

## Book Reviews

**Guns, Germs and Steel: The Fates of Human Societies.** Jared Diamond. New York: W.W. Norton, 1997, 480 pp.

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*Guns, Germs, and Steel*, the author tells us, grew out of his attempt to answer "Yali's question." Yali, a New Guinea native, allegedly asked Jared Diamond, an evolutionary biologist specializing in the study of birds, "Why is it that you white people developed so much cargo and brought it to New Guinea, but we black people had little cargo of our own?" "Cargo" is used here in the same sense as in the famed 'cargo cult,' to refer to all that technology—airplanes, guns, steel axes—European whites brought to New Guinea, whose dark-skinned inhabitants were still using stone tools. Since social science had yet proved unable to satisfactorily answer Yali's question, Diamond tells us that he researched the topic for 25 years and found not an answer, but *the answer*—compared to New Guineans, Australian Aborigines, Africans, and Amerindians, the peoples of the Eurasian continent were environmentally rather than biologically advantaged. They had the good fortune to have lived in centrally located homelands that were oriented along an east-west axis, thereby allowing ready diffusion of their abundant supply of domesticable animals, plants, and cultural innovations.

In his geographical determinist answer, Diamond, well-known academic, regular writer for *Discover* magazine, and author of *The Rise and Fall of the Third Chimpanzee*, joins the debate about group differences in intelligence. But you won't find any careful weighing of the evidence for or against his and other environmental, as opposed to genetic, arguments in *Guns, Germs, and Steel*. Throwing down the gauntlet, Diamond brands the genetic argument on IQ "racist" (pp. 19–22), anathematizes Herrnstein and Murray's (1994) *The Bell Curve*, declaring it "notorious" (p. 431), and dismisses any possible role for genetic differences with his *ex cathedra* statement that: "The objection to such racist explanations is not just that they are loathsome but also that they are wrong" (p. 19). Diamond summarises his long book in one credal sentence: "History followed different courses for different peoples because of differences among people's environments, not because of biological differences among peoples themselves" (p. 25). It seems incredible that, as an evolutionary biologist, Diamond seems unaware that it is different environments that cause, via natural selection, biological differences among populations.

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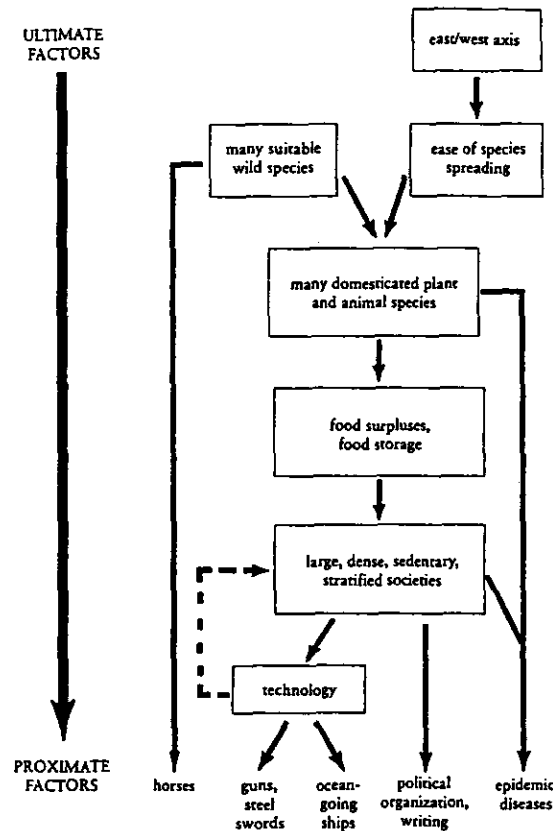
As a card carrying "race-realist" (Rushton, 1995), I should register my objection to Diamond's claim that *Guns, Germs, and Steel* is a good faith effort to solve one of the most controversial and enduring controversies in the history of philosophy and social science. Diamond's many omissions constitute at best shoddy, and at worst dishonest, scholarship. However well written, however encyclopedic in scope, and however much truth there may be in this book about 10,000 years of human history, Diamond does not give his readers the whole truth and nothing but the truth. In fact, he gives them much less.

