

Ethnobotany

The Origins of Agriculture



Homework

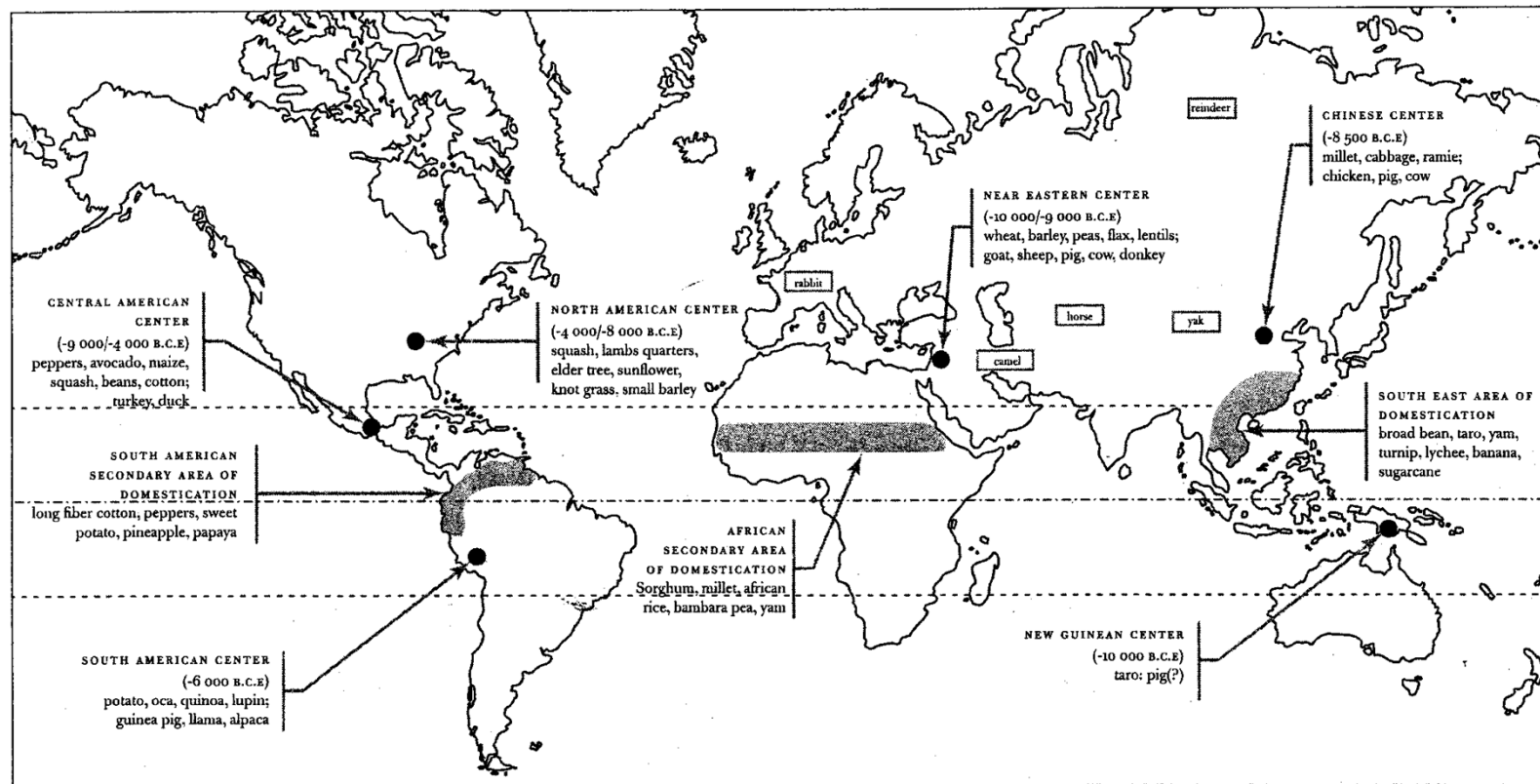


Figure 2.1 (continued) Centers of Origin of the Neolithic Agricultural Revolution and Secondary Areas of Domestication

