Postglacial complex hunter-gatherers and the origins of agriculture

Introduction

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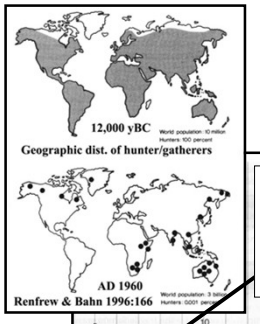
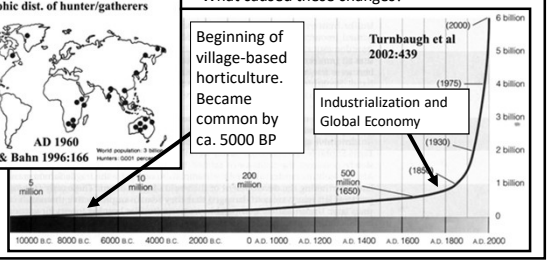
The Holocene -- transformation of human society



- Until about ca. 10,000 BP all humans lived in hunter and gatherer societies, organized as bands.
- After the development of agriculture, humans came to live in larger, more complexly-organized groups.

What caused these changes?



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The Pace and Direction of Change during the Holocene

- Within the brief time of the Holocene, humans became the dominant species on the planet.
- We transformed landscapes and ecologies to suit our needs.

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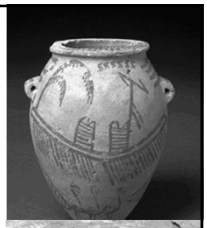
We developed or extended ingenious new technologies, including:



- Pottery
- Metals
- Food production

5

- From a common root of hunting and gathering bands, most societies have been transformed into sedentary, predominately urban, non-egalitarian states.

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Defining food production (agriculture)

- In general, agriculture refers to a reliance on domesticated plants and animals, with certain other conditions:

1. Propagation: the selective sowing of seeds and/or breeding of animals, such that genetic change happens through conscious or unconscious human selection

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Defining food production (agriculture)

- In general, agriculture refers to a reliance on domesticated plants and animals, with certain other conditions:

2. Husbandry: care of the young plants and/or animals while they are growing

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Defining food production (agriculture)

- In general, agriculture refers to a reliance on domesticated plants and animals, with certain other conditions:

3. Harvesting: collection of the food resources

9

Defining food production (agriculture)

- In general, agriculture refers to a reliance on domesticated plants and animals, with certain other conditions:

4. Storage: of selected seeds and animals to ensure successful reproduction in future seasons

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Why did people become farmers and stock-herders?

Theories on the origins of food production

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Early Perspectives

- Agriculture was seen as a radical departure for humanity.
- Indeed, some thinkers considered the origins of food production, farming, as the moment when men and women freed themselves from nature. They became **controllers** of nature.

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The Neolithic "Revolution"

- The Neolithic "Revolution" was seen to involve:
  - Controlling nature leads to control over food supply / food production.
  - Increasing food supply – a surplus – supports increased population.
  - Increased population leads to settled villages…
  - What's next? Cities, Civilizations, States & Empires.

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Farming isn't such a big shift in the relationship between men/women & nature.

- Ethnographic perspectives on hunting/gathering:
- Hunter/Gatherers have complex and sophisticated understandings of the animals they hunt and the plants they exploit.
- Similarly, H/Gs often practice complicated behaviours with respect to their food sources.
  - Concepts of stewardship and management are applicable.
  - For example, use of fire to create forage for preferred mammal prey

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Farming isn't such a big shift in the relationship between men/women & nature.

- Ethnographic perspectives on hunting/gathering:
- An easier life
  - H/Gs may have a "Zen" attitude: their wants are finite and few, their technical means unchanging but adequate (after Sahlins 1972)
  - H/Gs work less than do farmers!
  - H/Gs are healthier than were the first farmers
- What ever were the reasons then to become a farmer???