Nonetheless, Diamond's thesis that the facts of history can be explained by anchoring that discipline in the biogeographic and evolutionary sciences, rather than assuming as do many professional historians, that history is just "one damned thing after another," merits careful consideration. *Guns, Germs, and Steel* certainly reads well and it does contain a storehouse of data that cry out for a unifying explanation. Astonishing, for example, is the fact that the island of Madagascar was colonized around 500 A.D. (about the same time as Hawaii) by an Austronesian-language people (similar to Polynesians) from Borneo, some 4,000 miles across the Indian Ocean, rather than by East Africans living only 250 miles away. Diamond's answer (again) is that conquerors had better homelands rather than better brains. The immediate reason why Austronesians crossed the Indian Ocean was because they invented ocean-going canoes. They did this by outrigging dugouts, to stop them from capsizing, by lashing two smaller logs parallel to the hull and several feet from it, one on each side, connected to the hull by poles, with sails added later.

According to Diamond, the underlying explanation of why the Austronesians were more inventive than Africans is that they were colonizing farmers originating in south China where they had achieved a head start through domesticating pigs, chickens, dogs, and rice. They simply loaded their domesticated products into their ocean-going canoes and moved on to replace the original tropical southeast Asians (possibly hunter-gathering Negritos). The Austronesian expansion began in Taiwan (3,500 B.C.), then moved to the Philippines (3,000 B.C.), Indonesia (2,000 B.C.), New Zealand (1,000 A.D.) and the Pacific Islands (500 A.D.).

Why did the Polynesians develop a technology that Africans did not dream of? (Until the Arabs and Europeans arrived, south-of-Saharan Africans had failed to invent the wheel, written languages, numbering systems, measures of time, rules of law, or dwellings larger than two storeys; Baker, 1974). Why did Europeans colonize Africa, Australia, and the Americas while sub-Saharan Africans, Australian Aborigines, and American Indians did not colonize Europe? The Austronesian replacement of existing populations, Diamond tells us, occurred for the same reasons that Europeans later replaced Amerindians, Khoisan, and Native Australians, that is, they had denser populations, superior tools and weapons, more developed watercraft and maritime skills, and epidemic diseases to which farmers, but not hunter-gatherers, had developed resistance (the "guns, germs, and steel" of the book's title).

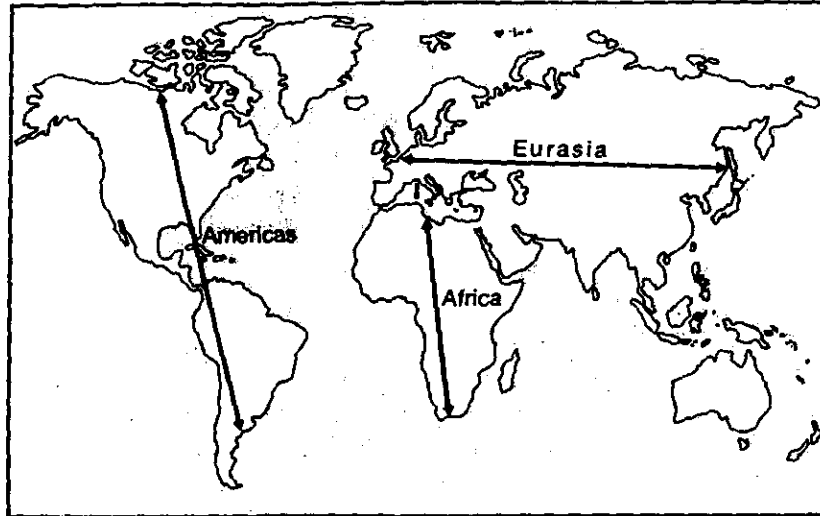
To clarify chains of causation, Diamond invokes the concept of 'ultimate' and 'proximate' levels of explanation, as used in evolutionary biology (Figure 1). Thus, although the 'proximate' reason why Europeans and Asians 'conquered the world' lies in superior technology in the form of ocean-going ships, guns, steel swords, and superior political organization and writing, occasionally helped along by epidemic disease, the 'ultimate' reason is that technology began earlier and proceeded faster in continental Eurasia because of Eurasia's heritage of domesticable plants and ani-



