Foundations of World Civilization: Notes 10

Processes of domestication and adoption of food production

- This material corresponds roughly to Diamond's Chapter 6
- Why would people start farming?
  - farming is actually more work than foraging (as we saw last time)
  - many historically and ethnographically documented foragers knew about how neighboring groups practiced food production, but chose not to adopt it
    - Aboriginal Australians
    - Native American Californians
    - Khoi herders in southern Africa traded with Bantu farmers
    - Khoi-san (!Kung) foragers sometimes worked for Bantu agropastoral neighbors
      - When anthropologist Richard Lee asked a !Kung man why they don't farm, the famous reply was "Why should we farm when there are so many mongongo nuts?"
      - there is a vignette in Lee's ethnography when the Kung have convinced him to drive them to a mongongo grove, where they would have gone anyway, but on foot.
        - they sing a song with the refrain "People who work for a living, that's their problem"
    - They know that they can get the food they need with less work by foraging
- As we saw last time, the ultimate cause is that there are too many people for wild products to feed
- How did that process actually happen?
  - The earliest well-documented transition to a significant dependence on agriculture was in the western part of the Fertile Crescent
    - Diamond does not discuss the archaeological specifics of this case, but he clearly has this case in mind
    - Prior to about 10,500 BCE, this area (the Levant) was occupied by small, mobile bands of foragers
    - The Levant wetter and warmer than it is now from about 12,500 to 10,800 BCE
      - this expanded the area of patchy oak and pistachio woodland and natural stands of wild grains and legumes
    - this allowed some foragers to settle in permanent villages around 12,500 BCE
      - These people are called Natufians
      - they were highly specialized foragers
        - intensively harvested wild grains
          - as shown by abundant grinding stones
          - sickles with sickle gloss
          - they harvested lots of wild wheat and barley, also some rye
        - also used wild legumes including lentils, peas, chickpeas (garbanzo beans), and vetch (a relative of peas and beans),
        - also collected nuts such as almond, pistachio, acorn
          - both the almonds and acorns had to be processed by leaching or roasting to remove toxins

    - also hunted herds of gazelles that migrated through the region seasonally
  - The resources were so rich that they could be semi-sedentary or even fully sedentary
    - as indicated by hamlets of circular houses with stone foundations
  - they stored the cereals and nuts in pits
    - storage is a necessary part of this specialization
    - since the cereal seeds and nuts are only available seasonally
    - so they had to collect large quantities and store them for the rest of the year
  - each house had its own storage pits, grinding stones, and so on
    - suggesting that each family harvested, stored, and processed its own grain and looked after its own needs
    - so economically, these sedentary Natufians were organized similarly to mobile foragers
- Natufians settled at Tell Abu Hureyra around 11,400 cal BCE
  - forming a village of about 100 to 200 people
- around 10,800 BCE, the climate abruptly turned cooler and drier
  - over a period of just a few decades
  - the cool, dry period is called the Younger Dryas, and is currently a hot topic of research
  - the area of rich woodland contracted
    - for example, the Natufian site of Tell Abu Hureyra was gradually stranded as the woodlands pulled back some 60 miles away
    - this kind of change probably happened at other sites, too
  - the plant foods found in hearths and garbage gradually shifted, with the ones that need the most water fading away first
  - but wild wheat continued to be stored and consumed in great quantities
    - even though it would not naturally have grown nearby anymore
  - the Natufians evidently encouraged it to grow nearby, by planting, watering, tending, etc.
  - this was not a major change for them
    - instead, it was a way of maintaining the way of life that they already had
    - they already knew how to harvest, store, and use the grains and were accustomed to doing that
  - right at the same time, grains of rye from Abu Hureyra show modern features that suggest domestication
    - apparently the earliest detectable case of plant evolution due to humans meddling with the plant's reproduction
    - three radiocarbon dates directly on seeds bracket the beginning of the cooler period: 11,100 cal BC to 10,600 cal BC
    - so this domestication process must have happened very rapidly
    - experimental studies show that selection from planting can indeed cause these changes in under 300 years, maybe as fast as 25 years
  - later, lentils and other legumes reappeared in the garbage
    - the climate was still unfavorable for them to grow wild nearby
    - so they were presumably starting to farm these plants, too

