

Correction

OPINION

Correction for “Opinion: To understand how migrations affect human securities, look to the past,” by Jeffrey H. Altschul, Keith W. Kintigh, Mark Aldenderfer, Elise Alonzi, Ian Armit, Juan Antonio Barceló, Christopher S. Beekman, Penny Bickle, Douglas W. Bird, Scott E. Ingram, Elena Isayev, Andrew W. Kandel, Rachael Kiddey, Hélène Timpoko Kienon-Kaboré, Franco Niccolucci, Corey S. Ragsdale, Beth K. Scaffidi, and Scott G. Ortman, which was first published August 5, 2020; 10.1073/pnas.2015146117 (*Proc. Natl. Acad. Sci. U.S.A.* **117**, 20342–20345).

The authors note that references 1 and 2 appeared incorrectly. Reference 1 should have been the United Nations (UN), Migration, which is currently listed as reference 2. The correct reference 2 was omitted from the article, and is included below. Additionally, the citation to ref. 2 on page 20342, left column, first full paragraph, line 3, should be omitted. The article has been updated online.

2. E. Alonzi, N. Daly, G. Gordon, R. E. Scott, K. J. Knudson, Traveling monastic paths: Mobility and religion at medieval Irish monasteries. *J. Anthropol. Archaeol.* **55**, 101077 (2019).

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To understand how migrations affect human securities, look to the past

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Every day 37,000 people leave their homes and join the 258 million migrants who live in a different country from where they were born (1). And experts believe that the number of migrants will continue to grow.

Climate change alone is expected to force 200 million people to leave their homeland by the year 2050 (3), and some expect the number to reach 1 billion by the year 2100 (4, 5). Routinely, we hear that these numbers



Texts about the founding of early medieval monastic sites in Ireland, such as St. Colman's Abbey on the island of Inishbofin (pictured here with a 12th-century church), portrayed the sites as interregional religious and cultural hubs. But recent archaeological research using chemical analyses on similar early medieval Irish monastic sites suggests that few nonlocals were buried at such places (2). Such a relatively low level of migration may have been attributable to laws that restricted individual's rights outside of their natal territories.

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are unprecedented, that this level of migration is unsustainable, and that these migrants threaten our way of life. Are these claims right?

The truthful answer is, “we don’t know.” What is clear is that if we are to create migration policies that balance the human rights of migrants with the security concerns of host populations, we will need evidence-based answers to these questions and others like them. At least some of those answers will be found in our past, and the researchers best suited for this task are archaeologists.

Studies using the rich corpus of contemporary demographic, sociological, economic, and psychological data have revealed much about the proximate causes and consequences of modern migration. By nature, these studies lack the ability to ferret out the socio-environmental dynamics that unfold over generations, centuries, or millennia—dynamics that underlie migrations in the past and present and those projected for the future. After examining the current state of migration studies in archaeology, history, and anthropology and evaluating the policies of such institutions as the United Nations (UN) High Commission on Refugees and the International Organization of Migration, we designed three projects aimed at uncovering dimensions of migration that would otherwise go undetected or underappreciated, but which are vital if our society is to successfully meet the upcoming challenges posed by migration in the 21st century.

Migration and Security

The UN has long held that world peace is predicated on individuals having security in their lives (6, 7). Security for the UN has two aspects. The first is safety from chronic threats such as hunger, disease, and repression, and the second is protection from sudden and hurtful disruption in the pattern of daily life. The UN recognizes that migration is a process fraught with risk and insecurities, and as such the UN Trust Fund for Human Security “draws attention to the importance of early warning and early action, and emphasizes inclusive and sustainable development to create conditions under which migration is a choice rather than a necessity” (8). But instead of orderly plans, much migration policy is reactive. Only after people leave their homes do we ask: Should we help or hinder them on their travels? Should we accept or reject them in our countries? And should we incorporate or segregate them in our communities?

Reactive policies tend to be poorly designed and badly executed. Our goal, then, must be to react less and plan more. But to plan, we need to know the parameters of the problem, and for that we need to look to past migrations. To that end, under the auspices of the Coalition for Archaeological Synthesis [CfAS (9)], we have developed three projects for which archaeological data are essential: 1) establishing global, historic variation in rates of migration at regional and community levels; 2) examining how the characteristics of past migrations affected the different dimensions of human security; and 3) identifying the social conditions

that made past societies more vulnerable to climate-related migration.

Baseline Conditions

The first project provides baseline information critical for all migration studies: What are “normal” rates of migration? How many migrants can a community absorb and remain socially viable? What effect do “pulses,” or dramatic short-term increases in migration, have on human security within a community or region? These

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questions, and others like them, can now be answered because large amounts of high-quality bioarchaeological, genomic, and historical demographic data exist from contexts around the globe. For example, recent innovations in the analysis of DNA recovered from human remains (aDNA) has revolutionized the study of ancient migrations.

Using these data makes it possible to test patterns of global migration processes as well as more specific regional patterns of movement, such as the peopling of the Americas or the sources of population movements into Europe after the Last Glacial Maximum (10). For the CfAS project, large databases of strontium isotope ratios compiled from human burials in many regions will be mined to determine the intensity and frequency of flows of individuals from their place of birth to their location of death (11). Likewise, rich historical census data and epigraphic data, largely but not only from Medieval, Roman, and Greek contexts, will be used to refine and augment the isotope chemistry data (12).

