



The Great Leap Forward

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World population figures around 1 A.D. have been estimated at about 200 million people. One million years prior to 1 A.D., population figures of early humankind of Homo sapien or Homo erectus have been estimated at about 125 thousand. In order for us to understand and appreciate the very long path of this development and growth of humankind, it is helpful to discuss early hominoid history and its development, expansion, explosion along with a discussion of the relationship of tools, concepts and technology to that expansion. The Great Leap Forward gives some perspectives on the early struggles of humankind and exponential growth toward modern creativity, expansion, and technology.

One can hardly blame nineteenth-century creationists for insisting that humans were separately created by God. After all, between us and other animal species lies the seemingly unbridgeable gulf of language, art, religion, writing, and complex machines. Small wonder, then, that to many people Darwin's theory of our evolution from apes appeared absurd.

Since Darwin's time, of course, fossilized bones of hundreds of creatures intermediate between apes and modern humans have been discovered. It is no longer possible for a reasonable person to deny that what once seemed absurd actually happened—somehow. Yet the discoveries of many missing links have only made the problem more fascinating without fully solving it. When and how did we acquire our uniquely human characteristics?

We know that our lineage arose in Africa, diverging from that of chimpanzees and gorillas sometime between 6 million and 10 million years ago. For most of the time since then we have been little more than glorified baboons. As recently as 35,000 years ago western Europe was still occupied by Neanderthals, primitive beings for whom art and progress scarcely existed. Then there was an abrupt change. Anatomically modern people appeared in Europe, and suddenly so did sculpture, musical instruments, lamps,

trade, and innovation. Within a few thousand years the Neanderthals were gone.

Insofar as there was any single moment when we could be said to have become human, it was at the time of this Great Leap Forward 35,000 years ago. Only a few more dozen millennia—a trivial fraction of our 6-to-10 million-year history—were needed for us to domesticate animals, develop agriculture and metallurgy, and invent writing. It was then but a short further step to those monuments of civilization that distinguish us from all other animals—monuments such as the *Mona Lisa* and the Ninth Symphony, the Eiffel Tower and Sputnik, Dachau's ovens and the bombing of Dresden.

What happened at that magic moment in evolution? What made it possible, and why was it so sudden? What held back the Neanderthals, and what was their fate? Did Neanderthals and modern peoples ever meet, and if so, how did they behave toward each other? We still share 98 percent of our genes with chimps; which genes among the other 2 percent had such enormous consequences?

Understanding the Great Leap Forward isn't easy; neither is writing about it. The immediate evidence comes from technical details of preserved bones and stone tools. Archeologists' reports are full of such terms as "transverse occipital torus," "receding zygomatic arches," and "Chatelperronian backed knives." What we really want to understand—the way of life and the humanity of our vari-

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