A typical hunter gatherer group does just three to four hours of work a day. The rest of their day is spent relaxing in camp, chatting to their friends and family.
wikimedia commons

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Theories

- Why become a farmer? There have been many explanations. Here we concentrate on the most reasonable.
- Ester Boserup (1965) demonstrated that different subsistence systems occur as responses to population pressure.
  - As populations increase, groups tend to choose solutions that involve intensifying production – working harder, adding more technology, more capital, etc.
  - Food production itself – i.e., farming – can be seen as just such an intensification. It amplified and focused practices already seen among some hunter/gatherers.

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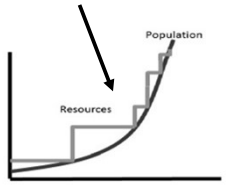
Boserup

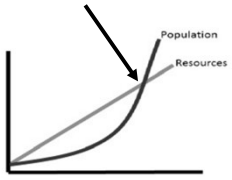
What happens when population growth hits the ceiling of carrying capacity and outstrips food production?

Malthus

Intensification



Crisis: war, famine, etc.



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Theories

- Multiple factors: ecology & demography (Binford, Flannery, Harris)
  - Interaction of demographic and climate factors
  - Marginal zones hypothesis
- Multiple factors: social dynamics (Bender, Hayden)

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Theories invoking multiple factors: ecology & demography

- Climate change after Ice Ages leads to spread of certain wild plants and animals that can be reliable sources of food.
- Hunter-gatherers find these resources attractive and alter lifestyles to exploit them.
- Population grows; so does reliance on these wild resources. Human settlement of even the marginal zones for these resources.
- Climate change again causes contraction of zones where food resources are found.
- Instead of moving away, inhabitants of marginal zones begin to plant own seeds, tame and raise animals.

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Theories invoking multiple factors: social dynamics

There is a distinction between generalized and complex H/Gs

- Complex H/Gs subsist on resources that are predictable and virtually inexhaustible. In such societies competition between individuals is not maladaptive for the group and so it occurs.
- In tribal societies, competition takes the form of generosity: gift giving and feasting.

Raven Yakutat Tlingits at a Sitka Potlatch, Dec. 9th, 1904.
https://www.sheldonmuseum.org/vignette/tlingit-potlatches/

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Theories invoking multiple factors: social dynamics

- Competitive feasting brings pressure for surplus production and the production/acquisition of delicacies and high-quality food…
- Innovation and hard work both fueled by this process.
- In this model, changes in H/G adaptations to the Holocene world then interact with social factors to push societies towards agriculture.

Artist's impression of a Wassamasaw feast
https://twitter.com/wassamasawtribe/status/1463855254890549259

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The Holocene

- The climate period after the Ice Ages.
- The last 10,000 years.

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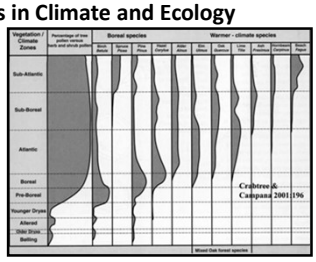
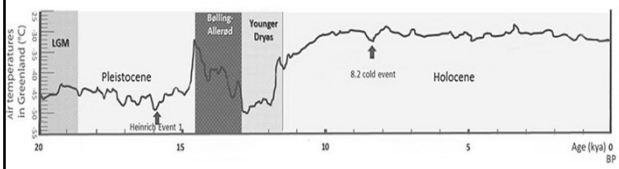
Holocene Changes in Climate and Ecology

Oxygen isotope data from ice cores indicate dramatic global warming since about 12,000 BP.

Pollen cores document local and regional vegetation changes.

These ecological impacts occurred on a global scale.





https://commons.wikimedia.org/w/index.php?curid=78989262

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Rising sea level at the end of the last Ice Age drowned significant areas of low-lying land (shown here in darker brown), especially in East and Southeast Asia and northwest Europe. One outcome was the formation of new islands: the Japanese archipelago; New Guinea; Borneo, Sumatra and Indonesia; Britain and Ireland.

The loss of productive lowlands must have had major regional impacts on human and animal populations.

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Rock art in the Sahara. During the early postglacial period, North Africa experienced a wetter climate than today and much of what is now the Sahara Desert became dry grassland, punctuated in the south by extensive lakes. Rock art of the period depicts crocodile, elephant, and other animals now restricted to the sub-Saharan region.

