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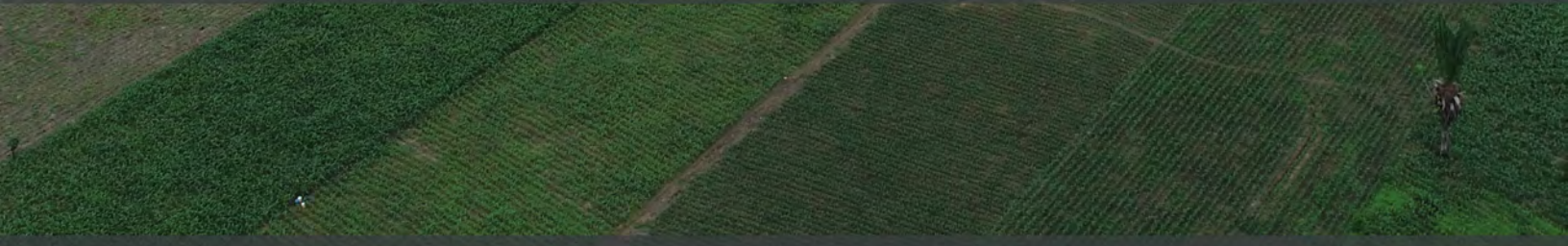

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The cover image is a view of the Chixoy River, Guatemala. Image courtesy of Brent K. S. Woodfill.

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FEATURE

MULTIPLE WAYS OF UNDERSTANDING PERU'S CHANGING CLIMATE

By Rebecca Bria and Doris Walter

Archaeologies of climate change have long been interdisciplinary in practice, with paleoenvironmental reconstruction studies providing the principal methods—from ice cores to pollen and soil analyses—through which ancient climates can be known and considered against the broader record of materials ancient humans left behind. Archaeology is unique among the disciplines that examine climate change, particularly during the past twelve thousand years known as the Holocene, because it can reveal the many ways humans have responded to climate shifts, such as by constructing new settlements, inventing new technologies, reorganizing political systems, and reshaping environments.

Archaeological site of Aukispukio in a now uninhabited area of the Cordillera Blanca mountain range. Image courtesy of Rebecca Bria.

In this article, we consider how the perspectives and experiences of contemporary people facing climate change can enrich our archaeological interpretations of climate change in the past. In particular, we present an ethnographic study from highland Peru that highlights the complex and varied ways people are responding to environmental uncertainty, and explore how their perspectives and responses have led us to question and expand the narratives we construct about ancient people. Such ethnographic data, we argue, help move us beyond solely defining what happened in the past—for example, identifying a period of increased drought that led to crop failure and house abandonment—to also think broadly about human agency in moments of widespread social and environmental change. Rather than painting past human experience with broad strokes, an attention to contemporary responses to climate change challenges us to consider the complex mosaic of individual perceptions and actions that collectively come to define "the past" for a group of people. For instance, we can inquire into how someone's ability or perceived ability to act—that is, their agency—is linked to their relationship to and perception of the places they inhabit. This gets us to a fundamental question we explore here: how do ontological understandings of the nature of the world, for instance, the logics of cause and effect, influence how people respond to climate-based uncertainty? With this question in mind, how can we employ ethnographic data to consider new possibilities for how ancient humans responded to a shifting climate?