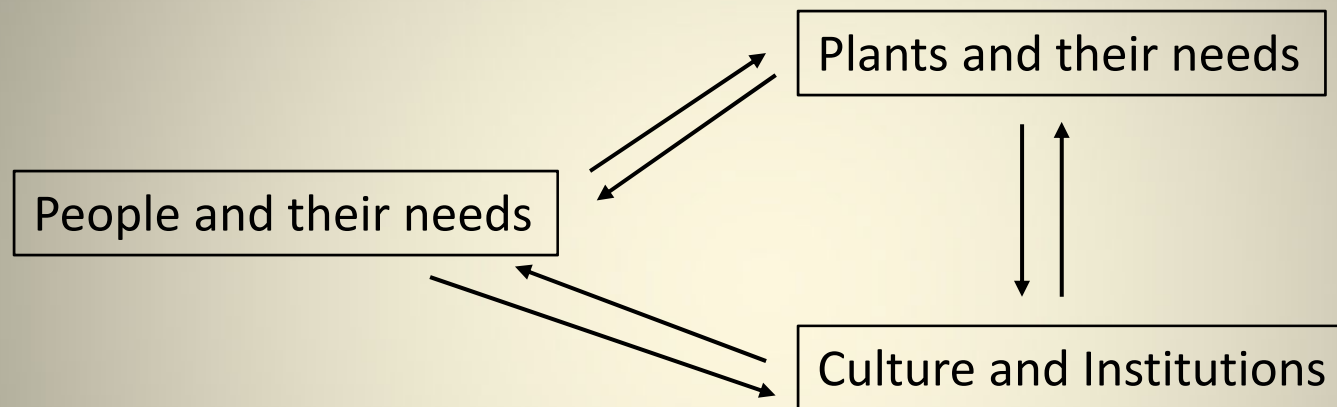


Homework

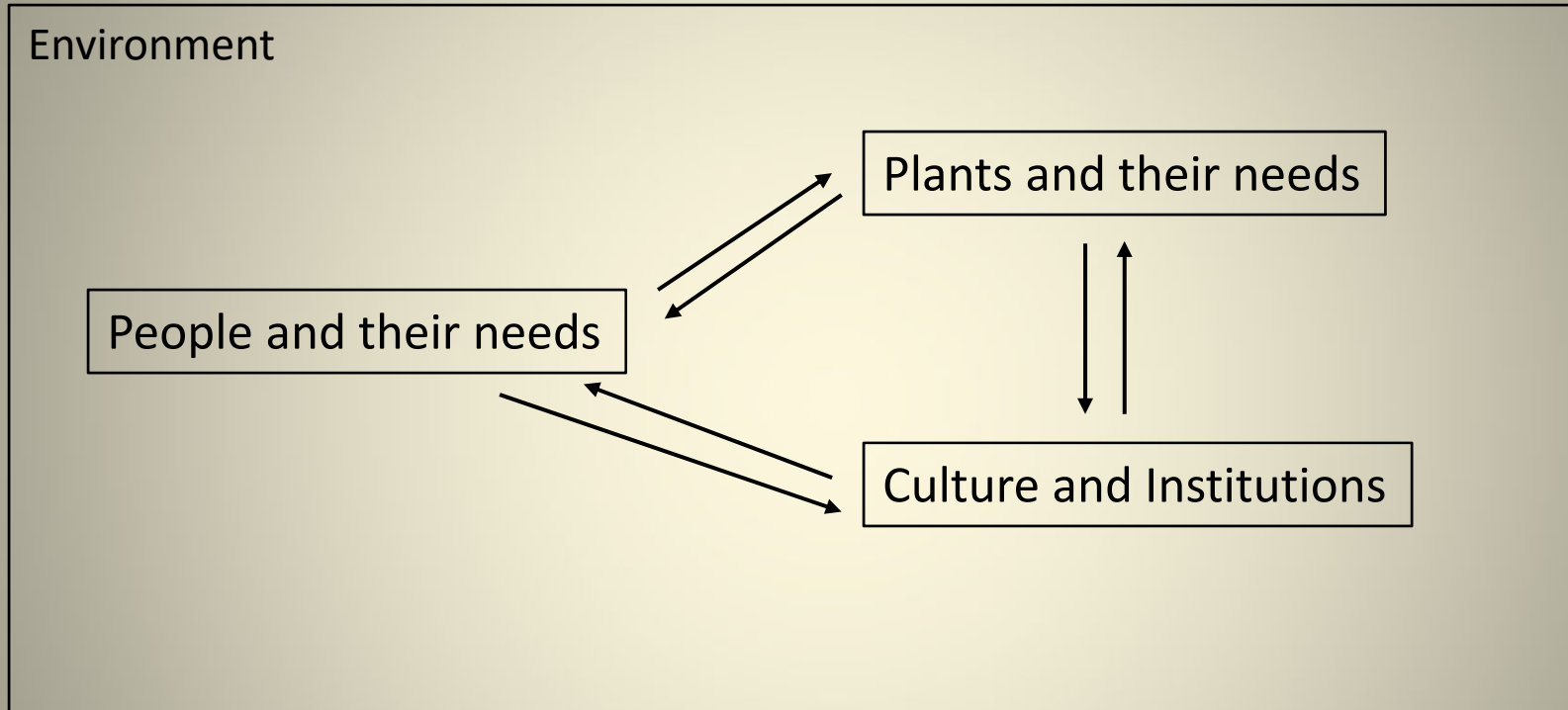
Your answers



Homework



Homework



Stop - Think



The Fertile Crescent.



Stop – Think

If you were thinking about ethnobotany in the Fertile Crescent, what would you study?



Stop – Think

If you were thinking about ethnobotany in the Fertile Crescent, what would you study?

How would you study it?



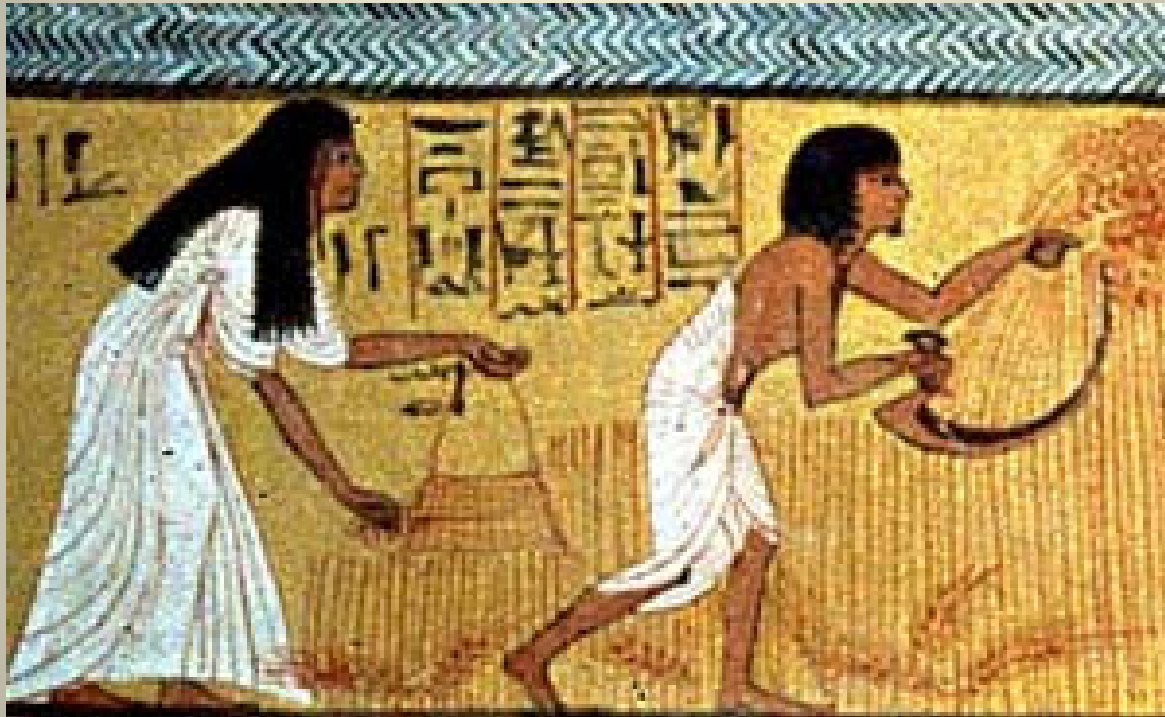
Egypt 1.



