Your DNA and Your Family Tree



Presentation given to the Coffey Cousins Convention in Jefferson City, MO, on 4/29/2017

Your DNA

and Your Family Tree

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Your DNA and Your Family Tree

Some of you in this room have heard me talk about DNAbefore. Today I will try to put a different spin on it by skimming over the science, and by talking more about Coffey families' diversity. Is this a diverse group sitting in this room?

Several of us trace back to Edward Coffey. Danny Coffey and I have the Coffey name. David Smith and Tim Peterman are Edward descendants. Sue McClure sponsored her brother Ron Coffey, also from Edward. And we all have multiple DNA tests to prove it.

Bonnie (Flanigan) Culley and Mildred (Hayes) Smith are third cousins who descend from Elizabeth Coffey who married George Hayes. They have a solid paper trail linking Elizabeth back to Edward.

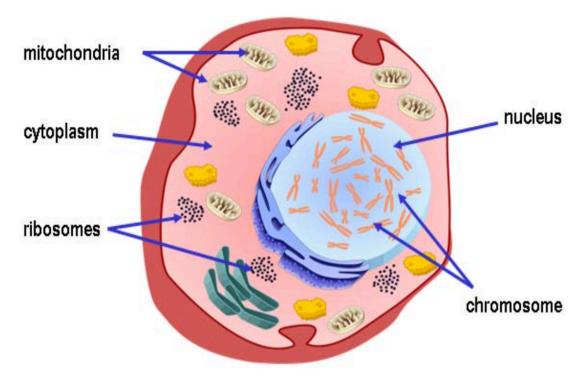
Jean Mower descends from Peter Coffee, who arrived in America separately from Edward. And the DNA says Edward and Peter were related.

Terri is NOT related to any of the others here. She descends from the unrelated Hugh Coffey line. She has a major investigation of descendants of Hugh underway, and can prove their connections.

And then there is the CCC President, Larry. He has a perfectly good Coffey name, and descends from a solid Irish immigrant to New Jersey. And he belongs to one of our biggest DNA groups. That is, people who don't YET match any OTHER tested Coffey.

And I don't believe ANY of us have a valid claim to the Coffey Crest on this first chart. But it is pretty!

YOUR DNA IS IN ALL OF YOUR CELLS



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YOUR DNA IS IN ALL OF YOUR CELLS

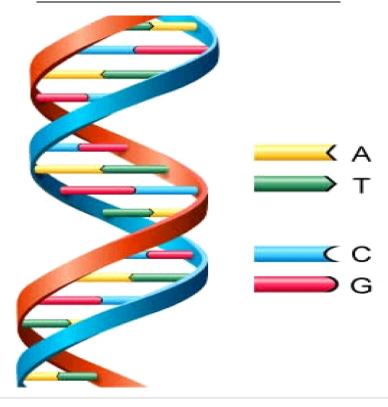
Where do we find your DNA? Every single one of your body's cells has a full complement. Let's slice open one of those cells:

Most of your DNA is in the chromosomes, found in the cell nucleus. We'll talk more about those in a moment.

However there are also a number of critters scattered through the cytoplasm, called mitochondria. They have their own, entirely separate, DNA.

And how do we get a sample for DNA testing? Order a test kit, and rub the inside of your cheek with a plastic swab. That will rub off enough dead cells for testing. Then send the sample back.

DNA MOLECULE: A DOUBLE HELIX



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DNA MOLECULE: A DOUBLE HELIX

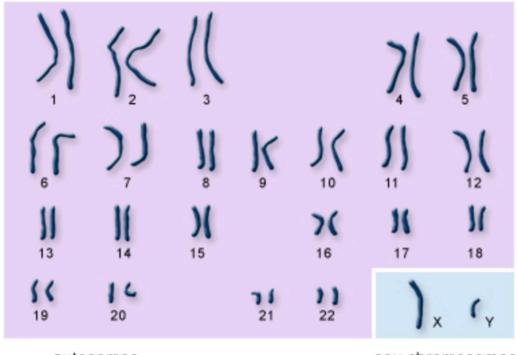
Next, let's have a quick look at a small segment of a DNA molecule.