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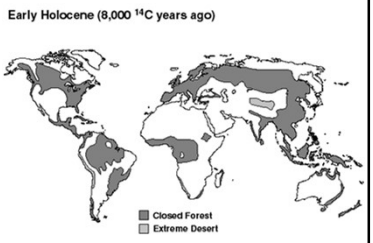
Other ecological changes

- As climate warmed, glaciers melted, sea levels rose (flooding coastal plains), and former tundra warmed enough to support forest vegetation. Some formerly temperate areas became deserts.
- Humans used more diverse landscapes than during the Pleistocene.
- Arctic grazing animals were displaced further northward or became extinct.
- Forested zones became more biologically diverse, with more browsing animals, and many fewer grazing animals.
- Much of this new biomass (trees) was inaccessible to humans who had specialized in hunting large grazing animals.
- To sustain population, new resource exploitation strategies were required.



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The Mesolithic and the Archaic:

Marked by cultural diversity and regionalization in the post-Pleistocene world

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The Mesolithic Period

- **Adjustments to the new conditions of the Holocene**
- During the early Holocene (ca 12,000 to 8,000) similar processes occurred in both E & W Hemispheres. In the Old World archaeologists call this the "Mesolithic", while in North America it is the "Archaic".
- People became intensive hunters, fishers and gatherers.
- Seasonal habitat shifts to intercept a diverse range of wild plants and animals. This seasonal shifting between habitats sharply contrasts with the Palaeolithic strategy that focused on the hunting of ungulate herds.

Hadza hunters, Tanzania, 2001.

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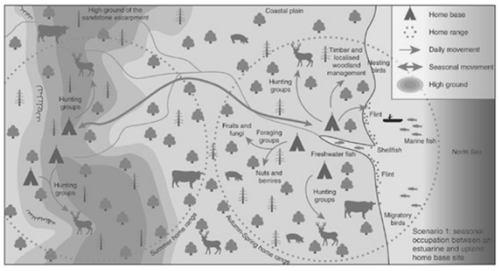

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- In addition, fish and shellfish became important. The predictability of fishing (spawns, weirs) enabled stable occupation. In turn, this led to a buildup of camp debris in middens.

A layer of shells exposed by excavation

Eroded and exposed shells on the surface of Mound A, Crystal River Archaeological State Park, Florida.

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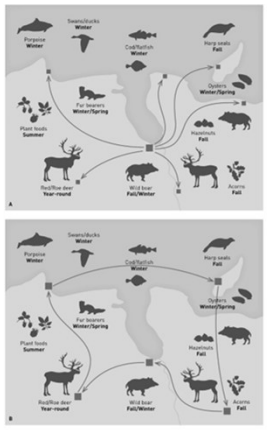
Settlement Strategies

Hunter-gatherers practice several strategies when it comes to locating their settlements. These strategies form a continuum of residential vs logistical mobility.

A. Collectors. Logistic mobility. Occupying a fixed base camp, collectors use temporary, specialized sites to extract resources, then return to base.

B. Foragers. Residential mobility. Residential camps are moved regularly through the year to exploit seasonally-available / abundant resources.



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Examples of post-Pleistocene cultural diversity

- Europe: Maglemosian
- Asia: Hoabinhian
- Africa: Iberomaurusians
- Africa: Capsian
- Australia: Australian Small Tool
- North America: Paleo-Arctic
- North America: Maritime Archaic
- North America: Mast Forest Archaic
- North American Lake Forest Archaic
- North America: Shell Mound Archaic
- North America: Desert Archaic
- South America: Vegas Complex

Each of these cultures possessed a unique adaptation

However, in general, in every part of the world where we see the origins of farming, we see it was preceded by complex hunter/gatherer strategies of broad spectrum adaptation.

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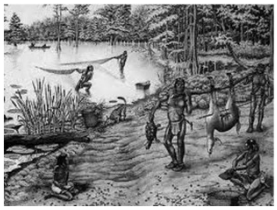
- Harvesting a broader range of available resources (plant or animal) may have been caused by the need to feed more people living in an increasingly crowded landscape.
- An ever-wider array of specialized tools was created in order to exploit this range of plants and animals.



