

Andean Archaeology and Ethnohistory - Anthro 326: Class 3  
**The ecological and social setting, and general chronology**

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- Announcements
- Quiz
- General chronology
  - Background: Archaeologists tell time in the past in two ways
    - **absolute dating**: dates in "years ago" or "years BC/AD", etc.. Various methods:
      - based on objects with dated inscriptions or other ties to known history, like a coin that says 1843
      - or on counting **tree rings (dendrochronology)**
        - the most accurate and precise method available
        - but only usable in certain regions where certain species of trees are preserved
        - works back to around 8000 BC
      - or based on physical tests, like radiocarbon dating
        - which can tell how old certain kinds of things are in years
        - **radiocarbon dating**
          - works on organic materials (wood, charcoal, wool, plant materials, bone, shell, etc.)
          - tells how long it has been since the organic tissue died
          - works in most circumstances, but only within a range of uncertainty, like "600 ± 50 BC"
          - radiocarbon dates may be given in two forms
            - **radiocarbon years**: based on some simple assumptions we now know are not quite correct
            - **calibrated**: radiocarbon years adjusted to match tree-ring dates
              - these should correspond to standard calendar years
              - but involve some more assumptions
              - most archaeologists working on the last 5000 to 8000 years now use calibrated dates, but some still prefer not to adjust the plain radiocarbon years
              - I will use calibrated (calendar) years in this course
    - **obsidian hydration**
      - works on flaked obsidian (volcanic glass), often used for projectile points and other tools
      - tells how long it has been since the obsidian was flaked
      - much rougher and less reliable than radiocarbon dating
    - **relative dating**: putting things in order without knowing how many years separate them
      - **stratigraphy**: the study of layers of soil in the ground
        - the bottom layers are oldest, the top layers more recent
        - so if one building is buried under another, the buried one was built and used first, and the upper one was built later
      - **stylistic chronologies**

- using stratigraphy or other methods, archaeologists put styles of pottery (or other things, like projectile points or textiles) in relative order
- then they can roughly "date" layers or sites by the style of pottery (or whatever) that is found in it
- analogy: say you know that black cars with wooden spoke wheels came first, followed by bulbous metal cars with tail fins, followed by the current Lexus
  - you could put photos of street scenes in rough chronological order based on the cars in each photo
  - or you could put the ruins of several garages in chronological order by the kinds of broken car parts lying around each one
- ceramics (pottery) is most often used for stylistic chronologies because
  - pots can be made and decorated in a vast number of styles
  - they are relatively easy to make, so they tend to be common
  - they break easily, so pieces in the current style tend to get thrown away frequently
  - the pieces are durable
    - so archaeologists tend to find a lot of them
    - making them convenient time markers
- in practice, absolute dating is often used to confirm and assign dates to ceramic styles
  - then the styles are used for dating instead of radiocarbon dates
  - because radiocarbon dates are expensive and slow
- Period / Horizon system in the Andes: based mostly on ceramic styles
  - **Horizon**: a span of time during which a style of ceramics (or other goods) was found throughout a large geographical area
    - assumed to imply long-distance interactions
    - possibly a state, empire, widespread religion, etc.
    - all sites with objects in a horizon style would have been roughly contemporary with each other
      - this allows sequences of styles in different areas to be correlated to each other
  - **Period**: a span of time during which styles of ceramics (and other goods) were more localized and patchy
    - assumed to imply the absence of any overarching connections or organization
    - "period" can also have a more general meaning in other contexts as simply a span of time
- John Rowe (UC Berkeley) suggested a general chronology that comprised a series of alternating Periods and Horizons
  - with the time during which Inka style ceramics were used throughout the Inka Empire being the "Late Horizon", for example
- there are two ways of looking at this system
  - in a "culture-historical" view,
    - the calendar dates of periods and horizons vary from place to place due to the time it takes for a horizon style to spread
    - for example, the Late Horizon would start earlier near Cuzco, where the Inka empire started, and later in Ecuador, near the limit of its expansion to the north
  - in a "strict chronological" view,

