Jared Diamond's Environmentalism

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Note

This presentation is based on the theories of Jared Diamond as presented in his works. A more complete summary of Diamond's theories can be found in *Sociocultural Systems: Principles of Structure and Change*, by Frank W. Elwell. If you would like to receive a .pdf file of the book go to http://www.aupress.ca/index.php/books/120219

Diamond is a public intellectual who has made social evolution accessible to a broad public; his work is very consistent with ecological-evolutionary theory. In his latest book Gerhard Lenski strongly recommended Jared Diamond's *Guns, Germs, and Steel: The Fates of Human Societies* (1997).

Introduction

While noting that Diamond does not label his analysis as ecological-evolutionary theory, “most of the chapters in *Guns, Germs, and Steel* provide valuable further tests of the principles on which ecological-evolutionary theory is based” (Lenski 2005, 145).

Introduction

Diamond posits that characteristics of the environment—physical, biological, and social—play a dominant role in sociocultural stability and change in human societies. What he demonstrates is that these environmental characteristics largely condition what is possible in production and population, and that these environmental and infrastructural factors combined affect not only individual sociocultural systems, but the world-system of societies as well.

Introduction

Diamond first focuses on what he calls “ultimate factors” in explaining the vast differences in social development among societies. These ultimate factors are all environmental in nature: geography, soil fertility, plant and animal availability, and climate.

Ultimate Factors

Other factors that lead to inequalities between societies according to Diamond—population, production, social organization, ideologies—all come into play in his analysis as "proximate causes," strongly influenced (if not determined) by environmental "ultimate factors." But the differences are ones of semantics: the social scientists and the biologist all begin with environmental-infrastructural relationships and focus upon how these factors profoundly affect the rest of the sociocultural system.

Proximate Causes

Inequality

How then does Diamond explain the great inequalities between sociocultural systems in the modern world? What explains the patterns of wealth and poverty we see between societies? The short answer is that technological and political differences around 1500 determined this pattern of inequality between societies today, but this merely begs the question (15-16).

Jared Diamond's short answer to these questions is that the speed and course of sociocultural development is determined by the physical, biological, and social environment of that sociocultural system (25). It is to a slightly longer version of Diamond's answer, specifically how these factors are directly related to population size and density, division of labor, and technological development, that we now turn.

Inequality

About 10 thousand years ago according to Diamond, agriculture originated independently in five areas of the world: the Near East (or the Fertile Crescent), China, Mesoamerica, the Andes, and the eastern United States. While there are several other areas that are candidates for this distinction, in these five areas the evidence for independent development is overwhelming (98). Most other areas developed agriculture as a result of diffusion from other societies, or through the invasion of farmers or herders. Others failed to acquire agriculture until modern times.

Neolithic Revolution

Through the use of environmental variables, Diamond attempts to explain this pattern. Why did the domestication of plants and animals first occur where and when it did? Why did it not occur in additional areas that are suitable for the growing of crops or the herding of animals? Finally, why did some peoples who lived in areas ecologically suitable for agriculture or herding fail to either develop or acquire agriculture until modern times?

Neolithic Revolution

Neolithic Revolution

Like Harris and Lenski, Diamond posits that the transition was not the result of conscious choice but rather was the result of thousands of small cost/benefit decisions on the part of individuals over centuries. “The underlying reason why this transition was piecemeal is that food production systems evolved as a result of the accumulation of many separate decisions about allocating time and effort” (107).

Echoing Harris, Diamond posits that many considerations go into this decision making process, including the simple satisfaction of hunger, craving for specific foods, a need for protein, fat, or salt. Also consistent with Harris, Diamond states that people concentrate on foods that will give them the biggest payoff (taste, calories, and protein) in return for the least time and effort (107-108).

Neolithic Revolution

Throughout the transition, hunting and gathering competed directly with food production strategies for the time and energy of individuals within the population. It is only when the cost/benefits of food production outweigh those of hunting and gathering that people invest more time in that strategy (109).

Neolithic Revolution

What finally gave food production the advantage? It was not that food production led to an easier life-style. Studies indicate that farmers and herders spend far more time working for their food than do hunter and gatherers (109). Nor are they attracted by the abundance, as most studies indicate that peasants and herders do not eat as well as hunter and gatherers either.

Neolithic Revolution

Rather, Diamond posits several factors that led some hunter and gatherers to gradually make the shift. The primary factor was perhaps a decline in the availability of wild foods; with the receding of the glaciers, many prey species became depleted or extinct. A second factor enumerated by Diamond is an increasing range and thus availability of some domesticable wild plants. “For instance, climate changes at the end of the Pleistocene in the Fertile Crescent greatly expanded the area habitat of wild cereals, of which huge crops could be harvested in a short time” (110).

Neolithic Revolution

A third factor, according to Diamond, was an improvement in the technologies necessary for food production, specifically tools “for collecting, processing, and storing wild food” (110).

Neolithic Revolution

The fourth factor, mentioned prominently by Diamond, (and Malthus) is the relationship between population and food production. Diamond calls this relationship autocatalitic, population and food production rise in tandem—a gradual increase in population forces people to obtain more food, as food becomes more plentiful, more children are allowed to survive. Once hunters and gatherers began to make the switch to food production their increased yields would impel population growth, thus causing them to produce even more food, thus beginning the autocatalitic relationship (111).

