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Bringing Nature Back In

Geopolitical Theory from the Greeks to the Global Era

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Recent years have witnessed an explosion of interest in the relationships between the physical environment and human affairs. One particularly active area of research has been "environmental security and conflict." The new concern for nature as a factor in human events marks a sharp departure from the main direction of post–World War II international-relations theory, which (with a few notable exceptions)[1] has neglected nature and sought to locate the social causes of social events.

The recent literature typically casts the natural environment as a new factor in politics, but in fact the idea that nature is a powerful

force shaping human political institutions is extremely old. Arguments about nature as a cause of political outcomes were among the first in Western political science.[2] Analysis of nature as a cause was central to Aristotle and Montesquieu, the two major preindustrial writers universally identified as predecessors by twentieth-century political scientists (as opposed to political philosophers). Long before the "greenhouse effect" had even been discovered, let alone connected to human politics, Montesquieu had declared the "empire of climate is the first and greatest empire."[3] Long before the terms realpolitik or geopolitics were coined, political scientists had sought to understand nature as a cause of political events. Thus "bringing nature back in" returns political science to its earliest and most basic theories.

The new literature on environmental security and conflict is also generally antirealist in its rhetoric and content. At the same time, neorealists have sought to downplay environmental issues and exclude them from the "security studies" subfield of international relations.[4] Yet the recent environmental conflict and security literature emphasizes *conflict* as an outcome of natural forces, which is consistent with realism's assumption that conflict, scarcity, and insecurity are endemic in world politics. Thus, despite its antirealist rhetoric, the emergent environmental security paradigm has a great deal in common with realism. The sources of this peculiar estrangement between contemporary realists and analysts of environmental security are to be found in the narrowness of recent realist theory, and the historical shallowness and conceptual underdevelopment of environmental security theory.

The version of realism closest to environmental security concerns is not, however, the neorealism now dominant in American international relations theory, but rather an older and now neglected naturalist and geopolitical realism. This early naturalist and geopolitical theory is also the historical predecessor of contemporary environmental security studies. Unfortunately, the term *geopolitics* has lost the theoretical weight it once had, and has come to be used as a loose synonym for interstate power politics or to evoke an extremely conflictual view of international politics. The actual center of gravity of early naturalist, materialist, and environmental theory was the broad claim that variations in nature caused significant variations in human culture, society, economy, and politics.[5] The conventional association between geopolitics and conflict also conveys an incomplete and misleading view of the scope of geopolitical theory because geopolitics has traditionally concerned itself with the ways in which

environmental factors are the cause of political order, cooperation, and interstate peace, as well as competition and conflict.

This chapter attempts to improve the conceptual sophistication and historical depth of the contemporary debates about environmental security by "bringing nature back in" in three ways. First, I examine several major conceptual issues involved in theorizing about nature as a cause of political outcomes. Simply inserting environmental factors into existing social scientific models is more problematic than recent researchers have recognized. Before nature can be brought back into social science, a set of thorny conceptual problems must be addressed. Because modern social science began its distinctive intellectual career by rejecting natural causes of social outcomes, the implications of the expulsion of nature from social science must be clarified and rethought.

Second, I aim to add historical depth to the environmental security and conflict debate by briefly describing and evaluating three early geopolitical arguments about climate, arable land, and Darwinian "survival of the fittest" metaphors. An examination of these arguments will demonstrate the range and complexity of early theorizing about natural sources of conflict, and the existence of an equally robust body of naturalist arguments about the environmental causes of cooperation and order.

Third, I provide a synoptic summary of arguments, both old and new, about the role of environmental factors in causing the global rift between the wealthy countries of the "North" and the poorer countries of the "South." Melding the arguments of early geopolitical writers with recent work by historians operating with implicitly naturalist approaches, the third section of the chapter illustrates the power of naturalist social science in explaining major features of world politics while challenging the currently dominant social scientific explanations for Third World underdevelopment.

Conceptualizing Nature as a Cause

Many of the propositions being advanced about the political consequences of the environmental change are causal chains that run from human-nature interactions, and/or nature-technology interactions to political outcomes. Neglected earlier naturalist and geopolitical theories explored such causal chains, and set forth a diverse array of claims about the natural environment as a cause of political, economic, and social outcomes. What does it mean to posit nature as

a cause of human behavior? How do such theories differ from more conventional social science? How can naturalist theory avoid eliminating human agency and succumbing to complete determinism?

The Varieties of Naturalism

Naturalist theories are diverse, but all posit nature as a cause of human events. They disagree in their characterizations of nature, in the ways they claim nature shapes humanity, and in the human phenomenon they hold to be caused by natural forces. Naturalist thought comes in at least four[6] main varieties: *cosmic naturalism*, *analogical naturalism*, *anthropological naturalism*, and *functional-materialist naturalism*. The first two varieties of naturalism are pre-scientific or quasi-scientific, while the latter two types are more compatible with scientific understandings of human affairs.

First in breadth and antiquity, is *cosmic naturalism*, where an intuitively grasped cosmology is understood to be guiding human events. For example, astrologists locate the cause of human events in astronomical patterns, but do so unscientifically because propositions are not tested through empirical investigation, and the mechanisms linking causes and consequences are mysterious. Despite the cultural hegemony of science, recent concern over ecological decay has evoked a resurgence and reformulation of cosmic naturalist claims with concepts drawn from modern natural science, most notably mythopoetic formulations of the "Gaia Hypothesis."[7]

A second body of theoretical writings in which nonhuman physical nature plays a central role are *analogic naturalisms*, which hold that the logic of human social systems can be understood as analogous to the operation of natural ones. Although steeped in the images and languages of nature, such analogic naturalisms are not, strictly speaking, natural *theory* because they typically do not claim that nonhuman physical nature is the *cause* of human outcomes, but only that human social processes *parallel* natural ones. Many social science theories indulge in casual or episodic analogic naturalism by borrowing various metaphors and models from natural science, but this borrowing has been mutual, as when Charles Darwin applied "the doctrine of Thomas Malthus . . . to the whole animal and vegetable kingdoms."[8] By far the most elaborate and influential analogic naturalism is to be found in various versions of "social Darwinism."

The use of organic metaphors and analogies to describe politics is fraught with pitfalls and full of undisclosed and unexamined

agendas. In general, there is no convincing reason to believe that deeply recurrent patterns in nonhuman nature—even if properly understood—must serve as a model for human interaction, because human beings differ in so many important ways from other animal and all plant life. Nor is it clear which part or process of nonhuman biological nature is analogous to which part or process of human social and political life.