<https://www.thinglink.com/scene/381452199487602688>



Egypt 2.



Egypt 3.



Egypt 4.



<https://www.pinterest.com/pin/347762402447239213/>



Mesopotamia 1.



Photo credit: Weebly.com, Photo credit: Weebly.com



Mesopotamia 2.



<https://www.sutori.com/story/mesopotamia-section-d-ea24bd3f-8a5e-4591-ab6c-b63b44ee44cd>



The Fertile Crescent. (again).



Levant 1.



<https://www.sciencedaily.com/releases/2014/06/140606091425.htm>



Levant 2.



<http://armchairprehistory.com/2012/05/18/bronze-age-egypt-or-the-levant-which-was-the-greater-economic-power/>



The Younger Dryas and beyond.

~20,000 BP end of last glacial period, warming.



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~11,500 BP abrupt end to Younger Dryas

10°C temperature increase in a decade in some places



The Younger Dryas (tangent).

THE ANTHROPOGENIC GREENHOUSE ERA BEGAN THOUSANDS OF YEARS AGO 263

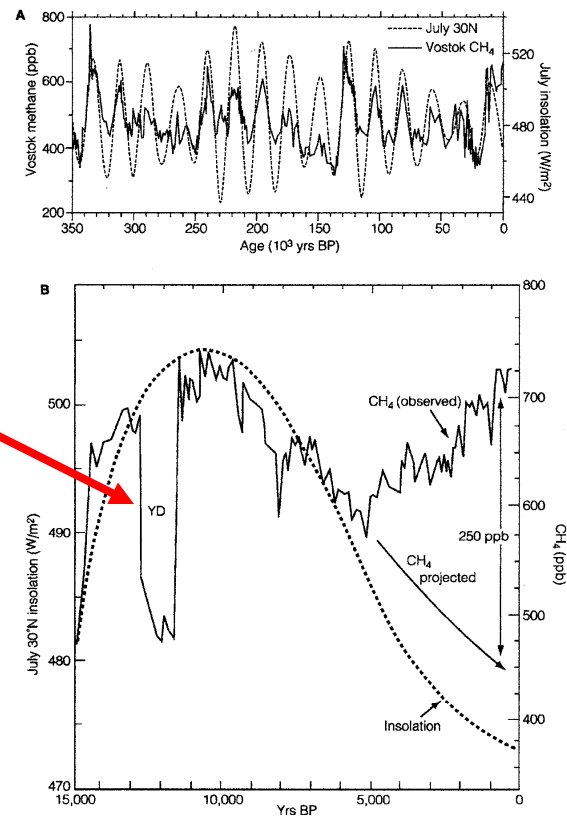
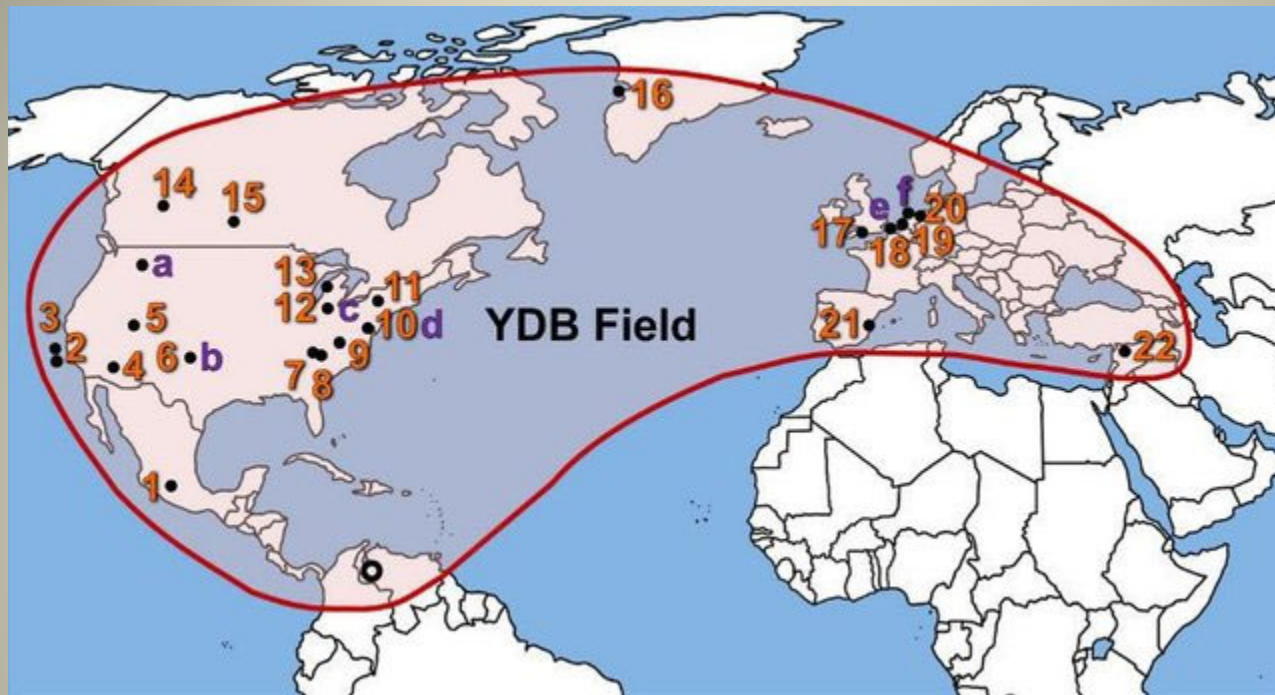


Figure 1. Comparison of July insolation values from Berger and Loutre (1996) with ice-core concentrations of atmospheric CH₄. (a) Long-term Vostok CH₄ record of Petit et al. (1999), using time scale of Ruddiman and Raymo (2003). (b) GRIP CH₄ record from Blunier et al. (1995), dated by counting annual layers. Early Holocene CH₄ trend projected in late Holocene to values reached during previous early-interglacial CH₄ minima.



The Younger Dryas (tangent).

