



Science Magazine Podcast Transcript, 11 October 2013

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Promo

The following is an excerpt from the *Science* Podcast. To hear the whole show, visit www.sciencemag.org and click on “*Science* Podcast.”

Music

Interviewer – Sarah Crespi

Finally today, David Grimm, editor for our daily news site, *ScienceNOW*, is here to talk about some recent stories. I’m Sarah Crespi. So, Dave, first up we have a story on what happens when historians and geneticists team up. This is a story where genetics meets history. Let’s start with the artifacts in play. We have a handkerchief, supposedly bloodied, by the decapitation of the last French king and a mummified severed head from a British king. What do these things have to do with each other?

Interviewee – David Grimm

Well, the French King was Louis XVI. As you said, he was the last French king. He was beheaded in 1793 during the French Revolution. Actually when he was beheaded, according to legend, a witness soaked up his blood with a handkerchief and stored it in a decorated gourd.

Interviewer – Sarah Crespi

That’s a really nice detail.

Interviewee – David Grimm

That’s the handkerchief. The mummified head of King Henry IV is important because this king is a direct ancestor of Louis XVI, so they are related.

Interviewer – Sarah Crespi

These samples were actually tested for DNA evidence. What did they find when they did that?

Interviewee – David Grimm

Well, it's contradictory. When the bloodied handkerchief was first tested a few years ago, the geneticist who tested it said yes, this is indeed the blood of Louis XVI. And he based that on a couple of things. First of all, the DNA that he looked at from this blood on a handkerchief came from a blue-eyed European male, and that matches with Louis XVI because he also supposedly had blue eyes. Now that's not very strong evidence. So he dug a little further and he looked to the mummified head of Henry IV and he looked at the Y chromosome of DNA extracted from this. And he found what he said was a pretty good match between this Y chromosome and the Y chromosome of the blood taken from the handkerchief. And he put all this together and he said there's a pretty good chance that this handkerchief actually contains the blood of Louis XVI.

Interviewer – Sarah Crespi

Not everyone was convinced by this evidence. What were some of their objections?

Interviewee – David Grimm

Well, there was so little of the Y chromosome taken from the head that the matchup between the head and the blood on the handkerchief could have just been due to chance. So what happened in this new study was a French historian teamed up with a geneticist from Belgium and they looked at the relatives of French kings. These would be people that were somehow descended from Louis XVI's line, and they belong to something called the House of Bourbon. And they looked at the Y chromosomes of a few of these individuals and he created what they called the Bourbon Y chromosome profile. And what they found was that this profile didn't match up with the blood on the handkerchief or the head of Henry IV. So they put all this together and they say that not only is the blood on the handkerchief probably not that of King Louis XVI, but even the mummified head may not actually belong to King Henry IV.

Interviewer – Sarah Crespi

What about the original team? Did they take this new evidence and say, oh, you guys are right.

Interviewee – David Grimm

No, of course not. They are saying that looking at family trees related to royalty is fraught with problems, and they say that actually that the Y chromosome profile that these researchers constructed actually traces back to Philippe I, who was apparently known to be gay and therefore should not have had direct descendents. So there's a lot of

history, a lot of genetics going on here. Nobody's really agreeing. What's interesting is that a company has actually created a test where you can test to see whether you're related to French royalty. But this is all based on the original findings of the genetic analysis of Louis XVI's supposed blood and King Henry IV's supposed head.

Interviewer – Sarah Crespi

Next up we have a story on cyborg cockroaches. If you've ever lived in an insect-infested dwelling, the idea of using your iPhone to control them might seem like a dream come true. How can I make this happen, Dave?

Interviewee – David Grimm

Well, Sarah, you can purchase RoboRoach #12 for \$99 from a company called Backyard Brains. And they will send you a live roach in the mail with a tiny little backpack, and all you've got to do is you've got to sand a patch of its shell on its head so that you can superglue some electrodes and insert a ground wire into the roach's thorax. Then you'll have to trim the antennae a little bit and insert silver electrodes into them. You'll have to fit the roach with a little backpack, and when you've done all of this you can whip out your iPhone or other smartphone device and control the roach moving left or right and possibly right out of your building.

Interviewer – Sarah Crespi

Yeah, I was going to say that's just one. Will it lead the others away? So why did they come up with this idea, what is it for?

Interviewee – David Grimm

Well, the company wanted to design a do-it-yourself neuroscience experiment. And these RoboRoaches aren't really designed for the general public – although I'm sure you could order them – they're really designed for students, students as young as 10 years old. And the idea is to teach them ostensibly about how the brain works, how neuroscience works, and potentially even the interface between electronics and living organisms, also known as cyborgs.

