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NEWS AND COMMENTARY

Hidden African Ancestors

Hidden secrets of your ancestors

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Genealogy is no longer simply a matter of pen, paper, and patience. It seems that modern genealogical reconstruction is not complete without genetic confirmation by means of Y-chromosome genotyping. As usual, when there is a demand, commercial enterprises pop up like autumnal mushrooms. A simple Google search with *genealogy + y + DNA* results in approximately 468 000 hits. Many of these sites are surname-specific projects or internet companies offering commercial genotype services. What these companies offer is what I call a blindfold scenario: a male with surname X has his Y-profile typed and compared to all other types in the companies' database in the hope of finding a (near) match to someone else in the database irrespective of its surname. The error-prone nature of such a process is perfectly illustrated by the link by Oxford Ancestors of one of their clients to Genghis Khan.[1] Only rarely genealogists adopt the much more reliable open-eyed hypothesis driven kind of request: a genealogist has reconstructed a certain pedigree and either wants to have this pedigree confirmed or needs a genetic 'link' between branches of the pedigree which cannot be linked otherwise. This pedigree-based design was also used to obtain the first mutation rates of Y-STRs[2] and the reconstruction of the pedigree of Thomas Jefferson.[3]

In most Western societies surnames are co-transmitted with Y-chromosomes. As a consequence, surname and Y-chromosome reflect the same patrilineal ancestry. Generally speaking, the rarer a surname, the better its transmission over time reflects that of a particular Y-chromosome.[4] It has even been shown that in the ideal case population substructure can be inferred only on the basis of detailed surname analyses.[5] Although this might be true in general, in isolated cases false paternity or *in vitro* fertilization by means of anonymous sperm donors disrupts the link between a particular surname and its corresponding Y-chromosomal genotype. Of course, also a perfectly legal marriage can introduce 'exotic' Y-chromosomes into a pedigree. When this happened in the past, and is not adequately documented, one could learn something quite unexpected about one's ancestors. This is exactly what was described in the recent issue of this journal.[6]

King *et al*, much to their own surprise, discovered a single male carrying a classical African Y-chromosome type, called haplogroup A1, among a set of 421 males who were analyzed as part of an ongoing large British surname study. The surname of this male matched to another 121 individuals in the public record, predominantly in east Yorkshire. From these, 18 apparently unrelated males were relocated and genotyped. Of these, six more males also carried the same African A1 Y-chromosome. Genealogical research allowed them to be connectedto two pedigrees going back to 1788 AD and 1789 AD. These two pedigrees could not be connected, but a detailed Y-chromosome study strongly suggests that originally they must share a single common male ancestor. As such, the presence of African Y-chromosomes among Western European populations is not without precedent. At least for Britain, the presence of Africans has been reported since 200 AD (see King *et al*.[6]). However, what is surprising is the exact type of African Y-chromosome. In Africa itself three major Y-haplogroups are most frequently observed (A, B, and E) with frequencies of approximately 7.3, 11, and 69%, respectively. The frequency of haplogroup A1 is only about 1% in Africa. Its presence among a Yorkshire family dating back about 300 years was therefore quite unexpected.

Since nothing more definitive can be inferred on the basis of the present data, exactly how and when this very rare African Y-chromosome was introduced into the otherwise perfectly indigenous English family will most likely remain unknown. On the basis of Y-STR analysis a Western African origin of this Y-chromosome is likely, despite its rarity. A more detailed surname analysis and a coalescence analysis based on Y-STR differences failed to yield a more exact coalescence date between the two families, although it is probably within a few generations (ie 100–150 years) before 1788. Based on this, it cannot be decided whether the introduction is due to a direct or indirect route. The former could relate to reports of Nubians in the Roman army defending the North territories; the latter could be associated with the later slave trade, which brought the first West Africans to England in 1555.[6]

The study of King *et al* demonstrates that a Y-chromosome-only reconstruction of geographic origins can be seriously misleading. It also illustrates how a hitherto unknown secret pops up during a rather innocent pedigree reconstruction by means of Y-chromosome testing. As such it once again shows the importance of a general concept often ignored by participants of pedigree-based Y-testing: if you do not want to know, do not have yourself tested■

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