The Neanderthal within

Did our ancestors interbreed with other species of human? We might be more of a hybrid than we'd care to believe, says **Dan Jones**

AFTER the boy died, he was buried in a shallow grave along with some pierced shells and red ochre, as was customary among his people. There he lay for 24,000 years until his near-complete remains were unearthed by anthropologist João Zilhão at Lagar Velho in Portugal. He was expecting to find the remains of an early modern human – Neanderthals were thought to be long extinct by that time – but the boy's skeleton was different. Realising that he had something unusual and potentially significant on his hands, Zilhão called in Erik Trinkaus, an expert on Stone Age humans at Washington University in St Louis, Missouri.

In 1999, Trinkaus and Zilhão, who is at the University of Bristol in the UK, published their analysis of the Lagar Velho child. They argued that his bones provided the answer to a long-standing and delicate question about human evolution: did our ancestors interbreed with Neanderthals? The child, the team argued, was clearly a human–Neanderthal hybrid. He had the prominent chin and facial features of a Cro-Magnon, but also the stocky body and short legs of a Neanderthal. The only possible explanation was that he was the product of long and extensive interbreeding between early Europeans and the Neanderthals.

This interpretation was – and still is – controversial. While the possibility of interbreeding between our direct ancestors and other human species has long been recognised, there has never been much evidence to support it. Since the discovery of the Lagar Velho child, however, new lines of evidence have started to emerge, largely from genetics but also from new fossils (see "Wisdom of bones", page 30). As the findings stack up, researchers are edging towards the conclusion that interbreeding not only happened, but that it played an important role in our evolution. Like it or not, we may have to accept that our species is, to some extent, a hybrid. There's a little bit of Neanderthal in all of us.

For the past 20 years the prevailing view of the origin of modern humans has been fairly straightforward. About 160,000 years ago a small, isolated population of archaic humans, most likely in east Africa, evolved the anatomical characteristics that define modern humans. According to this "single origin" or "out of Africa" model, their descendants spread across the globe, completely replacing existing species, such as Neanderthals and *Homo erectus*, that were widespread at the time. If there was any interbreeding, it was insignificant.

That picture replaced an earlier consensus called multiregionalism. Multiregional theories propose that humans evolved towards modernity in a more distributed manner, with modern human genes arising in various sub-populations across Africa and Eurasia and then spreading throughout the entire human population through regular breeding between these sub-populations. Until the mid-1980s most palaeo-anthropologists were multiregionalists, based on fossil evidence hinting at widespread, parallel evolution towards modern forms.

Then genetic evidence entered the debate. In 1987, a team led by Allan Wilson of the University of California, Berkeley, published an analysis of mitochondrial DNA (mtDNA) sequences from 147 people from five geographically distinct populations. Mitochondria are very useful for tracking evolutionary history: their DNA passes directly down the maternal line, remaining unchanged unless a mutation occurs. Measured over thousands of years, these ▶

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