium set in the hillside. The orchestra was originally circular (as at *Epidaurus*), but eventually became semi-circular when the stage became more important. The backstage was permanent architectural backdrop, and actors entered through three doors.

- **Houses**

  The Greek town was probably a collection of white-washed inward-looking houses (windowless dwelling of hot climates and of segregated women). *Politics* was done in the marketplace *agora*, and *drama* in the theatre, so that the temple is the only exercise in grace and proportion.

Other buildings, important as prototypes for *Neoclassical Architecture* are,

- The ***Choragic Monument*** of *Lysicrates.*
  Built to commemorate a theatre prize won in 334 BC.

- The ***Tower of The Winds*** (1st century)
  Octagonal *horologium* water clock-tower complete with sundials and wind vane

Master builders and engineers

Ancient Rome

300BC – 300AD

The Etruscans were most probably settlers from Asia Minor (by Aenas after the fall of Troy?) who emigrated to what is now Northern Italy. They descended to Rome to establish a common settlement in the hills around the Tiber (Romulus and the Sabines).

Though at an early stage in its development, Rome was heavily influenced by the Hellenism in its own right, by the 3rd century BC, it spread its culture to Greece and Asia Minor.

At the beginning of the following century, Rome conquered Greece. However, at this time the Greeks of the Italic mainland were already independent of the parent states of the motherland, and had established an order in architecture that was very loosely based on the Classical models. An independent Roman style in art and architecture, was established during the reign of (the first Emperor) Augustus and lasted for more than four centuries.

The Etruscans left a legacy of engineering genius that was absorbed by the Romans. Though the Greeks were aware of the arch, they were never bothered to use it. Developments in the use of the arch contributed to a know-how in the construction of barrel or tunnel vaulting, and of an excellent infrastructure based roads and bridges (*Pons Fabricius*, Rome). A sprawling empire such as the Roman one required a good infrastructure to control its borders and have easy access to supply the far reaching outposts, during both war and peace.

THE ORDERS

The main elements of the Classical Orders were reduced to mere ornamentation. The Corinthian Order was popular and was used extensively. In fact, the Romans were responsible for the development of the **Composite Order**, consisting of an amalgamation of richly decorated volutes (taken from the *Ionic Order*) superimposed on a wreath of acanthus leaves (essential elements of the *Corinthian Order*), hence the name. Even the cornices became part of the decorative scheme of the facade.

In the *Amphteatro Vespasiano* (*Coliseum*, Rome) for instance, the columnar orders are applied, non-load bearing elements. The load is taken by the series of semi-circular arches and thick piers, set level upon level.

THE URBAN AND NON-URBAN LANDSCAPE

- **Imperial Fora** (***Foro Romano***, for instance)

  Town planning was based on two axes running North-South and East-West. Furthermore, the established Greek and Etruscan practice of a (regular) grid-iron pattern was used. The *forum* (centre of public life, very similar to the Ancient Greek marketplace or *agora*) was a square open space, surrounded by temples, triumphal arches (*Arco di Tito*, Rome), columns (*Colonna Traiana*, Rome) and other various longitudinal buildings such as *basilicas* (Trier and of Constantine, Rome). It was roughly located at the centre of the town or city, where the two main axes met.

  Circuses (*Circo di Massenzio*), theatres (*Teatro di Marcello*), amphitheatres, *stadia* (stadiums) and baths (*Thermæ di Caracalla*, Rome), were central to town planning activity.

- **Basilica** (of ***Trajan***, Rome, *circa* AD100 – 112, for instance)

  A generic rectangular building invariably based on a plan with nave and aisles, separated by a colonnade or arcade, and with an apse located opposite the main entrance, on one end of the main axis. It was used mainly for commerce and justice. This typological configuration was eventually used for the first Christian churches (places of gathering, though with a liturgical purpose).

TEMPLE FORMS

Roman temples are of two basic typologies, rectangular and circular. The first is a direct development of the Classical Greek temple form, whereas the second is a Roman development that was later to inspire Byzantine (centralised) churches.