- periods and horizons are tied to a specific moment in time
- In John Rowe's original version of this framework, the periods and horizons were defined by their appearance in the Ica valley, which was arbitrarily selected as the "master sequence"
- so the Late Horizon began at the moment the Inka arrived in Ica
- in this view, the Inka controlled areas closer to Cuzco *before* the beginning of the strict "Late Horizon"
- and they arrived in Ecuador *after* the beginning of the strict "late Horizon"
- there are advantages and pitfalls to both approaches
- now that radiocarbon dates are increasingly available, people tend to rely more on the radiocarbon dates, while using the period-horizon system more loosely to discuss general ranges of time
- This system is just a convenient general framework; it doesn't work perfectly everywhere
  - for example, evidence of the Early Horizon simply does not exist in southern Peru, so using "Early Horizon" as a chronological period there is not very meaningful
- The chronological system formalized by John Rowe, as presented by Moseley, pp. 22-23:
  - the charts and dates are quite approximate
  - Lithic Period: 11,000 - 4,000 BC
  - Preceramic Period: 4,000 - 2000 BC
  - Initial Period (Localized societies, temple mound complexes): 2000 - 800 BC
  - Early Horizon (Chavín): 800 - 200 BC
  - Early Intermediate Period (localized societies, Moche, Nazca): 200 BC - 500 AD
  - Middle Horizon (Wari and Tiwanaku): 500 - 1000 AD
  - Late Intermediate Period (warring chiefdoms; Chimor): 1000 - 1400's AD
  - Late Horizon (Inka empire): 1400's -1532 AD
  - Spanish Colonial Period: 1532 - through 18th century
- We will use an updated version of this scheme with slightly adjusted dates. I will post it on the class website soon.
  
- Geographic background
  - Moseley's account has a lot of good generalizations and explanations in it
    - I won't go over all of them; don't think what I leave out is unimportant!
    - instead, I will review some points in a differently-organized way, and try to make them a bit more real to you
  - Andean geography is extremely variable and compressed
    - seashore, desert, farmland, grasslands, snowcapped peaks sometimes within sight of each other
  - dominated by Andes mountains
    - pushed up by compression of the South American continental plate by the subducting Nazca oceanic plate
    - very tectonically active: earthquakes, active volcanoes common
    - very high because mountains are rising at a speed greater than that at which erosion wears them down
    - lots of steep slopes, deep, narrow valleys

- flat land is scarce
- uplift is very irregular from place to place
  - one part of the coast may rise, while another stays put, changing the slope of the terrain
  - this can play havoc with canal systems
- cross-sectional view of the South American continent (see Moseley pg. 30)
  - very steep, high mountains along western edge of the continent
  - depending on where in the range, one or two “inter-montaine” valleys running along the length of the range (in the north), or a broad, rolling plateau (in the south); making the range more a wide raised area than a single row of peaks
  - eastern edge of range only slightly less abrupt, dropping off into the Amazonian basin
  - which then slopes very gradually and essentially uninterrupted all the way across the rest of the continent to the Atlantic
- Rivers and topography
  - short, steep, deeply incised valleys flow generally straight down the Pacific slope to the sea
  - separated by vast tracts of inhospitable desert, often very rugged and hard to cross
  - rivers in most of the Andes are east of the continental divide
    - flow along the length of the Andes, then turn and flow into the Amazonian drainage
  - travel along the river valleys is relatively easy, but crossing from one to the next is much more work
    - so north-south travel is practical mostly in the highlands and along the shoreline, but less so on the western and eastern slopes, that is, the arable river valleys
    - this somewhat isolates the pacific drainage valleys from each other, while encouraging contacts up and down each valley from the coast to the highlands
    - and by boat along the coastline; probably mostly relatively late in prehistory
- rainfall patterns
  - western side
    - due to cold Peru current (formerly called the Humboldt current)
    - wind from the west blows towards land across the cold coastal water
    - this cools the air, so water vapor in it condenses and rains out over the sea
    - the air then hits the warmer land and heats up, allowing it to hold more water even as it is forced upwards by the mountains
      - so it very rarely rains on the coast
      - this is most pronounced in far southern Peru and northern Chile: the Atacama desert
      - so dry in parts that salt (sodium chloride) crystals and other water-soluble minerals exist naturally on the surface; no significant precipitation since the end of the Pleistocene
    - as air blows east, the mountains force it to rise, pressure drops, and eventually water condenses and rains over the high parts of the Andes
  - results
    - a dry coastal strip and dry western mountains
    - rainfall on the higher western slopes of the mountains feeds rivers that flow down through the desert to the sea
- eastern side