It's in the shape of a double helix, that spirals around like this sketch. And the backbones of each side helix are attached by connectors. The connectors are complex molecules, with long names, and are usually referred to by their initials A, T, C and G. The connectors are fussy - An "A" will only connect to a "T", and a "C" will only connect to a "G". So if you know one side, you automatically know the other.

Let me focus on the middle segment. On the left we have blue, yellow, red and green. We could label that section "CAGT"

Your entire DNA genome can be described by a list of these connectors, or nucleotides. And it is possible to do a "full genome" DNA test, and get the full list of your DNA nucleotide sequence. But you're going to need a lot of paper to write it down. There are SIX BILLION of these nucleotides in your genome!

THERE ARE 23 PAIRS OF CHROMOSOMES



autosomes

sex chromosomes

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THERE ARE 23 PAIRS OF CHROMOSOMES

Now, back in the nucleus, there are 46 chromosomes, in 23 pairs. Taken together, they are all the instructions necessary to create and maintain a human life. The first 22 of these pairs are called autosomes. Let's focus in on one of the big ones, like chromosome #1.

You got one of the chromosomes in this pair from your father, and one from your mother.

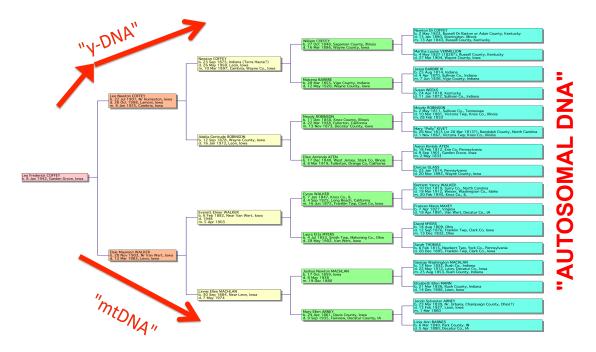
But you will only be able to pass on a SINGLE chromosome to your children. Which one will be used? Your body, before passing on a single chromosome to a child, will break the original pair into shorter segments, and then reassemble the pieces into a single chromosome. This is called "recombination".

The child then gets two of these 'recombined" chromosomes, one from each parent. Ultimately, the child ends up with a mix of segments from his parents, from grand parents, and so on back.

Now, at the bottom right there is a special pair of chromosomes. If you have two of the "X" chromosomes, you are female. If you have one "X" and one "Y" you are male. While two "X" can recombine, the "Y" is never able to do so.

And since "Y" is only found in males, it is handed down from father to son, just like the "Coffey" surname. And this makes it a wonderful target for tracking male-line genealogy!

WHAT THE DIFFERENT TESTS CAN LOOK AT



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WHAT THE DIFFERENT TESTS CAN LOOK AT

To see what the different tests can explore on your family tree, we need a tree. This is mine. I'm the guy on the far left. Moving up and to the right, you see my father, my grandfather, my greatgrand father, and so on.

The y-DNA tests can follow this line.

A moment ago I mentioned the mitochondria, which have their own DNA. Everybody has mitochondria, but we all got them ONLY from our mother. So a mtDNA test will follow the female line. Cool, just like the yDNA and the male line.

But there are two problems. First, it changes only slowly. Two people may have a PERFECT mtDNA match, and you then KNOW you have a common ancestor, but you don't know if that ancestor lived 100 years ago, or 1000 years ago.

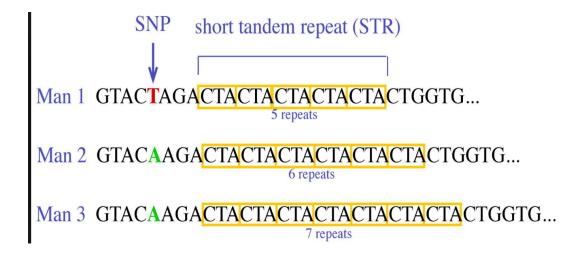
And the second problem is that our convention is for females to change their name upon marriage. That quickly gets confusing. My mtDNA line is "Walker/Machlan/Arney/Barnes/etc/etc.