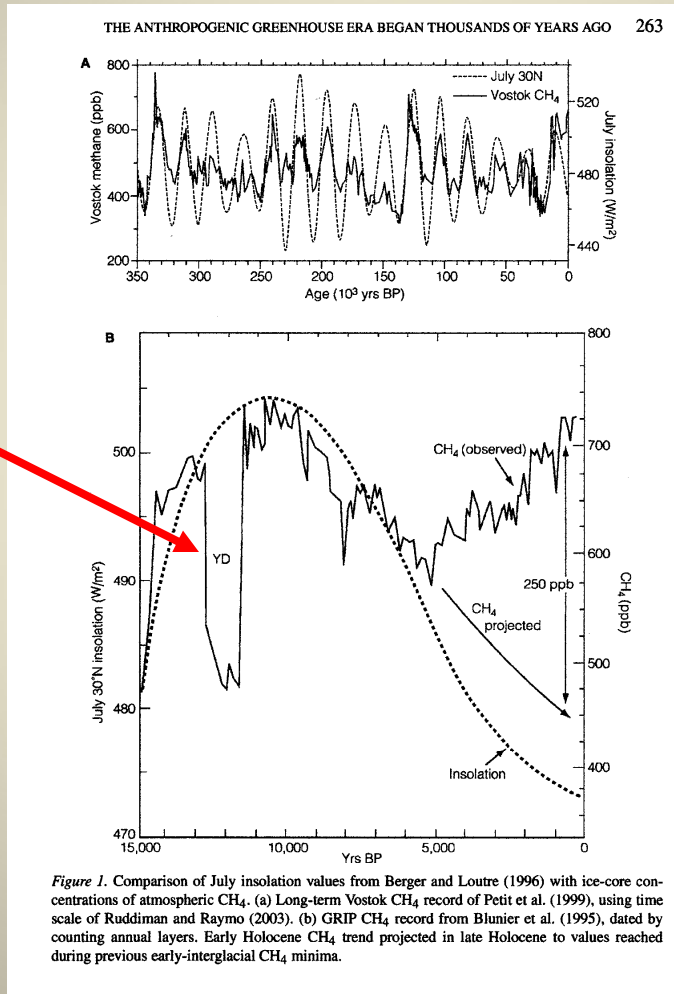


Northern currents in the Atlantic weakened considerably. Warm water did not move north.

Impact area.



The Younger Dryas (tangent).



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The why is still not resolved by geologists.



The Younger Dryas (tangent).

THE ANTHROPOGENIC GREENHOUSE ERA BEGAN THOUSANDS OF YEARS AGO 263

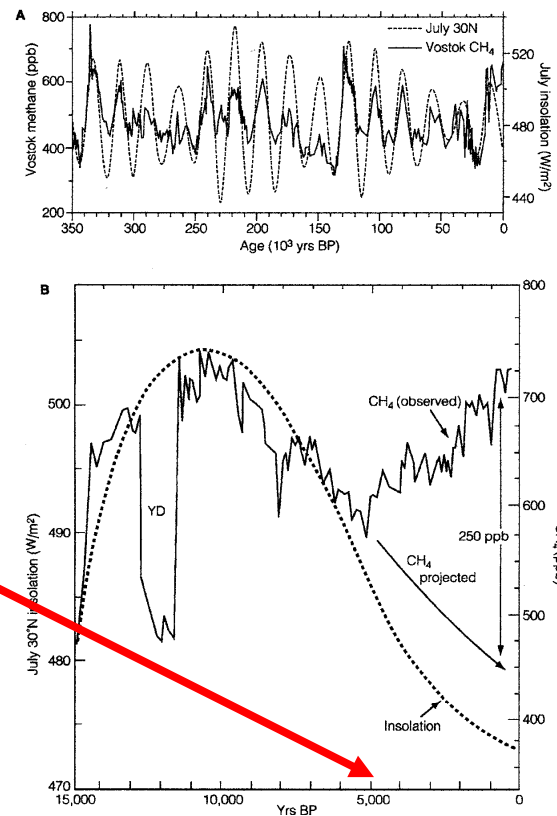


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Notice that the increase starts 5,000 years ago



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10°C temperature increase in a decade in some places

Hence the start of farming.



The Younger Dryas (tangent).

THE ANTHROPOGENIC GREENHOUSE ERA BEGAN THOUSANDS OF YEARS AGO 263

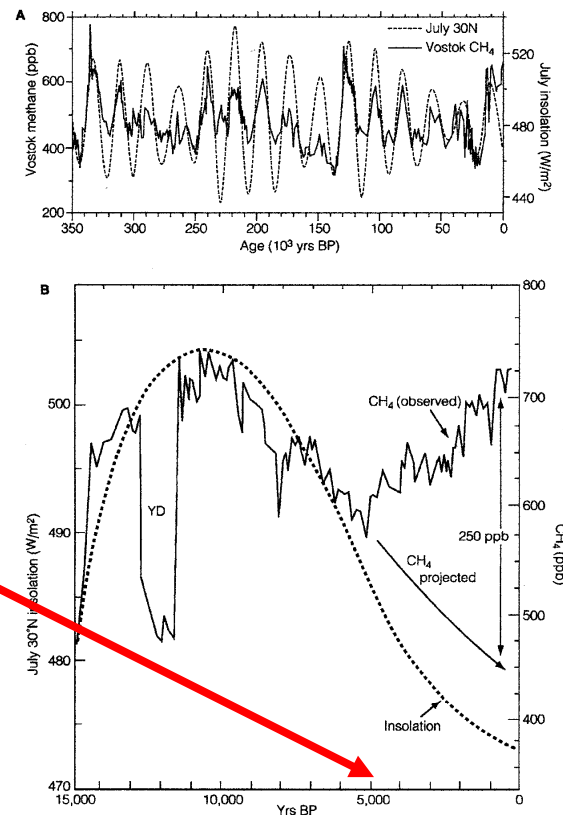


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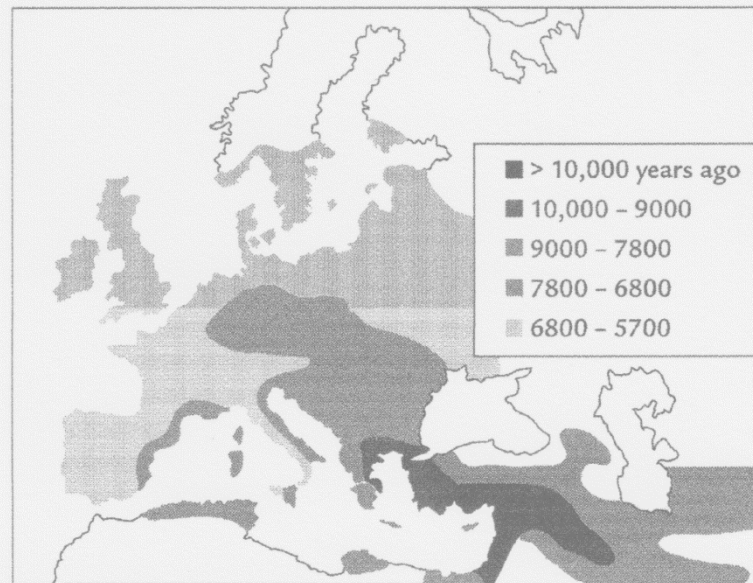


