

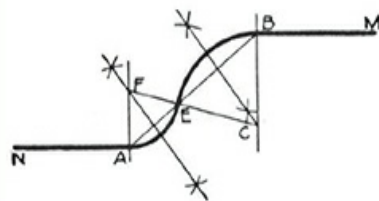
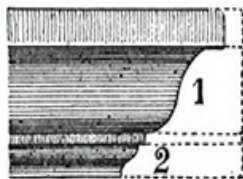
FROM **FRANK GEHRY** TO **ZIGGURATS**,
— AN ESSENTIAL GUIDE TO —
BUILDING STYLES AND MATERIALS



THE CORINTHIAN ORDER CAN BE TRACED BACK TO THE LATE CLASSICAL PERIOD, AND IS CHARACTERIZED BY ITS ELABORATE CAPITALS DECORATED WITH ACANTHUS LEAVES.



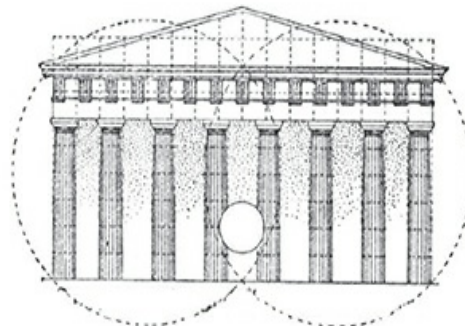
ARCHITECTURE



101



THE ROMAN AND GREEK CLASSICAL REVIVAL MOVEMENT WAS POPULARIZED IN THE U.S. BY THOMAS JEFFERSON, WHO DESIGNED MONTICELLO AND OTHER BUILDINGS IN THIS STYLE.



NICOLE BRIDGE

ARCHITECTURE 101

FROM **FRANK GEHRY** TO **ZIGGURATS**,
AN ESSENTIAL GUIDE TO **BUILDING**
STYLES AND **MATERIALS**

NICOLE BRIDGE


Avon, Massachusetts

To Cliff, M, C, and J—with love.

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INTRODUCTION

In its most basic definition, architecture is the tangible output of planning, design, engineering, and construction. It is the way we have shaped our environment for thousands of years, the process of building the places in which we live our lives. Architecture emerged as humans transitioned from hunter-gatherers to members of settled civilizations. In early Mesopotamia, residential quarters, courtyards, temples, and administrative buildings formed some of the earliest permanent human spaces. These places made it possible to establish agriculture, religious rituals, a government system, and commerce. They were, in short, the first urban communities.

Today, planning and building is still at the center of our society, but we have also come to appreciate the aesthetics of our constructions. We critique their artistic attributes and admire their innovations as if they were on display in a gallery. In this way, architecture has become a massive public art offering. The tension between the need to build structures that are sturdy and safe and the desire to design something that delights us visually is at the crux of architecture's power as an art form. Think of the Empire State Building (1931). The 102 stories on a two-acre plot in the middle of Manhattan constitute an efficient business center, pulsing with more than 150 tenants and seventy-three elevators racing countless employees to their jobs. But when we pass it on the street or see it in the backdrop of a movie or photograph, that limestone and granite façade, the shiny aluminum, the magnificent rows of lights above the observation deck . . . it becomes something more than its

function. It is one of the most iconic pieces of Art Deco, a world-recognized emblem of New York City. It is a testament to the power of architecture.

Even those simple houses back in Mesopotamia were beautifully designed. The Sumerians, their builders, took tremendous care to mold clay with their hands into uniform bricks, patiently dry them in the sun, and place them in elegant stacks. Imagine how mesmerizing those intricate, sand-colored cities must have looked against a clear blue sky 5,000 years ago. In good design, form and function have always lived together.

Today's cities are crammed with layers of different styles and designs. Our structures are a way for us to see who we were and admire who we are becoming. One can marvel over the ornate gothic towers such as Beauvais Cathedral (1225) in France and then turn to the Guggenheim Museum Bilbao (1997) in Spain. A triumph in modern architecture, the intertwined glass, titanium, and limestone museum is unapologetically nestled right into the heart of the old Basque city and has become the most recognized structure on its cherished river view.

As Frank Lloyd Wright said, "The mother of art is architecture. Without an architecture of our own we have no soul of our own civilization."

