LDS Perspectives Podcast

Episode 6: DNA Detective Work with Ugo Perego

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Russell Stevenson: This is Russell Stevenson, and today we have Dr. Ugo A. Perego, a population geneticist, who will be discussing with us the meaning and significance of genetic studies for Latter-day Saint history. Thanks so much for joining us, Ugo.

Ugo Perego: It's good to be here.

Russell Stevenson: Let's talk generally about the significance of genetics research for the study of Latter-day Saint history. You know, from a bird's eye view we typically haven't asked these kinds of questions. How has your field of study generally changed the way we look at Latter-day Saint history?

Ugo Perego: I don't think we are really changing anything, but we are bringing in something. I think that over time technology, and not just with genetics, but you would agree with any kind of field, you know, computer and digital imaging, and other ways. We've been able to bring in some tools that will allow us to take a different look or bringing in some new data that complements what we might have had before just using traditional methods. Like the archives and so on. And then what we can do is that we can bring this data and look at it within the context of what we already knew and see if we are shedding more light, or maybe we are confirming that we really cannot answer a particular question. Maybe before it was a suspicion, now we are confirming it using this genetic data.

Russell Stevenson: One of your major projects is studying the family of Joseph Smith, specifically within the context of polygamy. So tell us a little bit more about your work there.

Ugo Perego: Well, I started to actually look at the opposite direction, which was a number of years ago when I started working for Sorenson Molecular Genealogy Foundation in Salt Lake City, and I was a graduate student. One of the questions that was asked was, "Isn't it interesting we are

building this project to help people do the family history, their genealogy, and fulfill to some degree the Latter-day Saint's commandment to trace your ancestry back as far as you can. And yet, the founder of Mormonism, Joseph Smith, up to that point, that was something that was brought to me, there was uncertainty about where he came from in England. Genealogically the Smith family, and the genealogists that were interested in the Smith family, were unable to accurately trace back Joseph Smith ancestry all the way to the first Smith in America.

Russell Stevenson: For those people who are not well versed in genetic studies, they're not aware of how you actually carry out this sort of research, break down for us the logistics of how you trace somebody's ancestry genetically. What is it that you do step by step?

Ugo Perego: Okay, so everyone carries DNA. We all have DNA. We have it in the cells of our body. And the DNA is not created from nothing. It's inherited from those that came before us. So the simple math when it comes to DNA is that we all get 50% of our DNA from each of our parents. Fifty from Mom, 50% from Dad. Then on average we have about 25% of that DNA from each of our grandparents, and then we halve every generation. So, as I go back, I only get half on average from the individual on that particular generation. On the other hand, I'm also only giving half of my genetics and my DNA to my posterity, so to my children will only get each one of them 50% of my DNA. And so that DNA becomes an unbroken chain and it connects generations of past with generations in the future for a number of generations. And then because there are so many ancestors to that, that DNA tends to dilute and disappear in many cases. We won't talk about the mathematical models on DNA, but it's sufficient to know that within a reasonable amount of generations you can demonstrate how people are related with each other based on their DNA.

Within the DNA family, there are different ... Not all DNA is created alike. Meaning there are certain parts of the DNA that follow specific inheritance pattern, specific lines of our family tree. More specifically, every male carries a chromosome called the Y chromosome, which is the one that determines the male gender, which is inherited exclusively from the father and goes back along the paternal line as many generations as you want. So that becomes a very powerful tool to trace common paternal ancestry. There is another part of DNA called mitochondrial DNA, which follows the maternal line. Then there is the biggest part of our DNA, which is autosomal DNA, which is over three billion pieces of DNA,

which we share with all of our ancestors. So I got 50% of that from mom, 50% from dad, and then 25 from grandparents, and about 12% from each our great grandparents, and then eventually you only have some DNA of some ancestor but not all the ancestors because there is a lot of chance in that process. But we won't get into that.

Russell Stevenson: Let's talk specifically then about the question of Joseph Smith siring children through polygamist unions. Historically, Latter-day Saints have not really been aware of anybody, although there have been various candidates who have been presented as possibilities.

Ugo Perego: That's correct.