Finally, we have autosomal DNA tests. This looks at the MIX of all of the atDNA from all of our ancestors. It requires a LOT of data, but it's QUITE GOOD at spotting cousins out to at least the third cousin level. My third cousin would be anybody who descends from any of the sixteen people listed on the far right.

Let me focus briefly on the top four of the green people. These are four of my great-grandparents; William Coffey, Malcena Barbre, Moody Robinson and Ellen Aten. And sitting over here is Tim Peterman. His ancestors include a brother of William, a sister of Malcena, a brother of Moody, and a sister of Ellen. So our ancestry shares all eight of the parents of these marriages.

Tim and I have a lot of shared family. And Tim will talk about his Autosomal Project.

LOOKING AT THE "Y" CHROMOSOME



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LOOKING AT THE "Y" CHROMOSOME

Now let's take a quick look at that little Y chromosome:

Here are three men, showing one hypothetical segment of their yDNA. They all start out with a sequence "GTAC".

But wait, something is different in the fifth position! Maybe every male in the world originally had an "A" here, but there was a rare mutation, and one male got a "T". The mutation did him no harm, but from then on EVERY descendant of that first mutation now has a "T".

This is called a "single nucleotide polymorphism", or a "S N P", or a "snip". This has a lot of genealogical potential, but there are now thousands of known "snips" in the human y-chromosome, and trying to organize them can be a real challenge.

There's another type of mutation that is easier to use for genealogy. At a number of places in the yDNA there are sections where a short segment repeats itself. These are called "short tandem repeats", or STR's. Man #1 has the sequence CTACTACTACTACTA, or 5 repeats. Man 2 has six repeats, and man 3 has 7 repeats. The number of repeats will sometimes change. This does no harm to the man, but the number can become associated with a particular family line, like "Coffey".

EXAMPLE: Y-DNA Test Result

"EDWARD COFFEY" GROUP (12-MARKER TEST)

Locus	<u>DYS#</u> #	of STR's		
1	393	13	Think of "Locus" and "DYS#" as just labels.	
2	390	24		
3	19/394	14		
4	391	11	For each location, the test reports the number of those STR's, or "short tandem repeats".	
5	385a	11		
6	385b	14		
7	426	12	There is an estimated "1 in 500" chance the number of repeats at a given location will lengthen or shorten with the next generation.	
8	388	12		
9	439	12		
10	389-1	12		
11	392	13		
12	389-2	28		
Haplogroup is "R1b"			"Haplogroup R1b" says these Coffey's are European.	

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EXAMPLE: Y-DNA TEST RESULT

Here's an example of how this works for one family. This happens to be MY y-DNA, but all descendants of Edward show an identical, or nearly identical pattern:

In the first test position, called "DYS 393", I have 13 STR's. In the second position, called DYS 390, I have 24 STR's. And so on down the list.

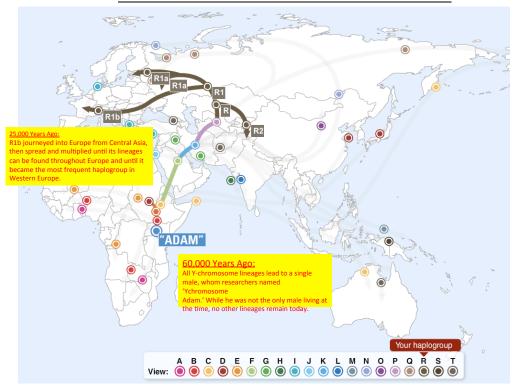
All Edward descendants have essentially the same pattern. You may once in a while see one marker that has changed, and possibly even two. But if the two tested people you are comparing also have the name "Coffey", this may be a significant match.

Testing only 12 markers may not be conclusive. Generally we would like to see a test on at least 37 markers, and the tests go up to 111 markers.