Interviewer – Sarah Crespi

So there actually are some objections to this, ethical questions that are raised by robocockroaches. Can you talk about that?

Interviewee – David Grimm

Well, some say that this is an animal welfare issue because you're basically taking a living organism, you're chopping off some of its body parts, you're gluing things into various parts of it, and then you're controlling it. So some people say that this is really a big ethical no-no. Some people have even written letters to the company saying that they are turning kids into psychopaths.

Interviewer – Sarah Crespi

So what do the inventors say, or the purveyors of this say, in response to these kind of comments?

Interviewee – David Grimm

Well, they say we're not turning kids into psychopaths, we're teaching them about neuroscience and this is very educational. If you don't like the product you don't have to buy it. So a very interesting debate going on over RoboRoach #12.

Interviewer – Sarah Crespi

And I see from the comments on the article that it's continuing on the website.

Interviewee – David Grimm

It is, yes, so definitely check out the comments. And you can actually see a picture of RoboRoach, too, on the website.

Interviewer – Sarah Crespi,

Finally, we have another story on our chitinous friends. This is actually a fortuitous finding story. One lucky man found a tick in his nose and happened to be in the lab at the same time. How did this come about?

Interviewee – David Grimm

Well, he had what he says is a distressingly familiar itch in his nose – this isn't the first time he had a tick in his nose – and he did what any good scientist would do. He pulled

out the tweezers, stuck them into his nostril and yanked out a tick. And he's pretty sure where this tick came from. He had been in Uganda studying chimpanzees. And these chimpanzees are known to carry nostril ticks, and they jump from primate to primate. And as a primate himself, he wasn't super shocked that it had gotten into his nose. And, indeed, this wasn't the first time it had happened, but at least this time he was back in the US, back in his lab, and is able to analyze this little disgusting creature. And you can see a picture of this creature on the website.

Interviewer – Sarah Crespi

So what did he find when he sequenced its DNA?

Interviewee – David Grimm

Well, what he found is that its sequence didn't match anything else known. He knew that the tick belonged to the genus *Amblyomma*, but beyond that it didn't match any particular species, which could indicate that he'd found a completely new species of nostril tick.

Interviewer – Sarah Crespi

But it could just be that we have a dearth of nostril tick DNA to look at.

Interviewee – David Grimm

That is also possible and he says a lot more genetic analysis is going to be required, perhaps some more researchers coming back to the US with ticks in their noses.

Interviewer – Sarah Crespi

Okay. So what's the weighty scientific import of this finding? Is it that they are likely to transmit disease?

Interviewee – David Grimm

Well, first of all, these ticks can transmit disease between primates, so that's always something important to study. The other thing is it's an interesting evolutionary story because if you're a tick you don't want to be picked off by your host, and chimps are fastidious groomers. So you've got to hide somewhere that they're not likely to find. Now there are a few orifices we could talk about, but for the purposes of this discussion

let's just say that the nose and particularly the nostril is the orifice they chose. Even though they are fastidious groomers and they do indeed pick their noses, it doesn't seem to be enough to dislodge these ticks, so these ticks have evolved to find a very safe, comfortable, and warm place on the body to hide out.

Interviewer – Sarah Crespi

So what else is on the site this week, Dave?

Interviewee – David Grimm

Well, Sarah, we've been covering the Nobel Prizes this week, and you can see all of our coverage and analysis of these prizes on the site. We've also got an interesting story about the origin of the Jewish people. It turns out it may not be what most Jews, and indeed most historians, believe it to be in terms of where Jews actually came from in the world. For *ScienceInsider*, we've got a lot of coverage on the government shutdown that's happening in the US and the impact it's having on science, everything from Arctic research to cell biology to even space sciences being heavily impacted. And we've got analysis about all that. Finally, for *ScienceLive*, our weekly chat on the hottest topics in science, this week's *ScienceLive* is about the Wild West of open-access publishing. It follows up on our sting operation, which we published last week about what exactly is going on with open-access publishing. Next week's chat is about water resources. How is the world coping with a dwindling water supply? So be sure to check out all of these stories on the site.

Interviewer – Sarah Crespi

Great. Thanks, Dave.

Interviewee – David Grimm

Thanks, Sarah.

Interviewer – Sarah Crespi

David Grimm is the editor for our online daily news site, *ScienceNOW*. I'm Sarah Crespi. You can check out the latest news, our upcoming live chats, and this policy blog, *ScienceInsider*, at news.sciencemag.org.