

Diamond in the Rough: Reflections on *Guns, Germs, and Steel*

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Jared Diamond's *Guns, Germs, and Steel: The Fates of Human Societies* (1999 [1997]) (henceforth *GGs*) may well be one of the most important books published in the final decade of the last century. Winning numerous book awards, including the Pulitzer Prize, it has been translated into over two dozen languages, sold millions of copies worldwide, and has been the subject of a documentary produced by the National Geographic Society and broadcast on PBS. The broad appeal of *GGs*, as with Diamond's previous book *The Third Chimpanzee* (1992) and his more recent book *Collapse* (2005), can be explained by its powerful and sweeping investigation into environmental history. Undeniably, few other scholarly works have been as comprehensive in scope and as prominent in public recognition.

Here, for the 10th anniversary of the original publication of *GGs*, we review Diamond's work, highlighting its major strengths, of which there are many, while also presenting some of the more compelling critiques of it, of which there are a few. We hope to spur discussion of what Diamond's approach has to offer human ecology and related environmental social sciences. We believe such a debate is necessary because, despite the international acclaim it has received, *GGs* has not had a dramatic impact in some of the environmental social sciences, including our own field of environmental sociology. This is ironic, since environmental sociology, like other disciplines close to it, is fundamentally concerned with how human societies are both affected by and affect their environments (Dunlap and Catton 1979). The same concern is at the core of Diamond's work, and *GGs* exemplifies how a consideration of geography, climate, resource base, and natural history can help us to understand the ways in which material conditions influence and constrain human societies and in turn how human societies affect material conditions. On these grounds alone, the arguments advanced in *GGs* deserve the focused attention of human ecologists.

The strength of Diamond's perspective lies in the fact that it is grounded in materialism, a philosophical and methodological orientation common in the natural sciences. In this regard, the fact that Diamond is not a social scientist

played to his advantage. As someone trained in the natural sciences, he intrinsically recognized the biophysical environment as a key causal force in human history. Although several 19th century social scientists, Karl Marx notably among them, were committed to materialism and recognized that the biophysical environment was the foundation on which human societies developed, the discipline of sociology, as well as most other social sciences, nevertheless moved away from this perspective as the 20th century unfolded (Catton and Dunlap 1978; Dunlap and Catton 1979; Foster 2000). Indeed, there is a long-standing tradition in sociology that privileges ideational constructs over material conditions, or that fuses these two domains in a manner that obscures important distinctions between them in order to avoid explanations that acknowledge environmental influences on societies. As a result, the assumption that humans can transcend any and all environmental problems through technological and cultural adaptation still lingers in the margins of contemporary sociological work, especially that which does not take a materialist perspective seriously.

A similar bias has led some scholars to prematurely dismiss *GGs* for what they perceive as vulgar materialism, biological determinism, or environmental reductionism (e.g., Blaut 1999). In contrast to these objections, we hold that Diamond builds a strong case for a nuanced, biogeographical conception of history. Diamond deftly illustrates that such factors as climate regime, biodiversity, and subsistence base have played a non-trivial role in the divergent histories of the world's peoples. While there are some limitations to Diamond's approach, they do not warrant a rejection of his work, but rather provide an opportunity to expand the human ecology project. Thus, we advocate for Diamond's biophysical approach but at the same time hold that certain qualifications, highlighted below, are necessary in order to adequately engage the social aspects of human-environment interactions.

Leading us through 13,000 years of human history, Diamond forwards a bold and sweeping theory concerning the factors that shaped the rise of civilizations. Central to his

thesis is the idea that, "History followed different courses for different peoples because of differences among peoples' environments, not because of biological differences among peoples themselves" (1999 [1997], 25). Rejecting crude biological determinism and racist arguments about the differences across societies, Diamond skillfully weaves together his vast knowledge of biology, geography, linguistics, anthropology, and several other fields to make his case, placing the biophysical environment at the center of human history.

A key question underlying *GGG* is this: Why was it that people from Eurasia expanded across the globe and conquered the Americas, Africa, and Australia, rather than the other way around? Diamond's answer, in short, is that Eurasian societies enjoyed a number of environmental and geographic features that gave them unique advantages over the peoples of other continents. Of particular importance was the substantial variety of both plants and animals native to the Eurasian continent that could be domesticated for human use.

Considering that agricultural productivity formed the foundation on which civilizations developed, because surpluses of food allowed for a share of the population to focus on other forms of production, the availability of productive, nutritious plant species that could be readily domesticated was crucial for the emergence of technologically complex societies worldwide. Yet, of the 56 known large-seeded grass species in the world, all of them prime candidates for staple crops, 32 are in the Mediterranean region alone, while only 11 are found in all of the Americas combined, and still fewer in Sub-Saharan Africa, and Australia. This quirk of biogeography gave a distinct advantage to the emerging civilizations of Eurasia, providing them with a greater pool of potential staples relative to other continents. Contained within the Mediterranean diversity were several especially valuable species. The wheat species of the Fertile Crescent were particularly high in protein and easy to domesticate when compared to, for example, maize, a staple of American agriculture, which is relatively low in protein and also was particularly difficult to domesticate.