Third, *anthropological naturalist* theories locate the causes of human behavior in intrinsic human nature—factors such as "race," intelligence, genetic endowment, and deep psychology.[9] Such theories, with a few exceptions[10] have largely disappeared from the study of international relations and political science, but they have not disappeared from the social sciences more generally, as evidenced by the continued vitality of sociobiology, physical anthropology, and biological psychology.

Fourth, of most relevance to issues of environmental security and conflict, are *functional-materialist naturalist* theories. Such theories are behavioral social scientific propositions about how specific human behaviors and institutions result from the interaction of humans with the nonhuman natural environment. These theories rest on the simple assumption that the physical world is not completely or even primarily subject to effective human control, and that these material contexts impede or enable vital and recurring human goals. Such theorists attempt to link specific physical constraints and opportunities given by nature (such as the presence of fertile soil, salubrious weather, access to the sea, and mountain ranges, etc.), to alterations in the performance of very basic functional tasks universal to human groups (most notably protection from violence and biological sustenance). Because humans conceive and carry out their projects in differing material environments, the various ways in which these environments present themselves to humans heavily shapes the viability of various human projects. Such theories are not exclusively about political outcomes, but encompass sociological, economic, and cultural[11] outcomes as well. The functional dimension of such theories stems from the positing of minimalist anthropological naturalist assumptions about naturally given human needs and capacities. Social activity is then assessed as being functionally adaptive or maladaptive in specific material contexts. Social activity is thus understood as mediations between a set of naturally given human needs and capacities, and the constraints and opportunities afforded by natural-material contexts.[12]

Geopolitics, or in more precise and less freighted terminology, *physiopolitics* (from *physis*, Greek for nature), is the subset of functional-materialist theories focusing on variations in the nonhuman

physical environment that shape human *political* outcomes. Thus defined, this tradition of theorizing is as old as political science itself, and encompasses a vast theoretical literature stretching from Aristotle, through Montesquieu to the global geopoliticans of the late nineteenth century. The main effort of these early theories is to show that a handful of natural independent variables (most notably *climate*, *arable land*, *mineral resources*, *population*, and *topography*) shaped patterns of human political life in important and recurrent ways. The range of the dependent variables is also wide, encompassing military vulnerability and capability, patterns of political identity and authority, political competition and cooperation, and modes of production.

Denatured Social Science

What is the relationship between the geopolitical or physiopolitical branch of naturalist theory and social science? Some naturalist theories are social scientific, in that they attempt to explain repeated patterns of human life. But not all, or even most social scientific theories are naturalist or physiopolitical. Most social science attempts to explain human outcomes as the result of human social causes: behavioral outcomes are the result of processes and patterns of human sociality and group dynamics. Thus most social scientists seek social causes of social outcomes. In contrast, naturalist social scientists seek natural causes of social outcomes. Thus social science (the scientific study of human outcomes) has two branches, *natural-social science* (one branch of which is physiopolitics), and what for simplicity and clarity can be called *social-social science* (the study of the social causes of social effects.) Because of the decline of natural-social science most contemporary social science is *denatured* social science. The new concern for environmental decay requires a move beyond social-social science, and back to natural-social science.

The decline of natural-social science and the rise of social-social science were intimately connected. The emergence of social science as a separate branch of academic inquiry in the late nineteenth and early twentieth century entailed an often explicit break with the naturalism of previous political scientists. As the sociologist Samuel Klausner has observed, "in part, social science has asserted its independence as a discipline by demonstrating the limited explanatory power of physical concepts of human behavior."[13]

The tendency of social scientists to neglect natural variables in

favor of human institutional and historical variables has intensified since World War II. In the new academic study of "international relations" defined as a branch of political science, the analysis of natural variables was largely absent. In part this resulted from the general discrediting of geopolitical theorizing produced by the links between Nazi aggression and the German geopolitical theory. The loss of earlier naturalist and materialist arguments is particularly visible in Kenneth Waltz's influential "three images" typology of theories of the causes of war.[14] Nature appears in the "first image" theories about human nature, but in Waltz's analysis of the "second image" domestic theories, and "third image" interstate theories, the earlier geopolitical lines of argument have nearly disappeared.

The expulsion of nature from social science in general, and political science in particular, has paralleled an opposite tendency in historical scholarship. The discipline of history exhibits diverse tendencies, but beginning in the late nineteenth century and widening in the twentieth, "history from below" has come to supplement, if not fully displace, the actor-centered history as the narrative of leaders, great events, and peoples. As the early-twentieth-century Berkeley social theorist Frederick Teggart observed, the older history "is the narrative statement of happenings which concern the fortunes and the existence of a particular nation." Such history "resembles closely that exemplified in Greek tragedy. They have described great and serious occurrences in the light of their outcome, and have sought to make the deeds of heroes and great men intelligible by the imaginative reconstruction of character."[15]

The turn to materialist analysis has been particularly pronounced among historians examining wide ranges of space and time. As the historian Geoffrey Barraclough observed, "the prevalent tendency [in world histories] is to adopt a broadly materialist position, in the sense that their central theme is man's conflict with his environment."[16] Without neglecting nonmaterial factors, historians such as Fernand Braudel, William McNeill, Alfred Crosby, and Geoffrey Barraclough have relied heavily upon material variables in attempting to explain patterns of regional and global history. Thus Braudel, reversing Leopold von Ranke's definition of the historian's enterprise, describes the mountain as more important than the ruler. Braudelian "structures" of the *long duree* are the largely static material realities of "man in his intimate relationship to the earth which bears and feeds him."[17] This rich and growing body of materialist history fits easily with the conceptual frameworks laid out by Aristotle and Montesquieu and constitutes a major resource from which revivalist physiopolitical theory can draw.

The Problem of Agency and Determinism

Before examining specific geopolitical arguments, it is useful to consider the interrelated issues of agency, structure, and determinism in natural-social science. How tightly are outcomes fixed by nature? What role does human agency play in shaping outcomes? And how are political institutions and structures of authority conceptualized? The answers that geopolitical theorists give to these questions are varied, and often implicit rather than explicit. But the conceptual center of gravity in the physiopolitical tradition is a functional-materialist argument distinctive from most contemporary international relations theory.

