

THE TROUBLE WITH CERTAINTY IN THE STUDY OF HUMAN EVOLUTION

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A Review of the Book

The Masters of the Planet: The Search For Our Human Origins

by Ian Tattersall. 2012.

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“Deeper than deep is the well of the past” ponders Thomas Mann, sending us into despair at the same time as confining our thoughts to a single shaft view of prehistory. Desperation is indeed the main feeling we have when we face the intellectual upheaval that has hit the students of human evolution in the past decade or so. Many of our facts have vanished into thin air as a multitude of new techniques has widened the toolbox of the field, while entirely new approaches have entered the arena.

The list of the new sources of our uncertainty is long.

Not only is there an unexpected increase in the rate of new fossil discoveries, but also palaeoanthropology has been blessed with the arrival of computer-based methods that help us learn more from fossils old and new (Aiello & Antón, 2012; Antón & Josh Snodgrass, 2012). The new fossils combined with new methods result in a renewed understanding of human evolution, often demonstrating how the previous simplistic explanations were dependent on overarching and unsupported assumptions that crumble under the new data, leaving more realism, but also more uncertainty.

New techniques are not only useful for analysing fossils, but also for finding them. The Green Arabia project, for instance, uses computer based paleoclimate models combined with high-resolution satellite photography to find potential fossil sites on the

Arabian Peninsula. With an estimated 14,000 sites identified so far, it promises to provide an entirely new image of human existence over the past 150k years (Jennings et al., 2014; Scerri, Drake, Jennings, & Groucutt, 2014; Scerri, Groucutt, Jennings, & Petraglia, 2014). These techniques then supersede some previous blind assumptions, but also force us to question what we thought we knew about the path of human evolution.

While the consequences of these new techniques increase our discomfort with intellectual shortcuts taken in the past, entirely new fields are also joining the quest to understand human evolution.

First, there is the undying wave of surprise that the study of the human genome (Lander et al., 2001; Naidoo, Pawitan, Soong, Cooper, & Ku, 2011) brings to our field. We now have a tree of human descent, one for each of us. This resulted in the death of multi-regionalism (Relethford, 2008), and an entirely new database to model a range of human behaviour from migration (Liu, Prugnolle, Manica, & Balloux, 2006; Ramachandran et al., 2005) to marriage systems (Oota, Settheetham-Ishida, Tiwawech, Ishida, & Stoneking, 2001; Seielstad, Minch, & Cavalli-Sforza, 1998). Although the early genetic findings reduced the uncertainty about human evolution by closing off some of the tired debates, the discoveries concerning interbreeding with Neanderthals (Green et al., 2010; Vernot & Akey, 2014), and especially with the Denisovans (Meyer et al., 2012b; Reich et al., 2010) suggest a much earlier common ancestor than previously imagined (Meyer et al., 2012a). This raises the possibility that there might have been a considerable length of time during which a creature not very different from us, perhaps no different at all, was not building large cities, nor designing complex technologies, nor writing grumpy book reviews.

Second, computationally intensive modelling allows a new set of insights into the evolutionary driving forces behind the appearance of modern humans, either concerning the human social system (Shultz, Opie, & Atkinson, 2011), or language (Lieberman, Michel, Jackson, Tang, & Nowak, 2007), or social brain (David-Barrett & Dunbar, 2013). These, together with a new set of laboratory (Barrett et al., 2013) and field (Henrich et al., 2006) experiments shed an entirely new light on the evolution of human sociality.

Ian Tattersall's book (Tattersall, 2012) on *The Masters of the Planet* is an interesting exposition of human evolution from mostly an archaeologist's point of view. Yet, none of the above earth shattering findings is given much attention in this book, and some are completely absent. (There is only one mention of the Denisovan hominin.) The description of human evolution leaves much of social behaviour untouched, whether the question concerns the relationship between sociality and the brain, the sensitivity to inequality, the propensity to be altruistic towards non-kin, or the ability to organise complex collective action in a large group. It is as if these were either not important, or not real human traits.

Perhaps most perturbingly, the book oozes certainty. Ian Tattersall forces the reader to a single shaft view of the past, in which one story, a single story, is true. If all you know about human evolution is what you find in this book, you will be content that, although there are some uncertainties (the unfinished quest to understand bipedality gets a fair

treatment, for instance), you can rest assured that a full picture is in the process of emerging. I could not shake off my own discomfort at the author's lack of discomfort about just how much we need to rethink.

Reading the book one might think that we lived in a different century, one in which bones were more important than genes, in which chimpanzees were regarded as closer to humans than bonobos, in which we did not have global databases about human social behaviour, in which phylogenetic reconstructions of human mating systems or language use were only dreams of the future, or in which computer modelling of the evolution of behaviour (as well the body) did not exist.

Nevertheless, it would not be fair to say that the book is a wasted opportunity entirely. I did learn some interesting insights (about australopithecines), which was an interesting, albeit short part of the book. Perhaps these small flickers of excellence are the true reason for complaint: they show what a fantastic book this might have been.

The well of the past is deeper than we thought a decade ago. If we recognise this, then science might allow hope that it is not bottomless.

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Germline genetic engineering "really touches the essence of who we are, what it means to be human," said Dr. Gregory Stock, a conference organizer and director of the Science, Technology and Society program at U.C.L.A.'s Center for the Study of Evolution and the Origin of Life. "We are talking about intervening in the flow of genetic information from one generation to the next." No one could say with certainty when this new kind of genetic engineering could be put into practice. But, he said, he is troubled by the idea of adding genes for certain complex traits. For example, he said, "somebody talked about genes for 'emotional stability.'" Scientists at the meeting also spoke quite seriously about extending the human life span with cassettes of anti-aging genes. Read *The Trouble With Testosterone* by Robert M. Sapolsky for free with a 30 day free trial. Read unlimited* books and audiobooks on the web, iPad, iPhone and Android. In the tradition of Stephen Jay Gould and Oliver Sacks, Robert Sapolsky offers a sparkling and erudite collection of essays about science, the world, and our relation to both. "The Trouble with Testosterone" explores the influence of that notorious hormone on male aggression. "Curious George's Pharmacy" reexamines recent exciting claims that wild primates know how to medicate themselves with forest plants. "Junk Food Monkeys" relates the adventures of a troop of baboons who stumble upon a tourist garbage dump.