Figure 5. Spread of agriculture out of the eastern Mediterranean fertile crescent across Europe, based on the first appearance of a distinctive package of domesticated grains (after Zohary and Hopf, 1993).

Notice the large starts about 7,000 to 10,000 years ago. The farming did not cover the entire area, just prime locations.



The Younger Dryas (tangent).

THE ANTHROPOGENIC GREENHOUSE ERA BEGAN THOUSANDS OF YEARS AGO 273

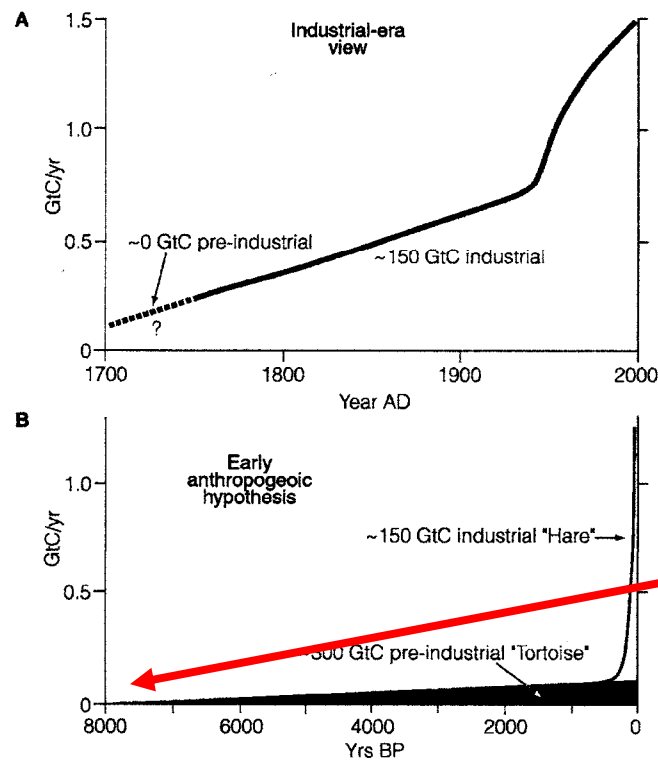


Figure 4. (a) Industrial-era perspective suggests that most land clearance occurred in the last 200 years. (b) Early-anthropogenic perspective suggests that much slower but longer-operating pre-industrial land clearance cumulatively exceeded clearance during the industrial era.

Two time frames.



What the experts see.



An upward trend?





Rachis – the entire head of wheat.

glumes – bracts around the seed, (also called lemmas)

hull – all of the glumes together

awn - end appendage on a lemma- emmer uses its awns to propel into the soil.



Einkorn – the earliest “wheat”

It is a **hulled** grain.

The grain retains the hull after harvest.
Hulls make processing harder, the hulls can
be singed in a fire to make it easier to
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Hulls protect the grain.

“Oversinge” the grain and you preserve it for archaeologists.



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It was originally free-threshing, but some mutants retained the grain, which is good for the people who want to harvest it.



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Free-threshing – grain easily separates from the glumes.

People retained seed from the plants that were not free-threshing and use them when they planted fields.



Emmer – a natural cross with Einkorn



<https://www.grownyc.org/blog/move-over-quinoa>



Emmer – a natural cross with Einkorn

Also hulled, not free-threshing.

(The grains don't break free easily from the rachis and they remain in the hull.)



Free threshing wheats

- including modern durum wheat**

Bred (but not the best for bread) from Emmer, but they are free-threshing and the grain falls out of the hull easily.



Spelt

Early free-threshing wheats crossed with wild grass to get Spelt.

A much more recent hulled and not free-threshing grain.

Better for breads with a higher gluten (protein) content.