Geopolitical theorists have held a wide range of views on determinism, agency, and structure. At one extreme are those, such as the German geographer Friedreich Ratzel and the American Ellsworth Huntington, who seem to argue that there is a tight and inevitable relation between the material forces and institutional structures.[18] Humans are presented as the puppets of material forces. If a writer holding this view were perfectly consistent, it is unclear why he or she would write or act. But in practice, extremely determinist claims are often accompanied by extremely voluntaristic exhortations to more "will." Perhaps the most famous example of this combination is found in Adolf Hitler's *Mein Kampf*. At the other extreme is the French geographer Lucian Febvre's concept of "possibalism," which emphasized human freedom in responding to material forces.[19] If taken to its extreme, this view holds that material forces are of marginal and fleeting importance in explaining human affairs, more like scenic backdrops than shaping forces.

Somewhere in the middle is a view that is more difficult to conceptualize but more useful to political science. Material forces significantly define the consequences of the choices humans make, but do not dictate which choice they desire or pursue. Which institutional response(s) are in fact viable is determined, but which institutional response (if any) is made is determined by social and political forces and free agency. While it is not determined that people will make a particular response or adaptation to a particular material environment, it is inevitable that they will bear the consequences of not making an appropriate response. Human institutions are not passive before nature, the puppets of nature, or parts of nature, but it is nature and not humanity that significantly determines whether human actions achieve their goals.

This approach is illustrated by Halford Mackinder's stance toward his famous "Heartland" proposition that certain regions in the interior of Eurasia could form the basis of a world empire.[20] After analyzing material constraints and opportunities produced by the interaction between geography and industrial technology, Mackinder proposed a series of institutional remedies to prevent the emergence of a world empire. Mackinder did not argue either that a Heartland-based world empire would emerge inevitably, or that people elsewhere inevitably would take the steps necessary to avert it. Thus Mackinder's proposition can only be refuted by showing that a Heartland-based world empire does not exist *and* that institutions to prevent such an empire are not a major feature of world politics.

A related common misunderstanding about materialist and geopolitical theory derives from speaking of human institutions as "reflecting" material conditions. Such metaphors are particularly common in naturalist and materialist theories when the Marxian vocabulary of "bases" and "superstructures" is employed to conceptualize the relationship between material contexts and political structures.[21] Such mirror metaphors fail to capture the fact that naturally shaped political structures can be either *compensatory* or *exploitative*. By this I mean that political structures can either be compensations or solutions to some problem or impediment imposed by nature, or they may harness or exploit natural possibilities. Natural forces thus can shape human political institutions in diverse ways. Particular political practices and structures may be solutions or compensations for some naturally given constraint, or they may employ some naturally given asset. But whether by empowering or impeding, natural contexts shape social structures as human agents interact with them.

To sum up, in functional-materialist theory, political institutions are understood to be congealed functional practices—solution sets to meeting recurring needs in particular material contexts. Political institutions do not automatically emerge and they are not parts of nature. Rather, they are constructed by purposeful and at least partially self-conscious human agents. Although created and maintained by human agents and often built according to human designs, functional political institutions are, in their broadest features, not arbitrary or contingent in their design, but roughly succeed or fail according to their ability to achieve or perform the deeply rooted goals and tasks that motivate their construction. Thus, functional-materialism holds that much of human political activity is *practical*: purposeful, but contextualized.

Early Geopolitical Theory

Having sketched several of the main theoretical assumptions of geopolitical theory, we are now prepared to examine specific theories about the natural causes of political outcomes, specifically arguments about climate, fertile land, and the "survival of the fittest."

Climate and the Character of Nations

Prior to the industrial revolution, climate was the single most important topic in geopolitical theory.[22] The first extant work of Greek science, Hippocrates' *Airs, Waters, and Places*,[23] advanced such claims, and climate appears as a prominent variable in Aristotle, the most empirical and scientific of ancient theorists of politics, and in Montesquieu, who occupies a similarly central role in Enlightenment political science. Early climate theories typically divide the earth into temperature zones or belts and then assert that human institutions are shaped powerfully by their climatic position via the intervening variable of individual psychology. In his *Politics* Aristotle delineates three zones and argues that people in cold northern regions were prone to an excess of "spiritedness" (*thumos*) and as a result were ungovernable, but free.[24] The dissociative tendencies stemming from their spiritedness also caused the neglect of the arts and crafts (*techne*), so that northern peoples were relatively uncivilized and technologically primitive. At the other extreme, people in the torrid zones of Asia and Africa (i.e., Egypt and Lybia) were prone to an excess of bodily desire (*eros*). Pursuing the wants of the body, Asians and Africans lived in a condition of material sophistication. But the absence of spiritedness made them relatively passive politically, and more willing to accept despotic rule. Thus Asians and Africans tended to live in highly civilized despotisms.

In Aristotle's view the middle temperate zone permitted a balance between the two appetitive parts of the soul, which in turn permitted reason (*nous*), the weakest part of the psyche, to govern. The Greeks, living in the temperate zone, were thus able to strike a balance and could enjoy the benefits of material civilization without despotism. This climate geopolitics conforms with Aristotle's general emphasis on the "golden mean." He also took the argument a step further by claiming that the Greeks had a natural propensity and right to rule over lesser peoples, thus beginning a long tradition of

explaining and justifying the domination of one group of humans over another by reference to natural facts.[25]

Many early modern writers, among them Bodin and Botero, extended the climate arguments of the ancients. The writings of the eighteenth-century French naturalist social scientist Montesquieu stand in much the same relation to the vast outpouring of early modern theory as Aristotle stood to his Greek predecessors. Like Aristotle, Montesquieu makes a largely unoriginal restatement of views that have subsequently come to be identified primarily with him.[26]

In attempting to understand the origins and variation in the laws of nations, Montesquieu also places a heavy emphasis on the ways in which climate affects temperament, which in turn conditions the type of custom and law of society. Unlike Aristotle, who emphasized the superiority of balanced or middle climatic conditions, Montesquieu argued that colder northern conditions are most conducive to the advance of civilization. Northern climates produce a vigorous and active way of life which in turn stimulates industry and commerce. Like Aristotle, Montesquieu linked colder climates with a love of liberty, and argued that warmer climates produce torpor, which retards material advance and induces political passivity and a predisposition toward despotism. Like Aristotle, Montesquieu did not attribute all political outcomes to climate, but rather recognized that conventions and traditions shaped by lawgivers and historical developments are also important. The arguments of both ancient and early modern climate theorists were based largely upon a limited knowledge of western Eurasia and northern Africa, and were thus flawed by an inability to assess conditions elsewhere.