We reflect upon these questions by interlinking our data and insights from ethnographic and archaeological research in highland Peru's Cordillera Blanca, a glaciated tropical mountain range in the region of Ancash that is experiencing rapid deglaciation due to global warming (Glas et al. 2018). Doris Walter, an ethnographer fluent in Quechua, has conducted research in the Cordillera Blanca for decades, focusing much of her work on how Indigenous Quechua speakers conceptualize and engage with their environment. In part through a collaboration with Rebecca Bria on a major climate change impact study led by geoscientist John All, Walter's recent ethnographic research presented here examined how Indigenous people in the Cordillera Blanca perceive the causes and effects of climate change, as well as how climate change is affecting the choices they make in response to these perceived changes. Since 2009, Rebecca Bria has carried out archaeological fieldwork in the Cordillera Blanca to expose how ancient people established and renewed a sense of place and community as they shaped local ecologies. Bria applies insights from Walter's research and her own work living and working with people in the Cordillera to how she teaches the archaeology of climate change. In particular, her instruction combines archeological and paleoenvironmental evidence with insights from ethnographic data that are further enhanced by using phenomenological techniques whereby students directly experience the landscapes and ecological niches they study. This "classroom" is the PIARA archaeological field school at Hualcayán. PIARA provides instruction in archaeological field methods while engaging students as participants in research on Hualcayán's social and ecological transformations over a period of nearly 4000 years, between 2400 B.C. and A.D. 1450. Teaching is important to our discussion here because it is a setting in which the boundaries of archaeological epistemology are defined, by both the professor and the student, and are thus rich contexts for exploring how to incorporate ethnographic perspectives into archaeology and to reflect upon what insights such activities may generate.

In short, we explore how the diverse kinds of knowledge that ethnography, archaeology, phenomenology, and paleoclimatology produce, and the multiple ways of knowing the world that each provides, are each essential to consider when studying and teaching about ancient climate change. We argue this is because they collectively bring human perceptions, logics,

and decision-making processes in times of climate change in conversation with the material evidence for practices in the present and the past. We contend that this array of data and perspectives can lead to new insights about how ancient humans may have experienced a changing world.

Archaeology, Ethnography, and Climate Change

In recent decades, cultural anthropologists have entered the scholarly discourse on climate change by documenting how contemporary societies are confronting a transforming world, building on a long tradition of "climate and culture" studies in archaeology (Crate 2011; Roncoli et al. 2009). Despite the new and growing potential for incorporating ethnographic insights on climate change into archaeological analyses of the ancient past, many archaeologists have yet to robustly consider them. Even ethnoarchaeology, which is the ethnographic study of contemporary practices to identify the materials they leave behind and their relationships to the non-material dimensions of social life, has yet to focus on climate change, such as how people are responding to the increasingly severe weather patterns, dwindling water availability, and other dramatic events that impact their livelihoods. Such ethnoarchaeological studies could nonetheless have a profound impact by bringing archaeology's unique expertise on the long-term social processes of collapse and resilience into the discussion of contemporary climate change, which is threatening the social fabric of communities and nations across the world today by contributing to mass migrations, hunger, political unrest, and warfare (for example, the recent events in Syria; Abel et al. 2019).

Recent ethnoarchaeologies of agricultural and pastoral economies have nonetheless generated insights into how people are responding to various climate-related crises, as global warming has left few such lifeways untouched (Metheny 2017: 239). Yet even so, the goals and aims of ethnoarchaeology too often focus narrowly on generating models for identifying what people did in the past at the expense of recognizing the ontological frameworks and epistemologies that inform and give logic to these practices (Gosselain 2016; Holbraad 2009; McNiven 2016). A theoretical archaeology that makes room for multiple cultural logics can help circumvent potentially ethnocentric interpretations (such as by using "rational actor" models taken from Western economic theory and indiscriminately applying them to Indigenous people worldwide and through time) for how ancient people responded to a changing climate, while opening up new conceptual frames for interpreting the past, including peoples' distinct relationships to local environments, their variable regimes of value, and their distinct definitions of who or what (e.g., mountains) can act (Marciniak and Yalman 2013; Politis 2015).