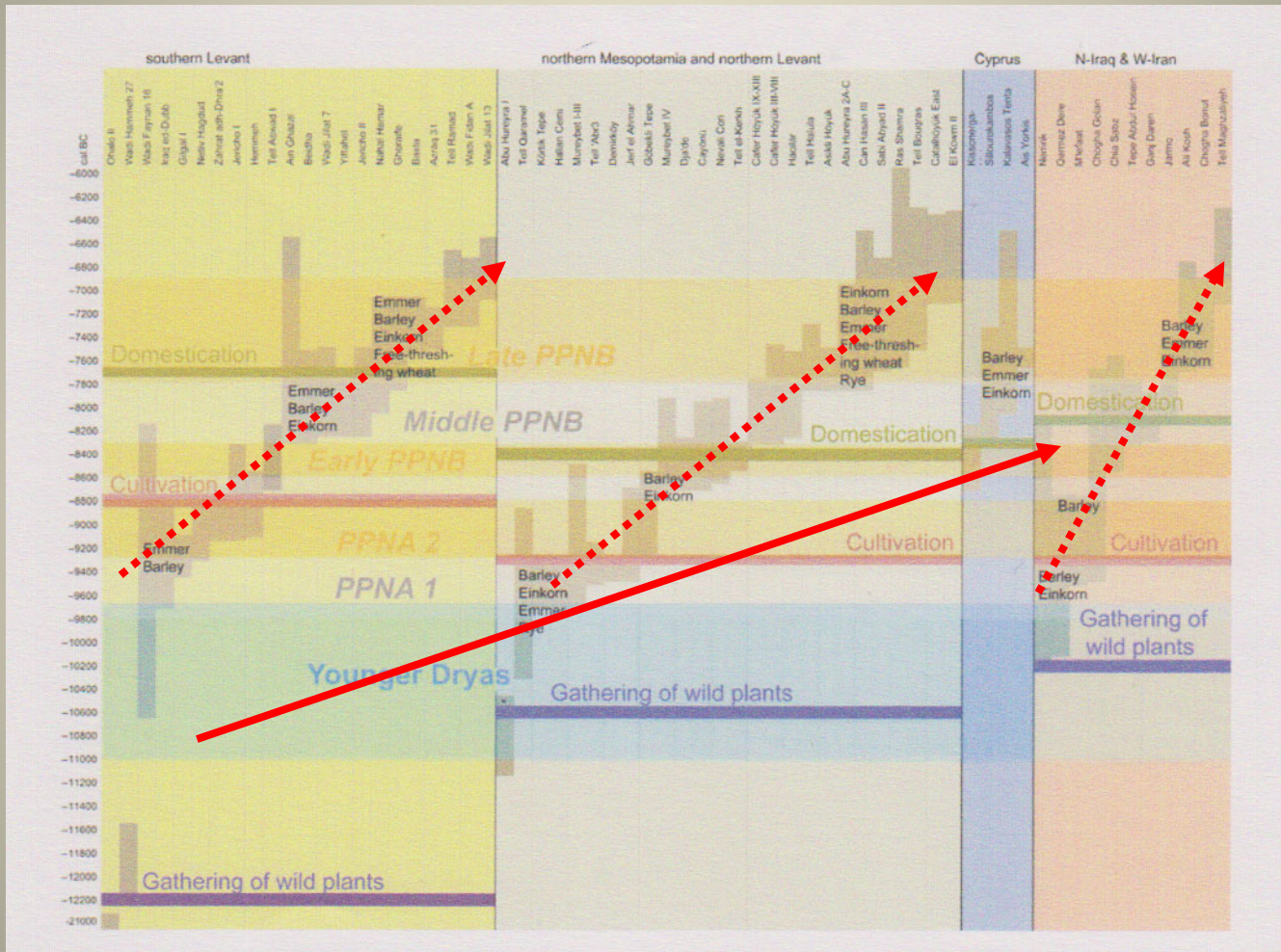
Spelt to common wheat

Hulled and free-threshing grain.

Even better for breads with an even higher gluten content.



What the experts see.



Movement across space and time



What the **genetics** experts see.



Two distinct human populations



Egypt

What I see. (notice "expert" gone)

Europe

Asia



Speculation !



Just a quick side
note:

locations in time

early settlement
of the Levant

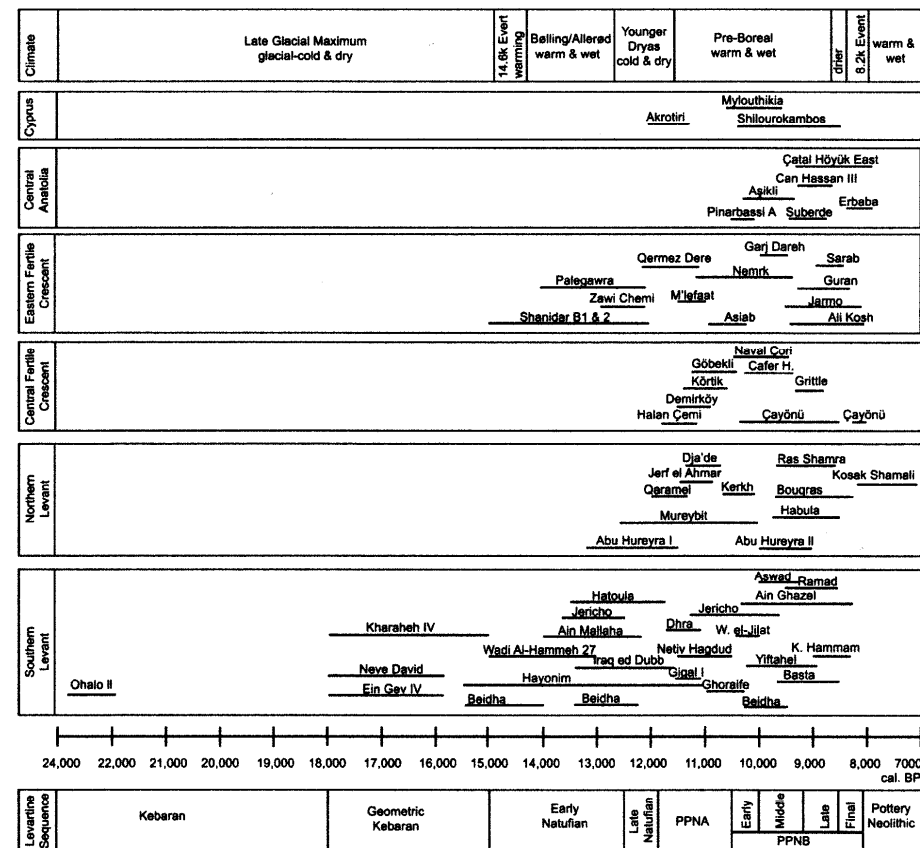


Figure 2. Time line of Near Eastern sites, Levantine chronology, and climatic conditions compiled using information from Aurenche et al. (2001); Bar-Yosef and Meadow (1995); Byrd (2005); Kuijt and Goring-Morris (2002); Nesbitt (2002); and Willcox (2005). PPNA, PPNB = Pre-Pottery Neolithic A and B, respectively.



