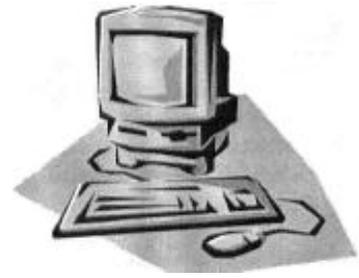


COMPUTER C O R N E R

By Mike Blackledge.com



DNA Revisited

Guest Column by John A. Farris

*From time to time, Computer Corner invites a guest columnist to present a subject of interest to themselves and our AGS members. DNA holds great promises for genealogists, and in this column, AGS member **John Farris** gives us an update on DNA and its application to Genealogy & to his family research. He also shares his review of the latest book by Bryan Sykes:*

DNA USA, A GENERIC PORTRAIT OF AMERICA

One of the best ways to keep abreast of the ever expanding impact that DNA testing is having on genealogy is to read the latest books on this subject. In this report you will get an overview of the latest book written by Dr. Bryan Sykes and then you will see the impact this has had on my research.

DNA USA is an interesting and important book, and I recommend it to all genealogists. This book is available in our library system in both printed form as well as Books on Tape. Copyright is 2012.

Bryan Sykes is a professor of human genetics at Oxford University in England. He has the rare talent to be able to explain complicated scientific concepts in terms that most of us mortal humans can understand, and he often does so with humor. He has written three other books, including *The Seven Daughters of Eve*, which were very well received by the public.

DNA USA is an unusual book in that it mixes a travelogue across the USA with his meeting people from many of our different cultures and taking DNA samples from most of them. For his DNA analysis Dr. Sykes uses Y-DNA, mt-DNA as well as SNPs. Y-DNA can only be tested using samples from males and traces their paternal lineage back hundreds of generations. Both females and males can have their mt-DNA tested and it traces their maternal lineage back hundreds of generations. The newest DNA testing that is available is SNPs which tests all of your branches back for at least five generations for both males and females. SNPs is the abbreviation for Single-Nucleotide Polymorphisms and is known more commonly as “snips”.

SNP testing was originally offered by the company 23 and Me (www.23andme.com). More recently a similar SNP test was made available by Family Tree DNA (www.familytreedna.com), which they call Family Finder. Dr. Sykes visited both of these companies and reports on these interesting meetings.

This book provides a history of human DNA testing. The first systematic test of racial groups used mt-DNA and were conducted on samples taken from two Native American tribes of North America: Nuu-Chah-Nulth in the Pacific Northwest and the Pima living in Southern Arizona. It

was found that their mt-DNA results fell into four distinct clusters which are now called the female Haplogroups A, B, C and D. Soon it was confirmed that samples from Native Americans from Alaska to Peru also fell into these same four Haplogroups. Then it was found that the natives of the Polynesian Islands as well as the indigenous Taiwanese fell into one of these groups. Then with the cooperation with Russian scientists it was discovered that the same four Haplogroups were in Northeast Asia.

Later a fifth cluster was found to be common among the Ojibwa Native Americans, which was called female Haplogroup X. It is a variation of a Haplogroup found in Northern Europe and raises the likelihood that during the end of the last ice age that immigration did indeed occur from Europe.

This book traces the migration of Europeans to North America starting with Leif Erikson in about AD 1002. The Spanish and Portuguese led the way for permanent settlements starting with Columbus in AD 1492. They were quickly followed by the English, French and the Dutch. Even Sweden established colonies. However, except for Florida, the Southwest USA and Mexico, the English became the predominant influence in North America.

Dr. Sykes summarizes the various immigration patterns to the USA up through 1965 and includes a very interesting full color Population Ancestry Map of the USA showing the origin of each of fifteen ethnic groups in a different color based on the 2000 census.

The book then shifts to a discussion of the male Y-DNA and discusses how useful these results can be to connect male lines by matching the Y-DNA markers between two living males. The book gives an example which proved that the children of slave Sally Hemings were actually fathered by President Thomas Jefferson. This was proven by comparing a living male descendant of Sally with a living male Jefferson descendant of Thomas' uncle.