Researching and Teaching Climate Change and Archaeology in Peru

The Andean Highlands is an extreme, vertical environment with many different, but closely-juxtaposed, ecological zones and microclimates (Pulgar Vidal 1981). In the steeper, more ecologically compact areas, one can traverse several ecozones, from the high *puna* grazing lands to the valley floor, within a few hours or less. Human social and economic adaptations to climate shifts in this vertical landscape are thus inextricably linked to how local communities take advantage

of these ecological zones through agriculture, animal husbandry, foraging, and hunting. These practices often involve resource sharing between communities or within different sectors of a community who live or labor in different ecozones (Brush 1976; Oberem 1976; Yamamoto 1985). In this extreme vertical environment, these practices are likely to have had great antiquity in the Andes, which produce systems of ecological complementarity that can reduce risk vis-à-vis the diversification of food, practices, and even settlement locations (e.g., Stanish 1989).

Much attention on ancient climate change in the Andes has focused on the coastal Andes, where prehistoric peoples experienced ongoing and often catastrophic climate oscillations due to El Niño (Moore 1991; Sandweiss et al. 2001)—patterns that continue and appear to be increasing today, leading to landslides and flooding. Such coastal climate shifts impacted weather patterns in the highland Andes as well, though to a lesser degree, causing ancient peoples to center much of their local ecological concerns on the need to stabilize a dynamic landscape that was geologically active due to heavy seasonal rains and earthquakes. They often did this through landscape engineering, such as terrace and canal construction. Nonetheless, ice core data from mountain glaciers, including from Peru's highest peak called Huascarán in the Cordillera Blanca, indicate that there were significant cooling and warming periods that correspond to wetter or drier conditions and which led to a variety of social and cultural shifts (Thompson et al. 1995; Thompson et al. 2000). These shifts range from minor to major. Perhaps the most consequential was the stabilization of the climate and environment after the last major ice age, which led to modern temperature and vegetation patterns by around 3000 B.C. This correlates to the emergence of Andean complex mound-building societies, such as Hualcayán, in both the coastal and highland Andes (Markgraf 1989; Thompson et al. 1995; see also Contreras 2010).

In highland Ancash, archaeologist George Lau (2011: 33–34) matches the paleoclimatic trends evidenced through glacial ice cores (Thompson et al. 1995) with the radiocarbon-dated settlement patterns and social trends of the Recuay culture, which flourished between A.D. 1 and 800. In particular, he notes that many Recuay polities flourished near the upper limits of agriculture during a warmer and wetter period between A.D. 400 and 500, and then came to their demise when temperatures plunged in a colder and drier climate between A.D. 500 and 800. While resource and food sharing systems operating under a system of ecological complementarity can protect from some of these fluctuations if short-lived, the dramatically plunging temperatures experienced at this time would have definitively lowered the upper limits of agricultural production. As an agro-pastoral society, the Recuay had long valued settlement locations at the ecotone between the upper limits of agriculture and the lower limits of prime camelid grazing lands in the high *puna*. The dramatic climate shift would have likely made it difficult to continue agricultural production near established Recuay settlements, perhaps straining the Recuay way of life that was long attached to its prosperity, eventually leading to the disaggregation of Recuay societies, and according to our recent skeletal analysis, warfare (Sharp n.d.; Sharp and Bria 2015).

This example serves to illustrate the kinds of paleoclimatic and archaeological data that field school students learn about when studying Ancash prehistory. Though scholarly articles and pictures can bring analyses of these dramatic landscapes to life for students in the classroom, the students who attend the PIARA archaeological field school at Hualcayán have the opportunity to experience the Cordillera landscape for themselves and imagine how climate shifts would have affected people living in that same landscape. That is, they can tangibly imagine the ancient landscape of the Recuay as they look across and traverse the vertical environment, as they feel the noticeably thinner, cooler air near the upper

reaches of agriculture above the field site, as they ponder the many abandoned settlements within immediate view in the narrow, steep, and circumscribed valley, and as they walk along the many refurbished and abandoned canals that cut across the mountainside, which are drawn from the glacial lagoons above. They also observe how contemporary people travel to different fields and elevations to tend their crops and animals each day, or experience unseasonal frosts that cover the ground on many mornings, both conditions causing them to consider the ways in which even slight climate fluctuations can be disruptive in this steep, high-elevation terrain. The interplay between climatic, ecological, and geological dynamics thus becomes perceptible for students, providing a foundation upon which to build concepts of shifting ancient climates in an often extreme tropical mountain environment.