- ***Maison Carrée***, Nimes (AD1 - 10)

  This is perhaps the best preserved Roman temple. It is the third structure built on the same site and uses a Corinthian Order. Half-round columns are attached around the cella. As opposed to the columns in a Classical Greek temple, here the practice is purely decorative and has no structural purpose. Originally, the temple stood in a forum surrounded by porticoes.

  Planning was influenced by the prototype Etruscan models in that axiality and monumentality replaced the apparently *irregular* disposition and sculptural quality, synonymous with Classical Greek temples. Unlike its Greek counterpart, the Roman temple was located in a busy cityscape (not in its own open space, such as in the case of the *Parthenon*, for instance) so that it did not have to be appreciated in the round.

  As in the prototype Etruscan model, the Roman temple stood on a high podium with a flight of steps located at the front. The side and rear walls of the cella were projected onto the *peristyle* (the colonnade surrounding a building), so that the strong sense of (uni-directional) axiality was further accentuated.

- **The Pantheon**, Rome (AD118 – *circa* 128)

  Dedicated to the Roman gods that represented the known celestial bodies (the planets). The interior is conceived to hold an imaginary sphere (representative of the universe, even in later Christian, non-pagan times), so that the internal height is equal to the diameter of the dome.

  An open *oculus* (eye) in the centre of the dome served to draw off sacrificial smoke and symbolised the sun in heaven (it is in fact the only source of light in an otherwise dark interior). The dome was constructed using Roman concrete, and the coffered ceiling has the dual purpose of lightening the structure and to articulate its decoration. The coffers towards the top are voluntarily smaller than the ones at the base, to further accentuate the sense of perspective.

  The marble cladding and statues in the interior were added during Christian times.

  The portico denotes Roman practice of *venerabilità*, so that for reasons of historic memory and value, it incorporates elements of a previous temple structure.

West meets East

Byzantine & Early Christian

300 – 540AD

This is a Western phenomenon that combined Roman and Eastern currents, and developed through Carolingian into Romanesque and Gothic. It inherited all the artistry of the Greek world and married this to the Roman engineering genius. It also absorbed the colour and mysticism of the East. All of this was exploited to the glory of the church - an imperial, powerful, hierarchical, sacerdotal and divine institution in liturgy and architecture, that meant the,

- Solution of the structural problem inherent in dome construction.
- Discovery of a decorative system for such buildings
- Integration of plan and liturgy that is the function.

On 25th July AD 306, in York, Constantine was crowned Emperor of the World. Seven years later, in the Edict of Milan, he gave freedom and official standing to the Christian Church. He proclaimed himself to be the 13th Apostle, was baptised on his deathbed and believed to be absorbed into the trinity when he died. In AD 326, he made Christianity the official religion of his Empire. He immediately embarked on an ambitious programme of church building. His choice of religion was politically opportunist since it secured him the loyalty of the army and people. Before his death in AD 337, he had already begun six major churches, most of which are basilican in plan;

- ***San Pietro in Vaticano***
- ***San Giovanni Laterano***
- and ***Santa Maria Maggiore***, in Rome,
- Old ***Hagia Sophia***, in Constantinople,
- The ***Church of the Nativity***
- and the ***Church of the Holy Sepulchre*** in Bethlehem.

In AD 334, he decided to move the centre of his Empire from Rome to Constantinople in the Bosphorus, for fear of the failing frontiers of the dying Empire. The new city was called Constantinople, but its culture was to be known as Byzantine. The city was founded on a key strategic site, at the meeting place between the maritime and caravan routes. Cities like Venice, Kiev and Peking were within the immediate orbit.

THE BASILICAN PLAN

The model for Constantine's church building programme was the Basilica of Trajan. The term *basilica* has come to have two confusing references. In ecclesiastical terminology, it refers to a church of a certain rank, however, for architectural purposes, it refers solely to a building with colonnades or arcades that separate aisles from central, higher roofed (and consequently, clearstory windows) nave. These early Christian churches were as large as the previously Roman places of gathering.