- the change was gradual, but within a few centuries at Abu Hureyra, cultivated cereals and legumes were a major part of the diet: they were committed to farming
  - although wild foods also remained important
  - sheep and goats were being domesticated by 8100 BCE, but hunted wild gazelle still comprised the vast majority of the meat in the diet
- reliance on domesticated animals came later at Abu Hureyra, around 7300 BCE
  - there was a rapid drop in bones of hunted gazelles over the span of just one or two human generations
  - replaced by more sheep and goats, which had been domesticated considerably earlier
  - maybe they had finally over-hunted the wild gazelles
- Abu Hureyra is just one particularly well-known site
  - others probably went through roughly the same process
  - with local variations, and not at exactly the same time
- From roughly 8500 BCE to 3500 BCE, and even later in many places, most people in Southwest Asia lived in farming villages generally like Tell Abu Hureyra
  - Most villages ranged from several extended families to a few hundred people; a few probably reached into the 2000s.
  - A tremendously stable, successful lifestyle of small-scale, traditional farmers
  - Lasted at least 5000 years with only relatively minor changes in most places
  - That is, agriculture did *not* lead directly to cities or civilization
  - instead, it led to a village farming lifestyle that worked fine for thousands of years, and in some places still does
- Diamond suggests that we look at the shift towards food production in terms of constant decisions about which tasks and products were preferable at a given time: foraging ones, or farming ones
  - for a long time – thousands of years in many cases – people in many regions practiced a mix of foraging and farming
    - gradually producing more and more food, until the farmed food became dominant
    - but in some cases, people shifted fairly quickly to farming when they could simply adopt a whole suite of crops and animals that had already been domesticated somewhere else
  - Diamond sees five major factors in these decisions
    - you can see how these were involved in the case of Abu Hureyra, for example
    - the ways these factors differed in different places would explain why some people shifted towards agriculture earlier or more rapidly than others
  - 1. decline in productivity of wild foods made foraging less attractive, and farming more so by comparison
    - as at Abu Hureyra
  - 2. availability of domesticable wild plants made farming more attractive
    - Diamond suggests that the Fertile Crescent had a particularly attractive, productive, easily domesticated suite of wild food plants
    - so that is why cultivation got started there first
  - 3. the accumulation of techniques and technology for handling food production made shifting to it easier and more attractive

        - as did the specialized, sedentary Natufian foragers at Abu Hureyra
        - who developed ways to harvest large amounts of wild grains and nuts in season, and store them to consume for the rest of the year
        - that foragers already knew how to do this would have made cultivating those same plants much more attractive
    - 4. rising population made farming more attractive relative to foraging, since it produces more food per unit of land
        - again, as we saw last time
        - cause, effect, or both? A positive feedback system
    - 5. others who do adopt farming have growing populations that begin competing with remaining foragers
        - they can push the foragers out by force or sheer numbers
        - the foragers either adopt agriculture to stake out land and survive in their increasingly surrounded regions
        - or they are overrun and conquered by farmers
        - either way, farming spreads
- So, Diamond concludes that farming emerged when it did in the Fertile Crescent because before that time, foraging had looked more attractive than farming
    - wild animals were a plentiful food source
    - wild domesticable plants were not as widespread
        - (prior to the wet period that increased wild grain stands and allowed foragers to become sedentary)
    - technology for farming had not been developed by intensive foragers yet
        - again, prior to the development of specialized grain foraging
    - populations were still low

- How does plant domestication take place? Diamond Chapter 7
    - Diamond discusses many aspects of the domestication process
        - Since we are so far behind, I won't review them here
    - but the general gist:
        - domestication is a process in which plants (or animals) evolve due to humans interfering with their reproduction
        - initially by accident
            - foragers "planting" certain seeds and not others in their feces
            - early cultivators using practices that happen to select certain kinds of seeds to be gathered and planted, and other kinds less so
                - for example, harvesting will tend to collect seeds from individual plants that sprout more quickly, since slower-sprouting individuals have not produced seeds yet
                - these seeds get planted and tended, selected, planted again and again… unintentionally producing a faster-sprouting variety of the plant
        - later intentionally, as people pick seeds or animals with desired characteristics to plant or breed
        - some plants have biological features that allow this evolution to be more rapid, others have features that tend to prevent new varieties from evolving

    - and different continents had more or fewer of such good wild precursors of domesticated plants and animals

- Why did some places (Eurasia) adopt agriculture faster than others? Diamond Chapter 8
  - These are essentially biological and evolutionary arguments
  - Again, since we are so far behind, I won't review them here
  - but the general gist:
    - the Fertile Crescent had numerous wild plants and animals that were useful and easily domesticated
      - because it was part of a large land area with a variety of ecological settings
      - and the climate selected for annual plants that put out big, storable seeds
    - compared to just a few on other continents
      - this slowed the adoption of agriculture because early food producers would not have had a good suite of plants and animals that provided carbohydrates, protein, fiber, etc.
        - foraging would have looked good by comparison
    - while early food producers in the Fertile Crescent were rewarded with a fairly complete suite of plants and animals that met most of their needs
      - encouraging them to shift sooner and more completely to settled farming
      - once they had, they were in a position to domesticate additional plants and animals that take more effort and are less essential to survival