Book review

Rooting history in the genes

Where Do We Come From? The Molecular Evidence for Human Descent

J Klein and N Takahata

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What do Matsuo Bashō (the great Japanese *haiku* poet), Paul Gauguin, and Rabelais' Oracle of the Holy Bottle have to do with human evolution? Apparently a good deal, according to Klein and Takahata. In their new book, *Where Do We Come From? The Molecular Evidence for Human Descent*, the authors merge literary, artistic, and mythological perspectives on human origins with a comprehensive look at the molecular evolutionary history of our species. The result is a wide-ranging, and very impressive, 'textbook'. (I use the term with some reservation, as the story is much more elegantly conveyed than the appellation typically implies.)

Where Do We Come From? takes its title, cover illustration, and much of its impetus, from Gauguin's Tahitian masterpiece *D'ou Venons-Nous?*, the full title of which translates to English as 'Where do we come from? What are we? Where are we going?'. In 12 chapters, the authors address these questions from the point of view of their combined scientific expertise: Klein's background in immunogenetics and molecular evolution is a robust complement to Takahata's in theoretical population genetics. Much of the text focuses on the first of the three questions, tracing the genesis of the human species to the origins of life itself, but the authors turn in the final chapter to a consideration of the latter two questions as well.

The first third of the book introduces the biological basis of descent, beginning with a brief introduction to the physical basis of ancestor–descendant relationships

(from homunculus to DNA) then considering the genealogical history recorded in DNA molecules, and the ways in which short-term changes in gene pools may accrue to large-scale evolutionary changes at the molecular (and of course, phenotypic) level. Following a description of methods of phylogenetic reconstruction, the authors then take the readers through a breathless molecular overview of the Tree of Life, starting first with the origin of the earliest life on Earth, then moving to animal phylogeny, and finally, ever closer to *Homo sapiens*, to a consideration of relationships among our nonhuman primate cousins.

In the latter third of the book, attention turns to the story of human evolution as it is most typically told: the hominid radiation following divergence from our common ancestor with chimpanzee, which culminated in the emergence of anatomically modern humans sometime between 2 million and 200 000 years ago. Although the fossil evidence is described, the focus is squarely on the molecular evidence relevant to competing models and the authors do an excellent job of introducing and explaining the currently available data. The final chapter is an introspective, largely un-molecular, look at the twin demons of contemporary human existence: widespread environmental degradation (*Homo destructus*) and racial intolerance (*Homo intolerans*).

Together, these chapters chart a remarkable journey, at times complicated but always compelling. While written with the nonspecialist clearly in mind, anyone with an interest in human evolution, and the molecular data that relate to it, will find much to occupy and entice them in this book.

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