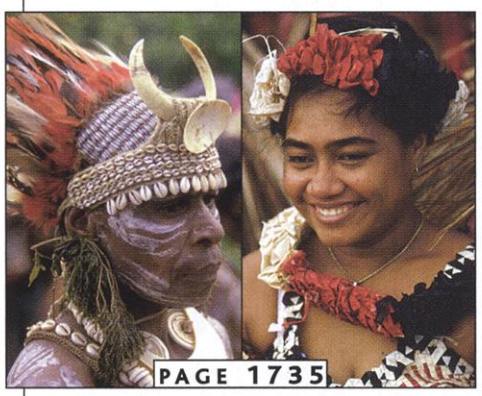
Humans on the Move

They say that much of literature is composed of only two plots: Someone goes on a trip or a stranger comes to town. The same might be said for the tale of human prehistory. The *Homo* lineage was born in Africa but soon expanded its range outside that continent, reaching Dmanisi, Georgia, by 1.7 million years ago and perhaps Java, Indonesia, even earlier. Members of our genus have been on the move ever since. These migrations began the global impact of humans on ecosystems and also transformed human evolutionary history, in ways researchers are still working to understand. This special issue explores where some of those early migrants went, how they got there, and what may have happened when they arrived.

Although we use the term "migrations," these journeys were probably nothing like the purposeful flight of a bird seeking winter grounds. Rather, ancient hunting and gathering peoples presumably ventured into new territory as they searched for new resources. These hominids developed progressively more sophisticated technology during their travels, as detailed in a Review by Ambrose, and the "journey" probably took the form of a slow expansion over many generations, leaving genetic "signatures" in descendant populations, as discussed in a Review by Cann. And although the overall movement has been from Africa outward, there were probably back migrations, too.

Colonization of new continents apparently happened not once but several times. Many anthropologists think that there were no fewer than three waves of migration out of Africa: first into the Middle East and Asia, and eventually to Europe. Our own ancestors, the modern humans, later recolonized those areas and also roamed into Australia, the Americas, and the remote Pacific Islands. Four News stories by Michael Balter, Ann Gibbons, and Eliot Marshall track these waves of settlement and probe what happened when later immigrants encountered the descendants of earlier wanderers.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Our understanding of these ancient travels has been invigorated in the past 10 years by genetics, as researchers use genes to trace the original homelands of populations. After years of focus on the maternally inherited mitochondrial DNA, the paternally inherited Y chromosome is now providing complementary data, as discussed in a News story by Elizabeth Pennisi and in a Review by Stumpf and Goldstein, and comparisons between the two are yielding surprises. And the just-published human genome sequence, with its catalog of human genes and listing of the many variations seen in our DNA sequence, offers a new wealth of data for detecting the movement as well as the evolution of our ancestors. Meanwhile, researchers mining traditional data sources—fossils and artifacts—continue to gather rich results, even from such presumably well-surveyed regions as Europe. Given that one of humans' great ecological advantages is the ability to reshape environments to our liking, perhaps it's no surprise that these data suggest a powerful and repeated drive to colonize.

–ELIZABETH CULOTTA, ANDREW SUGDEN, BROOKS HANSON

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