To study architecture is to investigate the heart of our existence. In this space we will examine the great architects, influential styles, and powerful contexts for the most admired and studied structures in the world. Let's take up residence here. Welcome to *Architecture 101*.

THE STONE AGE

The Earliest Human Settlements

In the beginning, humans were entirely preoccupied with the need to find food. Hunting animals and gathering fruit and grains was their means of survival. Their settlements were semi-permanent homes, functioning almost like a base camp, from which the tribes set forth to hunt and forage. Archaeologists have found evidence of huts built on the Central Russian Plain. These human shelters were organized into settlements, some dating as far back as 14,000 B.C.E. Among the creatures these humans hunted were mammoths, ten-foot-tall hairy elephants. They hunted the mammoths for food, but they also used their carcasses for other things like starting fires, manufacturing tools, and constructing huts. The hunters fashioned the bones into a dome, then filled any gaps between the bones with moss and shrubs before covering the whole structure with turf or a mammoth hide. This enterprise required a tremendous amount of resources; depending on the size of the hut, it could take as many as ninety-five mammoths to build a single structure. In fact, scientists are still not sure if the mammoths became extinct because of climate change or whether overhunting had something to do with it. The largest huts were elaborate enough to include multiple hearths on the inside and openings in the top from which smoke could escape.

Features of the Earliest Huts

- Mammoth bones

- Pine poles
- Animal skin linings
- Central hearth

Jericho

Urban civilizations began appearing much later, around 8000 B.C.E., when crop cultivation had begun to produce enough food that people did not have to move around so much. Now not everyone concerned themselves with food collection and production. People separated into other specialties such as warriors and priests. Humans began settling into permanent spaces and these early farming communities grew into villages often five or ten times bigger than the nomadic hunting settlements before them. Jericho was one of these communities.

Jericho was a fortified settlement positioned on the West Bank. Originally built in 8000–7000 B.C.E., it was enclosed and protected by a thick stone wall, in places as high as twelve feet, as well as a ditch. A tower about thirty feet rose over the area. The entire city stretched across some ten acres.

The Power of Mud

The earliest dwellings in Jericho, inhabited by hunters and farmers, were mud huts. Mud brick was the preferred building material in this area for thousands of years. It was easy to work with and manufactured from materials that were cheap and widely available. Builders mixed mud and water together with a binder such as reeds or straw and molded them into rectangles. They then set the bricks out in the sun to bake until they were dry. After the bricks were stacked

into the desired shape, the walls of the mud brick houses were plastered and painted.

Honoring the Dead

The early civilizations thought constantly about their ancestors. Even the way they built their homes emphasized this part of their culture. They often buried their dead family members beneath the floors of their homes. In the days immediately following the death, they would decorate makeshift shrines to the deceased in their homes with vibrant wall paintings or carvings. The subject of these paintings, like prehistoric cave paintings, was often hunting scenes, wild animal motifs, and cattle. To create these paintings, they would cover the wall with white plaster, almost like a blank canvas. Then they would use pigments bound with fats to make colorful paints. After the grieving period ended, the family would paint over these shrines. In some areas the skeletons of the dead were decorated. Sometimes the bodies were covered with red ocher or the necks and heads were painted with blue and green pigments. They were often buried with jewelry and weapons.

Jericho Skulls

One of the fascinating artifacts archaeologists uncovered from the ancient site at Jericho were skull "portraits." These were sculptural renderings of a dead person's likeness that were placed over his detached skull. These plastered skulls underscore just how important the dead were to the people of Jericho. They were an art form dedicated to preserving the memory of one who had passed on.

Çatal Hüyük

Çatal Hüyük (c. 6500–5700 B.C.E.) was situated in Anatolia, part of present-day Turkey. It was a highly sophisticated prehistoric city that sat fifty-seven feet above the plain and stretched out over thirty-two acres. Archaeologists have uncovered more than a dozen levels to this settlement, which indicates that it was likely inhabited for thousands of years. They also found evidence of a well-established trading network, agricultural system, and stoneware and ceramics production. More than 1,000 houses made of mud brick and wood were constructed here. There were no streets or outer stone wall like the one built around Jericho. Instead, the houses were densely packed and nestled right next to each other, leaving no gaps. This side-by-side layout of houses formed the perimeter defense wall.