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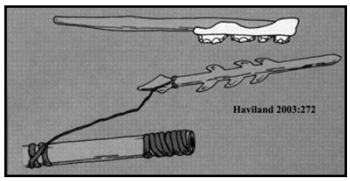

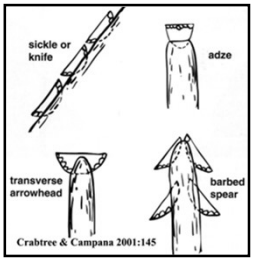

Mesolithic Technologies

- Barbed harpoons that were detachable from the spear shaft were important for hunting sea mammals and large fish.
- Also small stone microblades (microliths) were inset into wood, bone and antler handles to produce complex composite tools.
- By the end of the Palaeolithic bow and arrow technology was widely available. This offered improved range and efficiency over atlatl-launched spears.

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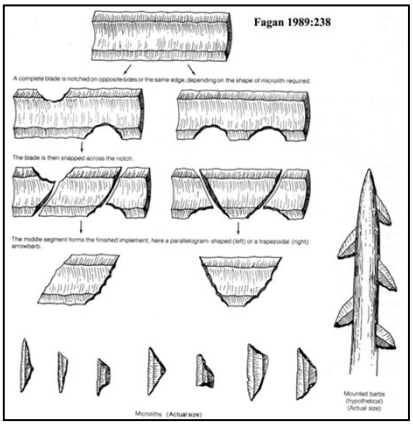

The production of microliths in the Mesolithic is a further embellishment of blade technology that developed earlier in the Upper Paleolithic.

Long slender blades are struck from a prepared core.

These blades and then carefully notched and snapped to produce angular pieces.

These bladelets are then set into special-purpose tools.

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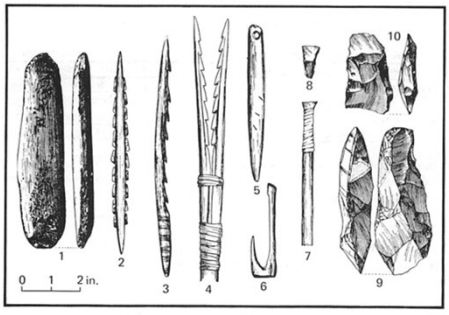

(1) limpet hammer;
(2) bone fish-spear with microlith barbs, southern Sweden;
(3) barbed point in red deer antler, c. 7500 BC, Star Carr, Yorkshire;
(4) leister prongs;
(5) net-making needle (?) and
(6) bone fish hook, Denmark;
(7) and (8) microliths or transverse arrowheads, one found in peat hafted in wood with sinew binding, Denmark;
(9) core-ax with transversely sharpened edge, Sussex;
(10) flake-axe, Denmark.

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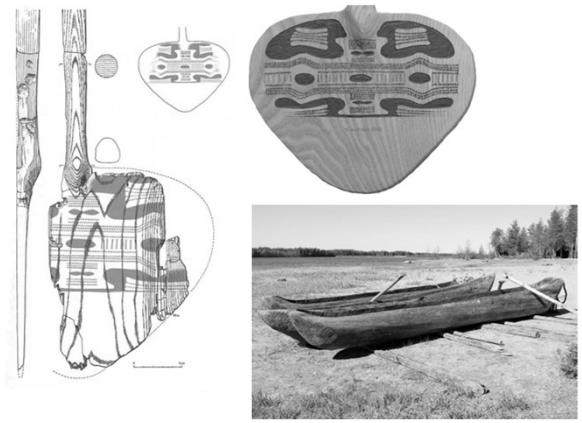

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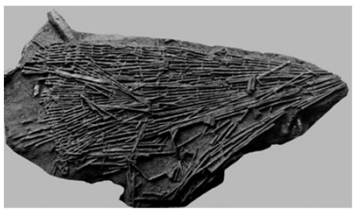

Above: Mesolithic fish trap from Ireland
Below: Reconstruction

Bone fish hook with line still attached. Tybrind Vig.

