Domestication in the Americas

Mesoamerica
- cucurbits: Guilá Naquitz, Oaxaca 10-8 ka
- Mesoamerican TRINITY
  - teosinte: San Andres 7.1 ka
- Tehuacán Valley
  - Coxcatlán Rock Shelter (Phase) 7 – 5.4 ka
  - maize-beans-squash grown widely by 4.5-4 ka & settled villages common
- Andes 10 ka; 5-4 ka
  - cucurbits; camelids-quinoa-potatoes; cotton

American Southwest
- turkeys
- TRINITY earliest 4-3.5 ka
  - supplemental to hunting-gathering
- eastern North America
- local domesticates: goosefoot, marsh elder, gourds (oily seeds)
  - earliest maize ca. 1.7 ka
- maize agriculture 1000 AD
- Cahokia 900-1200 AD
  - maize-beans-squash: cultural SUPRENOVA

Old & New Worlds

“centers” of domestication
synchronous, independent origins of agriculture

Desert Southwest
4.5-3.5 ka earliest maize
1000 AD maize-beans-squash

eastern N. America
3-1.6 ka squash/oil plants
900-1200 AD maize-beans-squash

Early Mesoamerican Sites

Tehuacán Valley
Coxcatlán Rock Shelter (Phase)

Guíl Naquitz

Mesoamerica
10 ka (cucurbits)
7.5-4.5 (maize-beans-squash)
early domestication events:
- cucurbits = plants of the gourd family; i.e. melons, cucumbers, squash
- domestication in humid tropical forests by 11 ka (?)
- Guilá Naquitz, Oaxaca, 10.75-8.67 ka
  - seeds of domestic bottle gourd and squash
  - original “interactions” with gourds as water containers?
  - seedbed tending…
    - selecting for early sprouting, also selects for larger plants and larger seeds

the Mesoamerican TRINITY
- maize-beans-squash
- *Zea mays*, or maize (corn) = domestic maize
- *Zea mexican* (“teosinte”) = wild grass progenitor of maize
  - originally thought that maize progenitor went extinct, but now demonstrated that teosinte is it
    - hybridizes (the “biological species” test)
    - few as 5 genetic mutations convert teosinte into maize…ease of domestication?

Early Mesoamerican Sites

- Tehuacán Valley
- Coxcatlán Rock Shelter (Phase)
- Guilá Naquitz

wild teosinte
hybrids as reconstructed early domesticates
modern maize (corn)
the TRINITY: domestication and human health

- teosinte/maize lacking in two essential amino acids!
  - lysine & tryptophan
  - maize-only diet not possible
  - beans: high in lysine
  - squash: high in tryptophan
  - eat one (maize), must eat all!
  - domestication as a group → beneficial health consequences
- domestication w/o knowledge of amino acids?

Earliest Maize Domestication 7.1 - 7.0 ka
San Andres, Tabasco, 7.1 ka proto-domesticate

- Excavations at Coxcatlán, Tehuacan Valley, Mexico
- Coxcatlán early maize cob

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the TRINITY: domestication and human health

- teosinte-beans-squash: natural ecological association
  - runner beans and squash grow naturally around the base of wild teosinte plants
  - teosinte/maize extracts nitrogen from soils; beans return nitrogen to soils
    - association helps maintain soil fertility
  - interaction with one (e.g., water containers), interaction with all?
  - easy to domesticate as a group?

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Old & New Worlds

Highland Andes…independent
- cotton: non-food! ca. 7 ka
- camelids: llama and alpaca < 8 ka
- Chenopodium: quinoa 4-5 ka
- potatoes: hundreds Of varieties 5 ka

turkeys in American Southwest who domesticated whom?
- a model for dog domestication?
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- Old & New Worlds

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Increasing marsh elder seed size under prehistoric human cultivation

Eastern North America
Moundbuilder Cultures 1000-600 BC
Hopewell 1-400 AD

Hopewell Mounds 1-400 AD
Eastern North America -- Cahokia 900-1200 AD
Cultural SUPERNOVA with arrival of maize-beans-squash

- Old-New World Comparison
  - late Pleistocene hunter-gatherers used wild precursors to domesticates to supplement diet based on other wild foods
    - Kebaran → Old v. Ajeureado & El Riego Phase → New
  - sedentism precedes development of full domesticates and/or contributes to domestication
    - Natufian v. Coxcatlan Phase
  - full sedentism and mature agriculture provides foundation for growing social complexity