

From: "John Minter" <minter55@earthlink.net>
Subject: **Re: New Deepest Relative**
Date: May 2, 2006 02:46:47 GMT+00:00
To: "Samuel Minter" <abulsme@abulsme.com>

I am impressed with your use of stats, but I'm not that deep into math and guess that you have done your homework correctly. I will revisit the material that I received from Herb Gilliam that is on my offline computer (virus free) and see what I have there that prompted me to delete it from my data base as currently unsupported. Will send you the details if appropriate.
John

----- Original Message -----

From: [Samuel Minter](#)
To: [John Minter](#) ; hjglm@msn.com
Sent: Monday, May 01, 2006 5:19 PM
Subject: Re: New Deepest Relative

Just following up more on the two Janes... I did a little math. I am rusty on these kind of stats, so they probably need to be checked to make sure I didn't make a logical error... I'm going to post this to my blog and see if any of my friends that have done more engineering and stats lately than I have can poke holes in it..

But here is what I came up with...

- * South Carolina in 1773 population was about 250,000 (based on 1790 census so this is actually bigger than reality)
- * Live births were approximately 50 per 1000 population in the late 1700's (based on stat in "Encyclopedia of the New American Nation")
- * This gives about 12500 births in South Carolina in 1773.
- * About 6250 of those would have been girls.
- * About 3% of those would be named Jane (based on Given Names Frequency Project for 1801-1810 time period)
- * That gives us about 181 Janes born in South Carolina in 1773.
- * We need to multiply by the percentage of the whole South Carolina population that were Gillhams.
- * I have no idea what that number is. Maybe you have better insight? For now I will call it "G". (As a fraction, not a percentage, to avoid the factor of 100 everywhere.)
- * So the number of Jane Gillhams born in South Carolina in 1773 would be about $181 * G$.
- * Now, we know pretty confidently that John Minter's Jane Gillham was born April 21st.
- * We could figure out the odds of a second Jane Minter being born on October 21st specifically.
- * It would be $1 - (364/365)^{(181 * G)}$. This would be our lower bound on the odds. (Using math principles found on Wikipedia Birthday Paradox page)
- * But... the hypothesis is that sometime in the last 233 years someone just transposed October for April in the Gillham family records.
- * In that case we don't care specifically about October 21st, but instead just the odds of a second person being born on ANY of the 21st other than April 21st.
- * That is because our hypothetical miscopier could have switched it with any of the eleven other months, not just October.
- * In that case our odds turn out to be $1 - (354/365)^{(181 * G)}$. This should be our upper bound on the odds.
- * This gives the chances of another Jane Gillham being born on the 21st of any other month besides April, given that our Jane Gillham was born on April 21st.

So lets run this with some possible values of G:

This shows the chances (X) of a second Jane Gillham being born on the 21st of another month, and therefore probably being an actual second Jane Gillham rather than the same person with the date miscopied.

Everybody in SC is a Gillham (G=1): 99.6%
1 out of 2 is a Gillham (G=0.5): 93.7%
1 out of 5 is a Gillham (G=0.2): 67.0%
1 out of 10 is a Gillham (G=0.1): 42.5%
1 out of 20 is a Gillham (G=0.05): 24.2%
1 out of 50 is a Gillham (G=0.02): 10.5%
1 out of 100 is a Gillham (G=0.01): 5.4%
1 out of 200 is a Gillham (G=0.005): 2.7%
1 out of 500 is a Gillham (G=0.002): 1.1%
1 out of 1000 is a Gillham (G=0.001): 0.6%

Reversing the calculation... and solving for G...

$$G = \log(1-X) / (181 * \log[354/365])$$

Plugging in a few numbers there...

As long as there are fewer Gillhams than 1 in 108 you have over a 95% chance that these two Jane Gillhams are the same Jane Gillham and not separate people after all.

If there are fewer Gillhams than one in 552 then you have over a 99% chance that these are the same Jane Gillham...

(And even if there were so many Gillmans that 1 in every 8 people in SC was a Gillham, you'd still have better than even odds that this was the same Jane Gillham.)

One in 108 would mean that there were about 2300 people with the surname Gillham in South Carolina around the time of the 1790 census

One in 552 would mean that there were about 450 people with the surname Gillham in South Carolina around that time.

So, this all depends on the number of Gillhams in South Carolina in 1790... but if there were any less than 2300 or so, I'd feel really confident betting that this is only one Jane Gillham, and someone just miscopied her birthday at some point (probably on the Gillham side... although all the math is the same if it was the reverse.)

Thoughts?

Links to the sites I got stats and math from:

- * <http://www.census.gov/population/documentation/twps0056/tab55.pdf>
- * <http://www.americanforeignrelations.com/Pa-Po/People-of-America.html>
- * <http://www.galbithink.org/names/us200.htm> Early American Name Popularity
- * http://en.wikipedia.org/wiki/Birthday_paradox Birthday Paradox Math

John Minter wrote:

Samuel,

Yes I have looked at Jane's line before and have been in communication with a Mr. Herb Gilliam, who has done extensive work with the Campbell connection. He has some information but is not certain that he can trace this Jane as being the correct one as I recall. I had included some of Jane's ancestors previously, but have deleted them as not being verified. I am quite certain of the dates that I have posted, but will keep this info that you have sent and will use it if it can be verified. I generally do not try to trace and post ancestral lines much beyond immigration because there is so much uncertainty in the ancient ancestral lines and I do not like to post unless I am fairly certain. If you look at my posting of Jane's notes again, you will see that I have included info from the Minter Bible and it seems to verify her death date and calculated birth date. This does not match with the Gilliam-Thomas family line.

Thanks for the info and keep searching. I am currently working with a lady who is doing original research on the early Minter's in Virginia and we hope that she will be able to shed some new light and verification on some of the doubtful links.

John Minter