Old San Pietro in Vaticano, demolished in 1500 was over 350 feet long and had a double-aisle configuration. There was a wide transept and apse at the far end, where the altar was situated. Similarly were Santa Maria Maggiore, and San Giovanni Laterano, the latter transformed by Borromini into a baroque church. Nevertheless, it still retained its octagonal fourth century baptistery. The Church of the Nativity, Bethlehem, though rebuilt in the sixth century, follows the original configuration of double-aisles as well. Old Hagia Sophia has been completely replaced after it was burnt down.

THE DOME

Roman architectural development branched into Western and Eastern inspired trends of structural forms. The first ultimately was responsible for the cathedrals of medieval Europe whereas the latter developed into the domed Byzantine churches. Key in the design manual of Byzantine architecture is the *dome*. Roman architecture was complex and rich but two main elements are very significant,

- The various great halls were of two basic types, rectangular or circular (or centralised). Whatever the stylistic changes, the rectangular plan of the long-aisled basilica and the vaulted hall of the thermae developed in the thousand years following the demise of the empire, into the Gothic cathedral. Basilica and vaulted hall merged to make a medieval architecture of long vistas, repetitive rhythm of vaults and long perspective. Though Rome is the staring point, Gothic and Byzantine architecture are opposing and contrasting in their structures.
- Thought the basilican plan remained the standard building for churches in the West, particularly after the Ostrogothic conquests in the early fifth century (since the invaders were converted to Christianity) the initiative for new architectural exploration, passed to the Eastern part of the Empire. The basilican form as employed at *St John of Studion*, Constantinople and *St Demetrius*, Salonika was soon replaced by the roman brick and concrete method of construction, and by the dome in particular.

Most Roman domes were built over a circular (drum like) superstructure, such as in the case of the Pantheon and in the thermae and caldaria such as those of The Baths of Caracalla. The circular hall may be even more impressive an achievement than the hall. The Pantheon is a complete sphere, lit at its apex by a circular oculus. Tremendous cosmic emotional appeal that reinforced the hierarchical imperial mind. Pagan, built by Hadrian, it must have been admired by Constantine as it was a perfect expression for the Byzantine mind.

Temple of Minerva Medicea, AD 260, or later

A nymphaeum with a dome of 80 feet in diameter. The plan consisted of a decagon with tiny pendentives at each corner, ten massive piers and consequently ten spacious apses that radiate from a central area, so that there are no walls. It seems almost fairly certain to suggest eastern influences from without the empire, for this type of plan.

Starting from the third century, the Sassians (in modern Iran) were already capable of building domes over non-circular plans. At the palace in Bishapur, built around AD 200, the plan consisted of four sides that opened into tunnel vaults with large niches set against the corners. At Sarvistan, squinches (or concentric arches of brick or stone) span across the corners to convert and help the transition between the square and the circle. Roman domed buildings, such as the various mausolea and thermae, had been turned into Christian churches. Other new buildings, such as *San Lorenzo*, Milan were built, but in the West, the dome never became an accepted architectural feature. They occur in the East, only after Justinian. Previously all examples avoid the issue by being roofed over in timber rather than stone. (e.g. *Church of the Resurrection*, Jerusalem)

The Byzantine style was essentially already established and fully formed when the greatest of the builder-emperors, Justinian (527-565) came to power. The great churches built by the Emperor had a propagandistic as well as a functional, utilitarian and ritualistic role. They represented political authority, and religious orthodoxy. Though the dome is the singularly most important design feature, it is by no means the only hallmark of Byzantine architecture. The Eastern Empire contributed to an ever expanding experimentation of church plans, right up to the Arab invasion. The *Blue Mosque* built in 1609-16 in fact, is almost a direct replica of the Christian church of *Hagia Sophia*.

