



# History of Engineering and Architecture

# Definitions

## Civil Engineering

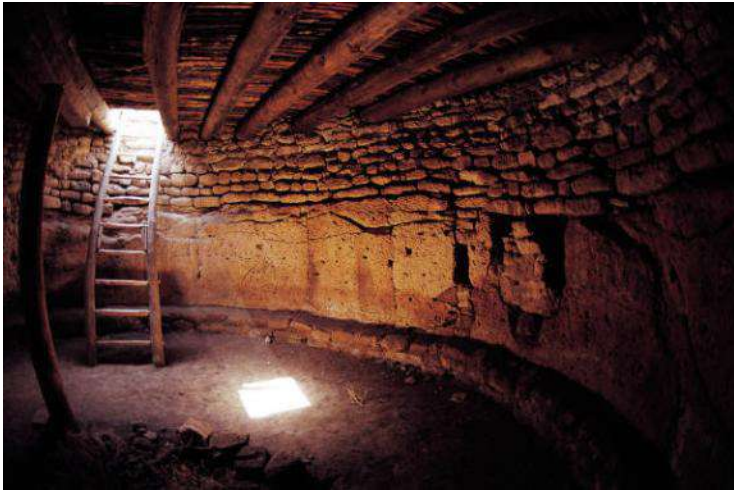
An engineer trained in the design and construction of public works, such as bridges, dams, and other large facilities.

## Architecture

Art and science of designing buildings for human habitation.

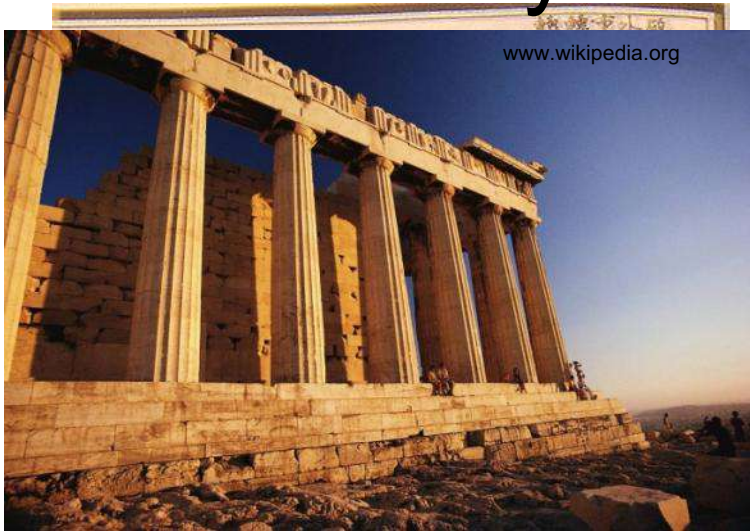


# Beginnings

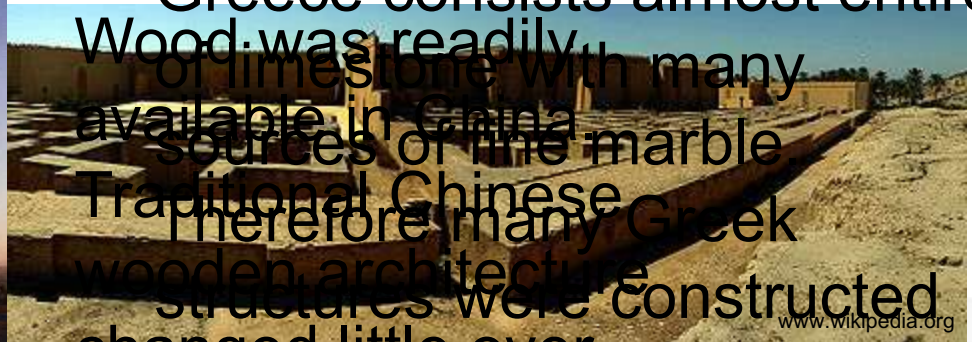


# Building Materials

Materials were chosen based on availability and climate.