When Dr. Sykes published *The Seven Daughters of Eve* it resulted in TV interviews about the book which created excitement among the genealogical community in England – particularly the existing One Name Societies who were already searching available records for their selected surname including all known spelling variations. This resulted in Oxford University spinning off in the year 2000 the first commercial DNA testing laboratory called Oxford Ancestors. Soon thereafter Bennett Greenspan formed Family Tree DNA. Next the Mormon Church under the generous sponsorship of the late James LeVoy Sorenson formed the Sorenson Genome Institute which has since morphed into the commercial venture called Relative Genetics. In 2005 the Genographic Project was formed by *National Geographic* and IBM, and was led by Dr. Spencer Wells. The testing for this project is done by Family Tree DNA, however they originally only tested enough markers to determine the female or male Haplogroups since their primary objective is to define the ancient migration patterns. Thus DNA testing quickly became widely available to the general public. With more competition and greatly improved analysis equipment, the price of DNA testing keeps dropping.

Dr. Sykes did the first One Name DNA Study on the “SYKES” surname. This was quickly followed by similar studies in England on the following surnames and their known spelling variations: BACHMANNS, BATH, CLOUGH, COHANIM (the first project of Family Tree DNA, which was worldwide), DEARBORN, DYSON, LEHMAN, LOCKWOOD, and POMERY. In the process of these studies, Dr. Sykes found “that surnames can mutate much faster than Y chromosomes.” He also discovered that in genealogical history that the mating habits of the peasants were often much different than those of the nobility. Thus the Y-DNA of nobility are often found in the male descendants of his subjects.

Dr. Sykes devotes an entire chapter as well as three Appendixes to “The World’s Biggest Surname Project.” It is the study of Scotland’s Clan Donald. By February 2011, this project had over a thousand tested male members using at least 37 Y-DNA markers. If you have Scottish heritage this chapter and its related appendixes are important. Here are seven important conclusions from this chapter:

All five of the living clan chiefs share a Y-DNA signature under Haplogroup R1a. This Haplogroup is of Norse Viking origin rather than Gaelic origin. Gaelic had been expected. This Haplogroup is not common in Scotland and is encountered mostly in the Highlands and Hebrides. The greatest concentration of R1a is in Orkney and Shetland. It is also common in Norway and Iceland, but not in Denmark. Name adoption was common where a subject of the chief adopted his surname. Classic genealogy shows that these five clan chiefs are descended from Somerled, a twelfth century Celtic hero. The clans MacDonald, MacDougall and MacAlastair are all descended from Somerled. Somerled claimed that he descended from Irish kings, perhaps for political reasons, but this is not supported by the Y-DNA results. He has Norse ancestry.

Another chapter is devoted to the immigration of Jews to the USA. The Jewish community, most particularly the Ashkenazim who immigrated to the USA mostly from Germany and Eastern Europe were the first ethnic group to fully embrace the power of DNA testing. This is in large part because of the high incidence of Tay-Sachs disease, a horrible condition that renders infants and small children blind, deaf and unable to swallow. The crippled child usually dies by age four. In the rest of the world’s population this condition is very rare. Using DNA screening tests Ashkenazim Jews have virtually eliminated this disease. This is the first example of disease control using genetics.

This book traces the Jewish migrations to Europe from the time of the Babylonian victory, to the persecutions by the Romans to the various persecutions within Europe ending with the Nazis. By the mid-1800s, the USA was seen as a safe haven for the Ashkenazim Jews and many migrated to the USA.

The Sephardic Jews share the same origin in Judea, however their DNA has developed in a distinct manner. They migrated to Spain and Portugal some think as early as 200 BC. Within these countries they were sometimes valued as major contributors to their country and sometimes they were persecuted. However, in January 1492 the Catholic monarchs, Ferdinand and Isabella issued their “Edict of Expulsion”. This gave both Jews and Muslims three months to either leave Spain or convert. Many moved from Spain in all possible directions including to the New World.

We all descend from a woman who is estimated to have lived in Eastern Africa 170,000 years ago. Our ancestors, the Homo Sapiens, departed Africa about 60,000 years ago. Because humans have lived so long in Africa, there is much more DNA variety. For instance, seventeen maternal Haplogroup clans have been identified in Africa. This compares to only ten in Europe. Dr. Sykes traces the migrations of the various maternal Haplogroups within Africa. He also discusses Haplogroup L3A, which were the only ones to leave Africa about 60,000 years ago. The rest of the world all descend from this Haplogroup and are known as maternal Haplogroups M and N.

