

DNA testing comes of age

How a surname-based DNA project can be organised and results benefit the one-namer



By Chris Pomery

FOR several years now, Guild member CHRIS POMERY has been in the vanguard of the "new genealogy" - the science of making genetic links by DNA testing.

His book, *DNA and Family History*, was published by The National Archives in September 2004 and has proved a best-seller.

In this specially commissioned article, he describes how the work he has been undertaking since 2001 has progressed and its effect on the Pomeroy One-Name Study.

With genetic genealogy now almost five years old, 2005 is a good time to review some of the predictions I made in July 2001 when I confidently described DNA testing as "a valuable tool for one-namers", and the progress of the Pomeroy DNA study.

What strikes me most clearly is that, while the promises that DNA testing offers to historians are slightly delayed in arriving, the potential that genetic genealogy now offers has grown larger than I'd anticipated just a few years ago.

To reveal how this is happening let's review how a surname-based DNA project can be organised and how its results might benefit the one-namer. Typically, a one-name study gathers together family trees researched by different, often unconnected researchers.

Some of these trees will have been drafted many years ago before mass transcription data such as FreeBMD came online, others more recently and benefiting from the flood of data now available on the web. Even as the diligent one-namer gathers transcription data from far and wide, one of the key problems he or she faces is how to link together the trees and to corroborate all this research already done by third parties.

Effective

DNA testing is proving an effective tool to corroborate the integrity of documented family trees for the simple reason that the DNA signature of each male descendant is passed down from father to son in a manner that exactly mimics the transmission of the surname from one generation to the next.

The Y-chromosome test results of any male descendant who shares the surname of the oldest male in the tree should, in almost all cases, be identical or extremely similar. By DNA testing several male descendants within a tree,

we can quickly identify whether they share a common DNA signature or not. If they do not, the answer will lie either in a documentary error within the tree, which we can then try to correct, or in a break in the line of DNA transmission in one generation from father to son.

There are, of course, good reasons why some male descendants might have a different DNA signature than the standard one for other male descendants in that tree. These include an illegitimate birth somewhere in the paternal line, the parenting of a male child by a man other than the documented husband, name changes for inheritance purposes, and the like. But the DNA testing of a small number of male descendants per documented tree will quickly reveal their common DNA signature, in turn isolating that part of the tree where a different DNA signature is found as warranting closer documentary investigation.

Impact

Four years on, it is hard for me to over-estimate the huge impact that DNA testing has had on the Pomeroy One-Name Study, which has benefited greatly from the hints provided by our DNA results. At the same time, I can reveal that virtually every large documented tree has revealed some anomalous DNA results which have caused us to reinvestigate the documented assumptions underlying each tree and to try to correct them. In a nutshell, most of the major trees had significant faults in them which the DNA results have flagged up and allowed us to start to remedy.

Within this context, I have to confess that I take a very pro-active role in running the Pomeroy One Name Study which I know would not suit every GOON. In fact, I even have the desire of one day "finishing" the study by reconstituting its family trees! In practice, what this means is that I have an active certificate-buying policy using society

research funds to identify the missing documentable links.

This is, over a few years, consolidating a large number of small family trees into our major trees. By doing this, I am – in consultantspeak – leveraging the benefits of the DNA results which have indicated which trees might be linked together through a common genetic heritage.

But I should stress that while I have been working at developing the one-name study in a very pro-

active way, I think the impact that DNA testing has had upon our study would be replicated in other surnames, too.

When we first started the Pomeroy DNA project in 2000, we had just two or three documented family trees with more than 200 name-bearers in them, and we deliberately chose one male descendant per tree to be DNA tested, regardless of the tree's size, in order to find out which trees would turn out to be linked by genetics.

The initial results identified seven "genetic families" where several participants shared a broadly identical DNA signature, plus a number of singleton DNA signature results. As we enter 2005 the picture looks markedly different. The number of DNA-tested male POMs has risen from 51 to 73; the number of "genetic families" (classified as two or more identical or near identical DNA results) has risen from seven to 14, and the largest of these "genetic families" has 18 members.

Handling the switch from paper systems to digital archives

BACK in January 2001 I wrote an article about how one-namers might handle the switch from paper-based systems to digital communications and archives. While that seemed a bit of pipe dream at the time, I can report that, after a long-term scanning effort, our paper archives have now been turned into a 1.5Gb folder of PDF files.

During this process I found that my predecessor, Tony Pomeroy, and myself have had contact with over 1,000 researchers or enquirers and that collectively in the archives we had details of over 400 certificates. Even more reassuring, we now have multiple copies of the archive shared among our leading members, so it is much safer than when it was simply on a single shelf.

I was quite surprised by these figures, as I've always thought we were quite a small study with fewer than 2,500 name-bearers in the UK, backed by my resolve to put no more than 20 hours a month into it. This realisation spurred me on, though, to attempt the next stage and switch the delivery of our newsletter wherever possible from post to e-mail. Just 37% of our 216 newsletter recipients don't have an e-mail delivery address, though a few of them still elect to take a printed posted copy.