Russell Stevenson: But there has been no conventional accepted wisdom on this. And more, you can even argue and even Joseph F. Smith is collecting affidavits attesting to Joseph Smith's polygamy. Even though you have women who were saying, "Yes, I did consummate my marriage with Joseph Smith. I had a sexual relationship with him." They never claimed to have children with him. It's been a bit of a mystery because how could Joseph Smith have consummated all these marriages without having any children through these marriages?

Ugo Perego: Yes, and I'm not an expert on Mormon polygamy, so I only superficially know about all the affidavits and all the documented data that is available on that subject. But what I can tell you is for one thing you do not need to have a child every time you have sex. The fact that a child doesn't exist does not answer the question, "Did Joseph Smith have sexual relation with his multiple wives?" You kind of have to look at other sources for that information. I'm not making that claim, "Oh, there is no genetically biological children. Therefore, Joseph Smith didn't have sex." Because that is a connection that cannot be made.

Russell Stevenson: Yeah, that's a non-sequitur, right? One of them does not lead to the other, certainly.

Ugo Perego: But if you do have a child then you know there was sexual relations.

Russell Stevenson: Right.

Ugo Perego: The other way around works fine. The question that we were trying to answer wasn't whether Joseph Smith consummated his marriages or of

some other kind of nature because I don't think that genetics can fully answer the question. But there is a rightful question that people want to answer: "Am I a descendant of Joseph Smith?" And that's more of a personal identity question. Sometimes we get so caught up with history, with —

Russell Stevenson: With the sensation, right?

Ugo Perego: The sensation, yeah.

Russell Stevenson: With the sex, right? We all want to talk about sex.

Ugo Perego: Exactly. We want to maybe ... It's kind of a crude way to say it, but we all kind of want to peek into Joseph Smith's bedroom. You know? It's like … let the poor guy alone. You wouldn't like to be put that to you, right? But, again, genetics is not really going to be able to fully answer that question, but there is a human aspect we tend to forget, which is the obvious posterity and knowing whether he was your ancestor or somebody else was, okay? So, with that, we can answer that, and we can answer now more than we could in the past. Technology has advanced, and we have some new tools that we can use and a better way to understand what the results mean and what they are telling you.

Russell Stevenson: Now how many people have approached you about whether they were the descendants of Joseph Smith?

Ugo Perego: Okay, that's a good question. So, you said the right word. You know, for one thing a child because there is about a dozen ... If you look at all the different sources and if you talk to historians that are dedicated to church history though Joseph Smith's life, there is no consensus about who could have been, who is the best candidate to be considered, Joseph Smith's son or daughter through a polygamist relationship. What we know is that Joseph Smith had nine biological children with Emma, plus two that he adopted. And out of all these children, only four of the biological ones, four sons, grew up to adulthood. And all the living descendants of Joseph Smith today only come from two of these four sons, which are Joseph Smith III and Alexander Hale, which were the president and apostles of the Reorganized Church of Jesus Christ of Latter-day Saints. But what we know is that Joseph Smith was a fertile man, he could procreate. He had nine biological children that were recorded, right?

So that eliminates the suspicion that maybe he couldn't have children because he could, right? That's the evidence. Talking about with different historians looking at different sources, and you have about a dozen of possible adult children. Some maybe are better documented or referenced in the literature than others. Of course, not that I want to take away the spiritual aspect of some individuals, but I even had individual coming to me and say, "I had a dream that I was a descendant of Joseph Smith." And I was like, "That's nice." You know?

Russell Stevenson: Thanks for sharing.

Ugo Perego: Thanks for sharing. You know.

Russell Stevenson: Powerful spiritual experience for you.

Ugo Perego: And it's great, but I don't want to ... Like when I invest time to look into something that since I don't have a personal interest, and I'm dedicating time and resources to answer this question. I just want to make the story, the history, not the story, the history right. If we have books that say Joseph Smith had this son with this woman based on this circumstantial evidence, and I can find a way to show if that was confirmed or not, then future books will have to consider the genetic evidence and make history right. That's what it draws to, so I am concerned about that aspect as well.

