

*EDGE* essay in response to the 2014 Question What Scientific idea is ready for retirement?

Peter Richerson  
Distinguished Professor Emeritus  
University of California Davis



## **HUMAN NATURE**

The concept of human nature has considerable currency among evolutionists who are interested in humans. Yet when examined closely it is vacuous. Worse, it confuses the thought processes of those who attempt to use it. Useful concepts are those that cut nature at its joints. Human nature smashes bones.

Human nature implies that our species is characterized by common core of features that define us. Evolutionary biology teaches us that this sort of essentialist concept of species is wrong. A species is an assemblage of variable individuals, albeit individuals who are sufficiently genetically similar that they can successfully interbreed. Most species share most of their genes with ancestral and related species, as we do with other apes. In most species, ample genetic variation ensures that no two individuals are genetically identical. Many species contain geographically structured genetic variation, as the modern humans do. A few tens of thousands of years ago, our genus seemed to have comprised of at a couple of African “species” and three Eurasian ones, all of which interbred enough to leave traces in living genomes. Most species, and the populations of which they are composed, are relentlessly evolving. The human populations that have adopted agriculture in the Holocene have undergone a wave of genetic changes to adapt to a diet rich in starchy staples other agricultural products, and to an environment rich in epidemic pathogens taking advantage of dense, settled human populations. Some contemporary human populations today are subject to new selective pressures owing to “diseases of abundance.” The evolution of resistance to such diseases is detectable. Some geneticists argue that genes affecting our behavior have come under recent selection to adapt to life in complex societies.

The concept of human nature causes people to look for explanations under the wrong rock. Take the most famous human nature argument: are people by nature good or evil? In recent years, experimentalists have conducted tragedy of the commons games and observed how people solve the tragedy (if they do). A common finding is that roughly a third of participants act as selfless leaders, using whatever tools the experimenters make available to solve the dilemma of cooperation, roughly a tenth are selfish exploiters of any cooperation that arises, and the balance are guarded cooperators with flexible morals. This result comports with everyone’s personal experience, some people are routinely honest and generous, a few are downright psychopathic, and many people fall somewhere in between.

Human society would be entirely different if this were not so. The human nature debate on the topic was sterile because it did not attend to something we all know if we stop to think about it.

Darwin's great contribution to biology was to abandon essentialism and focus on variation and its transmission. He made remarkable progress even though organic inheritance was a black box in his day. He also got the main problem of human variability right. In the *Descent of Man*, he argued that humans were biologically a rather ordinary species with a rather ordinary amount of geographical variation. Yet, in many ways, the amount human behavioral variation is far outside the range of other species. The Fuegians adapted to a hunting and gathering life on the Straits of Magellan were sharply different from a leisured gentleman naturalist from Shrewsbury. But these differences mainly owe to different customs and traditions, not mainly to organic differences. He also realized that the evolution of traditions responded to selective processes other than natural selection. Traditions are shaped by human choices a little like the artificial selection of domesticates, with natural selection playing a subordinate role.

In his *Sketch on an infant* Darwin described how readily children learn from their caregivers. The inheritance of traditions, customs, and language is relatively easy to observe with the tools of a 19<sup>th</sup> Century naturalist compared to intricacies of genetic inheritance, which is still yielding fundamental secrets to the high tech tools of molecular biology. Recent work on the mechanisms underlying imitation and teaching has begun to reveal the more deeply hidden cognitive components of these processes and the results underpin Darwin's phenomenological account of tradition acquisition and evolution.

In no field is the deficiency of the human nature concept better illustrated than in its use to try to understand learning, culture and cultural evolution. Human nature thinking leads to the conclusion that causes of behavior can be divided into nature and nurture. Nature is conceived of as causally prior to nurture both in evolutionary and developmental time. What evolves is nature and cultural variation, whatever it is, has to the causal handmaiden of nature. This is simply counterfactual. If the dim window stone tools give us does not lie, culture and cultural variation have been fundamental adaptations of our lineage perhaps going back to late australopiths. The elaboration of technology over the last two million years has roughly paralleled the evolution of larger brains and other anatomical changes. We have clear examples of cultural changes driving genetic evolution, such as the evolution of dairying driving the evolution of adult lactase persistence. Socially learned technology could have been doing similar things all throughout the last 2 million years. The human capacity for social learning develops so early in the first year of life that developmentalists have had to design very clever experiments to probe what infants are learning months before language and precise imitative behavior exist. At least from 12 months onward social learning begins to transmit the discoveries of cultures to children with every opportunity for these discoveries to interact with gene expression. In autistic children, this social learning mechanism is more or less severely compromised, leading to more or less severely "developmentally disabled" adults.

Human culture is best conceived of as a part of human biology, like our bipedal locomotion. It is a source of variation that we have used to adapt to most of the world's terrestrial and amphibious habitats. Using the human nature concept, like essentialism more generally, makes it impossible think straight about human evolution.