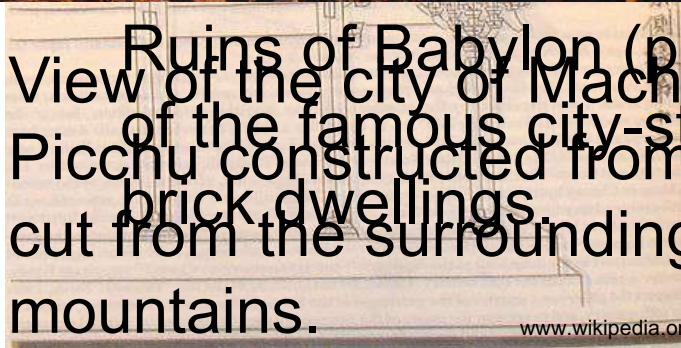


Greece consists almost entirely of limestone with many sources of the marble. Therefore many Greek wooden architecture structures were constructed with limestone and marble. changed little over thousands of years.



Ruins of Babylon (present day Iraq). All that remains of the famous city-state is a mound of broken mud-brick dwellings.

View of the city of Machu Picchu constructed from stone cut from the surrounding mountains.

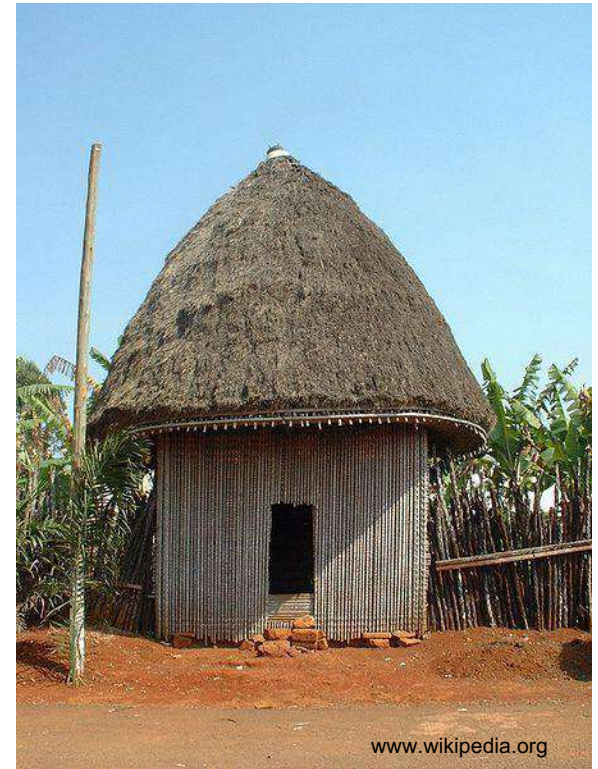


# Vernacular Architecture

Methods of construction that use locally available resources and traditions to address local needs.



An igloo, an Inuit winter dwelling



African Hut at Bana, a small village of Cameroon

# Vernacular Architecture



Apache  
grass, or reed



Southern African rondavel  
(or banda)