**FIGURE 1.** The ultimate-proximate continuum of factors underlying the broadest pattern of history. This chart represents Diamond's (1997, p. 87) view of the chains of causation leading from ultimate factors (such as orientation of continental axes, see figure 2) up to proximate factors (such as guns, horses, and diseases).

mals. By contrast, Australia was impoverished and other continents were only moderately endowed, hence their relative backwardness.

According to Diamond's reckoning, there are only 148 species of large, wild creatures that can be tamed (and of these only 14 species have made it to the farm). In the plant realm, only several hundred of 200,000 species can yield good protein. The ancestors of these mammals and plants—which include pigs, barley, and rice—just happened to be in the Fertile Crescent and China. Moreover, only the Eurasian continent has an east-west axis allowing diffusion of plants, animals, and people across similar, somewhat Mediterranean-style climate and terrain (see Figure 2).



**FIGURE 2.** Major axes of the continents (from Diamond, 1997, p. 177).

The north-south axis of Africa and America inhibited diffusion due to severe changes in climate. For example, the tropical jungle of central America effectively stopped the southward migration of domestic corn from Mexico and the northward migration of the domestic llama from Peru. Five thousand years after llamas had been domesticated in the Andes, the Maya, Aztecs, and all the other native societies of Mexico remained without pack animals. Similarly, the Saharan desert and tropical rainforests of Africa impeded the southward spread of technology from the Fertile Crescent of the Middle-East.

Though he is not the first to have offered such explanations, Diamond amply documents how the Fertile Crescent, which gave rise to European civilization, had the best agricultural resources of the five to nine cradles of agriculture. Its grasses had the greatest variety of large seeds. The region had plenty of domesticable animals. Goats, sheep, pigs, hens, and cows were tamed. Domestic beasts bore the burden of early agriculture, while horses powered military expansion. Diamond also shows the much less well known means by which people in New Guinea, Australia, and elsewhere in the world intelligently took advantage of every available resource. Even the aboriginal Australians, their land dry and infertile, managed in one region, where rivers reliably flow, to construct elaborate canals up to a mile and a half long, allowing eels to extend their range between marshes.

Diamond's conclusion, neither novel or unique (Crosby, 1986; Darlington, 1969), is that agriculturally wealthy Eurasians had a long head start in developing a surplus population with a division of labor that enabled the tools of civilization to arise. Agricultural settlements led small bands of nomadic hunter-gatherers to coalesce into village-based tribes. These grew into chiefdoms comprising thousands of people from many villages. Chiefdoms led conflict-mediating laws to be codified. Ruling classes and elites emerged to mobilize citizens and their resources to wage

war, build public works, and increase political power. Finally, the state arose and with it the large populations and technological developments including political organizations that produced fleets of soldiers engaging in transoceanic conquest.

Writing conferred additional administrative control and military success. For example, the letters and pamphlets coming back to Spain from Cortés's conquest of the Aztecs in Mexico, sent Spaniards pouring into the New World and supplied the necessary detailed sailing directions. Later, Pizarro explicitly modeled his ambush of the Incas in Peru on the successful (written down) strategy of Cortés's conquest of the Aztecs in Mexico.