Eurasia was also home to a large selection of big mammals capable of domestication, with 72 species of terrestrial herbivores and omnivores weighing on average over 100 pounds, 13 of which were eventually domesticated. In contrast, the Americas had only 24 species of this type, of which only one was domesticated, whereas the Australian continent contained only one such species, and it was not domesticated. However, it was not only the number of available species that is important, but also the particular character of those species. In an illustrative example of how the particularities of local geography and species composition modify history, 51 varieties of large mammals were found in Sub-Saharan

Africa, placing it close to its neighboring continent of Eurasia in total number, but none of these animals were domesticated. This fact can be explained, Diamond argues, by the innate characteristics of the animals themselves and not the cultural characteristics of the societies in question. Zebras, for instance, have a temperament entirely unlike that of the horses domesticated on the Eurasian continent, making them effectively immune to domestication. This and other examples show how Eurasia's unique species composition surpassed other landmasses in terms of both the quantity and the quality (from the perspective of would-be domesticators) of animals that could potentially be domesticated.

As a result, the emerging societies of the Eurasian continent had a distinct advantage in food production, transport, and warfare. Livestock provided a valuable source of protein, draft animals, particularly in combination with the plow, expanded agricultural production, and other large animals made possible the rapid transport of both humans and goods. Furthermore, the use of horses changed the face of warfare. To a degree that we generally fail to appreciate today, cavalry can be devastating on the battlefield. Horses are one of the reasons the Spanish were victorious against both the Aztecs and the Incas, despite being vastly outnumbered. Thus, the kinds and numbers of domesticated mammals available to Eurasian societies provided them with an enduring upper hand over societies in other parts of the world.

In addition to the important uses of livestock, Diamond notes how a critical, but often overlooked, factor in the Eurasian conquest of the world derived from animal husbandry: zoonotic diseases. Living in close proximity to livestock facilitates the spread of pathogens between animals and humans. In fact, many of the most devastating communicable diseases among humans originated in domesticated animals. Diamond notes that since people in Eurasia lived side-by-side with their animals for millennia, they developed resistance to many of these diseases. In contrast, because people in the Americas and Australia did not have the same variety of domesticated animals, disease transmission from animals to humans was rare and the types of human diseases common in Eurasia never developed. Thus, when Europeans arrived in the Americas and Australia, as well as other places where the local people had been isolated from prior contact with Eurasia, disease transmission almost exclusively went in one direction, wreaking devastation on the indigenous populations. Germs, far more than guns or steel, best explain why many societies around the world succumbed to European invaders.

Another basic geographic advantage of Eurasia is its large landmass, which makes possible a large combined human population, all connected to varying degrees through

trade and other social interactions. A broad distribution of societies across various terrains increased the potential number of technological innovations in Eurasia, while also facilitating the subsequent diffusion of technology throughout the landmass. Diamond points out that several of the key innovations of civilization, agriculture and writing in particular, arose independently in surprisingly few locations, originating in discrete locales and then spreading to other places. Eurasia's large landmass and consequently large human population made it more likely that such important technologies would have the chance to spring up in the first place and then later to become widespread.

The general East-West axis of the Eurasian continent, as compared with the North-South orientation of the Americas, provided yet another advantage to its inhabitants. Eurasia has a large share of its landmass at similar latitude, whereas the American landmass is spread over a wide range of latitudes, from the arctic North, to the southern extremes of modern day Chile. This directly affects the diffusion of crops, since climate and sunlight regime are key factors in determining where plants can grow. In the Americas diffusion of crops from north to south, or vice versa, is limited because the plants would have to grow in dramatically different conditions as they change latitude. In contrast, the crops of Eurasia could more readily spread throughout the landmass because other locations shared the same basic conditions.

Throughout *GGS*, Diamond makes his case for the environment's influence on human societies, building on his previous work. *GGS* is the middle book in a series, preceded by *The Third Chimpanzee* (1992) (henceforth *TTC*) and succeeded by *Collapse* (2005). In all of these three works, Diamond exhibits his penchant for biogeography and an interdisciplinary perspective, drawing on evolutionary biology, linguistics, and anthropology to elucidate human history. *TTC* considers a much longer sweep of time than *GGS*, starting from around six million years ago when our human ancestors diverged from our closest living relatives, the two extant species of chimpanzees (the common chimpanzee and the bonobo or pygmy chimpanzee), and tracing the evolution of our lineage to the present. Diamond compares and contrasts the biological characteristics of humans and our kindred primates in an attempt to understand the factors that led to the exceptional characteristics of humanity. Toward the end of *TTC* Diamond focuses on more recent human history (i.e., the past several thousand years), foreshadowing the issues covered in *GGS*.

