

## NEWS AND COMMENTARY

An African Y in Yorkshiremen?

# Y chromosome travelled north

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A recent study by King *et al.* (2007) reported in the *European Journal of Human Genetics* is a further step forward in the use of genetic lineages to elucidate human demographic history. New knowledge in this field is not easily gained and it is often the dog that did not bark that is as important as the dog that did.

As part of a survey of Y chromosome diversity in British nationals with a paternal grandparent born in Britain, the research group characterized the nonrecombining, exclusively paternally inherited portion of the Y chromosome (NRY). They did this using the now well established approach of identifying patterns of rarely mutating nucleotides (SNPs) and more rapidly changing repeat sequences (microsatellites). The SNP-defined types display geographic structuring on a worldwide scale, while variation in microsatellites can be used to estimate the time to the most recent common ancestor of a set of chromosomes, since diversity is expected to increase over generations.

In the course of their study, King *et al.* (2007) identified just one 'African type' NRY, in an individual bearing a 'locative surname' associated with east Yorkshire, a county in northern England. Recruiting 18 other men of the same or very similar surname and characterizing their NRYs, they identified seven of the 'African type'. Genealogical research divided the seven into two groups with origins in the fourth quarter of the eighteenth century. No less than 77 repeat sequences were then typed and used to estimate that the oldest statistically likely coalescence date linking these two groups was 1734. Reviewing a database of NRYs led the researchers to suggest a 'West African' origin for the east Yorkshire NRY.

So what's the news? It is certainly not that Yorkshire men have an origin in Africa. Among geneticists, at least, it is now widely accepted that Anatomically Modern Man emerged in Africa before spreading throughout the world. What is noteworthy is the way this study takes forward the important task of reconstructing human demographic history by combining genealogical

search, extensive genomic analysis and statistical modelling. The questions 'from where?' and 'when?' are addressed and variation in NRYs used to provide answers in circumstances where other sources of information are not available. It is as much the virtual absence of 'African type' NRYs from the British survey as the presence of the one identified that contributes to our understanding of when and by whom this corner of the world was peopled.

The researchers are also to be commended for the circumspection with which they interpret their results. They accept, for example, that the 'African type' chromosome studied may have been introduced into Britain at some indeterminate time in the past, before 1734. For all we know it could have been introduced with the wave of settlement that followed the last ice age some 10 000 years ago (see Weale *et al.*, 2003). What is certainly clear is that before the twentieth century and notwithstanding the long-range commerce of Roman times, the important role North Africa played in both the Ancient World and in the Middle Ages and the international slave trade – a male-mediated, sub-Saharan genetic contribution to the British gene pool – has, over the past few millennia, been small. Of course, as King *et al.* (2007) accept, in some towns and cities, the exclusively maternally inherited mitochondrial genome may tell a different story. Each person living today is descended along an exclusively paternal line from just one man and on an exclusively maternal line from just one woman in each generation. However, it is important to remember that they could nevertheless, be descended from as many as 256 unrelated ancestors living eight generations ago (the period covered by this research). By the time of the Norman invasion, the number of potential ancestors far exceeds the then populations of both Britain and France.

Genetic history is a discipline in which it is difficult to write both simply and with precision, and one in which offence can easily be given. We should therefore have sympathy for King *et al.* (2007) when they write in the first

sentence of the abstract to their paper 'The presence of Africans in Britain has been recorded since Roman times, but has left no apparent genetic trace among modern inhabitants.' A 5-minute walk through the centre of any British city would suggest otherwise. We know what the writers mean but they have not written what they mean.

It is a genetic cliché that there is more diversity within the principal groupings of mankind than between them. But that is not the whole story. During the evolution of Anatomically Modern Man, groups of humans were sufficiently isolated from each other that through genetic drift, selection or a combination of both, important inter-group differences arose. Genetic diseases common in one or more groups and absent in others and variation in many enzymes that metabolize drugs and foods are examples. During the past few thousand years, these previously separated groups have, with expansion and migration over increasing distances, encountered each other, sharing the diversity born in isolation. As that process advances, the genomic archive of populations will become increasingly like an indecipherable palimpsest. The challenge is to extract as much information as we can before the record disappears.

So what now? A paucity of variation in the human genome is unlikely to be a major constraint. Rather it is the need to develop approaches that interpret all the available data that represents the greatest challenge. King *et al.* (2007) address the questions of 'from where?' and 'when?' within the context of a geographic survey; a necessary first step. Greater insights into the recent demographic histories of peoples are likely to increasingly involve the analysis of genetic data within the context of evaluating hypotheses derived from multiple non-genetic sources: linguistics, history, social anthropology and archaeology. The genomic archive is not necessarily a decisive or even better source of information, but it is an additional tool that can be used to unravel the multiple treads of our common past.

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#### Editor's suggested reading

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