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Robin_McKie, science editor

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THE INCREDIBLE JOURNEY TAKEN BY OUR GENES

Sixty thousand years ago, a small group of African men and women took to the Red Sea in tiny boats and crossed the Mandab Strait to Asia. Their journey - of less than 20 miles - marked the moment Homo sapiens left its home continent.

The motive for our ancestors' African exodus is not known, though scientists suspect food shortages, triggered by climate change, were involved. However, its impact cannot be overestimated. Two thousand generations later, descendants of these African emigres have settled our entire planet, wiped out all other hominids including the Neanderthals and have reached a population of 6.5 billion.

Now scientists are completing a massive study of DNA samples from a quarter of a million volunteers in different continents in order to create the most precise map yet of mankind's great diaspora. Last week, in Tallinn, Estonia, they outlined their most recent results. 'As the ultimate ancestor begat son, who begat son and so on, they picked up mutations in their DNA that we can now pinpoint by gene analysis,' said project leader Dr Spencer Wells. 'When we look at these markers' distributions we can see how our ancestors moved about.'

Scientists have known for several years that modern humans emerged from sub-Saharan Africa within the past 100,000 years. However, the £25m Genographic project - backed by National Geographic, IBM and the Waitt Family Foundation - has recently transformed that knowledge by painting in a mass of highly detailed information about our African exodus.

After emerging into the Arabian peninsula, some of our ancestors took sea routes along the south Asian coast to reach Australia 50,000 years ago. Only later, about 40,000 years ago, did we enter Europe - its cold and its Neanderthals making it far less hospitable - while one group of Asians headed farther east over the land bridge that then connected their continent to America.

'We can also see that just before humans left Africa, about 70,000 years ago, mankind was brought to the brink of extinction when Mount Toba, in Sumatra, erupted,' said Wells. 'It was the most powerful volcanic eruption for two million years and dropped thick ash and killed vegetation across the globe. Our research now shows Homo sapiens numbers dropped alarmingly at this time and we only just hung on as a species.'

Nevertheless, humanity bounced back, evolving new creative and intellectual gifts under the extreme selective pressures it then had to endure. Since then, waves of

men and women have moved round the planet and DNA analysis can detect traces of these movements - often with intriguing results.

One study by project scientists Pierre Zalloua and Chris Tyler-Smith has discovered a genetic marker typical of Europeans in modern Lebanese men. The inference is clear they say: this distinctive Y-chromosome was left behind by 11th-century Crusaders when they invaded Lebanon and then settled in the country. A similar sort of genetic legacy has been detected in regions where Gengis Khan ruled and which has been linked to the many male descendants he produced.

As for Africa, it has the most genetically diverse population of all the continents, as would be expected of humanity's birthplace. And of those living today, the Khoisan people of southern Africa are probably the closest, genetically, to the founding mothers and fathers of humanity, say project scientists.