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ARIADNE VAN ZANDBERGEN/ALAMY

Isolated? The genes say otherwise

The return to Africa that time forgot

CALL it humanity's forgotten U-turn. When our species migrated out of Africa around 65,000 years ago, many African populations that stayed behind became genetically isolated from the rest of humanity until European colonialism.

Or so we thought: an analysis of DNA from what is supposedly one of the most distantly isolated of all African populations has revealed the presence of genetic material from western Eurasia. The Eurasian genes entered the African populations between 900 and 3000 years ago, hinting at important human migrations in historic times that barely registered in written records.

The Khoisan tribes of southern Africa are hunter-gatherers and pastoralists who speak unique click languages. Their extraordinarily diverse gene pool split from everyone else's before the African exodus.

"These are very special, isolated populations, carrying what are probably the most ancient lineages in human populations today," says David Reich of Harvard University.

That makes Reich's latest find all the more surprising. Within the DNA of 32 individuals belonging to a variety of Khoisan tribes, Reich and his colleagues found signs of western Eurasian genes. "I think we were shocked," he says.

The unusual DNA most closely matched sequences found today in southern Europeans. Dating methods suggested the snippets made their way into the Khoisan genome between 900 and 1800 years ago – well before known European contact with southern Africa (*PNAS*, doi.org/rbx).

On the face of it, the result appears to suggest that at the height of the Roman Empire, Eurasian DNA made its way into southern African tribes living thousands of kilometres away. There is no historical evidence for anything of the kind – but ancient stories do appear to offer anecdotal explanations for the genetic findings.

A number of religious works, including the Bible and the Koran, describe a meeting some 3000 years ago between King Solomon of Israel and the Queen of Sheba, who lived in what is now Ethiopia in east Africa. According to some, the pair even had a child.

In 2012, another genetics study revealed that ancient Middle Eastern genes – which are today found in southern Europeans – did indeed enter the east African gene pool around 3000 years ago, which nicely matches the Queen of Sheba story.

So much for anecdotes and tales. The migration deeper into Africa is perhaps easier to support with science. Indeed, linguistic and archaeological studies suggest a subset of the Khoisan, the Khoe-Kwadi speakers, arrived in southern Africa from east Africa around 2200 years ago.

It has been proposed that the Khoe-Kwadi tribes brought pastoralism with them – and it appears they brought the Eurasian genes with them too. When Reich and his team looked more closely at the Khoisan genetic data, they found that the Khoe-Kwadi tribes carried between 1 and 14 per cent west Eurasian DNA – the proportion was never more than 2 per cent in other Khoisan tribes. In east African tribes, they found an even bigger proportion of Eurasian DNA still – up to 50 per cent.

The genetic and archaeological evidence together explain how the Khoisan tribes' long-lived isolation from non-African humanity ended centuries earlier than we thought (see map).

"These populations were always thought to be pristine hunter-gatherers who had not interacted with anyone for millennia," says Reich's collaborator, linguist Brigitte Pakendorf of the University of Lyon in France. "Well, no. Just like the rest of the world, Africa had population movements too. There was simply no writing to document it."

"Eurasian genes made their way into east African genomes around 3000 years ago and spread south"

The forgotten migration has broader implications. In 2010, a research team that included Reich published the first draft of a Neanderthal genome. Comparisons with living humans revealed traces of Neanderthal DNA in all of us, with one notable exception: sub-Saharan peoples like the Khoisan.

That made sense. After early humans migrated out of Africa 65,000 years ago, they quickly bumped into, and interbred with, Neanderthals somewhere in the Middle East. The genetic legacy of this interbreeding spread across the world, but because humans were thought not to have returned to Africa, sub-Saharan tribes were believed to lack Neanderthal DNA.

Now it appears that the Back to Africa migration 3000 years ago carried a weak Neanderthal genetic signal deep into the homeland – last month Reich found this signal in another sub-Saharan group, the Yoruba.

In other words, carrying a bit of Neanderthal inside you is a global phenomenon. **Catherine Brahic** ■

Unexpected journey

Genetics show humans migrated to Africa starting ~3000 years ago (ya), long before European colonialism

The Khoisan tribes of southern Africa carry Eurasian DNA