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# All change: Theories of human ancestry get an overhaul



By Professor Clive Finlayson Director, Gibraltar Museum



The Denisovans are known from one location in Siberia, but they probably ranged more widely [Continue reading the main story](#)

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For over 150 years the name "Neanderthal" has been household property.

And it has become associated with dim-witted, ape-like brutes that scurried across vast ice-covered wastes waiting for the day when our ancestors - the intelligent and modern humans - would wipe them from the face of the Earth.

Now, we have discovered the Denisovans and I wonder what image we will choose to give them.

But there are already hints that suggest that the status quo will prevail and we will find reasons

for making these people a little bit less clever than our direct ancestors.

The irony is that the scientific community is going to have to come round to the acceptance that the Denisovans and the Neanderthals also belonged to the species which we call *Homo sapiens*.

The Denisovans, for that is how we must know them (for now as the authors of a recent paper in Nature have preferred not to give them a scientific name), lived in southern Siberia.

We do not know how much further their range extended but it seems highly unlikely that they were confined to this region alone.

The site in which their remains were found seems to have been occupied over two periods, one older than 50,000 years ago and the other between 30,000 and 23,000 years ago.

It seems that it is not possible at this stage to determine whether the Denisovans occupied the site in one or other period, or both. Either way they must have lived close to Neanderthals or our own ancestors, depending on which time period they lived in.

[An earlier study](#) already showed that Neanderthals contributed a percentage of their genome to some of us, right across Eurasia from the west to the extreme south-east.

The present study shows that the Denisovans were closer genetically to the Neanderthals than to us but that we all shared a remote common ancestor.

Reality check

The Denisovans do not seem to have contributed much to the European gene pool but their genes made it all the way into that of the Melanesians.

Put together, this evidence shows us that humans formed an interwoven network of populations with varying degrees of gene flow between them. Some humans may have looked quite different from each other, revealing a combination of adaptation to local environments and genetic drift, but it does seem as though those differences were not large enough to prevent genetic interchange.

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DNA from ancient remains shows the Denisovans shared a common ancestor with Neanderthals

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I have suggested that humans, at any point in time in our evolutionary history, behaved as a polytypic species; they consisted of an array of regional populations clustered into geographical races which had not achieved independent species status - they could exchange genes when they met.

And this is not a new idea either. The great evolutionary biologist Ernst Mayr proposed it for the human species as far back as 1950! An obsession with turning each new fossil into a distinct species has clouded the biological reality that we are now retrieving.

One aspect of the findings of this recent study shows that the Neanderthals experienced a severe genetic bottleneck in the course of their history which means that their overall genetic diversity was much lower than that of present-day humans.

The Denisovans seem to have escaped the bottleneck too. Now, the interesting point for me is that the bottleneck, affecting all Neanderthals, was an ancient one.

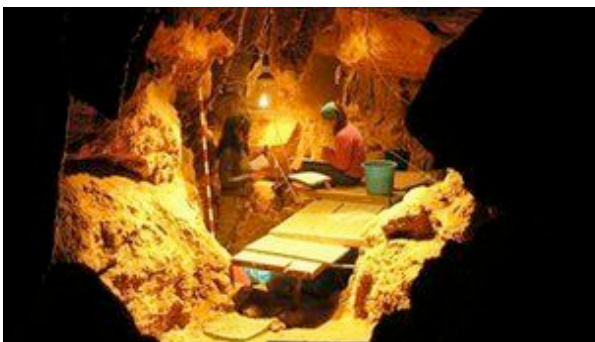
It predated the arrival of modern humans into Eurasia and thus must have been the result of an ecological impact and not competition.

This conclusion is exactly what I have been predicting over the past decade, that Neanderthal populations were in decline for a long time and well before the arrival of modern humans.

Food for thought

Almost concurrently with the Denisova findings, [a paper published in the US Proceedings of the National Academy of Sciences](#) (PNAS) journal looked at an unusual case - a family group of Neanderthals who lived in northern Spain and whose remains were preserved.

These Neanderthals from El Sidrón have provided DNA that reveals that the males were very similar to each other but the females were not. The conclusion is that Neanderthals were patrilocal - the males stayed put while the females wandered between clans and tribes.



Researchers have retrieved DNA from a Neanderthal family found at El Sidron cave (pictured)

What is more, these Neanderthals lived in small groups with low genetic diversity. Added to the Denisova paper findings, we can begin to understand the population biology of the Neanderthals. As I have suggested previously, their populations became heavily fragmented and gene flow between them became reduced.

They were in crisis but not because of the arrival of modern humans. Like pandas today they

were in danger of extinction.

They were not in such danger because they were ape-like brutes either. [A paper published this week](#) in the Proceedings of the National Academy of Sciences has provided conclusive evidence that Neanderthals regularly ate plants and even cooked them before eating them!

A detailed study of Neanderthal teeth from Spy in Belgium and Shanidar in Iraq found traces of plant matter including grass seed starches that had been cooked. We had suspected that Neanderthals consumed plants for some time, and it was logical to do so, but now we have the evidence.

So those who claimed that Neanderthals only ate meat, an almost physiological impossibility, have to rethink their argument.

Seafood platter

In 2008, [we published evidence of marine mammal and mollusc consumption](#) by Neanderthals in Gorham's Cave, also in the PNAS journal. I have been arguing that omnivory is a defining characteristic of the genus *Homo*, including the Neanderthals, and these latest findings have confirmed this conclusion.

So the Neanderthals weren't stupid apes but humans, and they interbred with our own ancestors. Yet they were affected by environmental perturbation and went extinct.



Neanderthals living

at Gibraltar enjoyed a broad menu including monk seals

This is a lesson for us all to learn. But in spite of the evidence there are those who will resist. A hallmark, for the archaeologists, of modern humanity has been the Upper Palaeolithic technology.

In recent years the boundary between this technology and its makers has become increasingly diffuse and I would argue that technology can no longer be used as proxy for human taxa.

Now, the findings at Denisova have included typically Upper Palaeolithic technology. It would be ironic if we were to establish that it was the Denisovans, not modern humans, who had made them.

But the authors of the Denisova paper are unsure of the association between the bones and the tools and have opted for "the reasonable hypothesis that the phalanx and molar belong to the older occupation".

In other words the Denisovans lived prior to 50,000 years ago and the tools were made

between 30,000 and 23,000 years ago by invisible humans.

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