

Chapter 1: The Earliest Human Societies: 1-3 The Paleolithic Age
Book Title: World Civilizations
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1-3 The Paleolithic Age

The lengthy period extending from about the appearance of the first toolmaking hominids to about 10,000 B.C.E. is known as the **Paleolithic Age** ([The period from the earliest appearance of *Homo sapiens* to c. 10,000 B.C.E., though exact dates vary by area; the Old Stone Age.](#)), or Old Stone Age, so called because tools were made of stone and other natural materials and were still quite crude (*paleo* = old; *lithos* = stone). By the end of the Paleolithic, humans inhabited all the continents except Antarctica. Late Paleolithic peoples were hunters and foragers, but life was not easy, and famine was always near at hand.

Paleolithic hunting and gathering was done in groups, and success depended more on organization and cooperation than on individual bravery or strength. The family was the basic social unit, but it was normally an extended family, or clan, that included uncles, aunts, in-laws, and other relatives, rather than the nuclear family (that is, mother, father, children) that is common today. A unit larger than the nuclear family was necessary for protection, but the total number able to live and hunt together was probably quite small—no more than forty or so. More people than that would have been difficult to sustain when hunting was poor or when wild fruits and seeds were not plentiful. Close family relations and interchange with other similar groups among the Paleolithic hunters were critical to their survival, a fact that we will see reflected in many other locales in later history. The Framing History: Society & Economy features throughout the book refer to this theme.

The Historian's Craft

Using the Science of Genomics to Reconstruct Human Global Migrations

Where did the human race originate? What paths did our ancestors follow that brought them to where we are now? Using the science of genetics, scientists recently have provided intriguing answers to these questions. (See [Map 1.1.](#)) What, then, is the science behind these discoveries?

All human beings have between 50 and 100 billion cells, which comprise the tissues of their bones, skin, and organs. Despite variations caused by their functions, all human cells share the same basic structure and parts, namely, an outer membrane that enfolds the *cytoplasm* and the *nucleus*. Both the nucleus, at the center, and tiny bodies inside the cytoplasm, called *mitochondria*, contain [chromosomes \(Pairs of genes that living creatures pass on to their offspring. Human beings have twenty-three chromosomes in their cells.\)](#). Chromosomes (see the chapter-opening image of [the human genome](#)) are made of genes, strings of double-helical DNA that human infants inherit from their parents and ancestors. DNA determines humans'

physical makeup: their height, body shape, and the colors of their eyes, skin, and hair, for example.

As shown in the chapter opening [photo](#), nuclear DNA contains twenty-two numbered pairs of chromosomes, one half of which is inherited from the mother, the other half from the father. The twenty-third pair is the one that determines a person's sex. Anyone born with an XX sex chromosome is female, one with an XY pairing is male. In these pairings, the X half can come from either parent, whereas the Y genome comes exclusively from the father and his ancestors.

Mitochondrial DNA differs from nuclear DNA in two noteworthy aspects. First, mitochondrial DNA does not recombine during reproduction, and it is inherited entirely from the mother, just as the Y half of the gender-determining chromosome comes exclusively from the father. Therefore, important clues about a person's maternal ancestors can be obtained by studies of his or her mitochondrial DNA, whereas genetic clues about one's paternal ancestors come from studying the Y genome.

Another important detail is that, typically, some segments of the human genome differ from what is inherited from people's parents and forebears. These differences are the results of random changes, called *mutations*, which occur from time to time in every individual. Geneticists call these changes [genetic markers \(A mutation that occurs randomly in chromosomes as a result of genetic drift. Once these happen, they are passed down to all offspring. Thus they mark a deviance in a genealogical tree of descent.\)](#), since they "mark," or are important signifiers of, what makes a person genetically slightly different from his or her ancestors. Mutations, once they occur (usually from ambient radiation), are passed down in the chromosomes of a person's descendants. In other words, when they occur, such mutations become "markers" of descent, so groups of related individuals who share these markers can trace their descent back to a common ancestor in whom the mutation originally occurred.

Every point at which a marker or divergence occurs in the human family tree serves as a genetic beacon for tracing genealogical descent. By tracing backward, marker by marker, divergence by divergence, geneticists have in effect discovered the history of the entire human race back to a single genealogical male and a single female who are the genetic ancestors of us all. Since each divergence occurred as the human race spread across the world, by studying the age and prevalence of each marker in certain regions, geneticists have provided historians with a basic map of humans' migrations out of Africa and around the globe ([Map 1.1](#)).

Analyze and Interpret

Based on the information above, which type of DNA test would be most helpful for a woman who wanted to trace her maternal ancestors? Which type would be best suited for a man wishing to find his paternal ancestors?

Although conflicts frequently arose over hunting grounds, water, theft, or other problems, the Paleolithic era probably saw less warfare than any time in later history. So much open space capable of sustaining life was available that the weaker units probably just moved on when they were confronted with force or threats. Violence tempered and controlled by consensual authority was a constant factor in determining historical and prehistoric life. The Framing History: Law & Government features throughout the book will help us follow this theme.

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