Unacknowledged by Diamond is that the Chinese were often in advance of Europeans. By 1442, for example, the Chinese had developed a vast ocean going fleet which arrived off the east coast of Africa with 200 ships and 20,000 men. (Contrast these logistics with those of Christopher Columbus who had only 3 ships and 200 men 50 years later!) The Chinese had already invented the magnetic compass and could easily have sailed around the Cape of Good Hope and 'discovered' Europe. That they did not do so and instead skuttled their ships and destroyed the plans for building them remains a curiosity.

### PROBLEMS UNRESOLVED AND DATA UNEXPLAINED

All of the foregoing developments created positive feedback loops selecting for increased intelligence and various personality traits (e.g., altruism, rule-following, etc.). Not surprisingly, Diamond ignores this eventuality. As a differential psychologist and evolutionary theorist studying race differences, I was struck by how much potentially explanatory information Diamond omitted. Large data sets dovetail too virtuously (to use Robert Oppenheimer's poetic phrase) to be ignored. For example, well documented racial differences in brain size and IQ map very closely to the same cultural histories Diamond is at such pains to try to explain. Although Diamond dismisses such research as "loathsome", he leaves his readers, many of whom would no doubt like to agree with him, clueless as to what, if anything, might be scientifically wrong with any of it.

Although independent researchers have repeatedly confirmed: (1) The geographical distribution of intelligence, (2), the relationship between intelligence and brain size, (3), the geographical distribution of brain size, and (4), the heritability of intelligence, Diamond, the author of *The Rise and Fall of the Third Chimpanzee*, is like a composite of the three wise monkeys and does not want to see, hear, or say anything about these topics. Therefore, I will briefly summarize them. Readers seeking a more extensive summary can consult *The Bell Curve*, and for a complete discussion of how brain size and IQ explain much of human behavior and are in turn explained by human evolution, see my *Race, Evolution, and Behavior*.

1. *The geographical distribution of intelligence.* One hundred years of research has established that East Asians and Europeans average higher IQs than do Africans. East Asians, measured in North America and in Pacific Rim countries, typically average IQs in the range of 101 to 111. Caucasoid populations in North America, Europe, and Australasia typically average IQs from 85 to 115 with an overall mean of 100. African populations living south of the Sahara, in North America, in the

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Caribbean, and in Britain typically have mean IQs from 70 to 90 (see Lynn, 1997, for a comprehensive review).

Parallel differences are found on relatively culture-free tests such as speed of decision making. All children can perform the task in less than one second, but children with higher IQ scores perform faster than do those with lower scores. Asian children in Hong Kong and Japan average faster than do European children from Britain and Ireland, who in turn average faster than do African children from South Africa. This same pattern of racial differences is also found in California.

2. *The relationship between intelligence and brain size.* Diamond neglects to mention any of the remarkable discoveries made during the 1990's 'decade of the brain' using magnetic resonance imaging (MRI). Such MRI studies, which construct three-dimensional models of the brain *in vivo*, show a correlation of about 0.40 between brain size and IQ, as replicable a set of results as can be found in the social and behavioral sciences. The first MRI/IQ studies were published in the late 1980's and early 1990's in leading, refereed, mainstream journals like *Intelligence* (Willerman et al., 1991) and the *American Journal of Psychiatry* (Andreassen et al., 1993).

3. *The parallel geographical distribution of brain size.* Racial differences in brain size have been established recently using wet brain weight at autopsy, volume of empty skulls using filler, and volume estimated from head sizes. Using endocranial volume, for example, Beals et al. (1984, p. 307, Table 5) analyzed about 20,000 skulls from around the world. East Asians averaged 1,415 cm<sup>3</sup> (*SD* = 51), Europeans averaged 1,362 cm<sup>3</sup> (*SD* = 35), and Africans averaged 1,268 cm<sup>3</sup> (*SD* = 85). Using external head measures to calculate cranial capacities, Rushton (1992) analyzed a stratified random sample of 6,325 U.S. Army personnel measured in 1988 for fitting helmets and found that Asian Americans averaged 1,416 cm<sup>3</sup> (*SD* = 104 cm<sup>3</sup>), European Americans 1,380 cm<sup>3</sup> (*SD* = 92), and African Americans 1,359 cm<sup>3</sup> (*SD* = 95). Moreover, a recent MRI study found that people of African and Caribbean background averaged a smaller brain volume than did those of European background (Harvey, Persaud, Ron, Baker & Murray, 1994).