(In the total tested population, I have 1397 12-marker matches, of which 1095 are EXACT. Only about 4% of the total are truly "Coffey Cousins".)

The testing service computers also look at the overall pattern of each sample, and conclude that this looks like "Haplogroup R1b". That simply indicates that the Edward descendants are part of a larger group, which includes much of the population of Europe.

MOST COFFEYS YDNA IS GROUP "R1b"



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MOST COFFEYS' YDNA IS GROUP "R1b"

Let me briefly discuss this "Haplogroup", since it tells us something about the evolution of the Coffeys:

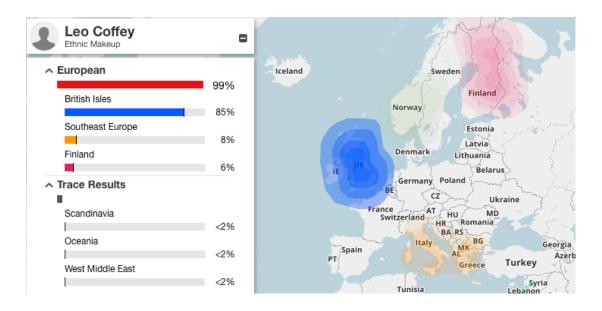
There are many different Haplogroups, as indicated by the list at the bottom of this page.

Scientists believe that all y-chromosome lineages eventually lead back to a single male, who lived about 60,000 years ago. They call him "Ychromosome Adam". He was not the only male living at the time, but all the other lineages failed to survive.

The original "Adam" DNA evolved through several different Haplogroups, and eventually led to the "R" group, which split off "R1", which became "R1b" by about 25,000 years ago. This is the most common group in Europe, and is particularly concentrated in Ireland.

We are using SNP testing to begin to break this into smaller and smaller sub-groups. But that's a subject for another day.

SOMETHING YOU LEARN FROM ATDNA



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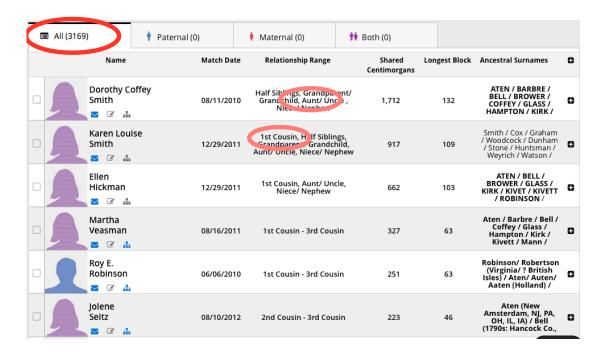
SOMETHING YOU LEARN FROM ATDNA

Enough on yDNA for the moment, let's turn to autosomal DNA:

One of the interesting things you get from this test is an assessment of your overall Ethnic Makeup. My test says that I am, overall, 99% from European stock. And of that, I am 85% from British Isles, with 8% from Southeast Europe and 6% from Finland, with just a hint of Scandinavia.

Be aware, this is looking at ALL your DNA, not just the tiny parts that are "Coffey Male Line".

MATCHES FROM "FAMILY FINDER" FOR FRED



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MATCHES FROM "FAMILY FINDER" FOR FRED

Perhaps more useful, the atDNA test provides an assessment of people that the computer has identified as sufficiently closely matched to be your "cousin" at some level.

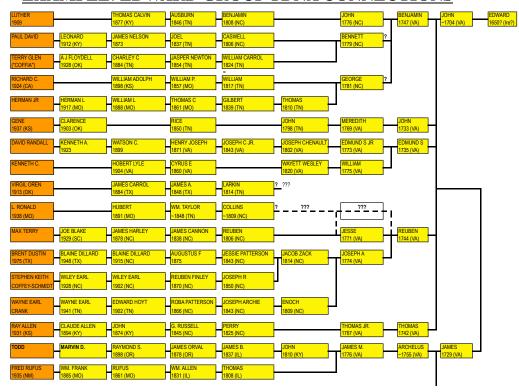
It gives me a list of 3169 matching people, ranging from very close (nobody can beat an identical twin) down to remote. That's rather an overwhelming number!