THE DECORATIVE SYSTEM

This system of massive piers and walls below and great curved surfaces above, needed a covering material. The Byzantine architects did not devise such a covering. Rather, they transformed a Roman creation for their own purpose. For the walls, marble was used whereas for the curved surfaces, domes and vaults they employed mosaic. The Byzantine Empire was rich in white, grey and green marbles, and mosaics could be either of the same material or made of glass. Millions of tiny tessere are pressed into wet concrete to form a continuous covering that seems molten and surreal, running over curved surfaces, corners and plain walls, so that there are no hard joints. Moreover, the irregularities of the mosaic required that simple stylised and hieratic designs were employed. Realism is impossible. The different angles at which the various tessere were pressed into position give a shimmering effect when hit by sunlight. This creates a scintillating ephemeral quality that sparks in the gloomy interior. The small windows at the base of the domes, gave enough light that was needed for this surreal effect.

SQUINCHES AND PENDENTIVES

There are certain limitations in that a dome is arcuated. It therefore exerts thrust and needs abutments. Unlike intersecting vaults, Roman or Gothic, where thrust is concentrated at the four corners of each vaulted bay, the dome exerts a uniform thrust around its base and needs an encircling abutment, or belt. The Pantheon achieved this through the sheer size of the walls, 20 feet thick, built to absorb the outward push of the dome, very much like an igloo.

The organisation of the Pantheon is very simple, yet planning wise is inflexible. The circular plan is not compatible with all liturgical functions; therefore the Byzantine solution was to have a square plan roofed over by a circular dome. This gives flexibility in the various arrangements of central area, semi-domed apses, and vaulted aisles.

However, as opposed to the awkward detailing in the marriage between the circular plan and the square portico of the Pantheon, in a Byzantine building, *squinches* (a series of small arches that bridge an octagonal springing to the dome) or *pendentives* (curved triangular segments that have a similar function) are required to bridge the gap between the planimetric square base and the inscribed circle of the base of the dome. The pendentives were the most successful device and are the small triangular segments of a dome that rises from the four corners of the square plan, to eventually meet the base of the true dome. The transformation from square to circle is thereby achieved. The pendentive is as much the element of Byzantine construction as the ribbed vault and buttress is to Gothic construction.

Once the central dome is established, there is nothing that impedes the setting up of a whole series of abutting domes, each set over a square bay, one dome set against another to create a cluster of domes. Only, it is (Roman and) grander in its proportion. At *San Marco*, Venice, three large domed bays are enough to cover 180 foot length of plan. *Hagia Sophia* is a vast rectangle 250 feet long by 220 feet wide. The Byzantine domed bay, large and Roman in its dimensions is comparable to the Gothic vaulted bay. Whereas the gothic mason was more interested to shed mass (modern point-loading), to create the most delicately possible structure to let in more light, the Byzantine builder preferred Roman massing. He preferred to rely on a few masses rather than on a multitude of thin columns.

The archetypal Byzantine plan is therefore a single central dome with subordinate aisles, apses and secondary spaces (*Hagia Sophia*), and the Greek cross plan with more or less equal arms covered in domes (*San Marco*, Venice).

- ***Hagia Sophia***, Constantinople

  The planimetric arrangement is very similar to a congregation of soap bubbles, rising out of each other. The aisles reduce the central liturgical area, but large semi-domes extend the space further in two directions. These in turn open out into semi-circular exedrae. The main dome rests on a square plan and is supported by four massive arches and pendentives. These arches have their thrusts absorbed by the semi-domes to one side and by sheer buttresses that extend over the roofs of the aisles. The semi-domes therefore resist the thrust of the main dome and then eventually transfer their thrust to the ground.

  The arrangement of dome and semi-domes is unified in its design and is also aesthetically pleasing. All domes and semi-domes spring from an imaginary horizontal line that encircles the interior. Conceptually, the structure below this line is clad in marble. Above is covered in mosaic.

  The central dome is constructed out of forty ribs that channel the thrusts to the underlying structure. This also enabled the insertion of forty small windows at the base of the dome.

