Our Clark Ancestry and Y-DNA Timeline for Haplogroup R

by George J. Clark, updated 15 Dec. 2016

(This document supercedes "Our Current DNA Classification and Historical Locations," dated 30 Mar. 2013)

(Note that the dates are approximate. Also, there is still some disagreement on the locations and dating. Experts don't even agree on when the different parts of the stone age start and end, although they do agree that they started and ended at different dates in different regions.).

First, to be sure we are all on the same page, here are some definitions:

The human genome consists of 23 chromosomes organized into 2 strands that wind around each other in a double helix. The genome is the same in most locations for all humans. However, there have been mutations at various locations over time. The location where each mutation has occurred is called a SNP (single nucleotide polymorphism), and is assigned a name by the research group that finds it. Sometimes, it is named by two different groups, and thus can appear under different names. This is indicated below with the two names separated by a slash, as in DF27/S250. If you have a particular SNP mutation, you are said to be positive for that mutation, else you are negative. If positive it is indicated by a plus sign following the SNP name, as in DF27+, else with a negative sign, as in U106-.

A haplogroup is a definition of the defining SNP changes that have occurred. There are two haplogroup designations, one for Y-DNA and one for mitochrondial DNA (mtDNA). This paper only discusses the Y-DNA haplogroups. The paternal ancestor that is common to all humans alive today lived in Africa, and has haplogroup A00. Haplogroups originally started with one letter descriptions, such as R. As new mutations occurred, these original haplogroups were expanded. For example, R was divided into subgroups R1 and R2. R1 was divided into subgroups R1a and R1b. Our particular haplogroup ancestors migrated out of Africa and up into South-central Siberia. Several mutations occurred along the way. I am only covering the mutations starting with haplogroup R. Because of new intermediate mutations being discovered, the classification has been changing. For example, what used to be R1b1a2a1a1b1 changed to R1b1a2a1a2a (and has recently changed again). That is why most people today use a haplogroup shorthand, such as R-DF27 or R1b-DF27 (this example states that the person has DF27 as the most recent known named SNP, and that DF27 is under haplogroup R1b). At the moment our haplogroup is R1b-Y22891.

There are multiple haplogroup trees showing the subdivisions of each haplogroup. These are updated in different ways at different times, based on the data each organization has available. FTDNA has one of these trees. Others are ISOGG and The Big Tree.

Most modern Western Europeans are in subgroups of R1b (particularly subgroups of R1b-M269). Most of them also have the mitochondrial DNA (mtDNA) haplogroup H. Most modern

Eastern Europeans are in subgrioups of R1a.

The modern European genome comes from three main sources:

1. ANE = Ancestral North-Eurasians (Siberian Hunter-Gatherers)
2. WHG = Western Hunter-Gatherers (in Europe)
3. EEF = Early European Farmers (originally from Anatolia)

The ANE brought the R1 haplogroup from South-Central Siberia to Eastern Anatolia and merged with EEF from Western Anatolia. That combination moved up to Western Russia, where the R1a and R1b haplogroups originated, and whose descendants moved further westward into Europe. The WHG may have merged in with ANE/EEF after they moved into Europe, or it may have existed in the Anatolian region. ANE is also a large component of Native Americans.

A summary of the Y-DNA SNP descent for all of us in the "Peach Clark" group follows.

P312 → ZZ11 → DF27 → ZZ12 → ZZ39 → Z225 → Z2543 → Y22891.

Y22891 was just assigned to SNP 24390413 (same level as SNP 23145767), but is not available to order on FTDNA yet. F3867.2+ may be a mutation from Y22891, or it may be a false positive. Although I tested positive for this SNP, I do not know of anyone else who has tested positive. The only way to find out if you have F3867 is to order an individual SNP test on FTDNA. To find out about the other SNPs, you can either order a SNP pack test or the Big-Y test.

We have the SNPs in blue that are mentioned below. We do not have the SNPs in red; they represent other haplogroups.

I have included in the timeline important events that put things more into context with what was happening when the mutations occurred.