However here are the closest six people it has identified for me.

Number 1 is Dorothy (Coffey) Smith. She is actually my father's sister, and Family Finder suggests she might be my aunt. Got that right! Number 2 is Dorothy's daughter, and it suggests I'm looking at a first cousin. Got it!

All of the remaining people on this page are actually KNOWN cousins of mine, plus many more beyond those. This is Tim Peterman's fault. In a little while he will tell you about a major autosomal DNA project he is working on. And he keeps bugging me to "find me some more cousins". My aunt Dorothy is one of his favorite subjects, because she was from the closest tested generation to our core ancestor pool.

EXAMPLE: EDWARD GROUP YDNA CONNECTIONS



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EXAMPLE: EDWARD GROUP YDNA CONNECTIONS

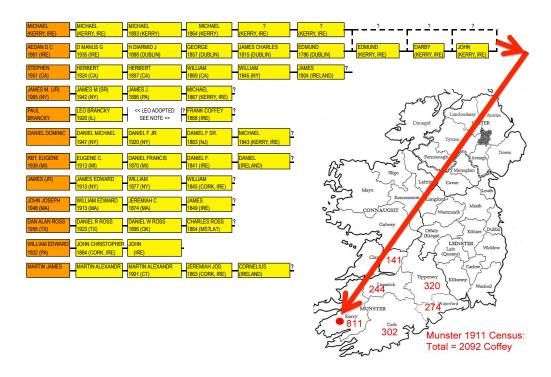
Those who have attended my previous DNA talks may recall that I spent a lot of time talking about divisions WITHIN our Edward Group. I won't do that kind of detail today, but I will talk about this Group in a larger context.

I'm going to show just one "fragment" of this group, just to introduce my format for displaying connections. The people listed on the far left are some of the tested people. Each has given me his assessment of HOW he descends from Edward, per the lines of yellow boxes. All of them ultimately arrive back to Edward, on the far right.

The test results don't tell me anything about the individual path to Edward. Some aren't fully known, and many have question marks. They all came from the participants.

But one thing is NOT in doubt. All of these people descend from Edward by SOME path. There is no doubt of that. The DNA tells us that much.

IRELAND TOUR: "MUNSTER" GROUP



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IRELAND TOUR: "MUNSTER" GROUP

Let's leave Edward for a bit, and talk about other unrelated families, and where they came from in Ireland.

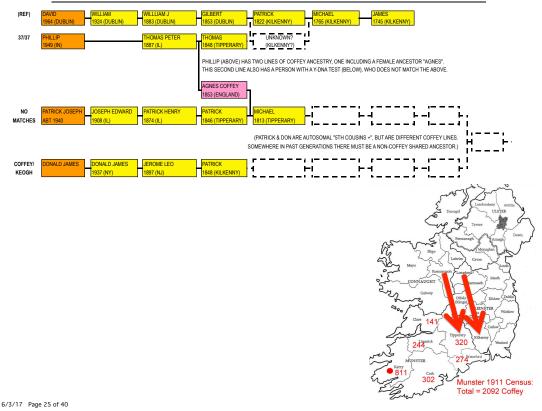
One group, with DNA matching individuals, is our "Munster" group. Munster is an ancient area in Ireland, to the south west. The 1911 census tells us that there were 2092 people with the Coffey name living in Munster. And the population for each county is shown in red.

Notice the biggest population is from Kerry, and we think that is one of the most ancient Coffey homelands. And the top two people on this chart trace their ancestors to the area of the red dot. And the top person is a farmer, who has been on his family land for as far back as he knows.

In Irish law, the oldest son always inherits the farm. If not so, the farm would gradually be divided down to nothing. So if there's a big family, where do the big brother's siblings go? Sooner or later, they have to leave.

And where to they go? Many would go to neighboring counties, to make their way as best they can. And that may be a significant factor in the Coffey population of these adjacent counties.

