

# Modern life's pressures may be hastening human evolution

April 13 2009, By Robert S. Boyd

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We're not finished yet. Even today, scientists say that human beings are continuing to evolve as our genes respond to rapid changes in the world around us. In fact, the pressures of modern life may be speeding up the pace of human evolution, some anthropologists think.

Their view contradicts the widespread 20th-century assumption that modern medical practice, antibiotics, better diet and other advances would protect people from the perils and stresses that drive evolutionary change.

Nowadays, the idea that "human evolution is a continuing process is widely accepted among anthropologists," said Robert Wald Sussman, the editor of the Yearbook of Physical Anthropology at Washington University in St. Louis.

It's even conceivable, he said, that our genes eventually will change enough to create an entirely new human species, one no longer able to breed with our own species, Homo sapiens.

"Someday in the far distant future, enough [genetic changes](#) might have occurred so that future populations could not interbreed with the current one," Sussman said in an e-mail message.

The still-controversial concept of "ongoing evolution" was much discussed recently at the annual meeting of the American Association of Physical Anthropologists in Chicago.

It's also the topic of a new book, "The 10,000 Year Explosion," by anthropologists Henry Harpending and Gregory Cochran of the University of Utah, Salt Lake City.

"For most of the last century, the received wisdom in the social sciences has been that human evolution stopped a long time ago," Harpending said. "Clearly, received wisdom is wrong, and human evolution has continued."

In their book, the Utah anthropologists contend that "[human evolution](#) has accelerated in the past 10,000 years, rather than slowing or stopping. ... The pace has been so rapid that humans have changed significantly in body and mind over recorded history."

Evolutionary changes result when random mutations or damage to DNA from such factors as radiation, smoking or toxic chemicals create new varieties of genes. Some gene changes are harmful, most have no effect and a few provide advantages that are passed on to future generations. If they're particularly beneficial, they spread throughout the population.

"Any gene variant that increases your chance of having children early and often should be favored," Cochran said in an e-mail message.

This is the process of "natural selection," which Charles Darwin proposed 150 years ago and is still the heart of modern evolutionary theory.

For example, a tiny change in a gene for skin color played a major role in the evolution of pale skin in humans who migrated from Africa to northern Europe, while people who remained in Africa kept their dark skin. That dark skin protected Africans from the tropical sun's dangerous ultraviolet rays; northerners' lighter skin allowed sunlight to produce more vitamin D, important for bone growth.

Another set of gene variants produced a different shade of light skin in Asia.

"Asians and Europeans are both bleached Africans, but they evolved different bleaches," Harpending said.

Despite modern medical and technological advances, the pressures that lead to evolution by natural selection have continued.

The massive AIDS epidemic that's raging in southern Africa, for example, is "almost certainly" causing gene variants that protect against HIV, the virus that causes AIDS, to accumulate in the African population, Harpending said.

When he was asked how many genes currently are evolving, Harpending replied: "A lot. Several hundred at least, maybe over a thousand."

Another anthropologist, John Hawks of the University of Wisconsin-Madison, said, "Our evolution has recently accelerated by around 100-fold."

A key reason, Hawks said, is the enormous growth of the world's population, which multiplies the size of the gene pool available to launch new varieties.

"Today, beneficial mutation must be happening far more than ever before, since there are more than 6 billion of us," Cochran said.

The changes are so rapid that "we could, in the very near future, compare the genes of old people and young people" to detect newly evolving genes, Cochran said. Skeletons from a few thousand or even a few hundred years ago also might provide evidence of genetic change.

"[Human evolution](#) didn't stop when anatomically modern humans appeared or when they expanded out of Africa," Harpending said. "It never stopped."

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The American Association of Physical Anthropologists: [physanth.org](http://physanth.org)

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