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Socio-Environmental Dynamics along the Historical Silk Road

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<RF:VERSO>ASIAN PERSPECTIVES • 2021 • 60(2)

<RF:RECTO>BOOK REVIEWS

<T>The question of climatic influence on ancient human societies has been a focus of research in archaeology, history, and the environmental sciences for some time. A variety of methodological approaches and theoretical frameworks have been applied to the question as well, spanning environmental determinism, collapse narratives, complex adaptive systems theory, and political economy. In the volume *Socio-Environmental Dynamics along the Historical Silk Road*, editors Liang Emlyn Yang, Hans-Rudolf Bork, Xiuqi Fang, and Steffen Mischke bring together 22 wide-ranging chapters spanning these approaches, with a singular geographic focus to unite them.

The times and places encompassed by the “Silk Road” are rich and diverse enough in their geography, politics, and economic system to offer fascinating case studies that illustrate the variations in human-environment interactions. At the same time, the Silk Road, as an organizing concept, is flexible enough in its geographic and temporal definitions to allow for broad exploration.

The main strength of this volume is the way it brings together an array of approaches for studying past socio-environmental dynamics. The individual chapters, some discipline-specific and some more multidisciplinary, include studies in archaeology, history, historical geography, climatology, physical geography, art history, water policy, and others. The authors also approach the topic from a range of spatial and temporal scales. In the study of ancient human-environment interaction, there have been frequent calls to include more interdisciplinary work (Clarke et al. 2016; Rick and Sandweiss 2020; Ruddiman 2013). This volume contributes to that effort, living up to its title by presenting a truly “socio-environmental” approach.

The introductory chapter rightly emphasizes that the relationship between “climate, ecosystems, and societies” is “non-linear, complex, and variable over time” (p. 34). The editors and their co-authors in the Introduction call for studying “coupled social and natural evolution,” moving beyond determinism to resilience, and linking climatic impact and social response into one interpretive framework. Given similar recent calls in the literature (Carleton and Collard

2019 Carleton 2019; Fausleit 2016; McAnany and Yoffee 2009 McAnany-2009; Redman 2005), this volume appears at an opportune moment as an example of such efforts. The reader can enter the book at any point and find interesting and well-written new material. Furthermore, the authors are all experts in their respective fields, yet the individual chapters are written in a way that is accessible to non-specialists, a critical feature for a volume that covers so many different areas.

After the Introduction, each section of the book delves into a topic relevant to past socio-environmental dynamics. Part 2, “Landscape Evolutions in the Human-Environment System,” contains five chapters that examine hydrology and land use patterns. These draw heavily on geological data, in combination with historical, paleographic, archaeological, and ethnographic data. In chapter 2, Fei and colleagues confirm the existence of saline lakes in the Guanzhong Basin of China over the last 2000 years and conclude that the lakes dried up as a result of a combination of climate change, silt sedimentation, irrigation, and land reclamation. Chapter 3 presents the findings of Mischke and colleagues; they argue that lakes in the regions surrounding Han Dynasty territory in Northwest China experienced relatively wet conditions, while at the same time, lakes within the empire had decreased moisture availability and sometimes complete desiccation, suggesting that differences in lake levels were due more to human activity than climate change. In chapter 4, Deom, Sala, and Laudoisot report multiple lines of evidence suggesting that the Ili River delta in Kazakhstan was settled earlier than previously thought, with two phases of settlement before and after 2000 B.C. Sala, in chapter 5, examines drops in the water level of the Aral Sea over the past 2000 years and concludes that the main driver of such regressions was the diversions of the Syr Darya River in medieval times. Chapter 6, by Spate, refers to Niche Construction Theory in presenting evidence that variable land use patterns in the Valley of Kashmir allowed ancient societies to adapt to climate change.

Part 3, “Natural Disasters and Impacts in the Past Societies,” contains four chapters. In chapter 7, Kázmér traces the spread of earthquake-resistant architecture in the past, not only through earthquake-prone areas, but also along ancient trade routes, and discusses how perception of risk determined the use of construction techniques across space and time. In chapter 8, Ganiev and Kukarskih find correlations between past climate extremes, often caused by volcanic eruptions, and important historical events in Inner Asia, especially among nomadic societies when these climatic events coincided with challenging socio-political conditions. Opała-Owczarek and Owczarek in chapter 9 identify past climate change events in Sogdiana using tree rings and find a correlation between dry periods and social or economic deterioration. In chapter 10, Chen and colleagues present evidence for drought in sixteenth century Kazakhstan and again find correlations between climate change and historical events.