Just a quick side
note:

locations in space

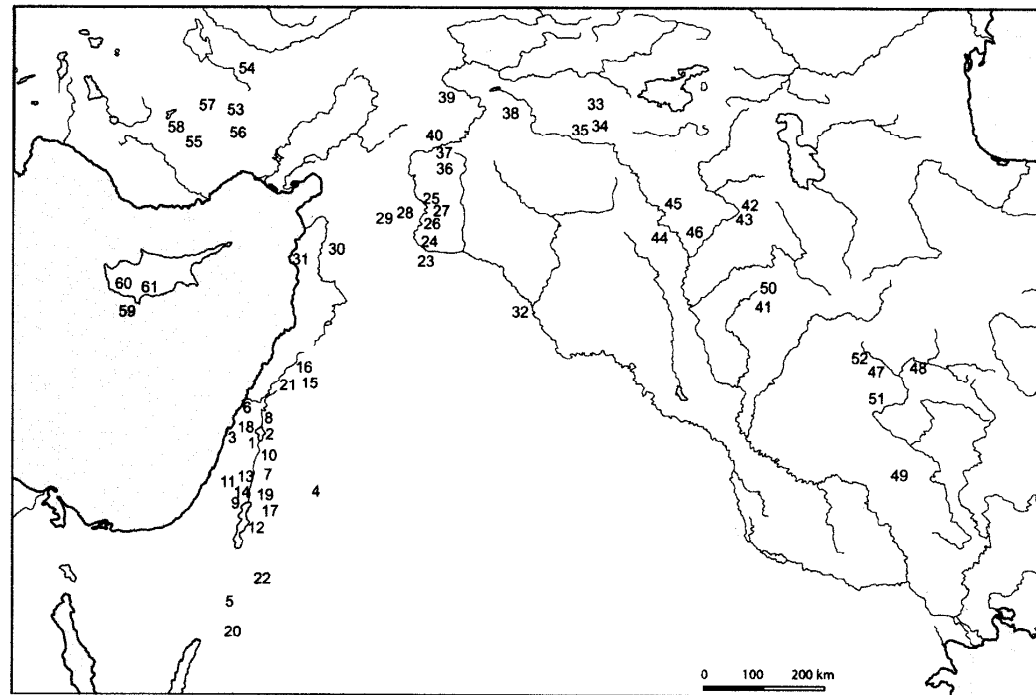
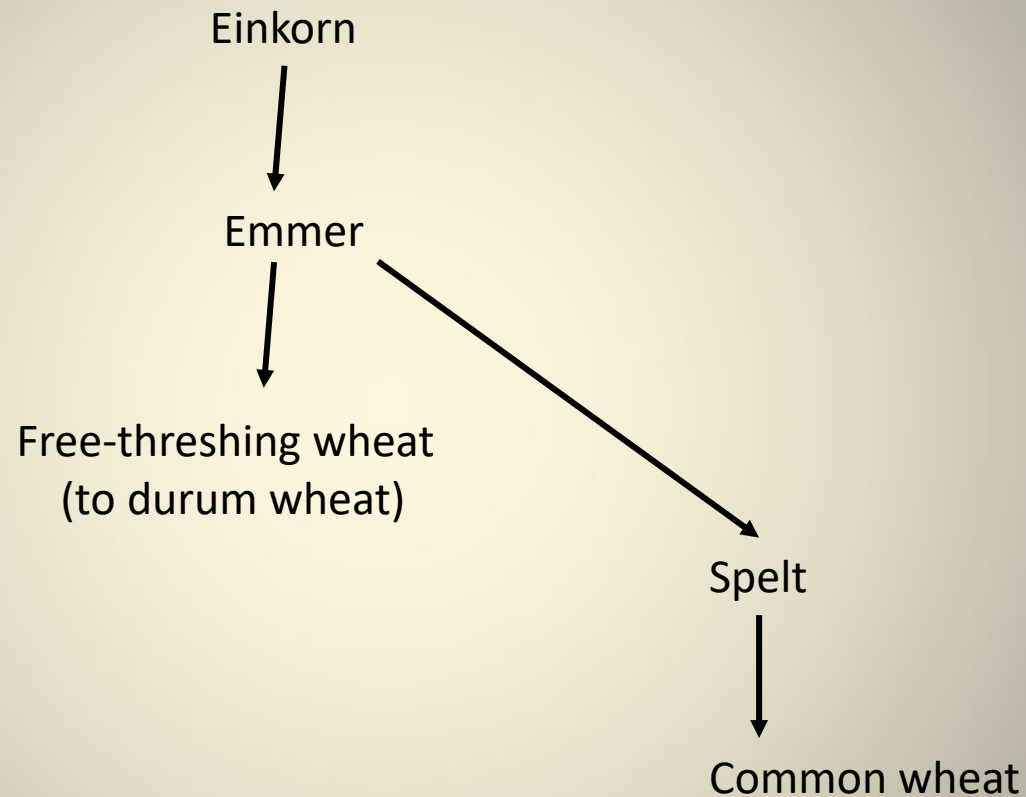


Figure 1. Distribution of main Late Epipaleolithic and Neolithic sites in the Near East. 1, Ohalo II; 2, Ein Gev IV; 3, Neve David; 4, Kharateh IV; 5, Beidha; 6, Hayonim; 7, Wadi al-Hammeh; 8, Ain Mallaha; 9, Jericho; 10, Iraq ed Dubb; 11, Hatoula; 12, Dhra; 13, Netiv Hagdud; 14, Gial I; 15, Aswad; 16, Ghorraife; 17, Wadi el-Jilat; 18, Yiftah'el; 19, Ain Ghazal; 20, Basta; 21, Ramad; 22, Khirbet Hammam; 23, Abu Hureyra; 24, Mureybit; 25, Dja'de; 26, Jerf el Ahmar; 27, Kosak Shamali; 28, Halula; 29, Qaramel; 30, Tel el-Kerkh; 31, Ras Shamra; 32, Bouqras; 33, Hallan Çemi; 34, Demirköy; 35, Körtik; 36, Göbekli Tepe; 37, Nevali Çori; 38, Çayönü; 39, Cafer Höyük; 40, Grittle; 41, Palegawra; 42, Shanidar cave; 43, Zawi Chemi Shanidar; 44, Qermez Dere; 45, Nemrik; 46, M'lefaat; 47, Asiab; 48, Ganj Dareh; 49, Ali Kosh; 50, Jarmo; 51, Guran; 52, Sarab; 53, Pinarbassi A; 54, Aşikli Höyük; 55, Suberde; 56, Can Hasan III; 57, Çatal Höyük; 58, Erbaba; 59, Aetokremnos; 60, Mylouthikia; 61, Shillourokambos.



What the experts see simplified.



Movement across time



Stop and think and write.

Why would people do this?



A tangent: Göbekli Tepe



11,000 to 9,500 years ago
Pre-Pottery Neolithic A to B.