So about a dozen, if you make a list, you have about a dozen of these potential, possible children of Joseph Smith. And if people .... Well, what happened is each one of these children would have needed to grow to adulthood and have a living posterity. Because the way that you do it is, is that you test the descendants to reconstruct the DNA of the alleged child and then compare that to the DNA of Joseph Smith to reconstruct it from the descendants that he had with Emma. Okay? So we have the confirmed descendants through Alexander Hale and Joseph Smith III, and then you do the same process with whatever candidate comes as a potential child of Joseph Smith, and you look for his descendants or her descendants to do that. So if Joseph Smith had a child with another woman, and that child died in infancy, and we have absolutely no idea where it's buried, like an infant—

Russell Stevenson: You don't have any hair samples, you don't have ... There's nothing you can do.

Ugo Perego: One of the things we need to keep in mind is that maybe that list, although it might not be exhaustive and complete, we might not ever be able to tackle each one of those documented or recorded additional children. Sorry if it took so long but the question was how many of these people can afford them? So far I had that I was able to test and bring forth an answer through DNA is eight.

Russell Stevenson: Eight.

Ugo Perego: Yes.

Russell Stevenson: Okay.

Ugo Perego: Eight cases. And some of these cases are better historically documented than others. I consider them a stronger case and a weaker case.

Russell Stevenson: What kinds of barriers are presented in studying the genetic makeup of male descendants as opposed to female descendants? And out of all the candidates that you have studied, are there any that have been demonstrated that they are in fact the descendants of Joseph Smith?

Ugo Perego: Good question. So, with regard to the first question, there is a definitive difference with regard to a possible child that is a girl versus a child that is a boy. Nowadays, if you have a paternity test, where a man is trying to prove if his children are his, you do a paternity test that it doesn't matter if he's a boy or a girl you can do it. All you need is to test the DNA of the living father and living mother and the living child that you are trying to demonstrate the biological paternity. By having these three samples, there is a fairly straightforward test that you can do and answer the question. We don't have that with Joseph Smith because Joseph Smith is dead.

With a boy, you can look at the Y chromosome. So knowing that Joseph Smith was a male and he had two boys, Alexander Hale and Joseph Smith III, who have on their own had, they had sons, and sons, and sons, and sons, grandsons, great grandsons and all down Alexander and Joseph Smith III. We can reconstruct a very accurate Joseph Smith Y chromosome profile, and it is just as accurate as if I would have Joseph Smith give me a saliva sample and had run the same test. It would be the same thing. It would not be any different.

Russell Stevenson: That's an impressive degree of confidence that we can place in that test.

Ugo Perego: That is, that is, it's very straightforward. It follows an unbroken line, it's not mixed with any other type of DNA, it's not shared, there is no contribution by others, so it's a straight arrow type of approach. With girls, you have a bigger problem. Because the girls do not inherit the father or Y chromosome, otherwise they would not be girls. Okay, and they don't inherit the father mitochondrial DNA because a man is incapable of passing the mitochondrial DNA of his genes, of his cells, to any of his children. All the mitochondrial DNA, it comes from the mother.

So what do you do? Whether it is autosomal DNA that could be used to do that. But autosomal DNA enters into the realm of probabilities. And so in order to increase our level of confidence, which you are never going to reach 100% but we can get pretty close to it. Then you need to get a lot more people tested, and because you lose about 50% of it at each generation, then you're also kind of running against time because we don't have any children of Joseph Smith alive, we don't have any grandchildren that are alive. So we already kind of going down. So these will be people who have 50 or 25% of Joseph Smith DNA.

So now we are going down to like people that would have maybe, that are still alive, that would have 12 or 6 or 3% of his DNA. Then I need to find another person that I think is also a descendant of Joseph Smith, through a girl, and she would have given the same autosomal DNA of her father, which is Joseph Smith. But that same process of halving each generation would occur, and so now I have maybe a potential descendant of a daughter of Joseph Smith, of a potential other Joseph Smith, that would carry 3% of the DNA, and then I have a descendant of Joseph Smith that carry 3% of his DNA, and then I am overlapping them, and so I am expecting that out of 100%, they would have inherited the same 3%. Do you see the difficulty with that?

Russell Stevenson: Yes, you're making some rather large assumptions, or maybe anticipations or hopes.