Second, the Recuay example suggests that while we can correlate the end of Recuay with a colder and drier environment, we cannot adequately access the perceptions of Recuay individuals as they fought to maintain their society and understand a changing world. Certainly, ongoing research is enlightening us about how Recuay communities began shifting their system of beliefs during the final centuries. But even with a studied knowledge of Recuay ideology, worldview, and ecology, we are limited in knowing or imagining the ways in which people socially and conceptually responded in times of dramatic climate change. Students today have

The Hualcayán landscape (center left), situated in the Cordillera Blanca mountain range. Image courtesy of Rebecca Bria.

an intimate experience growing up in a time of climate change. Yet as students primarily from non-indigenous communities in North America or Europe, we should not expect their own largely Western/scientific view of global climate systems to match the perceptions of other groups of people, especially when considering the many alternative ontologies in which the world operates according to different chains of cause and effect. Following from this, we should also not expect human responses to climate change to fit neatly into a set of climate-response models. Engaging students in these alternative perceptions through explorations of ethnographic accounts can be an effective way to open students to how and why people may have chosen distinct paths in the face of a changing climate, strengthening their ability to link anthropological and scientific concepts. Perhaps the most effective way to communicate these ideas is by presenting and discussing ethnographic data that has been collected from people currently inhabiting the same landscapes that are of archaeological interest. How might these contemporary Indigenous perspectives inform how we understand the archaeological record more broadly?

Glacial retreat is advancing rapidly in the Cordillera Blanca. Image courtesy of Marc Anger.

Ethnographic Research in the Cordillera Blanca

In the tropical Andes, and particularly in the Cordillera Blanca of Peru, the impacts of global warming on glaciers are accelerating. Since 1962, glacier mass has decreased by 38 percent causing considerable concern among scientists, who predict significant changes affecting water availability, ecosystems, and rural livelihoods, as well as an increase in risks of natural disasters, such as avalanches and glacial lake outburst floods (GLOFs), which are floods that occur when a high altitude lake suddenly overflows or breaks a natural dam of ice or soil in rising temperatures. Such events can cause devastating landslides known locally as *huaycos*.

But how do local people perceive the current changes? Here we review how people living below the snow-capped peaks of the Cordillera Blanca perceive the effects of glacier recession and climate change, as well as their causes. This ethnographic research was undertaken by Walter in various Indigenous, Quechua-speaking communities within the mountain range.

A dried-up quenoal tree standing above a shrinking bog. Image courtesy of Marc Masconi.

The Effects of Climate Change and Glacier Recession

The local inhabitants all agree that the glaciers are shrinking. They also mention an increase in temperature extremes: it is much warmer during the day and colder at night, with increased risks of frost. In addition, the alternation of the dry and wet season is more irregular, and the rain patterns less predictable. These factors negatively affect the crops as well as animal husbandry. Nevertheless, in some areas the fact that maize now grows at higher altitudes than before—due to warmer temperatures—is mentioned as being something positive.

Other inhabitants indicate certain effects on ecology: for example, shrinking wetlands, the disappearance of certain plant and animal species, and an increase in disease. Weather extremes, such as heat and frost, harm not only crops but also important high altitude plants, such as *quenoal* trees (*Polylepis* sp.). As for water availability, in some valleys of the Cordillera Blanca, water from glacial discharge has already begun to decrease due to glacier recession, creating sometimes-severe tensions between users. In other areas where the glacial mass is more important, water shortages have not yet become a subject of worry for the local inhabitants.

If almost everyone agrees on the effects of climate change in the Cordillera Blanca, the causes attributed to these changes vary according to the individuals and the immediate environment they live in.

The Different Causes Attributed to Climate Change

Although many rural communities have access to the media (radio, TV, or sometimes the internet), its influence on their comprehension of climate change is either superficial or reinterpreted according to cultural values and traditional beliefs. If the local people hear about global warming through the media, they do not understand the notion, and the causes of climate change are viewed as local, and by no means global.