IRELAND TOUR: "TIPPERARY/KILKENNY" GROUP



IRELAND TOUR: "TIPPERARY/KILKENNY" GROUP

Staying in the same general area, here are three genetically separate family lines, but with interesting connections:

The first two men, per the DNA, are related. The first one, David, still lives in Ireland. And yDNA combined with atDNA leaves only a narrow window within which the two may connect see the dotted line and box.

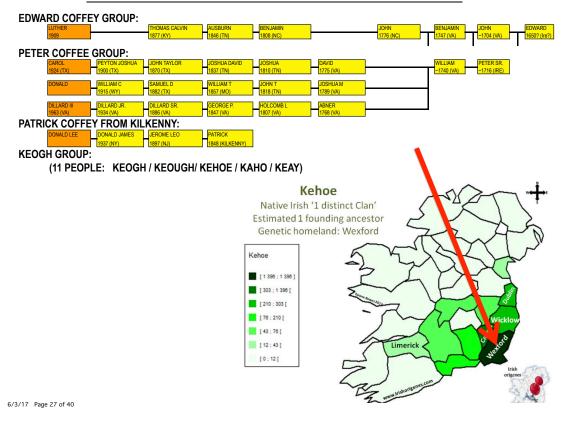
But one of the anestors of Phillip, Thomas Coffey, married Agnes Coffey. We managed to follow Agnes' genealogy down to a present-day descendant, and the yDNA proved that Agnes was NOT a relative of her husband Thomas.

And then atDNA showed that Patrick had a match to the final person, Don. But not the Coffey male line. Somewhere they had a shared ancestor.

And the really interesting thing is that DON is related to our Edward Group!

Make a mental note that these arrows point to Tipperary and Kilkenny, and that the next county to the east of Kilkenny is Wexford. I'm going to turn my attention to Wexford now:

IRELAND TOUR: "COFFEY/KEOGH" GROUP



IRELAND TOUR: "COFFEY/KEOGH" GROUP

All right. You already know we have a LOT of tested people in our Edward Group. I've shown a single line to represent the masses.

And we have our Peter Coffee descendant group, with three tested men. And the DNA says Edward and Peter were absolutely related.

And we have Don, a descendant of the Patrick Coffey from the previous page, who DNA says is related to Edward and Peter.

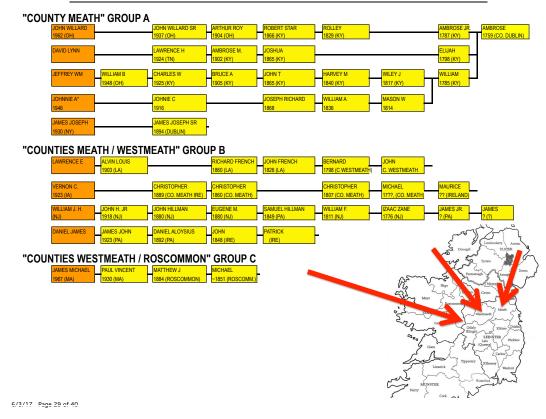
And finally, we have 11 tested people, with names like Keogh, Kehoe, Kaho and Keay. I'm calling them the "Keogh Group", and they are absolutely related to all the Coffeys.

The Keogh are an ancient Irish clan, and their homeland is Wexford.

On examinagion, I conclude that ALL of these people, including the Coffee/Coffey lines, were originally "Keogh".

For the moment, take my word for it. I can give you a complicated paper I wrote on the topic, and you're invited to poke holes in my logic. I hope someone can prove me wrong, and that we actually belong to an ancient COFFEY line!

IRELAND TOUR: "MEATH/WESTMEATH" GROUP



IRELAND TOUR: "MEATH/WESTMEATH" GROUP

Enough for southern Ireland. Let's move our attention up to the middle.

Here's another group, with 3 subgroups, that have origins in the counties Meath and Westmeath area. And this is believed to be an ancient Coffey homeland.

Per DNA, all are related, but the relationships are closer within the subgroups.