<http://blog.world-mysteries.com/mystic-places/gobekli-tepe-garden-of-eden/>



A tangent: Göbekli Tepe



SE Turkey, the “top” of the Fertile Crescent.
There are other smaller but similar settlements,
PPN with T-shaped pillars and round structures.

<http://blog.world-mysteries.com/mystic-places/gobekli-tepe-garden-of-edén/>



A tangent: Göbekli Tepe

Other stone sites:

Gobekli Tepe 7250 BC

Barnenez (France) 4800 BC

Stone Temples from Malta 3700 BC

Sechin Bajo (first stone building in Peru) 3500 BC

Baalbek stones (Lebanon) 3000 BC

Pyramid of Djoser (first Egyptian pyramid) 2700 BC

Caral-Supe (Peru) 2600 BC

Stonehenge in England 2600 BC

Great Pyramid of Giza 2500 BC

Knossos in Greece 2000 BC



A tangent: Göbekli Tepe



Pillars as human, male – both people and animals.

<http://blog.world-mysteries.com/mystic-places/gobekli-tepe-garden-of-eden/>



A tangent: Göbekli Tepe



9 hectares, no residences, ceremonial. Earliest construction is pre-agricultural.

https://www.researchgate.net/publication/317433676_Gobekli_Tepe_a_6_th_millennium_BC_monument/figures?lo=1



A tangent: Göbekli Tepe vs. Nevali Çori



Dancing Turtle Bowl at Nevali Çori. Limestone. No metals. Also clay figurines. Residential. Oldest domestic einkorn. Now flooded. Earliest settlement postdates Göbekli Tepe: earliest is PPN B.



A tangent: Göbekli Tepe



Ladder for scale.

https://www.researchgate.net/publication/317433676_Gobekli_Tepe_a_6_th_millennium_BC_monument/figures?lo=1



A tangent: Göbekli Tepe



Hunters-gatherers
Wild einkorn nearby. Mortars / Pestles.
Why? How?



A tangent: Göbekli Tepe



People gathered from a large area to feast here. (Similar icons elsewhere)
Some, but not conclusive, evidence of **beer** brewing. Bones.



Thyme to pull this together.



Thymus vulgaris

Thyme as a tea for stress reduction.

High in potassium and antioxidants.



Thyme to pull this together.

Perspective Taking

Awareness of diverse perspectives and open-mindedness

Cultural Diversity

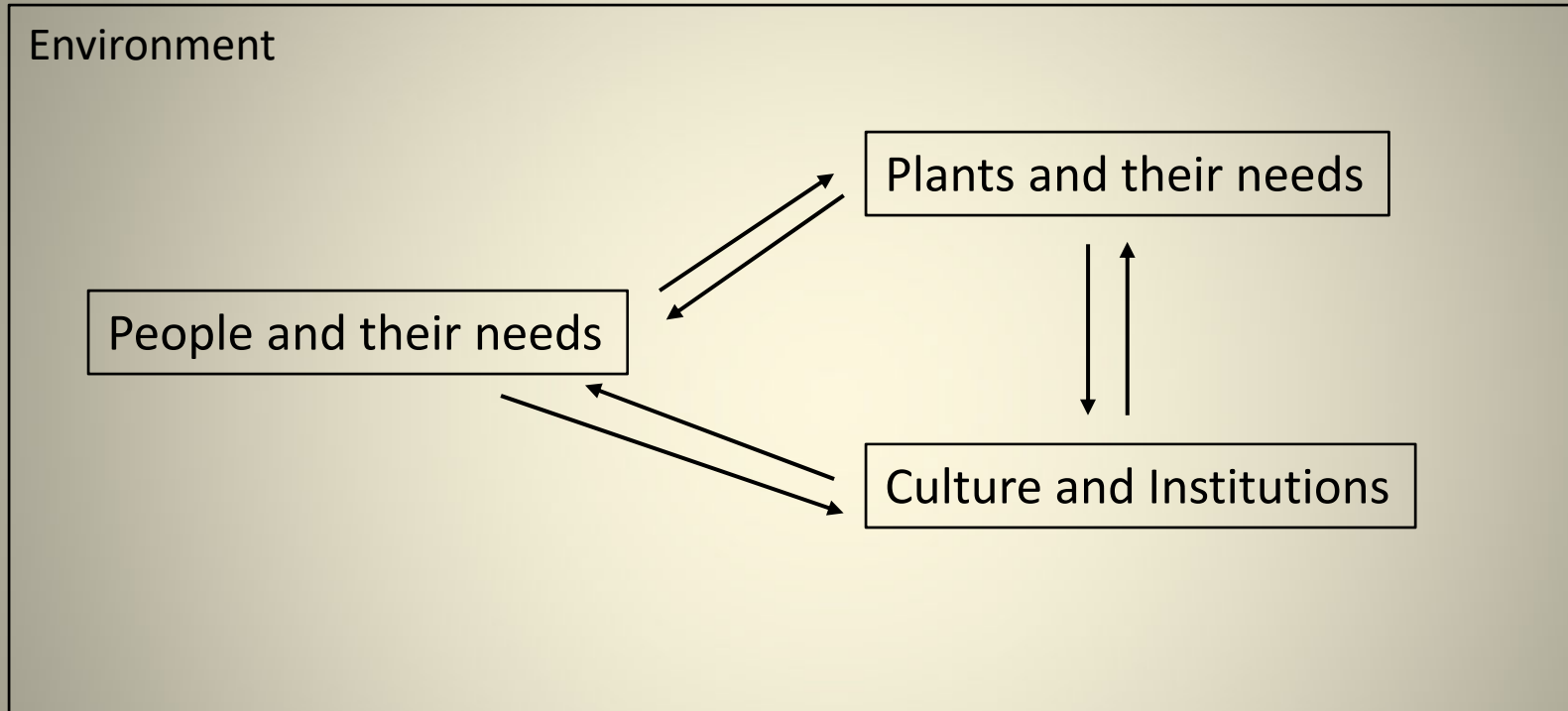
Knowledge of cultural diversity across a spectrum of difference

Understanding Global Systems

Ability to examine global systems.



Thyme to pull this together.



Another tangent – the modern world.



Einkorn flour
Whole Foods
Amazon

Also, spelt and emmer

Were grown in remote places,
now grown for specialty
markets in the U.S. and Europe.



On to the new world in the next topic.