Ugo Perego: Exactly, so it's like, "Oh they don't share any, these two people don't share any DNA. Oh, okay, then they are not related." It's not true. I can be related to a distant cousin, just we didn't have enough that by chance we didn't inherit the same components of DNA on the same chromosomes to show generations. So what you need to do, you need to test a lot of people on one hand, and you need to find the oldest alive individual, so the closest number generation to the person that you are trying to reconstruct.

With the Y chromosome, you do not have that issue. And the same on the other side, and then compare that. So, extremely different, and this technology for the Y chromosome has been around now for maybe like 20 years, but this one about the autosomal DNA, that allowed us to look at girls has been around only for at this level and the understanding on how to run the statistics has been around for less than five years.

Russell Stevenson: So, this is cutting edge research.

Ugo Perego: Yep. Absolutely.

Russell Stevenson: I mean these are brand new questions. So, let's talk—

Ugo Perego: You want to answer the other question?

Russell Stevenson: Oh, yes, please.

Ugo Perego: So, looking at the seven cases.

Russell Stevenson: Okay.

Ugo Perego: Of boys and the one girl that we looked at. None of them were shown to be biologically related to Joseph Smith.

Russell Stevenson: One of his wives was Sylvia Sessions Lyons, and she had a daughter named Josephine Lyons, and the question has been, was Josephine the daughter of Sylvia and Windsor. Or was she the daughter of Sylvia and Joseph? For Latter-day Saints this is significant because it is one thing to have a child with a polygamist wife who is not married to another husband. It's another to have a child with a woman who is still married because that feels like adultery right?

Ugo Perego: I think the question more than adultery I think that, and again this is me speaking, I'm not speaking as a Mormon historian.

Russell Stevenson: Mm-hmm (affirmative).

Ugo Perego: But I think the concern or where people are having a hard time is how could you have, in Victorian America, a woman that would at the same time have sexual relation switch from one man to the other, been married to two men, and have the same type of relationship with both men? And that is very hard for us to accept today as Latter-day Saints or as

individuals, and I think that is hard to consider the thought that even back then it was okay.

Russell Stevenson: And, you know, we have documentation attesting to sexual relationships with a number of his wives, but none of them have been among his polyandrous wives. So, Josephine's genetics might illuminate the fact that he did, in fact, have a sexual relationship with a polyandrous wife.

Ugo Perego: And I know a little more about that family from an historical point of view. I actually was approached to work on this case back in 2000. So, that marks about 16 years that I've been involved with, no studying, this particular situation and the documents that came with it. But working with the family, with the descendants of Josephine that want to know this answer once and for all based on the affidavit that Josephine signed based on their mother's last moments of earthly life, a testimonial to her that she was Joseph's. One of the things that we have to consider in this situation is that we're looking at a relationship that was between Joseph Smith and Sylvia Sessions with Windsor in the picture that took place around 1844. With the testimonial left by Sylvia Session to her mother on her deathbed something toward the end of the century. I think we're looking about 1885 or 1895. I cannot remember the exact year right now. And then Josephine recording the affidavit at the beginning of the 20th century.

Russell Stevenson: We have some gaps in the chronology.

Ugo Perego: There are some, yes. And when you have gaps like that, and they are so long, you always wonder if the information is being recorded and transmitted correctly. Again, I'm not a historian here, so I'm not the one that needs to judge that, but it's important to point out that Sylvia Session didn't walk out of a bedroom and say, "Hey, I just had ... This just happened to me." You know.

Russell Stevenson: Right.

Ugo Perego: Okay, this is, I think, perhaps a little bit creating a more acceptable context, you know, as we're dealing with this. And to me, it's important because I don't want to always take for granted that somebody might have done something. Jump to conclusion, that's what I'm saying, you know.

Let me tell you how I approach the thing, you know. I didn't only compare Josephine's descendant's DNA with Joseph Smith descendant's DNA, I

also compared Josephine's descendant's with other descendant's of her father Windsor. So, other Lyons that are now involved with Joseph Smith and Sylvia Session relationship.

Russell Stevenson: Mm-hmm (affirmative).