Contrary to purely environmental theories, these racial differences in brain size show up early in life. Data from the U.S. National Collaborative Perinatal Project on 35,000 children found that Asian children average a larger head perimeter at birth than do White children who average a larger head perimeter than do Black children, even though, at age seven, Asian children average smaller body size (and Africans larger body size) than do Europeans. Further, head perimeter at seven years correlates with IQ at age seven in all three racial groups (see Rushton & Ankney, 1996, for review).

4. *The heritability of intelligence.* As discussed in *The Bell Curve* and *Race, Evolution, and Behavior*, the heritability of intelligence is now well established from numerous adoption, twin, and family studies. Particularly noteworthy are the heritabilities of around 80% found in adult twins reared apart (Bouchard, Lykken, McGue, Segal & Tellegen, 1990). Moderate to substantial genetic influence on IQ has also been found in studies of non-Whites, including African Americans and Japanese. Even the most critical of meta-analyses find IQ about 50% heritable (Devlin, Daniels & Roeder, 1997).

Transracial adoption studies suggest a genetic contribution to the between-group differences. Studies of Korean and Vietnamese children adopted into White American and White Belgian homes show that, although as babies many had been

hospitalized for malnutrition, they grew to excel in academic ability with IQs 10 points or more higher than their adoptive national norms (Frydman & Lynn, 1989). By contrast, Weinberg, Scarr and Waldman (1992) found that at age 17, Black and Mixed-Race children adopted into White middle-class families performed at a lower level than the White siblings with whom they had been raised.

### THE MORALISTIC FALLACY AND BEHAVIORAL CREATIONISM

It is not as though Diamond is unaware of the importance of brain size in human evolution. Indeed he discusses the relation of brain size to behavioral complexity in describing the evolutionary sequence from *Australopithecus* through *Homo erectus* to *Homo sapiens* (pp. 36–40). According to Diamond: "Although *Homo erectus*, the stage reached around 1.7 million years ago, was close to us modern humans in body size, its brain size was still barely half of ours. Stone tools became common around 2.5 million years ago, but they were the crudest of flaked or battered stones" (p. 36). I know Diamond is aware of the MRI studies on brain size and IQ, and of studies on race differences, because my colleagues and I routinely sent him copies as they appeared and asked him what he thought! For the record, let it be known that Diamond did not reply to the missives regarding this published scientific data. Now he has chosen to withhold all these data from his readers.

Moreover, Diamond (pp. 38–40) acknowledges the accumulating evidence in favor of the "Out-of-Africa" theory of human origins. It holds that *Homo sapiens* arose in Africa 200,000 years ago, expanded beyond Africa in an African/non-African split about 110,000 years ago, and then migrated east in a European/East Asian split about 40,000 years ago. Diamond refuses to acknowledge any relationship between this evolutionary sequence and the parallel ranking of Africans, Europeans, and East Asians in brain size and other behavioral traits. Nor does he tell his readers that evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold Arctic where East Asians evolved.

Diamond's omissions are compounded by his idiosyncratic (mis)use of the causal flow chart in Figure 1. When evolutionary biologists describe ultimate and proximate factors they typically do so to explain *how natural selection works on genes*. Diamond is far too well-informed and experienced an evolutionist not to know this. Brain size and IQ are obvious candidates for mediating mechanisms. Yet Diamond sidesteps this literature, denigrating any such thoughts as "loathsome" and "racist." Diamond owed it to those who rely on his work to explain why all the carefully conducted work carried out on this topic should be so summarily dismissed.

