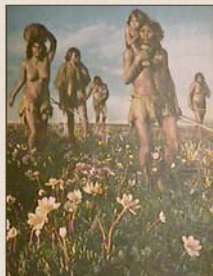


ENVIR 202: Lesson No. 3



Human History:
Early
Development

January 10, 2005

Chuck Treser
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Lesson Overview

- ❖ Origins of the Species
- ❖ Basic Requirements
- ❖ Population Growth
 - > Hunting & Gathering
 - > Agriculture

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In the beginning . . .



ENVIR 202: Lesson 3 Courtesy: NASA 3

Life ...



Requirements for Survival

- Food
- Water
- Air
- Habitat

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Human Evolution

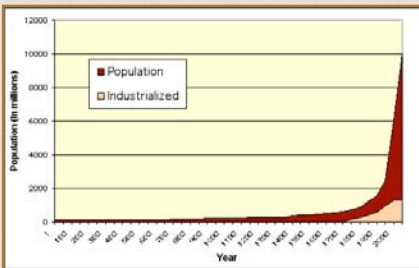


Human requirements for Survival

- Air
- Food
- Water
- Habitat (*Shelter ?*)

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World Population Trend



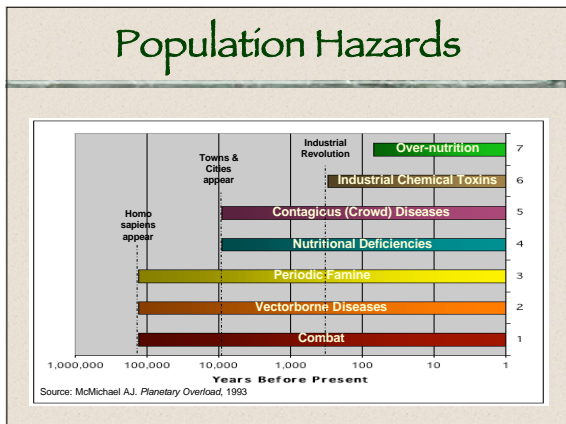
Population (in millions)

Year

Legend: Population (red line), Industrialized (orange line)

Year	Population (millions)	Industrialized (millions)
1000	~300	0
1500	~400	0
1800	~600	0
1900	~1,500	~100
2000	~6,000	~1,500

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Hunting & Gathering

- ❖ Subsistence
- ❖ Hunting & gathering lifestyle provides
 - > Limited diet
 - > Small bands
 - > Limited range --
 - But the range could change due to environmental or other pressures

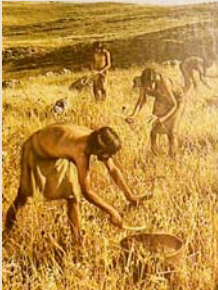
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Animal Husbandry

- ❖ Domestication of valuable species
- ❖ Close relationship between humans and their animals
- ❖ Food preparation and storage becomes an issue

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Early Agriculture



- ❖ Supported larger populations ??
- ❖ Vulnerability of food supplies
- ❖ Water supplies
- ❖ Sewage disposal
- ❖ Solid waste disposal

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Cooperative Labor



- ❖ An assured food supply leads to:
 - Larger populations possible
 - Specialization
 - Organization of society
 - In turn leads to . . .

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Development of Cities



- ❖ New Problems with
 - Food Supplies
 - Water Supplies
 - Wastewater treatment/disposal
 - Garbage disposal

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Trade



- ❖ Links previously unlinked peoples
- ❖ Leads to Trade Routes
 - > Roads
 - > River and Ocean travel
- ❖ Speeds and Facilitates spread of pathogens

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War



- ❖ Large concentrations of men
- ❖ Tends to follow Trade Routes
 - > Roads
 - > River and Ocean travel
- ❖ Speeds and Facilitates spread of pathogens

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Völkerwanderungen



- ❖ Movement of large people groups
- ❖ Europe from the collapse of the Roman Empire to the Middle Ages
- ❖ Contact with previously unknown
 - > Peoples, and
 - > Their pathogens

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Industrialization



- ❖ Machines save "labor"
- ❖ Machines save money
- ❖ Machines improve consistency and quality
- ❖ Machines free humans to engage in more rewarding activities

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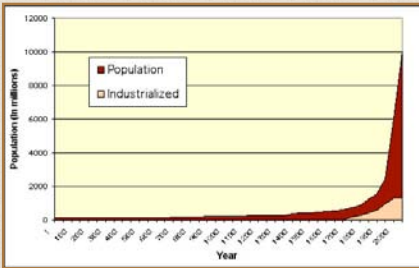
Urbanization



- ❖ Concentrates People
- ❖ Public Works
 - > More people = More projects
 - > Seasonal migration of workers
- ❖ Facilitates spread of pathogens

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World Population



Population (in billions)

Year

Legend: Population (red line), Industrialized (shaded area)

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Stages of Human Development

- ❖ Four Stages of Human Development (19th Century Ideas):
 1. A "savage" state in which all hunter-gatherers
 2. A herdsman or nomad stage
 3. A farming stage
 4. "Civilization"

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19

Origins of Agriculture

"Through agriculture, we deliberately restructure nature to create artificial ecosystems that increase the environment's carrying capacity for the human species."

