

A recreation of a Neanderthal hunting party in prehistoric Britain.

EVOLUTIONARY BIOLOGY

Twisting the tale of human evolution

John Hawks enjoys a debunking of myths about our evolutionary fitness for the twenty-first century.

Advances in medicine and psychology may be stunning, but why is humanity plagued with persistent and widespread ills, from diabetes to depression? Some anthropologists and psychologists speculate that an evolutionary mismatch is at work: we are cave-dwellers struggling in a high-tech world. But as Marlene Zuk explains in *Paleofantasy*, many of these ideas amount to little more than pseudoscience based on an imagined past.

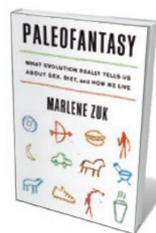
The palaeofantasiist's basic idea is this: natural selection tends to make a population well adapted to its environment. But change the environment enough, and finely tuned adaptations start to fail. Human environments in particular have changed radically in the past 10,000 years, meaning that many human traits may not work well today.

Except, argues Zuk, it is not that simple. Zuk, a biologist, reviews how our assumptions about the past have shaped the science of human biology in relation to factors ranging from exercise and diet to mating and marriage. She ably presents a sceptical and light-hearted view of a long list of palaeofantasies and supposed solutions. (My name appears in the book a few times as a sceptic of various poorly supported hypotheses and as a researcher investigating well supported ones.) For instance, our feet seem well adapted for running, yet stress injuries

to feet, legs and backs are rife among runners. Palaeofantasy solution: run barefoot. Some psychologists have argued that humans aren't meant for monogamy, because our ancestors were supposed to have interacted like the 'sexually social' bonobo. Palaeofantasy solution: open marriages.

How do these controversies arise? Because scientists try to reconstruct ancient environments by piecing together archaeological data, comparative primate behaviour and observations on living, small-scale societies such as the Hadza of Tanzania or the Aché of Paraguay that have lifestyles similar to those of our ancestors. But every living and archaeological group has its own distinctive circumstances and history. We can't blithely assume that we can reconstruct the environment relevant to natural selection in the past.

By presenting the state of evolutionary science, Zuk shows that palaeofantasies cannot be justified across a range of environments or with a range of behaviours. She



Paleofantasy: What Evolution Really Tells Us About Sex, Diet, and How We Live
MARLENE ZUK
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details the evolutionary analysis of human mating patterns, showing that monogamous mating goes way back. Human childhood is long compared with that of our ape relatives, and the palaeofantasy explanation is that cognitive development necessitates a long childhood. Zuk runs through extensive data on the supply side, establishing the credibility of the alternative hypothesis that humans have maintained high rates of reproduction by reducing maternal energy investment in children, instead recruiting grandparents and other relatives to help care for them.

There are other such examples. Many clear cases of recent adaptation show that natural selection has kept pace with some rapid environmental shifts. For example, malaria has induced dozens of genetic adaptations in tropical peoples during the past few thousand years. And diets in the late Pleistocene epoch, which came to a close about 11,700 years ago, were very diverse; Neanderthals, for instance, noshed on cooked grains. With advances in our understanding of the global human population and the rapidly shifting climates of the most recent glaciation, no single model can encompass this diversity.

There are a few real mismatches among the fake ones Zuk highlights. Diet is one. Pleistocene people did not rely on large stored harvests of starchy grains, fatty meat and milk from domesticated animals, or processed sugars — all of which are among the causes of the obesity, type 2 diabetes and metabolic syndrome that are so prevalent today. Some popular diet regimes attempt to rectify the problem by prescribing a menu modelled on one that probably prevailed before the invention of agriculture 10,000 years ago. But although cutting out starchy grains, sugars and milk, and relying on lean meat has helped many people shift to a healthier lifestyle, it has driven some adherents to extremes.

As an anthropologist, I observe that Zuk's use of the term 'fantasy' is just an emphatic way of describing the hypothesis-forming that is essential to evolutionary science. We play with hypotheses, explore their predictions and try very hard to falsify them. So it is, in a way, unremarkable that so many hypotheses proposed by anthropologists about ancient environments now seem to be wrong — and, in a few cases, even ridiculous.

It means that science is working. Genomics, high-resolution climate records, and microscopic and isotopic evidence have changed our understanding of what the past has to offer. With that in mind, let the next round of palaeofantasies begin. ■

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