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EDITORIAL

The Environmental Legacies of Colonialism in the Northern Neotropics: Introduction to the Special Issue

Introduction

The arrival and settlement of Europeans throughout the Americas led to unprecedented demographic and environmental transformations (Crosby 2003). The voluntary and forced migration of peoples from Europe, Africa, and Asia, and the simultaneous introduction of new forms of production, along with exotic biota and diseases, contributed to the emergence of novel social, economic, and ecological systems. The consequences of these changes have had significant and enduring impacts on local socioecological systems, and are often visible on the landscape today. Through analysis of soils, plants, animals, and other environmental proxies, archaeologists are uniquely situated to investigate the localised manifestations of these processes. Yet, while research on the environmental impacts of prehistoric societies in the Americas has burgeoned in recent years, the direct archaeological examination of the lasting ecological effects of European colonial expansion remains rare.

This special issue developed out of a symposium organised for the 2015 annual meetings of the Society for American Archaeology in Orlando, Florida. The session responded to the dearth of research on ecological change since colonial times by bringing together scholars studying the environmental legacies of European settlement and colonisation in the northern Neotropics (New World Tropic Ecozone). This biogeographical region consists of northern South America, Central America, the Mexican lowlands, the Caribbean islands, and southern Florida – all together containing one of the largest contiguous areas of tropical rainforest on the planet that houses a vast reserve of biodiversity and a wide array of indigenous peoples. This region is also historically of key importance for understanding contemporary environmental challenges because of its singular role in initial European contact and colonisation in the fifteenth and sixteenth centuries (e.g. Keegan, Hofman, and Ramos 2013; Mondini, Muñoz, and Fernández 2017).

In this special issue, we refer to ‘environmental legacy’ as the long-term socioecological consequences of human interactions with the environment. This perspective foregrounds the importance of human history in shaping environmental trajectories (e.g. Ruddiman 2005). In this way, such legacies represent diverse historical processes that explain aggregate changes in environmental properties over time as a result of human impacts (Crumley, Lennartsson, and Westin 2017; Redman et al. 2004). Research aimed along this path is therefore useful for understanding the resilience of socioecological systems over long periods because it demonstrates how environ-

mental systems and processes are historically contingent on human activities at a range of scales (Fisher, Hill, and Feinman 2009; Moran 2010). Archaeological reconstruction of these dynamics thus can inform today’s populations about the past, present, and potential futures of environmental change (e.g. Hornborg and Crumley 2007; Redman 1999). As such, through the research presented here, we seek to identify the implications of these changes for contemporary communities and ecosystems, as the legacies of colonialism continue to shape modern social and environmental challenges.

The articles in this issue draw on historical ecology (Balée 1998) and especially the ideas of niche construction and ecological inheritance (Laland and O’Brien 2010), which examine how organisms shape, and are shaped by, their environments through selective pressures over long periods (see also Boivin et al. 2016). Such research focuses ‘on the evolution of ecosystems, the effects of anthropogenic and natural changes and the relationship between humans and their environments’ (Braje et al. 2017, 2). The articles in this issue demonstrate convincingly that the state of an ecological system is historically dependent and that human impacts influence ecological systems long after they cease to operate. The studies presented here specifically consider transformations after Europeans began to settle throughout the Western Hemisphere, with an emphasis on understanding how this historical process has differently structured socioecological landscapes in the northern Neotropics. The cases examined include the Caribbean (Dominica, Martinique, Barbados, Antigua and Barbuda, and Puerto Rico), Central America (Mexico and Guatemala), and northern South America (Venezuela) (Figure 1).

As contemporary peoples around the globe contend with the ecological consequences of complex historical processes, archaeology can help reconstruct the root causes of anthropogenic changes to the Earth system (see Wells 2015). The data offered by such studies help to establish historical ranges of variability in ecosystems, providing more comprehensive ecological baselines that can contribute to current environmental management (Rick and Lockwood 2012, 48). An objective of historical ecology is to integrate data across time from different sources to inform our understanding of modern systems (Isendahl and Stump 2015). Due to limited data sources, most historical ecological investigations do not extend more than 200 years into the past, a problem Szabó and Hédl (2011) identify as the ‘pre-1800 dilemma’ (see also van der Leeuw and Redman 2002). As demonstrated by the articles in this issue, archaeologists can, and should, address this problem by applying our data to develop



Figure 1. Locations of studies in this issue.

better measures of the long-term interrelationship between humans and the biosphere. The papers in this special issue move us in this direction, as local communities across the globe face the challenges of climate change, transnational development, and increasing migration and mobility.