NOTE: Sources for the data in the timeline are listed at the end.

45000 BCE – 18000 BCE = Upper Paleolithic Age (Upper Stone Age)

45000 BCE – Some hunter-gatherers may have stayed in the Anatolian region and Northern Mesopotamia or Northern Iran, while others moved on towards Europe. They have dark skin, dark hair, and dark eyes.

43000 BCE = Humans spread through Europe (WHG = Western Hunter-Gatherers). aDNA shows they had Y-DNA = I and mtDNA = U2, U4, & U5.

32000-24000 BCE – Gravettian Culture in Europe.

26800 - R = M207+ mutation from haplogroup P (P295+) occurs in Southern Siberia in the Upper Paleolithic period. aDNA (ancient DNA) found in human remains in South Central Siberia from 22000 BCE to 15000 BCE. Early people were mammoth and reindeer hunters. They are ANE (Ancestral North-Eurasians), who are one of the three ancient gene sources for modern Europeans.

20000 BCE = Pressure Blade Making starts in Southern Siberia and Mongolia.

18000 BCE – 16000 BCE = Last Glacial Maximum

18000 BCE – 10000 BCE = Mesolithic Age (aka Epipaleolithic). Blue eyes mutation occurs during this period in Y-DNA = I people.

17000 BCE - R1 = M173+ mutation from M207 occurs in southern or southwestern Siberia in the early Mesolithic period. Bison and cattle (auroch) hunters.

17000-9000 BCE – Light skin gene mutation occurs sometime during this period in the R1 population.

14000 – Major warming period starts.

14000 BCE - R1b = M343+ mutation from M173 occurs in Northern Iran. Red hair gene mutation occurs in this population.

14000 BCE – R1a = M420+/L146+ mutation occurs in Volga-Ural region. Blond hair gene mutation occurs in this population.

12000 BCE – L278+ mutation from M343 occurs in Northern Iran or Northern Mesopotamia.

10000 BCE – L754+ mutation from L278 occurs in Northern Mesopotamia.

10000 BCE – 4500 BCE = Neolithic Age
- 10000 BCE – 8200 BCE = PPNA (Pre-pottery Neolithic A)
- 8800 BCE – 6400 BCE = PPNB (Pre-pottery Neolithic B)
- 6400 BCE – 4500 BCE = PN (Pottery Neolithic)

10000 BCE – First farming starts in Eastern Anatolia. There is also an increase in population in Mesopotamia and the Levant (the east coast of the Mediterranean). Y-DNA = G, E1b1b, and T.

9000 BCE – First animal (cattle, goats, & sheep) domestication in Eastern Anatolia.

8500 BCE – L389+/L388+ mutation from L754 occurs in Eastern Anatolia.

8500 BCE - V88+ mutation from L754 occurs in Levant. mtDNA = J1b, U5, & V. These people spread down into Egypt by 6500 BCE and later across the rest of North Africa.

8000 BCE – End of last ice age. People (hunter-gatherers and fisherman) re-colonize Northern Europe.

7250-3250 BCE – The Sahara was a vast savannah full of grass (i.e., not a desert yet).

7000 BCE - P297+ mutation from L389 occurs in the Caucasus or Eastern Anatolia. They migrated north onto the Pontic-Caspian Steppe (the region from the Danube estuary on the Black Sea in the west to the Ural Mountains north of the Caspian Sea in the east). Note that aDNA shows that the Trojans and Hittites are of P297 descent.

6500 BCE – Dairy Farming started around the Sea of Marmara (separates Western Anatolia from Thrace).

6500-5500 BCE – Lactase Persistence gene mutation occurs sometime during this period in the R1b population. A smaller number of R1a people have this mutation, possibly due to marriages between R1b and R1a people. This gene mutation today is roughly proportional to the percentage of people who are R1b.

6200 BCE – Farmers spread into mainland Europe from Western Anatolia, carrying with them pottery for cooking. They are mostly Y-DNA = G2a and mtDNA = N1a with some Y-DNA = J, E1b1b, & T. They carry the Salivary Amylase gene, which enables them to break down starches more efficiently.

