NATURE'S ROLE IN LATIN AMERICAN GOVERNANCE AND HISTORY

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EL NIÑO IN HISTORY: STORMING THROUGH THE AGES. By César N. Caviedes. (Gainesville: University Press of Florida, 2001. Pp. 279. $24.95 cloth.)

WINDS OF CHANGE: HURRICANES & THE TRANSFORMATION OF NINETEENTH-CENTURY CUBA. By Louis A. Pérez, Jr. (Chapel Hill: University of North Carolina Press, 2001. Pp. 199. $18.95 paper.)

NATURE AND CULTURE IN THE ANDES. By Daniel W. Gade. (Madison: University of Wisconsin Press, 1999. Pp. 287. $18.95 paper.)

LINES IN THE WATER: NATURE AND CULTURE AT LAKE TITICACA. By Ben Orlove. (Berkeley: University of California Press, 2002. Pp. 287. $19.95 paper.)

THE GREEN REPUBLIC: A CONSERVATION HISTORY OF COSTA RICA. By Sterling Evans. (Austin: University of Texas Press, 1999. Pp. 317. $40.00 cloth, $19.95 paper).

STATES OF NATURE: SCIENCE, AGRICULTURE, AND ENVIRONMENT IN THE SPANISH CARIBBEAN, 1760–1940. By Stuart McCook. (Austin: University of Texas Press, 2002. Pp. 201. $22.95 paper.)

COLONIZATION AS EXPLOITATION IN THE AMAZON RAIN FOREST, 1758–1911. By Robin L. Anderson. (Gainesville: University Press of Florida, 1999. Pp. 197. $55.00 cloth.)

SPACE IN THE TROPICS: FROM CONVICTS TO ROCKETS IN FRENCH GUIANA. By Peter Redfield. (Berkeley: University of California Press, 2000. Pp. 345. $24.95 paper.)

The natural resource endowment of countries shapes choices that are made at national and local levels in regards to economic and social development. This legacy from nature includes the types of natural ecosystems present, the soil and climatic constraints that act upon those ecosystems, and the native plants and animals to be found. People occupy the land, installing homes and settlements and importing, inventing or adapting landuse systems for agricultural, pastoral, and

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silvicultural production. Natural environments are modified, converted, or enriched, depending on the perspective(s) of the observer and what criteria are utilized to evaluate the kind and degree of change. For example, agricultural systems utilize a set of domesticated plant and animals species now introduced around the world, a process of globalization that began with the first dispersals of humans and cultural artifacts. Often the extraction of forest resources or the need to establish pastures or fields in place of original forest results in deforestation or conversion to another type or phase of forest. In evaluations of these kinds of landuse and landcover change, sensitivity towards and knowledge of history and ethnicity is critically important, because most of these landscape conversions have played out sequentially or interactively beginning millennia ago, accelerated by the far-reaching effects of colonization, and further interwoven with national agendas and global interventions to the present time.

The authors of the books reviewed here explore these topics from disciplinary viewpoints of anthropology, geography, and history. Some of the authors look at climatic norms and extremes in relation to societal preparations for natural resource production and for the effects of inevitable natural disasters. Others evaluate the uses of native or introduced plants and animals, and the effects on plants and animals of that usage. Others take the history of colonization and/or globalization and apply its lessons to natural resource use, landcover change, and changing socioeconomic systems. Collectively, these works provide an insightful set of examples of differing approaches for evaluating nature-society interactions in Latin America.

César Caviedes takes a global perspective, but with considerable detail provided on implications for Latin America, on the El Niño Southern Oscillation (popularly shortened to El Niño) in his book entitled *El Niño in History: Storming through the Ages*. The tale begins with descriptions of the fundamental linkages initiated with energy balance in the world's tropics and in particular how it affects temperatures in the Pacific ocean leading to a repeated shift (or "oscillation") every several years in air pressures, wind directions, and ocean currents. Both atmospheric and oceanic circulations are altered, not only in the Pacific basin, but globally due to connections that link climatic changes in one place to changes elsewhere. Caviedes provides an engaging account of how knowledge of this global phenomenon was traced from perceptions of changed maritime conditions by fisherpeople on the coast of Peru and from historical documents reporting anomalous conditions in certain years on the land and on the seas.

