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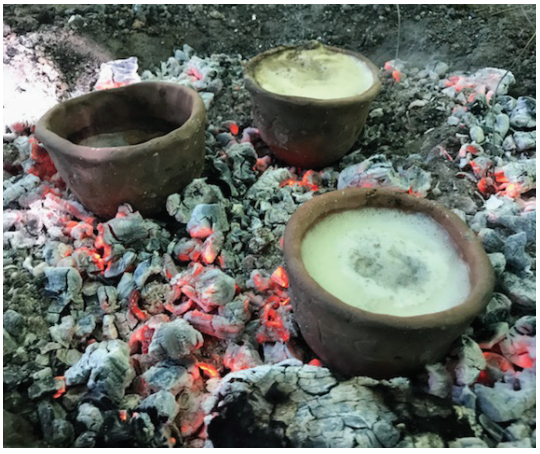
Bioregions and phylogenies reveal evolution in tropical Andes

For more than a century, researchers have sought to unravel faunal evolution in the tropical Andes, a topographically complex region noted for its extraordinary species richness and endemism. Despite general consensus about the geographical history of the Andes and origins of its biota, the mechanisms of isolation and diversification that explain the region's biodiversity remain murky. Focusing on Andean birds, Nicolas Hazzi et al. (pp. 7985–7990) used high-resolution species distribution modeling and dated molecular phylogenies to identify bioregions and map the regional speciation history in the context of the tropical Andes. The authors identified 15 bioregions associated with topographical barriers—species-isolating features such as valleys, elevation discontinuities, and high peaks resulting from Andean uplift and the pronounced temperature swings of the Pleistocene. Furthermore, the analysis found three models of speciation acting across different temporal scales, a potential mechanism for high endemism and biodiversity driven by multiple interacting instances of isolation and dispersal. The study reveals that the tropical Andes comprises several small but distinct bioregions that merit conservation. — T.J.

Hummingbird (*Oxypogon stubelii*) endemic to a biogeographic region in the tropical Andes.

Early pottery use by Japanese hunter-gatherers

The production and use of pottery in East Asia expanded dramatically at the beginning of the Holocene Epoch, approximately 11,500 years ago. This change coincides with climate warming, and researchers have suggested that the resulting environmental changes may have driven increased pottery production. Alexandre Lucquin et al. (pp. 7931–7936) analyzed organic residues from more than 800 Late Pleistocene and Early Holocene pottery samples from 46 ecologically diverse sites throughout Japan. Nearly half of the vessels contained a combination of fatty acids characteristic of aquatic food sources. The share of pottery associated with aquatic foods was largely independent of environmental setting

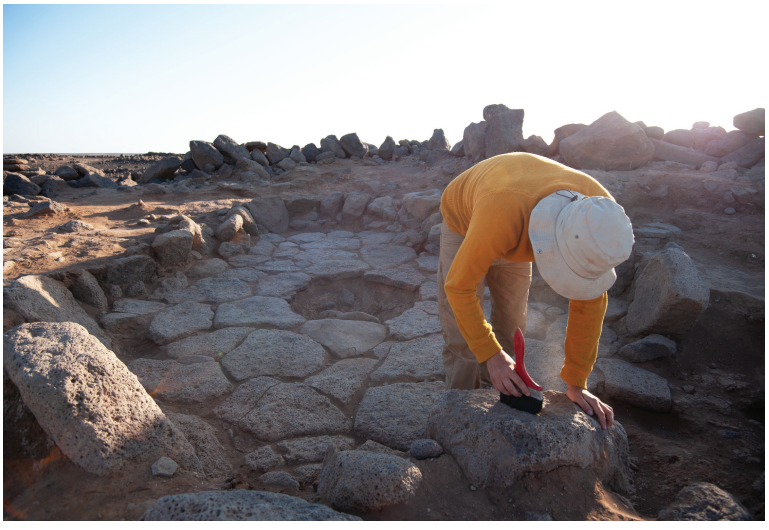


Simulation of Japanese hunter-gatherer cooking.

and did not change significantly between the Late Pleistocene and the Early Holocene, suggesting that pottery use did not fundamentally change with Holocene climate warming. However, residues from Early Holocene pottery contained a broader range of carbon and nitrogen isotope compositions compared with Late Pleistocene pottery, suggesting that Early Holocene pottery was used for a broader range of aquatic resources than Late Pleistocene pottery. According to the authors, the results suggest that environmental changes at the beginning of the Holocene may have facilitated increased inshore fishing, shellfish gathering, and reduced mobility, prompting increased pottery usage. — B.D.

Preagricultural origins of bread in the Near East

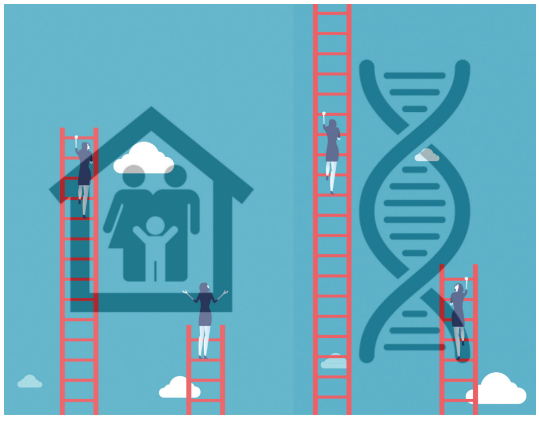
Bread is an important foodstuff in modern cuisine, yet its origins are not well understood. The discovery of bread in Neolithic archaeological sites suggests that the invention of bread is associated with the rise of agriculture. Amaia Arranz-Otaegui et al. (pp. 7925–7930) analyzed fragments of charred food remains found at a Natufian hunter-gatherer site in northeastern Jordan dating from 14,600 to 11,600 years ago. The fragments exhibited a porous matrix resembling that of a flat, unleavened bread-like product. Many of the fragments showed cereal grain features, but some also showed the presence of noncereal components derived from a root-type food, most likely club-rush tuber. Both cereal and noncereal components appeared to have undergone thorough milling, sieving, and/or winnowing, based on the particle sizes, the absence of cereal chaff or whole grains, and the prevalence of grinding implements at the site. The results provide evidence for the preparation of bread-like products 4,000 years before the emergence of agriculture. Nevertheless, existing archaeobotanical evidence suggests that other noncereal foods composed the bulk of the diet during the Natufian period. Thus, bread likely became a dietary staple only after the establishment of agriculture, according to the authors. — B.D.



Excavation of Structure 1 at the Shubayqa 1 site in northeastern Jordan. Image courtesy of Alexis Pantos (photographer).

Education, genes, and social mobility

A genetic measure called a polygenic score, derived from a genome-wide association study of education, can predict an individual's educational and economic success. Such predictions could indicate biological mechanisms or socially transmitted opportunities and advantages, given that children inherit both genes and social class from parents. Daniel Belsky et al. (pp. E7275–E7284) tested whether polygenic scores predicted social mobility in a study that included more than 20,000 individuals from Britain, New Zealand, and the United States who were followed from childhood into adulthood. The authors found that individuals with high polygenic scores achieved more upward social mobility in terms of education, occupation, and wealth, compared with their parents and siblings, regardless of the individuals' familial social class as children. Additionally, the study revealed that a mother's polygenic score predicted her child's success independently of the child's own polygenic score, suggesting that the family environment fostered by parents might influence children's life success. According to the authors, the findings indicate that an individual's genes and childhood family environment likely influence socioeconomic outcomes. — C.S.



Family environment and genes influence social mobility. Modified with permission from Shutterstock/notbad, Zenzen, and Alhovik.