- McMichael (p. 204)

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Origins of Agriculture

- ❖ But why?
- ❖ Profusion of models on the origins of agriculture

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21

Hypotheses (20th Century)

❖ Why did agriculture and domestication start (~10,000 YBP)?

- > Cultural invention
 - agricultural life inherently superior (<work, >reliable, >productive)
- > Environmental change
 - correlated with end of the Pleistocene
- > Population pressure
 - population pressure forced development of agriculture

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Hypotheses (Continued)

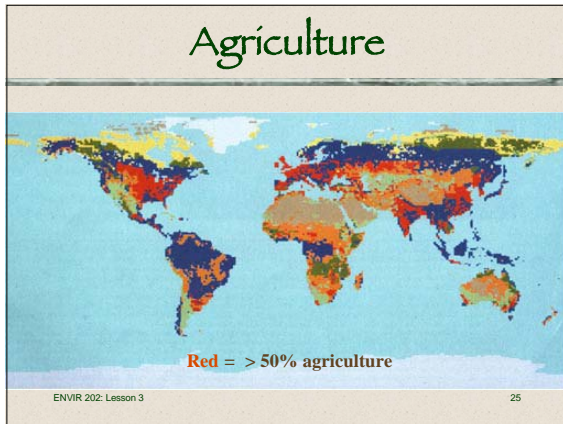
- > Coevolution
 - our use causes evolution of traits that increase their dispersal; a byproduct is increased yield
- > "No-model model"
 - emphasizes individuality of agricultural development in different regions
- > Garbage Dump

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Pre-Agriculture

Red = > 50% agriculture

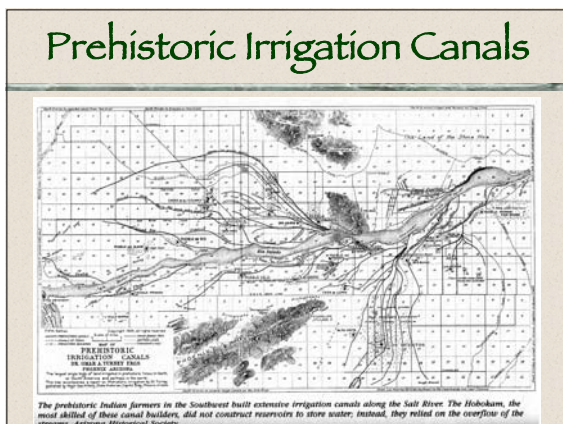
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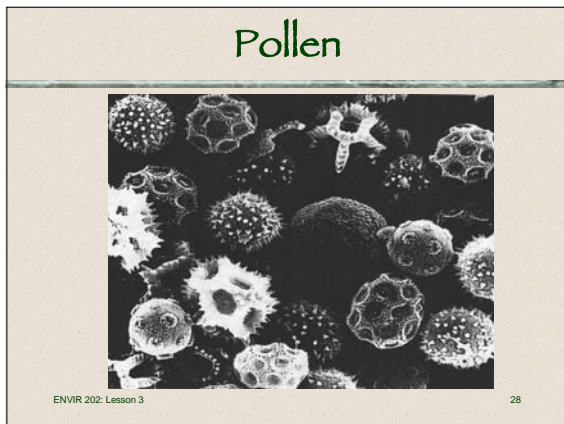


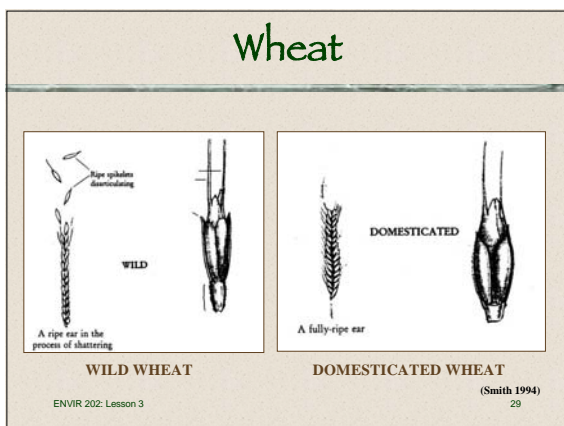
Early Agriculture

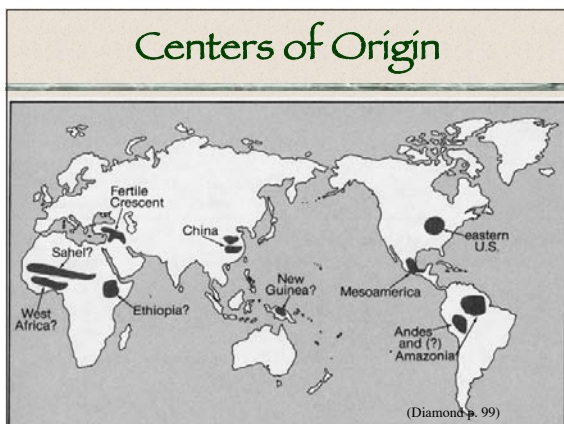
- ❖ How can we identify early agriculture?
 - Archaeological sites
 - Map distribution of wild ancestors
 - Map sequential geographic appearances