One surprising connection is that tropical environments usually kept moist by rains produced from rising air masses are often instead affected in those El Niño years by clear conditions and drought. Caviedes

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gives convincing yet nuanced case examples of droughts in the high elevations of southern Peru, Bolivia, Mexico, and the especially devastating droughts of northeastern Brazil, which had many consequences for national development and population shifts. He shows similar connections to droughts in sub-Saharan Africa, parts of India, and Australasia. Years following strong El Niños are often replaced by "La Niña" years wherein places that are typically moist receive particularly strong rains. The sudden planetary flips from one state to another form yet another clue that global processes are at work, making predictions possible. Ironically, hurricanes in the Caribbean are particularly common and destructive during La Niña-type years.

Nature plays a role in setting the environmental stage upon which world history is played out. Caviedes provides examples of plausible ties between El Niño climatic extremes and warfare and social strife in Europe, Africa, and China. Yet he returns at the end of the book to show that "El Niño . . . is eminently a phenomenon of South American climatology" (216). Although the ties he discusses from the archaeological and historical record for coastal Peru, Amazonia, and southeast Pacific islands are conjectural, they are plausible. He essentially asserts that human agency explains only part of human history, with another important aspect coming from knowledge of the actions of natural cycles, in this case due to the shifts in wind and rains. His figure 2.1 shows how El Niño can cause physical changes leading to floods, crop failures, and the collapse of fisheries. His further linkages to political repercussions in the form of governmental responses and possible institutional instabilities must be controversial, but also should stimulate follow-up research from a variety of disciplinary perspectives.

Louis Pérez, Jr. also examines atmospheric phenomena, in this case the winds and destruction associated with hurricanes, which also have profound ramifications for people and their goal setting. In this nicely illustrated book, he looks at the Caribbean, which is frequently under the influence of tropical depressions and hurricanes in the months from June to October. His book, entitled *Winds of Change: Hurricanes & the Transformation of Nineteenth-Century Cuba*, appraises the Caribbean's largest island in terms of how development history was intertwined with the consequences of repeated strikes by hurricane-force winds. In particular, there were successive hurricanes in the 1840s with impacts that continue to reverberate in island history because of effects on settlements, agriculture, and livelihoods. He states "Urban residents and rural folk alike, their way of life, their occupations and routines of daily existence, were changed permanently and in the process transformed the course of Cuban history" (11). The book is organized into six chapters that 1) assemble data on Cuban hurricanes from 1494 to 1850; 2) document agrarian development from the start of the nineteenth century;

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3) examine devastating hurricanes in 1844 and 1846; followed by 4) an account of post-disaster shifts in export goals from coffee to sugar and tobacco, linked to changes in how black slaves were used and how they resisted through uprisings, 5) rebuilding efforts in cities and the countryside, and ending with 6) an account of yet another hurricane in 1856 and subsequent influences on society as traced through literature, economics, and politics.

In this case, nature's role becomes one of the defining characteristics of Cuban nationalism. Pérez's argument is interesting and warrants critical examination with respect to the historical record and in relation to competing explanations dealing more with the off-island effects of global markets, and on-island effects of colonialism and slavery. It would also be of interest to utilize Caviedes' call for a global perspective on atmospheric phenomena to appraise the specifics of timings of the catastrophic hurricanes in Cuba since a brief examination of Caviedes' data on Caribbean hurricanes in his table 6.1 does not support obvious ties to the Cuban hurricanes listed by Pérez in his table 1.1. Further examination would be appropriate.

Daniel Gade directly addresses the complex and sometimes subtle ties between humans and society in his book entitled *Nature and Culture in the Andes*. His study region consists of Ecuador, Peru, and Bolivia, particularly the highlands and adjacent lowlands affected by highland people. He writes of seven case examples that could be labeled as historical ecology or ethnobiology, but viewed through his perspective as a cultural geographer called to interweave those examples with broader questions on how to interpret the people and landscapes of the Andes. His beginning and concluding chapters make explicit his goal of searching for more holistic explanations, not restricted to reductionism. For example, he states that the case examples are meant to integrate "ecology, space, and time into an intuitively derived unity that I call the culture/nature gestalt" (216). His first chapter would provide a useful introduction to philosophical and geographical literatures on nature-society relationships, and in particular to how Carl Sauer operationalized those concerns in Latin America. Gade's personal account is informative and richly illustrated with good quality photographs and detailed maps and tables.

