Pre-Columbian Andes: Architecture and Public Works

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Civilizations

- Muisca 1000 AD - 1538 AD
- Chimu 900 AD - 1470 AD
- Inca 1438 AD - 1533 AD
Muisca (Chibcha)

- Columbia
- 45,000 square kilometers
- More centralized politically than any other South American people outside the Inca Empire
- Political structure crushed in the 16th century
- 18th century their language (muyskkubun) ceased to be spoken

Source: Map taken from “Political Map of Colombia.”
Around 900 A.D. the Chímu absorbed the Wari and Lambayeque or Sican cultures becoming the largest empire in Peru. The Chímu lasted until 1470 A.D. and came to an end when the Incas conquered them. Chímu extended 1000 km along the north coast of Peru from Tumbez south to the Chillon Valley.
The Chimu Empire

- Agriculture was an essential function of society and the economy.
- Society was hierarchically based with the Ci-guic or King at the top. Beneath the king, the local chiefs, or alaecs beneath the alaecs were the pixllca or the urban elite. At the bottom of the social scale were the vassals or domestic servants--the paraeng and yana.
The Chímu Empire

- Cities were composed entirely of adobe blocks or Tapia walls (clay and dirt). To make the bricks, silt was pressed into rectangular molds, and sun dried.
- Chan Chan, the capital city, is the largest adobe city in the world
Inca

- Largest pre-Columbian empire
- Mainly located along the Andes Mountains
  - Present day Peru, Ecuador, Bolivia, Argentina, Chile, and Columbia
- Cuzco, the capital, held the governmental, militaristic, and religious centers for the empire
- Dominant religion worshipped Inti, the sun god
- Kings ruled the empire
  - Kings were thought as descendants of the sun, called the “son of the sun”
Chipus, the Inca Counting System

- System employed by the Incas to record information.
- Based on the type of knot, distance between knots, and color, the quipucamayocs (officials who handled this information) could determine what was being recorded.
- Essential for maintaining the system of forced labor (mit’a) because it allowed huge amounts of information to be accounted for.
Muisca - Architecture

- Chief leader:
  - A single community
  - At least one internal division of the community, the zibyn
    - Zibyn encompassed several uta groups
      - each with uta leader
Muisca - Architecture

- **Houses:**
  - Circular structures
  - Conical forms
  - Small doors and windows
  - Roof made of wood, straw, cane or palm.
  - Elites’: larger
  - Chiefs’: entrances covered with plates

- **Ceremonial structures:**
  - Elliptical or quadrilateral

Model of Muisca houses Archaeology Museum of Sogamoso
Muisca - Architecture

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Architecture in Chan Chan

- Chan Chan was the largest city in the Chimu empire and covers an area of 20 km$^2$ which was completely surrounded by a large wall.
- Composed of 10 large enclosures and many intermediate compounds and smaller domestic structures which housed most of the population.
● Both frieze patterns with no symmetries
• Frieze pattern with no symmetries

• 2-dimensional pattern: only 180 degree rotation
Inca - Architecture

- Universally renowned for masonry skills
- Degree of refinement depended on purpose of structure
  - Walls at Cuzco used fine cut stone, chiseled so perfectly that no mortar was needed
  - Walls for general use were made of less valuable materials and required mortar to hold
- Chiseling was done by pounding with hard river rocks
- Wooden frames used to copy a rough shape to stone before placing
- Blocks were placed by rolling up dirt ramps on logs
- Fitting was done by repeatedly placing, removing, chiseling, and re-placing
Inca - Architecture

- Front View
- Cross Section
Inca - Architecture

- Polygonal Masonry - Irregularly shaped and individually fitted
  - Cellular Polygonal uses small stones less than a meter in length
  - Cyclopean Polygonal uses large stones a meter or many meters in length
  - Stronger due to precise fitting, used for support walls in terracing
- Rectangular Masonry - Consistently shaped similarly to rectangular prisms
  - Encased Rectangular uses large semi-rectangular blocks, cut to align with wall corners
  - Sedimentary Rectangular uses rigidly rectangular blocks in horizontal or vertical rows
  - Aesthetically appealing, seen in major cities and places of importance or power
Inca - Architecture

- “Stone of Twelve Angles”
- Cuzco
Inca - Architecture

● The trapezoidal form was the focus in Inca architecture
  ○ Believed to be an inherited form of design from pre-Inca cultures

● Seen in town plazas, though rectangular was more common
  ○ Parallel lines aligned to east-west axis to within 5 degrees

● Trapezoids in doors, windows, and niches were a staple to any structure
Inca - Architecture

- Along with displaying trapezoidal form, the Inca paid close attention to symmetry when designing buildings.
Muisca - Agriculture

- Different ecological zones = great variety of foods
- Camellones or “Raised-field” agriculture
  - Prevents frostbite
  - Reduce the effect of droughts and floods minimizing crop failure
- Corn, beans, tubers, etc...
Agriculture in Chímu Empire

- Chan Chan located in a valley, far from the rivers in the mountains but since they were at a low terrain level so they had access to drinking water but not enough to grow crops.
- Huge canals were built, some reaching almost 100 km to carry water from the Moche and Chicama rivers, mainly for irrigation.
Agriculture in Chimu Empire

- Canals flowed through broken topography and were designed to carry a specific volume of water.
- For the water to be able to flow through this rugged terrain, an in-depth knowledge of the effect of terrain, choke points, and bed and sidewall slopes of the canal.
- “The size of Chimu canals was a function of the amount of water being carried by the canal, which was in turn determined by the amount of water needed to irrigate a given area” (Zak 25)
- Extremely complicated optimization problem, want to minimize labor and materials
Inca - Agriculture

- Terracing was necessary to farm within the Andes mountains
  - Walls either formed to the land or were zig-zag to provide extra support
- Qollqas were storage huts built frequently throughout cities and towns
  - These buildings were round in shape, differing from the common use of quadrilateral building
Nazca Lines

- Also known as geoglyphs, created by the Nazca and Paracas
- They were created by moving dark volcanic rocks aside, revealing the lighter colored clay beneath
- Additional contrast from the piles of rocks along the edges of the lines
- Humming bird is 886 feet long and the spider is 164 feet long
Nazca Lines
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