After *GGS*, which focused on the factors that facilitated the rise and dominance of Europe's civilizations, his third book in the "trilogy," *Collapse*, assesses the reasons why various societies, from the Greenland Norse to the Easter Islanders, ultimately failed to thrive and why others succeeded.

Collapse further develops his view that the particulars of geography are largely responsible for the fate of human societies, although he does consider some aspects of culture. For example, he notes that the Greenland Norse, surprisingly, shunned seafood, which could have helped them survive, even as their other food sources (mainly domestic animals) dwindled, while the Inuit with whom they lived side by side thrived on the bounty of the ocean. Nonetheless, the determining role of the environment in human history remains his primary focus. His argument that environmental degradation contributed to the collapse of many past societies, much as it threatens the survival of our global society today, is both timely and compelling.

Both *Collapse* and *TTC* are well worth reading, and help flesh out Diamond's perspective, but *GGS* is the most original and important of the three books. Taken as a whole, Diamond's work is powerful and his intellectual vision impressive. The originality of many of his insights is striking. However, it is noteworthy that Diamond does not always acknowledge the achievements of other scholars who have made arguments similar to his, while offering valuable insights of their own. In this regard, the work of Marvin Harris (1979), especially his development of the theory and method of cultural materialism, is glaringly absent. Harris was one of the main exponents of a materialist and environmentally focused tradition in anthropology despite, and often in the face of, the above noted resistance to biophysical explanations characteristic of 20th century social science. Similarly, Diamond ignores Alfred W. Crosby's (1972, 1986) work, which focused on the fundamental roles biological and ecological factors played in human history, particularly in their connection with European imperialism. There is also worthy and well-known work in environmental history such as that of William Cronon (1983) and related work in the French Annales school (e.g., Braudel 1981). Although Diamond offers much that is original, and his macro-level vision, particularly the scope of time he considers, well exceeds Harris's, Braudel's, and Cronon's, as does his overall development and integration of ideas surpass Crosby, it would nonetheless have been appropriate for Diamond to acknowledge the scholarship of other important scholars.

Despite the many strengths of Diamond's work, it is not without its limitations. He is often a bit rough in the application of his perspective, overemphasizing the determining role of environmental advantages to the neglect of social and cultural dynamism. For example, many scholars of pre-Columbian America argue that American societies were far more "developed" than is widely recognized, and probably more so than Diamond assumes (Mann 2006). The details of the Spanish conquest of both Mexico and Peru suggest that Spanish victory may not have been entirely inevitable, but

rather the outcome of particular circumstances. By missing such details Diamond neglects the role of contingency in human history. There likely are historical events that could have turned out differently than they did, which would have led to a world substantially different from the one in which we live. One is left to wonder if Diamond's theoretical approach has sufficiently addressed the contingencies of history, as he sometimes seems to suffer from the myopia of the present, where it is all too easy to see past events as inevitably leading to the contemporary world.

Moreover, his arguments toward the end of *GGS*, about why Europe rather than China came to dominate the world, are less convincing than the rest of the book, and here his neglect of contingency is especially apparent. After all, being on the Eurasian continent, China shared many of the basic geographical advantages of Europe, and although Chinese civilization did not emerge quite as early as civilizations in the Fertile Crescent, it was for long stretches of time the most "advanced" civilization in the world. The internal politics of China that led it to turn inward and abandon its naval exploration in the 15th century do not seem well explained by geography, but rather are more plausibly explained by the particular social context of the time. The historian and social commentator Mike Davis (1997, 68), who is generally sympathetic to Diamond, summarizes these concerns well:

If Diamond provides a lucid perspective on "why Eurasia and not Africa or America?" he offers only his own conceptual confusion on "why Spain and not China?" or "why England and not Spain?" I am not even sure that the epochal collision at Cajamarca in 1532 between Inca and Hapsburg absolutisms was as completely "determined" as Diamond seems to believe. The Incas' descendants, after all, are still actively contesting the outcome.

Of course, while the outcome of the confrontation with Pizarro may well have gone another way, it still remains that European diseases had weakened the Incas before that pivotal moment. Also, Diamond is cautious in his claims about why China did not end up conquering the world. Nevertheless, his perspective could clearly be refined by a consideration of not only the material necessity that contributed to the formation of certain broad historical patterns, but also the role of historical contingency in determining which paths among those possible were actually taken.