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- Across Europe, overall biomass increased, and resources diversified.
- In the early Holocene, the North Sea was a marshy lowland, home to the so-called Maglemosian culture.
- Maglemosian communities were composed of intensive hunters, fishers, and foragers.

The North Sea region at the beginning of the Holocene. Note location of Britain.

39

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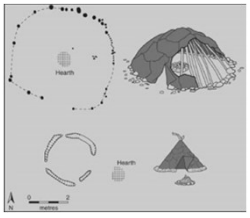
The British Mesolithic

Howick,
c 7800 BC

Mount Sandel
c 7500 BC



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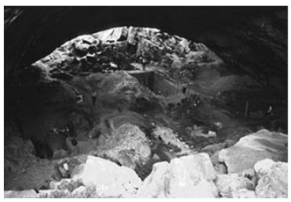
Franchthi Cave, Greece



Franchthi was occupied in the Palaeolithic, Mesolithic and Neolithic.

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Obsidian found at Franchthi came from the island of Melos.
This, plus the presence of tuna vertebrae, is evidence for Mesolithic deep-water seafaring.

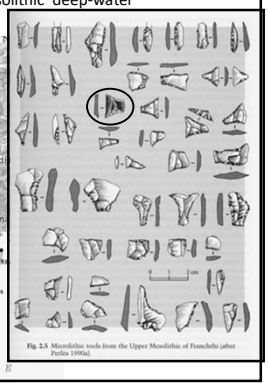
Fig. 2.5 Microlithic tools from the Upper Mesolithic of Franchthi (after Perlès 1990a).

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The south coast of Melos (above left), a field of obsidian nodules on Melos (above right), obsidian blades and microliths (right)

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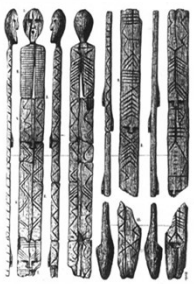
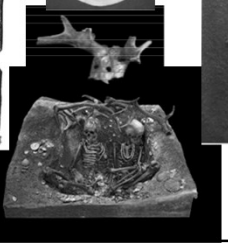
Belief Systems





Vedbaek (above right), a Mesolithic cemetery of the Ertebølle culture. The richest burial here is that of a juvenile women, who was buried together with a baby on a swan's wing

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Tungus Shaman 1785

Grave of a female in Bad Dürrenberg,

Middle Mesolithic burial interpreted as a female shaman interred in a 30-cm thick layer of red hematite, together with an at most twelve month-old child. Gifts included several flint blades, two bone needles, a antler hoe, a polished stone celt and several decorative plaques from boar tusk. In addition, there were two bones of a crane, one bone of a beaver and of red deer, 16 red deer incisors, two matching skull fragments with antlers of a roe deer, shell fragments of at least three swamp turtles and 120 fragments of freshwater mussels. A container made from a crane's bone held 31 tiny flint blades. The reconstruction of the shaman's dress as shown here is based upon the position of the finds in the grave. Renewed examination of the skeleton a few years ago revealed a deformity in the first neck vertebra of the female, which could have caused lameness and difficulties in movement. Therefore, it can be presumed that it was an alleviation for the woman to be in trance. Techniques in ecstasis are the prerequisite for a shaman's journey into the supernatural, through which they can enter the world of spirits.

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Shigir "idol"

Evidence for Early Holocene art

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Shigir "idol": Evidence for Early Holocene art

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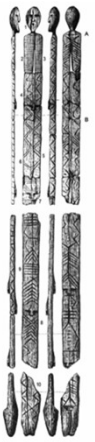
- On 24 January 1894, gold prospectors were digging in the Shigir peat bog, north of the town of Yekaterinburg in the Ural mountains, when they uncovered a strange collection of carved pieces of wood.
- A total of 10 fragments were found beside each other. When put together, a wooden idol more than 5 m high was created, one that had clearly been carved from a single, carefully smoothed plank of larch wood. Its surface was covered with zigzag lines and human faces and hands.
- This is the Shigir Idol



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- Head of the wooden Shigir sculpture and anthropomorphic face on fragment 7.