  Hagia Sophia is the epitome of the structural, decorative and functional Byzantine system. Though the magnificence of the imperial cathedral of Justinian does not exactly repeat itself elsewhere, the centralised plan became the norm and many other churches relate to its design. In this case, the clergy occupied the whole of the nave whereas the congregation crowded into the aisles, the galleries and the narthex. The central dome still retained the liturgical meaning where the climax of the Eucharist took place.

- ***SS Sergius and Bacchus***, Constantinople

  Begun some years before *Hagia Sophia*. The plan of the church makes use of the Byzantine concept of an encircling aisle. Pendentives are not yet used here, as the dome is still built over an octagonal rather than square plan. The dome itself is only 52 feet in diameter, and rises over a free and unencumbered central area that is surrounded by a colonnaded encircling aisle.

- ***San Vitale***, Ravenna

  Similarly, this church has an octagonal configuration on plan, and the dome is 100 feet in diameter. It also has a surrounding aisle that is vaulted and galleried, so that the central area is approximately half the diameter of the total planimetric circle. The central area extends over the surrounding aisles, and complicated structural issues have been avoided (rather than confronted and solved). The pendentives at the corner of the octagon are negligible, as compared with those at the corners of a square. The dome itself is built out of clay pots, so that it is lightweight enough to exert almost no thrust. The decoration programme is of considerable importance. The white marble capitals resting on the coloured marble shafts have been carved using a drill, rather than a chisel, so that the overall impression is very crispy. The mosaics are sumptuous.

Darkness and seclusion

Romanesque

750 – 1260AD

Early Christianity is the link between imperial Rome and medieval Christendom. Earliest Christians met in houses or halls, or when in the catacombs, they were under the pressures of persecution. It was here that pagan burial rites were modified to adapt to Christian ideology, and that the church of Christ was established. The first real churches were built after the Edict of Milan in AD 313. The church won its freedom at the cost of its subordination to the Imperial power. The main church building boom was between the fourth and fifth centuries, and though some of these churches still survive they have been extensively modified. They were to be the germ of Western architecture for the next millennium.

THE DARK AGES

May not have been as dark and barbarous as they were once supposed to be. Nevertheless, Western Europe was quite bleak between the 5th century, and the coronation of Charlemagne in AD 800 secured France against Islam forever. Clovis had accepted Christianity as early as AD 496. In Southern Europe civilisation survived the fall of the Roman Empire through the great monastic establishments.

In the north however, little architecture was to be found, but the asceticism of the desert around Alexandria in Egypt, found its way to the wild Atlantic world, bringing Christianity to far away shores of England (the Northumbrian churches at *Jarrow* and *Hexham*, both *circa* AD 680), Ireland (*Gallarus Oratory*, Dingle, *Monastery at Skellig Michael*) and Scandinavia. In Gaul (such as at the *Baptistery at Venasque*) there are scanty remains of a few basilican churches, distinct from Mithraic temples.

PROTOTYPE BASILICAN PLANS

The pagan basilica was a place of assembly, and did not specify any particular architectural form. Some, such as the basilica of Constantine was a big vaulted building very similar to the halls of the thermae. Trajan's basilica had a larger timber roof and consisted of a nave with columned aisles. It was a convenient and cheap typology to build. The long aisled basilican plan was an excellent prototype for the earliest humble churches.

At the far end was commonly a simple semi-circular apse. Here it was essential to see the celebrant and the sacrificial altar from the other end of the building. The original rite was simple and uncomplicated.

Is this liturgy dictating architecture or vice-versa? The hierarchical nature of the Byzantine church dictated a centralised dome. Apart from Charlemagne's Palatine chapel, the monastic nature of the Western church called for a different plan that was found in the Roman basilica. As Rome disintegrated, the bishops and the great abbots became the civilising elements who radically changed architecture. With the emergence of the new churches, architecture metamorphosed in what we call Romanesque. It made of the following characteristics a new typology of building, strong, articulated, heavy, logical and mystical.