Neolithic Revolution

A final factor noted by Diamond is the expansion of territory by food producers. This expansion is made possible by their much greater population densities and certain other advantages enjoyed by food producers when compared to their hunting and gathering neighbors (112).

Neolithic Revolution

While Diamond has not turned over any new ground in his analysis of the neolithic revolution, he has certainly produced a far richer description of the domestication process. For example, Diamond explains in interesting detail how the early domestication of plants could proceed without conscious thought on the part of early farmers.

Domestication

Plant domestication, Diamond explains, is the process by which early farmers selected seeds from plants that were more useful for human consumption thereby causing changes in the plant's genetic makeup. But it is not a one-way process, once humans begin to select certain seeds over others they are changing the environmental conditions of the plants themselves, changing the conditions upon which certain plants will thrive and propagate their seed (123).

Domestication

Plants that produced bigger seeds, or a more attractive taste for humans, would initially be chosen in the gathering process and would be those that were first planted in early gardens (117). Then, the new conditions would favor some of these seeds over others (123). The conditions of the garden as well as the unconscious and conscious selection of the farmer over which seeds to sow the following spring gradually changed the genetic structure of domesticated plants so that domesticated varieties are often starkly different than their wild ancestors.

Domestication

Through this process, Diamond notes, hunters and gatherers domesticated almost all of the crops that we consume today; not one major new domesticate has been added since Roman times (128). Further, only a dozen plant species account for over 80 percent of the world's annual crop yields. "With so few crops in the world, all of them domesticated thousands of years ago, it's less surprising that many areas of the world had no wild native plants at all of outstanding potential" (132).

Domestication

Animal domestication, Diamond explains, is the process by which early farmers selectively bred animals that were more useful for humans thereby causing changes in the animal's genetic makeup. There are 148 wild, large, herbivorous mammals that were available for domestication, Diamond reports, but only 14 were ever domesticated.

Domestication

Domestication

These included the “major five” (sheep, goats, cattle, pig, and horse) and the “minor nine” (Arabian and Bactrian camel, llama and alpaca, donkey, reindeer, water buffalo, yak, Bali cattle, and the mithan) (160-161). Diamond asks: Why did so few of the 148 become domesticated? Why did so many fail? Because, Diamond answers, not just any wild animal can be domesticated; to be successful a candidate must possess six specific characteristics, lack of any one of which would make all efforts at domestication futile (169).

Domestication

The first factor required for successful domestication is the diet of the animal. To be valuable, the animal must consume a diet that efficiently converts plant life to meat. This plant life also has to be readily available. A second factor is growth rate, to be worth raising the animal must grow relatively quickly; animals that take 10 to 20 years to reach mature size represent far too much of an investment for the average farmer.

A third factor is the problem of breeding—many animals have problems breeding in captivity, requiring range and privacy that stymies domestication efforts. A fourth factor is disposition, many animals have nasty dispositions toward humans and are far too dangerous to domesticate as a result. A fifth characteristic is tendency to panic; many species are far too nervous and quick to flight when confronted with a threat.

Domestication

The sixth and final characteristic that is necessary for a domestic relationship with humans regards herd structure. “Almost all species of domesticated large mammals prove to be ones whose wild ancestors shared three social characteristics: they live in herds, they maintain a well-developed dominance hierarchy among herd members; and the herds occupy overlapping home ranges rather than mutually exclusive territories” (172).

Domestication

Domestication

Eurasian people, befitting their large landmass and environmental diversity, started out with many more potential domesticates than people on other continents. Australia and the Americas, you will recall, lost most of their potential domesticates either through climate change or the actions of early settlers to these lands. A second factor is that a far higher percentage of the Eurasian candidates “proved suitable for domestication” than in Africa, Australia, or the Americas (174-175).

Why did food production first appear in the Fertile Crescent? The primary advantages of this area is that it enjoyed a Mediterranean climate of mild, wet winters, and long summers, ideal for crop production. It also possessed a number of wild ancestors of crops that were already highly productive and growing in large stands in the wild (136). A third factor behind the origin of agriculture in the Fertile Crescent was that it contained four large herbivores that fit the profile of domestication as well several plants that were suitable for domestication.

Domestication

"Thanks to this availability of suitable wild mammals and plants, early people of the Fertile Crescent could quickly assemble a potent and balanced biological package for intensive food production" (141-142). Other early originators had similar (though not quite so varied) biological advantage as well as physical and climatic conditions suitable for agricultural production. Because of the paucity of wild plants in the New World that were suitable for domestication, and the almost complete lack of big herbivores for meat or traction, the coming of agriculture to these areas was much delayed, and once started was much slower to develop.

Domestication

One cannot readily imagine people choosing agriculture over hunting and gathering in their cost/benefit decision making when their only available domesticates were sump-weed or squash. In such cases, agriculture would remain a supplement to the basic hunting and gathering life style for much longer periods.

