

Guns, Germs and Steel: The Fates of Human Societies

Jared Diamond

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Why is it that Europeans ended up conquering so much of the world? Or, as one of Diamond's New Guinean friends asks him, why do they have all the "cargo"? Despite all the contrary evidence from anthropology and human biology, many persist in attributing the differing political and economic successes of the world's peoples to biological, "racial" differences. Others appeal to cultural differences or to historical contingency. But Diamond sees the fundamental causes as environmental, resting ultimately on ecological differences between the continents. An extended argument for this, *Guns, Germs and Steel* is nothing less than a history of *Homo sapiens* on a scale of continents and millennia.

Diamond begins with a survey of human pre-history, covering the spread of humans around the world down to 11000 BC. He then introduces Polynesia as a "natural experiment", an illustration on a smaller scale of his overall thesis. In the Polynesian exploration and settlement of the Pacific, settlers from the one cultural and ethnic background ended up in vastly different environments, ranging from continental New Zealand, through volcanic islands of various sizes, to barren atolls and remote Easter Island. Hunter-gatherer societies eventuated on some islands — and sophisticated states and proto-empires on others.

As an exemplar of contact between different societies, Diamond chooses the meeting of the Spanish conquistador Pizarro and the Inca Atahualpa at Cajamarca in 1532. This resulted in Pizarro's victory, despite a numerical disadvantage, and the capture of Atahualpa. The proximate causes of this were germs, technology (guns and steel weapons, ships), domestic animals (horses), and writing. Hence the title.

Underlying these immediate causes, however, is what Diamond sees as the central key to understanding human history — food production, or the domestication of plants and animals. In an excellent summary — probably the best popular account I have seen — Diamond chronicles the origins of agriculture. He describes where and when food production originated, how it spread with demographic expansion and by emulation, and why it never took off in some regions. He also touches on the largely unconscious coevolutionary processes underlying domestication, the origins of specific crops, and the characteristics that made some plants more suitable than others for domestication.

Next Diamond considers, and rejects, the idea that some peoples failed to adopt agriculture, or adopted it late, because of cultural characteristics ("backwardness"). Hunter-gatherers have a good understanding of the potential of the plants in their environment and, while some groups are conservative and resist change, there are always some who are prepared to innovate. The Fertile Crescent had a climate which favoured annual plants (which tend to have large seeds) and a species mix which included critical, large-seeded, self-pollinating grasses. The result was a swag of crops including protein-rich cereals and pulses; other regions (New Guinea and the eastern United States are his examples) lacked such a crop suite. (Potential crops can't be evaluated in isolation — you can't maintain a sedentary society on apple cultivation alone.)

A similar analysis is carried out for the domestication of large mammals. Here, again, Eurasia was favoured with almost all the suitable species. While there appear to be many others which could have been domesticated (especially in Africa), they have behavioural traits which militate against it. (As evidenced by the failure of modern animal-breeders, backed by genetics, to domesticate any of them.) When they did become available, the indigenous peoples of other continents rapidly adopted Eurasian

domestic animals. The rapid mastery of the horse by some Amerindian groups is a notable example.

Finally Diamond suggests a key difference between the continents: the primary axis of Eurasia is east-west, whereas the axes of Africa and the Americas are north-south. Because crops are climate dependent and climate varies strongly with latitude, crops and domestic animals could spread across Eurasia more easily.

Returning to the proximate causes touched on earlier, Diamond looks more closely at diseases, writing, technology, and centralised government. Contagious diseases caused high levels of mortality in populations throughout the New World and Australia, often well before direct contact with European settlers. In contrast, European penetration into the tropics was slowed by Old World tropical diseases to which they lacked immunities. Where did these diseases come from, and why did so few travel in the other direction? Higher population densities in Eurasia created a niche for new diseases, the presence of domestic animals provided a reservoir of suitable candidates, and their spread was assisted by good cross-continental communications.

Next Diamond presents a capsule history of the origins of writing (in Mexico and Sumeria, and possibly in China and Egypt), exploring the limited uses of early writing systems, its gradual refinement, and its spread by emulation and copying. This is followed by a chapter on technological innovation more generally, highlighting its dependence on population size, the easy diffusion of ideas, and auto-catalytic feedback (with synergism between different forms of technology).

But the single most significant consequence of food production was that, by creating reliable food surpluses, it allowed large, dense, sedentary, and stratified societies to come into existence. Diamond uses a simple

band/tribe/chiefdom/state typology to illustrate the relationship between population density and social structure and the movement from egalitarian societies to redistributive "kleptocracies". He also touches on the contributions of religion and ideology to political organisation.