The different causes can be classified in two main categories: those that depend on cosmic, natural, or divine elements, and those that are directly related to human behavior. Some people (usually elderly folks) simply state that the earth is old (*el mundo está viejo*), thereby explaining why the glaciers are shrinking and gradually disappearing. A particularly frequent explanation is that the sun's position in the sky has changed. The sun has come closer to the earth, therefore, its rays are much stronger. Others assert that the sun is ill: the "skin" that envelops it is full of holes, like a sieve, and lets out the heat. This appears to be an obvious reinterpretation of holes in the ozone. The holes, they say, are caused by smoke from fires—the burning of garbage and toxic materials.

Another cause derives from traditional myths. In Andean thought, where space and time are linked, there is a cyclical succession of different eras, each era being annihilated by a cataclysmic event, or *pachakuti*. For example, these myths recall how the pagan era, preceding the present era, was destroyed when God ordered a cosmic flood, which filled the earth with water like in a giant pot. He then sent two suns out into the sky; as the water began to boil, all of the pre-Hispanic ancestors were burned to death. The inhabitants of the Cordillera often refer to these myths, stating that a new cataclysm is probably underway and that they will similarly be burned by the sun.

Many informants in the Cordillera Blanca also mention that the mountains, which are sacred and considered as living ancestors, become angry

when human behavior is inappropriate or disrespectful. As a punishment, they cause avalanches and icefalls, reducing the ice mass. On the other hand, many Catholics and members of evangelical religious congregations believe that the current climate changes are God's punishment because there are too many sinners. Apart from these cosmic, mythological, and divine explanations, in certain valleys of the Cordillera Blanca frequented by foreign mountain climbers and trekkers, the foreigners are often held responsible for glacier recession. This is mainly because their expeditions are said to pollute or harm the ice, but also because they might be irritating the mountain deities along the way.

In rural communities located near cities or towns, modern ways of life (traffic, industries, pesticides, etc.) are incriminated for contaminating the air, which in turn affects and poisons the glaciers. Mines and metal extraction are also implicated. In more remote communities, the reflections of plastic bottles and aluminum foil thrown on the ground, along with modern corrugated iron roofs, act like mirrors that direct the sun, and are thus believed to have a direct impact on melting the glaciers. In short, the inhabitants relate climate change to their immediate environment and do not perceive it as a global phenomenon.

When asked if the situation worries them, Indigenous people usually give the following type of answer: "Yes of course we're worried, but for the time being, we're not in lack of water. When that happens, we will all die." Some people suggested this lack of water would become a reality in 20 years while others suggested up to 200 years. Many informants stated that up to now, there are no major changes either in their lives or in the ecosystem. At the same time, people perceive an overall feeling of helplessness and resignation in the face of destiny.

In Quechua-speaking Indigenous communities, mountains are often perceived as agents and deities. Image courtesy of Marc Anger.

Challenging Assumptions: Bridging Archaeologies and Ethnographies of Climate Change

The resignation to fate that Indigenous people in the Cordillera Blanca express reflects the concept of *pachakuti*. *Pachakuti* is both a modern and an ancient concept, documented during the early Spanish colonial period by first generation *mestizo*historian Garcilaso de la Vega (1979 [1616]). *Pachakuti* is the "termination and reversal of an established order," or a moment in which the world dies and is reborn anew (MacCormack 1988: 961; MacCormack 1993: 961). *Pachakutis* exist as myth (such as in creation stories about the formation of the Andean landscape when giants roamed and turned into mountains), but they also exemplify a deeply rooted social memory of the various epochs and ages of Andean history (separating the pre-Inka from Inka times, or the Inka from the Spanish colonial period), as well as of the moments marked by environmental catastrophes and their aftermaths. As an inevitable and periodic process of the world, *pachakuti* and similar concepts have been used as a political tool for uprising—such as the Taki Onkoy Indigenous revitalization movement against Christianity in the mid 16th century (see MacCormack 1998: 983). Or, as is apparent through the modern-day perceptions explored in this paper, *pachakuti* is equally a way to acknowledge and accept the inevitable traumas of history. *Pachakuti* thus embodies the past, present, and future (MacCormack 1988) and is thus a lens through which a person can understand the course of history and conceptualize their position and agency within the world during times of widespread transformation.