Answers to questions about variable numbers and proportions of nonlocals in ancient societies lead to the second CfAS project: how migrants fared in these societies in terms of human security measures. For each of the UN Development Programme’s (UNDP) seven dimensions of human securities (7)—economic, food, health, environmental, personal, community, and political—we have developed archaeological proxy measures and identified possible migration-related threats for varied environmental and social contexts. By synthesizing data across time and space, we can explore how human securities are affected by variables such as size differentials between migrating and receiving populations, the duration of the migratory process, the nature of social and physical boundaries, and differences in the social and political complexity of migrating and receiving populations.

Helping the Most Vulnerable

A third CfAS project moves beyond using the past to assess present conditions, to using the past to assist

Indigenous groups cope with ongoing climate related migration. Why Indigenous peoples? Although all people, no matter where they live, will be faced with the consequences of climate change and variability, the Indigenous peoples of the world—hunters and gatherers, pastoralists, and small-scale farmers, people who are relatively poor by global standards and who live primarily in developing nations—will be those who will be the most dramatically affected (13, 14). Indigenous peoples make up only 5% of the world's population but account for 15% of the world's poor. According to the UN Department of Economic and Social Affairs (13), more than 30% of them are characterized as "extremely poor rural people." Many of these people live in environments most vulnerable to the effects of rapid climate change (15, 16). Yet, most Indigenous people want to stay on their ancestral lands, and most places receiving migrants would rather that they stay there (17).

To systematically explore the interaction of social and ecological factors within contexts of climate related

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migration, we endorse using the deep time perspective offered by comparative, synthetic archaeological research. To contribute a historical and social perspective useful to the Indigenous peoples of the contemporary world, we will frame our project within an archaeological implementation of the UNDP human securities approach. We will create a crowd-sourced database of global scope for the preindustrial Holocene of well-documented cases of climate-related migrations and the social and environmental contexts within which these migrations occurred.

Analysis of these cases may identify particular patterns and intersections of social institutions, cultural behaviors, and/or the environment that make migration more or less likely when people are confronted with climate extremes. Importantly, the project will work from the outset with Indigenous participants representing societies in analogous socioecological contexts to collaborate in the development of the database. Key outcomes of the project will be recommendations concerning how to anticipate the likely social impacts of climate-related migration and to create local, culturally relevant solutions to vulnerability-exacerbating conditions that can be applied by affected Indigenous communities in concert with governmental and nongovernmental organizations.

Inform the Present with the Past

We recognize that past efforts by archaeologists to influence public policy have mostly failed. The Intergovernmental Panel on Climate Change (IPCC), for example, has long recognized that past societies provide cases of adaptive and maladaptive responses

to climate change that are instructive to our present dilemma. Nonetheless, archaeology is generally lacking in IPCC reports and absent in the crafting of public policy (18). To some, this is evidence that the problems of today are not like those faced in the past. Society is fundamentally different: global in nature, more complex, and more technologically advanced. Still, many millions of people worldwide, including many of the most vulnerable, live in conditions not much different from their ancestors in the distant past.

Even where this is not true, as is the case for a majority of the world's population, groups will respond to future social and environmental threats much like they did in the past. Nomadic herdspeople of East Asia, for instance, will continue their pastoral way of life as long as they are free to move their herds. If access to pastures is restricted as a result of privatization or the pastures themselves are destroyed or transformed by climate change or mining, then nomads will migrate to urban areas and likely adopt a different lifestyle. Whether these migrations are temporary or permanent, lead to social integration or isolation, or result in equal opportunities or institutional barriers will in part be determined by socio-cultural processes that have evolved over long periods of time. Understanding these process, and deriving policies that privilege behaviors consistent with them, is critical if we hope to meet the social challenges confronting us.

Archaeologists can best meet these challenges not by examining one or a few sets of cases but rather by drawing on the completed experiments of hundreds of similar cases in the past. Thanks to data obtained largely in response to laws and mandates requiring archaeological investigations as part of development projects, we now have a wealth of information, most of it under-analyzed, at our disposal. Additionally, we have the cyber tools to discover, access, and analyze these data in ways that heretofore were simply not possible.

For archaeologists to be successful in this endeavor, they must not only listen to affected communities but also bring them into our research. Traditional knowledge experts and elders must not be subjects to be interviewed but instead collaborators in identifying the problems to be studied and how to study them. Similarly, policymakers from various levels of government and nongovernmental organizations need to be part of the research team to ensure that the results fit within the overarching goals and objectives of migration policy and are presented in a language that resonates with and can be used by these groups. Our goal at CfAS is to be honest brokers trusted by all parties as opposed to knowledge experts.

People have migrated since the dawn of humanity. For most of human history, frequent movement was the global norm, and even today migration remains the way of life for substantial numbers of nomadic and semi-nomadic peoples. Although the rise of agriculture, civilization, and urbanism has changed the nature and characteristics of migration, people moving from their birthplace to settle elsewhere endures as a major

aspect of the human experience for a significant portion of the human population. Archaeology shows that the reasons for migration in the past were multiple, that the scale of migratory processes varied from households to larger social formations, and that migrations varied in pace and distance traveled.

Contemporary migration may feel different, requiring responses untethered from the past. Yet, public policies based on observations of contemporary migrants or historical studies of shallow time depth have been found wanting by both migrants and hosts. We contend that a long-term perspective is needed. There is no evidence that the social processes behind people moving today differ in any fundamental way from migrations in the past. It stands to reason that understanding these processes is central to creating public policies that meet the human

security concerns outlined by the UN. The CfAS projects are a first step to injecting evidence-based insights from the past into the migration debate and ultimately into policies that successfully meet the daunting challenge ahead of us.

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