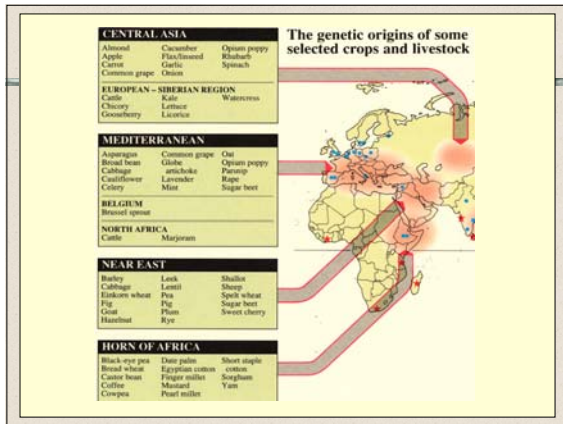
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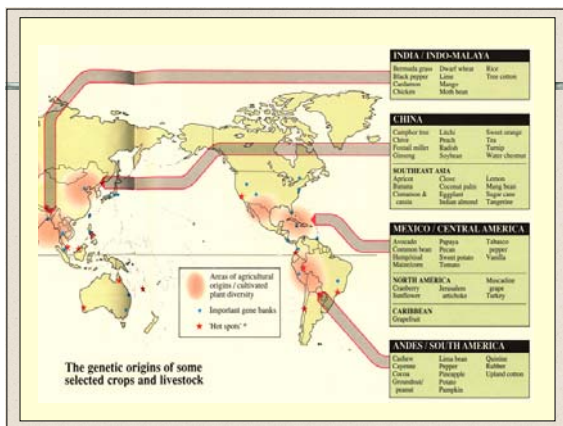


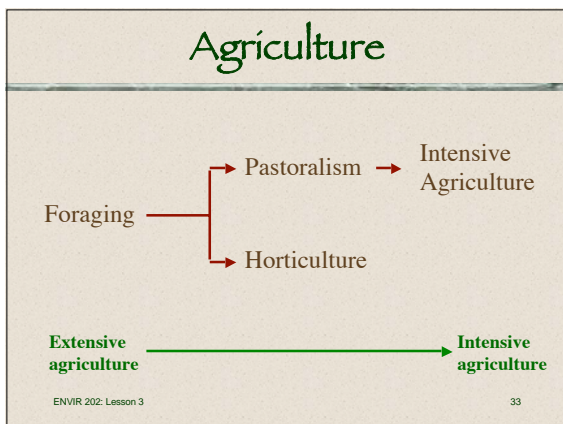








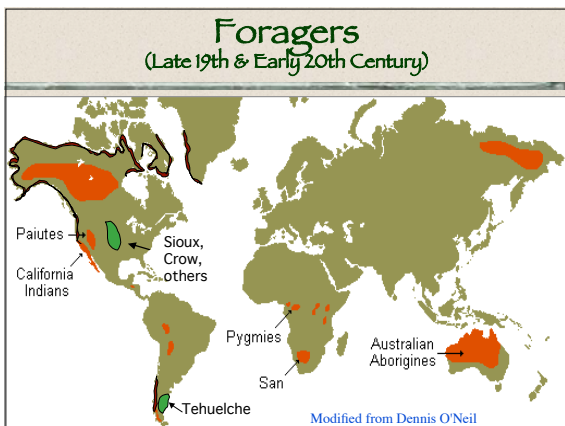




Subsistence Patterns

- ❖ Foraging
- ❖ Pastoralism
- ❖ Shifting Farming ("slash and burn")
- ❖ Traditional Farming
- ❖ Modern Farming

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Agriculture

"If agriculture provides neither better diet, nor greater dietary reliability, nor greater ease, but conversely appears to provide a poorer diet, less reliably, with greater labor costs, why does anyone become a farmer?"

- Cohen 1977: 141

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Values of crops and livestock

- ❖ More calories
 - > more people
 - 1 acre farmland feeds 10-100x more than hunter-gatherer
- ❖ Domestic animals
 - > Meat, milk, bone, fiber, fertilizer, work, warmth, transportation and disease!
- ❖ Plants
 - > Food, fiber, containers

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Extensive agriculture

❖ Typical features:

- Productivity (yield/area) LOW
- Fallow LONG (10-40 yrs). Requires large amt. land /capita
- Efficiency (yield/labor time) HIGH
- Population density LOW
- Technology SIMPLE
- Fertilizer LITTLE
- Land tenure COMMUNAL
- Economic system SUBSISTENCE
- Sociopolitical complexity gen. LOW

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Intensification

❖ Prehistoric

- Identification difficult
 - Find by aerial photography, radar scanning
 - Ancient field systems and settlements rare
 - What survives in landscape? Marginal lands

❖ Later examples

- Native North America (canals, wild rice)
- Africa (flood systems of W. Africa)
- Mexico (Chinampa fields)

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