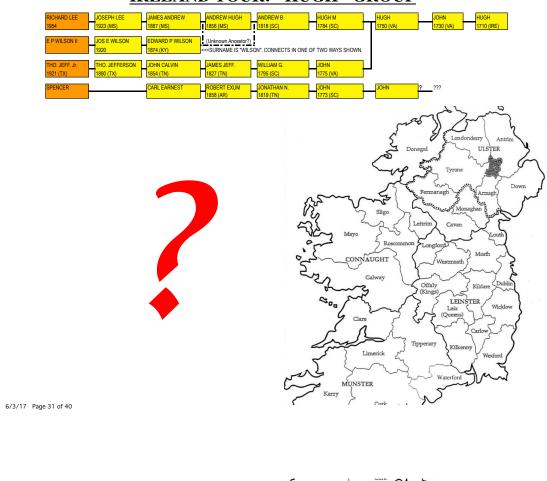
Notice that four of the people tested in the first group lead back to an "Ambrose Coffey". This Ambrose has long been known to Coffey genealogists, and he is famous for being an Irish immigrant who joined Daniel Boone in fighting the Indians.

Now we know, per DNA, that this Ambrose is NOT related to Edward. (There is an "Ambrose" in the Edward line, but that's a different person!)

The last person on this page, James Michael, knew his great grandfather was an immigrant from County Roscommon who settled in Massachusetts. Roscommon is believed to be an ancient Coffey homeland, and I was surprised when the DNA said "Meath".

But then I looked at the known exact location in Roscommon. It is right on the border with Westmeath, and the nearest significant village was in Westmeath.

IRELAND TOUR: "HUGH" GROUP



IRELAND TOUR: "HUGH" GROUP

One of the long-known Coffey groups in America are descendants of immigrant Hugh Coffey. And as far as I know, nobody has determined where in Ireland Hugh came from.

Regarding yDNA, we have four tested people.

One of them is named "Wilson", but y-DNA said he was genetically a "Coffey", and atDNA pretty well determined the approximate genealogical location where his line picked up the DNA.

Terri now has a major atDNA project under way, involving quite a few participants. She will talk about that shortly.

IRELAND TOUR: "SCOTTISH COFFEY" GROUP



Buncrana Coleraine

AYRSHIRE

Dungloe Letterkenny O Londonderry

Derry Ballymena Larne

Donegal

Donegal

Donegal

Donegal

Donegal

Cookstown Carricktergus o

Belfast O

Belfast O

Ramsey

Isle of Man

Douglas Barrow-in-Furness o

Rildare Gray Cones

Athlone

Athlone

Athlone

Athlone

Athlone

Althone

Athlone

Althlone

A

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IRELAND TOUR: "SCOTTISH COFFEY" GROUP

This isn't much of a "group", since I only have one tested person.

But it's interesting because the line descends from one George Raymond Coffey, an immigrant who was born in 1801 and who settled in Pennsylvania, and who told the census takers he was FROM SCOTLAND!

I did a long search to find a living male descendant to test, but finally turned up Brian, who lives in Texas.

Again, I have a paper you can read. But I finally concluded that yes, George came from Ayrshire in Scotland. But he was born in Ireland, probably in County Down.

The Coffeys in County Down are Presbyterians, and they are generally fishermen. They travel freely around the seas between Ireland and Scotland, and it is quite plausible that George's family hung out in Ayrshire, before finally heading for Pennsylvania.

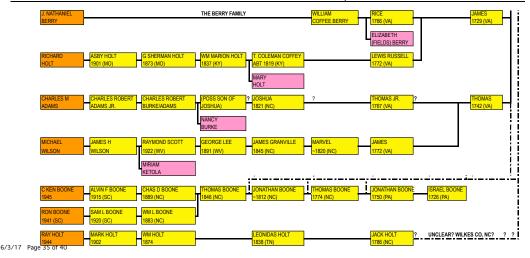
What I really want now, is some DNA samples from Coffeys living in County Down, and I have been able to locate a couple. But they are very shy about sharing their DNA. As soon as I ask for a DNA swab, they stop talking to me!