6000-3500 BCE – Cucuteni-Trypillian culture northwest of Black Sea. Y-DNA = I2a1, G2a, E1b1b, J, T.

5500 BCE – M269+/L265+ mutation from P297 occurs on the Pontic-Caspian Steppe. These people develop the early PIE (Proto-Indo-European) language.

5500 BCE – M73+ mutation from P297 occurs either in Volga-Ural region or in Northern Iran. These people later go east to central Asia.

5500 BCE – Dairy farming occurring at the mouth of the Danube.

5000 BCE – 3000 BCE – Chalcolithic (Copper or Eneolithic) Age.

5000-4500 BCE – Nalchik culture in North Caucasus. R1b and R1a.

4600 BCE – Horse domestication on Pontic-Caspian steppe.

4600-3900 BCE – Sredny-Stog Culture on the Dnieper River (speaks a PIE language).

4200-3800 BCE – cold period in Europe. Balkan settlements in lower Danube basin abandoned and Balkan metallurgy collapsed. These R1a people had formed an area where Copper was smelted which is now called the Carpatho-Balkan Metallurgy Province (CBMP),

which had fallen apart by 4000 BCE.

4000-3200 BCE – Cernova (Cernavoda) culture – started by steppe herders (R1b) who pushed into the marshes and plains around the mouth of the Danube.

4000 BCE - L23+ mutation from M269 occurs in Southeast Europe around the mouth of the Danube. Probably the time the Anatolian language splits from PIE. People speaking Anatolian later moved south to Western Anatolia (Hittites, Luwians, Phrygians, Armenians).

4000-3000 BCE - The Uruk people's migration north from the Northern Euphrates along the Southern Caspian seashore up to the South Caucasus, which created the Kura-Araxes culture, and then to the Northeast Caucasus, which created the Maikop culture. There were already people of R1a descent living in the Caucasus, Black Sea, and Baltic Areas.

3800-3300 BCE – Repin culture between the Volga Basin and Ural mountains (i.e., north of the Caspian Sea) began kurgan (barrow) burials typical of later Yamnaya culture (single graves versus earlier mass graves). They were mostly R1a with a substantial minority of R1b. Note: The Ural mountains divide Europe from Asia. Aound 3700 a group migrated across the Great Eurasian Steppe from the Volga-Ural region east to the Altai mountains in east-central Asia and established the Afanasevo culture (3600-2400). They spoke an Indo-European language with archaic features that later became Tocharian.

3700-2500 BCE – Maikop (Maykop) culture in the north Caucasus started what is now called the Circumpontic Metallurgy Province (CMP), which used Arsenic as an alloy when smelting Copper. They introduced to the steppe this arsenic-copper alloy. First bronze-working. They also had Kurgan burials. The oldest wagons and bronze artifacts were found in the northwest Caucasus.

3700-3400 BCE – Mikhailovka culture on lower Dnieper river (north of the Black Sea) – a cross between farming and steppe influences. Created first anthropomorphic stelae (memorial stones).

3600-2500 BCE = Yamnaya Culture between Volga and Don Rivers – a mobile horse-riding, wagon and tent based cattle-herding economy. They (mostly) have light hair, light eyes, and light skin. Note: The Don river is north-northeast of the Sea of Azov, on the northern edge of the Black Sea).

3500 BCE – A Yamnaya group of herders merged with Mikhailovka stelae makers and late Cucuteni-Tripolye farming communities to form the Usatovo/Cotofeni culture (3500-2500) between the mouth of the river Dniester (northwest of the Black Sea) and the mouth of the Danube (west of the Black Sea).

3300 BCE – 1200 BCE – Bronze Age

3200 BCE – conditions became colder and drier.

3200-1800 BCE – Some Usatovo people migrated up the Dniester, blended with descendants of Balkan farmers produced widespread Corded Ware (Battle Axe) culture (2900-2350) in the northern forest steppe region, which spread around the Baltic, Poland, as far west as Germany and in Scandinavia as far northwest as Sweden and Norway. aDNA shows they had 75% Yamnaya DNA, and that they were in Poland by 2700 BCE and in central Germany by 2600 BCE. They were R1a with a small minority of R1b. They developed the Proto-Baltic-Slavic IE language.