- From the basilica it got its length, from the thermae it got its groin vault, and from Roman engineering and buildings in general, it got the semi-circular arch.
- Whereas the basilica was long and low, the church was tall and vigorous.
- Whereas the Roman column was a single shaft, and the arch had a smooth intrados, the Romanesque pier and arch were heavily moulded and articulated.
- Ornament was sparse. Mediterranean marble veneer was replaced by a Nordic taste for masonry.

- ***San Clemente***

  Dates from the 12th century but was built over the remains of an earlier 4th century basilica. In addition to the nave and aisles, it still retains the atrium, forecourt and ablution fountain. The unbaptised and penitents could hear the service in a large porch or narthex.

- ***San Pietro in Vaticano***

  The original basilica built by **Constantine** in c.AD330, was demolished to make way for the present structure.

- ***San Paolo fuori le Mura***

  The current structure is a 19th century partial and reduced copy of the original 4th century basilica after this was burnt down. It still leaves a good impression of the original church configuration.

- ***Santa Maria Maggiore***

  Founded by Sixtus III in AD 432, but was eventually integrated in a much larger Baroque church.

MAJOR INFLUENCES

As the Roman dome passed eastwards to inspire Byzantine architecture, so did the basilican plan come to be transformed into the Gothic cathedral.

The transformation must be traced in terms of,

- **Plan**

  The typical basilican plan consisted of a central nave flanked by aisles and an apse at the far end of the nave. However at say, *San Clemente* the service ritual had already flowed from the apse to occupy part of the nave, so that a chancel is so created. Nearly half of the space consisting of the nave has been taken up by the priest and the choir and is segregated from the remainder of the church by a marble balustrade or *cancelli*.

  Essentially, the nave still remained the reserve of the laity, but the apse continued to expand, until an eastern limb was established as the chevret of chapels.

- **Structure**

  And just as the basilican plan was the prototype for the columned hall and clerestory, the Roman vault inspired medieval structure. Medieval architecture developed from the attempt to span large areas with a fireproof roof that was made of stone. And these stones had to be small enough to be drawn by mules or pack-horse.
  This process developed from the bold 11th century arches of *Ste-Foy*, Conques to the 16th century Gothic of *St Anne*, Anneberg, *Louviers* or the *Westminster Chapel* of Henry VIII.

- **Decoration**

  This process is usually separated into two styles, Romanesque and Gothic. Though most argue that the Romanesque or Norman style used the semi-circular arch whereas the Gothic style is associated with the pointed-arch that achieved more structural flexibility and aesthetic lightness, the development from one style was continuous and our division of styles frivolous.

  At *Durham*, for instance, the builders were undoubtedly using the Romanesque style when they started work in 1093 but when they reached the level of the vaults a few years later, they explored the use of the pointed arch and rib vault. For them it must have been a useful innovation. It had nothing to do with style. Indeed, arches and rib vaults were consciously explored only some 30 years later at *St-Denis*.

THE MOULDED ARCH

The walls of a Romanesque building are thick. Building elements such as, arch, door, and window would penetrate a massive wall and have a thick undersurface. In Byzantine architecture this would be an ideal background for mosaics, but in actual building it created difficulties. The timber centering or false work had to be elaborated and strong and had to be supported from on scaffolding, from the floor.

The urge to lighten this timber centering was a major factor in the development of this style. If the arch was built as a series of rings, then only the inner ring needed centering. When complete the same arch acted as centering for the remaining rings. Therefore the whole arch was then complete as a series of concentric rings.

The lines of thrust carried visually to the ground. Eventually the compound and articulated Romanesque pier replaced the Roman column with immediate effect. It was of course destined to be transformed into the moulded pier of the Gothic cathedral.

THE TRIFORIUM

The basic Romanesque church with a high nave, lean-to aisles, clerestory windows, and a two-tiered arcade that below divided the nave from the aisles was in its embryonic form based on the basilica. In many areas, notably Germany, this configuration was retained.