The walls of these houses were made of mud bricks and, since they rested right against each other and the sides were not reachable, each house could only be accessed by the roof. The roofs were held up with heavy wood timbers. These in turn supported smaller timbers covered by reeds and mud. There were also high, small openings in the walls for ventilation. Residents would climb over the rooftops and enter their house by a ladder that went through an opening in the roof. Each house included a main room with raised areas for sitting, preparing food, and sleeping. Many houses also included an oven or hearth, possibly one in the middle of each room, for baking bread and making pottery. A ventilation shaft situated in the ceiling allowed smoke from the ovens and hearths to escape. These homes were built with post-and-lintel construction.

The houses were built over the ruins of older houses. Newer buildings were supported by the ones that came before them,

raising the houses to different levels. This practice also created open spaces between houses, where citizens could burn their garbage. Interior room walls were lined with white plaster, and the beams that were used to hold up the roofs were painted red.

Within these tight rows of houses were also shrines dedicated to the inhabitants' deities. These appeared sporadically in the layout, usually windowless and without ornamentation. They sometimes included statues and a simple decorative motif of bulls, symbols of one of the important gods worshipped in the city.

Post-and-Lintel Construction

This common building technology is found all over the ancient world. Vertical supports (posts) were set in the ground and a horizontal structure (lintel) was balanced on top. The posts support the lintel and its loads without crushing or buckling. This method would later be central to ancient Greek architecture and is still used today for doorways set within walls.

Eventually cities such as Çatal Hüyük were abandoned, possibly because they did not have room for the addition of public buildings. Once people began to establish governments and undertake civic initiatives, they would require more space and deliberate city planning.

MEGALITHIC CONSTRUCTION

The First Stone Builders

In these early days of human civilization, while urban communities were not as widespread in western Europe as they were in Mesopotamia, in the former you could find many megalith constructions. The purpose of these large stone structures still mystifies but archaeologists have formulated some ideas about their uses: possibly they were erected for astronomical observations or to serve as communal tombs for the upper classes. They were likely also used to claim land. More than 500 of these sites have been documented in Ireland alone. There were three different types of these massive stone structures: menhir, dolmen, and cromlech.

Carnac, Brittany, France (c. 4000 B.C.E.)

Carnac, in Brittany, France, contains one of the most extensive menhir assemblies in the world—more than 10,000. The word *menhir* derives from two Celtic words: *men*, meaning “stone,” and *hir*, meaning “long.” These stones were slightly shaped and placed standing upright into the ground. They often stood individually, but at Carnac they appear in rows. Some people believe that these shapes were phallic and their position is supposed to represent the male fertilizing the earth. Others think the menhirs functioned as a point on a landscape map, suggesting that the area might have been used as an observatory to track the movement of heavenly bodies.

Stonehenge (c. 3100 –c. 1500 B.C.E.)

Henges were made of wood or stone circles. Stonehenge, the most famous of these constructions, is a cromlech. The word *cromlech* derives from the Welsh words *crom*, meaning “curved” or “bent,” and *lech* meaning “stone.” It is clear that cromlechs were used to mark sacred spaces but their exact purpose is still unknown.



Stonehenge, in particular, began as a ditch running in a circle. Fifty-six pits inside the circular ditch have been excavated; they were filled with rubble or cremated human bones.

Later, sarsen stones (sandstone blocks) were erected in a layout that aligned with midsummer sunrise and midwinter sunset and the positions of the moon. The stones stand on a slightly sloping ridge with a mile-long road that runs east to west. In form Stonehenge consists of a series of concentric circles and U shapes. The outer circle is a post-and-lintel construction with blocks of stone thirteen feet high. The blocks are rough on the outside and a little bit smoother on the inside, and each stone tapers slightly at the top.

To secure the outer circle at Stonehenge, a tenon projects from each post. This tenon then fits into a hole that has been carved into the lintel. For the outer wall of structures, the lintels were slightly

curved, creating a circle when they are all attached end to end. The inner circle is formed from single upright bluestones. These include five large trilithons that are arranged in a U shape. Then there is an even smaller U shape of bluestones that echoes the shape of the five posts-and-lintels. Within this U, one lone stone lies on the ground. This has been called the Altar Stone, although its true use is not certain.