The case examples all build upon fieldwork and archival research by the author. He first examines the numerous Andean highlands that lack extensive forest cover but which appear climatically capable of supporting forest vegetation. Many areas have less forest cover than expected due to past clearing, burning, and extraction of forest products. Gade is particularly gifted at clarifying the likely role of European control during the colonial period in further reducing forested areas. He states, "My personal assessment, based on travel and satellite imagery, is that less

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than 3 percent of the central Andes is in native forest" (73). The next example examines interrelationships among colonial settlement in eastern drainages of the Bolivian highlands, population changes, and the effects of malaria. Until malaria could be controlled in the 1950s, its presence altered the paths of land use change in "virtually all parts of the Andean region below 2,000 m" (101). The third example returns to the highlands to examine the nature of native Andean pastoralism, and in particular why native domesticated camelids were never used for dairy products and what happened in the Andes as cattle, sheep, and goats were brought as part of imported Old World landuse systems.

The implications for better understanding nature-society interrelationships are profound in these examples. He continues with the case of a proposed linkage between tapirs and magical practices apparently meant to treat such maladies as epilepsy. Yet another example discussed in some detail refers to the cultivation of coca in eastern drainages by Andean people, including the Incas, which drew highlanders down into the lowlands to grow this valuable plant. Although remote today, in fact these areas were integrated into regional trade networks from an early date, these economic links survived through the colonial period. Gade then takes a detour to the Ecuadorian coast where he interrogates Guayaquil as a city influenced by the stresses of urbanization, including the effects of introduced rats accompanied by bubonic plague. His final example examines the career of Carl Sauer in relation to knowledge of the domestication and diffusion of crops. Gade updates plant examples where Sauer's conclusions have been superseded, but also celebrates Sauer's goals and imagination in examining the human-society nexus.

Lines in the Water: Nature and Culture at Lake Titicaca, by Ben Orlove, is also a personal reflection on nature's legacy based upon many years of immersion and study in Latin America. He too moves from personal experiences in the Andes, to inspirations from the literature, including novels and environmental philosophy. His goal is to better understand the Andean villagers living next to Lake Titicaca, a spectacular high elevation lake in the central Andes. The insights Orlove shares are embedded in a chronological account of his studies in the Puno area in the 1970s and are updated to the present. He examines local versus national attempts to control fishing and other resource extraction in the lake. He communicates the difficulties of research given the subtleties involved in understanding long-term subsistence practices and the added complexity of deciphering different meanings underlying the Quechua used by his informants and the Spanish-dominated urban and national discourses on natural resource use. By the 1980s local fishers had wrested back control of most of the lake's resources from the central government, and in Orlove's opinion, this was for the better: "they manage the lake well" (46).

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This is a nature that is commodified by people for products from Lake Titicaca, but also a nature that is viewed differently by long-term residents dependent for subsistence and existence on those products compared to the urban-based needs and goals of others who insist on using planning and management prescriptions from elsewhere. Orlove's anthropological and linguistic sensitivities to other people's perspectives are illustrated throughout the book. His contrasts between the aspirations of objective, data-based scientific methods compared with the knowledge, attitudes, and responses of local people are thought provoking. The local response appears to fit a more general case of how territoriality and access to natural resources are mediated by Andean traditions and Andean peoples. Orlove contextualizes both fishery practices and the use of totora reed (technically a sedge) for boat and raft construction and as cattle forage. The traditional management of the reed conflicts with the goals of Titicaca National Reserve, designed to fit national biodiversity conservation goals of a protected high Andean wetland. The reed beds are productive for people because they are harvested, however this potentially disrupts the nesting of rare birds within the reserve. By the late 1980s, the reserve was "a protected area that is depicted on maps and discussed in reports, but is not managed in any way by government officials or scientists" (208).

Lake Titicaca's indigenous fisheries utilized the indigenous fish of the lake, small fish species found nowhere else but the high Andes. Current fishery practices, nicely described and illustrated by Orlove, also include the very different methods used to capture two introduced fish species that are commercially valuable, rainbow trout from the United States and silverside from Brazil and Argentina. The conservation of native biodiversity is an important national and global goal: Orlove graphically describes the intersection and conflicts of that aspiration with the need for local people to use natural resources for food and income. In his concluding chapter, he puzzles over whether his writings on Lake Titicaca should be considered a conquest narrative, documenting old and new struggles of indigenous people for their rights, or as a narrative about economic development paths. Neither really captures Orlove's innovative attempt to derive a new approach that adds in his informants' viewpoints and actions as they remake their social and natural environments in ways that build on their heritage in unique ways.

