# A letter on the Denisova discovery

**25 January 2011**

*The* World Socialist Web Site *received this letter in response to* "The Denisova discovery: Ancient genomics shed new light on human origins," *published January 17, 2011.*

Thank you for this highly informative article.

This important discovery and, more generally, the wealth of new information that is being developed from recent genetic, paleontological, and archaeological investigations serve to bring into ever sharper focus the dual nature of human evolution, that is as both a biological and a cultural process. Organisms that exist purely as biological entities adapt to their environments through changes in their physical structure and genetically controlled behavior. This is a slow process and is furthermore constrained by the genetic 'raw material' upon which natural selection can operate. The capacity for learned behavior (i.e., intelligence) that has evolved to differing degrees in a variety of species, primarily among mammals and birds, affords greater flexibility in interactions with the environment.

The evolution of hominins, and most especially modern humans, has taken this tendency to increasingly rely on learned behavior to a qualitatively higher level than any other group of organisms. The development of culture and technology gives humans a dual and contradictory character, both part of nature and, at the same time, separate from and opposed to it. This creates a dynamic and one might say 'unstable' relationship between humans and their environment. While all species have a dialectical interaction with their surroundings, their ecological niche, human culture has no niche in the traditional sense. Humans are continually creating a new niche, adapting to but at the same time modifying their environment. They are constantly remaking themselves. Therefore, it is not surprising that virtually as soon, in a geological sense, as we see the first evidence of technology in the form of Oldowan tools, there is evidence of humans moving out of their African birthplace, as seen, for example, in the very early materials at Dmanisi in the Republic of Georgia.

Once 'out of Africa', however, there is no reason to believe that there were not many centers of both cultural and biological evolution for humans spread out over multiple continents. When plant and animal species move into new territories the pioneer populations tend to adapt to their changed surroundings and thus differentiate from the parent population, sometimes ultimately developing into new species. This tendency toward speciation must have affected hominins as well. However, unlike other species, hominins adapt both biologically and culturally. So, the development of absolute species differences (i.e., the inability to mate and produce fertile offspring) would likely have been dampened. Also, it is probable that, as cultural/technological innovations accelerated, groups with better tools, forms of social organization, etc., would have tended to spread into adjacent areas where other people were already present, leading to a frequent 'churning' of both biological and cultural characteristics.

Given this dynamism, I would suggest that both the "multi-regional" and "replacement" models of human evolution over-simplify what is likely to have been the real situation. The Denisovans are likely to be but one instance of an extremely complex historical geography of human evolution that will be gradually revealed by ongoing research.

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18 January 2011

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