many “centers”
- Fertile Crescent
- Founder Domesticates
  - cereals: Emmer, Einkorn, barley
  - pulses: lentils, peas
  - dogs, sheep, goats
- IDing domesticates
  - large seed size ($e$)
  - semi-touch rachis ($h$)
  - quantity of seeds ($\lambda$)
  - small body size ($h$)
  - excess males ($h, \lambda$)

**BP vs. BC Confusion**

- **BP** = Before Present
- **BC** = Before Christ
- **BP** = **BC** + 2000 years
- Younger Dryas
  - 12.95-11.65 ka
  - 12,950-11,650 BP
  - 10,950-9650 BC

SW Asia & the “Fertile Crescent”

- Kebaran 18-12,000 BC
- Natufian 12,000-9600 BC
- PPNA 9600-8800 BC
- PPNB 8800-6900 BC

- simple hunter-gatherers
- complex hunter-gatherers
- early Abu Hureyra, Eynan
- mature agriculture
- late Abu Hureyra, Jericho, Jerf el Ahmar
- Çatalhöyük, ‘Ain Ghazal

synchronous, independent origins of agriculture

SW Asia & East Asia 12-8 ka
- Americas 10-8 ka

SW Asia & the “Fertile Crescent”

- Anatolia
- Zagros Foothills
- Levantine Corridor
- Tigris & Euphrates Rivers
Continental

Mediterranean

Monsoonal

Med: cool wet winters, hot dry summers
Con: cold dry winters, cool dry summers
Mon: cold dry winters, warm wet summers
zone of overlap = high biodiversity

- Founder Crops
  - Emmer and Einkorn wheat
  - barley
  - legumes (pulses): peas, lentils

- Founder Animals
  - sheep and goats
  - dog

IDing Domesticated Cereals – large seed size ($e$)

advantageous to plants only with human intervention in reproductive cycle...
large seeds come at cost; too much energy devoted to reproductive cells rather than G & D
Identifying Domesticated Cereals – semi-tough rachis ($h$)

advantageous (to plants) only with humans intervening in reproductive cycle...

limits dispersal ability in natural setting

Identifying Domesticated Cereals – quantity of remains ($\lambda$)

seeds minimally in the 100s or 1000s

Identifying domesticated animals – body size ($h$)

toe bones from domestic (left) and wild sheep (right) Ganj Dareh, Iran, ca. 8000 BC

IDing wild animals: mortality profiles ($\lambda$)

preferred

Easy to capture (but small, or low health)
IDing domesticates--mortality profiles ($h$, $\lambda$)

- many “centers”
- Fertile Crescent
- Founder Domesticates
  - cereals: Emmer, Einkorn, barley
  - pulses: lentils, peas
  - dogs, sheep, goats
- IDing domesticates
  - large seed size ($e$)
  - semi-touch rachis ($h$)
  - quantity of seeds ($\lambda$)
  - small body size ($h$)
  - excess males ($h$, $\lambda$)

SW Asian sequence
- Kebaran 18-12,000 BC
  - simple hunter-gatherers
- Natufian 12,000-9600 BC
  - complex hunter-gatherers
  - early Abu Hureyra, Eynan
- PPNA 9600-8800 BC
  - mature agriculture
  - late Abu Hureyra, Jerico, Jerf el Ahmar
- PPNB 8800-6900 BC
  - proto-cities?
  - Çatalhöyük, ‘Ain Ghazal

early Epi-Paleo Kebaran 18,000-12,000 BC
- simple hunter-gatherers
  - microlithic tools, wild emmer wheat, legumes and gazelles!!!
- Ohalo II ca. 18,000 BC

Distribution of wild cereals @ onset of Younger Dryas
Evidence for what behavioral changes?

Natufian 12,000-9600 BC
- decorated sickle handles & microblades with sickle polish
- saddle querns (grinding equipment)

Natufian @ Abu Hureyra, Syria, 11,000-8800BC
- carbonized cereal remains in moderate quantities
- not wild? not full domesticate? proto-domesticate?
- experimentation with crops
- but still heavy reliance on gazelle hunting

Natufian child buried with a dog, 10,000 BC
- Dogs domesticated from wolves > 12,000 BC
- World’s earliest domesticate? (carnivorous turkey!)

late Natufian sedentary life at Abu Hureyra, Syria (1ha)
- cause OR consequence of proto-domesticates?
- Aceramic Neolithic 9600-6900 BC (PPNA & PPNB)
- Sites 3-8 ha in size
- Simple → mature agriculture
  - simple = intensive use of single crop to supplement diet
  - mature = use of multiple crops in complex sequence as major component of diet
    - crop rotation and fallow system
- Spatial & cultural link to Natufian
  - burial practices, house shapes, agricultural technology

Animals in the diet during early aceramic (PPNA) reliance on hunting, but sheep-goats rapidly domesticated at end!!!

“Domino Effect” during late aceramic (PPNB) cattle and pig domesticated soon after sheep-goats

- Consequences of “mature” agriculture
- Large complex settlements (with fortifications?)
  - PPNA Jericho—tower and “moat”
  - Communal labor organization
  - Keeping people in or out?
Greater social complexity in the Aceramic Neolithic cause OR consequence of greater reliance on domesticates?

end PPNB
Çatalhöyük Reconstruction; 12 ha, 1000 rooms large villages with extensive ceremonial functions; proto-cities?