Nature conservation efforts in Costa Rica are interesting for the rest of Latin America because they are often highly visible in the environmental literature. Of course there are limitations on using the conservation of native biodiversity as a single lens for evaluating a country. Costa Rica may have an admirable park system, but it also has high indices of environmental loss due to deforestation and the resulting

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fragmentation of original forest cover. Some researchers question if the United States-inspired goals of declaring wilderness areas and endangered species protection as the targets for conservation are appropriate models for other places in Latin America. Sterling Evans does a fine job of documenting the history of the national park and nature reserve system in Costa Rica in his book entitled The Green Republic: A Conservation History of Costa Rica. He then grapples with the question of whether there are more general lessons to be learned.

He clarifies the scientific, institutional, and national contexts that permitted the development of a protected area system that is admirable on its own merits. Some of the explanations for this success can be found in Costa Rican history and in more recent global economic and social developments. In addition, the critical roles of several key people are discussed, in particular Mario Boza and Alvaro Ugalde, the 1983 winners of the Getty Prize for conservation. This focus on several key Costa Ricans allows the reader to follow the sequence of events as many other people are mentioned, political events within Costa Rica are described, and the gradual assembly of the park system is elaborated on into the 1990s. The scene is set by describing foreign influences on scientific explorations and on institution building beginning in the late 1800s, perhaps uniquely continuing to the present with sustained efforts by the Organization of American States, the Tropical Science Institute, and the Organization of Tropical Studies, now a consortium of more than fifty universities, which runs field stations and field courses in Costa Rica. These attributes kept a pool of qualified environmental scientists in country. The initiation of the protected area system was pioneered by Costa Ricans who were able to get the establishing legislation passed. Evans is generous in listing many other Costa Ricans and their contributions, but always Boza and Ugalde emerge as critical spokespeople, administrators, and experimenters as they react to local land disputes, shifting national politics, and international interest in Costa Rica. The last factor became important in the early 1980s because it was possible for the national debt crisis to be ameliorated by the encouragement of donations and loans from foreign governments and from international environmental nongovernmental organizations. Costa Rica became a world showcase for how debt forgiveness could be "swapped" for commitments to continue to add lands to the protected area system.

This book is an indispensable resource for understanding these years in Costa Rica. The second part does a nice job of broadening the lessons to be learned so that comparisons potentially can be made to other countries and to evaluating the relative roles of different parts of society in effecting change. He describes how environmental education served to promote Costa Rica's parks into a source of national pride and identity.

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He describes the pervasive role of nongovernmental organizations and the critical contributions of ecotourism in two separate chapters. Finally, he mentions the unique Instituto Nacional de Biodiversidad, which has been able to leverage native biodiversity to receive both scientific and commercial investments.

Evans asks "Is Costa Rica a 'green' republic?" It obviously is by many criteria. But this achievement appears to be unique, due to a history of having no military and a comparatively fair distribution of lands, of welcoming personal and financial contributions from outsiders to the national scientific and environmental community, of having tourism destinations within reach of visitors from North America and Europe, and of enjoying the effective participation and leadership of dynamic Costa Ricans. Evans says that "it was the combination of the country's unique biogeography, legacy of scientific inquiry, and reliance on primarily locally owned and relatively small agricultural units that provided the foundation for Costa Rica's conservation success" (245). If so, Costa Rica is a model example of the result of the convergence of those social and institutional parameters, but not a model useful for duplication in many other places in Latin America.

Stuart McCook, in *States of Nature*, presents a broader nature-society evaluation by looking at how the production of exports of coffee, tobacco, sugar, and other plant-derived products shaped landuse, landcover change, and institutional development in five countries. He uses examples drawn from Colombia, Venezuela, Costa Rica, Cuba, and Puerto Rico, and connects national development trajectories with shifts in global markets. His operating premise is that this development can be explained through concomitant developments in the agricultural and plant sciences. Institutionally, this relation can be documented through the actions of botanical gardens and experiment stations as the respective areas shifted from being colonies of Spain to being independent countries. This stance also allows him to evaluate the development of science itself, in terms of goals and practice.

