



Science Magazine Podcast Transcript, 10 May 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 – Kerry Klein

Finally today, I’m Kerry Klein, and I’m here with online news editor David Grimm, who’s going to give a rundown of some of the recent stories from our online daily news site. So Dave, in our first story, we’re looking at nice guys versus bullies.

Interviewee – David Grimm

Right and this is in spiders. It turns out that nice guys do indeed finish last, at least if you’re a spider. There’s a social spider known as *Anelosimus studiosus*. This is a spider that’s native to North and South American forests. And it turns out this spider has a bit of a personality. Some of the spiders can be pretty docile, and some can be pretty aggressive.

Interviewer – Kerry Klein

So what were scientists interested in? Why do we want to know the personalities of spiders?

Interviewee – David Grimm

Well, what scientists wanted to know is is one personality better from an evolutionary standpoint? In other words, are aggressive spiders more likely to survive in the wild than docile spiders or vice versa? And what the researchers did in this study was they basically separated this population into aggressive and docile spiders, and they returned them to the wild. It was actually just one researcher here, and he actually monitored the spider nests for six years, and he wanted to see how the aggressive spiders did versus the docile spiders.

Interviewer – Kerry Klein

Well backing up a second, how do we even determine the temperaments of spiders in the first place?

Interviewee – David Grimm

That’s a good point. When the researchers actually had the spiders in the lab, what they did was they put two spiders together, and what will happen is if both spiders are docile they’ll just sort of hang out together overnight. If they’re both aggressive they start fighting each other, and then they move to opposite ends of their enclosure, and if you have an aggressive one and a docile one, the aggressive one sort of fights off the docile one. So it turns out that these personalities actually made a big difference. When they

returned these spiders to the wild, what happened was that the researchers let some of the colonies just sort of exist on their own. And with other colonies, they actually prevented invading spiders from coming in. Now, when they did that they didn't notice any difference in the success between the docile spiders and the aggressive spiders, but when these spiders were left to fend for themselves, at first the docile spiders seemed to be doing better, but a few years into the study the docile spiders were really starting to decline. A lot of the colonies had disappeared, and by the end of the study all of the docile spider colonies had disappeared. Meanwhile with the aggressive spiders, three-quarters of the original nests were still standing.

Interviewer – Kerry Klein

So what happened here was nice spiders did better in the short term; mean spiders did much better in the long term.

Interviewee – David Grimm

Right and it seems to be because nice spiders, although they get along well with each other, they're not very good at defending their colonies. And while this mutual sort of cooperation will be good in the short term, in the long term, it's really bad because you're not going to be able to defend yourself against enemies. Where the aggressive spiders, even though there's a lot of in-fighting, and they're probably killing each other a bit, that personality really protects the colony as a whole. And in the long term that's really good for the population.

Interviewer – Kerry Klein

So does this mean that meaner is better?

Interviewee – David Grimm

It kind of does. It does mean that from an evolutionary standpoint, it's better to be a jerk than to be a nice guy, but the researcher says that actually a mix is probably good because if you have these aggressive spiders that defend the nest, the docile spiders probably do important things. They probably gather food. They probably take care of the young – also very critical functions for the colony although apparently not as critical as being able to fight off an enemy.

Interviewer – Kerry Klein

Right, well interesting implications for international diplomacy.

Interviewee – David Grimm

Right.

Interviewer – Kerry Klein

All right, moving on, a new look at the origins of language.

Interviewee – David Grimm

Well Kerry, this story suggests rather controversially that some of the words you and I are speaking right now may date back more than 15,000 years to a time when people may

have been sitting around campfires and watching the glaciers recede at the end of the last ice age.

Interviewer – Kerry Klein

Why is that a controversial view? How old are most languages and words today considered to be?

Interviewee – David Grimm

Well, it's a very tricky field to figure out how old some languages are, but researchers in the past few years have focused on something called cognates, which are basically words that are shared between two different languages. For example, the word for "mother" in French is *mère*; not exactly the same word, but it's clear that there are some similarities there. Researchers actually can look at them the same way scientists look at genes. For example, we share 99% of our genes with chimpanzees. That means we're really highly related; we diverged fairly recently. We don't share that many genes with turtles, which means, from an evolutionary perspective, we're much more distant relations. Researchers can do something similar with cognates and language. Using these methods, researchers have dated many common words back as far as 9,000 years ago. They've suggested there's this ancestral language known as Proto-Indo-European, which gave rise to languages including Hindi, Russian, French, English, and Gaelic. But this new study stretches things back even further. It suggests that maybe there's an ancestral language that existed not 9,000 years ago, but as far back as 15,000 years ago.

Interviewer – Kerry Klein

Okay, so researchers had previously used this method similar to genetics that languages that share more words diverged more recently from a common ancestor. What was new about this particular study that got this much older common ancestor?