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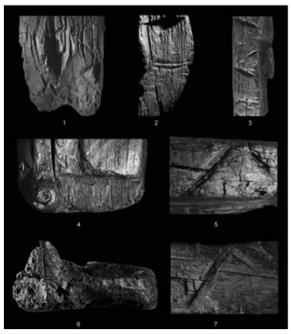

- Details of the ‘body’ of the Shigir idol:
- (1) shows part of the sculpture with traces of a broad polished adze visible on the bottom and obverse;. (2–7) are all examples of traces made by narrow chisels

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- It was once assumed hunter-gatherers were not capable of the type of symbolic thinking, nor the organisation, that underpinned the design of great monuments (such as Gobekli Tepe in Turkey).
- However, the dating of the Shigir Idol suggests this is not the case and that the period just after the last ice age was not a cultural desert as some experts have argued.
- The lack of remains of hunter-gatherer monumental art may simply be blamed on the fact that they used wood which has not survived – unlike the stone works of their farming folk successors. Only the freak conditions of the peat bog of Yekaterinburg permitted the idol’s survival.

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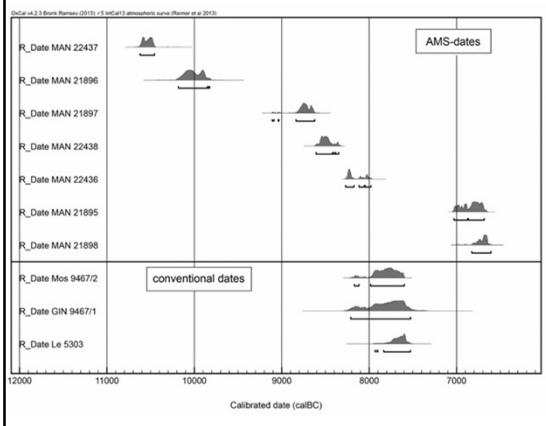

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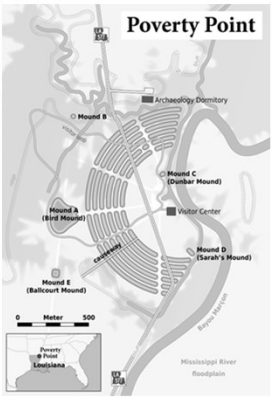

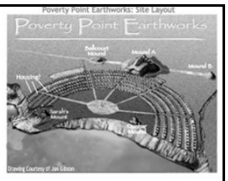

Large quantities of stone were brought to the site from great distances (70 metric tons of chert, crystal quartz, slate from sources up tp 700 km distant)

The Late Archaic period site of Poverty Point, LA, consists of massive earthworks, evident planning. There are six concentric rings, 2 m high and 20 m wide, enclosing a semi-circle 1 km in diameter.
Within the embankments we see mounds (bird-shaped?)
Domestic refuse suggests that some habitation took place, but there are no surviving dwelling structures.
What kind of social organization is reflected here?

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- The relationship between late Pleistocene / early Holocene hunter-gatherers and their environments was a very close one.
- Hunter-gatherers became skilled at manipulating aspects of that environment, aiming always to make subsistence resources more predictable, more reliable and more productive.
- The next step –logically– is *domestication*.

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Shahsevan pastoral nomads with domesticated animals in a domesticated landscape, Moghan, Iran. 2014.

http://www.zef.de/index.php?id=2228&mediaID=43&cHash=c6e6fda1794b29e082a34a18258cd2a2

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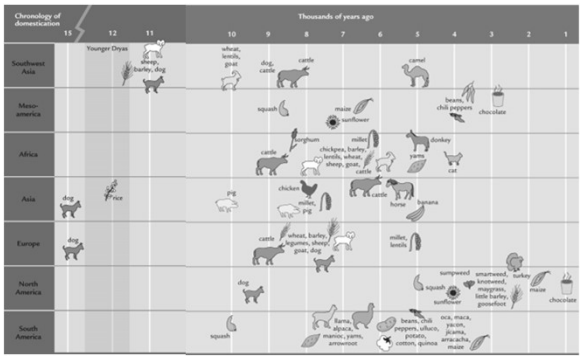
The Neolithic

The shift from food collection to food production happened in several places and at several different times, independently.