Diamond's other main weakness is his tendency to view societies as holistic entities. Although he is not an extreme functionalist, and indeed has some dialectical insights, he generally neglects divisions within societies and how these divisions have shaped human history, a point that critical scholars have highlighted (Davis 1997; Laibman 2003). For

example, arguing that increases in population density resulting from changes in agricultural technology would have brought more and more people with little or no direct kin-relation into contact with one another, Diamond concludes that the formation of tributary chiefdoms and state societies emerged and stabilized largely to fill the need for large-scale conflict mediation and resource allocation. This emphasis on the functional totality of a centralized polity neglects the role of conflict and violence in the formation and maintenance of state power. Moreover, it misses the structural features that contribute to conflict, advancing an ahistorical view of human social behavior. His position would be strengthened if he more fully recognized that different types of societies have different internal dynamics, and that each era has its own particular processes and contradictions. Exemplifying such an approach, Jason Moore (2000, 2002), working in the historical materialist tradition, has shown how feudal and capitalist societies have distinct dynamics and how each generates a different type of environmental crisis. In contrast, Diamond's "one size fits all" approach to understanding societies and their interaction with the natural environment, although broadly valid, can fall short of such nuance when crudely applied to any and all historical eras and types of societies.

Diamond's failure to understand the dynamics of particular social systems is especially apparent in the assumptions that underlie his discussion of global capitalism in *Collapse*. Demonstrating a fundamental naiveté about the logic of capital, and taking the fashionable but untenable position that corporations can help to solve the environmental problems we face, he praises Chevron for its operation of the Kutubu oil field in Papua New Guinea, noting that the company minimized the impact of oil extraction operations on the local environment through careful planning and design. Intending to show that corporations can behave responsibly in the right context and, thus, can help stem the tide of environmental degradation, he nonetheless errs when inferring from this example that a global economy largely controlled by corporations need not be environmentally unsustainable.

Diamond recognizes, but apparently does not sufficiently appreciate the implications of his insight, that Chevron took steps to improve environmental performance because it wanted to avoid opposition from the local population, which could potentially shut down its operations if perturbed. Chevron was also concerned about the bad publicity abroad that would have resulted if its activities caused notable environmental damage, anticipating future boycotts and lawsuits generated by a global environmental movement committed to raising public and governmental awareness of the impact of oil production (Diamond 2005, 451-2). Diamond's example, therefore, is less an illustration of how corporations can be al-

lies in the struggle to protect the environment and more a case which brings into focus how collective social action and sensible government policy can serve as a counterforce to corporate excess. In this sense, giving Chevron the primary credit for improving its environmental performance is akin to crediting business owners with the improved wages and benefits for workers that only came about because of labor unions and government regulation. It is *resistance* to capitalism and corporate dominance that has led to occasional improvements in working conditions and environmental protection, not the innate tendencies of capitalism and corporations, which if left unopposed would likely run roughshod over humanity and nature.

Furthermore, referring to any type of oil extraction as environmentally responsible is absurd on its face. Reductions in impacts at the point of extraction do not cancel out the long-range effects of a polluting substance. The combustion of fossil fuels, oil chief among them, is the primary force leading to global climate change, acid rain, and a myriad of other environmental problems. Any company that pedals a product inextricably linked to the most extraordinary environmental problems of our era can in no meaningful way be considered environmentally responsible. The direct environmental impacts caused by oil extraction are indeed substantial, and taking steps to ameliorate them can hardly be called a bad thing, but such gains pale in comparison to the potential consequences of global climate change.

In spite of the variety of valid criticisms of Diamond's work, a fair assessment of it affirms that it deserves the attention it has received and is worthy of more focused attention in the social sciences. Diamond has forwarded a remarkably insightful perspective on human history and has had the courage to focus on big and important questions. Such a bold approach cannot help but draw criticism, and the controversy surrounding Diamond's work, particularly in geography and the social sciences, is more a sign of its relevance and originality than its shortcomings.

In several ways, Diamond's work actualizes the vision laid out by two key founders of environmental sociology (Catton and Dunlap 1978) for a social science that incorporates the biophysical environment into its analyses. Environmental sociologists and other social scientists will be helped in their efforts to advance Catton and Dunlap's vision if they take Diamond seriously. Diamond's work opens up the opportunity for environmental social scientists to analyze the full sweep of human history, rather than focus almost exclusively on the modern environmental crisis. In this, it has the potential to revitalize human ecology.

Diamond is unquestionably a sophisticated thinker and *GGG* is a masterwork that will likely be influential for years to come. His polymathic intellectual accomplishment cannot

be dismissed lightly. *GGG* is a goldmine of ideas, thought-provoking throughout, continually pointing to new questions as it answers old ones. Diamond presents a well integrated perspective of extraordinary scope that few other thinkers can match. Although he does occasionally over-extend his arguments, and there are many historical particulars that he glosses over or ignores, it is clear that Diamond has produced a theoretical perspective with extraordinary explanative power. Engaging Diamond's work can help further a science of society in which the natural world is at the center. *GGG* may be a diamond in the rough, but it is a diamond nonetheless.

Endnotes

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