A different typology based on the two-tier elevation was developed in the churches of central France (*Conques* and *Clermont-Ferrand*) and on the pilgrimage roads to *Santiago da Compostela*. Here the clerestory was eliminated so as not to weaken the walls by piercing them, and the heavy tunnel vault rests directly on the *triforium*. The result is a massive dark interior.

The triforium (dark storey) ranged from a simple gallery just above the aisle, overlooking the nave, to a blind arcade and solid wall. The three-tier arrangement of arcade, triforium and clerestory is found all over Europe, and was standard in England. Changes in the basic arrangement were tantamount to varying the basic proportions of the storeys, the subdivisions of the triforium, the choice and rhythm between compound piers and columns for the arcade, and the different mouldings and surface decoration

Influence and independence

Islam

622 – 1600AD

FROM MOHAMMED TO GRANADA

622 – 1492

THE GREAT OTTOMAN EMPIRE

1400 – 1600

Great cathedrals of light and spirit

Gothic

1130 - 1500

TEXT

The church triumphant

High Renaissance & Mannerism

1500 - 1600

WORLD EVENTS

- Development of humanism in the mid-15th century.
- Fall of Constantinople (1452) and the diaspora of Greek intellectuals to the Italian city states.
- Invention of moving-type printing by Johannes Gütenberg and subsequent dissemination of information, more rapidly and to a wider audience.

Architects now started to publish unrealised drawing-board projects and treaties about the experiences and approaches to design, so that the unbuilt ideal architecture assumed importance. The church, initially resisted Renaissance developments, particularly in the field of natural sciences but at the same time developed (like most secular princes) the desire for prestige, hence what initially was intended to be a healthy form of heroic individualism now turned into hedonist self-glorification.

A shift occurred whereby the epicentre of the Renaissance shifted from Florence to Rome (following the ecclesiastic seat of power). Already many humanists criticised the worldly attitude of the church and called for a reformation.

Architectural features also changed, and the facades became more sculptural. The interplay between repetitive modules, now called for grouping and alternating of the same elements. For instance, equidistant apertures in the facade were now grouped together followed by alternating wide or narrow blank masonry strips. The apertures themselves assumed greater importance and were framed with combinations of pilasters, architraves or arches, and/or triangular or rounded gables, frequently, a combination of all permutations and combinations.

Whereas early Renaissance buildings displayed a certain sobriety (humble, inward looking) and separation between the public (facade) and the private (interior, courtyard) elements, the Late Renaissance and Mannerist buildings were designed in such a way that the articulation of building elements, consistently and hierarchically flowed from the interior to the exterior in a display of pomposity but also with a holistic approach to design.

FROM MANNERISM TO BAROQUE

Mannerism (Italian meaning manner, *maniera*, *manierismo*) refers to the imitation, (purposeful) corruption of the rules and the subsequent surpassing of a certain style. The original ideal of the same style becomes irrelevant as its stylistic elements are exploited and recombined (to create a new style) with virtuous ease. The rules that define the style are known but this does not impede a wilful and systematic disobedience. The intention is to demonstrate how unstable (insecurity, upheaval, political disorder) the governing world is.

Therefore if the Renaissance initiated the modern era, it was to a certain degree a victim of its own doing. Through scientific observation (fact as opposed to faith), Nikolaus Copernicus (in 1543) proved that the planets were after all not governed by a geocentric (the earth as the centre of the universe) system. Christopher Columbus and the discovery of America further demonstrated that the earth was not a flat disc. The established and balanced harmony of this world began to come apart, and a new secular religion independent of Rome came to pass.

The first reaction of the church was to suppress this urge for individualism (for instance, Galileo Galilei and the Holy Inquisition). Others called for a reform within (such as, Martin Luther, the rebuilding of S.Pietro in Vaticano).