3100-2300 BCE – A massive migration (probably in several waves) spread with people using stelae up the Danube to the Carpathian basin and eventually to the heads of the Danube and Rhine. Y-DNA = R1b & G2a3b1. They spoke Old European, which split from PIE. They reached Germany by 2500 BCE, France and the low countries by 2200 BCE, Britain by 2100 BCE, Ireland by 2000 BCE, and Iberia by 1800 BCE.

3100-2800 BCE – A group migrated from west of the Black Sea to the Balkans and Greece. They were about 90% R1b and about 10% R1a. They developed the Balkan group of IE languages.

2800 BCE - L51+ mutation from L23 occurs in the Carpathian Basin. They spoke Old European, which split from PIE.

2700-2000 BCE – The European steppe was at its most arid.

2700-1900 BCE – Bell-Beaker period. This was a multi-cultural phenomenon and trade network, not a unique ethnic culture. They traveled to southern France and to Brittany by 2500 BCE and to Ireland by 2400 BCE.

2500 BCE – L11+/P310+/L151 mutation from L51 occurs in Western Europe. They speak an Italo-Celtic-Germanic language that developed from Old European.

2300-1600 BCE – Unetice Culture. Y-DNA = L11. aDNA shows they have 60%-65% Yamnaya DNA. Spread through parts of Czech Republic, Slovakia, Poland, Germany, northeast Austria, and western Ukraine.

2300 BCE – U106+/S21+ (Germanic Branch) mutation from L11 in Germany around the mouth of the Danube. They continued up the Danube and spread through western Germany and the Netherlands. Note: The eastern Germanic tribes had Y-DNA of R1a and I1. They were in Scandinavia by 1700 BCE creating the Nordic Bronze Age (1700-500 BCE). Undoubtedly this is when Germanic split off of the Italo-Celtic-Germanic branch of language. Some of their descendants came to Britain as the Angles and Saxons. Other descendants

were the Frisians, Franks, Burgundians, and Lombards.

2300 BCE – P312+/S116+ (Celtic Branch) mutation from L11. They migrated from the head of the Danube and Rhine to Northwestern Italy and Southeastern France. 80% of modern people in the British isles are P312+. Undoubtedly this is when Italo-Celtic split off of the Italo-Celtic-Germanic branch of language.

2200-1178 BCE – There were IE speaking Hittites in Central Anatolia. The Trojans were Luwian speakers related to the Hittites. Trojan War 1194-1187 BCE (?).

2100-1800 BCE – expansion east of Ural mountains created first fortified settlements on Asian steppe and led to Indo-Iranian languages.

2100-1300 BCE – There was light traffic on the Atlantic.

2100 BCE – ZZ11+ palindromic mutation from P312.

2100 BCE – L21+/M529+/S145+ (Atlantic Celtic Branch or Gallo-Brittanno Celts) mutation from P312, probably in Switzerland, from a group that moved from Italy up through Switzerland to the North along the Rhine, eventually crossing over to the British Isles. They spoke Q-Celtic. Today they are almost entirely in Britain and Brittany.

2000 BCE – Horse drawn war chariots.

1900 BCE – DF27+/S250+ (Gallo-Iberian Branch) mutation from ZZ11. Probably originated in Southeast Germany (Bavaria). A large number of them migrated into France, Spain and Portugal. Some of them went up to Belgium and to the British Isles. They spoke P-Celtic.

1700 BCE – ZZ12+/Z239893+ is a palindromic mutation from DF27.

1600-1200 BCE – Tumulus culture (descended from Unetice culture).

