Human evolution

Homo economicus?

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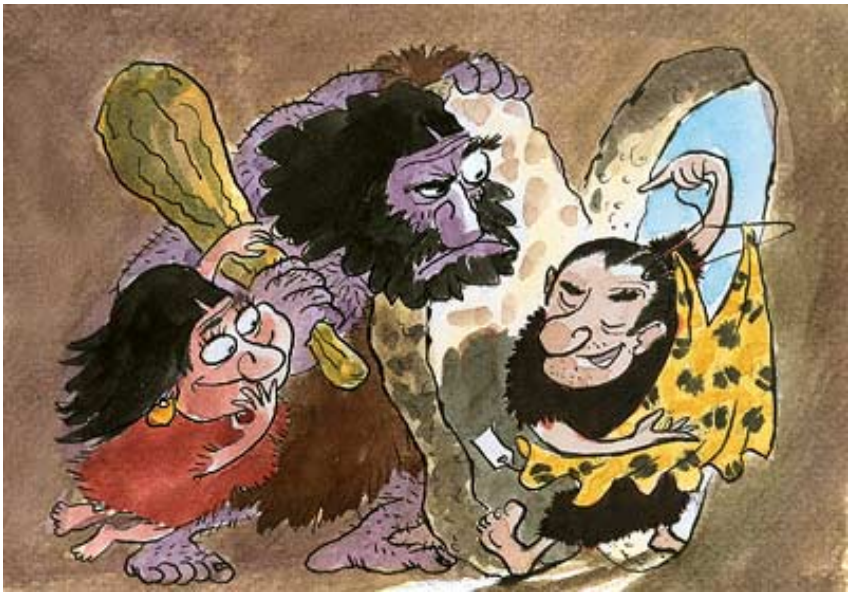

Sound economics may lie at the heart of humanity's evolutionary success

SINCE the days of Adam Smith and David Ricardo, advocates of free trade and the division of labour, including this newspaper, have lauded the advantages of those economic principles. Until now, though, no one has suggested that they might be responsible for the very existence of humanity. But that is the thesis propounded by Jason Shogren, of the University of Wyoming, and his colleagues. For Dr Shogren is suggesting that trade and specialisation are the reasons *Homo sapiens* displaced previous members of the genus, such as *Homo neanderthalensis* (Neanderthal man), and emerged triumphant as the only species of humanity.

Neanderthal man has had a bad cultural rap over the years since the discovery of the first specimen in the Neander valley in Germany, in the mid-19th century. The “caveman” image of a stupid, grunting, hairy, thick-skulled parody of graceful modern humanity has stuck in the public consciousness. But current scholarship suggests Neanderthals were probably about as smart as modern humans, and also capable of speech. If they were hairy, strong and tough—which they were—that was an appropriate adaptation to the ice-age conditions in which they lived. So why did they become extinct?

Neanderthals existed perfectly successfully for 200,000 years before *Homo sapiens* arrived in their European homeland about 40,000 years ago, after a circuitous journey from Africa via central Asia. But 10,000 years later they were gone, so it seems likely that

the arrival of modern man was the cause. The two species certainly occupied more or less the same ecological niche (hunting a wide range of animals, and gathering a similarly eclectic range of plant food), and would thus have been competitors.

Bartering for your life

One theory is that *Homo sapiens* had more sophisticated tools, which gave him an advantage in hunting or warfare. Another is that the modern human capacity for symbolic thinking (manifest at that time in the form of cave paintings and carved animal figurines) provided an edge. Symbolic thinking might have led to more sophisticated language and better co-operation. But according to Dr Shogren's paper in a forthcoming edition of the *Journal of Economic Behaviour and Organisation*, it was neither cave paintings nor better spear points that led to *Homo sapiens*'s dominance. It was a better economic system.

One thing *Homo sapiens* does that *Homo neanderthalensis* shows no sign of having done is trade. The evidence suggests that such trade was going on even 40,000 years ago. Stone tools made of non-local materials, and sea-shell jewellery found far from the coast, are witnesses to long-distance exchanges. That *Homo sapiens* also practised division of labour and specialisation is suggested not only by the skilled nature of his craft work, but also by the fact that his dwellings had spaces apparently set aside for different uses.

To see if trade might be enough to account for the dominance of *Homo sapiens*, Dr Shogren and his colleagues created a computer model of population growth that attempts to capture the relevant variables for each species. These include fertility, mortality rates, hunting efficiency and the number of skilled and unskilled hunters in each group, as well as levels of skill in making objects such as weapons, and the ability to specialise and trade.

Initially, the researchers assumed that on average Neanderthals and modern humans had the same abilities for most of these attributes. They therefore set the values of those variables equal for both species. Only in the case of the trading and specialisation variables did they allow *Homo sapiens* an advantage: specifically, they assumed that the most efficient human hunters specialised in hunting, while bad hunters hung up their spears and made things such as clothes and tools instead. Hunters and craftsmen then traded with one another.

According to the model, this arrangement resulted in everyone getting more meat, which drove up fertility and thus increased the population. Since the supply of meat was finite, that left less for Neanderthals, and their population declined.

A computer model was probably not necessary to arrive at this conclusion. But what the model does suggest, which is not self-evident, is how rapidly such a decline might take

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The University of Wyoming has information about Mr Shogren's study.

place. Depending on the numbers plugged in, Neanderthals become extinct between 2,500 and 30,000 years after the two species begin competing—a range that nicely brackets reality. Moreover, in the model, the presence of a trading economy in the modern human population can result in the extermination of Neanderthals even if the latter are at an advantage in traditional biological attributes, such as hunting ability.

Of course, none of this proves absolutely that economics led to modern humanity inheriting the Earth. But it does raise the intriguing possibility that the dismal science is responsible for even more than Smith and Ricardo gave it credit.