Summary: 01 Are we there yet?

The most remote ancestors of us all came from Africa. The modern people who most resemble those distant relatives are the Khoisan of southern Africa with their coppery-brown skin, epicanthial fold, peppercorn hair and short stature.

Genetic genealogy is a very modern discipline drawing on genetics, pre-history, paleoanthropology and of course, archaeology. It can be used — for example — to determine one's remote ancestry (say Celtic), clarify relationship among people, track the migratory paths whereby the earliest inhabitants reached their new homelands. Another and perhaps most popular use is to find "long lost cousins", ie. distant relatives for whom no paper-trail exists. This however is still in its infancy and much larger data bases are required before this will be anything more than a lottery.

Laboratories able to test genetic sequences are proliferating: the best known are-

Family Tree DNA	*http://www.familytreedna.com/default.asp*
DNA Heritage	*http://www.dnaheritage.com/default.asp*
Ethnoancestry	*http://www.ethnoancestry.com/index.html*

Costs and services vary but no fewer than 37 and preferably more markers are required. While these might look expensive, it is probably no more so than the cost of acquiring many BDM certificates for a historical family history.

Genetic genealogy started with attempts to trace human origins using blood groups. This proved too coarse a measure so in the 1960s the switch was made to genes. Some basic terms and concepts of genetics are essential to understand genetic genealogy and a few are given below:

DNA: DeoxyRibonucleic Acid, the essential genetic material of all organisms. It is found in every cell in your body (except for red blood cells) and usually forms the famous double helix. DNA is a class of nucleic acids containing phosphate, deoxyribose (a sugar), and the four **bases**. These bases are substances derived from either *purine* or *pyrimidine* and are adenine (A), cytosine (C), guanine (G) or thymine (T). There is no need to remember the names — geneticists refer to them simply by their initial: **A, C, G** or **T**.

Chromosome: Chromosomes are responsible for physically transmitting hereditary information and are created by combining a strand of DNA with small proteins called histones. Once combined, these then wrap themselves up in such a way that they form a kind of elongated X. Twenty-two of our chromosomes are common to us all, irrespective of gender, and are called *Autosomes*. Until recently these were not used in genetic genealogy. Two of our chromosomes at the point of conception determine whether we will be male or female. These are labelled the X and Y chromosomes.

mtDNA: Mitochondrial DNA is inherited only from your mother. The mitochondria are the modern representatives of very ancient bacteria which formed a symbiotic relationship with every living animal cell in the world, including our own. Since mtDNA is "non-recombinant" (is inherited only from the mother) and mutates at about once very 20,000 years so, by mapping the mutations, the time and place of the ancient people can be ascertained. Prof Bryan Sykes in his book "*The Seven Daughters of Eve*" found 7 mtDNA patterns which originated in 7 women at different times in pre-history. These women he called *clan mothers* and gave them the names “Ursula”, “Xenia”, “Helena”, “Velda”, “Tara”, “Katrine” and “Jasmin” but the proper scientific labels are **mtHaplogroups “U”, “X”, “H”, "V", "T", "K", and "J"**. Of these, U is the oldest and entered Europe in the Paleolithic while J dates from the Neolithic.

y-DNA: Only males have the y-chromosome. This too is non-recombinant and mutations can be used to date and place ancient populations. However, problems with the length of a "generation" and uncertainties about the rate of mutation on different "markers" leads to confusion in dating. When a man's y-DNA is sequenced, the laboratory returns a list of numbers like this:

DYS→	393	390	19	391	385a	385b	426	388	439	389i	392	389ii
BH	13	25	14	10	11	14	12	12	11	13	13	29

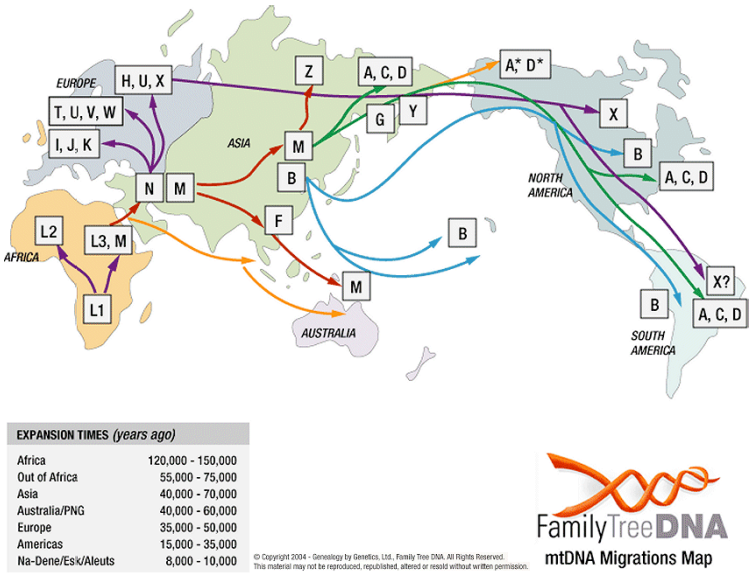
This is my (individual) **haplotype**. When a whole population of men show the same pattern, it is called a **y-Haplogroup**, sometimes abbreviated to **yHg**.

DYS is shorthand for *DNA Y-chromosome Segment* and is simply a location or ***locus***. At the locus DYS 390 you find the ***base pair***s repeat themselves in the pattern TCTA TCTG in the range of 17 to 28 times. In my case above, the sequence was repeated 25 times and so it is said that my ***allele*** (or number of repeats) for DYS390 is 25. Different alleles are found characteristically for different geographic locations - my "25" is most frequent in Russia and the Baltic region of Europe and only about 10% in the British Isles. That does not mean my ancestors came from Russia - you have to consider the whole complex of markers (and the more the better the resolution).

Sometimes a pattern called a "***modal haplotype***" can be extracted from population data. The most common among Western Europeans is the ***Atlantic Modal Haplotype*** which is a pattern of alleles for men whose remote ancestors were in the Franco/Iberian refugia during the **LGM** (Last Glacial Maximum, commonly called the *Ice Age*) and who ventured north after the Ice retreated, hugging the Atlantic coast, many ending up in Ireland and western Britain.

DYS	**939**	**390**	**19**	**391**	**385a**	**385b**	**426**	**388**	**439**	**389i**	**392**	**389ii**
AMH	13	24	14	11	11	14	12	12	12	13	13	29
BH	13	25	14	10	11	14	12	12	11	13	13	29
Diff.	0	**+1**	0	**-1**	0	0	0	0	**-1**	0	0	0

This shows my **GD** or **Genetic distance** from the AMH is 3 so my ancestors were probably not among these early settlers in the British Isles.



SNPs: A different set of tests can divulge what mutations occurred in a man's remote ancestry. These are referred to as SNP (pron. *snip*) which stands for *Single Nucleotide Polymorphism.* While the haplogroups derived from many haplotypes can be a useful guide, SNPs are definitive. The most common male Haplogroup in Europe is R1b1c and there are 10 known ***clades*** (or sub-groups) of this. For example, men who test positive to M222 are most likely to have ancestors from north-western Ireland. My own is R1b1c10 because I test positive to SNP test S28. This indicates my ancestry was with the La Tène Celtic culture, Cimbri tribe, my remote ancestors who went to Britain probably doing so with the Jute invaders from Denmark or southern Norway in or after the 5th Century AD.