McCook begins this task by describing science as practiced in the Spanish Caribbean during this time period, which he labels "creole science." This effort consisted of undertaking botanical inventories, adapting the local or national science to that practiced elsewhere (principally in the United States), and dealing with environmental problems created by the establishment of large monocultures in tropical lowlands. The book is organized in terms of major time periods and applications of scientific efforts. The first chapter is an overview of the plant sciences from 1760 to 1890. Obviously this tale begins with the efforts of Spain to systematize knowledge of plant resources in the New World. Independence required the national development of scientific capabilities, including natural history surveys. It was with liberalism (1850 to

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1900) that the shift to export-driven economies required technical solutions to maintaining crop production despite diseases and other environmentally related problems. The second chapter provides more details on the plant sciences in Venezuela and Costa Rica: the national emphases were on the practical goals of documenting the presence of useful plants and the distribution of ecological zones, while scientists also tried to interact with their peers in the United States and Europe.

The third chapter shifts to Cuba and Puerto Rico in order to compare and contrast the role of science in agricultural development from 1898 to 1930. Some efforts went into creating alternatives to the export-producing plant crops, while other ventures were focused on treating diseases and other limitations on crop production. In both countries, the United States affected and, in some experiment stations, controlled what research was done and how and to whom results were distributed. Because agricultural science most clearly increased production for the sugar industry, McCook evaluates this aspect in more detail for 1780 to 1930 in his fourth chapter. This time period became a history of plant diseases. He states "It is not a coincidence that these epidemics erupted at the same time that the value of Latin America's agricultural exports reached new heights" (78). The diseases needed to be better understood in terms of the causal environmental factors and the pathogens involved. But they also were acting upon genetically impoverished sugar cane strains that in some cases could have been improved through the development of hybrid varieties. This in turn led to events described in his chapter five where the tropical agricultural research institutions in Puerto Rico and Colombia were formally established.

McCook's final chapter considers plant science up to the start of World War II, with its continual efforts to formalize research. Nature in this book is in part a passive recipient of change imposed by agriculturalists. Their motivations in turn are shaped by global markets and nationally directed incentives for producing exports. Where nature becomes an active participant, especially as mediated through scientific research, is in the interplay among fungal and insect diseases and the genetic variation within the crops that could be manipulated to reduce disease impacts while also improving yields and quality. McCook states that his research "highlights the importance of nature as an analytical category: as a variable that requires explanation rather than as constant that does not" (4). The natural and applied sciences are a tool for permitting the dominion and partial control of nature.

Robin Anderson, in *Colonization as Exploitation in the Amazon Rainforest*, takes on a similar period of world history but examines the consequences for the world's largest and most diverse rain forest. As the title suggests, the occupation of lands by Portuguese explorers and settlers was meant to convert the Amazon into a resource-supplying

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area for Europeans and later for global markets. One of Anderson's goals is to derive lessons and warnings for the current planners who wish to colonize and settle the Lower Amazon. This task is done in a comprehensive narrative style arranged chronologically and presented in considerable detail. There is also an appendix that clarifies the sources of quantitative data, qualifies their possible errors, and provides several regression analyses that test if one product meant for exportation altered the amounts of production of other products.

After a description of the general features of eastern Amazonian environments, Anderson then describes the establishment and functioning of the Directorate that organized Portuguese colonization efforts from 1758 to 1798. This time period was from the start characterized by overexploitation of valuable resources, followed by switches to alternative or new resources. Indian and slave labor carried out the hard work of resource extraction and the establishment of settlements. Agriculture was meant to feed laborers and to provide some export products. Anderson states "Economic exploitation of available goods from forest and river has been at the root of all penetration and colonization of the Amazon Basin" (40). This history up to 1911 constitutes the remainder of the book.

By the time of independence in 1822, there were internal episodes of violence that affected agriculture and resource extraction over the following decades. It was the rise of rubber as a global commodity that eventually dominated discourse and trade in the Amazon, and especially as controlled by elites in the city of Belem. Anderson characterizes this period to 1911 as "a hodgepodge of schemes, programs, plans, projects, and designs"(84). Interior lands, away from the river floodplains, became places to settle. The droughts in northeastern Brazil (connected to El Niño by Caviedes) also drove the entry of settlers into the Amazon. Anderson provides information on how and where land was settled, including the health and logistical difficulties experienced by migrants.