In the traditional highland Andean ontology, many landscape features, particularly water sources and mountain peaks (notably the features also affected by climate change), are personified social actors (Allen 2002; de la Cadena 2015). The recent disappearance of their most vibrant qualities, such as the glacial caps from which essential waters flow, is seen by many to reflect their aging, existing much like any other living thing in the world (Roncoli et al. 2001). There is often a perceived causality between the modern world's tarnished morality and the disappearance of glaciers—sinners bring insult to these beings who in turn dwindle in potency. The evangelically Christianized may alternatively see these sins as bringing insults to their god, who can unleash natural disasters at will. In either sense, the Andean landscape is full of agentive forces.[1]

The perceptions and actions of people living in the Cordillera Blanca today reveal what many climate change studies are beginning to point to: that people rarely perceive climate change in uniform or predictable ways, and that inaction, rather than reaction, is a common response to increasingly extreme climate variability during the early decades of a major climate shift. These ethnographic insights clearly have broad implications for understanding non-Western ontologies and shaping informed policies that can help mitigate the impacts of climate change. The principal archaeological interest in the ethnographic data, however, was to elucidate how the perceptions of climate change inform new kinds of social and ecological practices as people adjust to a variable climate. However, the question was not *whether* people were changing their daily practices in response to climate change. The assumption was that people were already adapting to climate shifts in measurable ways, as people in highland Ancash communities commonly expressed concern over weather, water, and frost. In many ways, this oversight is indicative of an archaeological mode of inquiry that is used to considering patterns of change across hundreds or even thousands of years, in which punctuated changes are obvious, but

short-term processes are not. Moreover, the common feelings of resignation and decisions made *not to act* in the face of a dwindling water supply flies in the face of theories that assume ancient social actors are perpetually self-interested agents who will always work to maximize their profit and minimize their labor at any given moment. People are constrained by their sociopolitical conditions, their daily routines (habitus), and their connection to place. It seems that, in the case of the Cordillera Blanca, the abundance of water has—for the moment—provided a buffer from some of the climate extremes that others in Peru are experiencing, especially those living through frequent flooding and landslides on the desert coast. But this doesn't change the fact that all local inhabitants have long recognized the rapid disappearance of the water sources—the mountaintop glaciers—and foresee their eventual demise.

Though people living in the Cordillera Blanca do not claim to have transformed their practices in response to climate disruptions, at least not in measurable ways, there are a few notable changes in food production that may be related to mitigating an increasingly unpredictable climate. Specifically, some communities have introduced new crops, such as *yana mashwa*, a native tuber, or sugar snap and snow peas, European crops that were brought in by a European export agriculture company seven years ago. Local

Water is still abundant in many high-altitude valleys. Image courtesy of Marc Masconi.