As an incentive, any member who takes the e-mail PDF version now only has to pay a one-time membership fee, so we've also slashed the administrative time taken to chase subscriptions every year. Next year I plan to market the study more widely outside the UK and I'm hopeful that we'll get a stream of new members who will, in effect, pay a one-time donation to join our e-mail newsletter mailing list and boost our research funds. I'd be interested in hearing from any GOON who's tried this approach and to hear whether the experience has been good or disappointing.

Documented

Some of these genetic families are now clearly documented as a single family tree. The best example is that of Tony Pomeroy, my predecessor who set up the Pomeroy ONS, whose DNA result was shared by four other DNA study participants whose smaller trees have subsequently been documentarily linked with Tony's Dorset tree, expanding it from around 200 to 500 members.

By contrast, other "genetic families" are still a documentary work in progress. Traditional methods suggest that the trees of a set of eight DNA participants are highly likely, based on their geographical origin, to form a single family tree. The DNA results are, however, less clear cut, suggesting that there may be three distinct DNA signatures within such an expanded tree. One of those DNA signatures is only found within this family tree, so I am fairly confident that this one is truly associated with the tree as documented.

The other two DNA signatures have also been found in other unlinked family trees. This opens up two possibilities for each of these DNA signatures: firstly, that the trees they are associated with might one day be documentarily linked together and with the main tree; or, secondly, that the same DNA signature independently exists in two genuinely unlinked family trees, despite the common surname.

If the caveats above seem a bit vague and unsatisfactory, the answer lies in the particular circumstances of our DNA project. The reason why the Pomeroy DNA study has yet to answer this type of question is simply because we ran our initial set of Y-chromosome tests on 51 members four years ago when this kind of DNA testing was still in its infancy. Just to backtrack, each DNA signature is defined by a series of numbers generated by investigating the structure of the DNA at a number of different places (known as markers) on the Y-chromosome.

The very first surname-based DNA study in 2000

compared just four markers across its participants; the Pomeroy DNA study a year later compared 12; today, the standard genealogical Y-chromosome test measures 43 markers.

If we were running the same test surname programme today our results would be much, much clearer because of the higher resolution of a routine test procedure that uses almost four times as many markers as we had access to four years ago. Basically, I would now be able to look at every individual DNA result and determine the linkages between them with a much higher degree of clarity than I can with the low resolution tests we received in 2001.

Upgraded

This move from low resolution Y-chromosome tests (12–25 markers) to high resolution tests (37–43 markers) is the key one that has upgraded the usefulness of genetic testing for genealogists across the board and guaranteed the continuing growth of interest in the investigation of DNA links.

Back in 2001 I predicted that it would soon be possible to compare one's individual Y-chromosome result with a large public database, and that control populations of results based on regions and data on the mutation rates of individual markers would become available to help organisers with some of the more advanced aspects of DNA testing. While these have not yet arrived in the form I had expected, there are signs that they are now in the process of arriving.

Price drop

Better news is that the price of a high resolution Y-chromosome test has dropped significantly helped in part

by the current weakness of the dollar against the pound. A 43-marker test can now be bought for around £85–90, putting it within reach of the dedicated genealogist.

The key test of any technology is an assessment of the benefits it brings. Purely personally, the indication from our DNA results that the majority of

people bearing my own variant surname – Pomery – link back to a single family, is an invaluable hypothesis that I'm hoping future trawls through the documentary evidence will gradually back up.

But whenever anyone asks me what's the point of DNA testing. I cite the case of one of our American members who for several decades has tried to document his links back to a Pomeroy family in County Cork in Ireland in the mid-17th century. Two British men who separately trace back to a family in the same time and place we already knew share the same DNA signature. Why not take the DNA test and see if yours is the same as theirs, I asked the American?

Identical

A few weeks later the answer came back: his result was identical. While the match is only at a low resolution, anything other than an exact match would have tended to disprove his research and family history, so he was extremely pleased that the DNA test tends to confirm, even if it cannot conclusively prove, the link.

As I see it, DNA testing opens up a highly valuable way for Guild members to link name-bearers in the New World with their Old World ancestor families, a feature which I, with my focus on the origins of the British families, find extremely useful to engage our overseas cousins. ○

CHRIS POMERY
Member 3400
Slough Enterprise Hub
Thames Valley University
Wellington Street
Slough SL1 1YG
pomero@one-name.org

How to get a copy of Chris's book

CHRIS Pomery's book, "DNA and Family History", was published by The National Archives in November 2004. A signed, dedicated and numbered copy can be bought direct from the author at the book's website, www.DNAandFamilyHistory.com

The website publishes and links to a range of other genetic genealogy resources, including detailed results of the Pomeroy DNA study, advice how to run a surname-based DNA project and a list of testing companies & prices.

I need your help!

• FOOTNOTE

Can I please enlist GOONS members' support? I'm currently trying to identify inspiring, complex and ambitious history projects undertaken by non-academics, i.e. people like us.

These would include genealogy and family history projects, surname studies, local history projects such as parish, community and factory studies, plus anything quirky and fascinating with a strong historical theme to it that involves an historical person or a quest of some sort.

They can be published or unpublished. I'm doing this within a part-time diploma in history and I'd be very grateful to hear of any projects that members can signpost me towards. Please feel free to e-mail or write to me with suggestions.