INTRODUCTION

Yali's question:

"Why is that you white people developed much cargo and brought it to New Guinea, but we black people had little cargo of our own?" (Diamond, p. 3)

Or

Why is it that the United States is the most influential economic and political nation in the world?

Or

How can we account for the differences between peoples of the U.S. and the Aborigines of Australia

Or

Can we explain western Eurasian societies' disproportionate accounting of world power and innovation?

One answer could be that whites/Eurasians had the guns, infectious diseases, steel tools and manufactured products, which enabled them to kill and conquer other peoples. We could call these **proximate causes**. What, then, might be the ultimate cause(s) that can explain why the Eurasians and not the Africans or Native Americans dominate the world.

Mr. Diamond suggests "history followed different courses for different peoples because of differences among people's environments, not because of biological differences among people themselves." In other words, geography can determine the ultimate causes for the broadest patterns of history.

How does geography make the leap to the "ultimate"?

It starts with the agricultural revolution when hunter-gatherers were making the transition to societies that built literate industrialized, politically centralized, democratic states based on metal tools and food production. The geographical good luck to live in a location where people were likely to receive advances in agriculture and technology developed in the warmer parts of Eurasia. The Fertile Crescent was the prime example. The people of the FC developed farming and the domestication of animals because of the geographical features with which they found themselves. This situation positioned these people to be among the first to possess those items necessary for the conquest of other people — guns, germs and steel — those items that determined the fate of human societies.
LOCATION FOR THE DOMESTICATION OF PLANTS AND ANIMALS

I. PLANTS
“...human wealth and success depends on interaction with the environment.”

Photograph A. Wheat, as shown here, has a large grain size. All photographs in this lesson are courtesy of the NRCS.

Photograph B. The large seed size of wheat has certainly increased with modern practices, but when it was originally domesticated, it certainly had a large seed size.

Photograph C: Barley is another grain, from the fertile crescent, with a large seed size.
Figure 1. Locations of origin of food production.

Figure 2. Mediterranean climate zones around the world.
Table 1. World distribution of large-seeded grass species

<table>
<thead>
<tr>
<th>Area</th>
<th>Number of Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Asia, Europe, North Africa</td>
<td>33</td>
</tr>
<tr>
<td>Mediterranean zone</td>
<td>32</td>
</tr>
<tr>
<td>England</td>
<td>1</td>
</tr>
<tr>
<td>East Asia</td>
<td>6</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>4</td>
</tr>
<tr>
<td>Americas</td>
<td>11</td>
</tr>
<tr>
<td>North America</td>
<td>4</td>
</tr>
<tr>
<td>Mesoamerica</td>
<td>5</td>
</tr>
<tr>
<td>South America</td>
<td>2</td>
</tr>
<tr>
<td>Northern Australia</td>
<td>2</td>
</tr>
</tbody>
</table>

1. Which area of the ancient world had the greatest number of large seeded species?

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________________________________________________________________________________

2. In what zone is most of these species located?

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3. Comparing figures 1 and 2, determine which center of “origin of food” production is most closely associated with the response to question #2?

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4. Figure 2 presents several Mediterranean zones around the world. Why weren’t all of these places the centers of early food production?.

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II. ANIMALS

“To exploit large animals for food, energy, or other services, domesticable wild animals need to exist… Domesticable animals are able to breed in captivity and must be safe around children and other human beings…”

<table>
<thead>
<tr>
<th>Cow</th>
<th>Pig</th>
<th>Goat</th>
</tr>
</thead>
</table>

Table 2. The Earliest Species of Domesticated Mammals

<table>
<thead>
<tr>
<th>Sheep</th>
<th>The wild ancestor was the Asiatic mouflon sheep of West and Central Asia. Sheep now have a worldwide distribution.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goat</td>
<td>The wild ancestor was the bezoar goat of West Africa. Goats now have a worldwide distribution.</td>
</tr>
<tr>
<td>Cow, ox or cattle</td>
<td>The wild ancestor was the now extinct aurochs with a former distribution over Eurasia and North Africa. Cows now have a worldwide distribution.</td>
</tr>
<tr>
<td>Pig</td>
<td>The wild ancestor was the wild boar, distributed over Eurasia and North Africa. Actually, the pig is an omnivore, and its distribution is worldwide.</td>
</tr>
<tr>
<td>Horse</td>
<td>The wild ancestor was the now extinct wild horses of southern Russia. A different subspecies survived in the wild to modern times as Przewalski’s horse of Mongolia. Horses now have a worldwide distribution.</td>
</tr>
</tbody>
</table>
Teacher Consultant Mike Fogel’s Adaptation of Jared Diamond, *Guns, Germs, and Steel*

**Figure 3. Locations of origin of food production.**

**Table 3. Mammals available for domestication.**

<table>
<thead>
<tr>
<th></th>
<th>Eurasia</th>
<th>Sub-Saharan Africa</th>
<th>The Americas</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of &quot;candidates&quot; for domestication*</td>
<td>72</td>
<td>51</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>Species domesticated</td>
<td>13</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Percent of candidates domesticated</td>
<td><strong>18%</strong></td>
<td><strong>0%</strong></td>
<td><strong>4%</strong></td>
<td><strong>0%</strong></td>
</tr>
</tbody>
</table>

* A candidate for domestication is a mammalian species weighing on average over 100 pounds. A candidate must be terrestrial (not marine), and either herbivorous or omnivorous.
1. Which continent possessed the largest number of mammalian candidates for domestication?
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________________________________________________________________________________

2. Which continent possessed the largest number of domesticable species?
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3. Part A. Using the information in Table 2, identify the original locations of the five major domestic animals. Part B. Plot those approximate locations on Figure 3 using the first letter of each animal.
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4. After you've plotted the locations of the five major animals in Figure 3, which of the "origin of food" production locations are all five species in close proximity?
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________________________________________________________________________________

5. Which continent(s) is/are the five ancient species found?
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6. Where are the five species found today?
________________________________________________________________________________
________________________________________________________________________________
7. Why wasn't Sub-Saharan Africa a place where animals were domesticated early in human history?