Nature's role in the colonization of the Amazon is obvious to the extent that it provides the forest and river ecosystems to people who then extract useful products or convert them to croplands and pastures. Anderson's account is a detailed but standard description of how colonization and settlement took place. Its unique aspect is the Epilogue, where the author tries to extract conclusions that will be useful in thinking through the deforestation, loss of indigenous lands, extraction of iron ore, and the new transportation routes that characterize today's changing Amazon. Thus, the "Amazon Basin has been and remains a colony of the more developed parts of the world" (141).

Peter Redfield brings the reader to the present and then aims his book towards the future by examining the contradictions inherent in turning a tropical rain forest area first into a penal colony and then into

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the high-technology blastoff site of the European Space Agency. He entitles his book, *Space in the Tropics*, and asks "How is it that a small wedge of the South American continent, long claimed by a major European power and still administered by it, could present a profile of wilderness at the end of the twentieth century? How might this same location on the globe have proved useful for such an unlikely combination of purposes as the resettlement of convicted criminals and the launching of rockets?" (xiv)

The "Devil's Island" penal colony was operated by the French government from 1852 to 1946. Following two introductory chapters on his research orientation and on the history of how French Guiana went from colony to department, Redfield provides insights into the historical context of the bringing of convicts, the procedures used, and the resulting consequences for the people involved against their wills. As an example, by 1866 more than 17,000 convicts, including political prisoners, had been sent to French Guiana; about 40 percent perished, mostly due to diseases. He illustrates the hardships by reference to particular cases and high-profile prisoners, and he includes summaries of published accounts by survivors. The tropical rain forest served as a natural incarcerating barrier, because convicts were typically reluctant to enter the forest to escape.

Redfield then shifts to the present by describing the launch of the Ariane rocket in 1979, which signified Europe's entry into the space race by sending up satellites. Kourou, centrally located on French Guiana's coast, was transformed into a space center in 1965. The odd disconnects that resulted between its short-term residents and nationals are described and illustrated. In addition, Redfield points to the irony of how nature is used as a symbol: the proximity of the rain forest, within a "wilderness preserve," lends the Space Center the sense of being a "clean industry" and suggests that the Center's activites, such as satellite launching, are environmentally benign.

Once again nature is presented as an almost passive entity— the recipient of changes imposed by French and European colonialism and a means to deal with domestic concerns and obtain global self-glorification by influencing economic and political decisions in South America. The paradoxes, mixed signals, and awkward roles of Europeans in tropical environments are further evaluated by Redfield in three concluding chapters. He points out additional ambiguities inherent in the ecotourism industry of the French Guiana rain forest and the current strife between development planners and environmentalists. Drawing upon his own photographs, allusions to novels and popular culture, and impressions while living and traveling incountry, Redfield points to more general issues of "local against global, nature against technology, and improvisation against design" (261).

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Contrasts in writing styles and goals are notable in this collection of books. Gade, Orlove, and Redfield in particular provide personalized accounts that express the authors' voices and dispositions. Their books are enjoyable reading because of the clarity this provides. In fact, sometimes their writing becomes almost poetic; in particular, Orlove is a gifted and inspiring writer. Anderson, Evans, Pérez, and McCook take a more standard route from environmental history practices of presenting data in reference to a chronological sequence that clarifies the role of time and often government in shaping outcomes. Caviedes draws upon his geographical background to elucidate the role of spatial scale in affecting outcomes, with Pacific ocean fluctuations in temperature driving shifts in global wind circulations that then have outcomes for particular places in the world, in the form of torrential storms or year-long droughts.

Collectively, they illustrate the importance of evaluating nature's endowments and afflictions as countries develop. There are contradictions and tensions among the authors in the relative importance given to individual initiatives or climatic phenomena in altering historical outcomes, in the usefulness of scientific reductionism and scientists, in the evaluation of colonial effects and global commodity chains, and in methods to characterize the role of nature in affecting contingencies and destinies. Yet these contrasts are only in part due to the respective academic specializations of the authors. Indeed, it appears that anthropologists, geographers, and historians are grappling with similar quandaries in this ongoing endeavor.

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