Overview of the Articles

Oas and Hauser's archaeobotanical research on a colonial plantation in Dominica illustrates the importance of providing baseline historical ecological data to help understand the impacts of the sugar revolution and associated agricultural activities on the island landscape and local domestic economies. This research offers direct and local evidence of the transformation of island flora during the colonial period and the development of novel political ecological systems, many of which continue today.

Through a comparative investigation of the lasting impacts of animal exploitation and management on three plantations on three islands in the Lesser Antilles, Wallman takes a regional approach. This research connects historical practices, identified through archaeological data, to modern foodways and biodiversity on the islands, to better understand the origins and impacts of these subsistence practices on local and island-wide socio-ecological landscapes.

Examining soils and sediments from Betty's Hope sugar plantation in Antigua, Wells and colleagues offer an insightful example of niche construction by connecting past activity to contemporary ecological conditions. Using geoarchaeological methods, the authors investigate the cumulative impacts of plantation agriculture on soil erosion and degradation, successfully illustrating how archaeologists can contribute to understanding long-term environmental consequences of human decision making.

In their article on open range herding under the colonial system in Barbuda, Bain and colleagues demonstrate that historical processes often have direct and overt impacts on modern eco-politics and economics. Using archaeological evidence from Barbuda, they find that

cattle herding was important to the local economy and permanently transformed water management and landscape patches on the island.

Perdikaris and colleagues integrate the historical and archaeological record of Barbuda to examine the biohistory of fallow deer. Using documentary, osteological and genetic evidence, this research evaluates the relationship of humans with the deer from the sixteenth century through the present, showing the importance of the deer to the island's economy and cultural heritage, as well as to the historical management of the species.

Antczak's study contributes to understanding long-term human ecodynamics by focusing on past solar salt production from the sixteenth-nineteenth centuries in the Venezuelan Caribbean. His research interrogates the economic and ecological consequences of anthropogenic landscape modification for salt 'cultivation' by several different colonial factions on these islands.

Alexander and Hernández Alvarez explore changes in domestic ecology arising from the introduction of European domesticates to Mexico's Yucatan peninsula beginning in the sixteenth century. Comparing evidence from a hacienda and farming settlement, they demonstrate how the imported animals and secondary products transformed local ecologies and contributed to uneven socio-economic development across the Yucatan.

In eighteenth century Guatemala, Freiwald and Pugh evaluate zooarchaeological data and strontium isotopes of Spanish-introduced mammals from a colonial mission near Lake Petén Itzá. Their research examines the historical and long-term impact of the management of these taxa on land use, farming, and local communities.

Finally, Rivera-Collazo and colleagues study human-environmental interaction in the Grande de Manati Hydrological Basin in Puerto Rico, from pre-Columbian times through conquest and the colonial period beginning in the sixteenth century, and into the twentieth century. This study focuses on changes to topography, sediments, and vegetation cover to reveal a long-term relationship between historical human activity and a tropical landscape.

Final Remarks

When Columbus and subsequent colonists entered the Neotropics in the fifteenth and sixteenth centuries, they encountered anthropogenic landscapes that had experienced thousands of years of human modification (Balée and Erickson 2006; Denevan 1992). As different cultures converged (some voluntarily, others forced) along with exotic biota, and as new social and economic systems developed over the next few centuries, landscapes in this region were rapidly and dramatically transformed. As shown here, archaeology is well-suited to examine the social, ecological, economic, and geopolitical consequences of human ecodynamics in the past. The data collected through archaeological research offer not only historical context for understanding contemporary landscapes and environmental conditions, but also insight into future trajectories of human-ecodynamics in the face of potentially dramatic ecological transformations.

To accomplish the goal of connecting historical processes to modern socioecological systems, we will need to make more creative and empirical use of historical datasets. And to do this, we will need to work in interdisciplinary and international teams that integrate archaeologists with cultural and medical anthropologists, economists, environmental engineers, and other experts who study more recent human-environmental relationships. Working collaboratively throughout the research process, these teams can examine the causes and consequences of environmental legacies by juxtaposing the documentary record with the archaeological and environmental science records to expose the ways and extent to which these different sets of information overlap with or diverge from one another. Doing so can allow us to contribute meaningfully to broader historical ecology theory in the social and natural sciences that seeks to understand the social/economic, engineered, and environmental factors that create and sustain environmental legacies.

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