1500 BCE – ZZ39+ is a palindromic mutation from ZZ12.

1500 BCE - U152+ (Italo-Gaulish Celtic Branch) mutation from ZZ11 in Northwest Italy. It spread in that area and also moved thru Switzerland up along the Rhine. Apparently it displaced the earlier L21 people in those areas (unless L21 had already moved out of those areas). U152 is also known as the Italo-Alpine Celts. They spoke P-Celtic.

1300 BCE – Z225+(=S225+)/Z229+(=S359+)/F1343+ mutation from ZZ39 probably originated in Southern France or in the northern Iberian peninsula. Among those people who have been tested, very few people are positive for this SNP. So far, those tested appear to trace back to either England or Spain.

1300-700 BCE – Atlantic Bronze Age.

1300-750 BCE – Urnfield culture in central Europe (descended from Tumulus culture). It expands between 1300 BCE and 1200 BCE from Germany throughout Southern France to Catalonia. R1b, R1a, and I2a2b.

1200-750 BCE – Halstatt culture (Alpine Celts) develops from Urnfield culture around the Alps and later spreads throughout the Iberian peninsula.

1200 BCE – Migration from Balkans of Phrygians (1200-700 BCE) to west-central Anatolia and Proto-Armenians to Armenian Highlands.

1100 BCE – Z2543+(=CTS8001+)/Z2545+ mutation from Z225, probably in Southern France or in the Iberian peninsula.

900 BCE - Y22891+ mutation from Z2543.

800 BCE – Celtic iron age.

800 BCE – Remaining people on steppe emerge as the Scythians (R1a), speaking dialects of an East Iranian language.

500 BCE – Proto-Germanic developed.

500-100 BCE – LaTene culture developed from Hallstatt culture.

Sources:

For the DNA classifications, I use the current ISOGG tree (www.isogg.org), and The Big Tree (http://www.ytree.net), which is more up-to-date for the P312 branch.

The 2 APR 2008 article in Genome Research, "New binary polymorphisms reshape and increase resolution of the human Y chromosomal haplogroup tree" by Tatiana M. Karafet, Fernando L. Mendez, Monica B. Meilerman, et al. revised the dates of R and R1 downward from earlier estimates (genome.cship.org).

Other dates I originally got from Eupedia and a couple other sites, but subsequent information caused me to revise most of those downward. The dates in between R1b and M269 are estimates, based partly on aDNA (ancient DNA) results for R1b.

Some of the information on the Uruk, Maikop, and Kuro-Araxes came from the 2012 paper "Uruk Migrants in the Caucasus" by Konstantine Pitskhelauri in the BULLETIN OF THE GEORGIAN NATIONAL ACADEMY OF SCIENCES.

The 7 JUN 2016 article, “Ancient DNA and human history” by Montgomery Slatkin and Fernando Racimo (Proceedings of the National Academy of Sciences, vol. 113, no. 23) has

information on ancient DNA (http://www.pnas.org/content/113/23/6380.full).

Some of the information on the migration path from the Black Sea into Europe and the stelae came from Jean Mann's messages on the "A Genetic Genealogy Community" forum How did the Bell Beaker FOLKS spread across Europe. She has writtten two books about the subject. They include some information on ancient DNA.

The MAY 2016 article “The Genetic History of Ice Age Europe” by Qiaomei Fu, Cosimo Posth, Mateja Hajdinjak, and David Reich - Nature 534(7606) (https://www.researchgate.net/publication/301742169_The_genetic_history_of_Ice_Age_Europe).

Some of the information on the PIE languages came from Wikipedia.

Other information on various topics came from Dienekes' Anthropology Blog (http://dienekes.blogspot.com/), the “Anthrogenica” forums (http://www.anthrogenica.com/forum.php), "A Genetic Genealogy Community" forums (eng.molgen.org) and from the "World Families" forums (worldfamilies.net).

Some of the information are logical deductions that I made. For example, the split of L11 into the Germanic U106 and the Celtic P312 makes it pretty obvious that this is when the IE language split between Germanic and Italo-Celtic occurred. It is apparent that the U106 people developed a Germanic language after the split, and the P312 people developed the Celtic and later Romance languages.