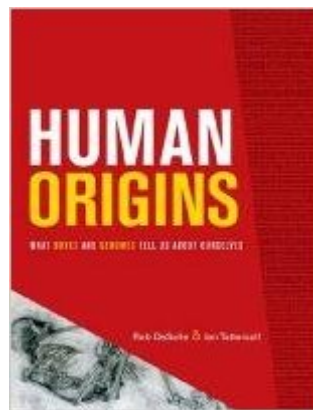


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# Human Origins: What Bones And Genomes Tell Us About Ourselves (Texas A&M University Anthropology Series)



## Synopsis

Ever since the recognition of the Neanderthals as an archaic human in the mid-nineteenth century, the fossilized bones of extinct humans have been used by paleoanthropologists to explore human origins. These bones told the story of how the earliest humans—bipedal apes, actually—first emerged in Africa some 6 to 7 million years ago. Starting about 2 million years ago, the bones revealed, as humans became anatomically and behaviorally more modern, they swept out of Africa in waves into Asia, Europe and finally the New World. Even as paleoanthropologists continued to make important discoveries—Mary Leakey's Nutcracker Man in 1959, Don Johanson's Lucy in 1974, and most recently Martin Pickford's Millennium Man, to name just a few—experts in genetics were looking at the human species from a very different angle. In 1953 James Watson and Francis Crick first saw the double helix structure of DNA, the basic building block of all life. In the 1970s it was shown that humans share 98.7% of their genes with the great apes—that in fact genetically we are more closely related to chimpanzees than chimpanzees are to gorillas. And most recently the entire human genome has been mapped—we now know where each of the genes on the chromosomes that make up DNA is located on the double helix. In *Human Origins: What Bones and Genomes Tell Us about Ourselves*, two of the world's foremost scientists, geneticist Rob DeSalle and paleoanthropologist Ian Tattersall, show how research into the human genome confirms what fossil bones have told us about human origins. This unprecedented integration of the fossil and genomic records provides the most complete understanding possible of humanity's place in nature, its emergence from the rest of the living world, and the evolutionary processes that have molded human populations to be what they are today. *Human Origins* serves as a companion volume to the American Museum of Natural History's new permanent exhibit, as well as standing alone as an accessible overview of recent insights into what it means to be human.

## Book Information

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## Customer Reviews

Paleoanthropology has always been multidisciplinary. The addition of the study of the human genome has simply added incrementally to the disciplines required to fully understand human origins. Genomics is a discipline which could easily have glazed the eyes of the entry level reader without contributing to the understanding of the already scientifically literate. What DeSalle and Tattersall do with Human Origins is to show how molecular systematics contributes to the established interpretation of the fossil record. They tee up the subject by reviewing the state of scientific knowledge in the fields of evolution, geology, stratigraphy, genetics, x-ray crystallography, cladograms... And if you need a remedial paragraph or two on what "science" is, or what a brain is, this is your book. Pay particular attention to the factors which alter genomes over time. Understand how "genetic drift" and "natural selection" do the hard work in changing allele frequencies. The authors' explanations are masterful, for instance equating drift to sampling error in statistics. Understanding these basics will make it easier to understand the how certain features of early hominid physiology resulted from drift or selection. And you have to love how the authors refer to some of the facile misunderstandings of evolution as little more than "just so" stories (though they omit an attribution to Rudyard Kipling for the analogy). Most distressing is the revelation that the human y chromosome has been shrinking at a steady rate, and will in a mere 125,000 years completely disappear, leaving women alone on earth, with terminal consequences for our species.

When I first paged through this book, it reminded me of a school text book. The book has glossy pages and loads of full color vivid illustrations which I found very helpful. The authors start by discussing the field of Paleoanthropology and then spend some time explaining genomics. In these chapters one exposed to a lot of related terminology, such as phyletic gradualism, cladistics, introns, and autosomes and so on. It would have been nice if the authors included a glossary of terms to better define the terminology for readers not expert in these fields. Some definitions were brief and lacking. The section on evolution and human origins was very informative. Here the discussion turned to alleles, RNA, major ways genomes in populations can change with time, an interesting

example of the sickle cell allele and malaria, and exaptations. We then learn about evolutionary trees, the role of archaea in the tree of life and continuing on to human evolution where we learn about the "bipedal apes", the first stone toolmakers, Homo erectus, Homo ergaster, the out of Africa movement and Homo heidelbergensis, the Neanderthals, and the emergence of Homo sapiens. In chapter seven, there is an interesting discussion on the deterioration of the Y chromosome, something that has been going on for the past 100 million years since the common ancestor of all mammals. There is an explanation of the working of molecular clocks and human migration both in Eurasia and the Western hemisphere which I found very informative. We finally get into the significance of symbolic thought, cave art and eventually language.

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