Arguments about climate as an important cause of cultural, social, and political life began to decline as natural history gave way to modern social-social science in the nineteenth century. But a small number of researchers continued to advance these arguments, most notably S. F. Markham and Ellsworth Huntington.[27] Climate also plays an important part in Arnold Toynbee's elaborate theory of civilization and history. These theories of climate determinism have sought to connect variations in climate with variations in human behavior via the intervening variable of "energy," the capacity for work and labor. Markham and Huntington argue that tropical regions of the world are economically and politically retarded relative to the temperate regions because of the enervating effects of humidity and heat. To anyone from a temperate climate who has spent time in the tropics, this theory has intuitive appeal, and has been supported by studies of physiology and behavior.[28] But as a comprehensive

explanation for relative levels of civilization, Huntington's theories have been broadly attacked and in the field of geography are currently seen as discredited.[29]

A major theme of twentieth-century theoreticians of climate geopolitics is that the development of manmade techniques of microclimatic control such as space heating and air conditioning expand the areas of Earth's surface habitable by "energetic" peoples. S. F. Markham argues that the expansion of civilization into the northern parts of the temperate zone resulted from the development of coal as a source of energy.[30] In this scenario, the harnessing of artificial sources of energy translates into personal and hence social vigor via the intervening variable of temperature-control technology. In this vein a largely antecdotal literature claims that the growth of the "Sunbelt" in the United States since World War II has been made possible by the new technology of microclimatic control, air conditioning.[31]

Over the last twenty-five years the study of climate's role in human affairs has become much more methodologically sophisticated and much less prone to sweeping historical generalizations. Much more accurate and detailed historical data has been assembled by demographers, archaeologists, agricultural historians, and climatologists.[32] A central interest of recent historical analysis has been with the impacts of short-term fluctuations in climate and weather. For example, the "Little Ice Age" that affected Europe between about 1500 and the middle of the nineteenth century caused widespread privation in rural areas as crops failed, and stimulated both social discontent and migration.[33]

Fertile Land and Military Insecurity

After climate, preindustrial geopolitical theorists gave greatest attention to "fertility"—arable land—as a factor in security politics. Between the close of the neolithic era and the maturation of the industrial revolution, the overwhelming majority of humankind were farmers and the main source of wealth was agricultural. Wars were primarily fought for control of arable land. Surprisingly, almost all early geopolitical theorists argued that peoples in more fertile regions suffered from grievous security problems that were directly linked to their agricultural way of life: more fertile regions are wealthier, which saps martial virtue, thus undermining military performance. In contrast, infertile regions produce poor inhabitants who make hardy warriors with incentives to plunder and who conquer

richer and militarily softer peoples in fertile regions. This argument appears in Hippocrates' *Airs, Waters and Places*, Thucydides' *History of the Peloponnesian War*, Machiavelli's *Discourses*, and Gibbon's *Decline and Fall of the Roman Empire*.[34] But its most developed version appears in the writings of Ibn Khaldun, the fourteenth-century North African Islamic philosopher, whose *Muqaddimah* (Arabic for "Introduction") is widely recognized as the first comprehensive theory of history.[35] Ibn Khaldun argues that when "people settle in fertile plains and amass luxuries and become accustomed to a life of abundance and refinement, their bravery deceases."[36] In contrast, "desert life is the source of bravery, [and] savage groups are braver than others," and are therefore, "better able to achieve superiority and to take the things that are in the hands of other nations." He sees history as a cycle in which steppe peoples conquer sedentary peoples, only to themselves succumb to softening and eventual conquest (see figure 2.1).

This argument captures an important feature of premodern security politics. For most of human history, military capability and the martial virtues were closely related, because almost all combat was

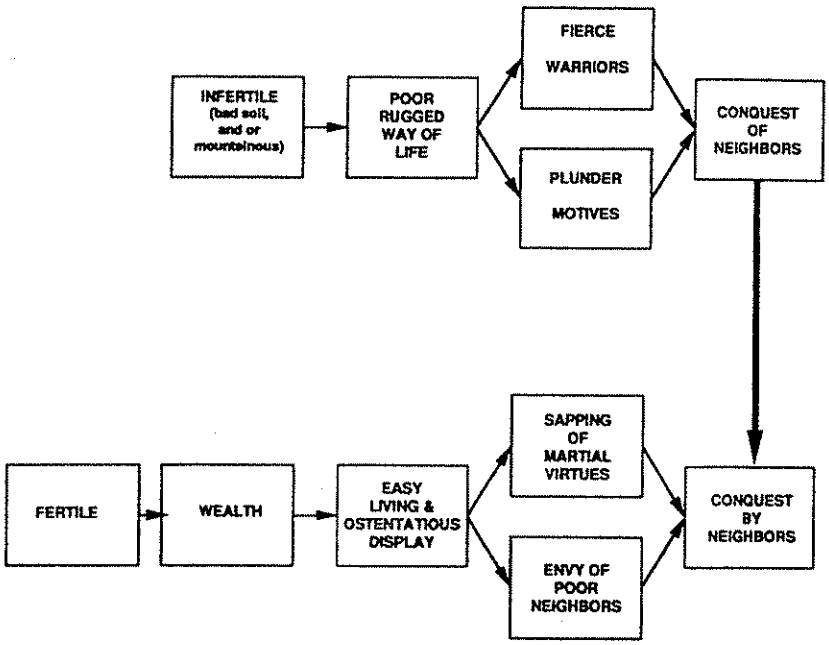

Figure 2.1 Early Views of the Military Consequences of Fertility and Infertility

at close quarters, where individual strength, endurance, bravery, and small-unit cohesion were critical to the outcome of battle. Early armies were also dependent on the feet of the soldiers for mobility, or upon horses and camels, thus placing a premium on physical endurance and conditioning. Martial virtue also was pivotal because technological changes, while important and far-reaching when they occurred, were relatively rare and were rarely monopolized by one group for long. Living close to nature, poor nomadic peoples were accustomed to deprivation and hardship, and so the rigors of war were not so onerous to them. Poor peoples in infertile regions also tended to hunt frequently and to settle their disputes violently, while sedentary peoples did not use arms or have recourse to violence in the course of their ordinary living. Prosperity served as a magnet for plunder, drawing the poor to attack the inhabitants of rich agricultural regions.

This pattern was the dominant one for many centuries, but was moderated by the military disadvantages of poverty and the countervailing advantages of wealth (see figure 2.2). Poor infertile regions supported limited populations, a product of the very infertility that kept them in poverty. But this disadvantage was not as great as the differences in aggregate population figures would suggest. Most of the population in sedentary agricultural regions was unarmed and unprepared for war because the martial arts were monopolized by elites. In contrast, virtually the entire male population of nomadic peoples were capable warriors. The smallness of population in infertile regions did, however, make it much easier for conquerors eventually to be absorbed by the sedentary peoples. The wealth of fertile areas may have been a magnet attracting plunderers and a cause of decay of military prowess, but it also had some compensating advantages: bribes could be offered,[37] mercenaries hired, and better weapons procured.