If anyone here is thinking of visiting Northern Ireland, I can give you a DNA test kit and can suggest a fish shop in Belfast that you should visit. And offer to buy a fish from the proprietor, if only he will throw in a cheek swab!

EDWARD GRP AMERICA: COFFEY NAME, NON-COFFEY DNA



EDWARD GRP AMERICA: COFFEY DNA, NON-COFFEY NAME



EDWARD AMERICA: EVOLUTION OF DIVERSITY

I've shown you there's a lot of "Coffey Diversity" coming from Ireland. I want to return to "Edward", to make a point about HOW much of this might have come about:

Edward arrived in America only a little over 300 years ago. But from that one-person starting point, we now find America has several Coffey lines that have the Coffey name, but non-Coffey DNA. And several lines that have Edward DNA, but not the Coffey name.

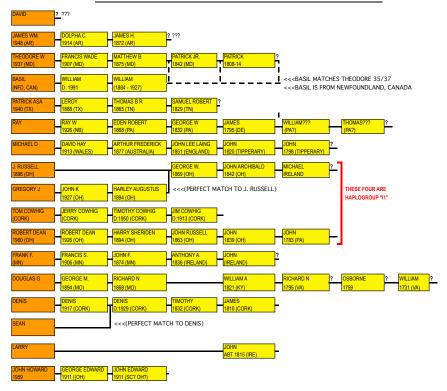
We know generally how this came about. But if we were starting a Coffey DNA project here WITHOUT knowing the history, we would quickly conclude we already had as much unexplained diversity as we now see in Ireland!

I'm only going to explain the top line on this page, for an interesting reason:

Edward had a daughter, Annister, who had a son named James, born out of wedlock. The Coffey genealogists have long known about this, because poor Annister got hauled into a Virginia court for her indiscretion. And via DNA testing, we have determined the father of James was almost certainly one "James Samuel". This is kind of like the famous Thomas Jefferson and his slave Sally Hemming case, but actually EARLIER.

The interesting thing is that this is the ancestral line of Leonard Coffey. One of the tested people is his brother. Leonard was the founder of the Coffey Cousins' Clearinghouse, and our convention today is an outgrowth of his work.

"UNKNOWN" COFFEY "GROUPS"



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"UNKNOWN" COFFEY "GROUPS"

In conclusion, I want to note we have quite a number of individuals, or pairs, that we cannot connect to anyone else via DNA. These of course have the potential to grow into new "Coffey lines" over time.

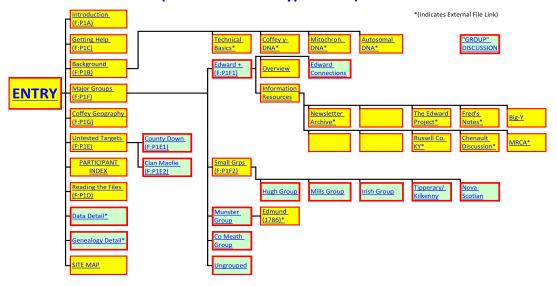
Direct your attention to the second person from the bottom. Here the tested person is our President, Larry Coffey, who is sitting in this audience.

Larry has a very solid connection to an immigrant, John Coffey, who arrived from Ireland about 1850-53 and settled in Mercer County, New Jersey.

Now we're waiting for someone to come forward for DNA testing, who has a match to Larry, and who can track the family ancestry back into Ireland!

WWW.COFFEY.WS/FAMILYTREE/DNA

WEB SITE OVERVIEW (Most Boxes are hyperlinks!)



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DNA WEB SITE OVERVIEW

I've run out of anything to talk about, and I'll turn the floor over to Tim and Terri.

I do want to point out that we have a DNA web page, that contains a tremendous amount of information. You may want to visit and investigate.

ON this chart, we've been talking about some of the "Groups", which are shown here in the green shaded boxes. We haven't talked about all of them, but the others have very limited membership.