Many of the original stones at Stonehenge have now fallen but those that are still standing show us a shadow of how impressive must have been the original monument. They have become one of the biggest tourist attractions in Britain.

Eventually a new group of settlers brought their pottery skills and new building techniques into the area. These settlers, called the Beaker People, are believed to have completed Stonehenge. Somehow, they managed to bring in huge sandstone blocks from a village that was about twenty miles away. No one knows for certain how the community managed to achieve this incredible feat.

Dolmens

Dolmens (the word comes from the Celtic word *dol* which means "table") are large, flat stones that are supported by two or more upright stones; think of it as the construction of a table. Dolmens could be constructed to form single-chamber tombs. These were usually covered with earth or smaller stones to form a burial mound. Later, additions were made to the dolmens that turned them into passageways. Dolmens may have also been used to mark the boundaries of

settlement territories. Sometimes the walls inside a dolmen were decorated with carvings or paintings.

Mysteries of the Stones

Archaeologists do not know how the massive stones that make up Stonehenge were brought to the site. The bluestones weigh as much as four tons each and the largest sandstones weigh as much as fifty tons. No one has any idea how the lintels were placed either. Scientists are constantly uncovering more information about the megaliths but we still do not know for certain for what purpose these structures were used. It is clear that there is some common purpose, since henges appear throughout Europe. The people who lived during these times were tremendously impacted by seasonal changes. Some archaeologists think these henges were the sites of dances, spring and summer celebrations, and processions dedicated to the change in season.

Another possibility stems from the construction of the megaliths at Stonehenge. These structures do not include roofs. Perhaps they were used as astronomical observatories to help keep track of time and the motion of the stars, including the sun. These monuments were situated according to positions of the sun and the moon at particular times of the year. Even the road is aligned with the rising summer sun.

As the use of metal increased starting around 2000 B.C.E., the prevalence of these massive stone monuments began to decline.

MESOPOTAMIA

Developing the Fertile Crescent

The earliest literate civilizations lived in the area between the Tigris and Euphrates Rivers (modern-day Iraq). This area, which historians refer to as the Fertile Crescent, was called Mesopotamia from the Greek meaning “the land between two rivers.” The fertile plains in this region are where writing began and the first major urban centers were organized.

The City of Ur

Ur was situated in what is now southern Iraq. It was a powerful, wealthy city. In fact, much of what we know about ancient history in general begins at Ur because it is here that archaeologists have found large collections of clay tablets. In the early Bronze Age (c. 3300–2000 B.C.E.) people started to write things down, record history, and keep track of laws. The ziggurat in this city was surrounded by other public buildings, with all enclosed by a double wall. A big mausoleum called the Royal Cemetery of Ur was located just outside of the wall. The contents of this cemetery later gave archaeologists a clue about just how prosperous Ur had been; here they found the remains of chariots, harps, and jewelry. They also found the bodies of people who may have been killed so that they could be buried with the dead as companions. Main residences were located beyond this enclosed area. Ur’s harbors saw a lively shipping trade on the Euphrates.

This area of the plains was prone to flooding, so the entire city was raised on a high earthen mound. A giant fortified wall further protected the entire city.

The houses were situated in densely packed neighborhoods with open courtyards and windows facing these so that fresh air could enter the rooms. The side of the house that faced the street featured a plain brick wall. This continues to be a common urban layout in Mediterranean and Middle Eastern communities today.

Characteristics of Architecture in Mesopotamia

- Mud bricks
- Tripartite design, meaning plans organized around three rooms
- Courtyards
- Reed roofs

The Ziggurat of Ur

Ziggurats were seen by their builders as a link between heaven and earth. These temples were built by Sumerian farmers who worked on them between planting and harvest seasons. It took millions of mud bricks to form these enormous structures. The builders formed the bricks into a large rectangle with inward sloping walls and a series of platform steps. Sun-dried mud bricks were very strong but they were also porous, which meant that they would not hold together very well in the rain. To add waterproofing to the ziggurats, the builders created another set of bricks that would be more resilient in bad weather. This second set was fired in a kiln and then stacked in front of the mud bricks as a protective shell. These buildings were placed on raised ground to provide protection from the floodwaters that were such an integral part of life in this region.