Wealthy and sedentary peoples also gradually developed institutional and cultural mechanisms to compensate for their environmental disadvantages, most notably sumptuary laws and martial education. Sumptuary laws discouraged excess private consumption and ostentatious display. In classical antiquity, both Sparta and Republican Rome were widely admired for their ability to inculcate martial virtue through civic institutions in which male citizens of all ages participated. In his famous commentary on the Roman Republic, Machiavelli observed that only "laws imposing that need to work which the situation does not impose" can prevent "idleness caused by the amenities of the land." Such laws could make "better soldiers than

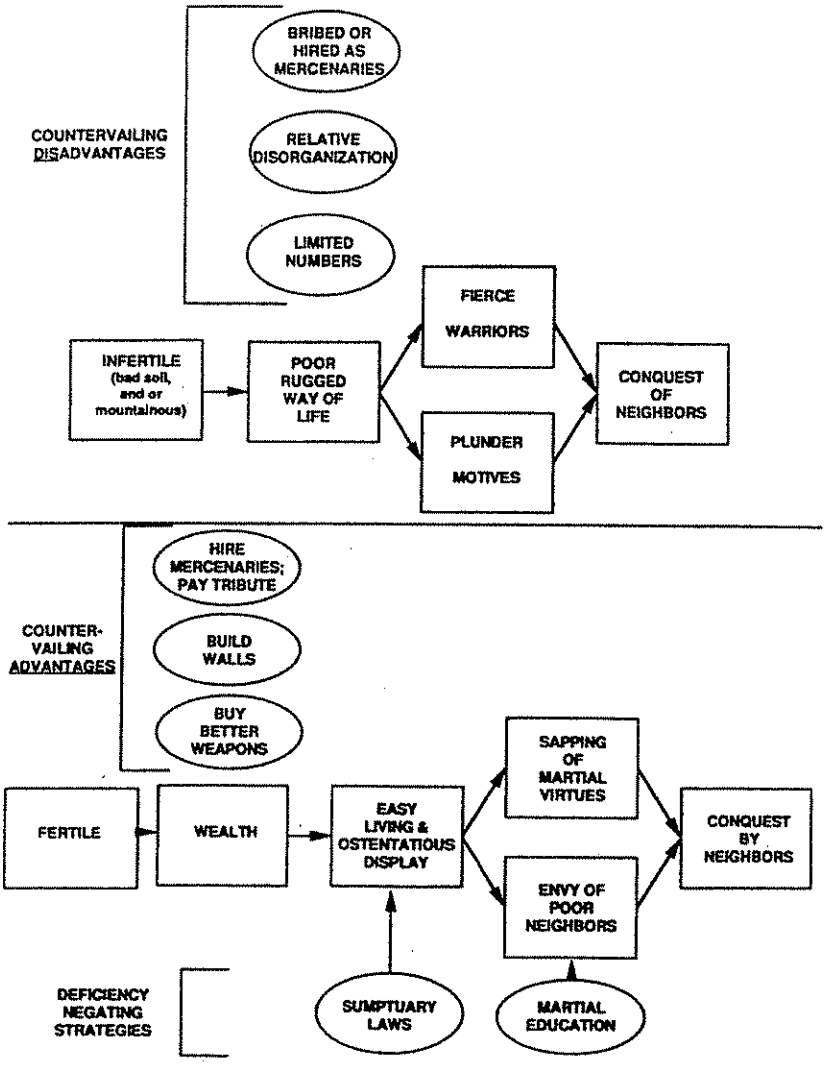

Figure 2.2 Factors and Strategies to Mitigate the Military Consequences of Fertility and Infertility

those in countries which were rough and sterile by nature," making it possible for peoples in "very fertile places" to defend themselves against attack.[38] However effective such institutions might be, they required great effort to create and maintain, and when they decayed the cycle of vulnerability and conquest resumed.

The ultimate solution to the security problem of sedentary peoples was technological. Walls and fortresses helped because the complexity of siege warfare was often beyond the abilities of nomadic peoples to master. Wealth could buy weapons and fortifications, but this was of limited value during the long periods when military technology was stagnant and the best weapons were simple and widely diffused. But the really epochal change was the development of gunpowder weapons. In his famous comparison between the Roman Empire and modern Europe, Edward Gibbon declared that gunpowder weaponry and related advances in military technology had brought an end to the ancient cycle of nomadic domination of sedentary peoples.[39]

The core of the argument connecting fertility and infertility with military outcomes is the claim that military prowess is a function of the way of life of a people that is environmentally determined. For explaining long stretches of history, this argument has considerable appeal. But this venerable naturalist argument has important limiting assumptions that are unarticulated, but variable. Infertile regions could produce military ascendancy only when close combat, employing simple pregunpowder weapons, dominated the battlefield.

Cooperation and Competition in Social Darwinism

In the late nineteenth and early twentieth centuries, the influence of Charles Darwin's theories of natural selection and evolution led to a revival and reformulation of naturalist arguments about the impact of the environment upon politics.[40] Such theories often characterize human groupings metaphorically as "organisms" whose viability is determined by their interaction with their material environment and their interactions with other organisms. But which unit of human life—the individual, the social class, the "race," state, or the human species—is analogous to Darwin's organism?[41] And which natural process—intraspecies competition or cooperation, or interspecies competition or cooperation (symbiosis)—is held to be natural? Depending on how one answers these questions, virtually any social and political practice can be vindicated as natural (see table 2.1).