The five chapters in part 4, “Climatic Factors in the Transitions of Social Systems,” turn their attention even more directly to past social change. Fang, Su, Wei, and Yin in chapter 11 approach the impact of climate change in historical China by looking at food security and population size at decadal intervals. They find support for the idea that warm conditions led to positive political results and population growth (and vice versa), but note that population growth during warm periods could lead to greater population stress when the climate cooled again. Hill,

in chapter 12, traces social changes such as the shifting of trade routes in Central Asia and their correlation with climate events over a period of 6000 years, which he concludes is suggestive of a causal relationship. Frenkel's chapter 13 presents climate-based explanations for the spread of the Saljuqs across the steppe-Iranian frontier in the eleventh century; based on historical records, he finds that there is inadequate evidence to conclude a climatological cause. In chapter 14, Luneau incorporates archaeological and palaeoclimatological data to examine the fall of, or change in, Oxus Civilization in the second millennium B.C. in the prehistoric Silk Road region, finding that climate effects were too local to account for the large-scale social changes of the time. Pow, in chapter 15, looks at evidence for the climate-based explanation for the Mongol Empire's withdrawal from Hungary and again concludes that multiple historical sources agree in their lack of support for climate as a primary explanation.

Part 5 addresses "Social Adaptation and Resilience to Environmental Stresses" in four chapters. Xu, Yang, Yang, and Hillman (chapter 16) use the adaptive cycle as an interpretive framework for addressing how increased pressure on the water system along the Southern Silk Road in Southwest China led to greater resilience to future stress on the water system. In chapter 17, Mächtle and colleagues look at the origins of the Karez tunnel-well system in Xinjiang and find that it was built and maintained during more humid periods. Panyushkina, Macklin, Toonen, and Meko, in (chapter 18), look at water supply in the Lake Balkhash Basin of Central Asia during the first millennium B.C.; they conclude that the economy in the area was quite mixed and that settled agriculture and exchange of agricultural surpluses across the continent were precursors to the historical Silk Road. In chapter 19, Vyazov and colleagues trace 2500 years of population expansion and contraction in the Middle Volga region, using pollen data to reconstruct plant communities in anthropogenic landscapes. They find some correlation between population decrease and cultural and climatic transitions.

Finally, the book concludes with the three chapters of part 6, "Social-Culture in Connection with the Environment." In chapter 20, Aerde uses an art historical approach to Buddhist carvings in Gandhara to demonstrate inter-regional connections, and considers environmental factors in the placement of ancient shrines in the first five centuries C.E., perhaps as overnight caravan stops. Chapter 21, by Marten-Finnis, presents a historiography of the urban neighborhoods of Bukhara, including Soviet ethnography, the cultural geography of the "steppe and the sown," and the principle of Eurasianism over Europeanism. Abudu, Sheng, King, and Ahn (chapter 22) again address the Karez well system, arguing for its preservation both as environmentally sustainable infrastructure and as a piece of cultural heritage.

As the preceding summary should make clear, this volume covers an enormous range of methods, geographic locations, and time periods. The data and concepts in each chapter are indeed fascinating. The diversity of methods, locations, and time periods is an advantage for readers in that they can choose chapters of particular interest to them. The disadvantage is that the concept of the Silk Road does not really unite the work. The existence of a historical phenomenon that could be called the Silk Road is more or less taken as a given in this volume, yet almost none of the studies in the research chapters use the concept of the Silk Road, either as an objective historical reality or as a heuristic device, to inform their questions or their analyses (cf. di Cosmo 2014; Frachetti and Rouse 2012; Kuzmina 2008; Selbitschka 2018). Both the

definition of the Silk Road offered in the Introduction, which includes southern, steppe, and desert routes, and the temporal range of the chapters from Neolithic to modern times, are so broad as to render the Silk Road framing not particularly useful. This raises some doubt about the usefulness of the concept of the Silk Road, such that future endeavors could frame a collection like this as addressing, for example, trans-Eurasian human-environment interaction in the past.

The theoretical frameworks employed by the chapter authors, as will be apparent, also range widely. While some chapters take simple correlations as adequate proof, or at least suggestive, of a causal relationship, the Introduction by the editors and their co-authors presents sophisticated alternative possible models of the relationship between climate and social or economic change. Some of the chapters follow suit in operationalizing these nonlinear approaches. In future, exploring which of these models best explains various kinds of data may increase the cohesiveness of work on varied times and places.

There have been other attempts to bring together studies that use both environmental and social data to reconstruct socio-environmental history (Rick and Sandweiss 2020), including some focused specifically on Silk Road societies (Li et al. 2017), as well as individual studies that take the socio-environmental approach (Frachetti et al. 2017; Iturrizaga 2019; Tang et al. 2014). This volume is the most far-reaching to date and is a rich and ambitious collection of research. It is an important contribution to the field of ancient human-environment interaction in the regions reached by the Silk Road, and will hopefully inspire even greater efforts towards temporal and geographic diversity, as well as interdisciplinary methods and sophisticated analytical frameworks, in the study of past human-environment interaction.

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