How could the group differences in brain size and intelligence have arisen? Diamond himself provided part of the answer in his earlier book *The Rise and Fall of the Third Chimpanzee* and even alludes to it in the present one. Internecine tribal and ethnic warfare has been a potent force in the natural selection of human groups. Accounts of genocide are found in almost every civilization from historical times to the present. There were no Golden Ages. And just as people have not been at peace with their neighbors, so we have never lived in harmony with nature. Although Diamond recognizes all this and more, he omits to discuss how inter-

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group competition over scarce resources influences the human genotype including why hominid brain size increased three-fold over the last 3 million years.

Does Diamond want to argue that natural selection stopped when anatomically modern humans arose in Africa 100,000 years ago? If so, this would be a prime example of what anthropologist Vincent Sarich has referred to as 'behavioral creationism.' Given thousands of years of Eurasian advantage in agricultural and technological wealth, wouldn't we expect the evolutionary process to have taken matters further there than elsewhere?

Even if cultural innovations were initially the result of relatively favorable geographic location, each such innovation would itself set the stage for a process of genetic selection for those best adapted to survive under such conditions. Further, if being centrally located increases the probability of receiving cultural innovations that arise elsewhere, it also increases the probability of receiving genes that provide a relative advantage in applying such innovations. Of course, this will not inevitably be true. If innovations lead to mass migrations of the genetically less able, a civilization could decline. The central point is that if Diamond's theory explains how groups that are genetically equal at the outset develop their cultures at different rates, it also explains why they will start to differentiate genetically in their ability to participate in that culture.

Another issue is the originality of 'Diamond's theory.' Even those who disagree with me completely on the nature-nurture controversy must register a surely reasonable complaint. Instead of scholarly references and footnotes to each statement, and openly giving credit in text as scientific norms dictate, Diamond simply appends a long list of books and articles to each chapter without specifying where his ideas came from. As James Shreeve, Diamond's fellow *Discover* magazine writer pointed out in his *New York Times Book Review*: "Mr. Diamond acknowledges that no single person can be an authority in all fields, yet he mentions most of the other scholars who must have informed his ideas not in the text but only in an addendum. This makes for a smoother exposition, perhaps, but combined with the sometimes didactic style of the narrative, it imparts an unwarranted sense of objectivity, as if everything happened when, where and how in prehistory just as Jared Diamond says it did."

At the risk of venturing into deconstructionism and the sociology of knowledge, I think it is worth asking whether "Yali" even exists, or if he does, did he actually ask his now-famous question in the plaintive manner Diamond reports? As presented, Yali's question has too much the ring of a set-up for an anti-racist sermon. It is simply too polite. For centuries, non-Europeans and people of color around the world have had no trouble generating their own answers. Some have concluded, as did the Honorable Elijah Muhammad, that Europeans are devils; others, like the ill-fated Emperor Montezuma, that they were Gods. To my knowledge, other than Yali, Kipling's Billy Fish in the fictional, *The Man Who Would Be King*, is the only one to so entreat the wise white man to enlighten him (only to be told, as Michael Caine so expertly delivers the line in his cockney accent in the 1975 movie version, that they were not Gods, "but Englishmen, which is the next best thing").

A reasonable case can be made that "Yali's question," is merely a rhetorical device to allow Diamond to lecture us on the race-IQ/nature-nurture issue. Diamond's statement that he finds IQ explanations "not just . . . loathsome but also



...wrong" shows he is suffering from the moralistic fallacy—if something ought not be so, it must not be so. But in recent years, the equalitarian dogma has been hit hard by some bad karma. In the wake of the success of *The Bell Curve* and other recent books about race (including my own) to provide race-realist answers to the question of differential group achievement, there has been an intense effort to get the 'race genie' back in the bottle, to get the previously tabooed toothpaste back in the tube. It is in such times that Diamond fortuitously puts aside his myriad of other activities to provide an answer that, just coincidentally, shores up the walls of the politically correct fortress, when they are being threateningly undermined by scientific research.

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