By far the most influential answer to the unit-of-analysis question was the human individual. Herbert Spencer, in his influential writings on ethics and politics, began with the human individual and then proceeded to build elaborate justifications for laissez-faire capitalist society.[42] In Spencer's philosophy, so influential it has inappropriately been dubbed "social Darwinism," individual human beings

Table 2.1 Darwinian and organic analogies for human politics

UNIT OF ANALYSIS	INTERACTION	
	Competition	Cooperation
Individual Human Being	Herbert Spencer: Laissez-faire capitalism	Peter Kroptkin: "Mutual Aid" communal anarchism
Intrasocietal	Class-conflict theories	Leonard Hobhouse and Lester Ward: Social welfare state
International and Interstate	Ratzel, Kjellan: "organic states" Benjamin Kidd: "national races" Karl Pearson and others: "Aryans" biological "race" war	H. G. Wells: the human species community

are seen as competing fiercely against each other. But exactly the opposite lesson was drawn from the new evolutionary science by the Russian communal anarchist Peter Kropotkin in *Mutual Aid*: human cooperation was the key to human evolutionary success.[43] These cooperative interpretations of human social life were then further developed and applied by a variety of critics of Spencerian laissez faire, notably Leonard Hobhouse and Lester Ward.[44]

The fundamental clash between Spencer and Kropotkin reappears in many guises. In an international version of competitive Darwinism developed by Friedrich Ratzel and Rudolf Kjellen, states are portrayed as organisms in competition for scarce resources, particularly land.[45] Stripped of its vitalistic metaphysic, this line of argument resembles the varieties of realism that emphasize the competitive and zero-sum nature of interstate relations. But even if one grants that states are organisms, the behavior patterns of organisms generally are so varied that it is difficult to imagine an important state function that lacks a natural analog, in which case the organic insight loses all discriminatory and explanatory value. Another approach was to identify separate human biological "races" as the main actors. Sometimes, as in the writings of Benjamin Kidd, the term *race* is a synonym for the *nation*, rather than actual biological groupings. But in the writings of Karl Pearson and others, human biological

races are understood as being in a primal contest for existence. In the hands of Adolf Hitler and the Nazi regime in Germany these racially centered Darwinian analogies served as a warrant for genocide.

In complete contrast, the prolific futurist H. G. Wells, building on both Kropotkin and Hobhouse, posited the human species itself as the basic unit of analysis and the relationship between the human species and nature as the decisive mechanism of the evolutionary struggle. Wells argued that the industrial revolution had produced a new material environment for the human species that required the rapid development of cooperative institutions on a worldwide basis in order to prevent the human species from regressing.[46]

Thus Darwinian analogies were used to justify laissez-faire capitalism, the welfare state, interstate war, racial genocide, and cosmopolitan world government. The biological sciences have a rich language and diverse set of examples, but biological analogies can never be more than interesting suggestions for understanding politics. If a compelling biological analogy constituted proof, than virtually every conceivable proposition in the human sciences could be proven. The inherent elasticity of analogic naturalism warrants a critical skepticism toward recent claims that quantum physics, cybernetics, or chaos theory vindicate any particular political practice or theory.

Nature and the Formation of the World System

Until very recently political scientists had largely abandoned the study of the effects of the natural environment on politics, but archaeologists, geographers, economists, and historians had not, and in recent decades they have made major contributions to geopolitical knowledge. Recent paleo-anthropologists have argued that natural climate change and climatic fluctuations played a key role in stimulating the evolution of humans from humanoids,[47] and the beginnings of sedentary agriculture in the Middle East.[48] Archaeologists and historians have also assembled convincing evidence that anthropogenetic ecological decay played an important role in the decline and collapse of earlier civilizations in Mesopotamia, Mesoamerica, and the Mediterranean Basin.[49]

Of more direct relevance to contemporary politics are geopolitical theories about the role of environmental factors in shaping the very uneven patterns of economic and political development during the emergence of the global system. Over the last half millennium the most far-reaching development has been the explosive emergence of

Europe as the dominant force in world history. In a burst of expansion the Europeans overran almost all the earth and created a dense system of interaction and exchange on a worldwide scale for the first time. Although direct European rule ended in the middle of the twentieth century, a "great rift" between the North and the South continues to be one of the most salient and troubling features of world politics.[50] In attempting to explain these extraordinary developments, three broad clusters of theoretical argument can be identified, two social-social scientific, and a third geopolitical. *External social systemic* explanations, including most Marxism and world-system theory, argue that the North has progressed further because it has plundered and exploited the rest of the world. Most theses on the "development of underdevelopment" emphasize that the source of the South's misery is external and located in the logic of a world system of capitalism and imperialism dominated by the North.[51] In contrast, *internalist social systemic* theories argue that domestic institutional and cultural factors explain the relative performance of these regions. Among the variants of this internalist view are the neoclassical economic claim that market institutions and incentives are the well-springs of development, and the anthropological argument that cultural dispositions toward work and savings are of decisive importance, and the political developmentalist argument that emphasizes states as catalysts of development. Despite their obvious and great differences both externalist and internalist theories look to social systemic, not natural, causes. Whether you are Karl Marx, Milton Friedman, or Gabriel Almond, variations in human institutions, not nature, are most important. A third cluster of arguments, once widely held but now pushed to a marginal status by the decay of geopolitics in political science, maintain that a great deal of the variation in performance between the West and the non-Western world can be explained as the product of ecological and climatic factors.

In order to help situate current debates about North-South environmental conflict in the context of a half millennia of environmental influences, this section will summarize historical arguments about the role of environmental factors in European development, European expansion, and the underdevelopment of tropical regions.

European Advantages

The starting point for the European ascent were changes in the patterns of economic and political activity within Europe in the early

modern era that took Europe in fundamentally different directions than the other great Eurasian civilizations. Three clusters of geographical and ecological factors played an important role in these changes, and their importance is evident when contrasted with regions where they were absent (see table 2.2).

First, late Medieval and early modern Europe was geographically positioned to maximize the benefits and minimize the costs of interaction with other regions of the World Island. As a peninsula of the larger Eurasian landmass, Europe was accessible to travellers from other Eurasian civilizations (Chinese, Indian, Persian, and Arab), enabling Europe to avoid both technological and immunological stagnation. During the 1300s, for reasons not fully understood, but perhaps connected with the Mongol's unification of the interior of Eurasia, Europe was swept by the "Black Death" of bubonic plague that killed approximately a third of the population. This catastrophe contributed to the demise of feudalism and stimulated technological advance by

Table 2.2 Climatic, topographical and positional factors in early modern European history

FACTOR	CONSEQUENCES	AREA WITHOUT FACTOR
Winters interrupt pathogen transmittal	Absence of tropical diseases	Tropical Asia and Africa
Diverse climates and ecologies in relative proximity	Trade in bulk goods facilitated	Middle East, China, and India
Fragmented topography	Military consolidation impeded	Chinese river basins
High coast-to-area ratio	Trade and travel facilitated	Africa
Many rivers without waterfalls, rapids, and swamps	Trade and travel facilitated	Africa
Forests to impede horse mobility	Steppe horsemen disadvantaged	Andian and Meso-America
Human travel accessibility in Eurasia	Epidemological contact: disease endemic rather than epidemic technological diffusion	Andian and Meso-America

making labor suddenly scarce.[52] During this period, many important technologies, such as gunpowder, the compass, and mathematics came to Europe from other regions.[53] Yet at the same time, Europe was militarily buffered during the thirteenth and fourteenth centuries when all the major civilized regions of the Eurasian periphery *except* Europe were attacked by the Mongols and other nomadic peoples from the Eurasian steppes who destroyed cities, massacred the elites, and disrupted commerce. Europe was sheltered from direct military contact with the steppe peoples because the dense forests of Eastern and Central Europe could not be readily penetrated by the horsemen acclimated to the steppe environment.[54]