- wind from the other side (the east) blows across the Amazon towards the eastern slopes of the Andes
- this air is warm and humid, not dried out by the cold water/warm land process that holds on the coast
- so as the air moves west and the eastern slopes force it to rise, it readily rains on the eastern slopes
- resulting in the eastern slopes being wet and green
- this creates a "rain shadow"
  - that is, by the time this air passes the eastern peaks of the Andes, most of the moisture has rained and snowed out
  - leaving the air dry and unable to provide rain for the center of the range or the western slopes
- normal variability in rainfall
  - see Moseley's discussion on pg. 28
  - bottom line: even many major coastal rivers vary from trickles or no flow at all for parts of the year, to raging torrents at other times of the same year
  - some years the river flows well, others it doesn't
  - this is very hard on farmers and their societies
- El Niño
  - you all know the gist of this...
    - El Niño events involve an unusual warming of surface ocean water off the west coasts of North and South America
  - occurs irregularly, noticeable El Niño events happen in maybe one out of seven years
    - very severe ones on the order of one or two per century
    - and super-Niños every several centuries or even millennia
  - effect varies depending on where you are
  - on the coast:
    - typically results in torrential rains
      - normally dry streambeds flow with flash floods
      - valley bottoms, farmland, and towns flood
      - farmland along the rivers may disappear, completely eroded away, leaving a rocky riverbed or floodplain
      - often the water loosens huge mudflows called *huaycos*
      - destroying roads, towns, canals, fields, etc.
    - also changes fish and shellfish species and numbers
      - normal cold-water species decline,
      - but unusual warm-water ones appear and prosper
    - normally barren hillslopes may turn rich and green, attracting camelids, deer, foxes, birds, and other animals that can be hunted
  - in the highlands
    - typically causes drought, crop failure, hunger
    - but sometimes downpours and catastrophic mudslides in middle elevations
  - typically most pronounced in the northern part of Peru, less in south

- may strike one valley hard, and the neighboring valley much less so
- probably played a role in some cultural changes, as we shall see
- major ecological and cultural zones
  - narrow coastal strip: extreme desert except where crossed by rivers
    - coastal desert is essentially useless and unoccupied throughout prehistory
      - except for places that have or used to have springs, where settlements are found
      - and places where useful minerals were found
        - silicates for stone tools
        - copper ore
        - clay deposits, etc.
    - except right along the shoreline, this desert is often very rough and difficult to cross
    - yet amazingly, criss-crossed by paths
  - short, steep, deeply incised river valleys running basically straight down to the Pacific
    - coastal parts tend to widen into fertile fans
      - easily irrigated with canals
      - in general, these valleys are biggest to the north, and get very narrow and dry to the south
      - many of these areas were major prehistoric population centers, especially on the north coast of Peru
  - along the coast, there are two major ways to make a living: farming and fishing (including gathering shellfish)
    - farming
      - coastal river valleys are good for growing maize, chili peppers (“ají”), coca, fruits, peanuts, cotton, etc. that don’t produce as well or at all at high elevations
      - since it virtually never rains, the problem is getting river water to the fertile desert soil
    - fishing and shellfish gathering
      - marine resources are extremely rich and dependable
      - shellfish gathering along the shore and by diving
      - line fishing from the shore
      - net fishing from the shore
      - net fishing from small boats made from reeds or logs
      - but even marine specialists tend to live near river mouths because they provide fresh water
    - there was a very longstanding practice of dividing these productive activities between distinct ethnic groups of farmers and fishers
      - who exchange their products through barter
      - but live in different areas, speak different dialects, and rarely intermarry
  - the “warm lands” of the coast and middle elevations up to about 2,300 m (~7,500 ft) are called *yungas* in Quechua
    - people who lived in the high, cold mountains and intermontaine valleys tended to want crops and goods from the *yungas*
    - getting them by trade
    - or by controlling portions of *yungas* lands themselves