Mt-DNA results have brought a lot of joy to those African Americans who have been tested. They can finally identify the tribe of their ancestors. Y-DNA results are not nearly as useful

because at least a third of the African American males have European Y-DNA. This is because it was all too common for the slave masters to impregnate their female slaves.

Dr. Sykes explains the science and power of the analysis of DNA snips. It is done on a microchip where each ethnic group shows up as a different color. For instance, European shows up as dark blue, African is green, East Asian/American Indian is orange, etc. This ethnic composition of each of the test person's 23 chromosomes is shown. The length of the colors indicates the percentage of that ethnic group. If the test subject has a varied ethnic background, the results are very colorful. You have to spend time studying the color illustrations in this book to understand this fully, but it is powerful. It is called chromosome painting.

Dr. Sykes admits that he had no idea how big the USA is until he traveled across it by train. He started in Boston and after several stops and side trips ended up in San Francisco, and flew back to Washington, DC with several stops along the way. He had traveled for six months and seen more of the USA than many, if not most, of our citizens. He presents many interesting results learned from all of these interviews, travel and DNA testing.

As you would expect with a book by Bryan Sykes, he includes a lot of detail on each of the subjects covered. In this short summary, it is impossible to do justice to his writing. If you only read this book review, you have cheated yourself. You need to read this book.

How does all of this DNA information impact me? Using my Y-DNA results (I have now upgraded to 111 markers) I have now met via EMAIL five distant cousins that I would have never known about without my Y-DNA test results. I have now met three of these families face to face. We are still looking for our common ancestor, who is likely in Scotland.

SNP testing was originally offered by 23 and Me (www.23andme.com) and they have recently reduced their price to \$99 plus S&H. Also recently, a similar SNP test was made available by Family Tree DNA (www.familytreedna.com) under a testing option, which they call Family Finder, which is offered for \$289 plus S&H. I have been snip tested by both companies. They both show me as Male Haplogroup "R1b1" and Female Haplogroup "H2a2b". However 23andMe gives my full male Haplogroup as R1b1b2a1a2f*, whereas Family Tree DNA says that it is R1b1a2a1a1b4 = R-L21. I don't know why they are different! 23andMe gives my female Haplogroup as H2a2b1 whereas Family Tree DNA gives me H2a2b. My full mt-DNA sequence has just been sent to me by Family Tree DNA. The migration history of each of these Haplogroups is explained on the www.FamilyTreeDNA.com WEB Site and you can also Google them. Your Haplogroup is your deep ancestry, such as 10,000+ years ago. I learned that both my maternal & paternal ancestors were in the Iberian Peninsula at the end of the last ice age. Perhaps they hunted together. But they didn't stay there. As the ice slowly melted they followed the herds as they moved north.

Even though I was told as I was growing up that my paternal great grandmother was a Cherokee Indian (which my classic genealogical research later appeared to disprove), my 23 and Me results show that my ancestry is 99% Western Europe. These SNIP results can identify your roots as being Northern European, Southern European, Ashkenazi, Eastern European, Middle Eastern/North African, Sub-Saharan African, South Asian, East Asian/Native American, and Oceanian. In several of these categories, they break the results into sub-categories. For instance, based on my 23 and Me results, I am 91.2% Northern European & 8.6% Southern European. However, within the Northern category, I am 25.4% British & Irish, 0.1% French & German, <0.1% Scandinavian and 65.8% Nonspecific Northern European. I am 0.0% Native American.

This shows that you can't always count on the validity of family traditions. 23 and Me also gives you a very interesting health analysis based on your genes. My health summary report is 23 pages long and I found it to be very interesting.

Another interesting result from the 23 and Me SNP testing is that, if you don't have pure African roots, they will tell you how much Neanderthal DNA you have inherited. The normal range is 1.0 to 4.0% and my result was 3.0%. The average for non-Africans is 2.7%.

My SNP Family Finder results from Family Tree DNA were similar, but with different details. They show me as 100% European: 91.22% +/- 7.51% (83.71 to 98.73%) Western Europe (French, Orcadian & Spanish) and 8.78% +/- 7.51% (1.27 to 16.39%) Europe (Tuscan, Romanian & Sardinian). Since this company is more attuned to genealogists, they offer more possibilities with matches with kin. However, they don't yet offer detailed health analysis.

I understand that Ancestry.com is also offering DNA testing, but I have no experience with them.

If you haven't been DNA tested yet, you are missing out.