In contrast, the civilizations of the New World suffered from too much technological and epidemiological isolation, and were at a serious disadvantage when the Europeans suddenly penetrated their long isolation in the 1500s. The Andean and Mesomerican civilizations had isolation-induced technological lag in metallurgy, gunpowder, ships and navigation, and horses. When the European mastery of oceanic transport brought the Spaniards into contact with the Aztec and Incan empires, these disadvantages contributed to their defeat, subjugation, and cultural annihilation.

Second, the physical environment of Europe was particularly well suited to trade, and thus more likely to develop capitalism. Even Max Weber, author of the famous social-social scientific thesis on the role of the "Protestant ethic" in the formation of capitalism, observed that "the first precondition of capitalism was geographical."[55] In Europe accessibility to navigable water is unusually large, because of the numerous islands, peninsulas, and rivers that extend far inland without rapids or waterfalls. Early European capitalist activity was closely related to maritime accessibility and activity: navigable water afforded cheap transportation, thus making exchange possible on a large enough scale to justify production for the market. In the late Middle Ages, Venice, Genoa, and the Hanseatic League depended heavily upon the sea and helped pioneer capitalist practices, to be followed in the early modern era by Holland and then Britain. Europe's significant climatic diversity also contributed to opportunities for trade, because the production of many of the bulk goods for trade (e.g., wine, cork, timber, naval stores, grain, wool, and fish) was confined to specific areas by climatic conditions.[56]

In contrast, African geography and ecology were particularly unfavorable to transport and commerce, thus making economic development and capitalism much less likely there. The African continent has few islands, peninsulas, or coastal seas, and its ratio of sea coast

to land area is particularly unfavorable for maritime access. Most of its major rivers have major rapids, waterfalls, and swamps that impede navigation, and several run through deep canyons and swamps infested with carnivorous reptiles, effectively isolating rather than connecting.[57]

Third, Europe's fragmented topography also had a profound effect on its political development. Prior to the industrial revolution, human mobility over land, whether for military or commercial purposes, was arduous under the best of circumstances and nearly impossible in many terrains.[58] But the landscape presented a very uneven resistance to human mobility. Mountains, forests, and bodies of water greatly impeded military mobility and thus political consolidation, such as in early Greece. Conversely, wide plains and river valleys permitted cavalry mobility, thus encouraging large-scale political consolidation, as occurred in Egypt and China. Because Europe's topography is fragmented by mountain ranges and bodies of water (such as the English Channel), separate political entities emerged in interactive proximity, but could not easily conquer one another. The particularly variegated European landscape thus tended to support a multistate system composed of smaller units than were common in the other regions of the world with comparable material civilization such as China, India, and the Middle East.[59] This meant that smaller states, where self-government was more feasible, could survive in Europe. The existence of an interactive plural state system also contributed to the viability of private property and capitalism, because the ability of capital and skilled labor to flee to more hospitable neighboring countries compelled authoritarian absolutist states to eschew high taxation and the confiscation of private property.[60] The competitive interaction of states also stimulated military technological and organizational innovation, making the European states increasingly superior to much larger imperial states elsewhere in Eurasia.[61]

Ecological Imperialism and the Disease Curtain

The internal features of the European region help explain why Europe was different, but why were the Europeans so extraordinarily successful in subjugating the rest of the world? Advantages in technology and organization were important factors, but ecological and epidemiological advantages that European conquerors and settlers enjoyed when they arrived in the New World and Oceana also played a major role.

As the historian Alfred Crosby has demonstrated, the European explorers and colonists brought with them a wide array of organisms, ranging from the black rat to the horse, that were *better adapted* to the geophysical environments of the Americas and Oceana than were species indigenous to those regions.[62] In the temperate regions of North America, southern South America, Australia and New Zealand, and far southern Africa, Eurasian pathogens brought by the Europeans had catastrophic consequences for the indigenous populations. Crosby's "ecological imperialism" has literal as well as metaphorical meaning. The most decisive ecological factor in European expansion was the impact of disease on indigenous populations. Far more AmerIndians died from diseases inadvertently introduced by the Europeans than were killed by the Europeans in battle.[63] As the indigenous population rapidly declined, the disoriented and disrupted populations were further vulnerable to direct European military attack and displacement. For the indigenous ecologies, economies, and cultures in the temperate zones outside Eurasia, the "national security" consequences of these ecological changes and exchanges were disastrous.

Not only did pathogens assault human populations, but many European plant and animal species also invaded, eliminating or marginalizing indigenous species. In the most extreme example, over the last two centuries New Zealand's ecosystem has come to be almost completely dominated by species brought, often by accident, from Northern Europe.[64] By the beginning of the twentieth century the temperate zones had become "new Europes" where European organisms and the agriculture based upon them thrived, supporting 250 million people of European descent and allowing a doubling in the percentage of all humans who were of European origin. Fueled by these ecological changes at the "great frontier," the Europe-centered world capitalist system enjoyed centuries of expansion, culminating in the great economic boom of the nineteenth century.[65] The rapid expansion and development of the United States as a "people of plenty" thus had as much to do with ecological change and displacement as with American institutions and culture.

In contrast, the trajectory of European expansion was quite different in the tropics. Here the ecological balance of power was not favorable to either European peoples or other temperate zone organisms. For several centuries, numerous diseases found only in the Tropics formed a "disease curtain" impeding European penetration of sub-Saharan Africa, the Amazon Basin, and the interiors of the islands and peninsulas of South East Asia.[66] The lag between contact

and penetration was particularly extreme for Africa, which was circumnavigated by the Europeans four and a half centuries before Europeans explored and mapped its interior. It is notable that the European penetration into Africa in the middle of the nineteenth century was significantly dependent upon advances in tropical medicine.[67] But even with these advances, Europeans did not migrate to tropical regions in significant numbers. The net effect of tropical diseases and ecology was to keep the Europeans at bay for centuries, providing the technologically ill-equipped indigenous populations with the functional equivalent of a military force capable of destroying European armies equipped with advanced military technology. Because of the disease curtain Africa was subjected to direct European control last, and was subjected to European rule for less than a century.