Part four presents a series of case studies from different regions, drawing on archaeological and linguistic evidence to reconstruct their history in the context of the framework developed earlier. Diamond briefly glances at how good communications and early political unification produced China's unusual linguistic and cultural unity. He also returns to the collision of the Old and New Worlds, comparing the dates for the adoption of agriculture, metallurgy, states, and writing in different regions. And there's room for a quick look at New World linguistics and the brief Norse contacts with North America.

Despite geographical proximity, Australia and Papua New Guinea had very different histories. Australia remained a continent of hunter-gatherers, while New Guinea was one of the original centres of food production. But New Guinea never developed centralised states and agriculture never crossed the Torres Strait. The explanations for this rest, once again, with environmental differences and ecological barriers. When Europeans did build an industrialised state in Australia, they had to import the key elements, the crops and technology, from outside.

The Austronesian expansion into Southeast Asia and the Pacific, starting from Taiwan and Southern China around 3000 BC, was one of the most significant movements of human history. Equipped with outrigger canoes, domestic animals and agriculture, Austronesian-speaking peoples overran and replaced the hunter-gatherer populations of Indonesia and the Philippines, and eventually expanded into the Pacific in the Polynesian diaspora. But the Austronesians failed to penetrate far into New Guinea, or to have any significant impact on Australia.

Ecology is also a major factor behind the complex human geography of sub-Saharan Africa. Iron-working and agriculture powered the Bantu expansion into southern Africa, displacing the pygmies and the Khoi-San. The characteristics of their crops explain why they stopped at the Fly River, leaving it for European settlers with suitable crops to introduce agriculture to South Africa. And the extraordinary Austronesian settlement of Madagascar is book-sized subject all by itself.

An epilogue, "The future of human history as a science", proposes extending the approach of *Guns, Germs and Steel* to smaller geographic and shorter time scales. Diamond suggests geographical fragmentation (producing the "right" amount of political unity) as an explanation for why, within Eurasia, it was Europe rather than China that eventually took the lead in technological innovation. (It is all too easy, however, to imagine a Chinese writer in an alternative universe invoking exactly the opposite argument.) He also hints briefly at a role for alternatives to environmental explanations, namely "cultural factors and idiosyncratic individuals". And he argues that history should be considered a science, sharing methods with the other historical sciences, though he barely scrapes the surface of the epistemological issues this raises.

While this is a program that I have a lot of sympathy with, it also leads me to some of the qualms I have about *Guns, Germs and Steel*: I am always nervous when biologists turn their attention to history or anthropology. Though Diamond is a physician turned evolutionary biologist, he avoids the major pitfalls and can be read by historians and social scientists without flinching. He achieves this by avoiding some areas rather than engaging with them, however.

In his introduction Diamond writes that "since Toynbee's attempt, worldwide syntheses of historical causation have fallen into disfavor among most historians, as posing an apparently intractable problem". This

disfavour is not entirely wilful, however, so Diamond's failure to elaborate is frustrating. Despite the breadth of *Guns, Germs and Steel*, it doesn't even begin to be a general synthesis of historical causation. When Diamond writes about the proximate and ultimate causes of the collision at Cajamarca, for example, he is not explaining why *Pizarro* captured *Atahualpa* at *Cajamarca* — only why a Eurasian leader was confronting a Native American leader somewhere in the Americas. Finer explanations require the invocation of forms of historical causation on which Diamond doesn't touch at all.

Diamond moves confidently around an amazing range of disciplines, but there are some where he isn't so well informed. Religion, for example, is for him just a handmaiden of the state, providing a justification for conquest and a method of inspiring personal sacrifice for the collective good. This naive functionalism hardly stands up to critical examination, so it was not surprising to find that the "Further Readings" section doesn't mention any studies of religion. (And it has been argued that Macassan contacts with North Australia *did* influence Aboriginal religion.)

But carping too much on this would be uncharitable, given the breadth of Diamond's achievement. He has produced a superb work of synthesis, bringing together history, archaeology, agriculture, linguistics, medicine and many other fields. It is hard to evaluate just how strong his overall thesis is, but he is persuasive and surely has the right general idea. And even those who disagree with Diamond completely may appreciate *Guns, Germs and Steel*, many chapters of which can stand alone. If you are looking for a last minute Christmas present, *Guns, Germs and Steel* is a book which should appeal to anyone who enjoys history or popular science.

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