Domestication

Diamond posits that the environment of Eurasia not only favored early domestication but also favored the spread of agriculture from pristine areas of origin to other societies. Recall that most societies do not develop agriculture on their own, but rather receive it through conquest or other cultural contact.

Agricultural Spread

The Eurasian continent has several advantages over Africa and the Americas in this regard. The foremost reason for the rapid spread of crops in Eurasia, according to Diamond, is that the Eurasian continent has an east-west axis—the bulk of the land mass stretches east to west rather than north to south. Similar latitudes, Diamond reasons, share the same seasonal variations, length of days, and often climate (1997, 183). Thus, plants first cultivated in one area, adapted as they are to such factors of latitude as growing season and length of day, can easily be cultivated in areas east or west of the original site.

Agricultural Spread

The axis of the Americas and Africa, on the other hand, are north-south. Corn that was first domesticated in the Mexican highlands with its long days and long growing season could not readily spread to areas of the eastern United States or Canada. To be grown in these new latitudes, corn had to be genetically modified (or re-domesticated) for these climates through a very long process of human selection (184).

Agricultural Spread

There are also other geographical barriers to the spread of agriculture, barriers that will also come into play in the diffusion of other technologies among societies. Such barriers as desert regions, tropical jungle, and mountains played a far more prominent role in preventing or slowing down the spread of agriculture in the Americas and Africa than in Eurasia, where the barriers are far less formidable.

Agricultural Spread

Diamond calls the acquisition, timing, and spread of agriculture the ultimate cause of the world inequalities in the 15th century, but not one of the proximate causes. These proximate or immediate causes were the superiority of Eurasian technology, particularly their guns, steel swords and armor; the centralized political governments of Eurasian nations that allowed the marshaling of armadas of ships and armies; and the more lethal germs carried by the conquerors. How are these proximate factors related to agriculture?

Back to Inequality

Diamond claims that there is an autocatalytic relationship between intensified food production, population, and societal complexity. First, food production allows for a sedentary life-style, thus allowing for the accumulation of possessions as well as the creation of crafts. Second, intensified food production can be organized to produce a surplus, which can then be used to support a more complex division of labor as well as social stratification (285).

Inequality

"When the harvest has been stored, the farmers' labor becomes available for a centralized political authority to harness—in order to build public works advertising state power (such as the Egyptian pyramids), or to build public works that could feed more mouths (such as Polynesian Hawaii's irrigation systems or fishponds), or to undertake wars of conquest to form larger political entities" (285). Thus, societal complexity can then stimulate further intensification of food production.

Inequality

During the hunting and gathering era, where population densities are low, conflict between groups often meant that the defeated group would merely move to a new range further removed from the victors. With non-intensive food production and consequent moderate population level, there is no place for the defeated to move; in horticultural societies with little surplus, there is little advantage in keeping the defeated as slaves or in forcing the defeated area to pay tribute. “Hence the victors have no use for survivors of a defeated tribe, unless to take the women in marriage. The defeated men are killed, and their territory may be occupied by the victors” (291).

Inequality

With population growth, Diamond maintains, wars begin to change their character as well. With intensified food production and high population densities, as with states that produce a surplus of food and have a developed division of labor, the defeated can be used as slaves or the defeated society can be forced to pay tribute to the conquerors.

Inequality

The most direct line from the ultimate cause of agriculture to a proximate cause is the relationship between raising livestock and lethal germs. “The major killers of humanity throughout our recent history—smallpox, flu, tuberculosis, malaria, plague, measles, and cholera—are infectious diseases that evolved from diseases of animals…”(196-197). Eurasian farmers were exposed to these germs from a very early time, thus many developing immunities to the diseases. Though Eurasians were mainly resistant to these diseases, they remained carriers. Thus native populations of the Americas, Australia, and Polynesia were often decimated before guns and steel were used to subjugate them.

Inequality

In summary, because food production was far more advanced on the Eurasian continent, there was great competition, diffusion, and amalgamation among the states that evolved on this continent. These states became far larger in population, more resistant to the diseases carried by domesticates, more sophisticated in terms of technology, and more centralized politically than the tribes, chiefdoms, and early states they came into contact with in the New World, the Pacific Islands, Africa, and Australia.

Conclusions

Thus, when worlds collided one barely survived. Though coming from a tradition based in the biological sciences and developed almost in isolation from social theory, Diamond's work exploring the many relationships between environment, population, and production—as well as the impact of these relationships on the rest of the sociocultural system—is perfectly consistent with the principles of ecological-evolutionary theory.

Conclusions

Note

For a more extensive discussion of Diamond's theory, as well as a fuller discussion of its implications for understanding human behavior, refer to *Sociocultural Systems: Principles of Structure and Change*. For an even deeper understanding of Diamond's thought, read from the bibliography that follows.

References

- Diamond, J. 1997. *Guns, Germs, and Steel: The Fates of Human Societies*. New York: WW Norton & Company.
- Elwell, F. W. 2013. *Sociocultural Systems: Principles of Structure and Change*. Canada: Athabasca University Press.
- Lenski, G. 2005. *Ecological-Evolutionary Theory: Principles and Applications*. Colorado: Paradigm.