Tropical Impediments

A related set of geopolitical arguments hold that natural impediments to economic and political development in the tropics in general, and Africa in particular, help account for the North-South divide. Advocates of this view begin by observing that the terms *North* and *South* obscure the fact that the underdeveloped South lies in the tropics, and that the few lands of temperate climate in the southern hemisphere (Argentina, Southeastern Brazil, the Union of South Africa, and Australia and New Zealand) have populations, economies, and polities similar to those found in the temperate North. In short, there is a strong correlation between temperate regions and economic development, and between tropical regions and relative underdevelopment. In attempting to explain this pattern, Andrew Kamarck, former Director of the Economic Development Institute at the World Bank, argues that high temperature and humidity hinder agriculture and handicap mineral exploration while enervating humans through disease and direct physiological restraints on strenuous labor.[68] Many diseases that debilitate hundreds of millions of people in the developing countries—malaria, schistosomiasis, trypanosomiasis, leprosy, onchocerciasis, and yellow fever—exist largely in tropical climates.

The impact of these impediments has been most severe in Africa, which is the most tropical continent and the least economically developed. A full survey of these impediments is impossible here, but one example is illustrative. Some ten million square miles of Africa (an area larger than the United States) is infested with the tsetse fly,

which is a vector for diseases that kill and debilitate cattle and transport animals. These African insects are very similar to the black flies that infest northern North America, but African fly populations, unlike those in regions with killing frosts, breed continuously, thus making possible the uninterrupted transmission of infectious microorganisms.[69] The consequences for Africa's development were monumental: without animals for transport the populations of vast tracts of central Africa were isolated economically from each other and the outside world, and human slavery was highly expedient.[70]

A somewhat different version of the tropical-impediments argument has been advanced by the Tanzanian political scientist Ali Mazrui. He speaks of the "frozen ecology of capitalism," and links Africa's lag in development to climatic factors, to what he calls the "winter gap."[71] Long and harsh winters forced the Europeans to develop habits of saving and planning, but Africans, lacking such stimulus, did not need to acquire these cultural traits so central to development. In contrast to Kamarck's emphasis on environmental obstructions to wealth generation, Mazrui emphasizes the absence of the need to compensate for environmental deprivations by generating wealth in order to survive. The emphasis of one on abundance and the other on impediments to capital formation seem at odds, but can be reconciled: the tropical environment affords subsistence abundance but impedes further labor and accumulation.

The tropical-impediments argument also casts the prospects for technology transfer in a pessimistic new light. If tropical environments impose a distinct set of constraints to development, many important technologies will not "diffuse" or "transfer" from temperate to tropical environments. An implicit assumption shared by the capitalist, modernization, and unequal exchange approaches to development is that the world has a homogeneous development potential, so that only "Chinese walls of exclusion,"[72] the "cake of custom," or "unequal exchange" impede universal modernization. However, the tropical-impediments argument suggests that there are at least two populated "worlds," one temperate and one tropical. Environmental conditions are sufficiently different that some basic technologies, particularly agricultural and medicinal, will have to be largely reinvented before sustained wealth generation can occur in the tropics.[73] Not surprisingly, efforts to modernize by the introduction of systems of agriculture developed in the temperate regions into tropical regions have often been economic failures and ecological catastrophes. The peculiar ecology of the Amazon rain forest has repeatedly frustrated even the most well-funded and ambitious agricultural and silvicultural

schemes.[74] These failures have led many ecologists to emphasize the importance of building upon local "agro-ecological" approaches instead of importing temperate zone forestry and agricultural systems.[75]

Conclusions

This brief analysis, sampling, and survey has mapped some of the promise and problems of bringing nature back into social science. For political scientists and security analysts, this project has just begun, and much work—both conceptual and empirical—remains to be done. This essay has illuminated some of the conceptual moves and pitfalls that attend this enterprise, and has demonstrated that geopolitical approaches have both a long history and considerable explanatory power in explaining important political events of the past. Three observations by way of conclusion emerge from this analysis.

First, to provide a robust analysis of the impact of natural factors and human-nature interaction, social science must supplement its concentration on social causes of social outcomes by returning to the natural-social scientific approach of the geopolitical tradition. Simply injecting natural variables into existing social scientific models is not likely to be very fruitful. Rather, a far-reaching reconceptualization of the role of nature in social practice is needed. Both logic and past efforts demonstrate that analogic naturalism is a perennially seductive but inevitably fruitless avenue, and that functional structural approaches promise better results. Unfortunately, the recent turn of social theory away from structuralism to an emphasis on the socially constructed nature of reality, while offering many insights and correctives to mechanistic structural arguments, could exacerbate the incapacity of social science to deal with environmental issues. Social structures are constructed by humans rather than themselves being natural. But social practices rise and fall and are valued or rejected not solely—or even primarily—because of socially constructed criteria, but rather because of their ability to function successfully in meeting enduring human needs in material contexts that are both diverse and shifting. Social constructions inevitably shape how nature is perceived and acted upon, but nature itself is not socially constructed, and any social science that assumes so will inevitably be blind to important aspects of human life. Nature constitutes a structuring reality for human beings that is not socially constructed. In short, a return to functional-materialist theory is the key to bringing nature back into social theory.

The second conclusion that emerges from this chapter is that geopolitical theories of conflict and cooperation have a long and diverse lineage, and defy easy classification. Earlier geopolitical theories of the impact of arable land upon security exhibit both the strengths and weaknesses of geopolitical theorizing. Here the conventional wisdom among analysts of environmental security is challenged, forcing the realization that the ways in which natural factors impinge upon the performance of security institutions is not straightforward and is often counterintuitive.

Third and finally, the synthetic reconstruction of a geopolitical explanation for the rise of Europe and the great North-South divide demonstrate that the legacies of environmental factors on politics are both profound and long lasting. Here geopolitical theory should serve to deflate the self-confidence and arrogance of the currently hegemonic Western civilization by showing that its rise and influence owes as much to contingent and accidental natural factors as to institutional innovation. At the same time, this geopolitical account undermines the optimistic and progressive assumptions of the Third World left that uneven and failed development is going to be solved by an institutional agenda of redistribution and equal empowerment.

Looking to the future with this naturalist understanding of the past and present, we are left wondering where the next turn of nature's wheel of fortune will leave the world. On the basis of what has come before, we can be confident only that the ways in which mother nature shapes the fates of her human children will be as powerful, as complicated, and as unpredictable as they have always been.

NOTES

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