Interviewee – David Grimm

Well, this new study focused a little less on cognates and focused more on the frequency of the word's use, the part of speech it was – a noun, verb, *et cetera*. They kind of ignored the sound; they were trying to find more basic ways that words can be related to each other. And then they looked at seven major language families. These included Indo-European, Eskimo, the group of non-Russian languages around Siberia. And they sort of combined all this together. They used some statistical methods again, and they found that there was core group of about 23 very common words that were used about once per 1,000 words in everyday speech. That not only persists in each of these language groups, but also sounds similar to the corresponding words in other families. For example, the word "thou" has a sound and meaning among all seven language families they studied. And they looked at the rate of change of these words over time, and the statistical model they used suggested that some of these words have retained a similar form since about 14,500 years ago. And this suggests the existence of an ancient Eurasiatic language that gave rise to many of the languages that are spoken today. And not only that, but some of the words may actually be similar to the words we speak today, even in English.

Interviewer – Kerry Klein

Okay. And our last story is about a very bizarre find in South America.

Interviewee – David Grimm

Kerry, I would say this is probably one of the strangest stories we've ever run *ScienceNOW*, and that's saying a lot. This story deals with a very unusual skeleton found in the Chilean desert about 10 years ago.

Interviewer – Kerry Klein

So why is this skeleton making the news?

Interviewee – David Grimm

Well, it's a very strange skeleton. We've actually got some pictures of it on the site. First of all, it's very tiny; it's only six inches tall. It looks like a human, but the head is very misshapen. It actually looks a bit like some alien heads if you're a fan of science fiction. It was found, apparently, in a pouch in a ghost town in the Atacama Desert of Chile. There's been recent documentary where a filmmaker has proposed that this is evidence of alien life. So there's a lot of controversy. There's a lot of strangeness swirling around this skeleton.

Interviewer – Kerry Klein

Right. And this picture just looks unreal. I mean it looks like something straight out of a fictional movie, a scifi movie. So my first question is is this for real?

Interviewee – David Grimm

And that was really the first question of the scientist that actually got involved in this study about a year ago. He had heard about the film. He had heard about the skeleton. He had heard it was sort of being hyped as alien life. He is an immunologist, and he said, let me lend some of my scientific expertise here. What he found right away was some other unusual things about the skeleton. First of all this specimen, which has been referred to as Ata, sports 10 ribs instead of the usual 12. He took some pictures to some doctors in the neonatal care unit at the hospital he worked at, and they said they'd never seen anything like it before. One of the going hypotheses was that this skeleton was potentially tens of thousands of years old. But when this researcher started doing some DNA analysis on it, he found it was only a few decades old. More importantly the DNA suggested this was indeed a human being. It was not an alien. And actually some specific analysis suggested that the specimen's mother came from Chile, so it probably died in the same region that it was found in.

Interviewer – Kerry Klein

Wow, what a disappointment. It's really human.

Interviewee – David Grimm

It's really human. Probably one of the most bizarre things that came out of the analysis was that the bone development suggests that this was actually a 6- to 8-year old child.

Interviewer – Kerry Klein

And it's six inches long.

Interviewee – David Grimm

Which is six inches high, which makes almost no sense. There is a couple going hypotheses. One is that Ata had a very severe form of dwarfism; was actually born as a very tiny human, lived until about 6- to 8-years old, and died. The other theory is that this was actually a fetus that suffered from some sort of severe form of rapid aging disease, which would have given it the bone structure of a 6- to 8-year old child, but that it died in the womb or died right after being born. There are ways to determine which of these is true or if potentially something else is true by some further analysis, which is ongoing.

Interviewer – Kerry Klein

So even though some mysteries remain, this scientist, Gary Nolan, actually debunked an alien theory with science.

Interviewee – David Grimm

He did. So that's a disappointment for those of us out there that were sort of hoping for evidence of alien life, but there's still a lot of really cool things going on here that remain to be teased out.

Interviewer – Kerry Klein

Great! Well, what else have we had on the site this week?

Interviewee – David Grimm

Well Kerry, for *ScienceNOW*, we've got a story about a story about a rejuvenating hormone that's been found to reverse symptoms of heart failure. Also a story about using mosquitos to fight malaria. For *ScienceInsider*, our policy blog, we've got a story about what the U.S. Senate is doing to address a shortage of helium in the United States – didn't even know that was happening. And also a story about how the retirement of a prominent proponent of teaching evolution in American schools will affect the future of U.S. science education. Finally for *ScienceLive*, our weekly chat on the hottest topics in science, this week's *ScienceLive* is about the search for exoplanets and alien life, not alien life in Chile's desert, but alien life out there in space. Next week's *ScienceLive* is about the fate of the world's bees – why so many of them keep on dying. So be sure to check out all of these stories on the site.

Interviewer – Kerry Klein

Thanks, Dave.

Interviewee – David Grimm

Thanks, Kerry.

Interviewer – Kerry Klein

David Grimm is the online news editor of *Science*. You can check out all of our news at news.sciencemag.org, including daily stories from *ScienceNOW*, science policy from *ScienceInsider*, and *ScienceLive*, live chats on the hottest science topics every Thursday at 3 p.m. U.S. Eastern time.