Ugo Perego: I used them as controls, and so Josephine's descendant's DNA is shared with the other Lyons. So showing that not only that Joseph Smith, you know, most likely, you know, there is no evidence that is no DNA that she shared with him, but she indeed shares DNA with the Lyons family adds to strength of the conclusion.

Russell Stevenson: And how many samples did you draw on?

Ugo Perego: This study was based on 55 individuals: about half of them from Joseph Smith and the other half from Josephine.

Russell Stevenson: This is a fascinating conclusion, and it's certainly going to be of tremendous interest.

Ugo Perego: Yeah, and then historians have to kind of take now this affidavit and say, "Well, what does it mean?"

Russell Stevenson: Right? Is she referring to some kind—

Ugo Perego: Spiritual.

Russell Stevenson: Spiritual relationship, which has been the ... You know that has been one theory that was postulated by Daines as well as some others.

Ugo Perego: Yeah.

Russell Stevenson: Well, fascinating, and we've talked about one case in which genetics can solve a long standing mystery within the study of Mormon history. Let's talk about some of your work or some of your research, however, deep or limited it was on Book of Mormon genetics.

Ugo Perego: Yes.

Russell Stevenson: For the past generation or so, ever since you see the rise of genetics research as we now understand it, a number of research scientists have critiqued Latter-day Saints for claiming that the Lamanites in the Book of

Mormon were, in fact, the descendants of ancient Near Eastern peoples. They said, "Listen, the genetics just don't show any kind of similarities they would say that we should expect there to be similarities between Native Americans of various ethnicities and ancient Palestinians, and it's not there." Therefore, there is no way they would argue that there could be an ancient Near Eastern community that would come across the ocean and then develop this large civilization in Mesoamerica or what have you. And of course the conclusion for them is the Book of Mormon is a 19th century fiction. Now based on your work, does their theory and interpretation hold any credence?

Ugo Perego: Yeah, you know, I can see why some people would jump at that conclusion, it definitely makes sense to look at the data that way. I am actually taking it a bit more cautious about that. I've explained that to you. We've been talking about Joseph Smith, and the difficulties of reconstructing an individual that lived 150 years ago, DNA, and based on his descendants today, and how some components of that DNA are disappearing. In a few generations, we won't be able to reconstruct Joseph Smith's DNA even if he still has thousands of living descendants alive. And it's lost due to chunks. Okay.

I'll give you a simple example. You go back ten generations yourself in time. If you want to know how many ancestors you had ten generations ago, all you do is take the number two, which is the number of people that you have each generation, and you elevate that to the power of that generation. If you want to know how many ancestors you had ten generations ago, you do two to the 10th. That's two times two, 10 times. You have 1,024 ancestors, right? Everybody would have that many ancestors.

Yet when I look at my DNA, statistically only about 10, 12% of them have contributed DNA that I have in myself. I have about the DNA of 100 of my 1,000 ancestors. That means that from a genetic point of view, the other 900 could as well not existed because they didn't contribute anything to me. And yet, even if one of them did not exist, I would not be here today because it took this 1,000 people to have children when they did to fill the next generation, and the next generation, and the next generation down to me. So only one of these 1,000 people was late to come back home that night or his wife had a headache and didn't want to have a relationship that night, and you wouldn't be here. But yet, so you're

genealogically related to these 1,000 people. They're all your ancestors, but genetically you only represent about 10% of them.

So looking at this, looking at Joseph Smith, I reconstructed the DNA of an individual that lived 150 years ago. It is an example of a genealogical study using DNA. We're looking at the DNA of an individual. What people are, in my mind, oversimplifying with regards to the Book of Mormon is that they take the text of the Book of Mormon, which talks about this great culture, this great civilization, and the wars that took place. So the dichotomy between the Lamanites and Nephites, and the good and the evil, and the obedient and the rebellious.

And to follow the whole story throughout the book, and it's impressive. And there are big numbers and big stories involved with that. And we think that all of them come from the one family that came to the Americas. Which is a possible interpretation that I'm not saying is wrong, but I'm saying there are other explanations. And now people can say, "Well, you're making a stretch here. You can't try to cop out like that." But the reality is if you talk with anybody that is outside of Mormonism, and you present them the case study of a family of maybe 30 or 50 individuals coming here in a continent that had millions of people, and we—

Russell Stevenson: That's an important aspect, too. Sometimes Latter-day Saints have ignored the fact that there were millions of people here.