people describe the introduction of these crops as their response to shifting market demands, not a shifting climate. For example, *yana mashwa* is gaining culinary popularity in the region, and there is both national and international interest in sugar snap and snow peas. It is nonetheless difficult to ignore how both economic demands and greater agricultural uncertainty due to climate change are together influencing these shifts in practice: the recent difficulties in agricultural production are a common topic of conversation, as people are not only concerned with the flow of water to their fields but also with the unpredictable and unseasonable frosts that ravage their crops. Moreover, the introduction of sugar snap and snow peas for export in farmlands located in rural Peruvian Indigenous and peasant communities (*comunidades campesinas*) alone reveals much about how the global economy is transforming the world in response to climate change. That a Belgian agricultural export company arrived at the rural village of Hualcayán to convince local people to grow sugar snap and snow peas in the first place is due, quite plainly, to the fact that Hualcayán, for the moment, has paradoxically more reliable water than previously relied upon sites of production elsewhere in the world. Equally, as potato farming becomes less reliable with increasing evening frosts that can easily kill the crop (Condori et al. 2014), sugar snap and snow peas, which are more frost tolerant, are a desirable replacement for local farmers. Community members have steadily increased the production of sugar snap and snow peas over the past seven years, transitioning away from a fairly diverse multicropping economy of native foods (potatoes, beans, maize) to one that heavily relies on the production of sugar snap and snow peas composing more than 70 percent of local yields. Placing so much attention on this crop is a way to reduce risk in these uncertain times—that is, by producing foods for which there is a fixed price for export—even if the decision to invest in sugar snap and snow peas is not explicitly linked to climate change. The lesson here, of course, is that such changes in food production during a time of climate change cannot be understood as a simple effect of the climate alone. Instead, these illustrate the messy links and disjunctures in the decision-making process between belief (i.e., that there is no reason to react to climate change) and practice (i.e., that the adoption of foreign frost-resistant crops is purely for economic benefit).

Conclusion: Interdisciplinary Perspectives in the Study of Climate Change Adaptations

This paper has argued that archaeological interpretations of climate change can be expanded through a consideration of ethnographic evidence for how people are experiencing, perceiving, and responding to climate change in distinct places. Our data raise issues about the links between ontology—or ideas about how the world works—and agency—or decisions and actions based in whether anything can be, should be, or is being done about a changing climate. Ethnographic examples like ours from the Cordillera Blanca complicate the sometimes overly-tidy models that many archaeologists apply to their interpretations of the past. Ethnographic research, if attended to, can lead archaeologists to check their assumptions about the motivations of ancient people, and refine their interpretations about how and why humans do what they do, which can only serve to strengthen any rendering of the past.

Finally, these observations have implications for teaching climate change—a theme which will undoubtedly shape countless aspects of our students' lived experiences as they move into the future, regardless of whether they become archaeologists or anthropologists. By teaching an

ethnographically-informed archaeology of climate change, we have an opportunity to not only teach students about what happened during periods of prehistoric climate change, and how we go about studying these events through both direct and proxy data, but also teach them to consider the diverse and unexpected ways that ancient people may have conceptualized these changes and how they creatively responded—or how they did not.

Footnotes

[1] For evangelical Christians, the world is full of potentially agentive forces, enacted by the will of an omnipresent and omnipotent god.

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About the Authors

Rebecca Bria is an anthropological archaeologist whose research in the Peruvian Andes examines how communities emerge and transform through human-environment interactions. She is also deeply invested in issues of culture heritage, and she works with Indigenous Andean communities to co-create heritage events and programs that explore how people in the Andean countryside perceive and value their past and landscape. Rebecca received her Ph.D. in 2017 from Vanderbilt University and is currently a lecturer at Boston University.

Doris Walter is a French anthropologist. Having first traveled to South America in 1987 as a trekker and mountain climber, she was fascinated by the Andes and especially by the Cordillera Blanca range in north-central Peru. While hiking and climbing with the local people (donkey drivers, porters, and guides), she discovered their beliefs on nature related to the upper mountain valleys and glacial peaks. Her Ph.D., earned at the University of Paris (Institut des Hautes Etudes de l'Amérique Latine) in 2002, analyzes the concept of nature through local myths, beliefs, and practices (hunting, plant gathering, and the rearing of livestock). Her study also examines how the local people perceive two outside actors, who interfere with nature: Huascarán National Park, established in the area in 1975, and foreign mountain climbers, who seasonally flock to the high valleys and mountain peaks for recreational purposes. Ever since, she has pursued her investigations in the Cordillera Blanca as an independent researcher, on themes related to nature, ethnobotany, as well as climate change. She also organizes cultural treks in the area.