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What is the evidence of domestication?

Geography:

Plant and animal remains appear abruptly in the archaeological record at sites located in territories where the plant and animal species represented are not known to have grown or lived naturally

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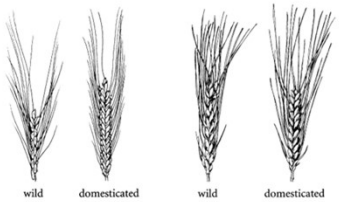
Evidence of domestication

Mean seed or animal size:

A change in the mean size of animals exploited by human beings may also be an indicator of human activity as people select for propagation plants that produce larger seeds or smaller, less dangerous members of an animal species



Two varieties of wheat (einkorn and emmer) in their wild and domesticated forms

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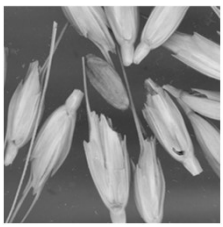
Evidence of domestication

Seed morphology:

Where the archaeological record shows the development of a predominance of nonbrittle attachments of seeds in plants harvested by an ancient people, a kind of unconscious selection may be at work



Wheat

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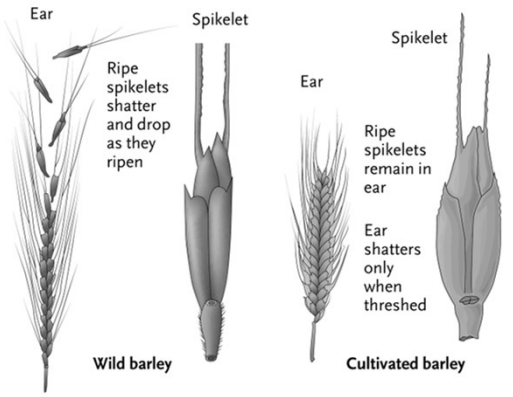

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Evidence of domestication

Osteological change:

Lightly constructed bones of otherwise wild animals found in archaeological contexts resulted from the animals having been penned by human controllers and protectors throughout their lives

← Wild
v
Domesticated →

Animal population characteristics:

An overabundance of the bones of subadult males found at an archaeological site indicates that people had a level of control over the population greater than what would be expected if they merely had been hunting free-roaming wild animals

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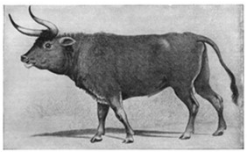
Domestication



An aurochs, now extinct, in an old engraving

Happy cow in Switzerland

Sheep in Wyoming

Camels in Saudi Arabia

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Domestication of globally-important mammals

Date (BCE)	Animal	Ancestry
20,000+	Dog	Wolf
8,000	Sheep	Asiatic mouflon sheep (W & C Asia)
8,000	Goat	Bezoar goat (W Asia)
8,000	Pig	Wild boar (Eurasia, Africa)
6,000	Cow	Aurochs (Eurasia – extinct)
4,000	Horse	Wild horse (S Russia – extinct)

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Domestication of regionally-important mammals

Date BCE	Animal	Ancestry
4,000	Donkey	African wild ass (N Africa)
4,000	Water Buffalo	Wild water buffalo (SE Asia)
3,500	Llama/Alpaca	Guanaco (Andes)
2,500	Arabian Camel	Wild camel (Arabia – extinct)
2,500	Bactrian Camel	Wild camel (C Asia – extinct)
?	Reindeer	Wild reindeer (N Eurasia)
?	Yak	Wild yak (Himalayas/Tibet)
?	Bali Cattle	Banteng (aurochs rel.) (SE Asia)
?	Mithan	Gaur (aurochs rel.) (S Asia)

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Factors involved in the domestication of mammals

- Diet
- Growth rate
- Problems of captive breeding
- Nasty disposition
- Social structure
  - Herds
  - Dominance hierarchy
  - Tolerance of overlapping home ranges.

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