Ugo Perego: Yeah, we cannot deny that. No matter what anybody has said in the past and how people have read the Book of Mormon. Even general authorities the way they might have interpreted that in the past, you cannot deny the continent as being peopled by indigenous people all the way from North America to South America for thousands of years before the arrival of Lehi's party, okay? That's how you need to humble yourself and change your paradigms and read the Book of Mormon in that context, and you'll be surprised how many things are going to jump out at you from the Book of Mormon when you start thinking of the question, "Were other people here before they came?"

The DNA argument — I should find some Israelite DNA here because they are the principle ancestors and so on, and so forth — would work only with an empty continent approach. But we're not talking about that. We're not moving the goal posts. It's as simple as what science says: there were a lot of people here. And as more family came in, you ask any

scientist that deals with population genetics, "Can I find the DNA of this family 2,600 years ago they came here." And they will tell you, "How are you going to do that?"

Russell Stevenson: Good luck.

Ugo Perego: You know, good luck. And I have approached this question because I wanted to make sure in my bias as a Latter-day Saints scientist, in my bias, am I missing the obvious? I talked to some of my colleagues. They are much more experienced and have done research that know what they're talking about. Would it be possible to test this hypothesis? And they are like, how you going to do that? You know because the question is not: Can we find Israelites DNA among the Native Americans today? The question is, Can I reconstruct Lehi's DNA based on descendants that are alive today? That is the question. Can we reconstruct the genetics of that family?

We're reconstructing one family, not one people, not one population. We do not have half of the Israelites moving here and competing as a massive number of people trying to conquer like the Romans did, for example, or the Etruscans or other populations that Attila the Hun or Genghis Khan, where there was like this major migration conquering with a lot of people where they left some genetic imprint in the modern population. We're talking about a family and then what we don't know, you know, we have more and more unknowns than knowns. We don't know how soon after they arrived they start mingling with the other people that were here. Did they keep to themselves for a number of generations to grow enough to become too rich, like some sort of a crucial number that at that point—

Russell Stevenson: Critical mass, right?

Ugo Perego: The critical mass, right? That they at that point group that was untouched, that did not mix with local population, had all the right DNA that you want and then they could make a dent in the local gene pool.

Russell Stevenson: In the DNA record.

Ugo Perego: Or, they immediately start mixing with the same people. And when you look at Nephi's record and Jacob's record and it sounds to me that there is some conversion process. As Latter-day Saints, we know the true dispensation … Every time that the true gospel, the fullness of the gospel

is found on the earth, and you have a prophet on the earth … If it was Moses or Noah, or anybody else, one of the commissions to having the gospel was to take it to other people. It's never meant to be only an exclusive to yourself. Even the Israelites being considered themselves a choice people they would accept, and omit, and include other individuals based on conversion. It's not only a blood relationship that of Israel. We do that nowadays as well.

I would assume that Nephi and his family having the gospel they would have included right away anyone that they would meet and agree with their standards. Now anthropologists and other individuals can think, you know, what is this kind of too much or presumptuous thinking that somebody comes in and everybody starts listening to them, you know? But we have in the Book of Mormon the story of the city of Zarahemla with these people, the Mulekites, that put out the king, a Nephite, that comes because of something. So it's a small number of people come and they recognize something, I don't know what. and they say, "Now you're going to be our king." So the Book of Mormon itself gave us an example of this grapple. But that kind of goes beyond the point. What I am saying is I am not surprised that we don't find any Israelite DNA in the modern population because I am not expecting, and other scientists, that are knowing what the Book of Mormon issues, are not expecting that you could find any. Period.

Russell Stevenson: Right. Okay, so that's ... That offers a considerable amount of room within the Latter-day Saint communities that, you know, listen genetics just cannot answer these questions in the way that we would like them to.