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Table 4. Deadline Germs from Animals

<table>
<thead>
<tr>
<th>Human Disease</th>
<th>Animal with the most closely related pathogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>cattle (rinderpest)</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>cattle</td>
</tr>
<tr>
<td>Smallpox</td>
<td>cattle (cowpox) or other livestock related to pox viruses</td>
</tr>
<tr>
<td>Flu</td>
<td>pigs and ducks</td>
</tr>
<tr>
<td>Pertussis</td>
<td>pigs, dogs</td>
</tr>
<tr>
<td><em>Falciparum malaria</em></td>
<td>birds</td>
</tr>
</tbody>
</table>

8. Table 4 above indicates that deadly human diseases came along with domesticated animals. To what advantage might this fact have been to those people who domesticated animals and chose to conquer other people (some foundational biology would be useful here)?

________________________________________________________________________________

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Table 5. Examples of species domesticated in each area

<table>
<thead>
<tr>
<th>Area</th>
<th>Domesticated Plants</th>
<th>Domesticated Animals</th>
<th>Earliest Attested Date of Domestication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southwest Asia</td>
<td>wheat, pea, olive</td>
<td>sheep, goat</td>
<td>8500 BC</td>
</tr>
<tr>
<td>2. China</td>
<td>rice, millet</td>
<td>pig, silkworm</td>
<td>by 7500 BC</td>
</tr>
<tr>
<td>3. Mesoamerica</td>
<td>corn, beans, squash</td>
<td>turkey</td>
<td>by 3500 BC</td>
</tr>
<tr>
<td>4. Andes and Amazonia</td>
<td>potato, manioc,</td>
<td>llama, guinea pig</td>
<td>by 3500 BC</td>
</tr>
<tr>
<td>5. Eastern US</td>
<td>sunflower, goosefoot</td>
<td>none</td>
<td>2500 BC</td>
</tr>
<tr>
<td>? 8. Ethiopia</td>
<td>coffee, teff</td>
<td>none</td>
<td>?</td>
</tr>
<tr>
<td>? 9. New Guinea</td>
<td>sugar cane, banana</td>
<td>none</td>
<td>7000 BC?</td>
</tr>
</tbody>
</table>

1. What was the earliest attested date for the domestication of
   a. plants?

   _____________________________________________________________
   _____________________________________________________________

   b. any of the five major mammal species?

   _____________________________________________________________
   _____________________________________________________________

2. Which region of the world was the first to domesticate both plants and animals?

   _____________________________________________________________
   _____________________________________________________________

Local Domestication: Following Arrival of Founder Crops from Elsewhere

<table>
<thead>
<tr>
<th>Area</th>
<th>Following Arrival of Founder Crops from Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Western Europe</td>
<td>poppy, oat</td>
</tr>
<tr>
<td>11. Indus Valley</td>
<td>sesame, eggplant</td>
</tr>
<tr>
<td>12. Egypt</td>
<td>sycamore, fig, chufa</td>
</tr>
</tbody>
</table>

____________________________________

6000-3500 BC
7000 BC
6000 BC
3. Referring to figure 5, which of the centers of “origin of food” production does this "region of the world" in question #2 approximate?

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4. Which center of “origin of food” production received a “head start” in the developmental race for civilization? Explain.

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THE DIFFUSION OF GOODS AND IDEAS ARE MADE EASIER BY A REGION’S SIZE AND ORIENTATION

“Axis orientation affected the rate of spread of crops and livestock, and possibly also writing, wheels and other inventions.”

Figure 6. Axis orientation of the continents

The ease with which Fertile Crescent crops spread across the world via an east-west axis can be understood by completing the following exercise – comparing the variance in climate between an east-west axis and a north-south axis.

1. What environmental/climatic characteristics affected the germination, growth and flowering plants?

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________________________________________________________________________________
2. Would a wheat seed from the Fertile Crescent traded to another human being be more likely to germinate and survive in a similar or different climate from where it came?

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Questions 3-10 utilizes maps found in the 20th edition of Goode's Atlas.

3. Where is the largest Mediterranean climate located?

________________________________________________________________________________

________________________________________________________________________________

4. Label the climatic regions of Portugal, Northern Iran and Japan using the legend on page 14.
   a. How many miles apart are Portugal and Japan?

________________________________________________________________________________

   b. What relative latitude #1-5 are the three places found?

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   c. Do these places have relatively similar or different climates?

________________________________________________________________________________

5. Label the climatic regions 1500 miles north and south of Tehran, Iran using the legend from page 14.
   a. Are the climates different or similar to Tehran’s?

________________________________________________________________________________

   b. Would you consider those climates conducive or hostile to human existence and/or travel?
6. Would a seed from a plant found in the Fertile Crescent have a better chance of germinating and growing in Italy or Chad?

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7. Looking at the Ecoregion map found on pages 28-29, is there a correlation between types of natural landscapes and the climates of Portugal, Northern Iran and Japan? Explain.

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8. Looking at the map on pages 30-31, is there a relationship between climate, natural landscapes and population density? Explain.

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________________________________________________________________________________

9. What conclusions can be made from the geographical information provided in questions 6, 7 and 8 about the interactions between humans and their environment?

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10. Why would an east-west orientation have been more conducive to the diffusion of ideas and goods than a north-south orientation?

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11. How is the diffusion theory supported by the above map?.