Nepalese house built  
of stone and clay

# The Pyramids



Great Pyramid of Khufu



Stepped Pyramid

# The Pyramids



Kukulcan's Pyramid



# Modern Pyramids



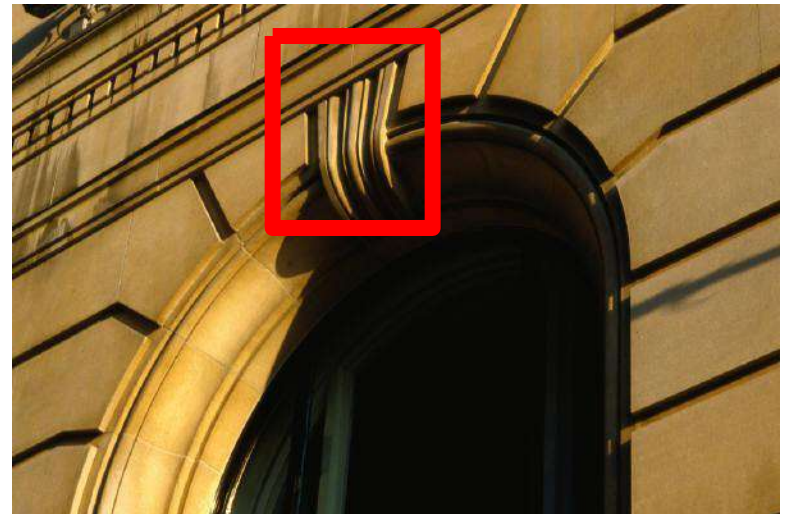
# The Parthenon



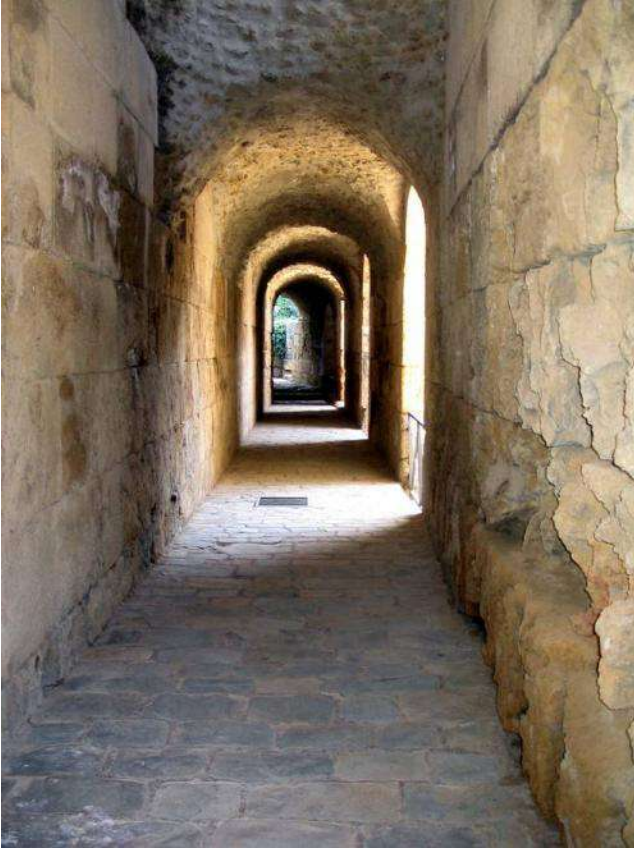
# Arches



Keystone



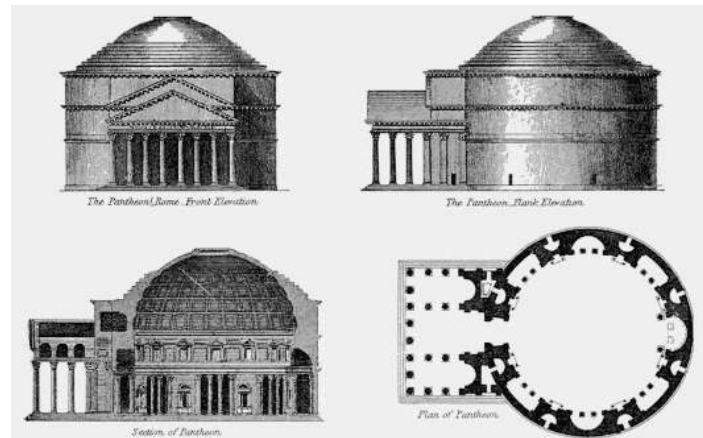
# The Vault



# Domes



# Pantheon



# Colosseum

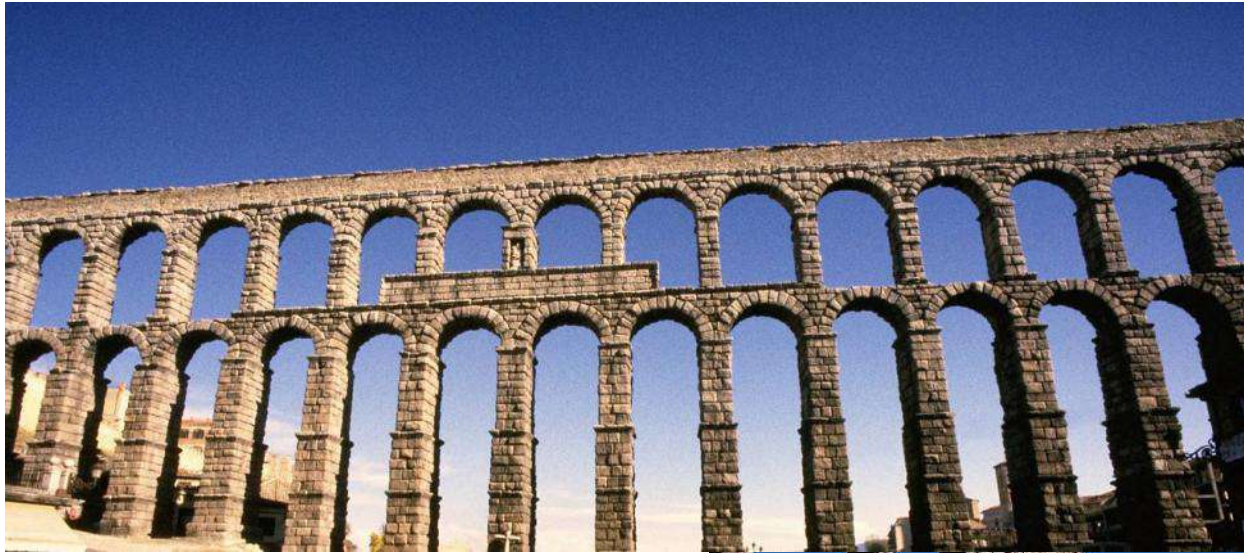


# Great Wall of China





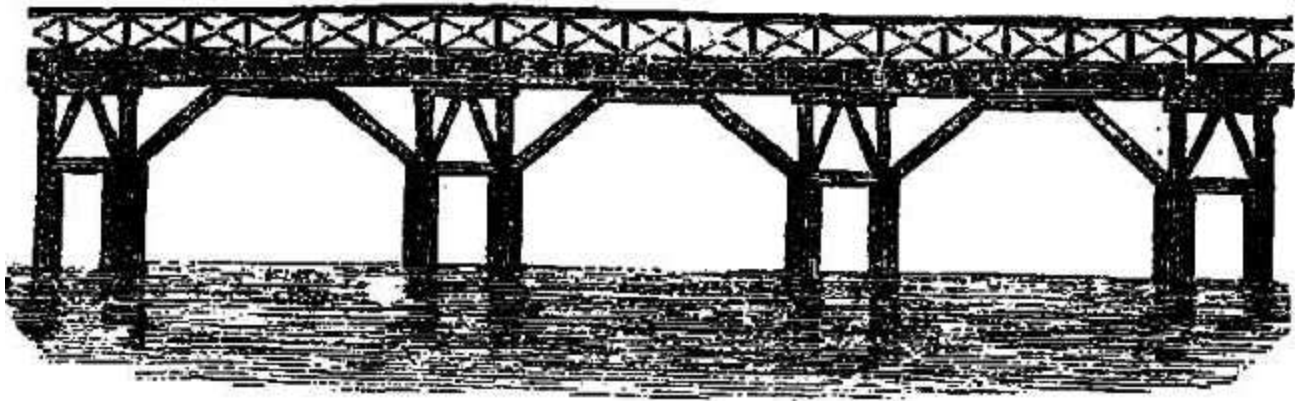
# Water Supply



# Road Systems



# Early Bridge Designs



[www.wikipedia.org](http://www.wikipedia.org)

# Roman Bridges



A Roman bridge crosses the Afrin River in northern Syria and is still in use today.



Roman bridge in Vaison la Romaine, south France

# After the Fall of Rome



The first arch bridge in the world to be made out of cast iron, a material which was previously far too expensive to use for large structures

# Structural Steel



Perhaps the best known structural steel framed building is the Empire State Building, completed in 1931.

# Reinforced Concrete



The Burj Khalifa (United Arab Emirates) is the tallest man-made structure ever built. It is supported by a reinforced concrete core using a special concrete mix.

# Reinforced Concrete Bridges



Cedar Avenue Bridge (actually carrying Tenth Street) in Minneapolis, MN over the Mississippi is a reinforced concrete open spandrel arch bridge.



# Image Resources

Microsoft, Inc. (2008). Clip art. Retrieved August 26, 2008, from <http://office.microsoft.com/en-us/clipart/default.aspx>

Wikipedia. Retrieved January 11, 2009, from [www.wikipedia.org](http://www.wikipedia.org)

iStockphoto. Retrieved January 11, 2009, from [www.istockphoto.com](http://www.istockphoto.com)

# References

Williams, T. I. (2000). A history of invention. New York: Checkmark Books.