Ugo Perego: It does answer ... DNA is very accurate in answering specific questions. it's a very powerful tool. We know a lot about the issue of who we are, and where we come from. The technology is there to do that. The knowledge is there to do that. It's just we need to understand the limitation, and we need to build a hypothesis that is testable, and then being able to understand the limitations of doing the experiment and being able to accept the conclusions of that. And I'm not the only one in the population genetics community outside of Mormonism that agrees that this will be a very, very, very, improbable hypothesis to test.

Russell Stevenson: Excellent. So, we're getting towards the end of the episode. However, I do understand that you have done some interesting case studies in regards to a topic that we would not suppose to be terribly related to genetics, at least

at first glance, but as your work has shown it actually can illuminate some important things. You have investigated certain case studies in the context of the Mountain Meadows Massacre. Tell us more about that.

Ugo Perego: The first case ... I have worked on two cases. Both of them have been published. One in the Mormon History, *Journal of Mormon History*, the first case, and the second one in a forensic journal. By the way, I have a website called JosephSmithDNA.org. All my publications and research work is there. There is also a way to contact me if anybody has a question.

But the first case was very similar to the one of Joseph Smith where somebody approached me with a genealogical question. The genealogical question was that we know the Mountain Meadows Massacre involved the extermination of a number of individuals in southern Utah that were part of a caravan that was crossing Utah on their way to California. One hundred and twenty people were killed in cold blood by local Mormons and natives. The story goes that a number of children were preserved, and they were not killed. The number of children that have been recorded as being preserved were eighteen. These were children age eight and younger, thinking that perhaps they would not remember the events and tell others about it. And then these children were placed with local families to be raised as their own. And when the whole investigation of the mountain massacre came into action, and the US government came and found out what happened, they were able to find and locate seventeen of these children and return them to their relatives in Arkansas, which is where this caravan came from.

So the question, the historical question, and you can read several books on the Mountain Meadows Massacre. They will always say that one of these children was not returned to their family back in Arkansas, and the Mormons hid the child away and kind of make a very bad situation into a worse one, if you want to, you know. Descendants of this girl, which is later been identified and recorded to be Priscilla Klingensmith was the bishop down in the village of Cedar City ...

Russell Stevenson: Yeah, and he was one of the leading organizers of the massacre.

Ugo Perego: He was involved in the massacre. So, the timing, and you know we're missing a birth certificate for this girl. She was two years of age at the time of the massacre, so there are a lot of elements that would say that kind of makes sense that she would the eighteenth child. And so

descendants of this girl have approached me, and because it was a girl, we did a mitochondrial DNA study where we looked at other female relatives of the Klingensmith family. To make a long story short, the DNA showed that Priscilla, this child, was indeed Philip Klingensmith's daughter and not one of the eighteen children from the massacre. And then later on, Rick Turley told me that it was good that we answered this question, but he say that the eighteen children number was a later account, but the earliest account actually said seventeen. For some reason, the eighteen number became the one that has been recorded and written and currently available, and so I think to some degree perhaps answering this question is giving more validity to the first account.

Russell Stevenson: Earlier account, right.

Ugo Perego: Earlier account.

Russell Stevenson: The seventeen children rather than the eighteen children. That's an important story not just for the understanding of Mormon history, but it's also an important story for understanding one's own history, right? This is a major part of this family's lore and your dealing with trauma and—

Ugo Perego: Exactly.

Russell Stevenson: The after effects of an awful atrocity.

Ugo Perego: Which we are still dealing with.

Russell Stevenson: Yes.

Ugo Perego: We can't fully put it behind us.

Russell Stevenson: Right.

Ugo Perego: We have to learn from our mistakes and move on.

Russell Stevenson: Absolutely.

Ugo Perego: Do the best we can.

Russell Stevenson: And your research helps us to some way or another take steps towards that. So thank you so much for joining us. Currently, Dr. Ugo Perego is the director of the Rome LDS Institute of Religion, and he is also a

population geneticist, an independent researcher, and he has offered us considerable answers in addressing various aspects of Latter-day Saint history that we have until now only used traditional methods, archives, and oral history to understand. We thank you for your efforts, and we appreciate your coming today Dr. Perego.

Ugo Perego: Thank you.

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