PROTESTANTISM AND ITS CONSEQUENCES

In Germany (as in France) there was no great Ancient Classical Roman architecture (ruins) to refer to so that the elements of the new style were imported and used mainly for decorative purposes. Beside these innovations, the main architectural tradition remained Gothic in character and most Renaissance buildings appeared very late. Domed buildings for instance were practically never built.

Renaissance philosophy (as opposed to architecture) however had a far reaching influence on German religion and politics. The financial burdens carried forward by an over-secularised church (and the subsequent sale of indulgences to purchase atonements for sins of the faithful) and the behaviour of the clergy in general, were seen in bad light by some critics. Also, certain European princes found out that they stood to gain political power and pushed for their independence from Rome. Martin Luther (originally a staunch internal reformer opposed to any schism), translated the bible for the first time (from Latin to German in this case) thereby making it accessible to a far wider audience.

The reformation was to come from below. Man (with his faith and conscience) was created equal. The church is therefore not authorised to sell forgiveness for sins and art should not convey faith (hence the destruction of iconography, sculpture and paintings). Though the Lutherans eventually returned to paintings, religion and politics were not to be confused ever again. In Northern, Western and (eventually so-called) Protestant Europe, the religious building lost its pride of place.

ENGLISH PALLADIANISM

In England, Gothic architecture remained very popular (up to and beyond the Industrial Revolution) so that the Renaissance spirit had practically no influence on the design of (particularly religious) buildings (particularly after the schism of Henry VIII). However a steady trickle of influence and interest in Classical buildings started in the late 16th century and continued well into to 18th. The Grand Tour of the Veneto region and the influence of the architecture of Andrea Palladio in particular, were responsible for this new tendency that was aptly labelled Palladianism.

The style was mostly employed by Inigo Jones, who had studied the works of Palladio, during his time in Italy. He was subsequently appointed General buildings inspector to the London Court (1615) and was responsible for buildings such as the Banqueting House in Whitehall, London (1619-22).

- ***San Pietro in Montorio, Tempietto***, Rome

  A *tempietto* that best illustrates the style of the high Renaissance. Built by Donato Bramante (*Santa Maria della Consolazione*, Todi, begun1504, and the *Cathedral at Como*, begun 1509).

  The building has a centralised plan with a dome that steadily rises from a stepped base. The orders (forms) are borrowed from or rather, are inspired by Classical antiquity but have been readapted to suit a new spirit of doing things. The circular colonnade and the way the building develops from the interior to the exterior has nothing to do with the circular temples of ancient Rome (*Tempio di Vesta*, and temple of *Minerva Medicea*)

- ***San Pietro in Vaticano***, Rome

  The generous patronage of the arts by the Vatican (Papal) state began under the reign of Sixtus IV (1471-84) when the Sistine chapel was commissioned. It reached its highest point under Julius II (1503-13).

  Donato Bramante, who eventually would have been responsible for the reconstruction of (more likely, the wholesale demolition of the old *basilica* to make way for a completely new and grander) *San Pietro in Vaticano*, proposed a centralised building based on the intersection of circles, squares, Greek crosses.

  The construction was eventually abandoned (for various historical twists, political and economic reasons) but was eventually taken up (after many others unsuccessfully tried their hand and considerably modified the original plan) by Michelangelo Buonarroti, who nevertheless returned to the (albeit revised, improved and updated) scheme as originally proposed by Bramante.

ILLUSIONISTIC TECHNIQUES

- ***Scala Regia***, Rome

  The spatial experience in architecture was given a further twist through the use of illusionist techniques, when for reasons dictated by lack of depth or space, visitors are deceived by drawn features with no actual depth. Therefore as the human observer is the measure of all things, so does his power of perception, hence of experiencing space and perspective. The technique of illusionism became a phenomenon was perfected in the Mannerist period (and expanded in the subsequent baroque period but not without gross political and religious shortcomings)

Theatrical grandeur and splendour

Baroque

1600 - 1750

TEXT

Flowering sensuality

Rococo

1710 - 1780

TEXT

Bibliography

Basic and essential reading

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