- coastal hills with fog vegetation: *lomas*
  - highly seasonal and variable; may look like desert one year, and lush undergrowth the next
  - good for seasonal hunting and gathering, firewood
  - relatively fragile environments that can only sustain a low density or temporary human population
  - important resources for early, foraging people; less important after the adoption of agriculture
- highlands valleys
  - the intermontaine valleys tend to be broader than the Pacific slope valleys
  - valley floor and lower slopes of the valleys are called the *quichwa* zone (2300 to 3200 m) (~7,500 to 10,400 ft)
    - little or no frost, good for growing potatoes, some maize, squash, etc.
    - big terracing projects (*andenes*)
  - very productive, but more limited range of crops than the *yungas*
  - upper slopes are called *suní* (3200 - 4000 m) (~10,400 to 13,000 ft)
    - freezes; good for tubers, quinoa, etc.
  - north-central Andes: one big intermontaine valley, the *Callejon de Huaylas* (“Avenue of Huaylas”)
    - between the *Cordillera Blanca* on the east (“White Range”, because it is snow-capped from the wet air that comes from the Amazon basin)
    - and the *Cordillera Negra* on the west (“Black Range” because it is mostly snow-free, due to the drying effect discussed earlier)
    - to the south is the *altiplano*, described later
  - some highlands valleys held big prehistoric population centers, including Cuzco, capital of the Inkas, and Huari, capital of the Wari state
  - this region is the center of the Quechua language, which was later spread throughout the Andes as the official language of the Inka
  - Moseley points out that people living at these high elevations must deal with lower partial pressure of oxygen
    - visitors get altitude sickness for days or weeks after arriving
    - and take weeks or months to get sufficiently acclimatized to be able to walk, carry things, and work more or less normally
    - but they typically never do as well as people born and raised at high elevation
  - these highland valleys and surrounding areas, like the coast, provide two main ways of making a living: farming and herding
    - farming by "dry" agriculture (dependent on rainfall directly on the fields) or irrigated agriculture in the valleys
    - herding of llamas and alpacas for wool, carrying cargo, and meat on the higher slopes and surrounding mountains
    - in some cases, these two kinds of production were separated almost as sharply as the fishers and farmers on the coast
    - but more often, they were more integrated within "agropastoralist" communities and families that did both
- in northern Andean highlands, *paramo*

- high, cold, wet grasslands, not extensively used by people
  - in central Andes, *puna* (4,000-4,800 m) (~13,000 to 15,600 ft)
    - high, cold, not-so-wet grasslands
    - excellent for herding llamas and alpacas, hunting vicuña
    - marginal agriculture in some places based on specialized high-elevation tubers
    - probably never supported large permanent populations, but was exploited by specialists linked to the highlands valleys
    - freezing but seasonally dry climate allows production of *chuño* (freeze-dried potatoes) and *charki* (dried camelid meat, the origin of our word “jerky”)
      - this is also possible in the higher parts of the *quichwa*
  - in southern Andes around Lake Titicaca, *altiplano*
    - similar to puna, but broad, relatively flat expanses
    - and a bit more suited to agriculture of tubers and other high-elevation crops
      - not maize, ají, etc.
    - some of the land right around Lake Titicaca is a unique resource of flat areas that could be farmed using raised field methods, extremely productive
    - home of some large, important populations, including the city of Tiwanaku
    - center of the Aymara language
  - eastern slopes
    - upper slopes have cactus, scrub, temperate forest, and cloud forest
    - lower slopes verge into jungle
    - called *montaña* or *ceja de selva*, literally “eyebrow of the jungle”
    - like the Pacific slopes, these areas are also “warm lands” or *ungas*, good for maize, coca, ají, fruits, etc.
      - at various times, exploited by colonists sent from the highlands
    - in general, the eastern slopes do not seem to have supported large, important groups
      - although that may reflect Inka propaganda, since they had trouble conquering and controlling the eastern slopes and jungle
      - and the difficulty of doing archaeology there to disprove their views
  - Amazonian basin
    - still poorly known archaeologically, we won’t cover it much in this class -- although eventually archaeology courses may have to stop ignoring this region
-